

# Economic Value Added as a Dependence on the Corporate- and Market-life Cycle

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## **Abstract**

Economic value added (EVA) is an indicator which is widely used as the main tool for financial analysis. There are two methods of calculating it. The original method which was made by Stern & Stewart is defined as the net operating profit after taxes minus the cost of capital. The second method which was developed and used by the “Czech Ministry of Industry and Trade” indicates that, the economic value added is the difference between return on equity and the alternate cost of equity that is composed of separate risk rewards, and this “spread” is consequently multiplied by the equity. Economic value added depends on many factors. Whereas some of them are controllable by the company, others are not. This article is focused on the relationship between economic value added and the corporate- vs. market life cycle. This is because, there is an assumption that conditions for developing EVA changes depending on the actual phase of corporate- and market life cycle. In this research, the model by Reiners (2004) is used to identify the phases of corporate- and market life cycle and the method provided by the “Czech Ministry of Industry and Trade” is used to calculate EVA. However, there is a consideration of the relativity of EVA in the form of “spread” because of the intercompany comparison. The study found that, the highest spread is achieved by companies that are in the phase of expansion and phase of market expansion. On the contrary, companies in the phase of declension during market declension achieved the lowest and negative spread.

*Key words: alternate cost of equity, corporate life cycle, economic value added, market life cycle, return on equity, spread*

## **1 INTRODUCTION – ECONOMIC VALUE ADDED AS THE FINANCIAL GOAL**

All companies drive for achieving their all defined partial goals and thus also the top financial goal, which is the measurement of the corporate performance.

Every company can use different indicators as the main financial goal, but in the present scientific literature, there is most recommended to use the indicator economic value added (EVA), on which the firm Stern&Stewart has the copyright. EVA is defined as the net operating profit after taxes reduced by cost of capital. In other words, it is an economic over profit, that remains the equity holders after considering all economic cost. Implicit cost are, in this case, cost of equity, because they are lost revenues, that would the alternate investment with the same rate of risk earn to the equity holders.

This indicator has some advantages as compared with the traditional “accounting” indicators like the profit, profit per share, return on sales (ROS), return on equity (ROE) or return on investment (ROI). Authors Maříková and Mařík (2001) mention these advantages:

1. indicator EVA has a big linkage on share prices
2. in the indicator EVA there is considered the risk, that is beared by the investors
3. the indicator EVA is usable for the corporate evaluation and also as the top performance indicator
4. in the indicator EVA there are considered many informations, that are got from financial reports, this implies lower work difficulty during its quantification

These facts are also acknowledged by researches of other authors. E.g. according to Machuga, Pfeiffer Jr. and Verma (2002) there is a big linkage between EVA and return on shares (by which is the share price derived). Therefore, the prediction of share prices is more accurate, when the analyst considers the values of EVA, that was achieved by the company in previous periods.

The using of indicator EVA is recommended also by Athanassakos (2007). His research proved, that the companies, that used EVA as a financial goal, achieved better results in the area of capital market.

But some authors draw attention to some deficiencies of EVA. E.g. Mir a Seboui (2008) came to the conclusion, that there is not a direct linkage between EVA and the making of shareholder value, because the calculation of EVA is, at least partly, affected by the accounting methods.

Furthermore, authors Lee and Kim (2009) recommend to use the indicator REVA (refined economic value added). The difference compared to EVA is, that to calculate REVA there is used the investment appreciated in market prices (not in accounting prices).

### **1.1 Application fields of EVA**

Economic value added can be used as the top financial goal by measuring the corporate performance. With this basic application there are connected some subsequent applications, for example:

1. Intercompany- and interbranch- comparison of performance
2. Employees stimulation and remuneration
3. Corporate evaluation
4. Investment efficiency evaluation

## **2 OBJECTIVES OF THE ARTICLE**

The research should find out the relationship between the economic value added and the phases of corporate- and market- life cycle. These two factors are not much influenceable by the company, but they have (or can have) a significant impact on economic value added.

The research is implemented as follows: First of all, there is selected one market and the periods, in which was this market in different phases of its life cycle. For these periods is the economic value added and its partial items calculated. Then, there is selected a sample of companies, that act on this market. By these companies there are also calculated the economic value added including the partial items, namely for same periods as by the market. For these periods are by the selected companies also identified the phases of corporate life cycle.

In this way there can be got some combinations (positions) of phases of corporate- and market- life cycle. The goal of this article is find out, in which position reach the companies the

biggest and the lowest EVA, and what is it due to (return on equity, or alternate cost of equity), whereas it will be ever considered the average EVA reached on the market for consistent period (there will be also implemented a benchmarking).

### 3 METHODOLOGY OF DATA PROCESSING

For the research there are used the secondary data, that are got from the financial reports of the companies and from the analytical and statistical documents published by the “Czech Ministry of Industry and Trade”.

There is selected the market with “Motor vehicles production”, because this branch is one of the most important branches of the Czech economy and moreover, the amount of sales reached on this market very significantly depend on the business cycle, which can be assessed for example by the gross domestic product (GDP). On this market act in total about 100 – 150 companies. For this research, there are haphazard selected 5 companies for each of 9 combinations of phases of corporate- and market life cycle, so the sample consists of 45 companies, whereas there are in every combination involved companies of all sizes from small and medium (with the amount of assets in millions and tens of millions czech crowns) to large companies (with the amount of assets in hundreds of millions and milliards czech crowns).

#### 3.1 Methods of calculation EVA

From the definition implies, that EVA is a difference between net operating profit after taxes (NOPAT) and cost of capital employed, that means the weighted average cost of capital (WACC) multiplied by the value of capital employed (C). The basic formula has this form:

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

But the formula constructed this way claims many adjustments in financial reports to figure out the economic value added. It is necessary to involve into the NOPAT only such cost and revenues, that come from the activities, that arise from the basic subject of enterprise. Similarly, into the capital employed there should be involved only such part of financial sources, that contributes to creation of NOPAT. For implementation of these adjustments there must be available all needed information, but it is not mostly possible. E.g. authors Fackler and Wimschulte (2009) talk about four levels of EVA (Basic EVA, Disclosed EVA, Tailored EVA and True EVA) according to the dispassionateness, which depends already on the amount of implemented adjustments.

The next problem, which arises from this formula for calculation EVA, is the quantification of the cost of equity, that are one of the basis of the weighted average cost of capital.

So the calculation of economic value added with this method is very difficult in czech corporate environment. Therefore, there was developed the methodics by „Czech Ministry of Industry and Trade“. According to this methodics is EVA defined as a spread between return on equity (ROE) and alternate cost of equity ( $r_e$ ) and this spread is multiplied by the value of equity (E). The modified formula has this form:

$$EVA=(ROE-r_e)*E \quad (2)$$

The calculation of return on equity is based on the earnings after taxes (EAT), therefore is in this formula more emphasized, that in case of positive EVA is the entrepreneurial activity preferable to alternate investment with the same rate of risk, because it brings the more over effect to the equity holders. But in individual companies there is used a different amount of equity, and therefore there is for intercompany comparison better to use the relative EVA in form of spread, which is used also in this research.

Methodics used by „Czech Ministry of Industry and Trade“ allows in order to EVA calculation also estimate the cost of equity through the use of constructional model.

This methodics of calculation EVA is applicable only in order to intercompany comparison and ranking of trends of corporate performance. In order to finding out the relations between the reached economic value added and the corporate- and market- life cycle is this methodics applicable.

For these reasons there is in order to figure out economic value added including partial items used the methodics by „Czech Ministry of Industry and Trade“ in this research.

**Calculation of partial indicators**

The pyramidal decomposition of economic value added, according to the methodics of „Czech Ministry of Industry and Trade, comes from the model INFA. This model uses relative indicators with the view of possibility of intercompany and interbranch comparison and it allows to monitor influences of partial indicators on EVA. The decomposition is demonstrated on Fig. 1:

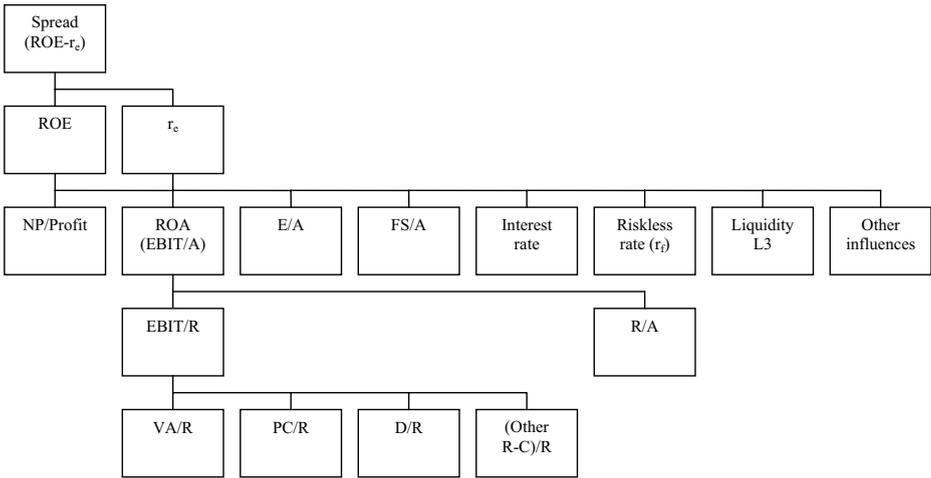


Fig. 1 – Decomposition of economic value added. Source: Finanční analýza podnikové sféry, available on [www.mpo.cz](http://www.mpo.cz)

Explanatory notes:

NP = net profit (earnings after taxes)

Profit = earnings before taxes

EBIT = earnings before interest and taxes

A = total assets  
 E = equity  
 FS = fund sources (equity + bank loans + corporate bonds)  
 R = revenues  
 VA = value added (business margin and the difference between outputs and consumption from operation)  
 PC = personal cost  
 D = depreciation (or amortization)

$$(\text{Other R-C})/R = \frac{EBIT}{\text{Revenues}} - \left( \frac{VA}{\text{Revenues}} - \frac{PC}{\text{Revenues}} - \frac{D}{\text{Revenues}} \right)$$

Return on equity (ROE) is a portion of earnings after taxes on equity. In order to investigate the influence of individual partial items there can be specified the formula into the form as follows:

$$ROE = \frac{NP}{P} * \frac{\frac{EBIT}{A} - \left( IR * \left( \frac{FS}{A} - \frac{E}{A} \right) \right)}{\frac{E}{A}} \quad (3)$$

where the variables mean:

NP: net profit (earnings after taxes)  
 P: profit (earnings before taxes)  
 EBIT: earnings before interest and taxes  
 A: total assets  
 IR: interest rate  
 FS: fund sources (equity, bank loans and bonds)  
 E: equity

The alternate cost of equity ( $r_e$ ) involve the riskless rate and rewards to individual risks, that are beared by equity holders. The formula is as follows:

$$r_e = r_f + r_{POD} + r_{FINSTAB} + r_{LA} + r_{FINSTRU} \quad (4)$$

where the variables mean:

$r_f$ : riskless rate  
 $r_{POD}$ : risk reward to entrepreneurial risk  
 $r_{FINSTAB}$ : risk reward to financial stability  
 $r_{LA}$ : risk reward to size of the company  
 $r_{FINSTRU}$ : risk reward to financial structure

Here is suitable to clarify briefly the term „risk“. The direct definition doesn't exist. According to Smejkal and Rais (2006) the risk can be defined for example as:

- probability or possibility of losses,
- variability of possible results or uncertainty of their achievement,
- deviation of real and expected results,
- probability of whatever result, that is distinct from the expected result.

The riskless rate is equal to the interest rate of ten-year government bonds. It is a reward to the so called systematic risks, that aren't controllable and diversifiable. E.g. in 2007 was the riskless rate on the level 4,28 %, in 2008 grew it up to 4,55 % in consequence of economic crisis and in 2009 was the riskless rate already 4,67 %.

Other risks are related to individual companies and the branches, in that the companies act, so these risks are manageable. The method of calculation of individual risk rewards including the minimal and maximal borders is described on website of the Czech Ministry of Industry and Trade.

### 3.2 Methods of identification phases of corporate- and market- life cycle

Most authors, for example Kislíngrová (2004), mention, those phases of corporate life cycle can be identified according to the value of cash flow. In the phase of foundation is the cash flow negative, because the company is investing in long-term assets, but is getting nearly no incomes. The phase of expansion is connected with additional investments, but also with increasing incomes and depreciation. That causes, that the cash is positive but still not too high. In the phase of stabilization is the cash flow positive and the highest, because the company doesn't have to invest very much, nevertheless the profit and the depreciation are high. And finally, in the phase of declension the profit decreases and thus the cash flow decreases, whereas it can reach the negative values. But there are no intervals of value of cash flow in order to identify separate phases of the corporate life cycle.

The identification of the phases is possible by using another conception by Reiners (2004). According to his model there must be considered the average percentual changes of assets, sales and operating cash flow. The formula for the calculation of this growth indicator has this form:

$$GI_c = \frac{\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}} + \frac{Assets_t - Assets_{t-1}}{Assets_{t-1}} + \frac{CF_t - CF_{t-1}}{CF_{t-1}}}{3} \quad (5)$$

where the variables mean:

$GI_c$  = growth indicator for identifying the phases of corporate life cycle

$Sales_t$  = incomes for own products, services and goods, reached by the company during actual period

$Sales_{t-1}$  = incomes for own products, services and goods, reached by the company during last period

$Assets_t$  = value of assets at the end of actual period

$Assets_{t-1}$  = value of assets at the end of last period

$CF_t$  = operating cash flow (operating profit after taxes + depreciation ± changes of working capital) reached during the actual period

$CF_{t-1}$  = operating cash flow (operating profit after taxes + depreciation ± changes of working capital) reached during the last period

According to the model by Reiners (2004) there can be also identified the phases of market life cycle. For this purpose there must be considered the percentual change of sales, that are reached in the whole market. The formula is as follows:

$$GI_m = \frac{Sales_t - Sales_{t-1}}{Sales_{t-1}} \quad (6)$$

where the variables mean:

$GI_m$  = growth indicator for identifying the phases of market life cycle

$Sales_t$  = incomes for own products, services and goods, reached by the market during actual period

$Sales_{t-1}$  = incomes for own products, services and goods, reached by the market during last period

The intervals for separate phases of corporate life cycle and market life cycle are mentioned on Tab. 1:

Tab. 1 - Identification of phases of corporate- and market life cycle. Source: Reiners (2004)

Phases of corporate life cycle	Intervals of values of $GI_c$	Phases of market life cycle	Intervals of values of $GI_m$
Expansion	$GI_c > 10\%$	Expansion	$GI_m > 10\%$
Stabilisation	$-2\% \leq GI_c \leq 10\%$	Stabilisation	$-2\% \leq GI_m \leq 10\%$
Declension	$GI_c < -2\%$	Declension	$GI_m < -2\%$

The intervals of values of growth indicator are also the same for phases of corporate- and market- life cycle. The phase foundation isn't identifiable according to this model, because of the possibility of high volatility of all partial items, that are involved in the growth indicator, either in  $GI_c$  or in  $GI_m$ . Therefore there aren't involved new companies, or companies acting on a new market, into the sample, which is under investigation.

There are also four phases of corporate life cycle and four phases of market life cycle, and so there are sixteen combination of phases of corporate and market life cycle. Reiners (2004) distinguishes three market positions:

1. Business pioneer – the life cycle of these companies “foreruns” the market life cycle
2. Business driver – these companies are ever in the same phase of their life cycle as the market
3. Business follower – the life cycle of these companies “is behind” the market life cycle

Some of these market positions are connected with low or middle risk and other can be identified as high-risk positions.

The combinations of phases of corporate and market life cycle, including the different risk level, is illustrated on Fig. 2:

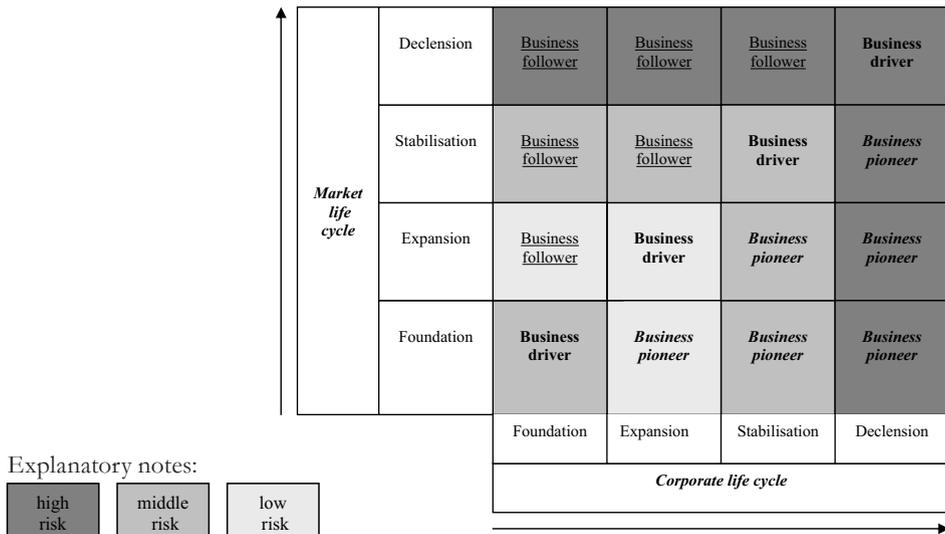


Fig. 2 - Combinations of corporate- and market life cycle including risk levels. Source: Reiners (2004)

There are in total sixteen market positions, but in this research there are only nine positions considered, because the phase of foundation isn't identifiable.

## 4 RESULTS

The research found out the values of economic value added in the relative form of spread and its partial items, so the return on equity (ROE) and the alternate cost of equity (re).

The values of spread, return on equity and alternate cost of equity are quantified for the whole market and for the separate three groups of companies according to the phase of corporate life cycle. The purpose is to show, which companies (=in which phase of their life cycle they are) reach higher, or lower values of spread and its partial indicators, than the whole market. The average values for the companies are quantified by using the same methodics as for average values for the whole market (so the values for individual companies are weighted with their equity).

On the Fig. 3 there is demonstrated the situation in 2007, when the market was in the phase of expansion.

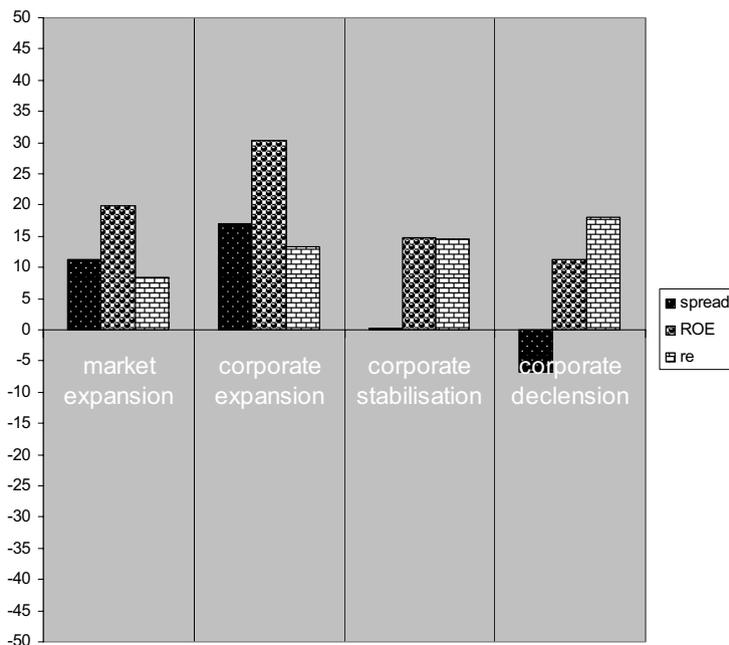


Fig. 3 – Relative EVA (spread in %), including its partial indicators, achieved by companies, in different phases of their life cycle, during the market expansion. Source: Finanční analýza podnikové sféry, available on [www.mpo.cz](http://www.mpo.cz), and financial reports of selected companies

During the market expansion, the highest spread is reached by the companies that are in the phase of expansion, which is caused especially by their high return on equity.

On the contrary, the companies in the phase of declension reached the lowest spread, because of low return on equity and high alternate cost of equity.

Highest risk rewards, which are included in the alternate cost of equity, are requested in companies in the phase of declension.

The values, that are reached in companies during the market stabilisation in 2003 are illustrated on Fig. 4.

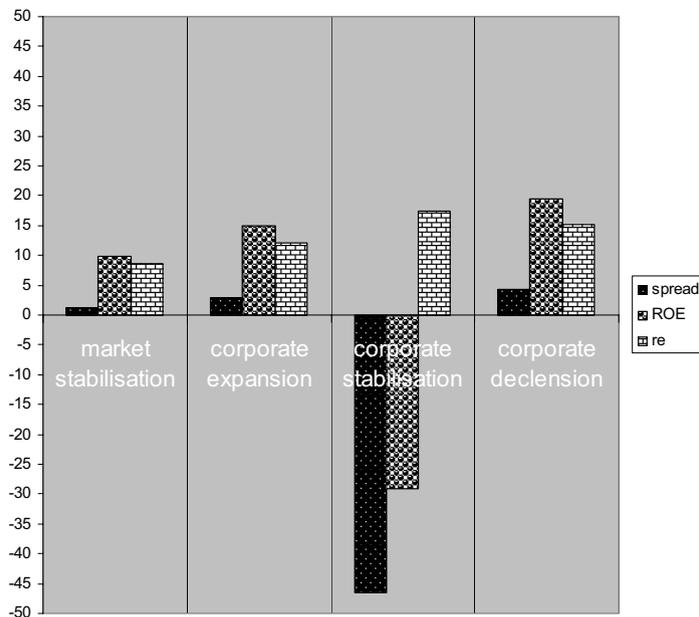


Fig. 4 – Relative EVA (spread in %), including its partial indicators, achieved by companies, in different phases of their life cycle, during the market stabilisation. Source: Finanční analýza podnikové sféry, available on [www.mpo.cz](http://www.mpo.cz), and financial reports of selected companies

During the market stabilisation, there is reached on the market evidently lower spread and return on equity in comparison to the market expansion, but the alternate cost of equity are approximately the same.

The lowest spread was achieved by companies that are in the phase of stabilisation, because there was reached a very negative return on equity and the alternate cost of equity were high.

The highest return on equity and also the highest spread was reached by companies in the phase of declension.

Fig. 5 demonstrates the situation, when the market was in the phase of declension in 2008.

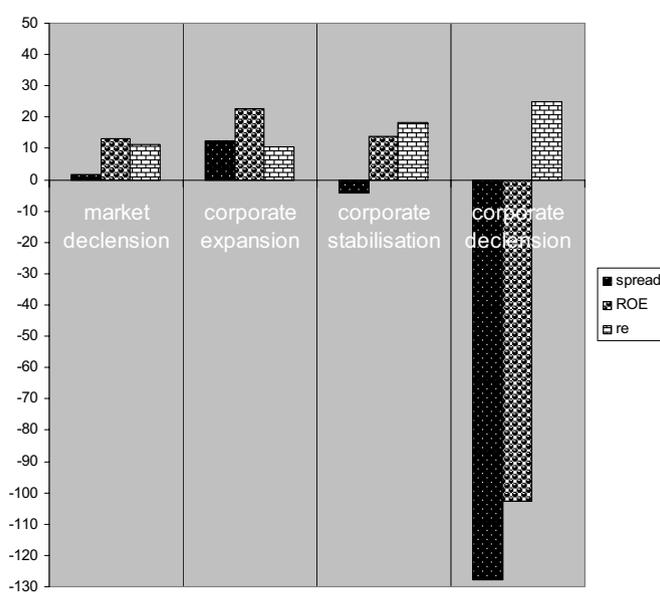


Fig. 5 – Relative EVA (spread in %), including its partial indicators, achieved by companies, in different phases of their life cycle, during the market declension. Source: Finanční analýza podnikové sféry, available on [www.mpo.cz](http://www.mpo.cz), and financial reports of selected companies

The highest spread was reached by the companies in phase of expansion because of the highest return on equity and the lowest alternate cost of equity.

By the companies, that are in the phase of declension, there is reached a very negative return on equity and there were requested the highest risk rewards and that was the cause of very negative spread.

And finally, on Fig. 6 there are mentioned all the nine market position according to the market- and corporate life cycle, whereas the positions are aligned from the highest to lowest relative economic value added in form of spread.

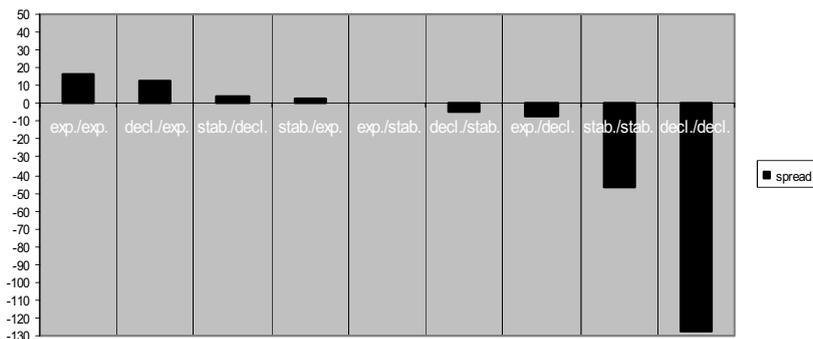


Fig. 6 – Relative EVA (spread in %) depending up the different market positions. Source: Financial reports of selected companies

Explanatory notes:

exp./exp. = market expansion/corporate expansion

decl./exp. = market declension/corporate expansion

...

...

decl./decl. = market declension/corporate declension

The highest economic value added was achieved by companies that were in the phase of expansion during the market expansion, which is the case of business driver.

On the contrary, the lowest economic value added was reached by companies in the phase of declension during the market declension, which is the case of business driver, too.

The positive values of EVA were reached by one position of business driver (exp./exp.) two positions of business follower (decl./exp. and stab./exp.) and two positions of business pioneer (stab./decl. and exp./stab.). Companies that are situated to other four positions achieved negative values of relative EVA, mostly because of low or negative return on equity (ROE).

## 5 CONCLUSION

The economic value added is, among others, influenced by the corporate- and the market life cycle.

According to the model by Reiners (2004) there are in total sixteen combinations of phases of corporate- and market life cycle. From this fact flows the existence of business pioneers, business drivers and business followers on the market. But this article is focused only on nine combinations, because the phase of corporate and market foundation isn't identifiable.

To calculate EVA and its partial indicators there was used the methodics by "Czech Ministry of Industry and Trade", whereas there was considered the relative EVA in form of "spread" because of the intercompany comparison.

There was under investigation the market "Motor vehicles production", because it is one of the most important branches of Czech economy. The data about the market were found out for three periods, in which was this market in different phases of its life cycle and for these periods were found out the data about the selected companies.

The basic results are that the highest spread of all nine market positions was reached by companies in the phase of expansion during market expansion and on the contrary, companies in the phase of declension during market declension reached the lowest spread.

The positive spread was reached in companies that belong to these five positions:

- market expansion vs. corporate expansion – the case of business driver
- market declension vs. corporate expansion – the case of business follower
- market stabilisation vs. corporate declension – the case of business pioneer
- market stabilisation vs. corporate expansion – the case of business follower
- market expansion vs. corporate stabilisation – the case of business pioneer

Companies that take the other four positions, reached negative spread, which was due mostly to low or negative return on equity.

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