Analysis of the Financial Condition of a Company

Zlatina Tzenova [1]

[1] *Technical University of Sofia*
Sofia, 1000, 8 "Kl. Ohridski" blvd, FAMI, office 2206
e-mail: zlatina_iv@mail.bg

Abstract. *The financial analysis examines the content of the financial statements, which are prepared in accordance with generally accepted accounting principles and aims to provide information on the amount and risk of future cash flows. The object of financial analysis are the inflows and outflows of economic activity and their distribution over time. The financial analysis needs an efficient capital market for stock prices. The analysis of the financial condition of the companies is of great importance for their future. Based on this analysis, certain decisions can be made by managers and owners. In addition, potential investors, commercial banks and other stakeholders can draw conclusions based on the analysis of financial condition and make certain decisions concerning companies.*

DUPONT MODEL ANALYSIS

DuPont's method [1] is used in the field of sales in the study of the impact on profitability of rising prices, declining sales, entering new markets, the change of assortment. It is used in marketing - for optimization of different types of assets; in financial management - for comparative analysis of the application of different financing strategies by finding opportunities to reduce the cost of interest payments. It is also used to assess the of risk in attracting additional external sources of funding needed to increase the return on equity. The DuPont model is useful for diagnosing a company's financial condition because it desegregates the profitability of three components: cost control, asset utilization, and credit utilization.

The calculation formula for this model is

$$ROE = \frac{Pure\ profit}{Sales\ revenue} . \frac{Sales\ revenue}{Total\ assets} . \frac{Total\ assets}{Equity}, \quad (1)$$

where:

ROE - Return on Equity; $\frac{Pure\ profit}{Sales\ revenue}$ - profitability of sales; $\frac{Sales\ revenue}{Total\ assets}$ - return on assets; $\frac{Total\ assets}{Equity}$ - financial leverage.

ALTMAN MODEL ANALYSIS

Particular importance to the company's creditors is the ability to anticipate corporate failure before it occurs. As early as the 1960s in the United States, Edward Altman developed a multivariate approach to predicting corporate bankruptcy, known as the Altman's Z -Score [2]. In essence, the model is a selection of relatively independent coefficients and determination of their weights. They are all connected in a structural equation that is based on

variables - financial ratios, which are separated into five groups: liquidity, profitability, indebtedness, solvency and efficiency, and parameters that are empirically occurred numbers. When applying the Altman method, a coefficient is obtained, which helps to determine the probability of the company going bankrupt in the near future.

Altman's scale of probability of bankruptcy is:

$$\begin{cases} Z \leq 1{,}8 - \text{ very high probability that the company will go bankrupt;} \\ 1{,}81 < Z \leq 2{,}99 - \text{ zone of uncertainty;} \\ Z \geq 3 - \text{ the company is stable and there is no possibility of bankrupt.} \end{cases} \quad (2)$$

The Altman Two-Factor Model

It is calculated:

$$Z = -0{,}3877 - 1{,}0736K_1 + 0{,}0579K_2 \quad (3)$$

where K_1 - current liquidity ratio; K_2 - financial dependency ratio, representing the ratio between the debt and the amount of the asset (liability) balance sheet.

Interpretation of results:

$Z > 0$ - the probability of bankruptcy is more than 50% and increases with increasing Z;

$Z = 0$ - the probability of bankruptcy is equal to 50%;

$Z < 0$ - the probability of bankruptcy is small and with the further decrease of the value of Z this probability decreases.

The Altman Five-Factor Model

The most popular of the many models is the five-factor model for predicting corporate bankruptcy, known as Altman's Z-Score [3]. Its essence comes down to connect relatively independent coefficients and determining their weights. They are included in a structural equation based on variables (financial ratios) and parameters (empirically derived numbers) [4]. The financial ratios involved in the equation are the following five indicators: liquidity, profitability, indebtedness, solvency and efficiency.

The formula for calculating the Z coefficient for public companies is:

$$Z = 1{,}2X_1 + 1{,}4X_2 + 3{,}3X_3 + 0{,}6X_4 + 0{,}999X_5, \quad (4)$$

where

$X_1 = \frac{working\ capital}{total\ assets}$ - share of net working capital in assets;

$X_2 = \frac{retained\ earnings}{total\ assets}$ - return on assets based on retained earnings;

$X_3 = \frac{earnings\ before\ interest\ and\ taxes\ (\text{EBIT})}{total\ assets}$ - return on assets based on operating profit;

$X_4 = \frac{\text{market value of equity}}{\text{book value of total liabilities}}$ - the coefficient of financing;

$X_5 = \frac{\text{sales}}{\text{total assets}}$ - return on all assets.

ROIC TREE

The ROIC Tree model [5] is used as a more specific model in terms of invested capital. The ROIC tree allows in the future to manage the profitability not only of the funds invested in the company, but also of future investments.

The disadvantage of this model is that the cost of capital is not taken into account, thus not corresponding to market realities.

The calculation formula for this model is

$$ROIC = \frac{EBIT}{Net\ sales\ revenue} . \frac{Net\ sales\ revenue}{IC}, \quad (5)$$

where

$ROIC$ - Return of Invested Capital; $EBIT$ - Earnings Before Interest and Taxes; IC - Invested capital.

The companies that make a profit less than the cost of capital, usually cannot create value only by growth until the value of their ROICs exceeds the cost of capital. The invested capital is formed by adding the interest-bearing debt of the company to the own capital.

CREDIT - MEN MODEL

The CREDIT-MEN model [6] is widely used in French banks. Developed in France, the method assesses the financial condition of the company on five indicators: rapid liquidity ratio; coefficient of financial autonomy; coefficient of coverage of fixed assets with equity; return on inventory ratio; receivables return ratio. For each of these indicators a normative value (type coefficient) is determined, which is compared with the level of the indicator in the analyzed company. Then the equation is solved:

$$N = 25R_1 + 25R_2 + 10R_3 + 20R_4 + 20R_5, \quad (6)$$

where

R_1 - rapid liquidity ratio;

R_2 - coefficient of financial autonomy;

R_3 - coefficient of coverage of fixed assets with equity;

R_4 - return on inventory ratio;

R_5 - receivables return ratio.

The coefficients in the equation (25,25,10,20,20) show the relative weight of the influence of each of the indicators.

$$\begin{cases} N \leq 100, & \text{the financial condition of the company is normal;} \\ N > 100. & \text{the situation is worrying.} \end{cases} \quad (7)$$

The effectiveness of the method is based on the normative values used during the analysis, and statistical surveys are used to determine them.

DIAGNOSIS OF THE FINANCIAL CONDITION OF THE COMPANY

A company that is a manufacturer of starter lead - acid batteries with various applications is analyzed. The company's production has been known on the international market for over 50 years. From 1959 to 1990 the company is focused mainly on the production of batteries for military vehicles and mobile armored vehicles In 2000 the first plant for recycling lead-acid batteries was opened. In 2001 the production of AGM (Absorbent Glass Mat) batteries was started. In December 2020 the company goes public. The company relies on the constant development and market introduction of new products, which combined with highly qualified specialists and the use of modern technologies and equipment makes it highly competitive in domestic and international markets.

DuPont Model Analysis of the Company

To calculate the DuPont model indicators, using formula (1) and the Table 1, obtain:

TABLE 1. DuPont model analysis of the company for the period 2016 - 2020

Indicator	2016		2017		2018		2019		2020	
Pure profit (€)	17307		25389		12832		22051		26527	
		0,086		0,106		0,052		0,090		0,101
Sales revenue (€)	202068		239425		248159		245958		263271	
Sales revenue (€)	202068		239425		248159		245958		262271	
		0,951		0,966		1,169		0,892		0,779
Assets (€)	212565		247730		212346		275660		336520	
Assets (€)	212565		247730		212346		275660		336520	
		1,680		1,531		1,372		1,504		1,691
Equity (€)	126524		161804		154785		183306		199018	
ROE		**0,14**		**0,16**		**0,08**		**0,12**		**0,13**

From the data presented in the Table 1, an analysis of the overall rate of return on the DuPont model and the various components of which it is composed, can be make.

The first component of the model expresses the ratio between net profit and sales revenue and is an indicator of return on profit. The growth trend in 2017 compared to 2016, followed by a decline in 2018 and growth again in the next 2 years, can be traced.

The second component of the DuPont model is the ratio of sales revenue to the company's assets and expresses the return on assets. The company has an increase in return on assets until 2018 and from 2019, the indicator decreases.

The third component of the DuPont model is the ratio of assets to equity or so-called financial leverage. Calculations show that until 2018 there is a downward trend and from 2019 it start increasing.

Considered in its entirety, DuPont's model provides information about the company's profitability. In 2017, the ROE indicator increased compared to the previous 2016. In 2018, there is a decline of 8 points and after this period, there is a trend of growth in 2019 - 0.12 and 0.13 in 2020.

Altman Model Analysis of the Company

The Altman model shows the probability that the company will go bankrupt in the near future. Using formula (4) and Table 2, obtain:

TABLE 2. Altman model analysis of the company for the period 2016 - 2020

Indicators	2016	2017	2018	2019	2020	Formula coefficients
Short-term assets (€)	96821	129729	101940	147775	188900	
Short-term liabilities (€)	68779	71747	20489	76061	89844	
Working capital (€)	28042	57982	81451	71714	99056	
Retained earnings (€)	0	6613	0	29447	41044	
EBIT (€)	19308	31186	12610	25157	28311	

Amount of the balance sheet asset (€)	212565	247730	212346	275660	336520	
Equity(€)	126524	161804	154785	183306	199018	
Net sales revenue (€)	202068	239425	248159	245958	263271	
Amount of debt (€)	86314	86817	57561	96181	143916	
X_1	0,132	0,234	0,384	0,260	0,294	1,2
X_2	0,000	0,027	0,000	0,107	0,122	1,4
X_3	0,091	0,126	0,059	0,091	0,084	3,3
X_4	1,466	1,864	2,689	1,906	1,383	0,6
X_5	0,951	0,966	1,169	0,892	0,782	0,999
Z – coefficient	**2,287**	**2,817**	**3,437**	**2,798**	**2,413**	

According to (2), following conclusions can be made:

In 2016 the Z - coefficient is 2,287 and falls into the uncertainty zone, the situation is similar in 2017. In 2018, the value of the coefficient is 3,437, which is an indication that the company is stable and there is no danger of bankruptcy. In 2019 and 2020, the Z - coefficients are as follows 2,798 and 2,413, according to which the company falls into the uncertainty zone. Throughout the period, from 2016 to 2020, the company has no value of the Z - coefficient, which is critical, the conclusion that the company is stable and there is no likelihood of bankruptcy can be made. The table clearly shows the trend of change of Altman Z - coefficient during the period under review. The highest value, the coefficient assumes in 2018, as seen at the peak of the chart, followed by a gradual decline in 2019 and maintaining the trend in 2020.

ROIC Tree Analysis of the Company

The ROIC Tree model expresses the ability to manage the profitability of the funds invested in the company and future investments.

To calculate ROIC Tree model indicators, using formula (5) and the Table 3, obtain:

TABLE 3. ROIC Tree model analysis of the company for the period 2016 - 2020

Indicator	**2016**	**2017**	**2018**	**2019**	**2020**
EBIT (€)	19308	31 186	12 610	25 157	28 311
Net sales revenue (€)	0,096 202068	0,130 239 425	0,051 248 159	0,102 245 958	0,108 263 271
Net sales revenue (€)	202068	239 425	248 159	245 958	263 271
Invested capital (€)	15,936 12 680	7,648 31 305	9,467 26 213	15,437 15 933	9,095 28 948
ROIC	**1,52**	**1,00**	**0,48**	**1,58**	**0,98**

From the coefficients calculated in the Table 3, the first component of the model, which expresses the return on capital, can be research. In 2017, the coefficient increased compared to 2016, declined in 2018 and increased again in

2019. In 2020, the growth trend continues. The second component of the model expresses the return on investment. Again, fluctuations in declines and increases compared to previous periods can be observed.

The coefficient obtained from the analysis of the ROIC Tree model shows, similarly to the coefficient expressing the return on investment, a constant alternation of declines and increases during the period under review. These fluctuations can be interpreted as management's efforts to allocate capital for investment as efficiently as possible to provide the greatest benefit.

Credit - Men Analysis of the Company

The formula (6) and the following Table 4 will be used to make the calculations.

TABLE 4. Credit - men model analysis of the company for the period 2016 - 2020

Indicators	2016	2017	2018	2019	2020
Short-term receivables (€)	51090	66200	62066	79602	94701
Financial assets (€)	2626	7673	9705	15232	5550
Current liabilities (€)	67783	70803	18967	73334	87082
Equity (€)	126524	161804	154785	183306	199018
Raised capital (€)	84169	84873	55628	93022	140652
Fixed assets (€)	115744	118001	110406	127885	147620
Cost of production (€)	182760	208239	235549	220801	234960
Inventories (€)	42861	55607	30103	52547	87970
Sales revenue (€)	202068	239425	248159	245958	263271
R_1	0,792	1,043	3,784	1,293	1,151
R_2	1,503	1,906	2,783	1,971	1,415
R_3	1,093	1,371	1,402	1,433	1,348
R_4	4,264	3,745	7,825	4,202	2,671
R_5	3,955	3,617	3,998	3,090	2,780
N	**233**	**235**	**415**	**242**	**187**

According to (7), the values of the N indicator are well above 100, which means that the financial situation is not optimal. After the sharp rise of the N indicator in 2018, there is a downward trend, which can be interpreted as attempts by management to improve the economic and financial condition and stability. In 2016 and 2017, the value of the N coefficient is approximately the same and this is reflected as an almost straight line between the two years. In 2018, there is a sharp rise in value, followed by a sharp decline in 2019, which continues in 2020 and reaches levels lower than in 2016.

COMPARATIVE ANALYSIS OF THE RESULTS AND CHARACTERISTICS OF THE TRENDS IN THE DEVELOPMENT OF THE COMPANY.

To compare the results, obtained by different models, Table 5 is used:

TABLE 5. Summary of the analyzes performed by the company for the period 2016 - 2020

Financial coefficient	2016	2017	2018	2019	2020
DuPont model	0,14	0,16	0,08	0,12	0,13
Altman Model	1,52	1	0,48	1,58	0,98
ROIC Tree model	2,287	2,817	3,437	2,798	2,413
CREDIT – MEN model	233	235	415	242	187

The analysis based on the DuPont model shows how the indicators increase after 2018. For the period 2016 - 2018 the coefficient is fluctuating. The highest level is reached in 2017 - 0.16, and even after the upward trend of 2019, these levels cannot be reached. What is specific about DuPont's model is that it is considered in its entirety, all the components of which it is composed are analyzed. Considered by its constituent components, DuPont's model confirms the hypothesis that in 2018 the company has the worst financial performance and from 2019 begins a trend of increasing performance.

Altman's analysis shows the probability of a company going bankrupt. In 2018, the value of the Z - coefficient is 3,437, which is greater than 3 and falls into the zone where there is no probability of bankruptcy. During the remaining years of the study period, the values of the obtained Z - coefficient are in the uncertainty zone between 1.81 and 2.99.

The ROIC Tree analysis takes into account the ratio between working capital and investment in fixed assets, taking into account intangible assets. It consists of two components, which in themselves carry information to the analyst about the state of the company. The results of the company's analysis by the ROIC Tree method are dynamic in different periods, alternating periods of growth and decline. This is an indication of the efforts of the management to improve the economic condition of the company. In addition, fluctuations in the results obtained are interpreted as a decrease in the return on net sales revenue and an increase in the return on invested capital.

The CREDIT-MEN analysis is based on the analysis of five indicators. From the data attached in Table 4, it can be seen that during the period under review, the value of the N - indicator is above the critical 100 points, which is indicative of financial instability based on the specific assessment. The specificity of this type of analysis must be taken into account, namely that it is developed and used by French banks and takes into account the specifics of the particular country and its economic and political characteristics.

CONCLUSION

The analyzes performed show the relative financial stability of the company. During the five-year period from 2016 to 2020, some of the analyzed components show a relative decline in 2018 of some of the indicators, followed by growth over the next two years. Observing other components of the financial analysis, it can be concluded that 2018 is financially stable. These fluctuations and differences are the result of management's attempts to stabilize and improve the overall economic condition of the company. Strengthening the company's market position and monitoring effective sales will make the financial situation more stable and will ensure sustainability for a longer period. When making decisions about the investment policy and the development policy of a company, in addition to the internal company factors that must be taken into account, the external factors and the environment must be studied. An important component regarding the development and prosperity of any company is the research and monitoring of major competitors. All decisions on investment and development must be based on a comprehensive analysis of

internal factors, in particular financial analysis, external analysis and analysis of competitors. For the period under review, the economic and financial condition of the company is stable and indicates strict and thorough management, which is working hard to improve and stabilize.

ACKNOWLEDGMENTS

The author would like to thank the Research and Development Sector at the Technical University of Sofia for the financial support.

REFERENCES

[1] Clemens Berghoff, Using DuPont Analysis to Predict Changes in Profitability: Evidence from Europe, Universität St. Gallen, 2017;

[2] Suchada Toni Meksavanh, Bankruptcy Prediction: The Altman Z-Score in the New Millennium, California State Polytechnic University, Pomona, 2004;

[3] Altman, E. I., Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy, Journal of Finances 23 (September 1968)

[4] Altman, E.I., Haldeman, R., Narayanan, P., Zeta analysis: A new model to identify bankruptcy risk of corporations, Journal of Banking and Finance, 1977;

[5] Prasanna Chandra, Corporate Valuationa: Guide for Analysts, Managersand Investors, McGraw Hill Education, Delhi, 2014;

[6] Joël Bessis, Risk Management in Banking, Wiley, 2010.