



MODELS FOR THE EVALUATION OF BUSINESS EXCELLENCE IN CAPITAL MARKET OF BOSNIA AND HERZEGOVINA

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Abstract:

It is always a problem to choose one or more indicators or to construct a model that reflects the achieved operating result. Companies all over the world have developed numerous models assessing excellence from various aspects in order to estimate the achieved operating result or overall business excellence. Applying most of the models requires data and estimation that are not available to investors. BEX model is primarily designed to assess business excellence enterprises in the capital market in Croatia. It is also possible to apply this model to all the other similar markets. This paper will be focused more on the possibility of applying the mentioned model in the capital market of Bosnia and Herzegovina., that is, to the most successful companies listed on the Sarajevo Stock Exchange but being a part of SASX – 10 index, and those listed on the Banja Luka Stock Exchange entering BIRS index.

Key words:

business excellence,
working capital,
value of creation.

INTRODUCTION

Beaver (1966) was the first to forecast corporate failure, among the others who worked very hard on the same problem. Therefore, he was the first who compared the characteristics of bankrupt companies to the identical characteristics of healthy companies, using different multivariate tests. Resulting from his research, he concluded that the indicators could improve one's ability to separate viable from non-viable enterprises.

One study (Beaver, 1966) states the first modern research on the prediction of business problems using ratio and the study is only a continuation of the research studied in his doctoral dissertation. He ob-

served a period of ten years, from 1954 to 1964, for 30 ratios in 79 companies that were determined by activity and property size. For each selected company, he selected companies without problems, but of the same activities and property size. In the section entitled „Suggestion for future research”, Beaver said that he used a single analysis and consequently proposed multiple analysis. Altman obviously accepted the suggestion and two years later published a Z - score model (Sajter, 2009).

Using the Multiple Discriminant Analysis, James (Džejms, 1997) has correctly classified 95% of the companies in the sample, prior to bankruptcy. A few years later, Altman developed a Z - score model which improved the Multiple Discriminant Analysis.

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In 1971 a regression analysis was successfully introduced. Both methods (regression analysis and multy - variety discriminatory analysis) were compared and the conclusion was that together these options gave much better results than the superior Multiple Discriminant Analysis. A year later, the investigated Z-score model gave the best results.

The most famous quantitative model for predicting bankruptcy is Altman's Z - score model was developed in 1968 by Altman, a professor at the Stern School of Business. Z - score model is a set of financial indicators in the multiple variant context, based on the multiple discriminant model for the companies where it is difficult to predict the complexity of making decisions or the scope of their total activities on the basis of a single measure.

In 1977 a new model called logit analysis was developed. The logit and discriminatory analysis was applied to explain the bankruptcy of 23 banks in the period from 1975 to 1976. The relevant empirical research with certain exceptions have shown that the majority of the proposed models lead to satisfactory predictions, according to the correct classification of 70% to 90% of companies in the sample. It should be noted that the results of several research papers are difficult to compare, due to systematic changes in the business cycle, industry and others (Bodie *et al.*, 2006).

Business Excellence model (BEX) for assessing company business excellence was founded in 2007 by Belak and Aljinović –Barać, 2008. The main objective was to develop a model for assessing the business excellence of the company based on financial indicators that were easily available to all external users. BEX index was tested on a sample of companies not listed on the capital market. Test results demonstrated that the application of the same model was possible with correction and limits when calculating individual indicators.

BASIC CHARACTERISTICS OF BUSINESS EXCELLENCE MODEL

Applying the logical selection in accordance with sustainability and compatibility criteria in displaying excellence among the multitude of indices from all areas, a total number of 14 indices was selected and those were: 5 structural indices, 5 fiscal performance indices and 4 indices of stockholders investment efficiency in capital market.

A group of indices assorted like this was subjected to statistical tests and consequently, a standard

discrimination function was obtained containing only four key indices that had the greatest influence on specifying company's affiliation to a certain group. Specifying the relative importance of the influence of the weighting factors in the chosen indices to the discrimination of two groups of companies and analyzing further, we have calculated an aggregate index of business excellence – BEX index.

BEX index indicates and measures business excellence of a company in two dimensions and those are:

- ♦ Current business excellence (lagging dimension),
- ♦ Expected business excellence (leading dimension).

Statistic research and modern scientific methods testified the prognostic value of BEX model by means of checking the real data of the companies on capital market in Croatia and, in the period from 2000 – 2006, the prognostic value reached 90%. Namely, it still needs to be noticed that this is about statistic evaluation of prognostic model potency, while the real prognostic value needs to be postulated using the time series, segmental evaluations and additional information. The advantage of this model compared to other similar models can be manifested in the following (Belak and Aljinović –Barać, 2008):

- ♦ BEX model and BEX index are designed in accordance to business conditions in the Croatian economy. Other imported models are designed in different conditions and therefore their accuracy is doubtful.
- ♦ BEX index is not dependent on indices from capital market, so it can be used for companies entering the capital market, which is extremely important, but also for other companies which are off the market. For example, basic Altman's Z-score, as the most popular model, does not provide this.
- ♦ The majority of similar models is aimed at forecasting the future danger, caused by financial distresses and bankrupts (for example Altman's Z – score, Ohlson's model or Argenty's model), and less to excellence. Unlike that, BEX enables the evaluation of business excellence as well as forecasting the success and failure which implies much greater quality.
- ♦ BEX index contains a brand new index of company's financial potency which has not been using in the world until now. Besides this, what can also be considered as brand



new is index of new value formation up to now which has not been using in this form in none of the models.

An interesting fact is that statistic research has showed that indices from the market have not been statistically important for deciding whether companies have been good or not. The main reason lies in the fact that there are companies with unsatisfactory business results, but which have positive market capitalization. Therefore indices such as, earning per share, dividend per share, refund to joint -share, yield from dividend and price-earnings ratio, have not manifested as statistically significant as a difference between good and bad companies. This proves that other factors also influence the share price not only business result factor measured by fiscal indices. The positive evidence is derived from especially high BEX index influencing the share price growth and market capitalization. Hence, evaluation of business excellence, by means of BEX index, represents a good foundation for additional evaluation by virtue of other relevant information which can improve the evaluation and forecasting model potency.

BUSINESS EXCELLENCE MODEL INDICES

BEX model consists of four indices with the influence of certain weighting factors which is indicated in the following: (Belak and Aljinović –Barać, 2008).

$$BEX = 0.388ex_1 + 0.579ex_2 + 0.153ex_3 + 0.316ex_4 \quad (1)$$

Where:

ex_1 - is Profitability;

$$ex_1 = \frac{EBIT}{Total\ assets}$$

Index ex_1 is the excellence measured by the ratio of profit and the capital measured by total assets. Index ex_1 does not have great influence on final value of BEX index because this is about the so-called „dull index” whose primary purpose is stabilization of BEX model. It becomes especially significant when its value is being estimated per segments. Warren

Buffett finds that continuously good return on total capital presents a very powerful index saying that the company in question can retain long-lasting competitive advantage.

ex_2 - Value creation

$$ex_2 = \frac{Net\ business\ income}{Equity\ capital \times cost\ of\ equity}$$

Index ex_2 is based on economic profit/income which exceeds the price of private equity. In the calculation, business profit category is used to avoid influences of unexpected events on business results. The price of private equity is derived from the result of equity capital and the price of capital that the proprietors could accomplish from the alternative risk free investments. If ex_2 is higher than 1, the company creates the value and if it is smaller than 1 the company „eats” its own substance.

ex_3 - Liquidity

$$ex_3 = \frac{Working\ capital}{Total\ assets}$$

To measure the liquidity we use classical index of working capital ratio to total assets. Working capital is calculated as difference of current assets and current obligations. Limit liquidity measure totals 25% of working capital relating to assets.

ex_4 - Fisical potency

$$ex_4 = \frac{5(Profit + D + A)}{Total\ obligations}$$

Index ex_4 is based on the ration of theoretically free cash flow from all activities, that is, the profit increased by amortization and depreciation and cover of all obligations with that money. Standard measure of obligation cover, by means of free cash flow, totals 20%. That index does not have linear influence. Therefore, the faster the obligations are covered from the cash flow, its influence on excellence grows progressively. In a longer time period, obligation cover from cash flow decreasingly falls. For example, upon investment by debenture of ex_4 it is being decreased because financial risk is increasing (Ćirović, 2011). Upon activation of investment



and first calculation of amortization, fiscal is returned and, upon the first profit accomplishment on the basis of that particular investment, fiscal potency completely stabilizes. Financing by initial public offering does not influence ex_4 but however influences ex_2 because thereby private equity and its cost increase. As it can be noticed, indices ex_1 and ex_3 return final value of BEX index. Namely, in all similar models, so-called dull indices have to exist preventing huge oscillations of indices. These two indices, still determine results of BEX index in limiting domains (Rodić *et al.*, 2011).

RANKING BY BUSINESS EXCELLENCE MODEL AND INDEX

Total business excellence is estimated via BEX index as it follows:

- ♦ BEX INDEX is greater than 1 = good company,
- ♦ BEX INDEX between 0 and 1 = needs improvement.

Detailed ranking of business excellence with forecasts expectations are illustrated in the following Table 1.

DATA

The research in the application of business excellence index (BEX index) in the capital market of Bosnia and Herzegovina covers the period from 1/1/2010 to 12/31/2010. To analyze market trends yield, we use an analysis focused on observing the most successful companies, which are located in the structure of stock exchange indices of Sarajevo and Banja Luka stock exchange.

INDICES

The official index of the Sarajevo Stock Exchange is SASX-10. This index is the benchmark index of the Sarajevo Stock Exchange, which tracks the price of the top ten companies in the market (excluding investments funds), as measured by market capitalization and trading frequencies. This index is not confined to one market segment but it can also include the issuers listed on the market as well as those of the market. After limiting the participation of issuers in the index, the index value on a day t is calculated using the following equation:

BUSINESS EXCELLENCE INDEX (BEX)	RANK OPERATIONAL EXCELLENCE (BUSINESS EXCELLENCE RANK)	FORECAST FOR THE FUTURE
greater than 6.01 – 4. consecutive years	World class	The company operates with excellent results which can be expected in the next four years, if management continues with improvements.
greater than 6.01	(world class candidate)	The company operates perfectly as it can be expected in the next 3-year period, if management continues with improvements.
4.01 - 6.00	excellent	The company operates perfectly as can be expected in the next 3-year period, if management continues with improvements.
2.01-4.00	very good	The company operates very well which can be expected in the next 2-year period, if management continues with improvements.
1.01 – 2.00	good	The company operates well, but the improvement can be expected only if they start with the improvements.
0.00 – 1.00	restricted area between good and bad	Business excellence is positive, but not satisfactory. Serious improvements need to be done.
smaller than 0.00 (negative)	bad	Existence is threatened. It is necessary to restructure and improve urgently, otherwise the bad work will continue and cause collapse (likely over 90%).

Table No.1: Ranking of business excellence and the prognosis for the future*

Source: Belak, Aljinović – Barać, 2008. p. 34.

* Rank of business excellence is defined by analyzing the current trends of actual results. However, accurate forecasts are not statistically confirmed because no sufficiently long time series of historical date, making forecasts, should be taken with caution.



$$SASX - 10_{(t)} = \frac{\sum_{i=1}^n P_{i,t} \times q_{i,R}}{\sum_{i=1}^n P_{i,0} \times q_{i,R}} \times 1.000 \times C_t \quad (2)$$

where: $P_{i,t}$ – is the stock price i on the day t ; $P_{i,0}$ – is the stock price i on the day $t=0$ (initial base date indices); $q_{i,R}$ – is the number of stock on the audit day and correction factor C_t ($C_0=1$).

SASX – 10 is a price weighted index, where the weight is used as a market capitalization of the issuer. Maximum participation of an individual issuer is limited to 20%, which is consistent with the limits set by UCITS III. The index base date is 12/31/2004. The base value of the index at that period was 1.000 index points. The official index of Banja Luka Stock Exchange is BIRS (stock exchange index in the Republic of Srpska – BIRS). BIRS includes the best stocks of enterprises and banks. It was formed on 5/1/2004. Number of shares being a part of BIRS can vary from 5 to 15, depending on the fulfillment of the criteria for inclusion of stocks in the BIRS index. Number of issuers, whose shares are included in the composition of BIRS, depends on the number of shares on the regulated market and the official number of issuers that meet the requirements for the composition of BIRS. BIRS can also include the shares of issuers meeting the general requirements and criteria for inclusion of stocks in BIRS, except for shares of investment funds. Initial value index was 1.000 points. The value of BIRS is calculated by the following equation:

$$BIRS = \frac{\sum_{i=1}^n P_{i,t} \times q_{i,R}}{\sum_{i=1}^n P_{i,0} \times q_{i,R}} \times 1.000 \times C_t \quad (3)$$

where $i=1, \dots, n$, n – is the number of issuers listed on the BIRS; t – is the trading day; R – establishment day or revision day of BIRS; T – a moment previous to calculating BIRS, according to a new composition; $P_{i,t}$ – the price of shares on day t ; $P_{i,0}$ – the base price of the shares (the price of the formation of audit BIRS); $q_{i,R}$ – the adjusted number of shares of the issuer i – while calculating market capitalization, we observe the number of adjusted shares because of the number of shares owned by the public and because of adapting shares participation of BIRS; and C – correction factor for ensuring the continuity of BIRS.

CONCLUSIONS

Here we will study and analyze companies in particular segments of the capital market in the Federation of Bosnia and Herzegovina. The companies in question are: BH Telecom – Sarajevo; JP Elektroprivreda B&H; JP Elektroprivreda HZHB Mostar; Tvornica cementa – Kakanj; Bosnalijek – Sarajevo; Energopetrol – Sarajevo and Fabrika duhana – Sarajevo.

Observing the results of a single part capital market in B&H, namely the free market, and the structure of the most profitable companies in the index SASX-10 for the period 1/1/2010 – 12/31/2010, we have reached these business excellence results:

No.	Company	Profitability	Value of creation	Liquidity	Financial strength	BEX index
1.	BH Telecom - Sarajevo	0.0468	1.8581	0.0244	2.0846	4.0139
2.	JP Elektroprivreda Mostar	0.01264	0.81766	0.00982	0.47188	1.312
3.	Tvornica cementa- Kakanj	0.05432	2.11381	0.02977	2.42899	4.626
4.	Bosnalijek - Sarajevo	0.0091	0.05129	0.03462	0.32326	0.4182
5.	Energopetrol - Sarajevo	0	0	0.08261	0.02133	0.1039
6.	Fabrika duhana - Sarajevo	0.01226	0.4344	0.06043	1.4272	1.9343

Table No. 2: Ranking of companies listed on capital markets in the Federation of Bosnia and Herzegovina according to the business excellence measured by BEX index for 2010.



No.	Company	Profitability	Value of creation	Liquidity	Financial strength	BEX index
1.	Hidroelektrana-Drina Višegrad	0.1119	0.61560	0.1144	1.3166	1.22407
2.	Telekom Srpske Banja Luka	0.051357	3.1919922	0.0039915	0.790355	4.03769
3.	Hidroelektrana Trebišnjica Trebinje	0.00518	0.43579	0.01339	1.54942	2.00337
4.	Boksit - Milići	0.00737	0.85471	0.02004	0.36222	1.24434

Table No. 3: Ranking of companies listed on capital markets in the Republic of Srpska according to the business excellence measured by BEX index for 2010.

Upon calculating the total of BEX index for all companies listed on the Sarajevo Stock Exchange, we can notice that the highest value of BEX index was registered by the following companies: BH Telecom Sarajevo (BEX: 4.0139) and Tvornica cementa –Kakanj (BEX: 4.626). According to records from the Table 2, we can see the values of 2.01 to 4.00 and describe the companies operating within this range as very good as it can be expected in the next two years, if management continues with improvements. These improvements are reflected in the following: a) IT; b) management type change; c) replacement of existing equipment; d) employing new staff; e) expansion of production capacity; f) current and investment maintenance; g) the introduction of software packages for stock control and h) the introduction of ISO quality standards. Comparing the companies with the highest values, we have two companies whose values are lower than one: Bosnalijek Sarajevo (0.4182), and Energopetrol Sarajevo (0.1039). The provided data indicates that the existence is threatened and therefore restructuring and business improvements are urgently needed.

The part of one research focuses also on studying and analyzing the segment of capital markets in the Republic of Srpska. The companies subjected to research are: Hidroelektrana na Drini - Višegrad; Telekom Srpske – Banja Luka; Hidroelektrana na Trebišnjici – Trebinje and Boksit – Milići. Studying the results of the analysis of one part of the capital market in B&H, precisely the free market and the structure of BIRS for the period 1/1/2010 – 12/31/2010, we have come to the following:

The greatest value of BEX index in the capital market of the Republic of Srpska was achieved by the company Telekom Srpske (4.03769). This value indicates that the company operates very well and

the same can be expected in the next two years if management continues with improvements. However, the lowest value of BEX index was recorded by the company Hidroelektrana na Drini - Višegrad (1.22407) and Boksit - Milići (1.24434). These values reflect that the company operates well, but better results can be expected only if the company starts to improve.

CONCLUSION

BEX model is based on financial indicators relevant for measuring business excellence enterprises in the capital markets in transition, and it can also assess the long - term stock prices. Assessment by BEX model is possible through segments of isolated part excellence and BEX index. Studies have shown that the medium and long term movements in share prices may be well approximated by using: a) the status of and trend in BEX index; b) information about the activities of management to improve operational excellence; and c) information about investing in the brand.

Through analyzing BEX index we can conclude that large enterprises with regard to the level of business and management, capability to have insight into the balance sheet and income statement, and statement of cash flows, have extremely large BEX index implying business stability and tendency that this will continue in the future. This leads to the conclusion that need to create a strategy choice at the firm level, as well as a permanent investment, can be followed by increased indebtedness. Adequate balance in financing is to follow the golden rule in finances – one to one; the perfect balance between the owned capital and the borrowed.



The advantage of BEX model, apart from other similar models known in the world, consists in the fact that the BEX index can be calculated in companies that have just been listed on the capital market, which is not possible with other models.

Using and benefiting BEX model, the possible investors should be able to assess whether the prices, under which the securities are offered at the market, are reasonable or not. The quoted prices of the securities have to reflect the possible value of the company so that the company could be satisfied as they represent the issuers of securities and investors who entrust their money.

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MODELI ZA PROCENU POSLOVNE IZVRSNOSTI NA TRŽIŠTU KAPITALA U BOSNI I HERCEGOVINI

Rezime:

Uvek je problem odabrati jedan ili više pokazatelja ili konstruisati model koji odlikava postignuti poslovni rezultat. Za procenu postignutih poslovnih rezultata ili ukupne poslovne izvrsnosti preduzeća razvijeni su brojni modeli u svetu koji izvrsnost procenjuju sa različitih aspekata. Korišćenje većine modela zahteva podatke i procene koje ulagačima na tržištu kapitala nisu dostupne. BEX model primarno je izrađen za procenu poslovne izvrsnosti preduzeća na tržištu kapitala u Hrvatskoj. Njegova primena je moguća i za procene poslovne izvrsnosti na svim sličnim tržištima kapitala. U ovom radu će biti reči o mogućnosti njegove primene na tržištu kapitala BiH, tj. na najuspešnije kompanije koje se kotiraju na Sarajevskoj berzi/burzi, a koje se nalaze u sastavu SASX-10 indeksa i Banjalučkoj berzi hartija od vrednosti, a koje se nalaze u sastavu BIRS indeksa.

Ključne reči:

poslovna izvrsnost, radni kapital, stvaranje vrednosti.

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