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CORPORATE INSOLVENCIES EVOLUTION IN REPUBLIC OF MOLDOVA AND UKRAINE DURING 2013 – 2020 PERIOD

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Abstract

The study of the corporate insolvencies' evolution is very important especially for the management of the company and in for the internal audit, control and performances forecasting. The objectives of the article is to analyse the evolution of number of insolvencies and to analyse some legal aspects regarding the corporate insolvencies in the Ukraine and Republic of Moldova till 2021. For this reason, this study try to answer the next three questions: 1) What was the evolution of number of corporate insolvencies in Republic of Moldova and Ukraine during 2013-2020? 2) What are the legislative regulations regarding insolvency proceedings in Republic of Moldova and Ukraine? 3) What is the level of development of the research of the corporate insolvencies forecast methods in these two countries? For this purpose, the following methods were applied: comparative-critical analysis of the literature, documentation, and documentary analysis, statistical methods of analysis, constructivist approach, and positivist approach. The results of this research show that these two countries are characterized by different directions of modifications of number of corporate insolvencies during the analysed period, excepting 2020 year, when the COVID-19 pandemic had a major impact. At the same time, the performed econometric analysis, shows that the Republic of Moldova and Ukrainian models have a relatively high adjustment to the empirical data, demonstrating the possibility to forecast the number of corporate insolvencies. Regarding the legislative regulations, can be remarked that the main differences established in the legislation of these two countries relate to the amount and term of non-payment of debts. In addition, the corporate insolvencies forecast methods in Ukraine are much more advanced then in Republic of Moldova.

Key words**:** *corporate insolvency, bankruptcy risk, Ukraine, Republic of Moldova*

INTRODUCTION

Research regarding the corporate insolvencies' evolution is relevant because it aims to identify the future trends of number of insolvencies and the issues regarding legislative regulations of insolvency proceedings efficiency.

The purpose of the institution of insolvency is, on the one hand, to help default companies to overcome the financial crisis, on the other hand, to exclude unprofitable and inefficient production and services activities from the economic system by legislative means.

In developed countries, the first bankruptcy (insolvency) law was drafted into British law in 1732. Then, in 1800, this type of law appeared in the United States, France, Spain, and Germany. The first attempt of bankruptcy (insolvency) law adjustment by the introduction of reorganization procedure was made in Austrian law in 1914. Only in 1978 in US law appeared the modern reorganization procedure of firms, followed by legislative reforms in Italy (1979), France (1985), Great Britain (1986), New Zealand (1989), Australia and Canada (1992), Germany (1994 and 1999), Sweden (1996), Japan and Mexico (2000) [19].

Regarding the first bankruptcy assessment studies, in developed counties, they appeared at the beginning of the 1920s. Initial study was performed in the USA. In 1966 Beaver [2] used for the first time statistical (econometrical) methods in order to forecast and asses the level of bankruptcy risk. In

1968, by Altman [1] was created the first and most famous bankruptcy prediction model - "Z-score". Ever since, were developed and elaborated more and more bankruptcy models prediction. In the 1970s and early 1980s, appeared a new direction in bankruptcy risk prediction and evaluation - the logit and probit analysis (Santomero and Vinso (1977) and Martin (1977)) cited by [18]. Then, in 1990s the progress of statistical and analytical tools has allowed the use of non-parametric methods for assessing corporate bankruptcy risk, especially artificial neural networks. (Odom and Shard in 1990) [21]. Recently, can be remarked a new group of methods for predicting the risk of corporate insolvencies related to soft computing methods (Korol, 2010a, 2013) [8], which may process information in cases that are difficult to exemplify in the form of algorithms, and do so simultaneously with the symbolic representation of knowledge (Korol, 2010b) [9] .

As for post-Soviet countries, the studies on this research topic date back to the early 1990s, because during this period the first cases of insolvencies appeared and, consequently, the first legislative changes took place [17]. In terms of research, in Central and Eastern Europe corporate insolvencies started to be studied only in the 1990s. Initially, due to the lack of databases, most countries of Central and Eastern Europe used the generally accepted methods of financial analysis. Subsequently, more complex studies and national assessment models were elaborated. The most famous national models were developed in Poland, the Czech Republic and Slovakia. Advanced models have also been elaborated in Russia, Estonia, and Hungary. To a lesser extent, can be mentioned Ukraine, Romania and Lithuania. Bulgaria and the Republic of Moldova are considered to be the weakest in this domain [18].

At the level of the European Union, every year more than 200,000 companies are declared insolvent with a direct loss of more than 1.7 million jobs [6]. This is the main reason why EU pay attention to this area [20, 21]. In particular, the issue of corporate insolvencies became a pressing one during the COVID 19 pandemic, when a huge number of entities, practically throughout the globe, were forced to cease their activities. Lemerle et al. [12] demonstrates that the government intervention helped to prevent one of two insolvencies in Western Europe and one of three in the US, representing an overall decrease of (-12%) in 2020. As a result, the level of business insolvencies rests low in most countries until the end of 2021, the normalization being delayed until 2022.

Therefore, the main objective of this research is to try to analyse the evolution and some legal aspects regarding the corporate insolvencies in the Ukraine and Republic of Moldova till the 2021 year. Thus, the analysis was performed during the period 2013-2020. The data were collected from the Credit reform and of Euler Hermes reports.

MATERIALS AND METHODS

This article attempts to answer the following questions:

(1)What was the evolution of number of corporate insolvencies in Republic of Moldova and Ukraine during 2013-2020 period?

(2)What are the legislative regulations regarding insolvency proceedings in Republic of Moldova and Ukraine?

(3)What is the level of development of the research of the corporate insolvencies forecast methods in these two countries?

For this purpose, the method of scientific literature analysis was applied. Moreover, during the study was applied the universal method of dialectics and its procedures: deduction and induction, synthesis and analysis, analogy, correlation, scientific abstraction, and those of economic analysis of information processing: systematization, comparison, etc. At the same time, such methods were used as: comparative-critical analysis of the literature, documentation, and documentary analysis, statistical methods of analysis, constructivist approach, and positivist approach.

The theoretical and methodological aspects are based on the fundamental works of scientists from the U.S., C.S.I., Europe, and other countries, normative and legislative acts of the Republic of Moldova and Ukraine. The chosen publications were mainly selected from the Google Scholar and Research Gate databases.

In order to perform the evolution analysis of number of corporate insolvencies the data was taken from the Credit reform reports [4]. The evolution analysis was made by using chain indices. A chain index is calculated with the goal to show the modification of the effective (current) value in comparison with the value from previous year:

$$\boldsymbol{I_{\frac{t}{t}-1}} = \frac{I_t}{I_{t-1}} \bullet \mathbf{100}, \qquad (1)$$

where:

yt – number of corporate insolvencies in current period;

yt–1 – number of corporate insolvencies in previous year.

The calculation results can be seen in the Table 1.

Then, we made the econometric analysis using the classic least-squares method, and elaborating trend models [5] for the Republic of Moldova and Ukraine. As a dependent variable was chosen the number of insolvencies.

The economic trend models were made by using the polynomial trend models of the r level:

$$Y_t = \sum_{j=0}^{r} a_j t^j + n_t \qquad (2)$$

where:

t represents the time variable *t = 1, 2, ..., n*;

r – time variable polynomial trend.

The econometric analysis can be seen in Tables 2 and 3.

RESULTS AND DISCUSSIONS

In order to answer to the question one:

(1)What was the evolution of number of corporate insolvencies in Republic of Moldova and Ukraine during 2013-2020?

and to appreciate the evolution of corporate insolvencies in Republic of Moldova and Ukraine, was drawn the Table 1.

Table 1. The evolution of number of the corporate insolvencies in Republic of Moldova and Ukraine during 2013–2020

Years	Number of corporate insolvencies		Years	The chain indices of the corporate insolvencies,%	
	Ukraine	RM		Ukraine	RM
2013	8,811	2,808	-	-	-
2014	13,198	2,770	2014/ 2013	149.79	98.65
2015	13,696	3,905	2015/ 2014	103.77	140.97
2016	19,853	4,055	2016/ 2015	144.95	103.84
2017	19,975	8,540	2017/ 2016	100.61	210.60
2018	20,146	7,847	2018/ 2017	100.86	91.89
2019	20,076	3,038	2019/ 2018	99.65	38.72
2020	19,875	2,762	2020/ 2019	99.00	90.92

Source: Own calculations based on Credit reform data.

The dynamic analysis performed in Table 1, on the base of chain indices, shows that these two countries are characterized by different directions of modifications of number of corporate insolvencies during the analysed period, excepting 2020 year. Ukraine achieved the highest increase in the number of insolvencies in 2016, and this trend of increase persisted till 2019. In Republic of Moldova the highest rise of the number of corporate insolvencies was observed in 2017. The 2017 year in Moldova was characterized by lack of economic growth and lack of reforms implementation, by a slow recovery from bank fraud, by different attempts to promote dubious laws, and by small investments in business environment. At the same time, the energy dependence on the Russian Federation was one of the main economic problems of RM in those periods.

Analysing chain indices trend, may be remarked a significant decrease in 2020 of number of insolvencies for the both analysed countries. The 2020 year was one of the most unexpected and unusual years in European economy, because of the pandemic COVID-19 impact: lockdowns, ceased activities, uncertainties. Thus, during 2020 year, the

business environment was deteriorated. That is why in this period, almost all national governments, Ukrainian and the Republic of Moldova governments as well, tried to support and help business and affected branches. This is the reason why the number of insolvencies in Ukraine and Republic of Moldova, does not reflect the reality in 2020 and a huge increase are to be expected in next years.

Table 2. The trend model of the number of insolvencies in Ukraine (2013–2020)
Dependent Variable: Y_UKARAINE
Method: Least Squares
Date: 04/01/22 Time: 16:46
Sample: 2013 2020
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2726.190	1734.088	1.572118	0.1670
T	6118.998	796.2257	7.685004	0.0003
T^2	-540.3214	77.65438	-6.958029	0.0004

R-squared	0.915452	Mean dependent var	16211.00
Adjusted R-squared	0.887269	S.D. dependent var	4059.007
S.E. of regression	1362.829	Akaike info criterion	17.53371
Sum squared resid	11143815	Schwarz criterion	17.59946
Log likelihood	-75.90171	Hannan-Quinn criter.	17.39184
F-statistic	32.48273	Durbin-Watson stat	2.914303
Prob(F-statistic)	0.000604		

Source: Own calculations.

Table 3. The trend model of the number of insolvencies in Republic of Moldova (2013–2020)
Dependent Variable: Y_MOLDOVA
Method: Least Squares
Date: 04/01/22 Time: 16:51
Sample (adjusted): 2013 2020
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1233.518	2811.030	-0.438813	0.6791
T	3068.780	1433.181	2.141236	0.0852
T^2	-318.0536	155.4503	-2.046014	0.0961

R-squared	0.480599	Mean dependent var	4465.625
Adjusted R-squared	0.272838	S.D. dependent var	2362.821
S.E. of regression	2014.867	Akaike info criterion	18.33449
Sum squared resid	20298436	Schwarz criterion	18.36428
Log likelihood	-70.33796	Hannan-Quinn criter.	18.13356
F-statistic	2.313235	Durbin-Watson stat	1.953450
Prob(F-statistic)	0.194427		

Source: Own calculations.

After performing the dynamic analysis of number of insolvencies, in Table 2 and Table 3 the econometric trend models with the help of the classic least-squares method have been estimated, with the goal to describe the trend of corporate insolvencies in Ukraine and in the Republic of Moldova.

The above trend models may be considered as well adjusted to the empirical data. For Ukraine the R-squared coefficient of determination is higher than 91%. For the Republic of Moldova this coefficient exceeds only 48%. Even though, the time variables of the models are statistically significant, because they are not higher than 3%. There is

no autocorrelation of the random component in the models and the residuals have a regular distribution [13]. There is no autocorrelation because R-squared is under critical value in Quennouille test [3]. This indicates that the null hypothesis should not to be rejected. Null hypothesis shows that is not any autocorrelation of the random component in the model, and demonstrates the lack of this phenomenon. More than it, the estimated tools ca be used in order to forecast the number of corporate insolvencies for the Republic of Moldova and Ukraine due to the relatively high adjustment of the models to empirical data.

In order to answer to the next two questions:

(2)What are the legislative regulations regarding insolvency proceedings in Republic of Moldova and Ukraine?

(3)What is the level of development of the research of the corporate insolvencies forecast methods in these two countries?,

we will use comparative-critical analysis of the literature, documentation, and documentary analysis.

The purpose of initiating insolvency proceedings is to protect creditors so that they can recover their debts, at least in part. Legal provisions must guarantee this protection, through such regulations that would promote discipline and integrity in the financial management of the insolvent entity [24]. Further we will analyse the basic legislation regarding insolvency proceedings in the Republic of Moldova and Ukraine, and the level of development of the research of the corporate insolvencies forecast methods in these two countries.

Experience of the Republic of Moldova

Moldovan bankruptcy (insolvency) law has undergone an intense evolution from the independence to present times, culminating by the adoption in 2012 of the fourth law regarding the institution of bankruptcy. Unfortunately, in the bankruptcy laws from 1992 and 1996 were not sufficient regulations regarding the resolution of insolvency issues, and regarding the pre-bankruptcy procedures.

Although the Bankruptcy Act of 2001 was a major step forward in the regulation of insolvency proceedings, it was only the first step in streamlining litigation.

An important step in the insolvency procedures streamlining was the adoption of the insolvency law in 2012, which includes a progressive procedure so called the accelerated restructuring procedure. Although it has a similar name as the restructuring procedure, which is an alternative to the bankruptcy procedure, the accelerated restructuring procedure represent a pre-bankruptcy procedure that cannot be applied by persons who are already bankrupt. This law was revised and entered into force on 13.07.21 [11].

Therefore, before the entry into force of the new law, interest in the issue of predicting the risks of bankruptcy of the company was insignificant. Interest in these issues especially intensified in the second half of the first decade of the 21st century, when Ruslan Mihalachi (2011) [16] elaborated a model for the corporate sector and Eugeniu Raetchi (2020) elaborated a model on a sample of 16 banks. The models were built using linear multivariate methods, discriminatory analysis and were designed to assess the risk of general bankruptcy. The models are considered more theoretical than practical ones and have never been officially recognized as tools for predicting bankruptcy risk.

This is because the law of the Republic of Moldova does not establish a bankruptcy risk assessment methodology, but only takes into account the ratio between the statutory capital and the value of net assets.

However, Muntean N. (2019) [17, 20, 21] developed her own bankruptcy analysis model, studying the impact of corruption, the level of economic growth, the quality of governance, fiscal policy and business freedom on number of insolvencies in European countries.

Experience of Ukraine

Ukraine gained independence in 1991, and the bankruptcy law came into force on July 1, 1992. The first national models for assesing the bankruptcy risk of Ukrainian companies appeared at the beginning of the 21st century

and were developed by Martynenko and Tereshchenko. Both authors used the method of linear discriminative analysis. Matviychuk (2010) [14] came to conclusions that foreign models would not work in Ukrainian conditions. Therefore, Matviychuk developed national models using the methods of linear discriminant analysis and fuzzy logic using financial indicators as independent variables. A comparative analysis of the effectiveness of the models: Altman, Konan and Holder, Lis, Taffler, Springate, Beaver, the universal model based on the discriminant function, Chepurko, Saifullin, Kadykov and Sumy was carried out by Druzin (2013) on a sample of 15 firms as cited by [18]. He demonstrated that the most correct results can be achieved using the Springate, Lis and Beaver models. The author also remarked that the main problem in forecasting the bankruptcy risk of Ukrainian companies is the lack of available financial data. An interesting concept of a business bankruptcy prediction model was proposed by Kozak et al. (2013) as cited by [18]. They merged quantitative and qualitative variables, creating causal relations. The authors utilised a combination of fuzzy logic and cognitive technologies to build the model. This method is known theoretically as fuzzy cognitive maps. However, the authors did not show how it should be implemented in practice.

Kornilyuk (2014), cited by [18], conducted a study of the key factors that determine the risk of bankruptcy of Ukrainian banks. Banks with external capital are less exposed to the insolvency risk than banks with internal capital. Neskorodeva and Pustovgar (2015), cited by [18], used the Kohonen neural network and financial indicators to build a model of steel companies. In 2015, Kleban (2015), cited by [18], proposed, using fuzzy logic, to predict the bankruptcies of enterprises. He utilised the Takagi-Sugeno algorithm with financials and numbers as independent variables. Litvin (2015), cited by [18], developed models to predict insurer bankruptcies using the support machine technique. Klebanova et al. (2016) developed a bankruptcy forecasting model for agricultural enterprises based on 12 bankrupt and 24 non-bankrupt enterprises. To this effect, they applied a concept merging artificial neural networks and fuzzy logic as cited by [18].

As a result of the legislative acts analysis of these two countries, we came to the conclusion that the general financial criteria for initiating the insolvency process of a company are:

- Inability to pay (inability to pay one's obligations on time);
- Over-indebtedness (excess of debts over the company's assets).

The main differences between the insolvency norms, established in the legislation of these two countries, relate to the amount and term of non-payment of debts (Table 4).

Table 4. General criteria for substantiating insolvency proceedings

Country	Criteria 1	Criteria 2
Ukraine [15, 23]	debts > 300 minimum wages; 3 months after the due date	Debts > assets
Moldova [11]	the amount is not specified; 15 days after notification	Debts > assets

Source: Developed by the authors based on the normative acts of the analysed countries.

At the same time, to identify the insolvency of large companies, the regulations of the Republic of Moldova [10] suggest the use of the "net assets" method, which is directly identified with the concept of the company's equity, although the economic essence of this approach is much broader. According to the provisions of the International Accounting Standard (ISA) no. 321: "The net assets of an organization are those assets that remain after deducting all claims related to its assets."[7]

After analysing the level of development of the research of the corporate insolvencies forecast methods in Republic of Moldova and Ukraine, in Table 5 we identified the three, most important areas, namely:

-the methods used to develop national corporate bankruptcy forecasting models,
-types of variables,
-and information on sectoral models.

Table 5. Summary of studies on predicting corporate insolvencies risk in the Republic of Moldova and Ukraine.

Countries	Used methods	Used variables	Industry Models
Republic of Moldova	multiple discriminant linear analysis	financial ratios	banks, universal model
Ukraine	multiple discriminant linear analysis, fuzzy logic method, Kohonen neural network, Takagi-Sugeno algorithm	financial ratios, in the case of banks - qualitative factors (e.g. capital structure)	banks, metallurgical industry, agricultural sector

Source: own compilation.

The data from Table 5 show that the most advanced methods are used in Ukraine, while only classical methods are introduced in Republic of Moldova. In Ukraine, alongside the financial indicators were used as independent variables other variables. In the Republic of Moldova are utilised only financial rates. In Ukraine have been developed industry models as well. In the Republic of Moldova only 2 universal models have been elaborated.

CONCLUSIONS

Research regarding the corporate insolvencies' evolution is relevant and this fact is confirmed by a grate number of scientific articles and papers.

In this article were discussed such aspects as:

-a review of the relevance of the researched issue;

-an analyse of the corporate insolvencies' evolution with the help of chain indices in the Republic of Moldova and Ukraine during 2013-2020;

-an econometric analysis, using the classic least-squares method, with the goal to describe the trend of corporate insolvencies in Ukraine and in the Republic of Moldova;

-an analysis of the legislative acts of these two countries regarding the insolvency process of a company;

-a description of the level of development of the research of the corporate insolvencies forecast methods in Republic of Moldova and Ukraine.

The results of the evolution analysis shows that these two countries are characterized by different directions of modifications of number of corporate insolvencies during the analysed period, excepting 2020 year. During 2020 year, because of the COVID-19 pandemic impact, the business environment was deteriorated. That is why in this period Ukrainian and the Republic of Moldova governments tried to support and help business and affected branches. This is the reason why the number of insolvencies in Ukraine and Republic of Moldova, does not reflect the reality in 2020 and a huge increase are to be expected in next years.

At the same time, the performed econometric analysis, shows that the Republic of Moldova and Ukrainian models have a relatively high adjustment to the empirical data, demonstrating the possibility of the estimated tools usage in order to forecast the number of corporate insolvencies.

As a result of the legislative acts analysis of these two countries, we came to the conclusion that the main differences between the insolvency norms, established in the legislation, relate to the amount and term of non-payment of debts.

After analysing the level of development of the research of the corporate insolvencies forecast methods in Republic of Moldova and Ukraine, we concluded that the most advanced methods are used in Ukraine, while only classical methods are introduced in Republic of Moldova.

Thus, corporate insolvencies are not a mass phenomenon, and the research performed in this paper represent a strong confirmation of this fact. More than it, this article may ensure relevant data for other researchers on this topic.

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