APPLICATION OF PROGNOSTIC MODELS OF BUSINESS ANALYSIS IN BUSINESS DECISION MAKING

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Summary: In today's uncertain business environment for business management, making business decisions is a big challenge. The basic information it uses in the decision-making process is the accounting information that is incorporated in the financial statements. In order for the financial statements to be useful for decision making, it is necessary to do an analysis of the financial statements on the basis of which we can evaluate the quantitative and qualitative characteristics of the business of the company. The forecasting models of business analysis are a late assessment of business performance as well as a forecast of future business. The information we get from using these models serves management and all interested users to make decisions. In this paper, we will apply the BEX model, which was primarily developed for the Croatian market, and the Altman Z-score model, which is widespread, to the telecom sector in BiH. The aim is first of all to obtain business results and a forecast of future business and after that to make a comparative analysis of the results of these two models.

Keywords: business decisions, financial statements, forecasting models of business analysis, BEX model, Altman z-score model

INTRODUCTION

The need for external financial reporting lies in the fact that the users of financial reporting are diverse categories of market participants such as existing investors, employees, creditors, customers, governments and their agencies and the public at large. Such financial statements are addressed to external users, which in this way gain the ability to assess exposure to real risks in their relationship with a particular company or potential risks should they enter into a business relationship with it. The set of financial statements includes: balance sheet, income statement, statement of cash flows, statement of changes in equity and notes to the financial statements. Based on the analysis of these reports, the end users make business decisions ie. whether to invest or not. The forecasting models of business analysis are a late assessment of business performance as well as a forecast of future business. The information we get from using these models serves management and all interested users to make decisions.

1. APPLICATION OF PROGNOSTIC MODELS TO THE FINANCIAL STATEMENTS

Forecasting models were created more than 40 years ago and are the most used in highly developed market economies. They are based on accounting data and / or financial statement data and are used to evaluate business performance and assess bankruptcy threats. We have very little use of these models in our country.

Given that corporate corporate failure results mainly stem from internal considerations such as inefficient management, undercapitalization, and excessive borrowing, and only a small portion comes from external influences, many authors have engaged in the use of ratio analysis as an analytical technique during their research and scientific work. bankruptcy forecasts of the company.[[28]

The approach to problem solving starts with the assumption that the data in the financial statements are credible and objective, because only in this way external and internal users will be satisfied with the assessment of business performance for a given period and be able to make adequate business decisions.

In our work we will use two prognostic models, one is the Altman Z-score model that calculates the risks of the business operations of the company[[29] and the other is the BEX model, which was primarily developed for the Croatian market as the work of the author prof. dr. Ph.D. Vinko Belak et al. Ph.D. Zeljane Aljinovic Barać[[30].

2. METHODOLOGY AND DEFINITION OF SELECTED PROGNOSTIC MODELS

The forecast for the future is based on the BEX index and the Altman Z-score model for the sampled three largest telecom companies in BiH for 2014, 2015 and 2016. The methods of ratio analysis are used in the part that assesses the general condition of the sampled companies in the telecom sector, which are later correlated with the time periods to which they apply and the different models. In addition to the quantitative, this paper also performs a qualitative analysis based on the obtained results, which represents the main roadmap for the management of the company and

[28] Petkovič Đ., Hajnrih J. (2012)

[29] Altman, E.I., Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy, Journal of Finance 23, 1968, p.189-209

[30] Belak V., Aljinović Barać Ž. (2008). Tajne tržišta kapitala. Zagreb: Belak doo

other interested users for future business decision making.

Business excellence model - BEX index appeared in economic-financial theory in 2008 as the work of the author prof. dr. Ph.D. Vinko Belak et al. Ph.D. Zeljane Aljinovic Barac. This model is intended to analyze the business performance of Croatian listed companies, but has subsequently received confirmation from non-listed companies or is about to enter. It is based on financial ratios calculated on the basis of the accounting information in the financial statements that is readily available to anyone interested in the analysis. A special advantage of this model is that it also contains an entirely new indicator of financial strength, based on the ratio of theoretically free money from all activities, which is a gain plus depreciation and depreciation and cover of total liabilities of that money. The application of this forecasting model is possible to evaluate the business performance of an enterprise in all similar capital markets. Considering that the market in BiH is similar to the market in Croatia, the intention was to test its application on the selected sample in this research paper. According to Belak V., Aljinović Barać Ž. (2008) The BEX index shows and measures business excellence in two dimensions as current and expected business success. They have developed the following formula:

BEX INDEX	RANG POSLOVNE IZVRSNOSTI	PROGNOZA ZA BUDUĆNOST I PREPORUKE ZA UPRAVLJANJE
Veći od 6,01 4 god. uzastopno	Svjetska klasa	Poduzeće posluje s vrhunskim rezultatima što se može očekivati i ubuduće ako uprava nastavi s unaprjeđenjima.
Veći od 6,01	Kandidat za svjetsku klasu	Poduzeće posluje izvrsno što se može očekivati i ubuduće ako uprava nastavi s unaprjeđenjima.
Između 4,01 i 6,00	Izvrsno	Poduzeće posluje izvrsno što se može očekivati i ubuduće ako uprava nastavi s unaprjeđenjima.
Između 2,01 i 4,00	Vrlo dobro	Poduzeće posluje izvrsno što se može očekivati i ubuduće ako uprava nastavi s unaprjeđenjima.
Između 1,01 i 2,00	Dobro	Poduzeće posluje dobro, ali se poboljšanje može očekivati samo ako uprava pristupi unaprjeđenjima.
Između 0,00 i 1,00	Granično područje između dobrog i lošeg	Poduzeće ne posluje zadovoljavajuće. Potrebno je čim prije pristupiti ozbiljnim unaprjeđenjima.
Manji od 0,00 (negativan)	Loše	Ugrožena je egzistencija poduzeća. Potrebno je žurno pristupiti restrukturiranju i unaprjeđenjima, inače je velika vjerojatnost stečaja.

Table 1. Business Performance Assessment - BEX index
Source: presentation by prof. dr. Željana Aljinović Barać, Business Performance Assessment Model and Management Based on Cash Flow Indicators, p. 25

$$\mathbf{BEX = 0{,}388\ ex_1 + 0{,}579\ ex_2 + 0{,}153\ ex_3 + 0{,}316\ ex_4}$$

$$ex_1 - \text{profitability} = \frac{EBIT}{Total\ assets}$$

$$ex_2 - \text{value creation} = \frac{Neto\ dobit}{Proprietary\ capital \times price}$$

$$ex_3 - \text{liquidity} = \frac{Working\ capital}{Total\ assets}$$

$$ex_4 - \text{financial strength} = \frac{5 \times (Profit + D + A)}{Total\ Liabilities}$$

The first model to begin applying the multivariate approach to calculating business risk was Altman's Z-score model. Unsuccessful businesses are expected to have financial ratios different from those of financially sound businesses. The Altman model also defines the threshold on which a financial institution makes its decision. The research conducted by Altman was made on a sample consisting of 33 failed and 33 successful businesses. The following formula has been developed:

$$\mathbf{Z = 1{,}2X_1 + 1{,}4X_2 + 3{,}3X_3 + 0{,}6X_4 + 1X_5}$$

$$X_1 = \frac{Working\ capital}{Total\ assets}$$

$$X_2 = \frac{Retained\ earnings}{Total\ assets}$$

$$X_3 = \frac{Profit}{Total\ assets}$$

$$X_4 = \frac{Market\ value\ of\ equity}{The\ carrying\ amount\ of\ liabilities}$$

$$X_5 = \frac{Sales\ revenue}{Total\ assets}$$

Z> 2.9 company operates well, stable, in "safe zone"

1.23 <Z <2.9 company operates in "gray zone"

Z <1,23 company operates in "problem area"

There is also a custom Z-score model but for non-listed companies. Since the sampled companies in this paper are listed on stock exchanges in BiH then we will use this model.

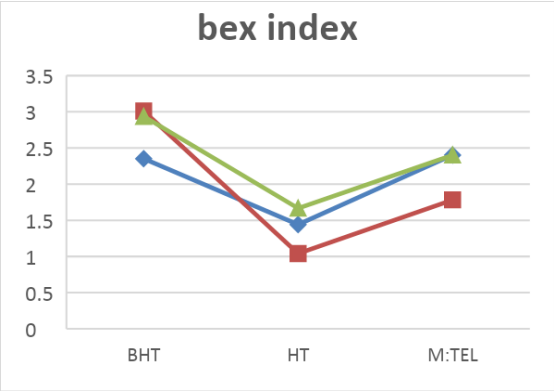
Based on the calculated Z-score model, the probability of bankruptcy can be calculated using the following formula:

$$P= 1 - \frac{ez}{1+ez}$$

2.1. RESULTS OF THE RESEARCH

After collecting the necessary data from the financial statements of the three largest telecom operators in BiH (BH Telecom, HT Mostar and M: tel), for the last three years (2014, 2015 and 2016), we obtained results for BEX index and Z-score model presented in the following graphs.

Graph 1. Overview of the BEX index for the telecom sector in BiH from 2014 to 2016



Source: Author's calculation based on data collected from annual financial statements

The BEX index values for BH Telecom range from 2.35 to 3.01, which is in the "very good" business, that is, the company performs well, which can be expected in the future if management continues to improve.

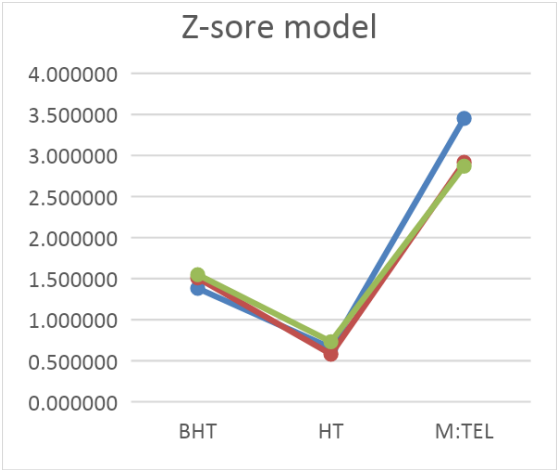
The BEX index values for HT Mostar range from 1.04 to 1.66, which belongs to the rank of "good" business, ie the company operates well, but improvement can only be expected if management approves the improvements.

The BEX index values for M: tel range from 1.78 to 2.4, which is on the border between "good" and "very good". Given that it had more than 2.4 for two years then we will conclude that it is in the "very good" rank.

According to these results, all three telecom operators are doing well, but they still need a lot of upgrades to reach "excellent", "world class candidate" or "world class" rankings. In 2015, only BH Telecom experienced an increase in the value of this index, while in others the index value fell. If you rank them according to this index then BH Telecom performs best, then M: tel and last in the list is HT Mostar.

The following chart shows the values obtained according to the Z-score model.

Figure 2. Overview of the Z-score model for the telecom sector in BiH from 2014 to 2016

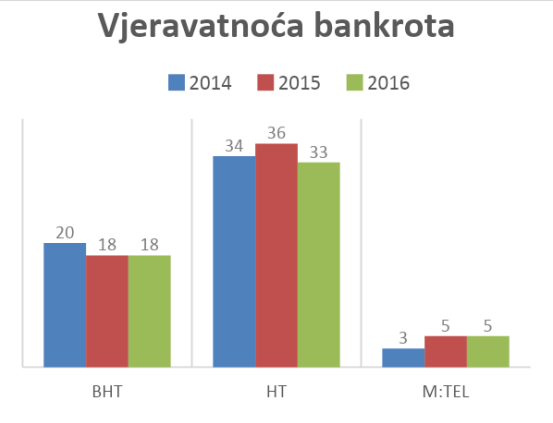


Source: Author's calculation based on data collected from annual financial statements

The obtained Z-score model values for BH Telecom range between 1.38 and 1.54 which means that the company operates in the "gray zone", for HT Mostar they range between 0.58 and 0.73 which means that the company operates in " problem area ", ie there are financial difficulties for M: tel, they range between 2.87 and 3.45 which means that the company is operating well or is in the" stable zone ".According to this model, M: tel performs better than BH Telecom in contrast to the results of the BEX index. HT Mostar has financial problems, as evidenced by the fact that in recent years they have acquired a negative image in terms of business transparency, as well as by expressing a negative audit opinion, which means that their financial statements do not present truthfully and fairly on all relevant issues the status of assets and liabilities. So we cannot take the calculated values for these two models as relevant.

Also, based on the obtained values of the Z-score model, we also calculated the probability of bankruptcy of these companies, which is presented in the following chart.

Chart 3. Bankruptcy probability of telecom sector in BiH from 2014 to 2016 based on Z-score model



Source: Author's calculation based on data collected from annual financial statements

M: tel has a minimum probability of going bankrupt in the coming period as the calculated probabilities range between 3% and 5%, while with BH Telecom the probability ranges between 18 and 20%, with HT Mostar the highest probability of bankruptcy, ie ranging from 33 to 36%.

When comparing the results of these two forecasting models, we can conclude that in the case of the telecom sector they give approximately the same results. The results for BH Telecom and M: tel are optimistic, low in bankruptcy, but it takes a lot of improvement and commitment from management to reach "excellent", "world class candidate" or "world class". HT Mostar is significantly behind in business for these two companies, index values indicate their problems in business and when it is taken into account that their financial statements are not transparent, they must make strong steps and improvements in order not to go bankrupt in the future.

3. CONCLUDING CONSIDERATIONS

Good quality financial statements are a prerequisite for company growth. The information contained therein is used to make relevant business decisions. The quality of these reports is a key factor in minimizing the risk to business-financial decision-making by management on the one hand and external users on the other. The new role of professional accountants in ensuring the quality of financial statements arises from the consequences of poor quality financial statements that are quantified by the costs of a criminal, repressive, and subsequent, corrective nature.[31] However, there are far greater consequences of a qualitative nature, such as the loss of the acquired reputation and reputation of not only professional accountants, but of management and businesses as a whole.

Through the presented research part in the paper, we can conclude that these two models ie. The BEX index and the Altman Z-score model provide similar forecasts for the telecom sector in BiH as a whole. All three companies are far from world-class but M: tel has a minimum probability of bankruptcy. Also, HT Mostar's results are the worst for both models, which is confirmed by negative audit reports.

Applying forecasting models can greatly help us in making business decisions, ie whether to invest or not if we are investing. As an investor, we can easily get the information we need, that is, the financial statements, on the assumption that they meet the qualitative characteristics required by the financial reporting standards. The application of these models in BiH is not sufficiently represented, which is understandable given that the financial market is poorly developed.

[31] Malinić S, Professional Ethics and Education in the Function of Financial Reporting Quality, XXXIX SRRS Symposium, Zlatibor, 2008, p.44

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