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Application of the Economic Value Added index in the performance evaluation of forest enterprise

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ABSTRACT: The paper aims at pointing to possibilities of using the Economic Value Added index in evaluating the forest enterprise performance. The given index ranks among the indices of fourth-generation evaluation emerging from the value-based management theory. When calculating the index, we took the financial statements of a chosen forest enterprise for our starting point. On the basis of the calculated results we can state that the index development in the enterprise had an increasing tendency during the period 2011–2013. Recognised values of the index were positive, i.e. the enterprise reached a positive market value for the enterprise owners.

Keywords: cost of capital; net present value

Modern conceptions of measuring enterprise performance emphasize a need of not only financial but also non-financial measures. They enable to make a dynamic picture of the competitive position of an enterprise in the market and help interlink short-term performance with a long-term strategic vision of the enterprise. Despite the intensive popularization of the non-financial indicators, the financial indicators remain irreplaceable. They reflect past actions, provide a retrospective view on the competitive position of an enterprise and they are able to forecast the short-term development of an enterprise relatively precisely.

Nowadays, with traditional indicators of measuring the enterprise performance, the emphasis is being laid on modern indicators based on the enterprise value-based management theory. To face keen competition, it is important to measure and evaluate the enterprise performance responsibly. The enterprise has to have at its disposal a set of financial and non-financial measures characterizing its performance as accurately as possible. "Generally, performance means the characteristic that describes a way or course in which an examined business entity performs an activity on the basis of a similarity to the reference way of performing this activity. An interpretation of the characteristic presupposes an ability to compare the examined and reference phenomena from the standpoint of the set criteria" (Wagner 2009).

For the most part, the concept of performance is defined as the capability of a company (business entity) to evaluate investments in its business activities as well as possible. This definition leads to a view that a company is efficient if it reports good earnings. With regard to the given definition this conception seems to be incomplete. Furthermore, enterprise performance is evaluated by subjects performing in a market from different standpoints. According to the customer, a company is efficient if it is able to anticipate their needs and wishes at the moment when they arise and at the same time to offer them a quality product at a price corresponding to their image of how much they are willing to pay for satisfying their needs. According to the customer conception, measures for this capability are

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the following categories: price, delivery time, and quality. From the manager's viewpoint, a company is highly efficient when it prospers, has a stable market share, loyal orders, low cost, balanced cash flows, and its economy is liquid and profitable. The entrepreneurial conception offers an increase in company competitiveness. A measure of this capability is the speed of response to the changes in macroeconomics and to arising new business opportunities. From the viewpoint of owners, the company performance presents the appreciation of capital they contributed to the company. According to their opinion, a company is efficient when it is able to appreciate capital to the highest possible degree and within a period as short as possible. The capability to succeed is evaluated by measures resulting from the categories: return on investment, Economic Value Added (EVA), and enterprise value (share value).

In the 1990s of the 20th century, the EVA became the conception which spread out from the theoretical level also to practice. The given fact was influenced by publishing the book "The Quest for Value" written by Bennet Stewart (Stewart 1991, 2013; Holečková 2008). Applying the EVA in company practice and exploring the relationship between the EVA and increase in the yield on shares were dealt with by several authors (Maditinos et al. 2006).

Performance is a relatively wide concept. It covers both financial and non-financial measures which create a dynamic image of enterprise competitiveness and at the same time disclose possibilities for further increase in its performance. Enterprise performance understood in both financial and non-financial perspectives is conditioned by successfully carried out development activities (Šulák, Vacík 2005). The evaluation and analysis of performance, economic and financial efficiency of the forest enterprise were dealt with by several authors (Kovalčík 2007, 2011; Hajdúchová et al. 2011; Balážová 2014).

METHODS

The aim of the contribution is to point to a possibility of applying the EVA index in evaluating the performance of a chosen forest enterprise, to describe the procedure of the calculation and then to compare developments of the EVA index during a set period of time.

The input data and information were obtained from the internal materials of the forest enterprise which is an organisational part of the state-owned enterprise Forests of the Slovak Republic Banská Bystrica. The branch is found in the south-western part of Banská Bystrica region. The territory of the branch is situated in the regions of Banská Bystrica, Nitra, Trenčín, it reaches the districts of Žarnovica, Žiar nad Hronom, Prievidza, Zlaté Moravce, Levice, Banská Štiavnica, Zvolen and it comprises 79 cadastral territories. Its area is 105,689 ha and the forest land area managed by the enterprise is 36,563 ha. Concerning the species composition, beech and mixed oak-beech stands preponderate. The overall broadleaves representation is 75% with the beech share of more than 46%. Coniferous species are represented especially by spruce growing at higher locations, fir and larch, and by pine in southern and dry sites. The main activities of the enterprise include silvicultural and logging operations, wood-processing, and wood trade.

In the contribution, the EVA index is calculated by means of the cost of capital. The EVA prefers economic profit, i.e. profit made up by the difference between capital gains and the economic cost (operating cost) that is the cost including also so-called opportunity cost besides accounting cost. The difference between traditional accounting profit and economic profit results from the following comparison:

$$\text{accounting profit} = \text{revenues} - \text{accounting costs}$$

$$\text{economic (operating) profit} = \text{total capital gain} - \text{cost of capital}$$

Accounting profit and operating profit differ from one another because of the following reasons: the accounting profit does not take into consideration the time value of money and risk. The accounting profit does not take into consideration the explicit costs resulting from the use of equity capital. The operating profit as a newly created value arises only when its value exceeds the value of profit derived from average capital costs exerted by creditors (i.e. costs in the form of interests) and from costs spent by owners and shareholders (i.e. opportunity costs).

The positive evaluation of enterprise performance is if the EVA > 0. That means that the capital gain is higher than its value and then the enterprise "creates" a value for its owners. If the EVA < 0, the revenue is lower than the cost, the enterprise "destroys" the value.

Between accounting and operating profit there is a relationship derived from the equation known for the calculation of net present value (Maříková, Mařík 2001; Eq. 1):

$$NPV = -I + PV \quad (1)$$

where:
NPV – net present value,
I – investment,
PV – present value.

To calculate the present value of a share, equation 2 is applied (Stehlíková 2002; Eq. 2):

$$PV = (EPS/r_e) + PVGO \quad (2)$$

where:
EPS – net earnings per share,
r_e – cost of equity capital,
PVGO – present value of share growth opportunities.

The final equation after adjustment (Eq. 3):

$$NPV_1 = (((ROE - r_e) \times VK)/r_e) + PVGO_e \quad (3)$$

where:
NPV_1 – net present value of all shares, i.e. net present value of equity capital,
ROE – profitability of equity capital,
E – equity capital,
$PVGO_e$ – present value of growth opportunities for equity capital.

First we can calculate the EVA by means of the formula for the cost of capital (Eq. 2). The EVA index is understood as net earnings of operational (economic) activity of an enterprise less the cost of capital.

The basic calculation of Economic Value Added (EVA) (Eq. 4):

$$EVA = NOPAT - NOA \times WACC \quad (4)$$

where:
NOPAT – net operating profit after tax, profit from enterprise operating activities (profit from operations) after tax,
NOA – net operating assets, capital tied up in net assets,
WACC – weighted average cost of capital (Vlachynský et al. 2006).

Determining the NOA. To calculate the NOA, a starting point is the balance sheet of an enterprise. The task is:
(*i*) to eliminate non-operating assets from among assets;
(*ii*) at market valuation, to capitalize assets which are not recognized within assets in the financial statements;
(*iii*) to decrease assets by non-interest-bearing debt capital.

The enterprise assets consist of these main entries in the balance sheet: (*i*) fixed assets, (*ii*) current assets, (*iii*) deferred assets.

Elimination of non-operating assets. Here it is necessary to determine which assets are of an operating character and so they are essential for the basic activity of an enterprise. It is important to emphasize that carried out adjustments depend on the current situation of a concrete enterprise. Financial assets – this category of the enterprise property includes bank statements, cash, and luncheon vouchers that are charged as stamps and vouchers. This kind of finances is considered to be important and therefore they are included in the final calculation of the NOA. We do not reflect about writing down assets in the sphere of short-term financial assets because on the basis of the internal enterprise information we have considered it does not serve an enterprise as its strategic reserve. Other assets that are not needed for operating activity – assets that do not serve the basic enterprise activity include also land and buildings that are not used, or land and buildings under reconstruction. As the enterprise does not own such assets, it will not be necessary to carry out any adjustments in this sphere.

Capitalization of operating assets unreported in enterprise accountancy. From the standpoint of theoretical knowledge concerning the modern EVA index, it is necessary to include also the finance lease in the NOA calculation. By means of the lease, the analysed enterprise acquires only motor vehicles. In 2011, the enterprise leased three cars by means of the finance lease and used them for working purposes. That year also the last instalment in the lease of one motor vehicle was paid back and it was the same in the year 2012. Toward 31st December 2013, the enterprise had only one motor vehicle leased by means of finance lease.

Weighted average cost of capital (WACC) is determined as the weighted average of costs of equity capital and costs of debt capital (Eq. 5):

$$WACC = (1 - T) \times r_d \times D/C + r_e \times E/C \quad (5)$$

where:
T – income tax rate,
r_d – cost of debt capital (rate),
D – interest-bearing debt capital,
C – total cost,
r_e – cost of equity capital (rate),
E – equity capital.

When calculating the EVA, the last step is determining the cost of capital. A starting point is WACC. When calculating the cost of equity and debt capitals, we will use a simpler way for their calculation using the values of the financial statement (balancing the books).

The cost of debt capital will be expressed according to Eq. 6:

cost of debt capital = interest expenses/debt capital (6)

The value of interest expenses was obtained from Table 4 "Total interest expenses". The item of the interest-bearing debt capital was substituted by the sum of total liabilities and timing difference (accruals) that are given in the balance sheet. With this calculation we have found out that the cost of capital is in the amount of 1%. The resultant value – the interest rate of 1% will be used each year of the observed period.

The cost of equity capital is expressed by means of the following formula (Eq. 7):

cost of equity capital = earnings/equity capital (7)

When calculating the cost of equity capital, we use the earnings in the accounting period.

RESULTS

Application of the EVA index in forest enterprise performance evaluation

In the following part we shall deal with calculating the EVA index in the period 2011–2013 in a chosen forest enterprise. The discount rate is set at a level of the cost of equity capital, however, at the zero indebtedness of the enterprise. We will calculate and evaluate the EVA index according to capital charge. Apart from the amount of the average cost of capital, for the calculation of the EVA index by this method it is necessary to calculate the amount of NOPAT and the amount of NOA.

Asset capitalization includes also capitalization of differences in valuation (gains and losses), goodwill, hidden reserves etc. (Table 1). As there is not available any information about such assets, we will write down operating assets by the interest-free debt capital. When writing down the operating assets by the interest-free debt capital, it is mainly the elimination of all financial expenses from the operating earnings. It is necessary to write down the adjusted assets by interest-free liabilities. The trend of interest-free liabilities of the enterprise is shown in Table 2.

Table 1. Values of instalments in finance lease

Year	2011	2012	2013
Finance lease capitalization (EUR)	27,510	17,280	7,720

Having substituted particular values from Table 2, we calculated the values shown in Table 3.

In Fig. 1 we can see the comparison of net operating assets with total assets of the enterprise.

The main principle of defining the operating earnings of NOPAT is reaching the symmetry between the NOA and NOPAT. When calculating it, as a starting point we used the earnings of current activity (before taxes). Then we carried out the adjustments that we can see in Table 5. The earnings were added the interest expenses including implicit interests obtained in lease payments. With regard to the bank loans, we used directly interest expenses paid by the enterprise as a starting point.

Table 5, in the first line, shows the value of income from ordinary activities before tax. In the second line, the earnings before tax were changed so that we added interest expenses of loans and also lease. In the third line, there is a difference between the earnings after adjustment and original earnings. The difference between them is then taxed by the flat rate of 20% in the fifth line. In the fourth line, there is a value of the originally paid tax. The resultant value of NOPAT was obtained by deducting the original tax and additionally calculated tax from the adjusted income before tax (difference in the original earnings and the earnings after adjustments).

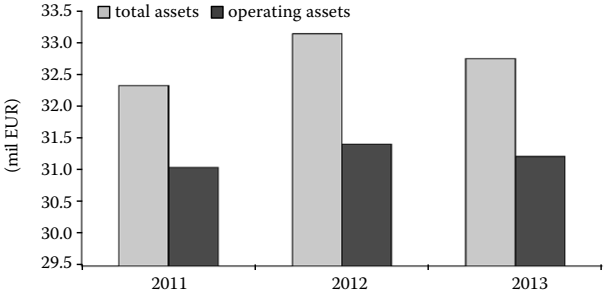

Fig. 1. Comparison of the total and operating assets in 2011–2013

Table 2. Trend of the interest-free debt capital

	2011	2012	2013
Reserves (EUR)	129,959	154,810	293,690
Fixed liabilities, interest-free (EUR)	181,959	222,610	350,690
Short-term liabilities (EUR)	1,004,522	1,371,680	901,250
Accrued liabilities (EUR)	0	0	0
Total (EUR)	1,316,440	1,749,100	1,545,630

Table 3. Overview of net operating assets (NOA)

	2011	2012	2013
Σ Fixed assets (EUR)	31,055,510	31,863,136	31,930,820
Fixed tangible assets (EUR)	30,987,000	31,784,711	31,873,650
Fixed intangible assets (EUR)	41,000	61,145	49,450
Long-term cash and investments (EUR)	0	0	0
Net working capital (EUR)	–9,015	–449,028	–713,186
Inventory (EUR)	217,698	229,270	226,184
Receivables (EUR)	1,083,901	1,065,132	599,167
Financial accounts (EUR)	5,826	5,670	7,093
Accruals (time differences) (EUR)	0	0	0
Interest-free liabilities (EUR)	1,316,440	1,749,100	1,545,630
NOA (EUR)	102,024	200,102	289,545

Lease value is added to the value of fixed tangible assets, the data concerning accruals (time differences) are left without changes; the interest-free liabilities were separated and so the value of assets in the balance sheet has been adjusted into net operating assets

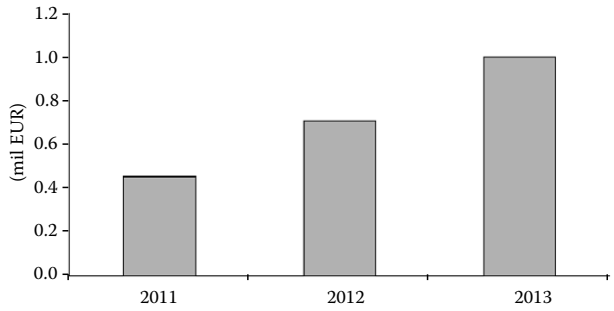

Fig. 2. Development of net operating profit after tax (NOPAT) in 2011–2013

Fig. 2 illustrates an increasing trend of the NOPAT, which proves the efficient use of operating assets.

Then we will calculate the total cost of capital by the simple substitution of other values from the book closing (or balancing) into Eq. 5 for the calculation of WACC. The results are shown in Table 6.

With regard to WACC, we can observe an increasing tendency in the enterprise within the examined period. In the year 2013 there was a growth of the WACC to the level of 3.21%. During the given year, the value of bank loans decreased and the enterprise was making a profit, thus increasing the share of its equity in the total invested capital.

Table 7 summarises the calculated data in regard to the EVA following the economic model and using Eq. 4. On the basis of the data in Table 7 we can state that the enterprise uses its assets effectively.

EVA is a method more and more frequently applied as a way of operating management on the basis of the value created for the enterprise owner or owners. The method is applied in evaluating the capital projects, investment decision-making, when measuring performance of an enterprise or when managing and motivating the staff and managers. While the EVA achieves positive values, then such an enterprise is successful. From the viewpoint of its owners, the enterprise value grows as they get back more than they invested in the enterprise and this is also in satisfying creditors – lenders. In Table 7 we can see that the EVA shows positive values during the whole observed period. These values have an increasing tendency each year, which means that the enterprise might prosper in the future. According to the previous findings and calculations of ratios, and

Table 4. Interest expenses

	2011	2012	2013
Interest expenses (EUR)			
– loans	8,760	9,320	7,920
– lease	2,530	2,019	1,023
– total	11,290	11,330	8,943

Table 5. The calculation of net operating profit after tax (NOPAT)

	2011	2012	2013
(1) Earnings before tax (EUR)	555,280	909,419	1,289,998
(2) Earnings before tax after adjustment (EUR)	566,570	920,749	1,298,941
Difference (2) – (1) (EUR)	11,290	11,330	8,943
Tax paid originally (EUR)	111,056	209,166	296,699
Tax additionally calculated (equally 20%) (EUR)	2,258	2,266	1,789
NOPAT (EUR)	453,256	709,217	1,000,153

Table 6. Input data for calculating the weighted average cost of capital (WACC) for the period 2011–2013

	2011	2012	2013	Source
r_d	0.010	0.010	0.010	interest expenses/debt capital
T (%)	20	20	20	
D (EUR)	1,186,481	1,571,490	1,232,940	balance sheet
C (EUR)	36,783,098	39,540,310	40,860,833	
r_e	0.016	0.027	0.038	P/E
E (EUR)	34,093,510	34,082,220	34,264,193	balance sheet
WACC	0.0151	0.0236	0.0321	$(1 - T) \times r_d \times D/C + r_e \times E/C$

r_d – cost of debt capital, T – income tax rate, D – interest-bearing debt capital, C – total capital, r_e – cost of equity capital, E – equity capital, P – profit for the accounting period

Table 7. Economic Value Added (EVA) index

	2011	2012	2013
NOA (EUR)	102,024	200,102	289,545
NOPAT (EUR)	453,256	709,317	1,000,153
WACC (EUR)	0.0151	0.0236	0.0321
EVA (EUR)	451,716	704,595	990,859

NOA – net operating assets, NOPAT – net operating profit after tax, WACC – weighted average cost of capital

allowing for input quantities in the calculation of the EVA, we can state that the growing trend in the enterprise performance should continue. However, a growth or increase in the EVA index need not lead to an increase in the enterprise value at the same time. Although the EVA increased, a decrease in the enterprise value can occur:

(*i*) if the increase in the EVA index at the present time has been achieved at the expense of the future surplus profits;

(*ii*) if the increase in the EVA index was influenced by the growing cost of capital.

DISCUSSION

The aim of the contribution was to point to possibilities of making use of the EVA index in a forest enterprise. In their works, Hajdúchová et al. (2011) and Kovalčík (2007, 2011) evaluated the forest enterprise performance by means of classical financial and economic indexes. The financial and economic indexes (e. g. profitability index) are important, however, they see processes connected with an increase in the value for owners, shareholders only insufficiently. At the beginning of the 1990s of the 20th century, the financial theory came up with new instruments for measuring the enterprise performance mainly thanks to Stewart (1991, 2013). The process of the value creation takes place at two basic levels: at the enterprise level where the value is created and in capital markets where the value is realized. Especially important are such indexes of the enterprise performance whose development correlates with the fluctuation of share prices in capital markets as much as possible (Holečková 2008). Applying the EVA in corporate practice and exploring the relationship between the EVA and the change in the Greek share market, shifts in share prices were dealt with also by other authors (Maditinos et al. 2006). The aim of our contribution was not the investigation of the dependence (correlation) between the EVA and the change in the market value of shares, but the application of the EVA calculation in a forest enterprise and research into a possibility of using the index of measuring performance in the particular forest enterprise. When carrying out the analysis, we started from the basic principles of the theory of value management which we used in the forest enterprise performance evaluating by the quantification of the EVA index. In part 3 we have carried out the calculation of the basic components of the EVA index. To calculate the EVA by means of the capital charge method, it is necessary to identify the amount of NOPAT and the amount of NOA. Part of the calculation is also the WACC. As the information about such asset entries was not available, we wrote down operating assets by interest-free debt capital. When writing down operating assets by the interest-free debt capital, it is mainly the elimination of all financial expenses from the operating earnings (or net profit). It was necessary to write down the adjusted assets by liabilities which were interest-free. Fig. 1 illustrates the trend of total and operating assets. The total assets had an uneven trend. In 2012, they reached the peak of 33,145,928 EUR. Also the operating assets reaching the value of 31,414,108 EUR were the highest in the year 2012. The highest share of operating assets was represented by receivables and interest-free debt capital – short-term liabilities. In this part we can also point to the fact that the net

working capital is negative. The higher it is, the higher should be the ability of the enterprise to repay its liabilities. If the net working capital has negative values, it is so-called unsecured debt. Concerning the calculated values of the NOPAT, we can state that it acquires a positive value, which proves an efficient use of operating assets (Fig. 2). Table 6 documents the values of the weighted average cost of capital WACC. From the standpoint of the WACC, we can notice an increase in the enterprise in the examined period. In the year 2013, the growth of the WACC reached the level of 3.21%. In the given year the value of bank loans dropped and the enterprise was making a profit and so stockholder's capital has increased within the total capital invested. The given facts have influenced also the enterprise market value that is expressed by the EVA index in Table 7. The EVA index was reaching a positive value in the enterprise and in the examined period it had even a growing tendency. If the EVA reaches positive values, then we can state that such an enterprise is effective, the enterprise value increases from the viewpoint of owners (in a sense of the value-based management theory) because they get back more than they invested in the enterprise, and that is at the same time with satisfying creditors – lenders. From the previous calculations we can also state, if the market value of the analysed enterprise is higher than zero, the enterprise creates values and there are conditions that these values will increase in the future.

CONCLUSIONS

On the basis of the found out results we can say the aim of the contribution has been fulfilled as we proved the fact that the EVA index can be applied in evaluating the performance of a forest enterprise as well as when analysing the market value of the forest enterprise. However, there is a limit connected with the realization of the market value of an enterprise in the capital market. The performance of forest enterprises can be measured by means of the EVA, however, an essence of the theory of value management is the interlinking of shareholders' (owners') aims with the aims and decisions of the enterprise management. This interlinking should result in the maximization of the value creation for owners, shareholders (shareholder value). It is a question of the increase in the margin between the value of vested capital and its present market value. The market value of an enterprise can be found out on the assumption about the existence and functioning of developed capital market in which the value of the enterprise is realized.

References

Balážová E. (2014): Hodnotenie výkonnosti lesného podniku. In: Sborník příspěvků z mezinárodní vědecké konference. Mezinárodní Masarykova konference pro doktorandy a mladé vědecké pracovníky, Hradec Králové, Dec 15–19, 2014: 1456–1462.

Hajdúchová I., Giertliová B., Trenčiansky M., Šulek R., Ivan L. (2011): Finančná stabilita podniku. Zvolen, Technical University in Zvolen: 51.

Holečková J. (2008): Finanční analýza firmy. Prague, ASPI: 208.

Kovalčík M. (2007): Porovnanie efektívnosti lesných podnikov podľa Data Envelopment Analalysis a Cost Benefit analýzy. In: Zborník referátov z medzinárodnej vedeckej konferencie. Financovanie 2007 Lesy – Drevo, Zvolen, Nov 29, 2007: 7.

Kovalčík M. (2011): Hodnotenie efektívnosti hospodárenia na lesnej pôde. Lesnícky časopis, 3: 166–177.

Maditinos D., Šević Ž., Theriou G. (2006): The introduction of Economic Value Added (EVA) in the corporate world. Available at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.456.5585&rep=rep1&type=pdf (accessed Feb 15, 2016).

Maříková P., Mařík M. (2001): Moderní metody hodnocení výkonnosti a oceňování podniku. Prague, Ekopress: 70.

Stehlíková B. (2002): Finančná analýza ako metóda finančného riadenia firmy. Acta Montanistica Slovaca, 5: 112–119.

Stewart G.B. (1991): The Quest for Value: A Guide for Senior Managers. 1st Ed. New York, Harper Business: 781.

Stewart G.B. (2013): Best-practice EVA: The Definitive Guide to Measuring and Maximizing Shareholder Value. Hoboken, John Wiley & Sons, Inc.: 324.

Šulák M., Vacík E. (2005): Meření výkonnosti firem. Prague, Vysoká škola finanční a správní: 89.

Vlachynský K. et al. (2006): Podnikové financie. Bratislava, Iura Edition: 482.

Wagner J. (2009): Meření výkonnosti: Jak meřit, vyhodnocovat a využívat informace o podnikové výkonnosti. Prague, Grada Publishing, a.s.: 248.

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