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Evaluation of the economic viability of forest management by the Forest Experimental Station in Krynica

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Abstract. The Forest Experimental Station (FES) in Krynica is a unit specialized in teaching activities. However, it also fulfils other educational, ecological and social functions. Additionally, as the FES in Krynica operates on the free market and needs to be competitive, primarily with respect to the raw timber prizes, it is also a forest management unit that can be subjected to economic evaluation. The aim of this study was to analyze the income, costs and overall financial outcome of the FES in Krynica for the years of 2008–2012. A financial analysis, using indicators of financial liquidity, profitability, economic activity and liabilities, was also carried out to evaluate the economic effectiveness and efficiency of the forest management unit's operation. The data was obtained from financial documents, particularly balance sheets, as well as profit and loss accounts.

In the years of 2008–2012, mean income and costs of the FES in Krynica amounted to 7 121.1 thous. PLN/year and 6 478.2 thous. PLN/year, respectively. The net financial outcome was positive and amounted to a mean of 628.8 thous. PLN/year. The proportionof the sale income compared to the total income from all activities carried out by the unit increased from 93% to 96%. This included income from the sale of products, goods and materials, which increased by 57% mainly due to an increase in the income from timber sales (ca. 83%). Costs incurred by the unit increased as well, being 40% higher in 2012 than in 2008, while the cost level indicator decreased by ca. 8%. In the examined time period, the economic effectiveness and efficiency of the unit's operation improved, as evidenced by the increasing profits and the values of the profitability indicators.

Results obtained in the comprehensive analysis of the financial situation in the FES in Krynica provide a basis for the evaluation of economic processes and for appropriate decision making concerning wealth management and the direction of future development. In the evaluation of the economic and financial activity of the FES in Krynica, the increase inprofitability in the analysed time period, as concluded from the indicator of turnover profitability, was particularly noteworthy. The financial indicator values greatly exceed reference values only on the level of financial liquidity. The liability indicators served as evidence of obvious financial independence of the FES in Krynica.

Keywords: profitability, financial management, ratio analysis, Forest Experimental Station in Krynica

1. Introduction

In Poland, the sustainable forest management is carried out in compliance with the forest management plan, with a special emphasis on the implementation of the objectives and principles of the Act on Forests (Ustawa o lasach 1991). At the same time, the managers of public forests are obliged to put into practice the regulations of, among others, the Nature Conservation Act (Ustawa o ochronie przyrody 2004) and the Act on Accounting (Ustawa o rachunkowości 1994). The management of forest resources is a complex task and depends upon numerous natural, economic and market factors. Forest management can be evaluated with the use of economic indicators, given that a basic measure of forest management effectiveness is its profitability (Zając 1998). In order to gain knowledge on economic effectiveness of management of a given forest unit, it is pertinent to conduct a cost and revenue analysis, as well as a financial result analysis. An analysis on economic activities is called "economic analysis" (Bednarski 2007). In the present paper, we have focused on the microeconomic analysis, comprising both

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technical economic analysis and financial analysis. The latter provides analytic information, which is used in further assessments of economic units and the decisions taken by managers of a given entity. It also enables forecasting future events, based on information on past relationships (Siudek 2004).

2. Study objective

An analysis of the selected aspects of financial management of the Forest Experimental Station (FES) in Krynica, Poland was carried out in the years 2008–2012, with the aim to evaluate the FES economic effectiveness, operational efficiency, financial condition and development perspectives. In particular, the analysis concerned: (1) the total revenue, mainly from timber sales, (2) the costs connected with conducting economic activities, especially those associated with timber extraction, silviculture and forest protection, as well as game management, (3) financial results. The FES financial analysis was performed with the use of financial ratios addressing financial liquidity, profitability, economic activity and debts. Also, an attempt was made to determine the usefulness of ratios selected in the evaluation of the financial condition of FES Krynica.

3. Methods

The financial statements were used as the data source. The balance sheets and profit and loss accounts for the years 2008–2012 were used in the analysis of FES Krynica incomes and deductible costs, as well as in the analysis of financial ratios. Moreover, in the analysis of revenues, especially those from timber sales (counting harvesting costs), the data provided by FES Krynica were used, such as the cost statements of the economic activities, prepared in accordance with the expenses by function (accounts from the group 5) and information on income (accounts from the group 7).

Particular attention was paid to the revenues from FES Krynica timber sales, as well as the costs of timber extraction in 2008–2012. At the same time, the per unit costs of timber extraction were calculated. The analysis concerned forest management costs, and especially those of forest silviculture and protection, as well as game management. The cost level indicators of timber sale and overall FES Krynica activity were also calculated. The lower is the value of the cost level indicator of timber sale, the higher is economic effectiveness of the enterprise (Gabrusewicz 2002).

The financial result is a basic ratio used in the evaluation of enterprise activity. The financial result is expressed by the net value, and the gross financial result includes incomes and losses, after the payment of tax (Leszczyński, Skowronek-Mielczarek 2004). The following aspects were considered in the analysis of the financial result: the absolute value of the financial result in consideration of its character (gain/loss) and the structure and dynamics of the financial result, namely, the shares of partial financial results.

The analysis of financial ratios aims to evaluate a given enterprise with the use of the determined measures of economic activity that take the form of absolute or relative values. The analysis allows for the evaluation of the past and present economic activities, as well as to forecast future activity (Bednarski 2007). The analysis in the present study was performed using the following ratios concerning enterprise financial liquidity, profitability, economic activity and debts:

- I degree financial liquidity = current assets [PLN]/current liabilities [PLN][1],
- II degree financial liquidity = current assets – stocks–current payables and accrued expenses[PLN]/current liabilities [PLN][2],
- III degree financial liquidity = cash [PLN] / current liabilities [PLN][3],
- return on net sales (ROS) = profit net [PLN] × 100% / sales revenue[PLN][4],
- return on gross sales = profit gross [PLN] × 100% / sales revenue [PLN][5],
- return on assets (ROA) = profit net [PLN] × 100% / total assets[PLN][6],
- return on equity (ROE) = profit net [PLN] × 100% / equity capital [PLN][7],
- total asset productivity = total income[PLN]/total assets [PLN][8],
- liability turnover = accounts receivable [PLN] × 360 [days]/total income [PLN][9],
- total indebtedness = total accounts receivable [PLN] / total assets [PLN][10],
- asset cover with equity capital = equity capital [PLN] / total assets [PLN][11],
- equity capital debt = total liabilities [PLN] / equity capital [PLN][12].

[1] Optimal ratio value ranges from 1.2 to 2.0 (Bednarski 2007)

[2] The value should range from 1.0 to 1.2 (Bednarski 2007)

[3] Reference value ranges from 0.1 to 0.2 (Kotowska et al. 2009)

[4] Higher values reflect enterprise beneficial financial condition

[5] Increasing trend is evaluated as positive

[6] Typical value amounts to several percent (Kotowska et al. 2009)

[7] The higher is the ratio value, the better is enterprise financial condition (Kotowska et al. 2009)

[8] High or increasing values are required

[9] The shorter period of time (the number of days) the indicator shows, the better is recovery of debts (Walczak 2003)

[10] Low ratio value indicates increased financial independence; increased value indicates high indebtedness (Kotowska et al. 2009)

[11] Ratio value close to 1 reflects favorable financial condition of an enterprise (Kotowska et al. 2009)

[12] Low ratio value reflects lesser engagement of external capital when compared to equity capital and low indebtedness (Kotowska et al. 2009)

4. Results

4.1. Analysis of revenues, costs and financial result

The average value of FES Krynica revenues in 2008–2012 amounted to 7121.1 thousand PLN/year, whereas the average total cost was 6 478.2 thousand PLN/year. The revenue increased gradually by 24% in 2009, 46% in 2010, 48% w 2011 and 53% in 2012, when compared to that in 2008 (Table 1). FES Krynica revenue was primarily influenced by financial means gained from sales, especially sales of timber, FES services and game management products. The revenue from sales was the lowest in 2008 (4956.3 thousand PLN) (Table 1).

In the analysis period, the total revenue was influenced mostly by cash from sales of products, goods and materials. In 2008–2012, the share of sales revenue in the overall revenue of FES Krynica increased from 62% to 75%. The remaining part of FES income was not directly associated with its economic activity. The amount of money gained from activities other than the economic activities was influenced, among others, by area payments, financial support of forest protection activities (provided by the National Fund for Environmental Protection and Water Management) and funding of other activities (e.g., education, didactic paths, nature protection, lodge furnishing, etc.). The highest operational income was recorded in 2010 (391.9 thousand PLN), and the lowest - in 2008 (just over 277.0 thousand PLN) (Table 1). The financial income mainly consisted of interest on deposits, which on average amounted to 0.9% of the total revenue in the period analyzed. The highest financial income (80.1 thousand PLN) was recorded in 2008, and the lowest (42.7 thousand PLN) in 2010 (Table 1).

In the analysis period, with FES Krynica rising revenue, the total costs also increased. In 2012, the costs were 40% higher than the costs in 2008. In 2008, FES Krynica operational expenses were the highest, and amounted to 5177.7 thousand PLN, whereas in 2012, the expenses were 7223.1 thousand PLN (Table 1). These costs were associated mainly with the outsourced service costs and wage payments. Other operational expenses comprised, among others, additional payments due to changes of insurance schemes. The operational costs showed considerable irregularity (Table 1). The lowest values were observed in the case of financial expenses (first of all, on the management of bank accounts and interests), and these amounted to 0.01 PLN, and in 2011 r. 20.4 thousand PLN.

A detailed analysis of revenues and costs associated with FES Krynica economic activities was carried out with special attention paid to the economic sizes shaping the values of incomes and expenses, and consequently, the financial result of the enterprise. The highest financial incomes were achieved from timber sales, and these increased with years and amounted to more than 6000 thousand PLN in 2012, and were higher by 83% than timber sales income in 2008 (Table 2). The highest income growth rate (34%) was recorded in 2010 when compared to the year 2009. Timber sales income was affected by thickness, as well as quality and prize of offered timber.

FES Krynica revenue was also affected by the existing supply of products of game management and forest nursery propagation. In the observation period, the income

Table 1. Revenues and operating costs of the Forest Experimental Station in Krynica in 2008–2012

Economic elements	Fiscal year				
	2008	2009	2010	2011	2012
	[PLN]				
Net revenues from sales	4 956 315.35	6 107 503.42	7 305 684.31	7 499 550.82	7 796 168.79
Other operation incomes	277 078.32	386 290.00	391 904.96	299 984.30	280 797.43
Financial incomes	80 077.10	68 400.79	42 696.55	65 181.24	47 903.42
Revenues from all operations	5 313 470.77	6 562 194.21	7 740 285.82	7 864 716.36	8 124 869.64
Operating expenses	5 132 551.21	5 928 847.36	6 975 044.39	6 965 551.35	7 200 371.13
Other operating expenses	45 174.71	6 578.04	73 714.88	13 593.22	7 372.04
Financial costs	0.01	1 002.48	5 345.37	20 363.11	15 406.29
Total costs	5 177 725.93	5 936 427.88	7 054 104.64	6 999 507.68	7 223 149.46

Source: Own calculations based on data of FES in Krynica

from FES Krynica nursery activities was the highest in 2011 (24.7 thousand PLN), and in 2012 – the lowest (9.6 thousand PLN). Financial means were mainly gained from seedling sales. The income from game management was on an average 60 thousand PLN/year. In 2009, the income was relatively lower and amounted to 35.3 thousand PLN (Table 2). The highest incomes associated with game management were from sales of carcasses of game animals, whereas the income from hunting sales was lower.

Next to product supply, the financial result of FES Krynica was affected by the sold product prices. The average price of 1 cubic meter of timber in 2008 was 160.84 PLN. In the analyzed period, timber price was the lowest in 2009 r. – 137.60 PLN/m^3. In 2010 and 2011, timber prices were 172.4 PLN/m^3 and 200.43 PLN/m^3, respectively. In 2012, the highest price 210.05 PLN/m^3 was recorded (Table 3).

With higher product prices and lower production costs, the enterprise had better financial results. In the analyzed period, the total cost of timber extraction within FES Krynica area showed an increasing trend – from 1 118.9 thousand PLN in 2008 to more than 1 944.4 thousand PLN in 2012 (Table 3). Timber extraction costs were affected by, among others, the thickness of harvested wood and a level of difficulty of forestry activities. The share of timber extraction costs in the total FES Krynica costs increased from 22% in 2008 to 29% in 2009, and in the next observation years, it became stable at 27% level. Timber prizes showed higher growth rates when compared to unit costs. In the year 2010, at a decreased timber price by 23.24 PLN/m^3, timber extraction unit cost increased by 5.32 PLN/m^3 when compared to 2009. In the next observation years, timber prices showed higher percent growth rates when judged against the costs of timber extraction (Table 3). The ratios of timber sales expenses in FES Krynica in the years 2008, 2009, 2010, 2011 and 2012 were 34%, 43%, 35%, 32% and 32%, respectively.

In 2009, the highest increase of the total timber extraction costs was recorded as compared to the previous year. In 2011–2012, the cost ratio decreased, which is a sign that the cost of development of unit revenue was decreased. In the years 2011 and 2012, the development of 1 PLN unit revenue required the engagement of monetary amounts at a level of 0.32 PLN.

Next to timber extraction costs, the total FES Krynica costs were significantly affected by the expenses related to forest silviculture and protection, as well as those of game management. High investments were undertaken to carry out forest regeneration activities. The costs gradually decreased with years. In the observation period, the total cost of forest protection increased, from 154.0 thousand PLN in 2008 r. to more than 216.0 thousand PLN in 2012. At the same time, the game management costs were about 28.5 thousand PLN/year. In 2010, the cost of game management was the lowest – 16.0 thousand PLN, which was a result of lower costs of compensation paid for the damage caused by game animals. The cost level indicator calculated for 2008 was 97%, and in 2009 it decreased to 90%, and then decreased by another 1 % in 2010. In the next observation years, it stabilized at a level 89%. These results demonstrate profitable management of FES Krynica.

In the years 2008–2012, the net financial result of FES Krynica showed positive values, and the profit increase indicated the rising internal flows of cash available to the enterprise (Table 4). A considerable increase of the net financial result was recorded in 2009 – 489% of the financial result achieved in 2008. In the next observation years, the percentage increases were as follows: in 2010 r. about 10% as compared to 2009, 26% in 2011 as compared to 2010 and merely 5% in 2012 as compared to 2011. The financial result value in 2008 was affected by a low value of the financial result of operational activities (only 55.7 thousand PLN, Table 4). In 2009–2012, the financial results of FES operational activities gradually increased (from 558.4 thousand PLN in 2009 to 869.2 thousand PLN in 2012). The financial result from financial activities in 2008 r. was higher than that achieved at an operational level and amounted to 8.1 thousand PLN. In the subsequent observation years, the financial result from operational activities increased, whereas that from financial activities showed a decreasing trend (Table 4).

Table 2.Income from economic activity FES in Krynica in 2008–2012

Economic size	Year				
	2008	2009	2010	2011	2012
Income from timber sales [PLN]	3 312 511.37	4 021 203.42	5 373 132.18	5 883 674.18	6 077 120.99
Income from nursery production [PLN]	23 179.02	9 852.46	14 528.71	24 741.91	9 569.46
Revenues of hunting economy [PLN]	59 200.80	35 295.74	60 941.71	55 880.54	63 657.07

Source: Own calculations based on data of FES in Krynica

4.2. Analysis of financial ratios based on data from balance sheet, as well as profit and loss account

In the analyzed period, in FES Krynica, the financial liquidity ratios showed very high levels, even though they indicated decreasing trends (Figure 1). In 2008, I degree financial liquidity ratio was the highest (6.04) and in 2012, it was the lowest (4.71). The values observed were higher than the upper optimum (2.0) by 202% in 2008, and by 136% in 2012 (Figure 1). At the same time, II degree financial liquidity ratio showed the highest value (5.63) in 2008, that is it was higher than the optimum value (1.0–1.2) by 369%. Relatively, the lowest value of II degree financial liquidity (4.22) was recorded in 2012 (higher than the optimum by 252%, Figure 1). Also, III degree financial liquidity ratio showed higher values than those recommended (from 0.1 to 0.2). The average of the latter was approximately 4.0, that is 20 times higher than the recommended value (Figure 1).

The obtained values of return on turnover, assets and equity were positive. In 2008–2012, these values showed an increasing trend, except for the year 2010, when return of turnover ratio decreased (Figure 2). The ratios of return on net sales and return on gross sales were the lowest in 2008 (2.11% and 2.74%, respectively). In 2009, these ratios increased by 7.98% and 7.51%, respectively, whereas in 2012 r., they achieved the relatively highest values of around 11.5% (Figure 2).

In 2008, the net return on assets ratio was 0.15% (the lowest in the period analyzed). This value gradually increased to 1.22% in 2012 (Figure 2).The values of net return on equity ratios were similar to those of net return on assets; the lowest value (0.15%) was observed in 2008 and the highest (1.24%) in 2012 (Figure 2).

The ratios as to FES Krynica debt levels (the total debt and equity capital indebtedness) were characteristic of low level stability (0.02). The situation like this indicates the minimum engagement of external capital when compared to own capital and confirms very high financial independence of FES Krynica. It was also observed that the stable value of the ratio measuring enterprise capability to cover debts (asset cover with equity capital) was close to 1 (0.98). The results obtained allowed for positive evaluation of the enterprise studied.

In the period 2008–2012, a small increase of revenue per unit assets was observed. On the other hand, the total asset productivity ratio showed an increasing trend that was eva-

Table 3. The size of the economic influence on the level of revenues. costs and financial results FES in Krynica in 2008–2012

Specification	Year				
	2008	2009	2010	2011	2012
The cost ofharvesting [PLN]	1 118 877.48	1 743 123.64	1 874 830.17	1 859 264.59	1 944 439.49
The thickness of the harvested timber [m^3]	20 594.57	29 224.59	31 104.71	29 355.61	28 931.20
Average price of wood [PLN/m^3]	160.84	137.60	172.74	200.43	210.05
The unit cost of harvesting [PLN/m^3]	54.33	59.65	60.27	63.34	67.21

Source: Own calculations based on data of FES in Krynica

Table 4. Financial result FES in Krynica at different levels in 2008–2012

Financial result	Years				
	2008	2009	2010	2011	2012
	[PLN]				
Financial resultfrom operating activities	55 667.75	558 368.02	648 830.00	820 390.55	869 223.05
Financial result from financial activities	80 077.09	67 398.31	37 351.18	44 818.13	32 497.13
Gross financial result	135 744.84	625 766.33	686 181.18	865 208.68	901 720.18
Net financial result	104 709.84	616 250.33	676 479.18	854 148.68	892 637.18

Source: Own calculations based on data of FES in Krynica

luated as a positive development. In 2008, the ratio achieved 0.077 PLN, and in 2012, it was the highest at 0.111 PLN (Figure 3).

The ratio of receivables turnover showed high variability (Figure 4). The advantageous values (on average 20 days) were observed during the whole observation period that indicated short-term income of receivables.

5. Discussion

In forestry, the financial analyses are mostly concerned with the profitability of economic functions (raw material production). In financial reports, the social and ecological forest functions are neglected. The need to adjust accounting to economic specifics of forest holdings has been emphasized, among others, by Buraczewski, Grygier (2011) and Adamowicz, Szczypa (2014). In FES Krynica, similar to other management units under administration of Poland's State Forests, mainly financial accounting has been carried out, and the balance sheets obtained do not include information on other forest values (Adamowicz, Szczypa 2014).

In the years 2008–2012, the Forest Experimental Station in Krynica developed a positive financial result, with increasing profits on annual basis. The increase of FES revenue and a relative decrease of cost levels in the years (2009–2012) resulted in 7.5-fold increase of the financial result when compared to the year 2008. First of all, this was associated with the implementation of the new Forest Management Plan by FES Krynica, as well as with an increased timber extraction starting from 2009, by almost 10 thousand/m^3/year. Also, the enterprise obtained financial support from the National Fund for Environmental Protection and Water Management for stand reconstruction (270.0 thousand PLN) and building modernization (80 thousand PLN).

The revenue from sales results from the amount of the production sold, assortment structure, product quality and price, as well as the conditions for sale (Sierpińska, Jachna 2007). In the analyzed period, the FES Krynica revenue from sales increased by 57% as compared to 2008. Among others, this was a result of an increase of income from timber sales by 83% (the share of income from timber sales in the total sale of products increased from 68% to 78%). Timber prices in FES Krynica were generally higher than those obtained in the State Forests (where prices of 1 m^3 of timber were 148.95 PLN and 182.61 PLN, in 2008 and 2012, respectively) (GUS 2009, 2013). Timber prices in the Forest Districts (Piwniczna and Nawojowa) located adjacent to FES Krynica, were even higher (Janusz 2010). In the analyzed period, the cost level indicator of the FES Krynica total activity decreased by 8%. This reflected the appropriate cost management, and resulted in an improvement of the

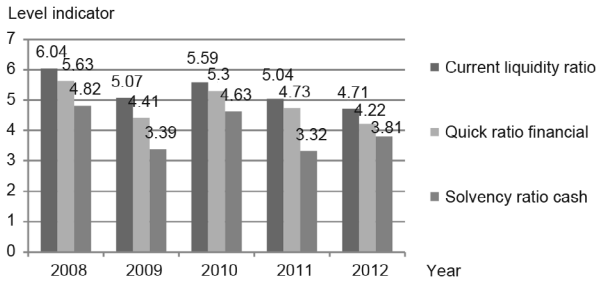

Figure 1. The values of iquidity in the FES in Krynica in 2008–2012

Source: Own calculations based on data of FES in Krynica

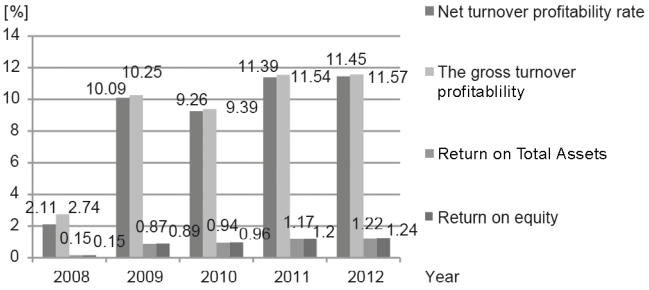

Figure 2. Values of profitability ratios in FES Krynica in 2008–2012

Source: Own calculations based on data of FES in Krynica

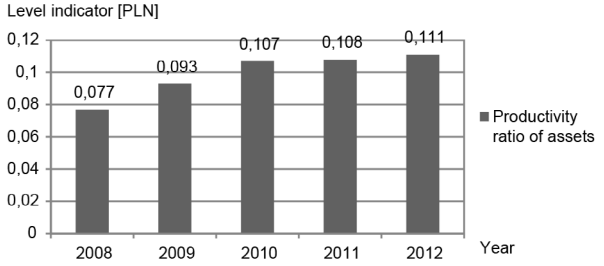

Figure 3. The values of productivity ratio of total assets in the FES Krynica in 2008–2012

Source: Own calculations based on data of FES in Krynica

enterprise financial condition. For comparison, in the years 2008–2012, the cost level indicators in the State Forests were: 96%, 97%, 93%, 88% and 96% (Skowronek 2013).

In 2008–2009, timber extraction costs in the Forest Districts next to FES Krynica were lower, and considerably more timber was harvested there (Forest District Piwniczna: 50 thousand m^3/year). In 2008, in the Forest District Piwniczna, the unit cost of timber extraction was similar to that in FES Krynica (53.85 PLN/m^3 and 54.33 PLN/m^3, re-

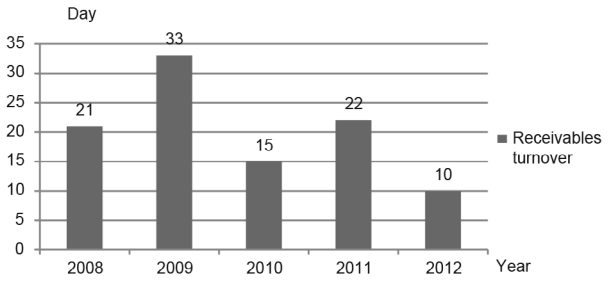

Figure 4. The values of receivables turnover ratio in days at the FES in Krynica in 2008–2012

Source: Own calculations based on data of FES in Krynica

spectively). In 2009 the cost in the Forest District Piwniczna was lower by 9 PLN/m^3 (Janusz 2010). In 2008–2012, there was a general increase in the timber extraction costs in Poland. Different trends were observed in the Austrian Forests (ÖBf); in 2013, the timber extraction costs decreased again to 25 EUR/m^3 (www.laspolski.pl). In the analyzed period, in FES Krynica, the timber prices increased faster than the extraction costs (31% price increase at 24% extraction cost increase). For comparison, the results of the analyses carried out in 2001–2009, on forests administered by the Regional Directorate of State Forests Zielona Góra showed that the increased rate of timber extraction cost was higher than the increased rate of timber price (Adamowicz, Kaciunka 2014).

The analysis of financial ratios was used for the illustration of financial condition of FES Krynica. It showed the usefulness of the method and the ratios selected in the evaluation of enterprise profitability and effectiveness. The results obtained confirmed the utility of the method in the evaluation of financial condition of entities that manage forest resources. The practical importance of financial ratio analysis in the evaluation of financial condition of the Forest District was described by Buraczewski and Wysocki (2000), who constructed a development index that allowed the comparison of financial conditions of different Forest Districts.

In the analyzed period, the FES Krynica financial liquidity ratios were much higher than the reference values. High financial liquidity ratios indicated the excess of financial liquidity of the enterprise, which is perceived as a financially unfavourable phenomenon. The difference between I and II degree ratios is on an average 0.43, and this value suggests a considerable share of stocks with low liquidity. High ratio values are also a result of accumulation of too much cash in bank accounts. Such situation is recognized as unfavourable for prosperous enterprises, as according to financial management rules, cash resources should be reduced to the minimum, in view of the fact that only assets engaged in the production process generate a desired financial result (Bednarski 2007; Sierpińska, Jachna 2007). In 2008–2012, the values of financial liquidity ratios in Poland's State Forests were lower when compared to those in FES Krynica, but yet higher than the reference values. In 2008, in the State Forests, the financial liquidity ratio was 2.9, and in 2011, it was 7. In the Forest District administered by the Regional Directorates of State Forests – Lublin, Białystok, and Krosno, there was also observed an excess of financial liquidity. Simultaneously, the Forest Districts' turnover assets in 2005–2009 covered more than twice the value of their obligations to the creditors (Marzęda 2013). Based on the above results, it can be concluded that in the years 2008–2012, Poland's forest management units showed a substantial excess of financial liquidity.

In FES Krynica, the values of profitability figures were at satisfactory levels and showed increasing trends. High levels and increasing trends of turnover ratios (sales) can be evaluated as positive. The values obtained indicate high efficiency of expenditures incurred and revenues achieved. The enterprise has to realize lower sales in order to achieve certain profits. The values of return on assets and capital ratios indicate beneficial financial condition of FES Krynica. This was associated with the growing total revenue, as well as the increasing enterprise equity and total assets. The increasing value of net return on assets indicates profitability improvement. At the same time, the increasing value of return on equity ratio indicates the FES Krynica's capability to develop profit from each 1 PLN of own capital, as well as from the income generated from economic activities. Return on turnover ratio in FES Krynica was comparable to that in the State Forests. In the years 2008–2012, in the State Forests, the lowest return on turnover ratio was observed in 2009 (3.5%), and the highest in 2011 (11. 5%), whereas in FES Krynica the turnover rations were 2.74% and 11.57% in 2008 and 2012, respectively. Return on assets ratios (0.15–1.22%) in FES Krynica were lower when compared to the State Forests (3.7% and 9.8% in 2008 and 2011, respectively). ROA ratio in State Forests is considerably influenced by the Forest Fund means, which increase the value of ROA (Marzęda 2013). ROE ratio was much higher in the State Forests when compared to FES Krynica (3.3% and 12.7% in 2009 and 2011, respectively). ROE ratio median obtained in the Regional Directorates of State Forests Lublin, Krosno and Białystok, calculated taking into account the financial means of the Forest Fund was 3.22%, and 1.6% when the Forest Fund was not included (Marzęda 2013). FES Krynica carries out forest management under mountainous conditions; nonetheless, its turnover ratios were increasing. In Poland's State Forests, the Forest Districts situated in the mountains and uplands are generally the least profitable due to a high degree of forest management complexity (Kocel, Kwiecień 2006).

In Poland, in the years 2000–2006, agriculture together with game management and forestry were distinctive of the

highest shares of equity capital in the balance sheet total (62.5–80.8%), whereas an average enterprise equity capital was no more than 52%

(Gołaś 2009). FES Krynica equity capital constitutes 98% of its assets. Likewise, the share of the State Forests equity capital in asset financing is considerably high (88% and 86% in 2010 and 2012, respectively). In the latter, the obligations posed no risk for the stability of the capital structure (Borecki 2013). In the years 2008–2012, in the State Forests, the total debt increased and was higher when compared to that in FES Krynica.

FES Krynica showed low efficiency of asset utilization; however, it increased gradually in the analyzed time period. Asset productivity ratio ranged from 0.07 to 0.11 PLN. The high ratio value or its increasing trend indicates good management of the enterprise (Kotowska et al. 2009). In 2008, in the State Forests, the total asset productivity ratio was 0.93 PLN and decreased in subsequent years to 0.80 PLN (2012). On the other hand, receivables turnover ratios achieved satisfactory values in FES Krynica, which means that the enterprise promptly received financial means and this is perceived as a positive development. Only under the conditions of timber market downturn in 2009, receivables turnover ratio was 33 days (considerably higher than the 5-year average). When compared to FES Krynica, this ratio was higher (25 and 26 days, in 2010–2011 and 2012, respectively) in the State Forests (Skowronek 2013).

6. Conclusions

The Forest Experimental Station Krynica fulfils numerous activities (educational, ecological and social), and exists on the market as well. It competes with commercial offers on timber of the Forest Districts and those of forest private owners. Consequently, there is a need to analyze FES financial condition so as to evaluate the enterprise's economic activities and use the results obtained in an appropriate decision making process concerning the enterprise's property management towards its future development.

The main goal of forest management is the protection and maintenance of forests, and subsequently – forest production and profit growth. However, economic accounting plays an important role in forest management. In the period analyzed in the present study, an improvement in the FES Krynica operational efficiency was observed. This was confirmed by increasing profits and profitability ratio values. A decreasing trend of the cost level ratio indicated positive development of the enterprise. Only financial liquidity ratios stayed at too high levels, however, they showed high investment capability of the enterprise. It would be worthwhile to consider variants of allocation of financial means, other than the ones being used now.

Poland's forest holdings grant only marginal importance to external capital and this is also the case of FESW Krynica, which showed financial independence. In the period of analyses, it was observed that there was no need for external financial means (probably due to savings, financial support, limited investment needs). On the other hand, engaging only own capital in the management process reduces the possibilities of using financial leverage mechanisms.

Evaluation of FES Krynica economic-financial activities in 2008–2012 showed high and increasing profitability, confirmed by profitability of turnover ratio. This resulted from favourable economic situation, and also probably from the rules adopted by the enterprise for the sale and the achieved level of timber prices. The performed analyses confirmed the FES Krynica potential for further development and the expansion of its commercial and service offer.

The analysis carried out in the present study confirmed usefulness of the selected financial ratios in the evaluation of financial condition of the enterprises involved in the management of forest resources. The ratios are commonly used in financial analyses concerning enterprises which are active in the market (among others, in evaluations of financial liquidity, profitability, economic activity, debts, cost levels, etc.). These can also be used in the evaluation of economic effectiveness of forest enterprises that function somewhat differently than the companies oriented at maximum profit. There should be continued studies aiming at the selection of financial ratios and elaboration of methodology that would enable comparisons between forest enterprises in terms of their economic efficiency.

It would be worthwhile to undertake efforts towards establishing the methodology and tools allowing for inclusion of the value of forest with its ecological and social aspects in the financial reports, and consequently – to carry out economic analyses, while taking into account the aspects other than productive functions of forests.

Conflict of interest

The Authors declare no conflict of interest

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Work share

A.K. – study conception, data compilation and analysis, preparation of discussion, conclusions and literature review;

M.R. – data compilation and analysis, preparation of tables and figures, literature review.

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