

## FINANCIAL STABILITY IN CENTRAL EUROPEAN COUNTRIES: CASE OF THE VISEGRAD FOUR

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### Abstract

A crisis may arise in any business, so it is essential to focus on any problems in order not to endanger the company viability or to be out of business activity. Extinction has an impact on the economy of a country and can cause social and human problems to grow. As part of this research paper, we decided to analyse the Visegrad Four (V4) countries. The aim is to verify the results of selected methods on a chosen sample of enterprises from each country. After applying the methods chosen to enterprises, we compare the results of prediction chosen methods over the past three years and verify their predictive ability. The first part of this paper defines the most important approaches of various authors dealing with a similar issue while pointing out the importance and place of financial analysis in the management process and explains the methods and indicators used. There are several models to estimate bankruptcy. On the other hand, the current situation in the business environment pulls attention to the fact that the application of ex-ante financial analysis predictive methods is a compassionate issue, considering a variety of internal and external factors. We decided to use primarily those designed and tested by authors from selected V4 countries, which is the next part of the research paper. We have defined the methodology and criteria for a sample of enterprises from which the database was subsequently created. The processed analyses of the individual economic indicators, through selected methods, show the financial situation of the company and its development over the monitored period. Findings of analyses were evaluated and subsequently interpreted.

**Keywords:** Financial analysis, Visegrad Four, insolvency, prediction.

## 1 INTRODUCTION

On 15 February 1991 a meeting of representatives of Poland, Hungary and Czechoslovakia took place in Budapest. This meeting was to confirm the close cooperation of the Central European countries. In particular, Visegrad came to the attention of the society, where in 1335 the meeting of the Czech King John of Luxembourg, the Polish King Kazimír the Great and the Hungarian King Charles Robert took place. This place was symbolic for all participants (Ivanova, Cepel, 2018, p. 54-72). At the Visegrad Summit, the Presidents V. Havel, L. Wales and J. Antall signed a "Solemn Declaration" stating, among other things, that

they were "firmly determined to take up their tasks and build on the common historical traditions that unite us to do in line with traditional European values and mainstreams, everything for peace, security and uplift to peoples. At present, the V4 is considered to be a community of four Central European countries: the Czech Republic, Hungary, Poland and Slovakia, and is an expression of the efforts of the Central European countries to cooperate on several sections of common interest within the framework of pan-European integration. The aim is to assess the financial soundness of V4 companies, whose turnover is over 3 000 000 € using various bankruptcy models, while verifying them. Using financial distress models to predict failure in advance is absolutely essential for most businesses in the decision-making process (Kasilingam, and Ramasundaram, 2012).

Successful entrepreneurship is a long-term process beginning with an idea, the subsequent establishment of a business, building a market position and maintaining its position. Bankruptcy prediction models are typically used to analyze some of the company's financial indicators, mostly financial indicators, or some other characteristics of the company or the environment in which it operates (Svabova and Durica, 2016). There are different methods to predict in different areas. Using these methods, businesses try to solve complex problems (Lendel, et al., 2016, p. 165-174). Financial analysis is a tool that allows you to know and explain past, present and, using a suitable methodology, to predict future phenomena. Throughout the 1980s, interest in developing models of financial distress prediction for large and small businesses remained. However, there is no review of this literature to assess the use and limitations of these models in the management context. That is why this area needs to be addressed (Keasey and Watson, 1991, p. 89-102). The prediction of a company's financial failure is crucial for decision-making by managers, investors and shareholders (Kantarelis, 2018, p. 32–62). In current prediction models of financial default, various financial indicators are usually selected as predictive variables, suggesting that these financial indicators are a possible cause of financial default (Xu and Wang, 2009, p. 366-373). The aim is to predict the financial health of companies in the conditions of the Visegrad quarter based on individual methods. As an instrument of assessing the financial health of a company, financial analysis is used by various economic entities. They are mainly managers, investors, employees, banks, the state and its authorities (Gavurova, 2017, p. 1156-1173). Subjects can be divided into two groups. The first group includes managers and employees who determine financial health for the needs of the company. The second group includes investors, banks, the state where financial analysis is conducted from the outside in order to evaluate the investment potential (Kovacova, et al., 2018, p. 167-179).

Bankruptcy is a situation where liabilities exceed the company's assets, usually due to capitalization, lack of sufficient cash, under-utilization of resources, efficient management of all activities, decline in sales and market situation, etc. Bankruptcy prediction is very important for taking corrective actions for better financial planning, profitability, liquidity and solvency efficiency (Venkataramana, et al., 2012, p. 40-56). A certain period of time before the crisis arises in the company symptoms of future problems or some anomalies occur, which is a prerequisite for almost all prediction models. Using various methods of forecasting financial health, it is possible to determine with appropriate reliability whether it is a company belonging to the category of prosperous or non-prosperous enterprises (Szymanska, 2018, p. 623-642). This requires that the overall financial-economic performance and business results be translated into a full-fledged, preferably one-digit expression; discriminant. The notion of appropriate reliability is vague, and therefore we will mean classifying at least three quarters of financially vulnerable and healthy businesses into the appropriate group.

## **2 METHODOLOGY**

In our case, we decided to analyse the financial situation of 1352 V4 companies and for processing we chose the bankruptcy models used to predict the bankruptcy situation.

Two methods were used to process this research paper to achieve the goal. The database with the necessary data was developed with the help of the AMADEUS program and includes random enterprises from individual V4 countries with a turnover of more than € 3 000 000. The data were processed and subsequently used two bankruptcy models. These are Altman's Z-score and the Polish model of Poznanski. The Altman model was developed based on a random sample of 66 enterprises. Of these, 20 went bankrupt and the remaining 33 did not go bankrupt. Individual indicators used in data processing are as follows. Another model of Poznanski is one of the best-known prediction models designed for Polish companies. The model consists of four financial indicators and its efficiency was set at 92.98% and that was the reason for its incorporation into this research paper pp. (Kliestik, et al., 2018, p. 791-803). Both models and their ratios are shown in Table 1.

Table 1. Bankruptcy models of Z-score and Poznanski

<b>Z-score</b>	<b>Poznanski model</b>
$= 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$	$= 3.562X_1 + 1.588X_2 + 4.288X_3 + 6.719X_4 - 2.368$
X <sub>1</sub> : working capital / total assets	X <sub>1</sub> : net profit / total assets
X <sub>2</sub> : retained earnings / total assets	X <sub>2</sub> : (current assets –inventory) / short-term liabilities
X <sub>3</sub> : earnings before interest and taxes / total assets	X <sub>3</sub> : fixed capital / total assets
X <sub>4</sub> : market value of equity / book value of total liabilities	X <sub>4</sub> : profit [loss] of sales / net revenues from sales
X <sub>5</sub> : sales / total assets	

In the case of the Altman model, if the value is higher than 2.9, the company has a satisfactory financial situation and is not failure expected. The grey zone is in the range of 1.81 to 2.9 and then the company has not won results. Financial problems and the risk of bankruptcy can occur if the model value is less than 1.81. In the case of the Poznanski model, there is a risk of a bad financial situation if the resulting value is less than 0. A favourable financial situation occurs when the value is greater than zero (Valaskova, 2018, p.105-121).

### 3 RESULTS

In research paper we focused on analysing the financial health of companies from the V4 countries. We have randomly selected 338 businesses from each country, and a total of 1352 businesses have been analysed in the last 5 years (2014-2018). We used two models to determine the results. These are bankruptcy models, namely the Altman Z-score model and the Polish Poznanski model. Complex results as a percentage of 338 analysed enterprises for individual prediction models are available in Table 2.

Table 2. Results of the inclusion of V4 companies in terms of financial health using bankruptcy models Z-score and Poznanski

		<b>SLOVAK REPUBLIC</b>				
		2018	2017	2016	2015	2014
	fin. stable	43%	40%	39%	39%	37%
<b>Z-score</b>	bankruptcy	27%	28%	30%	31%	34%
	grey zone	30%	32%	31%	30%	29%
	fin. stable	36%	41%	41%	40%	36%
<b>Poznanski model</b>	bankruptcy	34%	30%	31%	30%	31%
	grey zone	30%	29%	28%	30%	33%
		<b>CZECH REPUBLIC</b>				
		2018	2017	2016	2015	2014
	fin. stable	32%	37%	35%	33%	35%
<b>Z-score</b>	bankruptcy	37%	34%	35%	37%	35%
	grey zone	31%	29%	30%	30%	30%
	fin. stable	32%	33%	36%	34%	36%
<b>Poznanski model</b>	bankruptcy	33%	30%	30%	31%	31%

	grey zone	35%	37%	34%	35%	33%
		<b>POLAND</b>				
		2018	2017	2016	2015	2014
	fin. stable	45%	42%	40%	44%	43%
<b>Z-score</b>	bankruptcy	20%	23%	27%	28%	27%
	grey zone	35%	34%	33%	29%	30%
	fin. stable	36%	36%	38%	36%	37%
<b>Poznanski model</b>	bankruptcy	35%	33%	33%	38%	36%
	grey zone	29%	32%	29%	26%	26%
		<b>HUNGARY</b>				
		2018	2017	2016	2015	2014
	fin. stable	62%	58%	30%	33%	33%
<b>Z-score</b>	bankruptcy	22%	26%	37%	35%	37%
	grey zone	16%	16%	32%	33%	30%
	fin. stable	44%	40%	42%	41%	36%
<b>Poznanski model</b>	bankruptcy	28%	27%	26%	27%	26%
	grey zone	28%	33%	32%	33%	37%

Taking a closer look at the results from Table 2, almost 43% of enterprises in the Slovak Republic ranked financially stable in 2018 in the Slovak Republic. Compared to previous years, the financial situation of the companies surveyed has improved, namely by 6% since 2014. Companies that ranked this model as bankrupt is at a rate of 27% and there has been a decline since 2014 up to 7%. Enterprises whose results are not entirely clear and cannot be classified as either prosperous or bankrupt have not significantly changed their ratio on a year-on-year basis. According to the Poznanski model, 36% of the analysed enterprises in 2018 belong to the category of financially stable enterprises, which is also the same as in 2014, so no significant changes were recorded. In contrast to the Z-score, 7% more businesses were ranked as bankrupt for the year 2018. At the same time, an increase compared to 2014 was found in this category.

Based on the Z-score model for the Czech Republic, 32% of the 338 enterprises analysed were in the group of prosperous enterprises. Compared to Slovakia, this is 11% less and at the same time from 2017 to 2018 there is a decrease of 5%. Several companies were included in the group of bankruptcies, namely 37%. They need to analyse their situation on an ongoing basis and incorporate the measures necessary to avert the bankruptcy situation. The Z-score shows no significant deviations from the Poznanski model.

Based on the Polish enterprises whose data entered the financial analysis, 45% were classified as financially stable according to the Z-score model. This was a slight increase of 2% compared to 2014. The number of enterprises in the bankruptcy category has fallen by up to 7% and the share of enterprises that cannot be clearly categorized by the results has increased by%. According to the Poznanski model, among the group of financially stable enterprises in 2018 is 9% of enterprises less than determined by the Z-score. Up to 16% higher share is under the Poznanski model for bankruptcy companies for 2018.

The most significant difference was recorded in the analysis of Hungarian enterprises, not only between models but also between results from different countries. Based on a random selection of 338 Hungarian enterprises according to Z-score up to 62% is among financially stable with positive results and liquidity of funds for the year 2018. Since 2014 it is an increase of 29%. Between 2014 and 2016, approximately one third of businesses were included in this category, but since 2017, businesses have improved their results. The proportion of enterprises in a crisis situation also decreased, or they could not be included because they were in the grey zone. In the case of the Poznanski model, there was no such radical year-on-year increase, but from 2014 to 2018 on the basis of the results, the share of financially stable enterprises increased by 8%.

Figure 1 shows graphically the results of the financial health of 1352 enterprises of Slovak Republic, Czech Republic, Poland, and Hungary in 2018.

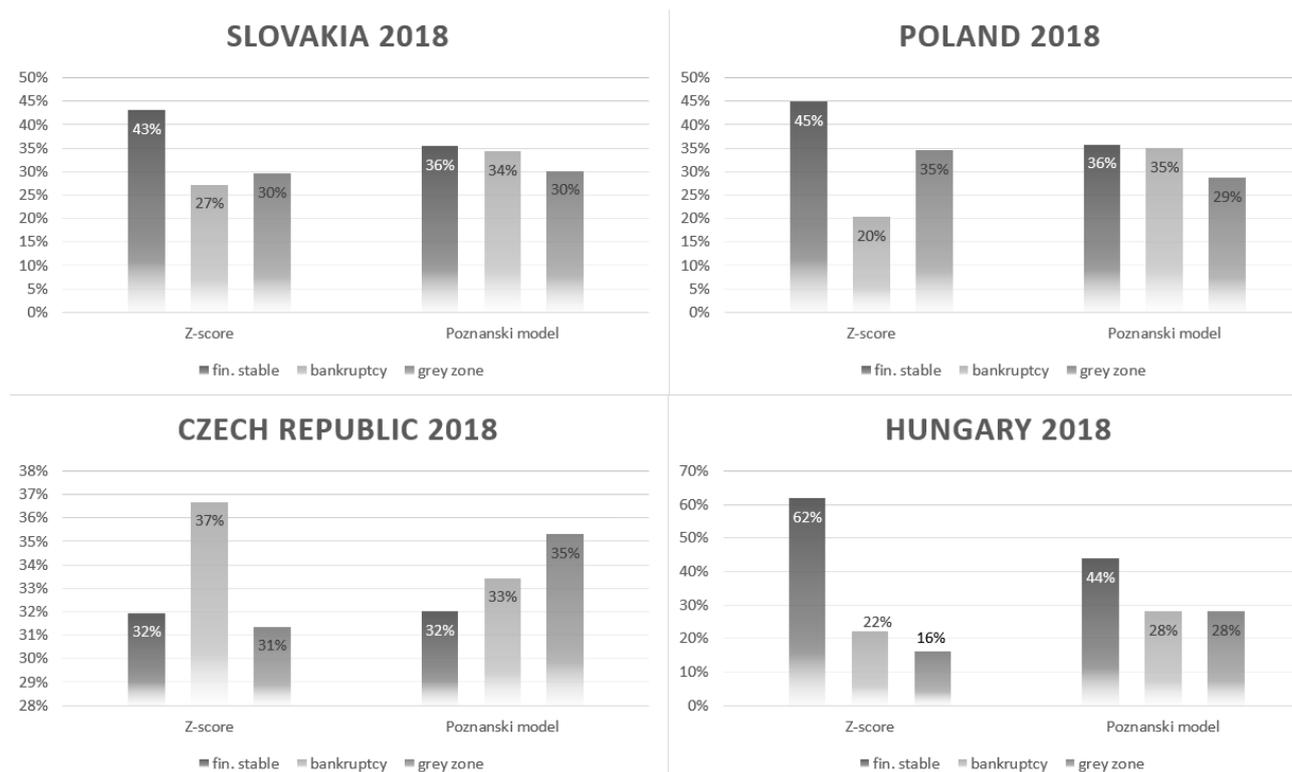


Fig. 1. One kernel at  $x_s$  (dotted kernel) or two kernels at  $x_i$  and  $x_j$  (left and right) lead to the same summed estimate at  $x_s$ . This shows a figure consisting of different

The graphs show the differences between the Z-score and Poznanski models from different countries. In the case of Slovakia, Poland and Hungary, the Z-score model ranked most businesses as prosperous at a higher rate than the Poznanski model. In the Czech Republic, non-prosperous enterprises dominated in 2018 and their number exceeded prosperous enterprises. It is a good concept to further investigate and analyse the cause of such a situation.

#### 4 CONCLUSIONS

The aim of this research paper was to analyse the financial health of randomly selected companies of the Visegrad Four. 338 companies were selected from each country and a total of 1352 companies were analysed. Two bankruptcy models were chosen for analysis. One of these models is originally from Poland it is a model Poznanski. Another model chosen for analysis is the well-known Altman model. The results have been interpreted, and at the same time, further questions are raised which need to be further addressed. Countries with a relatively similar business environment, trade and other ties showed different results. For example, the Czech Republic, which, on the basis of the models used in the sample, achieved a large proportion of the companies included in the bankruptcy category. At the same time, Hungary has achieved favourable results and most businesses have been classified as prosperous. However, it is important to note that the issue needs to be addressed much more in depth, and it is also important to take into account the different political, economic, legislative, social and cultural differences, as even a minor deviation can have a significant impact on results. Individual risk sensitivity is the result of an entity's response to changes in its

internal economic health, but also a response to general economic changes (Michalski, 2012, p. 538). The environment in which businesses operate is also important. The ability to predict the financial difficulties of companies can be enhanced by models that are responsible for serial correlation of data, include information from more than one period, and include stationary explanatory variables (Kahya, and Theodossiou, 1999, p. 323-345).

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