

The usage of economic profit and other forms of profit as a part of prediction models to forecast the financial stability of business entities in the context of globalization

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Abstract.

Research background: Predicting financial health of a company is in this global world necessary for each business entity, especially for the international ones, as it's very important to know financial stability. Forecasting business failure is a worldwide known term, in a global notion, and there is a lot of prediction models constructed to compute financial health of a company and, by that, state whether a company inclines to financial boom or bankruptcy. In the current global world of uncertainty and continuous change, it is in each business's interest to improve its performance. Businesses have to adapt to changing market conditions and keep moving to maintain their, either local or global, market position. In the past, entities preferred to increase primary accounting profit forms. The global modern goal of enterprises, value creation, is achieved through the concept of economic profit.

Purpose of the article: The aim of this article was to find out the connection between two very important terms for the global economy, namely prediction models and economic profit.

Methods: We focused on the research of both areas and looked for a common connection through how often different forms of profit, and especially the form of economic profit, are used in individual prediction models among the examined sample.

Findings & Value added: The output of the whole article is the finding the division of the use of economic and accounting profit in the sample of models and the importance of economic profit for mathematical constructions of prediction models.

Keywords: *Prediction models; economic profit; globalization; business failure; accounting profit.*

JEL Classification: *C53; G17; F65; M41*

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1 Introduction

In today's world of uncertainty and continuous change, it is in the interest of every business to increase its performance. Businesses need to adapt to changing market conditions and make steady progress in order to maintain their market positions. If a company wants to succeed in the fight against competition, it must be able to use its resources efficiently [1, 2, 3].

The term "prediction of a company's financial health" is well known in the world, but the intensity of how different countries deal with this issue is uneven. Business entities in our country forecast their financial stability only minimalistically, mainly due to the fact that for the conditions of the Slovak market a general prediction model has not yet been fully applicable to any entity, regardless of the sector in which they operate [4].

The professional literature names the issue of failure of business entities in various terms: ex-ante financial analysis method, bankruptcy prediction, default prediction, failure forecasting, early warning systems, financial distress forecasting, credit risk assessment, etc. Regardless of the diversity of individual names, all methods have a common goal - to determine in good time whether a business entity tends to go bankrupt or financial development. The failure of one entity also negatively affects the financial operation of all other entities that come into contact with it, either in closer or wider contact, often due to secondary insolvency resulting from non-fulfillment of obligations between individual entities. Based on financial analyzes and financial health predictions, it is possible to take corrective measures well in advance, thus mitigating or eliminating any bankruptcy risk [5].

Financial analysis represents a basic aspect of financial management of a business entity and points to the operation of the company. The state of financial stability of each entity is most reflected in the different forms of the profit indicator. Profit, within the result of management, represents one of the most important flow quantities. This explains how effectively corporate capital is used in the entity [6].

There must be some form of financial management within each business entity. It is in the interest of financial managers to consider the internal situation of the company in their decisions, but also the broad economic environment. This actually means constantly monitoring the financial health of the business entity. In order to ensure the best possible financial health of the company, we can predict it, i.e. predict how the funds and total assets of the company should be handled in the short or long term, for their most efficient use. Predictive models, also called early warning systems, are used to identify the level of a company's financial health. They assess the health of the company on the basis of a complex characteristic, both in terms of past and current development and in terms of future development of the entity. They are constructed by various combinations of financial and economic indicators, which often include various forms of profit.

2 Literature review

Paul Joseph Fitzpatrick was the first to address this issue. In 1931 he published a study comparing the development of indicators in solvent and insolvent companies. He pointed out that the development of selected corporate indicators - indicators long before the outbreak of serious economic difficulties, which usually result in insolvency - is beginning to differ in endangered companies. The next step in the research of the problem was taken by Merwin (1942), who published a research based on the comparison of arithmetic averages of selected business indicators, which he quantified in successful and unsuccessful companies. The disadvantage of this research was that it included in the set of unsuccessful companies those that ceased to exist for non-economic reasons [7].

V. H. Beaver (1966) and E. J. Altman (1968) are considered to be the founders of forecasting the financial development of business entities. Beaver came up with the method of one-dimensional discriminant analysis in 1966, now known as the Beaver model. The MDA (Multivariate Discriminant Analysis), also known as the multidimensional discriminant analysis, has been criticized for arguing that the results may have been skewed and lacked meaning. The three main critics of MDA include Eisenbeis (1977), Ohlson (1980) and Jones (1987). Ohlson came up with the Logit model (1980) and four years later was first applied to predict the bankruptcy of Zmijewski's Probit model (1984). Shumway (2001) stated that the Logit and Probit models have problems that can subsequently skew the results and also result in inefficiencies and inconsistencies in the estimated coefficient. To overcome these problems, he proposed the gambler Model [8].

3 Methods

The measurement of financial performance has developed relatively rapidly in the past. This development has been and still is driven by requests for information on performance in changing economic conditions from investors and managers. Ende (2017) states that the benefit of the analysis of the company's financial performance is the provision of information about the company's perspective in the financial perspective. Profit, within the result of management, represents one of the important flow quantities. This explains how effectively corporate capital is used in the entity. It is one of the pension sources of the owners of the accounting unit and the most important internal source of financing business needs, especially in the long run [9].

Business failure is common to every economy in the world. This failure can have various forms, manifestations and consequences. In the literature, the issue of business failure is referred to in many different terms, such as. bankruptcy prediction, failure prediction, early warning system, etc. Despite different terminology, they have a common goal - to predict the insolvency of business entities. Insolvency is the main cause of business liquidation [10].

An early warning system is a system that, based on symptoms, can identify changes in time within the company and in the company environment, where there may be danger [11].

Predictive models make it possible to identify the company's current position in the market environment based on the evaluation of selected financial indicators, and even to estimate its position in the given environment in the near future [12].

Given that profit is a very important indicator of the stability of business entities, we decided to determine on a selected sample of predictive models whether and to what extent the profit indicator and its forms are used as part of predictive mathematical constructions.

In general, profit means a positive benefit from a particular activity. In economics, this is usually the difference between revenues and costs over a period of time. In microeconomic theory, two categories of profit are distinguished, namely accounting profit and economic profit.

Accounting profit is considered to be a positive result of the company recorded as a mandatory information in the profit and loss statement, balance sheet and notes to the financial statements of the entity. This is the difference between total revenue and explicit costs.

There are several forms of profit that are reported in accounting.

Table 1. Forms of accounting profit.

<i>Forms of profit</i>	<i>Additional items conditioning the generation of the selected form of profit</i>		
EAT (earnings after taxes)	Income tax		
EBT (earnings before taxes)		Interest expense	
EBIT (earnings before interest and taxes)			depreciation
EBITDA (earnings before interest, taxes and depreciation)			

Source : processed according to [13]

The concept of economic profit uses the cost of capital in calculations. Every capital costs something. What is the price of a given capital is expressed by its cost. The cost of capital is spent on raising individual parts of capital. The cost of total capital consists of the cost of equity and the cost of debt. The cost of equity represents the expected share of profit for the owner investing his capital in the business. The asking price that owners ask for varies depending on the business and therefore the risk involved. The higher the risk, the higher the cost of equity, as it is necessary to compensate this risk to investors. The cost of borrowed capital is expressed as interest paid by creditors. Interest is determined by the situation on the financial market and its actual amount varies depending on the duration of the loan and the creditworthiness of the borrower. In general, the cost of equity is higher than the value of the cost of equity. For example, the degree of risk for the owner, which is higher than for the creditor, is considered to be decisive reasons, and interest paid on the loan is recorded in the company's costs, thus reducing the tax base [13].

Economic profit is achieved if the company makes an accounting profit and at the same time can cover the cost of equity.

Various other equivalents of economic profit are also used in the professional literature. In the domestic, but also in foreign literature, we can find the issue under terms such as surplus value, residual income, abnormal income, surplus profit, super-profit. The basic idea of all these terms is basically the same, namely to produce a company's income in excess of the cost of capital. The equivalent "residual profit" is used because it takes into account the cost of the opportunity sacrificed. This term is also related to residual income. The main idea is to produce such revenue for the owners to cover the cost of the opportunity sacrificed. The terms surplus-value, surplus-profit, or super-profit are used to denote returns in excess of the cost of total capital. Abnormal income expresses a profit which, after deducting the cost of equity, is positive. This positive result is no longer the normal profit produced by the company, but it is the so-called abnormal income of business owners [14].

Alternative costs mean the best feasible opportunity, but it has not been realized. Due to the limited economic resources, it is not possible to implement all the variants that are available on the market. For the highest achievable benefit, it is necessary to reject those variants where a lower benefit is achieved. The company has several options on the market and decides between several alternatives. By choosing one alternative, the company gives up the implementation of the other. Opportunity costs represent the value of the profit from the opportunities that must be sacrificed in favor of another alternative. Thus, opportunity costs do not represent the implemented activities of the company, but the potential profit from the implementation of the second alternative. They are also defined as lost revenue that the company did not achieve because it preferred another alternative [15].

$$\text{Economic profit} = \text{accounting profit} - \text{implicit costs} \quad (1)$$

$$\text{Economic profit} = \text{total return on capital} - \text{cost of capital} \quad (2)$$

$$\text{Economic profit} = \text{revenues} - \text{explicit costs} - \text{implicit costs} \quad (3)$$

The best-known indicators in foreign practice, which use the concept of economic profit to evaluate the company's performance, are Economic Value Added (EVA), Market Value Added (MVA), return on net assets (RONA), IN economic value added (INEVA). The basic features of these indicators are the calculation of opportunity costs in the form of Weighted Average Cost of Capital (WACC) and profit from operating activities after tax (NOPAT for short). An interest rate comparable to the degree of risk is used in determining the alternative cost of equity [15].

4 Results

Financial prediction models are used to diagnose and predict a company's financial situation, but they can also be used to evaluate the results of its economic activities within a group of competing companies, or even within the industry [17, 18, 19].

The financial situation of a company is a numerical expression of its results, which it has achieved in various areas of its activities. Prediction models are based on the evaluation and interpretation of the results achieved so far and on the basis of them predict the development of the future financial and economic situation of the company. Such an analysis is called an "ex ante" financial analysis. The word "ex ante" is of Latin origin and means "before the situation". The aim of the prediction models is to examine the financial situation of the company in time, and thus prevent potential problems. All prediction models are based on the assumption that some time before the bankruptcy of a company we can observe certain characteristic differences in the development of a bankrupt company in comparison with financially sound companies [20].

Mathematical constructions of prediction models consist in a combination of various financial and economic indicators indicating financial stability at individual levels of financial management of business entities. Due to the fact that profit is one of the basic indicators of this nature, we decided to examine the extent to which it is used on a sample of prediction models.

First of all, we looked at it, if at all, and if so, how many prediction models use profit in their estimates.

Based on research we found out that 96% of the prediction models of the selected sample use a certain form of profit in their mathematical constructions of financial and economic indicators.

We also distinguished to what extent the types of profit are used, i.e. whether traditional forms of economic profit or accounting forms of profit are used more.

The division of the use of economic and accounting profit in the sample of models, which our research brought shows, that, within the selected sample of models, forms of economic profit such as EVA, MVA, RONA or INEVA indicators are not part of mathematical combinations of financial and economic indicators for predicting the financial health of business entities. However, forms of accounting profit are fully used, whether in the form of indicators such as EAT, EBT, EBIT, EBITDA or even cash Flow.

5 Conclusions

In the case of a favorable future prospects for the company, good financial health of the company and the competitiveness of the company on the market and within the sector in which the company operates are assumed. However, if the prospects calculated using predictive models are not favorable, then the company can eliminate the shortcomings at a

time when its financial health is good and can thus prevent future bankruptcy and leaving the industry [21].

Bankruptcy is a situation where a company is unable to pay its debts and ultimately fails to meet its obligations. Bankruptcy is a situation in which all business and economic activities end, and is therefore also referred to as "economic death" [22].

Predictive models make it possible to identify the company's current position in the market environment based on the evaluation of selected financial indicators, and even to estimate its position in the given environment in the near future.

Models of financial health assessment are made up of indicators, the combination of which indicates the very state of the entity at various levels of financial management. In the presented article, we investigated the participation of profit and its various forms in the combination of these indicators in a selected sample of prediction models.

We conclude from the findings that the models do not use economic profit at all, but accounting profit is a very important part of assessing the stability and health of businesses through predictive models.

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References

1. Susanto, Y. K., Pirzada, K., Adrienne, S. (2019). Is tax aggressiveness an indicator of earnings management? *Polish Journal of Management Studies*, 20(2), 516-527.
2. Tahmasebi, R., Rostamy, A.A.A., Khorshidi, A, Sharif, S.J.S. (2020). A data mining approach to predict companies' financial distress. *International Journal of Financial Engineering*, 7(2), 2050031.
3. Stefko, R, Horvathova, J, Mokrisova, M. (2020). Bankruptcy Prediction with the Use of Data Envelopment Analysis: An Empirical Study of Slovak Businesses. *Journal of Risk and Financial Management*, 13(9), 212.
4. Svabova, L., Michalkova, L., Durica, M., Nica, E. (2020). Business Failure Prediction for Slovak Small and Medium-Sized Companies. *Sustainability*, 12(11), 4572.
5. Bilan, S., Melas, D., Melasova, K. (2020). Identifying manager's aspects associated with company's income through the point-biserial correlation: The middle Europe example. *Ekonomicko-manazerske spektrum*, 14(1), 1-9.
6. Valaskova, K., Durana, P., Adamko, P., Jaros, J. (2020). Financial Compass for Slovak Enterprises: Modeling Economic Stability of Agricultural Entities. *Journal of Risk and Financial Management*, 13(5), 92.
7. Valaskova, K., Klietnik, T., Kovacova, M. (2018). Management of financial risks in Slovak enterprises using regression analysis. *Oeconomia Copernicana*, 9(1), 105–121.
8. Klietnik, T., Valaskova, K., Lazaroiu, G., Kovacova, M., Vrbka, J. (2020). Remaining Financially Healthy and Competitive: The Role of Financial Predictors. *Journal of Competitiveness*, 12(1), 74.
9. Sebo, A. (2014). *Podnikové financie*. Nitra: SPU Nitra.
10. Cisco, S., Klietnik, T. (2013). *Finančný manažment II*. Žilina: EDIS-vyd. ŽU v Žiline.
11. Zuzak, R., Königová M. (2009). *Krizové řízení podniku*. Praha: Grada.
12. Pernsteiner, H., Wagner, E., Kabat, L. (2011). *Podnikanie v nových ekonomických a sociálnych podmienkach*. Bratislava: EUROKÓDEX.

13. Marik, M., Marikova, P. (2005). *Moderní metody hodnocení výkonnosti a oceňování podniku*. Praha: EKOPRESS.
14. Siekelova, A., Kovacova, M., Adamko, P., Stehel, V. (2019). Profit Management as an Instrument for SMEs Developing: The case for Slovakia. *Marketing and Management of Innovations*, (3), 285-296.
15. Kotulic, R., Kiraly, P., Rajcaniova, M. (2010). *Finančná analýza podniku*. Bratislava: Iura Edition.
16. Salaga, J., Bartosova, V., Kicova, E. (2015). Economic Value Added as a measurement tool of financial performance. *Procedia Economics and Finance*, 26, 484-489.
17. Kubenka, M. (2016). The strictness of traditional indicators for creditworthiness measuring. In T. Loster & T. Pavelka (Eds.), *Proceedings of the 10th International Days of Statistics and Economics (985 – 995)*. Prague, Czech Republic : Melandrium.
18. Jencova, S. (2011). *Finančno-ekonomická analýza podnikateľských subjektov*. Prešov: GRAFOTLAČ PREŠOV, s.r.o.
19. Shelley, G.L., Traian, A., Trainor, W.J. (2020). Stock market "prediction" models. *Economics Bulletin*, 20(2), 1548-1556.
20. Galetto, M., Verna, E., Genta, G. (2020). Accurate estimation of prediction models for operator-induced defects in assembly manufacturing processes. *Quality Engineering*, 32(4), 595-613.
21. Kocisova, K., Kubala, P. (2012). Bankruptcy and credible models and their use in a competitive environment. *The proceedings of the International Scientific Conference for PhD Students and Young Scientists* (pp. 403 – 418). Bratislava: Ekonóm.
22. Moharrampour, M., Esfandiyari, S., Asgarzadeh, A. (2014). Evaluating the Bankruptcy prediction models. *Applied mathematics in Engineering, Management and Technology*, 2(3), 620-633.