

THE DEVELOPMENT OF BANKRUPTCIES OF COMPANIES IN THE CZECH REPUBLIC

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Abstract

Bankruptcies of Companies are an inherent element of the market economy. In the Czech Republic in 2006 was published a law no. 182/2006 Coll., On Bankruptcy and Its Resolution (Insolvency Act), which came into effect from January 1st, 2008. This law came into effect just at a time when the new financial crisis started getting stronger. This crisis has affected the development of corporate bankruptcies not only in the Czech Republic but also in other countries. Bankruptcies of Companies (Mączyńska, 2009) are the necessary selection mechanism in the world of business and have an important rationalizing function – they rid the market of entities that are unable to meet the appropriate efficiency requirements. The aim of this paper is to analyze the development of bankruptcies of companies (using total and monthly data) in the Czech Republic in the period 2008 to 2017 with a forecast for 2018. The software STATGRAPHICS Centurion will be used for this analysis. The data needed to analyze the development of corporate bankruptcies has been taken over from the company Creditreform, s.r.o. Czech Republic.

Key words: bankruptcy, company, financial health

JEL Code: C31, G33

Introduction

From January 1st, 2008 the law no. 182/2006 Coll., On Bankruptcy and Its Resolution (Insolvency Act), which was published in 2006. came into effect. This law regulates not only bankruptcies of companies, but also personal bankruptcies. In the Czech Republic Boková and Randáková (2015), Bokšová et al (2014), Hospodka et al (2015) and Maixner et al (2014) published analysis results of personal bankruptcies in recent years. In this view bankruptcy models (Čámská, 2012) and basic characteristics of enterprises, which are in insolvency (Čámská, 2013), are very important. Detailed analysis of corporate insolvency during the crisis years (with data analysis from 2008 to 2013) were published by Kislingerová and Schoenfeld

(2014), Benetti (2016 a, 2016 b and 2017) and forecasts of corporate insolvencies for the period 2013-2017 were published in 2013 by Kislingerová (2013), Benetti (2017). However, no one has engaged in research of corporate bankruptcies within individual regions in the Czech Republic and their effects on their development (or economic performance).

The aim of this paper is to analyse the development of bankruptcies of companies (using total and monthly data) in the Czech Republic in the period 2008 to 2017 with a forecast for first six months for year 2018. The software STATGRAPHICS Centurion will be used for this analysis. The data needed to analyse the development of corporate bankruptcies has been taken over from the company Creditreform, s.r.o. Czech Republic.

1 Methodology and Data

In the research, scientific methods were particular used: induction, comparative analysis, synthesis of partial knowledge, elementary statistical analysis and dependence analysis.

For elementary statistical analysis were used the following selected three indicators (Hindls, et al, 2000):

- the first difference (absolute gain, ${}_1\Delta_t IN$ – for corporate insolvencies and ${}_1\Delta_t AU$ – for corporate audits) (1)

$${}_1\Delta_t = \Delta_t - \Delta_{t-1} \cdot \quad (1)$$

- the average absolute gain (2) and

$${}_1\bar{\Delta} = \frac{\sum_{t=2}^n {}_1\Delta_t}{n-1} = \frac{y_n - y_1}{n-1}, \quad (2)$$

- the average growth coefficient (3)

$$\bar{k} = \sqrt[n-1]{\frac{y_n}{y_1}} \quad (3)$$

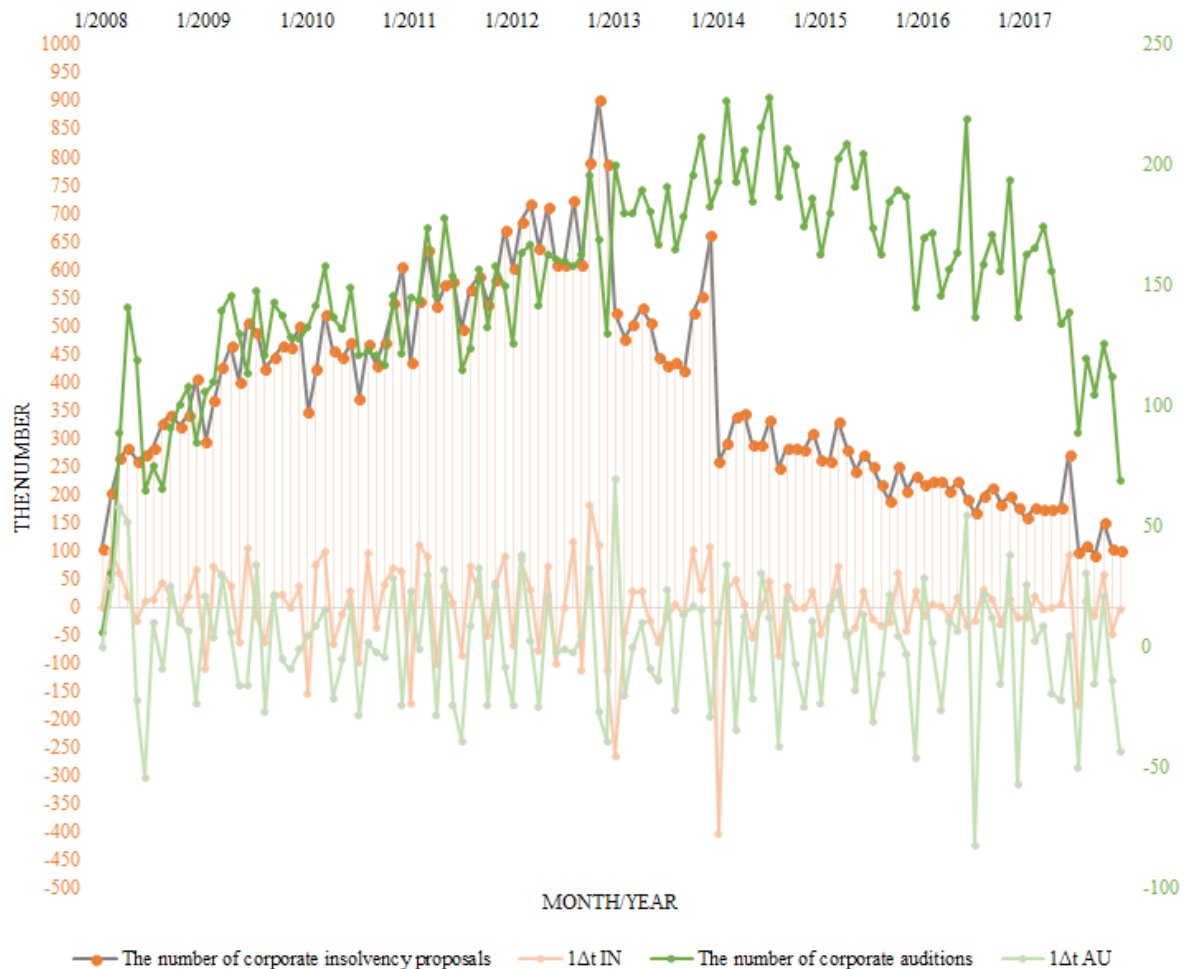
where n is the number of values (in this paper $n = 119$).

For the dependence analysis, the software STATGRAPHICS Centurion XVI was used. For the analysis were used secondary data from Creditreform (2017).

2 Results and Discussion

The results of elementary statistical analysis, by selected three characteristics, of development of number of corporate insolvency proposals and corporate auditions are given below. The basic development of number of corporate insolvency proposals and corporate auditions with development of its first difference illustrates Fig. 1.

Fig. 1 Development of Number of Corporate Insolvency Proposals and Corporate Auditions with Development of its First Difference



Source: author from Creditreform (2018)

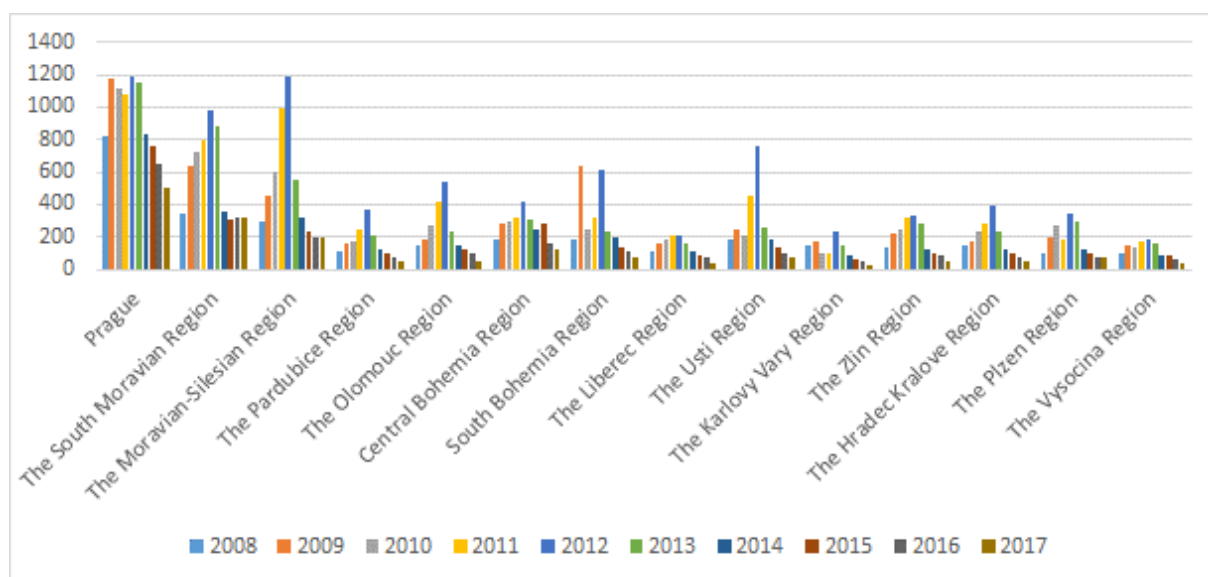
According to the development of the values specified in Fig. 1 can be deduced that the observed characteristics were examined over a period of very fluctuating development. For this reason, does not make sense to describe the examined values other statistical characteristics (such as e.g. coefficient growth, growth rate and increase rate). For a basic overview of the development of the examined values sufficient to indicate the results of absolute average gain and average growth coefficient.

The result of average absolute gain is for corporate insolvencies proposals 0,86 and for corporate auditions 1.76.

The results of average growth coefficient are for corporate insolvencies proposals 0.999957 (which corresponds to -0.000043%). and for corporate auditions 1.020736 (which corresponds to 2.0736%).

The development of number of corporate insolvencies by region from 2008 to 2016 shows the Fig. 2. The picture shows that the highest number of corporate insolvencies was reported in Prague during the monitored period.

Fig. 2 The Development of Number of Corporate Insolvencies by Region



Source: author from Creditreform (2018)

Other important indicators that can be used for the interregional comparison of the number of corporate insolvencies are the ratio of the number of company insolvencies per 1000 registered companies. For 2017, the results are as follows (from the highest to the lowest): Prague 0.83, the South Moravian Region 0.78, the Moravian-Silesian Region 0.57, the Plzen Region 0.53, the South Bohemia Region 0.49, the Pardubice Region 0.45, the Usti Region 0.41, the Karlovy Vary Region 0.38, the Hradec Kralove Region and the Olomouc Region 0.37, the Vysocina Region and the Zlin Region 0.35, the Central Bohemia Region 0.34, the Liberec Region 0.33.

The automatic forecasting function was used for the forecasting of the corporate insolvency proposals and corporate auditions in Czech Republic. The ARIMA (0,1,2) model was selected for the forecasting of the corporate insolvency proposals by the results of the p-value, the standard error, the root mean squared error (RMSE), the mean absolute error (MAE),

the mean absolute percentage error (MAPE), the mean error (ME) and the mean percentage error (MPE). The results of selected indicators for different ARIMA models see in Tab. 1. Forecasted values of number of corporate insolvency proposals for the Czech Republic for January 2018 was point value 113.219 and from February to June 2018 was 115.449.

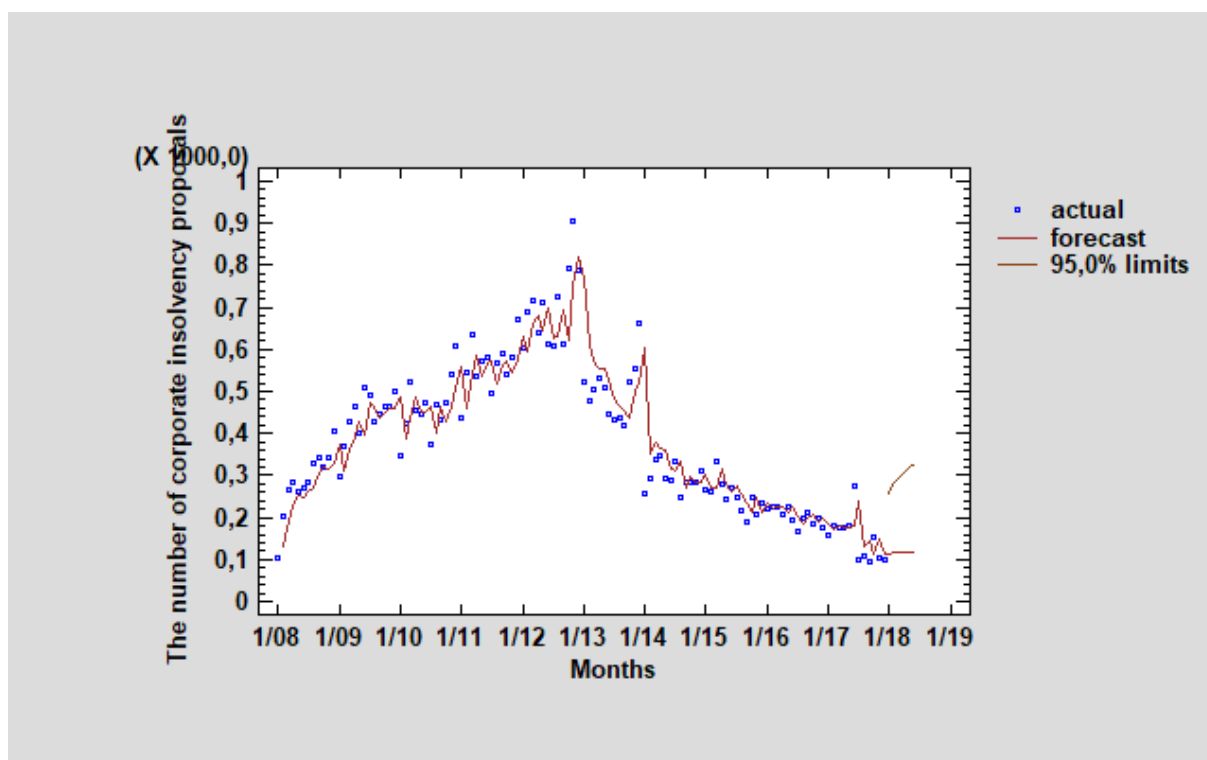
Tab. 1 Results of Selected Indicators for Different ARIMA Models

MODEL	RMSE	MAE	MAPE	ME	MPE
ARIMA(0,1,2)	71.2976	51.2254	14.9138	-0.51787	-3.39436
ARIMA(1,1,1)	71.7079	51.248	14.8673	-0.47211	-3.383
ARIMA(2,1,0)	71.9718	49.4441	14.562	-0.20137	-2.99306
ARIMA(2,1,1)	71.4841	50.8454	14.7782	-0.51198	-3.33274

Source: author

Fig. 3 shows results of development of corporate insolvencies proposals from January 2008 to December 2017 with forecast for next six months.

Fig. 3 The Development of Number of Corporate Insolvencies Proposals with Forecasting



Source: author from Creditreform (2018)

For the forecasting of the corporate insolvency audits was by the results of the p-value, the standard error, the root mean squared error (RMSE), the mean absolute error (MAE), the mean absolute percentage error (MAPE), the mean error (ME) and the mean percentage

error (MPE) selected ARIMA (0,1,1) model. Results of selected indicators for different ARIMA models see in Tab. 2.

Tab. 2 Results of Selected Indicators for Different ARIMA Models

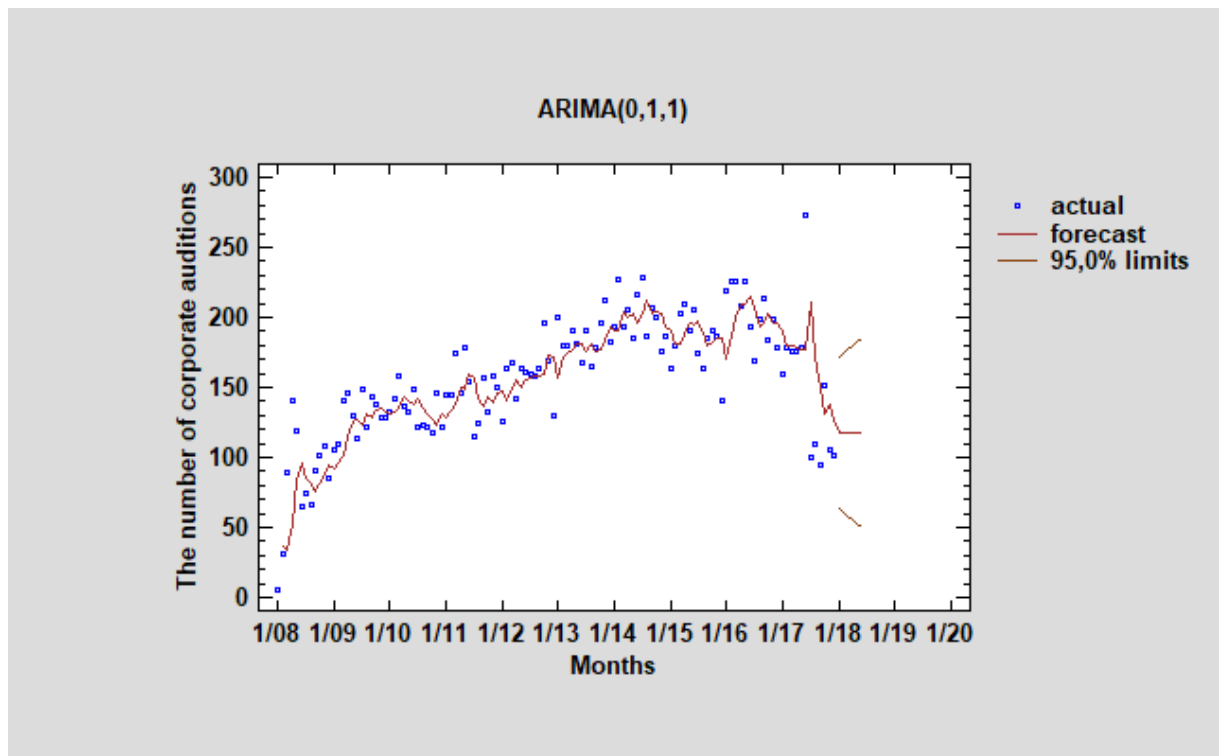
MODEL	RMSE	MAE	MAPE	ME	MPE
ARIMA(0,1,1)	26.6761	19.232	13.6149	1.9551	-0.63805
ARIMA(0,1,2)	26.524	19.106	13.3657	2.20819	-0.37223
ARIMA(1,1,1)	26.5607	19.1367	13.3848	2.27289	-0.31232
ARIMA(0,2,2)	26.6509	19.1063	13.6791	-3.34535	-4.29581

Source: author

Forecasted values of number of corporate auditions for the Czech Republic from January 2018 to June 2018 was point value: 117.556.

Fig. 4 shows results of development of corporate auditions from January 2008 to December 2017 with forecast for next six months.

Fig. 4 The Development of Number of Corporate Auditions with Forecasting



Source: author from Creditreform (2018)

Tab. 3 shows results of forecasting of development of corporate insolvencies proposals by regions. For the forecasting the automatic forecasting function was used from the linear, quadratic and exponential trend.

Tab. 3 Results of Forecasting by Regions

	Forecast model selected (trend)	Forecast for year 2018
Prague	quadratic	169.65
The South Moravian Region	quadratic	-137.083
The Moravian-Silesian Region	quadratic	-352.983
The Pardubice Region	quadratic	-88.8333
The Olomouc Region	quadratic	-176.75
Central Bohemia Region	quadratic	-2.81667
South Bohemia Region	linear	74.6
The Liberec Region	quadratic	-46.6333
The Usti Region	quadratic	-203.583
The Karlovy Vary Region	linear	35.7333
The Zlin Region	quadratic	-115.583
The Hradec Kralove Region	quadratic	-111.3
The Plzen Region	quadratic	-81.6833
The Vysocina Region	-quadratic	-31.6333

Source: author

From the above analysis results, it is clear, the most appropriate model for predicting value development was in most cases a quadratic trend. This fact is given by a small amount of values, so it was only possible to choose from a linear, quadratic and exponential model for predictions of the development of values.

Conclusions

This paper had as objectives: firstly, to describe the development of the number of corporate insolvencies proposals and the number of corporate audits in the Czech Republic since 2008 until the present (end of year 2017). Secondly, to predict the development of analyzed values not only for the Czech Republic, but also for the development of insolvency proposals, as well as by region in the Czech Republic.

For further research detailed analysis of corporate insolvencies proposals and corporate audits by the business sectors is recommended.

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