DETERMINING DEVELOPMENT OF BUSINESS VALUE OVER TIME WITH THE IDENTIFICATION OF FACTORS

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Abstract: The objective of the paper submitted is to determine the development of the business value over time using a selected valuation method and identification of factors leading to changes in its value, with a specific quantification of each of these factors. Based on financial and strategic analysis of a Company XYZ, the two-stage DCF model was chosen. The difference between the values over time determined the growth of the value. Subsequently, there were identified factors influencing the change of the value of the company over time, with a concrete quantification of the influence of individual factors.

Keywords: business value, factors influencing company value, inflation, DCF model, development of business value over time

1 Introduction

Business valuation is currently paid more and more attention to. For this reason, several effective methods have been developed to determine a business value. Business valuation is also a scientific discipline which is addressed not only by academics but also business owners and managers. In specific cases, the need to determine business value is based on legislation. Other reasons for business valuation include its sale or settlement of joint ownership.

A number of methods can be used to determine business value. Each of them is based on specific data of a company being valued. In this context, it is possible to determine the usual price of a company, its market value, the objective price of a business, etc. The methods used to determine a specific type of a business value are divided into income, market, and asset (substitution) approaches (Vrbka et al., 2019). Using the valuation process, a situation of selling a company to a third independent rational person is simulated. The process of business valuation should include certain steps necessary to correctly determine the value of a company, including the collection and analysis of the data on the business being valued, drawing up its financial plan, and subsequent selection and application of a valuation method (Mařík et al., 2018).

The objective of the paper is to determine the development of business value over time and identification of key factor and the extent to which they have influenced the development of the value of a company. The calculation of business value will subsequently be shown on a concrete sample company, XYZ.

2 Literary research

Over time, business value is formed by many factors. Mertzhal et al. (2017) state that the creation of a business value is influenced by its capital in the form of human resources. This capital can be increased through various employee trainings. According to Rachmawati (2019), the observance of the accrual principle in a business accounting has a long term impact on the creation of its value. According to his findings, larger companies have a better ability to observe this principle and thus increase their value than smaller companies. Nazarova (2015) examined the influence of mergers and acquisitions of a large company on its overall value. In some specific cases, the diversification of a company´s portfolio can lead to an increase in its value due to a better geographical location of its supply base closer to final consumers.
Business value is influenced primarily by microeconomic and macroeconomic factors. Macroeconomic factors can be used to forecast the company´s earnings in a specific time horizon. The influence of macroeconomic factors on the company´s earning can be determined using Fama-MacBeth regression. On a sample of business operating in the USA between 1962 and 2009, this model has previously confirmed the heterogeneous impact of macroeconomic information about earnings forecast for a particular business, while the results in earnings forecasts differed considerable across sectors (Shu et al., 2013). Khaustova (2016) analysed specific macroeconomic factors that influence innovation activities of Ukrainian companies. Based on the dynamics of macroeconomic indicators´ indexes, the main threats and opportunities of macroeconomic environment have been identified which indicate the direction of innovation activities in the future.

The creation of business value in agricultural sector is significantly influenced by microeconomic factors. Microeconomic factors in agriculture can lead to restructuring the organizational forms of such companies. They are also able to influence the production factors, and, ultimately also the performance of production systems, thus becoming the cause of structural changes in the sector (Bosc, Belieres, 2015). According to Blažková and Dvouletý (2019), microeconomic factors influencing the creation of a business value include also the size of the company and the length of the period the company operates on a specific market. The food-production chain is always headed by an agricultural company producing the basic raw material for the production in this economic sector. In the case of investing in agriculture, from the investors´ perspective, the economic efficiency of the food industry should be strengthened through public support and regulations.

Time aspect of the creation of business value as well as its earnings can be considered in the short term. According to Sapkauskiene and Leitoniene (2010), in terms of time, speed is a competitive advantage that companies have over their competitors in case they are able to react quickly to a sudden change in the market. This can also refer to launching a new product or technology before the competitors can do so. It is therefore the length of the company response time to a change in the market. In such a case, the response time is described as a time-based competition (TBC).

In terms of the development of value over time, there is also an issue of the difference between the real and nominal business value. Although nominal value can increase over time, after its conversion into the real value net of the effect of the inflation rate over the time difference, the increase can be smaller than it originally appeared. According to Bratsiotis et al. (2015), the inflation targets of the national banks reduce the inflation persistence. Moreover, they claim that the states that started to introduce inflation targets at the end of 1980s or at the beginning of the 1990s were able to reduce the inflation persistence significantly or even eliminate it. Phiri (2016) carried out an analysis on the sample of 46 African states in terms of the acceptance of the inflation target by the individual states between 1994 and 2014. He also tried to find out whether the inflation persistence was higher or lower before the introduction of the inflation target. It was concluded that the inflation persistence of the African states which introduced the inflation target was reduced by 40%. Conversely, the inflation persistence of the African states which did not introduce the inflation targets increased by almost 290% for the same period.

In the Czech Republic, inflation targeting was started in 1998. Horváth (2008) conducted an analysis of the inflation rate after introducing its targeting using the method of vector auto-regression on the basis of monthly data on the inflation rate for the period 1999-2007. He claims that inflation targeting is a significant factor of inflation expectations, which was significantly reduced due to a stricter monetary policy of a lower inflation target.

Another factor affecting the development of business value over time is gross domestic product (GDP) of the state where the company operates. The issue of GDP development has been addressed in many studies, especially in terms of its forecasting. In the Czech Republic, GDP has been monitored by the Czech Statistical Office (CSO) since 1990. As a response, Fischer et al. (2013) created a methodology which is in line with the processes of determining GDP by the CSO. This was used to convert the data on the national income from the years 1970-1989 to the current GDP. This significantly extended the time series of the GDP development for its more detailed examination from a longer historical perspective. Sixta et al. (2013), as one of the co-authors of the transformation of the national income into GDP between 1970 and 1989, subsequently used these results to compare the development of GDP in the Czech and Slovak Republic. Until 1992, GDP was the same in both states, since the states created one common state, Czechoslovakia. After their separation, the GDP of each state started to develop differently, with the GDP of the Czech Republic was higher than that of the Slovak Republic for most of the time. In addition to economic factors, GDP is also affected by a number of non-economic factors. Tumer and Akkus (2018) created a model to forecast the impact of individual non-economic factors on the development of GDP using artificial neural networks (ANN). The non-economic factors included mainly the level of education, number of scholarly publications per one academic worker, the number of researchers per one non-academic employee, the percentage of research-related expenditures in relation to the GDP development, and the number of patents per person. The results say that the created ANN is able to forecast the GDP development based on the non-economic factors with high accuracy.

For business valuation, a number of income, market or asset (substitution) approaches are used. The issue of business valuation was dealt with e.g. by Mikáčová and Gavlaková (2013). Income-based value of a company is a key indicator for investors and business owners. The identification of the development of business value over time can significantly influence the selection of the company´s next strategic approach in order to increase its value in the future.

The income-based valuation approaches include e. g. the method of discounted cash flow (DCF). For the application of this method, it is necessary to determine the amount of the future cash flows. According to Kumar (2016), for the DCF method, there are three basic valuation models: dividend discounted model (DDM), free cash flow to equity (FCFE), and free cash flow to the firm (FCFF). This method is also in a single-stage, two-stage or three stage vatiant of the calculation of business value.

Sayed (2015) examined the degree of accuracy of the prediction of the business value development determined using the DCF method at 70% compared to the actual future state. On the other hand, the accuracy of the prediction of the business value development using the accounting value is only 51.1%. The DCF method thus seem to be more accurate in the case of forecasting the future development of business value.

3 Materials and methods

A model company XYZ, whose business activity is in the agriculture sector provided partial financial statements from the period 2007-2011. First, it will be necessary to find out whether the company assessed meets the "going concern" principle using the financial and strategic analysis (Amin et al., 2014), on which basis the method for its valuation will be chosen. Following this step, two financial plans will be drawn for the company. Each of the plans will be used for the valuation of the Company XYZ using the selected valuation method for two dates of valuation: 17 February 2007 and 14 July 2011. The difference between the values of the Company XYZ will express the difference of the value of the business over the past time horizon (about 4.5 years). Furthermore, the paper will be focused on the identification of the factors which caused the change in the model company value in this particular case.

Financial and strategic analysis of the Company XYZ will be carried out with regard to the concept of the company and its situation between 2007 and 2011. The Ministry of Trade and Industry (MTI) does not have any official methodology for conducting financial analysis. However, there have been efforts of the MTI to implement certain methodological elements that shall be contained in the financial analysis of each particular sector. Financial analysis of a company shall contain several techniques that can be followed. These include quantitative testing methods based on processing the data in the financial statements, by which individual indicators of financial health of the company are derived. This include e.g. the absolute method with sees the items in the financial statements as the absolute indicators and does not consider other phenomena. Within this technique, it is possible to identify the indicators in financial statements as state and flow variables. Another method is relative method, which consists in measuring data from financial statements, i.e. this method is used to see one data as the data influencing other information (Vochozka, 2016).

Absolute indicators include horizontal and vertical analysis of financial statements. These methods are used when determining the development trends in a company. Horizontal analysis is used to monitor the development of the company over time, while vertical analysis is applied to identify the financial statement structure related to some meaningful quantity.

For the purpose of this contribution, the technique of ratio indicator will be chosen. It is a technique where one or a group of financial indicators is divided by another financial indicator or a group of financial indicators, given that there is certain relation between the individual indicators. These indicators include the indicators of profitability, activity and liquidity, and indebtedness (e.g. Vrbka, Rowland, 2019).

Another step will be to confirm or reject the "going concern" principle of carrying out the strategic analysis of the Company XYZ. Strategic analysis is one of the steps in the process of business valuation which can be used to define the overall income potential of the business valued.

Since the owner of the Company XYZ was not paid any remuneration for the job performed, but only financial reward resulting from the ownership, from the perspective of a third rational person, it is necessary to calculate simulated wage costs for the owner of the Company XYZ, or wage costs for a person that would have to be employed by an independent investor so that a financial plan could be drawn up, whose results will be FCFE necessary for valuation of the company according to the method selected.

To determine the development of the Company XYZ´s value over time, two-stage DCF model will be used. Using this method, the value of the company will be determined at both valuation dates. For the calculation of the value at the first valuation date (17 February 2007), the selected length of the first stage for the calculation will be almost five years (February 2007-2011). The year 2012 will be the first year of the second phase of the calculation. For the calculation of the value at the second calculation date, the length of the first phase will be five years (2012-2016). The year 2017 will be the first year of the second stage of calculation. Formula 1 shows the calculation of the Company XYZ´s value using the two-stage DCF equity model of the future development:

First stage → second stage →

$$H = \sum_{t=1}^{T} \frac{FCFE_t}{(1 + n_{VK(z)t})^t} + \frac{FCFE_{T+1}}{n_{VK(z)T+i} - g} * \frac{1}{(1 + n_{VK(z)t})^T} \qquad (1)$$

where: H – business value,
$FCFE_t$ – Free cash flow to equity for owners in year t,

$N_{VK(z)i}$ – costs of equity at specific indebtedness in year i,
T – number of years of first stage,
g – growth rate in the second stage.

One of the key parameters of income-based approach of the DCF valuation is a discount rate. The discount rate using the two-stage DCF equity model is represented by alternative cost of equity.

The discount rate will be determined at each of the valuation dates. To determine the amount of cost of equity (r_e), used for discounting future FCFE, build-up model can be used – Formula 2 (Vochozka, Rousek, 2011).

$$r_e = r_f + r_{pod} + r_{finstab} + r_{LA} \quad (2)$$

where: r_e – costs of equity,
r_f – risk-free return,
r_{pod} – risk premium for business risk,
$r_{finstab}$ – risk premium for financial stability,
r_{LA} – risk premium for size of company.

As input values for the build-up model of determining alternative cost of equity, the data released by the MTI and Czech National Bank (CNB) will be used. For the valuation of the Company XYZ at 17 February 2007, the discounted rate will be increased by 1%, which will reflect the specific risk associated with the lack of information when drawing-up the financial plan, which results due to the lack of data provided by the model company XYZ. It can be assumed that the financial plan is thus burdened with a possible deviation resulting from the limited amount of input data.

Subsequently, it will be necessary to determine the growth constant *g*. Growth constant is used in the second stage of the selected DCF equity method for the determination of the continuing value. Growth constant is the response to the question of expected long-term growth of the company in the future. In its determining, the historical data of a given company and the data on the market and sector in which the company operates shall be considered. In the long-term, in order to maintain the "going concern" principle, the lower limit of the growth rate is the CNB target inflation, since it can be assumed that as the prince of inputs in the Company XYZ increase, the company will have to reflect this increase in the input prices into the price of production (Vimpari, Junnila, 2014; Speranda, 2012). Determining the value of the growth constant will be based on the data provided by the CNB and MTI.

To determine the values of the company at the valuation dates, the calculation of their difference will be carried out. This difference will provide the information on the development of the company value over time.

The last step will be the identification of the factors participating in the change of the Company XYZ´s value over time. There will also be a quantification of the individual factors´ influence on the change in the company value.

4 Result

First, financial analysis of the company was carried out, which served as a basis for drawing-up the financial plan. Financial analysis was carried out on the basis of five previous financial years of the model company XYZ. Based on the financial analysis, it can be stated that the model company XYZ was viable in the reference period but it was not strong in capital. The biggest strength of the company was the ownership of a part of the land where the agricultural activities were performed. It was also concluded that the company is able to achieve long-term profitability, but if the subsidy is reduced, the company would suffer significant financial loss.

Strategic analysis showed that the company XYZ could secure its position in the market by appropriate promotion of its activity and products. Since the main activity of the company XYZ is the production and sale of beef from the slaughter of beef cattle, its market position is largely influenced by the state of domestic and European beef market.

Based on the analyses carried out, it can be stated that the company XYZ meets the conditions of the "going concern" principle and it is thus possible to carry out its valuation using the two-stage variation of DCF equity method.

Determining of value at 17 February 2007
To determine the value of the company at the first valuation date, it was necessary to draw-up financial plan of the company for the period 2007-2011. The resulting financial plan is shown in Table 1.

Tab. 1: Financial plan of Company XYZ for valuation at 17 February 2007 (in thousands CZK)

Year	Operating results	Financial results	Wage – employee	Corrected operating result before tax	Tax	Corrected economic result after tax	Depreciation	Investment	Loan repayment	Drawdown of credit	FCFE
2007	1960	-147	339	1474	354	1120	1960	1067	735	0	1278
2008	2156	-49	356	1751	368	1383	1960	1121	412	0	1811
2009	2264	0	374	1890	378	1512	1960	1121	392	0	1959
2010	2377	25	393	2009	382	1627	1960	1121	0	0	2467
2011	2496	29	412	2113	401	1711	1960	1121	0	0	2551
2012	2621	34	433	2222	422	1800	1960	1121	0	0	2639

Source: Authors

Based on the financial plan drawn-up (Table 1) it is evident that the financial result of the Company XYZ will be negative only in the years 2007 and 2008. The resulting financial analysis thus reflects well the prediction of good financial health of the company in the long term. This also indicates continuous growth of FCFE.

Subsequently, the discount rate at first valuation date was determined. The calculation was carried out using Formula 2.

$$r_e = 3.89\% + 3.32\% + 2.14\% + 1.71\% = 11.06\% \quad (3)$$
$$r_e^* = 11.06\% + 1\% = 12.06\%$$

where: r_e^* is the discount rate increased by specific risk resulting from the lack of information.

The input values were obtained from the data released by the MTI (Ministry of Trade and Industry, 2009) and CNB (Czech National Bank, 2019). After increasing the discount rate by 1%, which reflects the specific risk associated with the lack of information when drawing-up the financial plan, the resulting value of the discount rate is 12.06%, which will be used for determining the value of company XYZ at the first valuation date.

Another step was to determine the growth constant *g*, which is the last one of the key values necessary for the calculation of the company value using the selected method. The value of the growth constant is in the range of the rate of growth of the CNB´s target inflation rate and nominal GDP growth. The CNB´s inflation target in 2007 was 3%. In 2010, the CNB announced a new inflation target of 2%. According to the Macroeconomic Forecast of the Ministry of Finance of the Czech Republic from January, real GDP growth was estimated at 5.0% (Ministry of Finance of the Czech Republic, 2008). Similar

GDP growth was expected by the CNB, whose estimated GDP growth was at the interval of 4.4%-6.6%. However, the strategic analysis of the company XYZ showed that the company did not have an important growth potential. In the long run, its objective was stagnation or slight growth. For this reason, the estimated growth constant was slightly above the CNB´s inflation target applied since January 2010, which is 3%.

In this stage, there were collected all data necessary for the calculation of a usual price of the company XYZ at the first valuation data using the selected method. The valuation of the company at the first calculation data was carried out using Formula 1.

$$H = \frac{1{,}278{,}000}{(1+12.6\%)^1} + \frac{1{,}811{,}000}{(1+12.6\%)^2} + \frac{1{,}959{,}000}{(1+12.6\%)^3} + \frac{2{,}467{,}000}{(1+12.6\%)^4} + \frac{2{,}551{,}000}{(1+12.6\%)^5} + \frac{2{,}639{,}000}{(12.6\%-3\%)^6} * \frac{1}{(1+12.6\%)^6} \quad (4)$$

$$H \cong 20{,}942{,}000\ CZK$$

Using the two-stage variant of the DCF model, the value of the XYZ company was determined at CZK 6,231,000 in the first stage. In the second stage, the value was determined at CZK 14,711,000. By summing up the first and the second stage of the two-stage variant of the DCF method, the value of the company XYZ as of 17 February 2007 was determined at CZK 20,942,000.

Usual price of the company as of 14 July 2011

To determine the value of the company as of the date stated above, it was necessary to draw up the financial plan of the company XYZ, in this case for the period of 2012-2017. The resulting financial plan can be seen in Table 2.

Tab. 2: Financial plan of Company XYZ for valuation as of 14 July 2011 (in thousands CZK)

Year	Operating results	Financial results	Wage – employee	Corrected operating result before tax	Tax	Corrected economic result after tax	Depreciation	Investments	Loan repayment	Drawdown of credit	FCFE
2012	2389	79	339	2128	404	1724	1715	1117	274	0	2047
2013	2472	81	349	2204	419	1785	1767	1151	0	0	2401
2014	2546	83	360	2270	431	1839	1820	1185	0	0	2473
2015	2623	86	371	2338	444	1894	1874	1221	0	0	2547
2016	2702	88	382	2408	458	1951	1930	1257	0	0	2624
2017	2783	91	393	2480	471	2009	1988	1295	0	0	2702

Source: Authors

Table 2 shows that the drawn-up financial plan indicates the assumption that the company XYZ will continuously increase its value for the shareholders.

As in the case of determining the usual price of the company as of the first valuation date, for determining the discount rate, formula 2 was used.

$$r_e = 3.79\% + 3.95\% + 1.41\% + 2.23\% = 11.38\% \quad (5)$$

The input values were obtained from the data released by the MTI (Ministry of Trade and Industry, 2012) and CNB (Czech National Bank, 2019). The growth in the risk premium for business risk is probably caused by the economic crisis, when generally all types of entrepreneurship started to be seen as more risky than before. The same level of identified discount rate will be used for all future periods.

As in the case of determining the growth constant *g* for determining the value of the company XYZ as of the first valuation date, also in the case of determining the growth constant, it was based on two limit values, CNB´s targeting inflation and estimated growth of GDP carried out by the Ministry of Finance of the Czech Republic. As mentioned above, the CNB´s inflation target until January 2010 was set to 2%. The growth of the actual GDP was estimated by the Ministry of Finance to 2.5%. Nominally, the growth could achieve about 4.5%. As in the case of determining the growth constant for the first date of the company valuation, the results of strategic analysis were considered. The estimated growth constant was slightly above the CNB´s inflation target applied since January 2010, that is, 2.5%.

At this point, all data necessary for the calculation of a usual price of the company XYZ as of the second valuation date using the same method as in the first case were available. Also in this case, formula 1 was used to determine the value of the company.

$$H = \frac{2{,}047{,}000}{(1+11.38\%)^1} + \frac{2{,}401{,}000}{(1+11.38\%)^2} + \frac{2{,}473{,}000}{(1+11.38\%)^3} + \frac{2{,}547{,}000}{(1+11.38\%)^4} + \frac{2{,}624{,}000}{(1+11.38\%)^5} + \frac{2{,}702{,}000}{(11.38\%-2.5\%)^6} * \frac{1}{(1+11.38\%)^6} \quad (6)$$

$$H \cong 24{,}690{,}000\ CZK$$

In the first stage, the value of the company XYZ determined using the two-stage variant of the DCF method was CZK 8,749,000, while in the second stage, the value was CZK 24,690,000 as of 14 July 2011.

The difference between the values of the company in the first and second stage indicated the increase in the value of the company XYZ. The value of the company increased by CZK 3,748,000 between the first and the second valuation date (CZK 24,690,000 – CZK 20,960,000 = CZK 3,748,000).

Factors influencing the change in the value of company XYZ over time

Based on the drawn-up financial plans for the determination of the values of the company for both valuation dates, as the main factors causing the increase in the value, three macroeconomic indicators and inflation were identified: sales in agriculture, change in the growth constant *g* and tax.

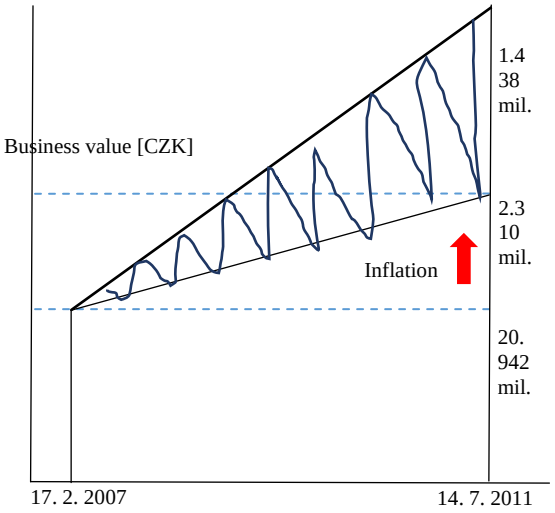
Based on the percentage difference of the values between both valuation dates (Czech Statistical Office, 2019), the percentage changes in sales in agriculture were set at 18.61%, the growth constants *g* at 16.667%, and the tax rate at 20.8334%.

Before the calculation of the individual factors´ share on the increase in the company value, the original value of the company had to be increased by inflation between the first and second valuation date. In this period, the inflation increased by 11.04% (Czech Statistical Office, 2019), which is CZK 2.31 million in the case of the model company XYZ. The value of the company was thus increased by the inflation to CZK 23,252,000 (CZK 20,942,000 + CZK 2,310,000 = CZK 23,252,000).

Subsequently, the individual macroeconomic indicators´ share on the increase in the value of the company by the remaining CZK 1,438,000.

(CZK 24,690,000 – CZK 23,252,000 = CZK 1,438,000) was calculated. Figure 1 shows the development of the XYZ company´s value over time with the impact of inflation.

Figure 1: Development of Company XYZ´s value over time with the impact of inflation



Source: Authors.

Calculation of percentage was carried out using the following formula:

$$X = \frac{1{,}438{,}000\ CZK}{(difference\ of\ sales\ in\ agriculture - g + difference\ in\ tax)} \quad (7)$$

$$X = \frac{1{,}438{,}000\ CZK}{(18.61\% - 16.667\% + 20.8334\%)} = 63{,}135\ CZK$$

where: X is the amount of change in the value by 1%.

Subsequently, the individual macroeconomic indicators affecting the development of the company value were recalculated.

- Difference of sales in agriculture

$$63{,}135\ CZK * 18.61\% \cong 1{,}174{,}942\ CZK \quad (8)$$

- Growth constant g

$$g = 63{,}135\ CZK * (-16.667\%) \cong -1{,}052{,}271\ CZK \quad (9)$$

- Difference in tax

$$63{,}135\ CZK * 20.8334\% \cong 1{,}315{,}316\ CZK \quad (10)$$

The difference of sales in agriculture between the two valuation dates increased the value of the company XYZ by CZK 1,174,942, the decrease in the growth constant g between the two valuation dates reduced the value of the XYZ company by CZK 1,052,271, and the reduction of the tax rate between the two dates increased the value of the company XYZ by CZK 1,315,316.

5 Conclusion

The aim of the contribution was to determine the company value over time while considering the perspective of a third independent rational person.

The financial and strategic analyses carried out confirmed that the company meets the condition of "going concern". Based on the drawn-up financial plan for both valuation dates, the development of the company value was determined by means of the application of the DCF equity method in its two-stage variant. The same methodology was then applied in a model case of the company XYZ operating in the agricultural sector. The development of the XYZ company´s value was evaluated as positive based on the methodology used. The value of the company in the reference period increased from CZK 20,942,000 to CZK 24,690,000. It was thus an increase by CZK 3,748,000.

In the final part of the contribution, this amount was divided by the macroeconomic indicators that had been identified as key ones for the development of the value of the model company. The inflation increased the nominal value of the company by CZK 2,310,000. The difference of the sales in agriculture resulted in the increase of the value by CZK 174,942, the decrease in the growth constant g resulted in the decrease of its value by CZK 1,052,271, and the reduction in the tax rate caused the increase in the value by CZK 1,315,316.

All objectives of the contribution were thus achieved.

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Primary Paper Section: A

Secondary Paper Section: AH