



THE ANALYSIS OF THE BANKRUPTCY OF ENTERPRISES EXEMPLIFIED BY THE VISEGRAD GROUP

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Abstract. The phenomenon of enterprises bankruptcy is an extremely complex process of economic, legal, social and even psychological nature. In the developed countries, the first studies on forecasting bankruptcy date to the early 20th century. In Central and Eastern Europe, due to, among other factors, the geopolitical situation and the introduced economic system, this issue became the subject of researchers' interest only in the 1990s. The universality and complexity of the phenomenon incline the Authors to make an attempt to identify the scale of the bankruptcy processes in the states of the Visegrad Group (V4). The countries of V4 were selected because of their common history and similar economic development. The aim of this article is to analyze the dynamics of the phenomenon of bankruptcy of enterprises in the states of the V4 Group in the years 2005–2016 on the basis of the data taken from the Credit reform reports. The estimation of trend models in time series on the basis of the bankruptcy in the Visegrad Group countries in the years 2005–2016 was used in the article as the primary research method. The descriptive analysis was also applied in the article.

Keywords: bankruptcy, company insolvency, business failure, Visegrád Group, trend models, time series analysis, comparative analysis, bankruptcy of enterprises in V4 countries.

JEL Classification: C22, G32, G33, D20.

Introduction

The phenomenon of bankruptcy is an indispensable element of any market economy and may concern any business (Matuszak & Tokarski, 2016). Although the current political, economic and legal system of a country influences the level and structure of bankruptcy, it is widespread and is constantly accompanying national economies. The ongoing processes of globalization and the internationalization of business have resulted in greater dependence and interconnections between businesses, often resulting in bankruptcy in the economically connected countries (Mączynska, 2013).

The phenomenon of corporate bankruptcy is an extremely complex process of economic, legal, social and even psychological nature. Depending on the size of the business unit and

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the extent of its activity, it can have international, national or local impact, involving and influencing many parties involved in insolvency proceedings (Mączyńska & Morawska, 2015).

The need for the constant monitoring of the phenomenon of business bankruptcy in a given economy, and nowadays also increasingly also of households (i.e. consumer bankruptcy), stems primarily from the fact that the smooth operation of these processes is an intrinsic part of an effective market economy (Matuszak & Tokarski, 2016a).

Bankruptcy and insolvency of enterprises are an inherent phenomenon in the market economy, whose scope, size, dynamics and intensity alter along with the changes in the both closer and further business environment, as well as in the global economy (Tokarski & Matuszak, 2016).

The complexity and universality of the phenomenon encouraged the Authors of the article to attempt to identify the scale of the bankruptcy proceedings present in the states of the Visegrad Group. The countries of Visegrad Four were selected because of their common history and similar economic development (Piotrowicz, 2015; Kořan, 2012). A similar historical development among these post-communist countries is reflected in the development of their insolvency laws. At present, the insolvency systems of the V4 countries are largely similar (Crhova et al., 2016). In 2019, 28 years has passed since the signing of the Visegrad Declaration and the creation of the Visegrad Triangle. The Visegrad Group has been a platform for the regional cooperation, the foundation of which is the common historical heritage and similar geopolitical situation of the Central European countries as well as the awareness of the convergence of challenges they face. For 28 years of its existence, it has developed a positive tradition of cooperation between its neighbours and it is commonly treated as an optimal formula for cooperation at the regional level. The V4 Group proved its usefulness as a platform for the articulation of the Central European interests and the core of broader political coalitions, above all on the EU forum. This has been particularly evident in the cooperation of the Group with other EU countries in the „V4+” format, for example with the Baltic States, Romania, Bulgaria, Slovenia, and with Croatia. The role of the Visegrad Group in bringing together political elites and societies of states that are not free from historical past and also in the alleviation of current political disputes that appear from time to time in neighbourly relations also should not be underestimated (Bukalska, 2003; Dangerfield, 2014, 2005; Jagodzinski, 2006; Baun & Marek, 2010; Ručinská & Fečko, 2016).

The main aim of the paper is to analyze the dynamics of the phenomenon of bankruptcy of enterprises in V4 states. The annual statistical data sets in the form of the time series characterising the bankruptcy of enterprise were used in the analysis. The data in question concerned the years from 2005 to 2016 inclusive, so each time series consisted of 11 observations. All data were taken from the Creditreform reports. The descriptive method was also used in the article. Various reference books on the bankruptcy of enterprises were also used in the analysis.

The content and process structure of the paper were defined in order to meet the research objectives. The introductory part consists of presenting the significance of the issue of bankruptcy and insolvency of enterprises in the economy, defining the purpose, structure and research methods used in the article. Next, the literature on the subject was reviewed in the field of research areas and approaches regarding the bankruptcy of enterprises. The discussed issues constitute an important area of empirical research, which is confirmed by numerous

scientific studies. It is the subject of theoretical considerations and empirical research in all countries with a free market economy. As the free-trade economy cannot exist without the possibility of declaring bankruptcy. In the following part an empirical analysis of the dynamics of enterprise bankruptcy in the V4 countries was conducted. The indexes of dynamics and the estimation of trend models based on the time series concerning the bankruptcy of enterprises of the Visegrad Group countries in the years 2005–2016 were used in that part of the research. The statistical data gathered from the Creditreform database was used in the analysis. The trend analysis allows you to examine the general trends occurring within the studied phenomenon. In most cases the degree of fitting the models to the empirical data indicated by the R^2 determination coefficients indicate their high practical utility. The obtained econometric tools can be used to predict the analyzed variable. In the summary, the authors also call for the practical and scientific applicability of the results and the need for a continuous research in this field. Finally, the authors evaluate the achievement of the aims of the paper and they discuss its further research potential.

This paper consists of five parts. The Introduction section presents the basic ground for the research, followed by detail literature reviews in section 1. While section 2 presents the models and the empirical results of the dynamics of the bankruptcy of enterprises, section 3 shows the analysis of the effectiveness of the bankruptcy system of the Visegrad Group countries in relation to the European Union countries. The final section concludes the paper.

1. The overview of the literature

The issues of bankruptcy of enterprises constitute a significant area of empirical studies, as numerous research papers prove (Mačerinskienė & Mendelsonas, 2013).

There have been many empirical and theoretical research studies conducted in the field of bankruptcy and insolvency of the business entities throughout decades as well as in different countries and different branches of economy, which leads to various conclusions (Tokarski, 2018). The research on bankruptcy was conducted with consideration of several areas and various approaches (Hart, 2000; Wang, 2006).

According to Wang (2006, p. 4) the scientific researches on the phenomenon of bankruptcy focus on four main areas:

- the changes concerning the corporate governance in the menace of bankruptcy,
- the costs of bankruptcy,
- the prices of shares and the long-term results,
- the changes in the legal regulations concerning bankruptcy.

Many of the research studies were focused on the forecast of the bankruptcy of enterprises (Altman & Hotchkiss, 2006; Prusak, 2018; Durica et al., 2019a, 2019b; Kliestik et al., 2018).

2. The empirical analysis of the dynamics of the bankruptcy of enterprises in the member states of the Visegrad Group in the years 2005–2016

The scale of the bankruptcy phenomena and the fact that the efficiency of the bankruptcy proceedings is taken into consideration while assessing the effectiveness of the national

economies prove that the significance of the bankruptcy in the modern economy is on the increase (A. Tokarski & M. Tokarski, 2018). Even though bankruptcy is not a mass phenomenon, it occurs frequently enough so that it cannot be deemed as irrelevant. The statistics concerning the bankruptcy gives evidence to the significant scale of that phenomenon (Tomczak, 2018; A. Tokarski & M. Tokarski, 2019).

The main aim of the empirical part of the paper is to analyse the dynamics of the bankruptcy of the enterprises in the Visegrad Group member states. The annual data sets in the form of time series (Baltagi, 2001) which characterise the phenomenon of the bankruptcy of enterprises in Czech Republic, Poland, Slovakia and Hungary were utilised in the conducted research. The data related to the period from 2005 to 2016 inclusive, so each time series consisted of 11 observations. All data was taken from the Creditreform¹ reports and their summary is presented in Table 1.

Table 1. The number of the bankruptcy of enterprises in the Visegrad Group countries in the years 2005–2016 (source: Own work on the basis of Creditreform.de, 2018)

Year	Czech Republic	Poland	Slovakia	Hungary
2005	3882	793	2200	7983
2006	4227	576	2150	9447
2007	4250	447	2100	9500
2008	4600	425	582	11322
2009	8394	590	900	14637
2010	5559	665	830	17487
2011	6753	762	870	30757
2012	8398	908	866	50224
2013	6021	926	880	46398
2014	3563	864	831	60637
2015	3004	844	715	47131
2016	2438	597	692	41007

Before estimating the trend models, the analysis of the dynamics of bankruptcy in the V4 countries was made with the use of the following measures (Aczel, 2012):

- one-base indices informing how the individual numerical values have changed in relation to the base year taken as the basis for comparisons:

$$I_{t/0} = \frac{y_t}{y_0} \cdot 100,$$

where: y_t – value of a specific variable in the period under consideration; y_0 – value of a specific variable in the base period.

- a chain index informing how the individual numerical values have changed in relation to the year preceding the year being the subject of the analysis:

¹ <https://www.creditreform.at/presse/insolvenzstatistik-europa.html>

$$I_{t/t-1} = \frac{y_t}{y_{t-1}} \cdot 100,$$

where y_{t-1} – value of a specific variable in the previous period.

The year 2005 was adopted as the base year in the one-base indices, which is the first of the collected numerical observations. The results of the calculations are presented in the following tabular statements.

Table 2. The chain indices of the number of bankruptcies in the Visegrad Group countries (source: Own work)

Year	Czech Republic	Poland	Slovakia	Hungary
2006	108.89	72.64	97.73	118.34
2007	100.54	77.60	97.67	100.56
2008	108.24	95.08	27.71	119.18
2009	182.48	138.82	154.64	129.28
2010	66.23	112.71	92.22	119.47
2011	121.48	114.59	104.82	175.88
2012	124.36	119.16	99.54	163.29
2013	71.70	101.98	101.62	92.38
2014	59.18	93.30	94.43	130.69
2015	84.31	97.69	86.04	77.73
2016	81.16	70.73	96.78	87.01

Table 3. One-base indices of the number of bankruptcies in the Visegrad Group countries (source: Own work)

Year	Czech Republic	Poland	Slovakia	Hungary
2006	108.89	72.64	97.73	118.34
2007	109.48	56.37	95.45	119.00
2008	118.50	53.59	26.45	141.83
2009	216.23	74.40	40.91	183.35
2010	143.20	83.86	37.73	219.05
2011	173.96	96.09	39.55	385.28
2012	216.33	114.50	39.36	629.14
2013	155.10	116.77	40.00	581.21
2014	91.78	108.95	37.77	759.58
2015	77.38	106.43	32.50	590.39
2016	62.80	75.28	31.45	513.68

The analysis of one-base indices indicates that the Czech Republic, Poland and Slovakia are characterized by similar strength and directions of changes in the scope of the analyzed

phenomenon. On the other hand, Hungary exceeds the increase in the number of bankruptcies in comparison to the other countries of the group in question. Starting from 2011, the increase in the number of bankruptcies exceeds to a large extent of 300% this number from the year taken as the basis for comparisons. On the contrary, Slovakia should be placed on the opposite side of the consideration as a country in which we observe a fall in the number of bankruptcies each year compared to the base year. The lowest value of the single-base index (26.45%) Slovakia reached in 2008 and since then it has remained at a low level which does not exceed 41% in relation to 2005.

Chain indices also indicate similarities between the Czech Republic, Poland and Slovakia, but different results for Hungary. The first three countries achieved the highest increase in the number of bankruptcies from the period to the period in 2009, and since 2014 they are characterized only by declines in this number. Hungary, on the other hand, reached its maximum not until 2011 and it is difficult to talk about any longer period of significant decreases in the analyzed period of time.

Having conducted the initial analysis, econometric trend models (Davidson, 2000) have been estimated. The number of bankruptcies of enterprises in individual countries of the Visegrad Group was used in the study as the dependent variable.

Polynomial trend models of the degree of r have been considered and which take the following form:

$$Y_t = \sum_{j=0}^r \alpha_j t^j + \eta_t,$$

where: t – time variable $t = 1, 2, \dots, n$; r – degree of the polynomial of the time variable.

The choice of the polynomial degree was made by means of the F test for equation of two variances (Greene, 2008). With the help of the classic least-squares method, appropriate models were estimated (Maddala & Lahiri, 2009) describing the trend of bankruptcies of enterprises in individual countries. The obtained results are presented in Tables 4–7.

Table 4. The trend model of the bankruptcy in the Czech Republic in the years 2005–2016 (source: Own work)

	coefficient	p value
const	1362.800	0.3383
t	1743.730	0.0052
t ²	-140.424	0.0034
R ²	0.6406	
Rho1	-0.1649	

Table 5. The trend model of the bankruptcy in Poland in the years 2005–2016 (source: Own work)

	coefficient	p value
const	1146.8900	0.0000
t	-448.3590	0.0000

End of Table 5

	coefficient	p value
t^2	88.3058	0.0000
t^3	-4.5681	0.0000
R^2	0.9650	
Rho1	-0.1604	

Table 6. The trend model of the bankruptcy in Slovakia in the years 2005–2016 (source: Own work)

	coefficient	p value
const	2717.4100	0.0000
t	-447.5610	0.0056
t^2	24.4875	0.0270
R^2	0.7551	
Rho1	-0.0493	

Table 7. The trend model of the bankruptcy in Hungary in the years 2005–2016 (source: Own work)

	coefficient	p value
const	26 060.100	0.0254
t	-17 867.000	0.0188
t^2	4308.880	0.0037
t^3	-225.729	0.0031
R^2	0.9339	
Rho1	-0.1900	

All presented trend models are characterized by a good adjustment to the empirical data. The R-squared coefficients of determination take values that exceed 75% in three models. Only for the Czech Republic this coefficient is lower and it amounts to about 64%. The time variables included in them are statistically significant at the level not exceeding 3%. There is no autocorrelation of the random component in the models and the residuals have a regular distribution (Maddala & Lahiri, 2009). There is no autocorrelation because rho1 value is under critical value in Quennouille (Box & Jenkins, 1983) test. That mean that we shouldn't rejected null hypothesis. Null hypothesis says that is no autocorrelation of the random component in the model. Critical value of test is in our case equal $1.96/\sqrt{12} = 0.57$. The lack of autocorrelation is indicated by low values of the rho1 coefficient. Their comparison to the limit value of the Quennouille test (Box & Jenkins, 1983) indicates each time that there are no grounds for rejecting the zero hypothesis, which just speaks of the lack of this phenomenon. The limit value of the Quennouille test is 0.57 for the above models.

In addition, graphs of actual and fitted values for two models which are characterized by the best adjustment to the actual data will be presented.

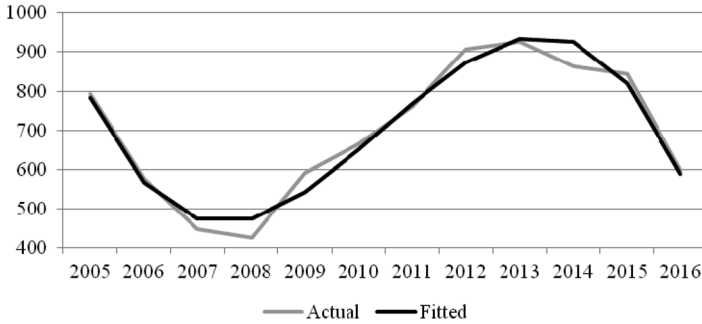


Figure 1. Actual and fitted values of the number of bankruptcy of enterprises in Poland obtained on the basis of the trend models (source: Own work)

From the estimated models of the enterprise bankruptcy trend we learn that within the scope of the conducted analysis the economies of the Czech Republic and Slovakia are best characterized by a quadratic function. For the Polish and Hungarian economies, the polynomial function of the third degree trend was the most appropriate one. This indicates the similarities occurring both in the first as well as in the other pair of countries of the Visegrad Group. Since in all four cases trends of higher degrees than the first (linear trend) were achieved, the obtained functional forms should not be interpreted from an economic point of view. Relatively high adjustment of the models to empirical data indicates the potential use of the estimated tools for forecasting the number of bankruptcies, especially in Poland and Hungary.

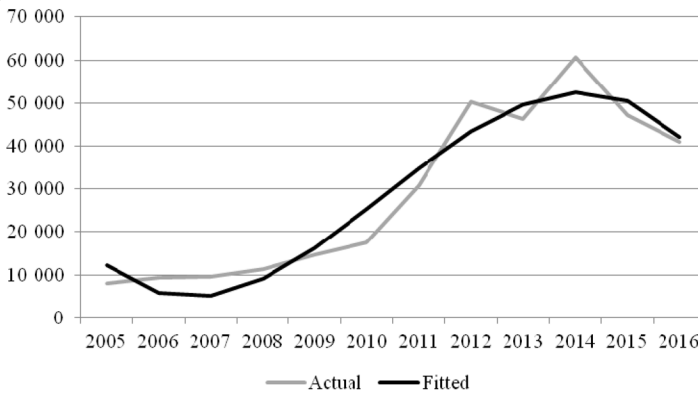


Figure 2. Actual and fitted values of the number of bankruptcy of enterprises in Hungary obtained on the basis of the trend models (source: Own work)

3. The analysis of the effectiveness (efficiency) of the bankruptcy system of the Visegrad Group countries in relation to the European Union countries

The research which enables to compare the effectiveness of bankruptcy systems between different countries has been implemented since 2003 by the World Bank as part of the “Doing Business” project. During the construction of the ranking within this research area, the

following factors are taken into account: costs of the bankruptcy proceedings, their implementation time, debt recovery rate and the preference ratio for liquidation or reorganization bankruptcy proceedings.

The time of the bankruptcy process (in years – T) is the period from the submission of the application for liquidation of the company to the publication of the court verdict in this case. This value is a derivative of the bankruptcy procedures, their number and complexity in a given country as well as the possibility of conducting them simultaneously. This indicator also takes into account the time of appeals against decisions *i.e.* the appeals. The cost of bankruptcy (expressed in% – C) is understood as the percentage value of the assets of the liquidated company. The cost is estimated on the basis of the actual results of research carried out by insolvency practitioners and it includes the following elements: court fees, fees of independent experts (appraisers), trustees, lawyers, attorneys as well as the accounting fees. The rate of return (Rr) measures the number of cents obtained from the dollar recovered from the debtor through bankruptcy proceedings *i.e.* through either the reorganization or liquidation of an enterprise (Szmal-Kaptur, 2016).

The final results are obtained on the basis of data received from respondents who take part in the survey and who are regarded as experts in this field (Morawska, 2013). The ranking is created on the basis of the debt recovery rate which constitutes the main variable. Table 8 shows the basic information illustrating the effectiveness of bankruptcy systems in the European Union countries, including the Visegrad Group countries. The data were ordered according to the place in the ranking, with the total number of countries analyzed being equal to 183.

While analyzing the time, cost and rate of return in the “old” EU group (EU-15) and in the “new” EU group *i.e.* the group that includes the countries of the Visegrad Group (EU-13) the following regularities can be observed (Szmal-Kaptur, 2016):

- longer time of bankruptcy proceedings than in western countries *i.e.* three or more years for the majority of the surveyed countries, while in the Visegrad countries the longest duration of bankruptcy proceedings is: 4 years in Slovakia, 3 years in Poland, 2.1 years in the Czech Republic. The shortest two-year bankruptcy proceedings time was noted for Hungary.
- higher bankruptcy costs amounting up to 18% in Slovakia, 17% in the Czech Republic, 15% in Poland and 14.5% in Hungary – distinctly lower rate of return. The rate for the Czech Republic is 66% and it is the highest result for the V-4 countries. Poland achieves 57%, Slovakia 54.7% and Hungary 41.7% rate of return. Finland, Slovenia, the Netherlands enjoy the highest rates of return at roughly 88–90%.

The comparison of time, cost and the rate of return between two groups of countries *i.e.* the countries of the “old European Union” (EU-15) and the countries of the “new European Union”, which include the countries of the Visegrad Group (EU-13), showed large discrepancies in the presented values.

The new EU countries, including the Visegrad Group countries, achieve worse results for the analyzed indicators, hence the conclusion that the implementation of EU bankruptcy law and international good bankruptcy practices significantly affects the improvement of national procedures and thus simplifies the process of the liquidation of an enterprise.

The analysis of the bankruptcy process of individual EU member states allowed to ascertain that the Visegrad Group countries are countries with ineffective bankruptcy system.

This is mainly indicated by the low rate of return in the bankruptcy proceedings as well as by their high costs and the long liquidation period of the enterprise.

Other studies which allow to compare European bankruptcy systems have been carried out by the European Commission and they were presented in the document entitled “*Business Dynamics: Start-ups, Business Transfers and Bankruptcy*”. The research was conducted in the form of interviews and questionnaires as well as the analyses of literature and statistical data. The studies included 27 EU countries as well as Croatia, Montenegro, Iceland, Norway,

Table 8. The effectiveness of bankruptcy proceedings in the European Union countries in 2016 (source: Kupis, 2017)

Country	The rate of satisfaction of the creditors' claims (in percentages)	The duration of the bankruptcy proceedings (in years)	The cost of the bankruptcy proceedings (as a percentage of the bankrupt's assets)
Austria	82.7	1.1	10.0
Belgium	89.3	0.9	3.5
Bulgaria	34.0	3.3	9.0
Croatia	30.5	3.1	14.5
Cyprus	71.4	1.5	14.5
Czech Republic	66.0	2.1	17.0
Denmark	87.8	1.0	4.0
Estonia	40.0	3.0	9.0
Finland	90.1	0.9	3.5
France	77.5	1.9	9.0
Germany	83.7	1.2	8.0
Greece	34.9	3.5	9.0
Hungary	41.7	2.0	14.5
Ireland	87.7	0.4	9.0
Italy	63.1	1.8	22
Latvia	41.7	1.5	10.0
Lithuania	42.8	2.3	10.0
Luxembourg	43.8	2.0	14.5
Malta	39.6	3.0	10.0
Netherlands	88.9	1.1	3.5
Poland	58.3	3.0	15.0
Portugal	73.4	2.0	9.0
Romania	32.7	3.3	10.5
Slovakia	54.7	4.0	18.0
Slovenia	88.2	0.8	4.0
Spain	71.2	1.5	11.0
Sweden	76.6	2.0	9.0

Turkey and Serbia. The research period covered 12 months, from November 2009 to the end of October 2010. Table 9 shows the basic characteristics of the individual bankruptcy systems such as the effectiveness of the early warning system, the effectiveness of out-of-court procedures as well as whether the bankruptcy system was debtor/creditor friendly or whether the bankruptcy law system was biased towards reorganization (restructuring) or liquidation of an enterprise. The data were based on the responses received from the respondents.

When analyzing the data shown in Table 9 for the Visegrad Group countries, the following conclusions can be drawn:

- in the Czech Republic the effectiveness of the early warning system is low and its bankruptcy system is friendly to creditors but there is a lack of data regarding the effectiveness of out-of-court proceedings;
- in Hungary there is a low level of efficiency of the early warning system, a low degree of the reorganization bias and the remaining elements of the analysis lack data;
- in Slovakia there is high efficiency of the early warning system, very high efficiency of out-of-court procedures and a neutral bankruptcy system for debtors /creditors;
- in Poland there is an average level of the effectiveness of the early warning system, the effectiveness of out-of-court procedures is very low, the bankruptcy system is friendly to creditors and, once the bankruptcy law reform was introduced in 2016, the system is biased towards reorganization.

Table 9. The characteristics of bankruptcy systems in selected European countries (source: European Commission, 2011)

Country	The origin of the Bankruptcy Law	The effectiveness of the early warning system	The effectiveness of the out-of-court proceedings	The Bankruptcy Law system friendly to debtors/creditors	The Bankruptcy Law system biased towards reorganisation / liquidation
Austria	German Civil Law	low	low	debtors' friendly	reorganization
Belgium	French Civil Law	low	N/A	N/A	N/A
Bulgaria	Combination of German and French Civil Law	low	low	debtors' friendly	N/A
Croatia	German Civil Law		very low	creditors' friendly	N/A
Cyprus	Pluralistic Rule of Law – combination of Common Law and Civil Law	average	low	creditors' friendly	N/A
Czech Republic	German Civil Law	low	N/A	creditors' friendly	N/A
Denmark	Scandinavian Civil Law	high	high	neutral	N/A

Continued Table 9

Country	The origin of the Bankruptcy Law	The effectiveness of the early warning system	The effectiveness of the out-of-court proceedings	The Bankruptcy Law system friendly to debtors/creditors	The Bankruptcy Law system biased towards reorganisation / liquidation
Estonia	German Civil Law	high	low	neutral	N/A
Finland	Scandinavian Civil Law	high	high	debtors' friendly	low bias towards reorganisation
France	French Civil Law	average	high	debtors' friendly	reorganization
Germany	German Law	vey high	average	neutral	N/A
Greece	French Civil Law	low	low	creditors' friendly	N/A
Hungary	Combination of German and French Civil Law	low	N/A	N/A	low bias towards reorganisation
Iceland	Scandinavian Civil Law	low	high	debtors' friendly	N/A
Ireland	Common Law	low	very low	neutral	low bias towards reorganisation
Italy	French Civil Law	low	low	creditors' friendly	N/A
Latvia	German Civil Law	low	very low	creditors' friendly	N/A
Lithuania	Combination of German and French Civil Law	high	very low	creditors' friendly	N/A
Luxembourg	French Civil Law	N/A	N/A	N/A	N/A
Malta	Pluralistic Rule of Law – combination of Common Law and Civil Law	low	N/A	N/A	N/A
Montenegro	German Civil Law	average	average	creditors' friendly	N/A
Netherlands	French Civil Law	high	high	creditors' friendly	low bias towards reorganisation
Norway	Scandinavian Civil Law	low	low	creditors' friendly	low bias towards reorganisation
Poland	French Civil Law	average	very low	creditors' friendly	reorganization

End of Table 9

Country	The origin of the Bankruptcy Law	The effectiveness of the early warning system	The effectiveness of the out-of-court proceedings	The Bankruptcy Law system friendly to debtors/creditors	The Bankruptcy Law system biased towards reorganisation / liquidation
Portugal	French Civil Law	low	low	neutral	N/A
Romania	French Civil Law	average	low	N/A	N/A
Serbia	French Civil Law	low	low	creditors' friendly	N/A
Slovakia	German Civil Law	high	very high	neutral	N/A
Slovenia	German Civil Law		average	neutral	N/A
Spain	French Civil Law	low	high	creditors' friendly	reorganization
Sweden	Scandinavian Civil Law	low	high	neutral	low bias towards reorganisation
Turkey	German Civil Law	N/A	N/A	N/A	N/A
Great Britain	Common Law	very high	very high	creditors' friendly	reorganization

Due to the political and economic changes, the institution of bankruptcy in the countries of Central and Eastern Europe began to function in the first half of the 1990s. During this period, the first cases of bankruptcy emerged.

The Visegrad Four countries are connected not only by their histories but also by their common endeavours in the economic, political and cultural fields. A similar historical development among these post-communist countries is reflected in the development of their insolvency laws. All analyzed countries had to reform their insolvency laws after 1990 (Venyš, 1997; Janda & Rakicova, 2014; Aghion et al., 1994; Gerlach, 1998). Because insolvency proceedings in the V4 countries were considered highly inefficient the insolvency systems of the Visegrad Four countries have recently been re-codified. At present, the insolvency systems of the V4 countries are largely similar. The insolvent state of business entities in these countries should be solved in two basic ways i.e. reorganization or liquidation. The only difference is in the naming of these ways in the different countries. In Poland, there is also the possibility of applying for out-of court reorganization, which means lower costs of proceedings (Crhova et al., 2016).

Insolvency of enterprises in V4 countries is an important problem that requires a solution. Its negative signs include limiting possibilities of the growth of enterprises, reduction in takings and profits, lowering of liquidity, growth of interest costs as well as workforce reductions. Creating an appropriate legal framework along with the implementation of ethics in business enable the stabilization of the insolvency system (Bobákova, 2016). The effort

to establish efficient insolvency proceedings is now being undertaken in each V4 country. If the enterprise is still salvageable, the best option appears to be reorganization that preserves jobs. However, if the rescue of the enterprise is no longer possible, bankruptcy proceedings are opened. Effectively set insolvency proceedings are one of the ways of improving the competitiveness of the country.

The predictability of law is crucial for the functioning of all economic subjects, both for those in insolvency and those which are prospering.

4. Discussion

In the empirical part of the paper, it was possible to calculate one-base and chain indices of dynamics which constitute the basic statistical apparatus for the analysis of changes over time occurring in variables in the form of time series. The results of the calculations showed similarities between 3 countries. Hungary was a country that proved to be different from the others.

Having conducted the statistical analysis, the basic econometric analysis was carried out in the form of specification and estimation of the trend models of the bankruptcy of enterprises in the Visegrad group members. Polynomial row trend models from the first to the third were specified and estimated. Thus, a total of 12 models were estimated, out of which a few the best from the statistical point of view were selected and presented. Here, it turned out that similarities can be observed among pairs of countries i.e. the Czech Republic obtained the same degree of trend as Slovakia and Poland obtained the same degree of trend as Hungary.

From the point of view of the analysis of the dynamics and its similarities among the members of the Visegrad group, the authors deem the analysis satisfactory. The selected models may find empirical application to forecast the number of bankruptcies of enterprises in the analyzed economies. However, the following issues shall be kept in mind:

- the increase in the number of observations considered in the analyzed time series may result in a change in the obtained results;
- the extension of the set of variables with potential explanatory variables could enrich the analysis in terms of the cause and effect relationships occurring in the field of bankruptcy of enterprises in the analyzed group of countries.

Nevertheless, it is impossible to do that only on the basis of the statistical material collected so far. The authors are considering extending the analysis of the above issues in their further work, as this article obviously does not exhaust the subject which shall be developed on an ongoing basis.

Conclusions

The issue of the bankruptcy of enterprises is an important area of empirical research, which is confirmed by numerous scientific studies. The phenomenon of bankruptcy is an extremely complex problem and it can be considered from different points of view. The substantive values of this publication are as follows: the ability to address the problem (deep approach),

the retrospective and critical review of the selected (extensive) literature on the subject, the appropriate adjustment of the empirical layer within which the relationships between the studied phenomena have been established.

This paper may provide the impetus for further research in this matter. The significance of bankruptcy in the contemporary economy is evidenced by the scale and dynamics of this phenomenon and the fact of taking into account the effectiveness of bankruptcy proceedings in assessing the efficiency of national economies. Therefore, the Authors believe that in the future it would be reasonable to conduct research on the effectiveness of bankruptcy systems of the Visegrad Group countries in terms of formulating responses to the following issues:

- the comparative analysis of bankruptcy systems of the Visegrad Group countries with respect to the European Union countries and with particular consideration given to the duration of bankruptcy proceedings, the cost of bankruptcy and the rate of return of the recovered receivables;
- the analysis of the impact of macroeconomic and microeconomic factors on the scale and the dynamics of bankruptcies of enterprises of the Visegrad Group countries;
- the analysis of changes in the provisions of law regarding bankruptcy proceedings in order to increase the efficiency of bankruptcy proceedings of the Visegrad Group countries;
- the analysis of the impact of the Second chance policy implemented in the countries of the European Union on the improvement of the efficiency of the bankruptcy systems of the Visegrad Group countries.

Although bankruptcies are not a mass phenomenon, they occur often enough so that they cannot be deemed irrelevant. The bankruptcy statistics presented in this paper regarding the economies of the Visegrad Group countries constitute a strong confirmation of the significant scale of the bankruptcy of enterprises.

Disclosure statement

The authors (Jarosław Krajewski, Andrzej Tokarski and Maciej Tokarski) have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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