

APPLIED CORPORATE VALUATION USING FCFF METHOD – THE CASE OF RABA PLC. THE ONLY COMPANY FROM THE AUTOMOTIVE INDUSTRY PRESENT IN THE HUNGARIAN STOCK EXCHANGE

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Abstract: *The article primarily seeks to analyze the corporate performance of one of the significant players of the Budapest Stock Exchange, Rába PLC (RABA) and to prepare its corporate valuation based on the free cash flow method. RABA is a premium share and one of the components of the BUX index, as well as the only company from the automotive industry present in the Hungarian Stock Exchange. Another reason for this study is that in 2011 the Hungarian State (Hungarian National Asset Management Inc.) acquired 74% ownership in the company, so the ownership structure was significantly changed compared to the previous period. We were interested in knowing how the change in the ownership structure had been valued by investors. Is the steady growth of share prices demonstrable? Has the performance of the company improved on the basis of annual financial statements and financial ratios compared to the period before the government acquired major stake? How did government influence affect profitability and capitalization? As a general background to the studies, we first reviewed the automotive industry's economic processes based on publicly available information. Second, we presented the most important financial features of the company's 10-year development trend. Third, based on the historical, fundamental data series of RABA, we conducted a trend analysis. We estimated the expected future free cash flow to firm data and the relevant weighted average cost of capital. When determining the equity component of the weighted average cost of capital, the capital asset pricing model was used and a systematic risk assessment was also performed. With a two-phase free cash flow model and scenario analysis, we defined a target exchange rate band that, according to our analyses and expectations, indicates the expected future exchange rate trend. Finally, we evaluated our results compared to the current market trading data.*

Keywords: *corporate valuation; free cash flow to firm; weighted average cost of capital.*

JEL Classification: G30; G31.

1. General industry background

We can make a general statement about the automotive industry: it is an important strategic industry, one of the most important elements of the industry-inspiring policy of the current Hungarian government. According to the public data of the Hungarian Central Statistical Office, the volume of vehicle production more than doubled in the period of 2010–2015, from HUF 3610 bn to HUF 7833 bn. The rate of increase is continuous, with respect to its share from total industrial production, as well.

One of the reasons for growth may be the economic policy of the current government, but in addition major automotive industry players can also decide to increase their production capacity independently or due to parent company incentives. While at the end of 2010, the output of the automotive industry represented only one sixth of the industrial production, by the end of 2015, the automotive industry volume exceeded one quarter of the industrial output (Table 1). Given the growing trend in total industrial production, it can certainly be stated that the automotive industry is producing a stronger growth rate than other sectors, which confirms the government's incentive efforts relating to the automotive industry.

It is also worth mentioning the change in sales. Although domestic and export sales tend to increase, the volume of export sales is considerable higher. The sales volume of the produced assets is only about 5–10% of the domestic sales volume. Domestic sales increased from HUF 300 bn to 618 bn in the period under review, while the value of exports increased from HUF 3300 bn to 7200 bn (Table 1). These data properly reflect the export orientation of the automotive industry and the volume, high standard and advanced state of its foreign market.

As a result of large investments realized from foreign direct investments, the development of vehicle manufacturing has been outstanding in recent years and it has been the industry's largest sector since 2011. Alongside the gradual introduction of new capacities, vehicle production in 2015 was 17% higher than in the previous year and more than double than that of 2010. Since 2010, the subsector has performed better than the manufacturing average every year.

Table 1: The Hungarian automotive industry in the 2010–2015 period

Year	Automotive industry production	% of industrial production	Domestic sales	Export	Total sales	Industrial production*
2010	3 610 240	17.64%	305 037	3 289 294	3 594 331	20 462 351
2011	4 100 546	18.10%	317 191	3 751 751	4 068 942	22 654 708
2012	4 448 366	19.22%	288 121	4 150 567	4 438 688	23 141 018
2013	5 401 375	22.91%	352 558	5 021 424	5 373 982	23 575 766
2014	6 659 071	25.98%	454 165	6 197 391	6 651 556	25 635 324
2015	7 833 303	28.61%	618 863	7 187 255	7 806 118	27 377 873

Source: Hungarian Central Statistical Office, 2016 (data in million HUF)

It is also an important feature that more than nine percent of the automotive production is divided by large companies. 92% of sales are realized on foreign markets, and consequently external demand determines the trend of production. The dynamic growth experienced in 2015, as in previous years, was primarily due to a 16% increase in external demand. Among the two major subsectors of vehicle manufacturing, the major subsector of road vehicle production increased by 17% in 2015, and the minor subsector of road vehicle components production increased by 20% compared to the previous year. The two subsectors together account for 97% of vehicle production in Hungary (HCSO, 2016).

Road vehicle production is almost entirely concentrated in 4 large companies, and when considering the whole subsector, companies having at least 250 employees have a share of production over 90% (Lepsényi, 2014).

2. Methodology and literature review

The article seeks to perform the corporate valuation of the premium share traded on the Budapest Stock Exchange, RABA PLC, based on the discounted cash flow method (Berk et al, 2015, p. 328). RABA is the only vehicle industry player in the Hungarian stock exchange, its main activity is production of automobiles and components. The company does not pay dividends, therefore the free cash flow to firm (FCFF) model was chosen as an analytical tool of the DCF models (Kiss, 2015; Becsky-Nagy – Droppa, 2015). In this model, free cash flow is the amount of money produced by the company's activities that is available to the providers of the company's resources (lenders and equity holders). The discount rate should reflect the alternative cost of each of the providers of the company's resources, in proportion to their contribution to all sources, according to the concept of weighted average cost of capital (WACC) (Copeland et al., 1999; Damodaran, 2006, p. 28). Based on the growth trend of the company's past FCFF data series and on future estimates, we have considered the use of the biphasic model as realistic. The estimated value was divided into two components: the present value of the cash flows during the explicit forecast period (5 years: 2017–2021) and the present value of the cash flows after the explicit forecast period (Copeland et al., 1999, p. 170; Berk et al, 2015, p. 329; Damodaran, 2006, p. 28). We used scenario analysis in order to realize the theoretical determination of the exchange rate band, for the growth rate relating to the residual value (Damodaran, 2012).

To substantiate our analyses, we examined the time series data of RABA's sales revenue, total assets and post-tax profit for the period 2006–2016. Thus, we were able to evaluate the basic data of the period before and after the economic crisis. Subsequently, we discussed the analysis of profitability indicators. We have investigated whether the return on sales (ROS), return on assets (ROA) and return on equity (ROE) data series show a change after the transformation of the ownership structure in 2011. The relevance of using profitability indicators was verified by the studies of Bodie et al (2005), Stankeviciene (2012), Rózsa (2014), Fenyves et al (2014) and Droj (2015).

The data of RABA PLC's annual report have been downloaded from government official annual reports' portal *e-beszamolo.im.gov.hu* with respect to the period of 2006–2016. We used a more detailed data series for the analysis of past FCFF data series with respect to the period of 2001–2016. We used the balance sheet, profit and loss account and supplemental notes to the financial statements for the analyses. In order to prepare the tests, calculations, and forecasts, the data was imported into Microsoft Excel spreadsheet software program. In support of the analyses, quarterly flash reports on the Budapest Stock Exchange website and other statements have also been used.

We also used *bet.hu* in order to download share prices and calculate seasonal yields. In order to calculate the WACC, it was also necessary to estimate the systematic risk, for which we have used the methodology of Bodie et al (2005): we have created logarithmic yields within annual intervals, using the daily exchange rate data, and then the covariance with the appropriate yields of the BUX index was determined.

Finally, the covariance data was divided by the variance of the market portfolio, so we obtained the annual systematic risk (beta factor) values.

3. Results of the research

3.1. Valuation of RABA PLC's corporate performance

The company employs nearly 2,000 people and is headquartered in Győr. The Holding's business consists of 3 business lines (axles, vehicle components and vehicles), with a share of the total sales revenue of 49%, 27%, and 24% respectively, based on the information published on the company's website. The Holding is a public limited company, which has been listed on the Budapest Stock Exchange since 1997. In recent years, RABA's turnover exceeded HUF 46 billion (i.e. EUR 148 million), and the most important sales areas are the followings, by the order of volume: EU, domestic, US, Asia (Figure 1).

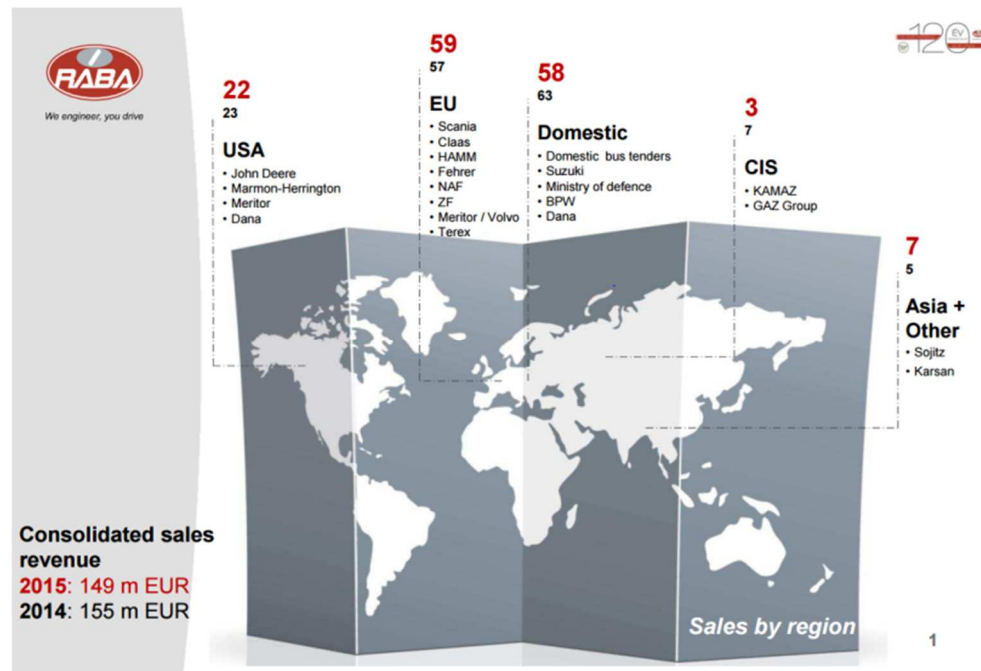


Figure 1. Sales structure of Raba Holding
Source: the Company's website, www.raba.hu

In 2011, the Hungarian State (Hungarian National Asset Management Inc.) acquired 74% ownership in the company, so the ownership structure was significantly changed compared to the previous period. It is worthwhile examining the main financial features of the company before and after the change of ownership (Figure 1). As shown in Figure 1, RABA's sales exceeded HUF 30 billion, over the entire period. A setback in sales turns out in 2009, its reasons can be found out in the quarterly report for the IV quarter 2009. The main reason for the decrease was the sudden decline in US sales volume: in 2008: USD 108.5 million, in 2009: USD 42.4

million, representing a decrease of 61%. The EU market also experienced a significant decrease: from HUF 12.6 bn in 2008 to HUF 6.2 bn in 2009. After the crisis, the revenue got back to normal, there is a rising trend, but the HUF 50 billion level cannot yet be exceeded for the present. There was a significant decrease in the asset portfolio during the period of 2006–2009. On the one hand, this is due to the post-crisis loss. On the other hand, it can be explained by the restructuring of the credit structure. At the same time, it can be stated that in 2010 the book value of total assets and total liabilities stagnates between HUF 32–37 billion, despite the fact that the ratio of long-term loans is continuously decreasing according to the annual reports.

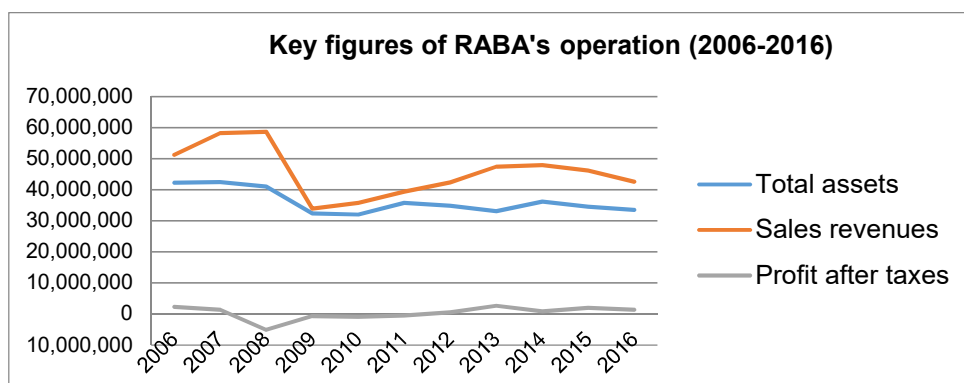


Figure 1. Key figures of RABA's operation (2006–2016) (data in thousand HUF)
Source: Private processing of the reports relating to the period under review (2017)

From the change in profits after taxes, it can be concluded that after the state's acquisition of shares in 2011, the company generated profits each year, which is explained by the balanced operating cost level alongside rising sales revenue and by the constantly declining financial expenditures. The decline in financial expenditures comes from the new credit policy. The balance sheet shows that the stock interest-bearing liabilities have been restructured. Under the new structure, the term of loans became longer, with a more favorable annual interest payment obligation, and the value of short-term interest-bearing liabilities significantly decreased. After the restructuring of the ownership structure, the favorable profit level justifies the analysis of the profitability rates in more detail (Figure 2).

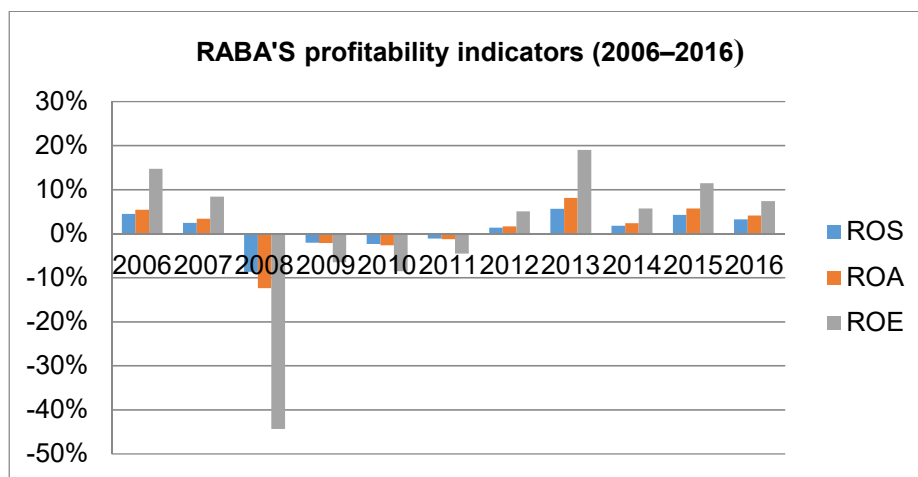


Figure 2. RABA'S profitability indicators (2006–2016)

Source: Private processing of the annual reports relating to the period under review (2017)

On the basis of the supplementary annexes and profit and loss accounts of the period, the recession caused by the crisis and the high expenditures of financial transactions have played a decisive role in the unfavorable change in profitability data during 2008–2011. After the government acquired major stake in the company, the above mentioned restructuring of the credit structure resulted in a positive outcome: fewer financial expenditures had to be attributed to the operating profit. Thus, the company was able to generate yields that were consistent with the profitability rates at the steadily increasing profit level. Based on the data obtained from the end of the year flash reports of 2016, RABA generated an equity pro rata income of 7.4%, which is considered relatively high in the current investment environment. This is supported by Figure 3.

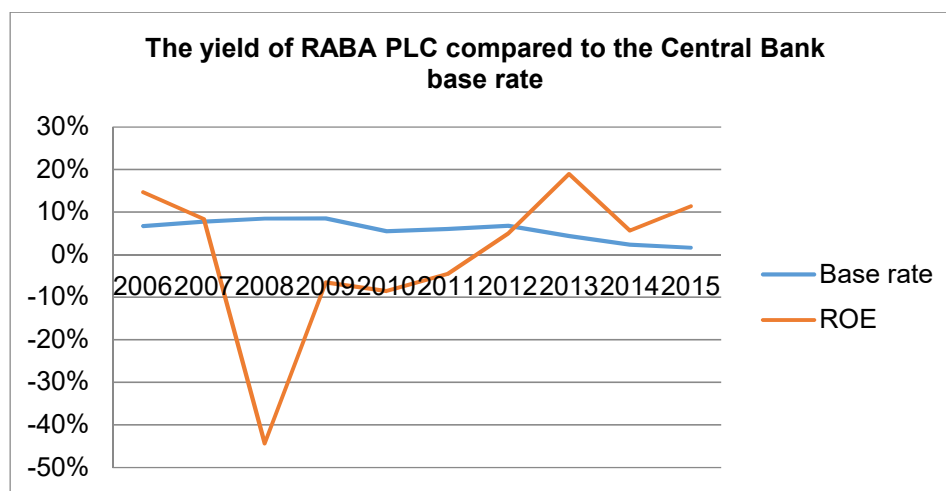


Figure 3. The yield of RABA PLC compared to the Central Bank base rate

Source: Private processing of the data of the National Bank of Hungary and of RABA

3.2. Applied corporate valuation of RABA using FCFF method

As explained in the methodology chapter, RABA's corporate valuation is calculated as the sum of the discounted present value of estimated free cash flows to firm that are expected in the future. From the FCFF data of the past period (2001–2016), based on the trend-adjusted growth, we have prepared a forecast for the next 5 years and then we assume a slower growth phase starting from 2021. For the definition of past FCFF data, the formula of Berk et al (2015) has been used.

$$FCFF = EBIT \times (1 - \text{Tax rate}) + \text{Depreciation} - \text{Capital Expenditures} - \text{Increases in Net Working Capital}$$

EBIT as operating profit was included in the reports with the appropriate financial content. According to the rules of corporation taxation, for an EBIT under HUF 500 million 10% tax, for an EBIT above that amount 19% tax is calculated. The increase in fixed assets is the difference between the value of the invested asset of the current year and that of the previous year. The increase in working capital requirement, i.e. the value of increases in net working capital is determined as a year-on-year change in the difference between current assets and non-interest-bearing liabilities.

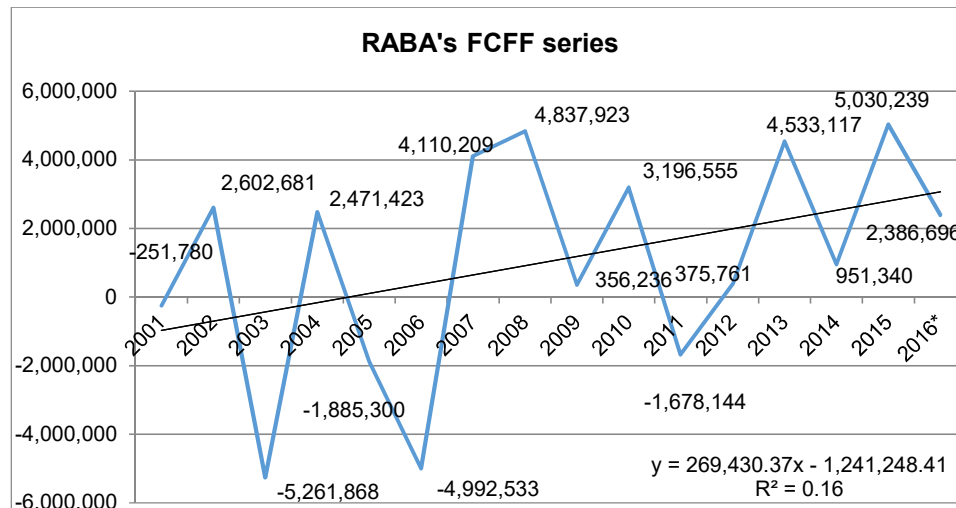


Figure 4. RABA's FCFF series during 2001–2006 (data in thousand HUF)

Source: Private processing of the annual reports (2017)

Figure 4 illustrates the FCF series of recent years (2001 - 2016). A trend function can be added to the data, which can be used to predict the expected free cash flow series for the coming years. It can be seen that the past FCFF series reached the bottom in 2003, in 2006 and in 2011 there was also a significant decrease compared to the previous periods. In all three cases, there is a common explanation for low values: the starting-point, the profit before interest and tax payments were extremely low and the growth in working capital further reduced these values.

Using the equation of the trend line ($y = 269\,430.37x - 1\,241\,248.41$), we estimated the FCFF values for the next 5 years (Table 2).

Table 2: RABA's estimated firm cash flows for the next 5 years (data in thousand HUF)

Years	2017	2018	2019	2020	2021
FCFF	3 339 068	3 608 498	3 877 929	4 147 359	4 416 789

Source: Private estimate (2017)

To estimate the value of the company, we use a two-phase discounted FCFF model based on Damodaran (2006) and Damodaran (2012). The first part is the discounted present value of FCFF values for the next 5 years using WACC. The second part is the discounted value of the estimated residual value of the 5th year (the present value of the FCFF series from the 6th year to the infinite period by theory) based on the following relation.

$$V = \sum_{t=1}^5 \frac{FCF_t}{(1+WACC)^t} + \frac{(FCF_5 * (1+g))}{(WACC_k - g)} \cdot \frac{1}{(1+WACC)^5}$$

3.2.1. Definition of the WACC

According to Damodaran (2012), the appropriate discount rate is the weighted average cost of capital for the company's free cash flow valuation. WACC calculation method:

$$WACC = re \frac{E}{V} + rd(1-T) \frac{D}{V}$$

We have used a 10% key for determining the value of T , the corporate tax rate. This is a simplification, but we have verified that it has practically no distorting effect. The CAPM model was used to determine the re , i.e. the expected return of equity (Bodie et al, 2005).

$$re = rf + \beta * (rm - rf)$$

The value of rf , i.e. the risk-free interest rate was estimated by the average annual Central Bank base rate. To calculate β , the systemic risk factor, we needed the variance of the yield on the market portfolio and the covariance between the yields of RABA and of the market portfolio. We selected BUX index as a market portfolio. The following relation was used for determining β .

$$\beta_i = \frac{COV(r_i, r_m)}{\sigma_m^2}$$

The covariance between the yields of RABA and of the market portfolio was determined on the basis of the annual logarithmic yields calculated from the daily closing rates of the BUX index and of the RABA shares, using the covariance function of Microsoft Excel, in the 2006–2016 period, for each year. The variance of

the yield of the market portfolio (BUX index) was also determined using the logarithmic yields.

The $rm-rf$ value, i.e. the risk premium of the market portfolio was calculated from the difference between the average annual yield of the BUX index and the average value of the risk-free rate.

In order to discount FCFF values at the appropriate rate, a trend has also been added to the WACC values. Using the trend function, the appropriate WACC discount rates were determined for the 5 year of phase 1, then we assumed a constant WACC value, increased by a risk premium, for phase 2, for the period after 2021.

Figure 5. Illustrates the change of WACC values.

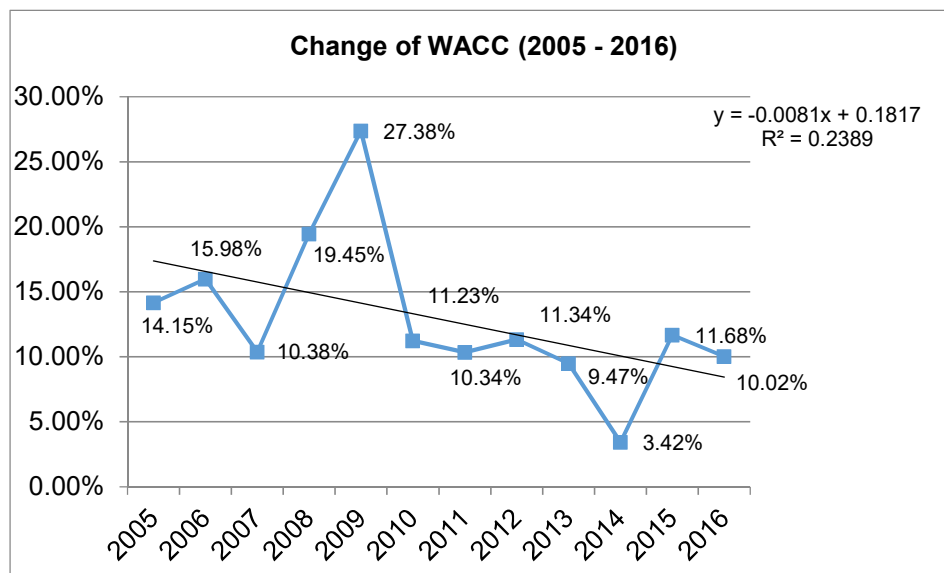


Figure 5. WACC values and their trend in the 2005 - 2016 period

Source: Private estimates (2017)

Figure 5 shows that data volatility is low, with the exception of the data for 2009 and 2014. The 2 breakouts are due to the fluctuation of the BUX index. While in 2009, during the crisis, a 73% rise in prices and a remarkable yield increase was created, in 2004 a decline of 10.94% was characteristic and these values had a strong influence on the expected return on equity and thus on the capital cost, with average beta values (0.44 and 0.48). The future expected WACC values generated by the trend function were very close to the average WACC value of the examined period. Therefore, we decided to apply the average WACC value (12.9%) as a discount rate for phase 1. In phase 2, a WACC increased by risk premium (13.9%) was used to compensate for the increasing risk of the forecast.

3.2.2. Structure of the two-phase FCFF model

The following table shows the discounted values of the estimated FCFF values for phase 1 according to the average WACC of 12.9% (Table 3). It can be seen from the table that the average WACC discount of the FCFF values determined by the trend calculation results in a value of HUF 13.4 billion for the present value of phase 1.

Table 3: Present values relating to phase 1 of RABA's estimated FCFF series

Data: in thousand HUF	2017	2018	2019	2020	2021
FCFF	3 339 068	3 608 498	3 877 929	4 147 359	4 416 789
PV (FCFF)	2 957 454	2 830 818	2 694 499	2 552 364	2 407 522

Source: Private estimates (2017)

In phase 2 a lower, stable FCFF growth rate will be characteristic and we will discount based on a higher $WACC_k$ (13.9%). The residual value is determined according to the following formula.

$$\frac{(FCF_5 * (1 + g))}{\frac{(WACC_k - g)}{(1 + WACC)^5}}$$

FCF_5 is the FCFF estimated for 2021. A scenario analysis is prepared for growth rate g . Residual values are estimated in optimistic, normal and pessimistic cases as well. The discount rate applied in phase 2 is $WACC_k$ (13.9%).

Based on the following table, we determine the growth rate g chosen for the 3 different scenarios (Table 4). The equation of the used trend line is as shown in Figure 5:

$$y = 269\,430.37x - 1\,241\,248.41$$

Table 4: Expected FCFF values based on the trend function

FCFF data: in thousand HUF	FCFF	Increase
2017	3 339 068	8.78%
2018	3 608 498	8.07%
2019	3 877 929	7.47%
2020	4 147 359	6.95%
2021	4 416 789	6.50%
2022	4 686 220	6.10%
2023	4 955 650	5.75%
2024	5 225 080	5.44%

FCFF data: in thousand HUF	FCFF	Increase
2025	5 494 511	5.16%
2026	5 763 941	4.90%

Source: Private estimates (2017)

The table shows that the optimistic average growth for the distant future is 5%, while the realistic growth is 4%, and the pessimistic estimate is an increase of 3%.

The final results relating to the evaluation of Phase 2 in the different cases are detailed in the following table (Table 5).

Table 5: Estimated value of the company (RABA PLC)

Data: in thousand HUF	Optimistic	Realistic	Pessimistic
Growth rate	5%	4%	3%
Residual value	28 392 301	25 282 296	22 742 753
The value of the Company	41 834 958	38 724 953	36 185 410

Source: Private estimates (2017)

Table 5 shows that based on our estimates, the value of a company can range from HUF 36 billion to HUF 42 billion, and that is significantly more than the total value of assets in the balance sheet of 2016, which is HUF 33.5 billion. We have to admit that the value of a company is not only composed of the total value of its assets in the balance sheet, but it is also important to take into account whether the sustainability of the company's business, the future estimates and the development opportunities are a reason for positive judgment and favorable expectations.

Since the value of a company is higher than the book value of all assets on the basis of our estimates, the reasons for the difference between the book value and the estimated value must be examined. The company's market value is estimated by Jägle (1999) as a combination of current performance and future forecasts. The higher value of the future projections, i.e. the Present Value of Growth Opportunity (PVGO) indicates that based on the tendencies, the company is operating in a strong position, and it is in a safe and sustainable situation that can justify that the estimated market value is above the book value. The fact that the FCFF currents have been estimated based on the trend for the values of the last 16 years, also has a strong impact on our estimates. The fact that the present value for the 5th year of phase 1 covers almost one-third of the company's asset value, projects a very positive future for the company.

4. Conclusions, proposals

The main purpose of our study was to estimate the value of the Hungarian automotive stock exchange company, RABA PLC (RABA), by the use of a free cash flow model. As a background of our financial research, we have presented the main characteristics of the automotive industry and analyzed the most important financial data of RABA's past 10-year performance, with regard to the 2011 ownership structure change (74% majority state ownership).

In order to carry out the applied corporate valuation, we selected the two-phase FCFF model for which detailed historical analyzes were made. We have added a trend function to the past FCFF data and used this to estimate the expected free cash flow for the next 5 years. Detailed analyzes were also carried out in order to determine the relevant data of the weighted average cost of capital. The most important element of this study was the use of capital market and Hungarian stock exchange data. With the yields of RABA shares, the yields of the BUX index, the covariance and variance data, and the estimation of the risk-free rate, a well-funded discount rate analysis was prepared. In case of growth rates applicable in phase 2, a scenario analysis was made, so the estimation of the value of the company resulted in one interval.

The result of the discounted FCFF estimate is that the company's estimated market value is between HUF 36 and 42 bn, depending on the growth rate of phase 2. This estimated corporate value allows us to determine the target price of RABA shares. The values necessary for the calculation are shown in the following table (Table 6).

Table 6: Determination of the target price band for RABA shares

FCF growth rate	Estimated corporate value (data in thousand HUF)	Value of liabilities in 2016 (data in thousand HUF)	Estimated market value of equity (data in thousand HUF)	Number of shares	Theoretical exchange rate of 1 share (HUF)
5%	41 834 957	14 835 874	26 999 084	13 473 446	2 004
4%	38 724 952	14 835 874	23 889 079	13 473 446	1 773
3%	36 185 409	14 835 874	21 349 536	13 473 446	1 584

Source: Private estimates (2017)

The estimated market value of RABA's own equity can be calculated by deducting the liabilities from the estimated corporate values. The estimated market value of equity is between HUF 21.3 and 27 bn. If the equity value is divided by the number of shares traded (in circulation), the theoretical target price band of 1 share can be calculated, which is in this case between HUF 1584 and 2004. At the moment the market rate (March 29, 2016) is HUF 1175, compared to a significantly higher target price, according to our valuation.

Since the change in the ownership structure, RABA has been profitable in recent years, it has a secure market position, and it is characterized by continuously decreasing financial expenditures and a decreasing long-term debt volume. All of these support that in the long run it would be reasonable for the share price to rise, the share may be proposed to be hold for the long term. The state ownership and the degree of trading give confidence for a long-term holding period. The share itself is considered less speculative, traded on a one-year average, in a value of HUF 3.9 million per day.

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