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MODELS OF APPLICATION ECONOMIC VALUE ADDED IN AUTOMOTIVE COMPANY

Summary. Enterprises are currently trying to bring new technologies into production and use new procedures and recommendations in various management activities. However, they should not forget to change their approach to the evaluation of the results achieved and focus on the use of modern methods of performance evaluation and prove to apply them in their enterprises. The aim of this paper is to point out several variants of the calculation of Economic value added (EVA) indicator, define the possibilities to apply EVA methods to the conditions of enterprises in the Slovak Republic and the need to adjust data providing financial statements and data for current accounts. Application of economic value added should be able to contribute to changes in the views of the owners and managers of enterprises in the Slovak republic for use not only as financial indicators.

1. INTRODUCTION

In 1982, the company Stern Steward & Co. developed the method Economic value added (EVA), which was focused on the change in perception in profitability of enterprises. This method has become a new method of defining the success of enterprises. It has changed the perception of managers in large enterprises in achieving economic profit and creating value for owners [5].

Stewart [11] defines economic value added as a residual income or operating profit reduced by costs related to capital to achieve this profit, whereas operating profit represents the profit from the basic business activities of the enterprise. Young and O'Byrne [16] characterise indicator as a net income from operating activities of the enterprise, which is reduced by the costs of capital. According to Pavelková and Knápková [9, p. 47], economic value added represents "economic profit an enterprise creates directly after the payment of all costs, including all costs of capital (foreign and equity in the form of costs of opportunity given up)".

The concept of EVA is focused on capturing and maximising economic profit of an enterprise and helps managers to make better decisions [1, 13]. It reveals the enterprise´s contribution to the change in value for the owners in the reporting period using the activities performed [9]. It offers the possibility of monitoring the value creation in the enterprise, and it was designed to connect several business activities that would affect constant improvement of decision-making, which will contribute to better results in this indicator. "A positive EVA indicates that value has been created for shareholders; a negative EVA signifies value destruction" [15]. The main indicator used in this method is the economic indicator with the same title EVA.

EVA indicator has the following characteristics:
1. is based on economic profit, which means it also includes alternative costs of own capital invested;
2. includes only revenues and costs associated with the core business, not including revenues and costs associated with special events or non-standard activities;

3. when calculating the costs of capital, it considers only capital of investors who expect return on its allocation to enterprise, bound in assets used in the core business;
4. is an absolute indicator that does not need a benchmark.

The indicator of economic value added is a financial indicator that expresses the value of the economic profit of the enterprise. It serves to provide owners of an enterprise with information on the formation of values and enterprise performance [2, 3]. It provides a view into the possibilities of its awareness with regard to invested capital of owners and the management can also use it as a tool to estimate the future value of the enterprise based on capital invested in other investments with similar risk. In addition to the use of the methods for monitoring the creation of value for the owners, it gradually began to be used as a tool for investment decisions, evaluation of the enterprise and remuneration of managers. It characterises the method as an enterprise management system that links strategic and operational decision-making at all levels of management. Salaga, Bartosova and Kicova [10] define EVA as "the most advanced instrument of business performance measurement because of simple approach compared with other evaluation criteria, and possibility of complex application of this indicator in the system of management". According to Gupta and Sikarwar [6] economic value added has more relevant information content than accounting measures and it is a better performance measure than traditional accounting measures.

2. MODEL FOR EVA CALCULATION

The difference between net operating profit after tax (NOPAT) and weighted average cost of capital (WACC*C) is the most frequently used calculation of EVA indicator. The value of cost capital is made up of the total invested capital (C) and weighted average cost of capital (WACC) [7].

$$EVA = NOPAT - WACC * C \qquad (1)$$

Net operating profit after tax, except the profit from the main business, includes profit and loss on sale of fixed assets and inventories from extraordinary activities, which do not relate to the main business, profit from financial activity and other expenses and income considered operating, whereas they are not connected with it or have a special character [12].

From the financial point of view, invested capital is the sum of all sources of enterprise funding, except for short-term trade payables. This means that it consists of the total amount of equity and long-term and short-term interest-bearing liabilities [4]. The value of funds invested in the enterprise can be calculated from the operational point of view as the sum of long-term operating assets at residual value and working capital.

Weighted average cost of capital – WACC – represents the last variable when determining the EVA indicator. The weight determines the ration of alternative costs for both equity and foreign funds in total. Calculation of weighted average cost of capital is defined as follows:

$$WACC = r_d(1 - t) * \frac{D}{C} + r_e * \frac{E}{C}, \qquad (2)$$

where r_d represents the cost of foreign funds – i.e, interest – t is the tax rate on income of legal persons, D represents foreign funds, C is total long-term invested capital, re is the cost of equity and E represents the value of equity.

There are a number of terms of economic value added. Equation 2 defines the indicator EVA on the basis of value spread, which represents the economic profitability (profitability on net operating assets). It is the difference of operational profitability calculated as a proportion of the operating profit with the operational assets and weighted average cost of capital [14].

$$EVA = \left(\frac{NOPAT}{C} - WACC\right) * C \qquad (3)$$

$$EVA = (RONA - WACC) * C \qquad (4)$$

Neumaierová and Neumaier have chosen a different approach to define the economic added value. When calculating they consider the equity only [8]. In this case, the benefits may not include those which originate from the foreign funds used. The calculation of such adjustments is expressed by:

$$EVA = (ROE - r_e) * VK \tag{5}$$

where ROE is the return on equity, VK is equity and re is the cost of equity. We can simply connect such economic value added to the internal accounts of enterprises.

3. THE POSSIBILITY OF USING METHODS IN AUTOMOTIVE ENTERPRISES ESTABLISHED IN THE SLOVAK REPUBLIC

Practical use of the indicator is quite challenging. When calculating the value of the enterprise it is important to insert correct values for individual variables to express relevant value for the further direction of enterprises. The adjustment of data in calculation, which is used to improve the expression of the economic situation of the enterprise, is very important. Setting the values of the variables it is necessary to follow several rules that are defined in the following steps. In this case, the method of EVA was applied in the manufacturing enterprise dealing with production of plastic products, mainly for the automobile industry established in the territory of the Slovak Republic, whereas its owner is a foreign company. In order to calculate the indicator, the most frequently used formula was chosen, which defines the difference between net operating profit and the costs invested. The methodology for the application of the EVA method was carried out in four steps (Fig. 1).
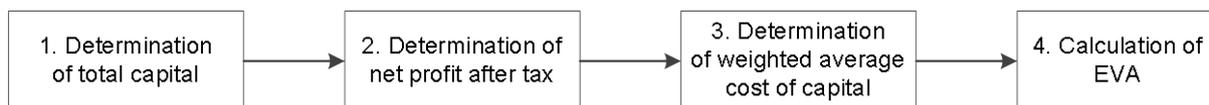
| 1. Determination of total capital | → | 2. Determination of net profit after tax | → | 3. Determination of weighted average cost of capital | → | 4. Calculation of EVA |

Fig. 1. Implementation of GPS In small, medium and large transportation enterprises

3.1. Determination of total capital

The first phase of the calculation of the indicator is to establish the value of the total capital, which is also called net operating assets (Tab. 1). These include assets that are covered by own capital and foreign interest-bearing capital. It is necessary to include those items first in the total capital that are not included in the balance sheet. These are mainly costs spent to achieve the further benefits (cost of training, research and development and advertising). Net assets also included assets owned by enterprises in the form of leasing or having it in lease.

Another adjustment to be considered is the adjustment of fixed and current assets based on the differences valued. A fixed asset is used by an enterprise in the longer period of time and, therefore, its evaluation should be regulated by means of reproduction prices (tangible and intangible assets). It is recommended to use market prices in stock. Investments, whether unfinished or strategic, may constitute a big problem in determining the value of net assets. Unfinished investments do not serve an enterprise over a given period for the creation of value and the strategy assumes that it will begin to build up in the future. In both cases, it is necessary to include them in the net operating assets only when they begin to participate in the making of a profit. It is necessary to remove a portion of the funds from short-term financial assets, which exceeds the recommended amount in terms of liquidity. Considering the assets adjusted in such way, it is necessary to deduct non-interest-bearing liabilities (short-term liabilities, non-interest long-term liabilities and passive items of accruals) [9, 13].

Values of the fixed asset in the enterprise were adjusted, whereas in each period, both tangible and intangible assets not used in the production were procured. The value of financial assets in current assets in 2009 was adjusted because the enterprise had a higher amount than was necessary in terms of liquidity.

Values of non-interest liabilities were deducted from the adjusted asset items, which, in the case of an enterprise, included long-term non-interest liabilities, short-term liabilities, reserves and value of accruals of liabilities (Tab. 2).

On the basis of determination of the value of the capital it is possible to observe expansion of the assets of an enterprise during the periods monitored.

Table 1

Adjustment of the assets of the enterprise in the years 2007–2013
in thousands of Euros

Indicators	2007	2008	2009	2010	2011	2012	2013
Intangible Assets	65.36	43.25	23.20	85.62	101.54	66.83	39.48
(-) Procured Intangible Assets	13.74	0.00	0.00	0.00	0.00	0.00	1.15
Tangible Assets	1 590.25	1 897.76	2 217.16	2 476.51	2 780.83	3 365.45	3 555.54
(-) Procured Tangible Assets	615.42	80.73	83.39	98.91	276.10	136.75	583.92
Stocks	423.62	373.43	352.71	432.04	534.32	776.72	1 073.56
Debts	1 324.11	1 647.91	1 229.05	1 640.76	1 968.26	2 311.96	3 559.04
Financial assets	253.34	123.22	284.58	240.39	214.19	572.06	145.93
(-) Financial assets	0.00	0.00	124.02	0.00	0.00	0.00	0.00
Accruals	53.21	60.88	51.52	166.94	187.77	69.79	39.56
Assets adjusted	3 080.73	4 065.72	3 950.81	4 943.35	5 510.80	7 026.05	7 828.04

Table 2

The value of net operating assets of the enterprise in the years 2007–2013
in thousands of Euros

Years	2007	2008	2009	2010	2011	2012	2013
Adjusted assets	3 080.73	4 065.72	3 950.81	4 943.35	5 510.80	7 026.05	7 828.04
Reserves	51.68	49.26	49.05	65.77	98.61	92.32	187.93
Long-term non-interest liabilities	8.63	4.12	0.74	5.68	2.28	21.31	7.75
Short-term liabilities	1 188.01	1 069.28	535.19	1 079.85	1 182.17	1 490.43	1 559.06
Accrual liabilities	0.00	0.00	0.05	26.42	0.00	23.84	18.17
Non-interest liabilities	1 248.32	1 122.65	585.03	1 177.73	1 283.05	1 627.89	1 772.91
NOA	1 832.40	2 943.07	3 365.78	3 765.63	4 227.75	5 398.16	6 055.13

3.2. Determination of net profit after tax

The application of the EVA method is useful in determining the value of operating economic result after tax. It is not always possible to consider operating economic result calculated in the enterprise based on Slovak rules of accounting the net profit of the operational assets, because it may contain items that are necessary to exclude for the needs of EVA. However, it is always necessary to come out of the adjustment of net assets.

The calculation of the net profit after tax in the enterprise is based on the economic result of ordinary activities before tax, which is added to the cost of interest, because, if they were retained, they would appear in the calculation twice. The result of economy was further adjusted by the

difference between the receipts from the sale of the fixed asset and the residual prices of this sale, as these revenues are not related to operational activities (Tab. 3).

Table 3

Calculation of the difference between the selling price
and residual value of fixed assets

Years	2007	2008	2009	2010	2011	2012	2013
Sales of Tangible Assets	20 879	80 728	17 132	16 636	95 478	6 729	29 814
Residual value of sold	27 485	56 065	20 751	8 064	43 473	259	24 504
(-) Difference	-6 606	24 663	-3 619	8 572	52 005	6 470	5 310

After calculating these items, net profit before tax was established, which was deducted from the income tax based on the tax rates set from the economic result. After deduction of taxes, net profit after tax was established (Tab. 4).

Table 4

Calculation of NOPAT in the enterprise in the years 2007–2013
in thousands of Euros

Indicators	2007	2008	2009	2010	2011	2012	2013
Economic result	1 166.27	904.24	557.99	946.51	918.95	1 578.58	1 534.61
(+) Cost interest	19.65	34.59	65.03	31.77	29.00	22.06	15.88
(-) Impact of sales of Tangible Assets	-6.61	24.66	-3.62	8.57	52.01	6.47	5.31
NOPBT	1 192.52	914.16	626.64	969.71	895.94	1 594.16	1 545.18
Income tax	226.58	173.69	119.6	184.4	170.23	302.89	370.84
NOPAT	965.95	740.47	507.58	785.46	725.71	1 291.27	1 174.34

Net profit after tax had a descending trend from 2007 to 2009 as did the economic result. In the years 2010 and 2011, the value maintained an average level of profit and then the value of profit increased significantly in the following periods because of increased orders from suppliers. Figure 2 shows the development of the economic result and net profit after tax, in which the value of the net profit is higher than the book value expressed in the statement of profit and loss.

3.3. Determination of weighted average cost of capital

Determination of the weighted average cost of capital represents the third phase of the application of EVA. In order to determine these costs, it is necessary to know the cost of foreign funds and equity. Determination of the cost of own funds represents a complication, especially in an enterprise that does not engage in stock-based business. There are several approaches to the calculation of the cost of equity. CAPM (capital asset pricing model) build-up method is the most commonly used model (the sum of the risk surcharges to the risk-free rate); determination is based on the average return on equity of the industry, or the return of foreign capital costs [9].

A build-up method was used for the calculation of the weighted average cost of capital in the enterprise, which is based on the sum of the risk surcharge of the enterprise. It assumed the independence of the enterprise's capital structure and it is based on the assumption that the enterprise is financed only by private capital: i.e, the identity of the weighted cost of capital and the return rate of equity are examined. Then, the cost of equity from the weighted average costs is defined. The calculation is based on the following terms:

$$WACC = r_f + r_{LA} + r_{business} + r_{FinStab} + r_{FinStr} \qquad (6)$$

where r_f represents the risk-free rate of return on Government bonds, $r_{business}$ is business risk, $r_{FinStab}$ is the risk to the financial stability of the enterprise and r_{FinStr} is a parameter that evaluates the financial structure of the enterprise (Tab. 5).
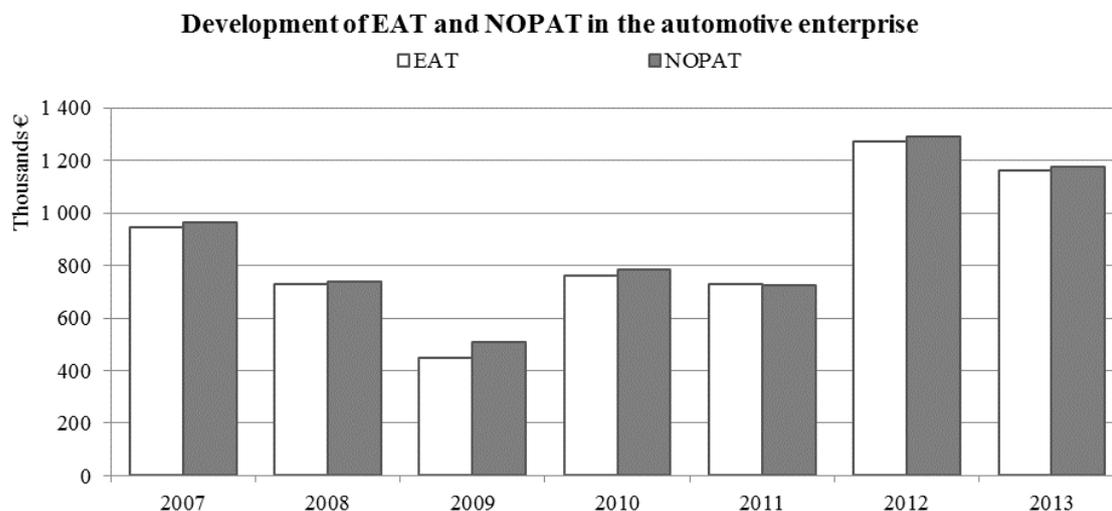
Development of EAT and NOPAT in the automotive enterprise

Fig. 2. Development of EAT and NOPAT in the automotive enterprise in thousands of Euros

Table 5

Cost of equity calculated

Years	2007	2008	2009	2010	2011	2012	2013
r_e	11.82%	9.72%	9.12%	9.06%	10.08%	8.80%	7.51%

The second component necessary for the calculation of the weighted average cost of capital consists of the cost of foreign funds. They were defined by the share of the cost of interest the enterprise specified in the statement of profit and loss and the sum of bank loans (Tab. 6). The highest value of the cost of interest and the rate of interest resulting from it was noticed in 2009, when the interest cost reached the highest value in this year, whereas the total bank loans had a decreasing trend since 2007 and the enterprise regularly decreased them. However, the enterprise also used current bank loans in the last two seasons, which contributed to a slight increase in the cost of foreign funds.

Table 6

Cost of foreign funds in the years 2007 – 2013

Indicators	2007	2008	2009	2010	2011	2012	2013
Long-term bank loans	679 977	516 232	486 706	402 061	317 417	184 410	148 191
Current bank loans	0	0	0	0	0	48 362	36 240
Interest cost	19 651	34 588	65 034	31 766	28 995	22 056	15 880
Rate of interest	2.89%	6.70%	13.36%	7.90%	9.13%	9.48%	8.61%

After the determination of both equity and foreign funds, it is possible to calculate the weighted average cost of capital in the enterprise based on the proportion of the total interest-bearing capital. As the enterprise has a high value of equity, there prevails the use of equity in the calculation of WACC. The weighted average cost of capital reached the highest value in 2011, which was caused by the increase both in foreign funds and equity.

Table 7

Calculation of WACC in the enterprise in the years 2007–2013

Years	2007	2008	2009	2010	2011	2012	2013
Foreign interest-bearing funds	679.98	516.23	486.71	402.06	317.42	232.77	184.43
Equity	1 152.43	2 426.84	2 869.76	3 363.57	3 910.33	5 165.39	5 870.70
Total interest-bearing capital	1 832.40	2 943.07	3 356.46	3 765.63	4 227.75	5 398.16	6 055.13
r_d	2.89%	6.70%	13.36%	7.90%	9.13%	9.48%	8.61%
r_e	11.82%	9.72%	9.12%	9.06%	10.08%	8.80%	7.51%
1 – tax rate	0.81	0.81	0.81	0.81	0.81	0.81	0.76
WACC	8.30%	8.97%	9.37%	8.78%	9.88%	8.75%	7.48%

In Fig. 3, the development of the cost of equity, foreign funds and weighted average cost of capital in an enterprise is shown. The weighted average cost of capital has a similar development as the cost of equity, which means that these costs have a large impact when determining.
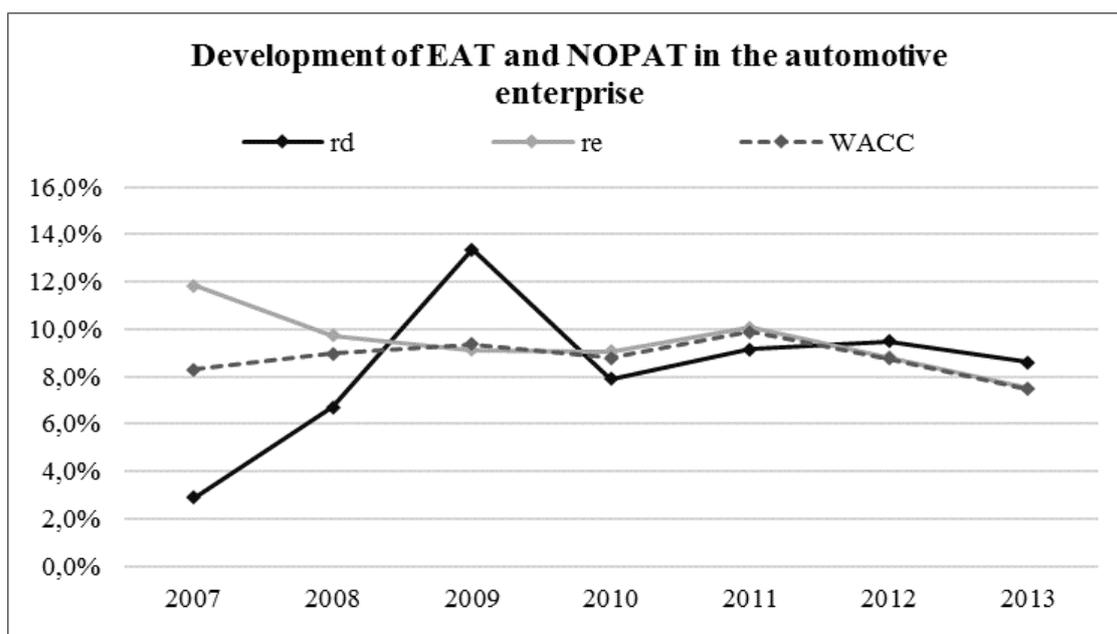

Fig. 3. Development of individual cost of capital in the enterprise

In the period of 2009, 2011 and 2012, we can see the increased value of the cost of foreign funds compared to the cost of equity. An enterprise should follow the development of these indicators in the future and, accordingly, focus on the optimisation of capital structure and investment using either own or foreign source of property coverage.

3.4. Calculation of the economic value added EVA – entity

In this case, a basic formula for the calculation of the indicator EVA is used, which is made up of net profit after tax, with deduction of the total costs of capital, which are calculated from the weighted average cost of capital and the value of the capital in each year. The individual components and the final value of the indicator are shown in the following table 8.

Table 8

Calculation of the indicator EVA in thousands of Euros

Years	2007	2008	2009	2010	2011	2012	2013
NOPAT (€)	965.95	740.47	507.58	785.46	725.71	1 291.27	1 174.34
NOA (€)	1 832.40	2 943.07	3 365.78	3 765.63	4 227.75	5 398.16	6 055.13
WACC (%)	12.77	9.72	9.12	9.06	10.06	8.86	7.58
EVA (€)	813.86 €	476.48 €	200.62 €	454.84 €	308.01 €	818.93 €	721.42 €

On the basis of the calculations, it is evident that the enterprise created value in all periods monitored. The value of the enterprise had a similar trend as the economic result. It achieved the highest value and highest profit in the year of 2012. On the contrary, the enterprise acheived the lowest value in 2009, because of the lowest profit achieved in the history of the enterprise, and compared with the previous years of capital growth trend in the enterprise.

3.5. Calculation of the economic value added EVA – equity

When calculating the EVA equity, the ability of the enterprise to appropriate capital that the enterprise has at its disposal will be assessed.

Table 9

Calculation of the indicator EVA – equity in thousands of Euros

Years	2007	2008	2009	2010	2011	2012	2013
Economic result (€)	943.74	730.73	450.63	763.25	729.50	1 272.08	1 160.44
Equity (€)	1 781.58	2 507.57	2 953.14	3 462.47	4 186.43	5 302.14	6 455.77
ROE (%)	52.97%	29.14%	15.26%	22.04%	17.43%	23.99%	17.98%
R_e (%)	17.66%	11.55%	11.63%	11.38%	10.82%	9.17%	7.75%
EVA (€)	733.153	486.955	181.298	449.549	307.504	805.487	675.616

As in the previous calculation, the enterprise also created the highest value in 2012. It was supported by the growing value of profitable equity and low value of the cost of equity. The enterprise even created a high value in 2007, when the return on equity reached more than 50%. Although the cost of equity was the highest and the value of equity the lowest, it was impossible for the enterprise to achieve the creation of such a value in the following three seasons as it was in 2007 because of declining profitability.

We can see in Fig. 4 that the value of the enterprise in both cases developed in the same trend as the economic result for each period. We can also observe that the ability of the enterprise to recover its total resources is lower in some years than the ability to recover only its own resources. It is also possible to conclude that the economic value added reaches lower values than the net profit after tax in the periods monitored. The orientation of the enterprise to achieve profit, thus, provides the only data on the means but not the creation of value for the enterprise and its owners.

4. CONCLUSION

On the basis of the practical example of the application of EVA in the enterprise in Slovakia it is possible to propose the sequence of steps in the calculation of this indicator. The process of calculating

the indicator begins with a preparatory phase in which it is necessary to prepare the basis for the calculation. It is mainly the balance sheet, profit and loss statement, documents that contain values that are not included in the financial statements and the like. Then, there are the preparation phases for the calculation of the indicator for the determination of the value of the net assets, net operating profit (Fig. 5), calculation of WACC and the calculation of the indicator itself.
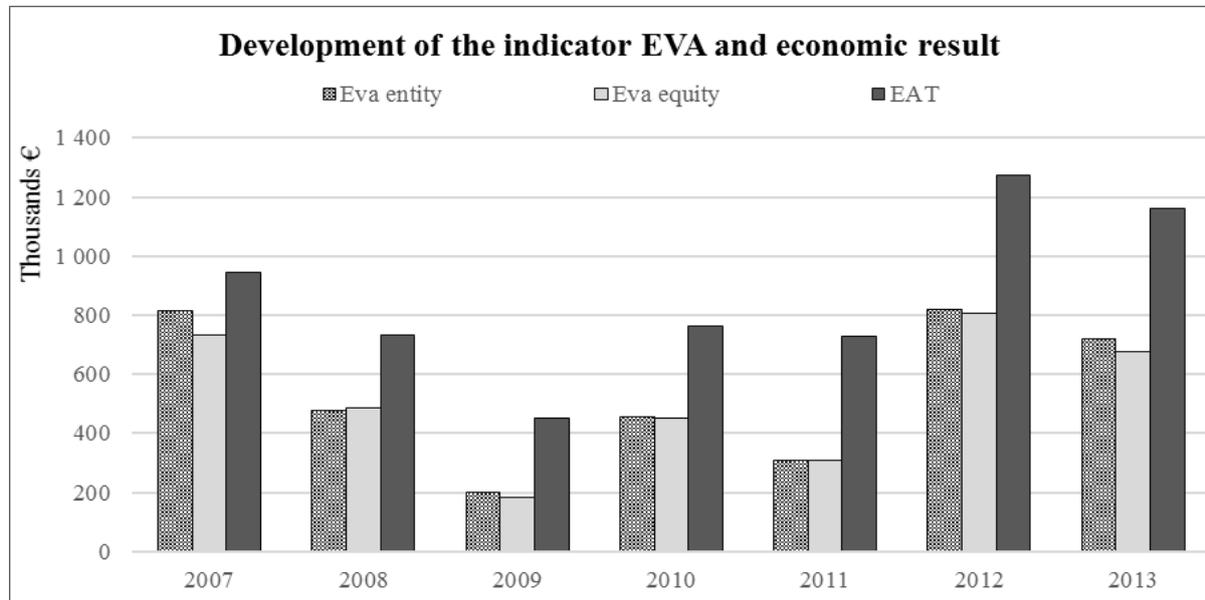

Fig. 4. Development of individual cost of capital in the enterprise
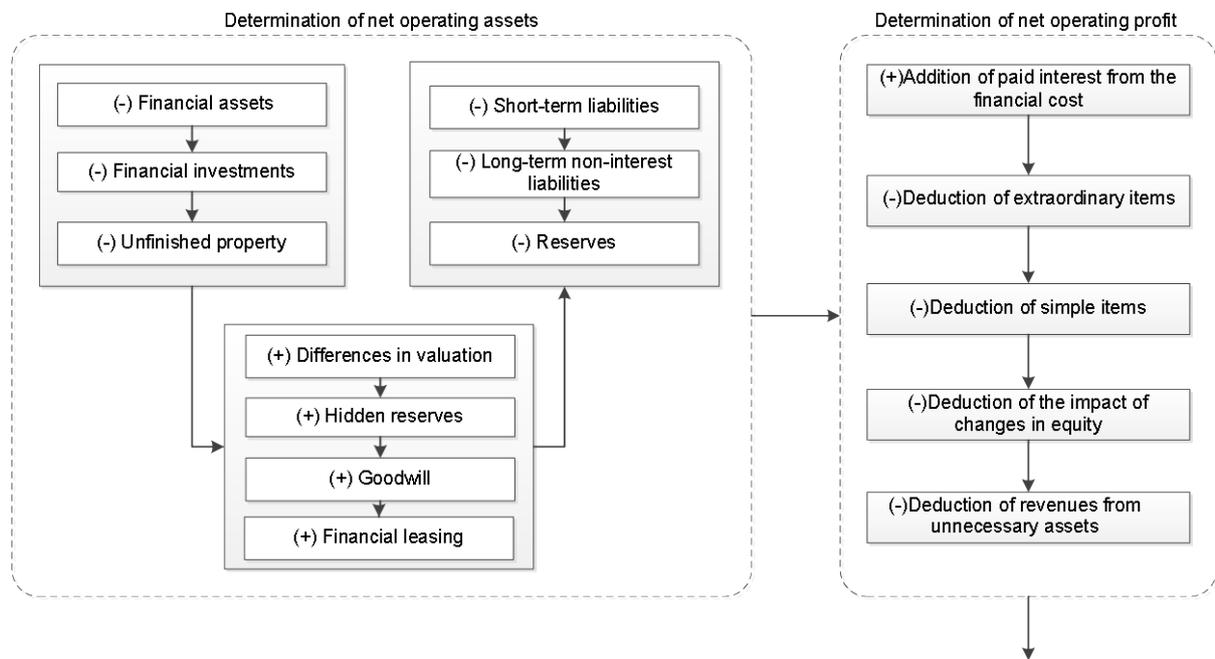

Fig. 5. Adjustment of net profit and assets (actual process)

The calculation of the weighted average cost of capital is more challenging in conditions of the Slovak Republic and, in particular, in Limited Liability Company. It is necessary to choose the correct method for calculating the cost of equity and provide proof to determine it using this method. Consequently, the cost of equity, cost of foreign funds and the weighted average cost of capital are

calculated. The last step of the process is the evaluation of the calculated value of the EVA indicator. The process itself would be useless without an economic interpretation.

The method of evaluation of economic value added brings to enterprises and their owners a view of the effective use of resources invested and the creation of value. However, its applicability for the conditions of enterprise in the Slovak Republic is very challenging in many cases, because it is necessary to activate an item of property, which is not in the balance sheet, to adjust profit, which is in the statement of profit and loss, and to determine the weighted average cost of capital, which is the most challenging activity for the enterprise. Therefore, the enterprises do not use it just for the difficulty, and focus on the evaluation of their results achieved through the use of indicators of profitability. These findings confirmed knowledge obtained from 21 Slovak enterprises that are, so far, within the preparation framework for further research. The sequence of steps for the calculation of economic value added and the recommendations concerning the adjustment of each criterion would be able to contribute to the change in the views of the owners, managers of enterprises and economic agents.

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