Original scientific paper

Economics of Agriculture 4/2017
UDC: 338.435:663.551.5

STUDY ON THE POTENTIAL OF SUBCONTRACT PALINKA DISTILLATION

***Imre Milán Harcsa*[1]**

Summary

Hungary has a centuries-long palinka distilling tradition. Palinka is prepared by the traditional method of "Kisusti" or the more economical single-step technology. Methods for the improvement of the quality and cost-efficiency of palinka preparation will include investments into an up-to-date technology, the focal point of my investigation in the present paper in terms of economic indicators (net present value), internal rate of return, profitability index and discount rate time. The calculations assessed several (optimistic, realistic and pessimistic) scenarios. Legislative changes have exerted a considerable impact on the turnover of palinka distilleries, and the re-introduction of the excise tax for subcontract distilling has resulted in frequent changes since 2010 and indicated an unpromising tendency. A further problem concerns dependence on agricultural source material production (fruit production) and the existence of home distilling. In conclusion, beneficial economic conditions will be the key elements in the implementation of the investment mentioned above.

Key words: *palinka, investment economic benefits, net present value, single-step distillation, scenario analysis.*

JEL: *O13*

Introduction

What is palinka? Palinka is a traditional Hungarian fruit spirit prepared exclusively by the distillation of fruit mash or fruit pulp. The production of Hungarian palinka is regulated by Hungarian local law LXXIII of 2008, often referred to as "palinka law", which is based on the regulation of generic fruit spirits of the European Union. An alcoholic beverage may be called palinka if:

1. it is fermented exclusively from fruit (excluding concentrates and dried fruits) grown in Hungary, and free of additional ingredients.

1 Imre Milan Harcsa Ph.D. student, Faculty of Economics and Business, University of Debrecen, Hungary. 4032 Debrecen Böszörményi Street no. 138. Phone: +36 70 331 61 08, E-mail: harcsa.i.milan@gmail.com

2. is grown, distilled and bottled in Hungary,

3. is not rectified higher than 86% and is bottled with at least 37.5% ABV.

In 2004 the European Union accepted palinka as a Hungarian speciality, and hence its production is limited to Hungary (and four provinces of Austria for palinka made from apricots) (*Harcsa et al., 2014*).

Subcontract distillation means that experts rectify distillates out of mash prepared by individuals in the course of one or two distillations, using copper or acid-resistant distillery equipment. Under this subcontract the volume of authorized pálinka is 43 Hlf (V/V %) per household and the products shall not be marketed and sold.

Hungary has a long tradition in palinka distillation. The two methods of palinka preparation, the Hungarian "Kisusti" and the German "columnar" technologies differ substantially. The Hungarian "Kisusti" method processes the mash by phased distillation, whereas the "columnar" system uses only a one-step distillation and the applied method in this case is rectification. Palinka distillation is a time and energy-intensive process. It is especially true of the traditional, "Kisusti" technology, where heating and cooling are carried out twice (*Bánvölgyi et al., 2013; Harcsa et al., 2014*).

"Everywhere, producers seek to produce the highest possible volume of best quality products with the least possible input, offering a sustainable supply at a low price (once these conditions are fulfilled, profit is reasonable)" (*Szűcs, Nagy, 2004*).

Being the head of the Hun-Dest Drink Kft., it is especially important for me to meet the demands of subcontract distillers for high-quality palinka. The history of our palinka distillery looks back to more than 30 years: my father established it in 1983 and operated it until 1997. After his death, the production unfortunately ceased and then re-started in 2001; however, due to its high costs (paid employees) it was not economically feasible and was closed again. Having obtained the required qualifications I set up a company with my sister in 2010 and we endeavored to re-start the distillery and acquire the necessary authorizations. All these activities lasted for a year. Promising economic conditions induced a massive surge in production, but the introduction of the excise tax on subcontract distillation from 2015 resulted in a setback of demand and our company suffered losses.

To limit and minimize the losses, we considered the purchase of a modern, single-step distilling equipment. Investment efficiency calculations were carried out to explore the potential of this investment as it is introduced in the following part of the study.

My research will hopefully provide assistance to micro-enterprises engaged in similar developments in their overview of the given situation and decision-making.

Investigation objectives

On the leading edge of my research is the investigation of the development potential of a palinka distillery with the traditional equipment, by investment viability calculations. My research is aimed at addressing the question of internal rate of return for a modern,

single-step distilling device. My calculations assessed several (optimistic, realistic and pessimistic) scenarios. These will be discussed in the following chapter. Investment is expected to pay off in the accounting period of asset depreciation, i.e. within 7 years. My baseline hypothesis asserts that the operation of the single-step palinka distilling equipment is profitable and it pays off within a short period of time. My research approach is not merely theoretical as its focal point is support for a real-life investment and the results obtained lend themselves to their utilization for other subcontract distilleries with the same business profile and objectives. It must be noted, however, that significant differences may occur in the cost-benefit conditions of distilleries due to their geographical locations, the main sources of fruit supplies, customers, supply chains and applied technological solutions.

Research methodology
Assumptions, standard base line data

1. Conditions of the quantity of subcontract distillation

The base line for the examination of the optimistic scenario is the distillate quantity produced in 2013, for each year in the research period. This allows standard high turnover and approximately full capacity utilization. In the year mentioned above 7.712.9 hld distillate was prepared for 338 subcontract distillers in the plant of Hun-Dest Drink Kft, which equals to 15.425.8 litres of 50% palinka.

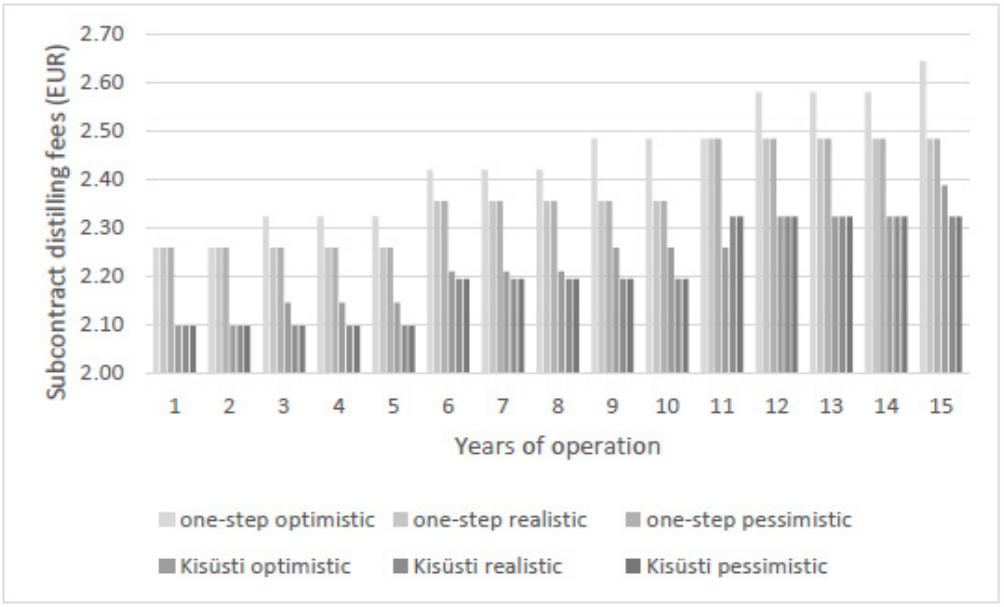
In case of the realistic and pessimistic scenarios, I drew the baseline data from the turnover of my own enterprise in 2015. Willingness to subcontract distillation was considerably influenced by the excise tax enacted from January 2015, and by the purchase price, quantity and quality of fruits. Another reason for the declining trend in subcontract distillation is stocks accumulated earlier, in addition to legal and illegal home distillation. In the year mentioned above 2.346 hld distillate was prepared for 107 subcontract distillers in the plant of Hun-Dest Drink Kft, which equals to 4.692 litres of 50% palinka. According to the realistic scenario, the turnover is expected to grow by 10% from the second year of production.

Based on the pessimistic scenario, distillation will stagnate in the first three years of operation. Subsequently, from the fourth year, willingness to subcontract distillation (therefore, the volume of palinka) will be expected to grow by 3% annually.

2. Conditions of subcontract distillation fees

Subcontract distillers, like every Hungarian consumer, are highly price sensitive. This is partly the reason why palinka distilleries with the traditional technology and typically lower subcontract fees seem to be attractive for them. My calculations were based on the following operational subcontract distillation fees on the following bar graph.

Figure 1. Movements of subcontract distillation fees according to the optimistic, realistic and pessimistic scenarios, depending on the technology used (EUR/litre, palinka of 50%)



Source: Author's development

According to the optimistic scenario, prices would rise in the third year of operation, and consequently in the 6., 9., 12., 15. years, adjusting to rising operating costs.

In the realistic and pessimistic cases subcontract distillation fees are left unchanged for five years to preserve the loyalty of the few customers or to attract new ones. Prices will be risen in the 6. and 11. years. Consequently, cost increases will be difficult to keep up with.

3. Assumptions on the revenue and costs in the first year of operation

From the second year, costs are expected to rise by approximately 3% annually (based on the Author's data).

Table 1. Development of varying revenues and costs depending on different technologies used according to the optimistic scenario, in the first year of operation (EUR)

	Kisusti technology	**Single-step technology**
Revenue	32.344.42	34.832.45
Labor costs and social contributions	7.741.94	7.741.94
Depreciation expense	0	2806.45

Material costs, of which	6.528.77	5.021.94
- Firewood	4.361.29	3.270.97
- Electric energy costs	929.03	774.19
- Cooling and washing water need	915.87	654.19
- Cleaning and washing liquids	161.29	161.29
- Protective clothing	161.29	161.29
Services received	4.903.23	4.806.45
- Transport of mash	1.032.26	1.032.26
	Kisusti technology	**Single-step technology**
- Marketing costs	967.74	967.74
- Internet, telephone bills	774.19	774.19
- Banking costs	580.65	580.65
- Maintenance and repair costs	580.65	483.87
- Accounting fees	580.65	580.65
- Safeguarding and security costs of the plant	387.10	387.10
Other costs	161.29	161.29
- Costs of representation	161.29	161.29

Source: Author's development

Table 2. Development of varying revenues and costs depending on different technologies used according to the realistic and pessimistic scenario, in the first year of operation (EUR)

	Kisusti technology	**Single-step technology**
Revenue	9.838.06	10.594.84
Labor costs and social contributions	7.741.94	7.741.94
Depreciation expense	0	2.806.45
Material costs, of which	1.990.97	1.538.71
- Firewood	1.308.39	981.29
- Electric energy costs	278.71	232.26
- Cooling and washing water need	274.84	196.13
- Cleaning and washing liquids	48.39	48.39
- Protective clothing	80.65	80.65
Services received	4.180.65	4.083.87
- Transport of mash	309.68	309.68
- Marketing costs	967.74	967.74
- Internet, telephone bills	774.19	774.19
- Banking costs	580.65	580.65
- Maintenance and repair costs	580.65	483.87
- Accounting fees	580.65	580.65
- Safeguarding and security costs of the plant	387.10	387.10
Other costs	80.65	80.65
- Costs of representation	80.65	80.65

Source: Author's development

4. Factors taken into consideration in the calculation of the discount rate

As Nábrádi and Szöllősi (2007) suggest, the following factors will be integrated in the discount rate:

- risk-free interest rate: equal to the Central Bank base rate, 1.35% (since October 2015)
- risk premium: 200% of the corporate loan interest rate (2.5%), 5%
- surplus premium 2%

Therefore, the value of the discount rate is 8.35%.

Methods of calculation

When an enterprise assesses the financial feasibility of its investment decisions, due consideration will also be given to the time value of money. As static indices fail to take account of it, my research carried out profitability calculations.

The interest rate, i.e. the discount rate used for the representation of the time value of money:

- expresses the return on the investment and

- makes it possible to add up the incoming and outgoing sums of varying volumes, at different dates" (*Tétényi, 2001:17.p.*)

The discount rate often refers to the minimum expected return on an investment. Its value is sometimes set in relation to alternative investments (e.g. bonds or money market funds).

Return on an investment is a key issue for entrepreneurs, i.e. generated cash flows should exceed the amount of invested money. (Anthony et al., 1992) Investments are analyzed by multiple methods, as the related expenses and returns occur at different times. (Kay, Edwards, 1994) The internal rate of return and net present value are the most often used methods by large companies for the evaluation of their investments. In the calculation, incoming money is regarded as a positive, whereas outgoing money, including the initial investment, a negative cash flow. In case the net present value of all cash flows is positive, taking account of the postulated internal rate of return, the actual rate of return obtained will exceed the expected one. However, if the net present value of cash flows is negative, the actual rate of return will be lower than the expected one. (Budnick, 1988)

The history of net present value calculation goes back as far as the XIX. Century. Karl Marx studied the rate of return, but it was Irving Fisher, who spread the use of the method. (Bóta, 2006) Net present value calculation is one of the basic methods of dynamic investment profitability assessments. Investments usually begin with an initial investment and require lesser or higher sums invested until the recovery phase. However, various inputs and returns fail to occur at the same time, making the traditional methods unsuitable for adding them up. Net present value calculation eliminates this

problem by taking account of the time value of money, to enable the calculation of all the returns in relation to the expected inputs and returns. The formula is the following:

$$NPV = -C_0 + \sum_{t=1}^{n} \frac{C_t}{(1+r)^t}$$

Where

t - the date of the given cash flow (e.g.: 3 if in the third year)
n - the length of the whole time period
r – rate of interest
C_t - net cash flow (amount of money) at t point of time
C_0 – the amount of money invested at 0 point of time (t = 0)

Evaluation
Assuming NPV > 0, the investment is feasible
Assuming NPV < 0, the investment is not feasible as it incurs the losses of assets.
Assuming NPV = 0, return on our investment is generated once

Nábrádi and Szőllősi (2007) discussed the special features of NPV calculations in their study. They claimed that inflation, risk and other factors would be reasonably included in the calculation of the interest rate.

Net present value in itself is not sufficient to bring investment-related decisions. Net present value can be expressed on the basis of the internal rate of return. The internal rate of return (IRR) is equal to the discount rate where the net present value is zero. This method is suitable for ranking the investments with different life cycles and initial investment costs. In this case, the alternative with the highest IRR is recommended. (Kay, Edwards, 1994) IRR is the rate of interest that makes incoming and outgoing cash flows precisely equal. Thus we can obtain the value where the net present value is zero. (Helfert, 2001) The IRR method encompasses the discounting principle and it determines the percentage of return on the invested capital. (Warren, 1982) IRR is also called the marginal efficiency of capital.

$$-C_0 + \sum_{t=1}^{n} \frac{C_t}{(1+IRR)^t} = 0$$

If IRR is above (or equal) than the selected discount rate (r) then the investment is reasonable.

The Profitability Index (PI) indicates the present value for a unit of investment. The investment is acceptable, if PI > 1. In those cases, when the amount of available capital is limited, the profitability index proves to be a useful means of ranking several projects that are independent from each other. (Lee et al., 1980), (Brealey et al., 2006).

$$P = \frac{\sum_{t=1}^{n} \frac{C_t}{(1+r)^t}}{-C_0}$$

The Discounted Payback Period (DPP) addresses the number of years needed for the initial capital investment to result in returns on the discounted cash flow of the investment.

Table 3. Correlations of economic efficiency indicators of investments

Net present value (NPV)	Discount rate ("r")	IRR Internal Rate of Return (IRR)	Profitability index (PI)
Zero	Equals to IRR	Equals to "r"	1 (one)
Above zero	Below zero	Above "r"	Above 1
Negative	Above IRR	Below "r"	Below 1

Source: Nábrádi, Felföldi, 2007.

In decision-making, all the methods listed above will be taken into consideration, as each of them has its strengths and weaknesses. Table 4 illustrates this.

Table 4. Strengths and weaknesses of economic efficiency indicators of investments

Method	Strengths	Weaknesses
NPV	- considers all relevant information - it is directly connected with the strategic objectives of most enterprises - NPV is additive, thus it can be easily supplemented with alternative evaluations	- it shows the absolute, and not the specific increase in the assets
IRR	- illustrates the internal rate of return in invested capital % - in most cases, its result is equal to NPV	- with mutually exclusive programs it may lead to fallacious results - it is not available for use if cash flows are irregular its manual calculation is cumbersome
PI	- indicates specific changes in assets	- with mutually exclusive programs it may lead to fallacious results
DPP	- if solvency is uncertain, it is unavoidable - it takes the time value of money into account	- it fails to consider the cash flows following the returns - it encourages the launch of hazardous investments

Source: Author's development based on Reference 15.

In the literature on the calculation of the economic efficiency of investments the majority of authors recommend the calculations with after tax cash flows. Factors to be taken into consideration include investment loans and depreciation. Credit interest increases expenses, therefore it decreases taxable income. Depreciation is not used in cash flow calculations, as it is not a financial expenditure. However, depreciation reduces taxable income and thus the amount of corporate tax. (Kay, Edwards, 1994), (Lee et al., 1980)

Results and their evaluations

1. Retaining the "Kisusti" system without using it.

The traditional Kisusti" system should be retained for subsequent refurbishment and modernization, as the purchase price of a complete, new distilling equipment is over 32.000 EUR.

Table 5. Economic efficiency indicators of investments in the 7. year of operation, retaining the "Kisusti" system without using it.

	NPV (EUR)	IRR (%)	PI	DPP (year)
optimistic	2.947.03	12.52	1.152	5.95
realistic	-10.629.48	-9.58	0.451	15.65
pessimistic	-12.253.85	-14.43	0.367	There's no return

Source: Author's development

According to the optimistic scenario, the investment will pay off due to the amount (considered average from subcontractor perspective) of palinka distillate produced during 6 years.

According to the realistic scenario, if the investment is implemented in the conditions presented above, losses would occur for 7 years, i.e. over the full depreciation period of the equipment. In the 8th year, however, low cost operation and high available turnover will have beneficial effects and result up to 300% profit after tax (1.019.35 vs 3.248.39 EUR) compared to the Kisusti Technology. The single-step technology will retain its considerable advantage subsequently and lead to a surplus of approximately 3.200 EUR annually. The examination of the discount payback time suggests that the investment (19.400 EUR for a 15 year study period) would not yield returns over 15 years, so the option is unacceptable.

In the pessimistic case modest turnover growth is insufficient to offset the operating costs and leads to loss-making operation in the long term. In this case neither the investment, nor the retention of the traditional technology are economical.

2. Retaining and using the Kisusti system

2.1. Optimistic scenario

Customers may stick to the taste of the traditional Kisusti and find it difficult to accept the new product. The old technology may also be useful when the new equipment needs to be repaired, to prevent downtime and to continue production.

Once the traditional equipment will be retained, it is worth making use of it, even if on a limited scale. My calculations addressed the question what combination would be needed to ensure a short payback time.

My first hypothesis establishes that the two technologies can be used in 50-50%. In this case the discount payback time will be 13.87. The net present value of surplus cash

flows compared to the use of the Kisusti system will yield positive results only in the 14th year. In this case:

NPV (EUR)	IRR (%)	PI	DPP (year)
120.45	8.45	1.006	13.87

Consequently, the proportion of the Kisusti system was decreased to 30%. In this case the discount payback time will be 8.94 years. If so, in the 9th year of operation:

NPV (EUR)	IRR (%)	PI	DPP (year)
104.63	8.48	1.005	8.94

The scenario is optimal if the significant part of the production is carried out by the modern technology and the Kisusti system is merely used to meet demands if the customers expressly so request, or under the maintenance of the single-step equipment. Given this, the traditional technology would be merely applied to produce 10% of the palinka output. In this case the discount payback time will be 6.66 years, i.e. the investment would already result in a return in the depreciation period. In the 7th year:

NPV (EUR)	IRR (%)	PI	DPP (year)
861.22	9.6	1.044	6.66

2.2. Realistic

According to the realistic scenario, subcontract distillers are less inclined to accept the product development, a part of them continue to stick to the traditional taste and odour of Kisusti palinka. If this is so, the following combinations may be used:

If the two different distillation methods are applied in 50-50%, DPP will just be within the remaining useful life of the asset.

NPV (EUR)	IRR (%)	PI	DPP (year)
788.72	8.82	1.041	14.6

As long as customers can be gained by the new type of palinka with more intensive odour but less characteristic taste, an increasing number of them will opt for the single-step technology. If this proportion is shifted in favor of the modern technology by 10%, we will get the following figures:

NPV (EUR)	IRR (%)	PI	DPP (year)
341.08	8.57	1.018	13.83

The investment will result in a return not much sooner, in 13.11 years if the proportion of Kisusti technology is merely 30% in production. Then the economic efficiency indicators of the investment in the 14th year shall be as follows:

NPV (EUR)	IRR (%)	PI	DPP (year)
1.858.11	9.54	1.096	13.11

2.3. Pessimistic

Subcontract distillers tend to refuse the application of the modern technology. A significant method of production is the Kisusti technology. According to this scenario, the investment will not result in a return during the useful life of the asset. If 60% of the palinka output is produced by the single-step method, the generated surplus cash flows set against the pessimistic scenario examined above will guarantee the return in the 10th year of operation. The results of the calculations shall be the following:

NPV (EUR)	IRR (%)	PI	DPP (year)
1.685.81	9.63	1.087	9.58

3. Sale of the Kisusti system, use of the single-step technology

Assuming that customers will accept the new method of distillation, selling the Kisusti equipment of high operating costs may come as a logical decision at the price of 9700 EUR. The initial cash flow required for investment purposes will be cut by 50% accordingly, and it will lead to a faster payback period. Therefore the investment will pay off within 15 years even in the pessimistic case.

Table 6. Economic efficiency indicators of investments in the 7. year of operation, after the sale of the "Kisusti" system

	NPV (EUR)	IRR (%)	PI	DPP (year)
optimistic	12.624.45	39	1.305	2.93
realistic	-952.061	5.65	0.902	7.81
pessimistic	-2.576.43	0.15%	0.734	10.35

Source: Author's development

4. Following the depreciation and sale of the Kisusti system

The old technology and the old equipment will be sold at the end of the 7-year depreciation period at the price of 6.500 EUR.

Table 7. Economic efficiency indicators of investments in the 7. year of operation, following the sale of the "Kisusti" system and the single step equipment, after depreciation.

	NPV (EUR)	IRR (%)	PI	DPP (year)
optimistic	14.464.52	40.53	2.495	2.78
realistic	3.060.78	16.69	1.316	6.02
pessimistic	3.634.19	20.44	1.376	4.97

Source: Author's development

In this case, all the three investigated scenarios ensure returns.

Summary notes, conclusions and recommendations

The investment is worth putting into practice:

- in the optimistic case, retaining the Kisusti system, without using it

- in the optimistic case, retaining the Kisusti system, using it in 10%

- in the optimistic case, selling the Kisusti system

- in the optimistic, realistic and pessimistic cases, after the sale of the Kisusti system and the single step equipment following the depreciation period.

Although the optimistic scenarios may seem to be attractive, having regard to the actual economic situation, it is worth being realistic as from January to October 2015 (almost all the year) the volume of the distillate produced in our plant approximated that of produced in October 2014. Willingness for subcontract distillation dropped significantly due to the re-enacted palinka tax as of 1 January 2015 on legal and illegal home distilling. There is a strong probability that it may be true of other palinka distillers as well.

In the realistic case the investment would result a return on condition the assets are put on sale. If the discount rate is decreased, the equipment would pay off its price even if it remains unsold and merely the Kisusti technology is discarded. However, it poses the risk of losing customers, as some of them were attracted specifically by our technology and disliked the distillate prepared by the modern technology, saying: "For good work tradition is needed". Consequently, traditional technology and heating are the main attractions for subcontract distillers in the Kisvárda small region.

The discussion of the potential modernization of the present, traditional technology is beyond the scope of this study (e.g. replacing the traditional heating method with a fast steam generator), but it represents an alternative to cut costs and decrease the distilling time.

The list of costs clearly indicates that the highest ones are the wages and employers' contributions (per person). Unfortunately, enterprises cannot change this situation, but working hours can be better exploited if two distilling equipment will work simultaneously and the scope of activities will be extended. As an alternative, commercial palinka distillation is to be continued, as its excise deposit in the case of a limited amount is approx 6.500 EUR.

In conclusion, a beneficial economic condition will be the key element in the implementation of the investment mentioned above. The current situation seems to be fluid: home-made palinka distillation has become actually taxable since January 2016 (In 2015 3.2 EUR flat rate contribution was imposed on those who sent their distilling activity statements to the tax office.) The excise duty on 1 litre home-made palinka is 2.3 EUR, whereas that of subcontract palinka distillate is 2.7 EUR. In my work I frequently meet the officers of National Tax and Customs Administration who reported that some distilleries remained closed from the 2015 season. I consider that

the professional experience gained in the next few years will still be essential before implementing investments for the development of the distilling plant.

Literature

1. Anthony, R. N. – Dearden, J. – Govindarajan, V. (1992): *Management Control Systems*. Seventh Edition, IRWIN, Boston, MA 02116, 290–292, 388–389. p.
2. Bánvölgyi Sz. – Galambos I. – Márki E. – Vatai Gy. (2013): *A palinkakészítés műveletei és berendezései.* Egyetemi jegyzet, BCE, Budapest, p. 107-114.
3. Bóta G. (2006): *Vállalati gazdasági elemzések reálopciókkal.* Ph.D. dissertation, Budapesti Műszaki és Gazdaságtudományi Egyetem, Budapest, p. 6-20.
4. Brealey, R. A. – Myers, S. C. – Allen, F. (2006): *Corporate Finance.* Eight Edition, McGraw-Hill, 84–143. p., 244–272. p.
5. Budnick, F. S. (1988): *Applied Mathematics for Business, Economics, and the Social Sciences.* Third Edition, McGraw-Hill International Edition, 894–897. p.
6. Harcsa I. M. – Nábrádi A. – Tar I. (2014): *Hungarian spirits Palinka as a hungaricum I.* In: APSTRACT Vol. 8. Number 2–3. 2014, p. 133-141. DOI: 10.19041/APSTRACT/2014/2-3/16
7. Helfert, E. R. (2001): *Financial Analysis: Tools and Techniques, A Guide for Managers,* McGraw-Hill, 221–296. p.
8. Kay, R. D. – Edwards, W. M. (1994): *Farm Management.* Third Edition, McGraw-Hill, 281–299. p.
9. Lee, W. F. – Boehlje, M. D. – Nelson, A. G. – Murray, W. G. (1980): *Agricultural Finance.* Seventh Edition, the Iowa State University Press, Ames, 59–80. p
10. Nábrádi A. – Felföldi J. (2007): *A mezőgazdsaági vállalkozások eredményének mérése.* In: [ed(s): Nábrádi A. , Pupos T. , Takácsné György K.], Üzemtan I., Debrecen: Debreceni Egyetem, Agrár- és Műszaki Tudományok Centruma. p. 85-97.
11. Nábrádi A. – Szőllősi L. (2007): *Key aspects of investment analysis.* In APSTRACT 2007/1 Agroinform Kiadó, Budapest, p. 53-56. DOI: 10.19041/Apstract/2007/1/7
12. Szűcs I. – Nagy L. (2004): *Gyakorlati alkalmazások – Az üzleti tervezés gyakorlata.* Campus Kiadó, Debrecen, p. 55-59.
13. Tétényi V. (2001): *Pénzügyi és vállalkozásfinanszírozási ismeretek.* Perfekt Kiadó, p. 17-23.
14. Warren, M. F. (1982): *Financial Management for Farmers, the Basic Techniques of 'Money Farming'.* Third Edition, Stanly Thornes Ltd, 240–246., 259–260. p.
15. http://193.6.12.228/uigtk/uipz/hallgatoi/befdont.pdf (access: 2017.06.01)

UDC 338.43:63 **ISSN 0352-3462**

ECONOMICS OF AGRICULTURE

CONTENT