

# OVERVIEW OF THE RELEVANT INDICATORS OF DEFAULTED AND NON-DEFAULTED COMPANIES AND POSSIBILITIES OF IMPROVEMENT FOR THE RATING SYSTEMS USED BY THE ROMANIAN COMMERCIAL BANKS

**Kovács Ildikó**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

**Dóczy Henrietta**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

**Erdély Attila**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

**Felfalusi Éva**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

**Knoch Renáta-Kinga**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

**Patka Kinga-Enikő**

*Babeş-Bolyai University Faculty of Economics and Business Administration*

*Since the beginning of the financial and economic crises many news came to light which discussed the increasing number of non-performing loans, and the fact that as a result of the company break-downs, the bank portfolios have also gone worse and worse. In this paper our goal is to find out which internal factors influence the solvency of a company, therefore, to point out the weaknesses of the current Romanian rating systems, which as we will see, do not take into only relevant criteria when according a loan to a company. In order to conduct this study, we choose 18 indicators from several categories to predict bankruptcy. Some of the indicators mentioned above are really common in the international and the Romanian literature (e.g. ROA, ROE, ROS, assets turnover ratio), some of them are less. On a sample of 3000 Romanian companies we use the T-test statistical method to find out if an indicator is significant or not. The sample consists of companies (defaulted and non-defaulted as well) which have presented their financial statements (balance, profit and loss account between 1999 and 2008). For each company a set of 18 financial indicators was calculated, but the results obtained show that only 8 of them is significant in predicting bankruptcy: ROA, assets turnover ratio, equity/total assets, general leverage, current assets to total assets, cash to total assets, total assets and sales. In the next step, by analyzing the obligatory forms used in credit lending, we conclude which indicators are used by different Romanian commercial banks. We found that only four out of seven banks calculate all of the significant indicators identified in the first part of the paper. Finally, we made a proposal about which quantitative indicators should the banks use to minimize the credit losses and to avoid the overdue payments. In addition, we consider that the banks should pay attention to the qualitative factors as well to effectively filter out non-performing loans.*

*Keywords: corporate failure, default, risk, financial ratios, rating systems, Romania*

*JEL-codes: G32, G33, D22*

## **I. Introduction**

The subject of our paper is a typical bank management issue whose importance is standing out now more than ever due to the financial crisis of the present days. As we know, because of the influence of the declining economy, many banks face the problem of late payments (1) and non performing credits. This trend is also true for the corporate credit portfolios of the Romanian commercial banks (2). In this paper we try to reveal those deficiencies of the rating systems used

in the Romanian bank sector which result in the erroneous consideration of the credit applies. We want to know what kind of economic and financial indexes are used by banks during the consideration of a credit apply, and which are significant in the prediction of the solvency of companies according to the relevant literature in the domain. Having studied the literature, we choose 18 relevant indexes that we calculate afterwards for more than 3000 companies from the county of Maros in the period of 1999-2008. Firstly, we determine the average of the indexes in the case of solvent and non-solvent companies, searching for significant differences. Secondly, we make a research to find out which are the indexes used by some Romanian banks (3). In the conclusion we offer a recommendation referring to the indexes which should be used to increase the commercial banks' rating system's efficiency.

## II. Literature review

Both the national and the international literature are dealing with the topic of the non-solvency prognosis. In our project we are searching for the explanatory indexes which are significant and relevant in analyzing the solvency of the Romanian companies. The relevant indexes, their definition and empirical support are presented in the table below. In the last column we mention the name of the author in whose work the respective indicator was used.

**Table 1: Name, definition and empirical support of indicators**

Indicator	Name	Definition	Empirical Support
ROE	Return on equity	Net Income/ Equity	Malcom, S. & Dah, K. (2007); Andreica, M. et all (2008); Mazilescu, V. et all (2010); Barbuța-Mișa, N. (2010)
ROA	Return on assets	Net income/Total assets	Malcom, S. & Dah, K. (2007); Bonfim, D. (2007); Andreica, M. et al. (2008); Trenca, I. & Benyovszki, A. (2009);
ROS	Return on sales	Net income (before interest and tax)/ Sales	Cielien, A. et al(2004); Malcom, S. & Dah, K. (2007); Trenca, I. & Benyovszki, A. (2009);
Costumer rotation speed	Costumer rotation speed	Net tincome/ Number of costumer	
Costumer rotation time	Consumer rotation time	365/ Costumer rotation speed	
Assets rotation speed	Assets rotation speed	Net income/ Total assets	Malcom, S. & Dah, K. (2007); Trenca, I. & Benyovszki, A. (2009)
Equity ratio	Equity ratio	Equity/Total assets	Clien, A. Et al (2004); Bonfim, D. (2007); Trenca, I. & Benyovszki, A. (2009); Mazilescu, V. et al. (2010)
Indeptedness	Debt ratios	Total debt/ Total assets	Laitinen, E & Laitinen, T. (2000); Kenneth, C. et al (2004); Trenca, I. & Benyovszki, A. (2009); Barbuta-Misa, N. (2010); Abbas, Q. & Abdul,R. (2011)
Solvency	Solvency	Liabilities/ Own equity	Trenca, I. & Benyovszki, A. (2009); Laitinen, E. & Laitinen, T. (2000)
Liabilities cover	Liabilities cover	Number of costumer/ Liabilities	
Fixed assets cover	Fixed assets cover	Own equity/ Fixed assets	
Capital ratio	Capital index	(Fixed asset+ Stocks)/ Own equity	
Current assets ratio	Current assets ratio	Current assets/ Total assets	Abbas, Q. & Abdul, R., (2011)

Indicator	Name	Definition	Empirical Support
Liquid assets	Liquid assets ratio	Liquid assets/ Current assets	Trenca, I. & Benyovszki, A. (2009)
Total Balance Sheet	Total Balance Sheet	Log (Balance Sheet)	
Net income	Net income	Log (Net income)	Kenneth, C. et al. (2004); Bonfim, D. (2007)
Fixed assets return	Fixed assets return	Net income/ Fixed assets	
Short term cover	Short term cover	(Liquid assets+ Accounts receivable)/ Fixed assets	

*Source: Own editing*

The outcomes of the researches are different, depending on the corporate structure of the countries and the industries examined. Malcom S. and Dah, K (2007) considered to be relevant the ROA, ROS and assets rotation speed, indicators also examined by us. In addition to those listed above, Trenca, I. and Benyovszki, A. (2009) consider that the proportion of the own capital, the indebtedness, the solvency and the proportion of the funds are also important factors. According to the research of Bonfim, D. (2007) the ROA, the own equity and net income are significant. The following authors consider significant variables in predicting the bankruptcy: Andreica, M. et al. (2008) ROA and ROE, Mazilescu, V. et al (2010) ROE and the own equity ratio, Barbuta-Misa, N. (2010) ROE and debt ratio, Clien, A. et al. (2004) ROS and own equity ratio, Laitinen, E & Laitinen, T. (2000) debt ratio and solvency, Kenneth, C. et al. (2004) debt ratio, Abbas, Q. & Abdul, R., (2011) current assets ratio.

### III. Methodology

We test 18 indexes (4) of around 3000 companies in county Mures, based on their financial statements in the period 1999-2008. In the examined period different number of solvent and non-solvent company data was processed. These numbers are specified in the next table by their dummy variable (5). The ratio presented shows the percentage of the defaulted companies in the current year.

**Table 2: Sample composition**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Defaulted companies	52	60	68	50	105	131	147	151	111	72
Non-defaulted companies	963	1093	1206	705	1738	2087	2389	2732	3236	3618
Total	1015	1153	1274	755	1843	2218	2536	2883	3347	3690
Ratio	5,12%	5,20%	5,34%	6,62%	5,70%	5,91%	5,80%	5,24%	3,32%	1,95%

*Source: Own editing*

We use the T-test method (6) to choose the significantly determining factors of the solvency of the companies. The applicability criteria of the test is the matching of the standard deviations, which we test using the F-test (7). We work with a 5% significance level. The Independent Samples T Test compares the mean scores of two groups on a given variable.

Furthermore, based on the forms used, and the requested documents in the event of a loan request we examine seven Romanian commercial banks (Banca Transilvania, Bancpost, BCR, BRD, CEC Bank, OTP Raiffeisen Bank, Volksbank) which are considering the above mentioned

indexes in their evaluation process. We try to guess which indicators of those found significant are used by them.

#### **IV. Results**

The T-test (6) data from Table 3. (see Appendix) are used as the main criteria in our way to choosing the significantly determining factors of the solvency of the companies. The applicability criteria of the test is the matching of the standard deviations, which we test using the F-test (7). Table 3 contains the results of the T-test (8).

The data from the table shows, that during the ten years, different variables proved to be significant (in total 8 indices): the **ROA** eight times, the **assets rotation speed** nine times, **own equity ratio** five times, **debt rate** six times, **current asset ratio** five times, **liquid assets** five times as well, **total balance sheet** eight times, and **net income** was significant only in one year. None of the other ten variables can be used in order to predict bankruptcy.

In addition, we analyzed the forms of the commercial banks, which are used in the landing process. The required documents at OTP bank include the yearly balance sheets for the last ten years and a monthly balance sheet from the last 3 months. The bank also requires information about the business activity. Thus, in the case of the OTP bank all of the data is available from the documents to calculate the eight indicators, that were found significant in our study. Just like for the OTP bank, we found that for the BCR, Banca Transilvania and BRD the relevant data are obtainable, and thus they shouldn't find it difficult to assess which companies will be able to pay back their loans and which not.

At the Raiffeisen Bank, CEC Bank and Volksbank among the two yearly balance sheets, the form only asks about the structure of the own equity. Using these documents only the ROA, the own equity ratio, debt rate, current assets ratio, liquid assets, total balance sheet can be calculated. However the rotation speed of assets and net income, which proved to be significant nine times, cannot be calculated.

#### **V. Conclusions**

This work focused on identifying the financial indicators which are significant in the prediction of the solvency of companies. The research was elaborated with the use of a sample containing about 3000 companies having their financial statements in the period of 1999-2008. For each company 18 financial indicators were calculated (ROE, ROA, ROS, Costumer rotation speed, Costumer rotation time, Assets rotation speed, Equity ratio, Indepctedness, Solvency, Liabilities cover, Fixed assets cover, Capital ratio, Current assets ratio, Liquid assets, Total Balance Sheet, Net income, Fixed assets return, Short term cover), but the results obtained show that only 8 variables influence significantly the probabilities of default of the companies. the ROA eight times, the assets rotation speed nine times, own equity ratio five times, debt rate six times, current asset ratio five times, liquid assets five times as well, total balance sheet eight times, and net income was significant only in one year. None of the other ten variables can be used in order to predict bankruptcy.

However, all of these variables are quantitative indicators, but we consider that the qualitative factors have a key role in predicting bankruptcy and the banks should develop a more quantifiable, integrated system for measuring them. We believe that the economic sector, the industry have a major importance as well in the prediction of the solvency of the firms, aswell as the management, partners, and other elements, as well. In the future we intend to analyse these variables, too.

## VI. Notes

1. According to the reports of the National Bank of Romania the number of loans rated as bad loans were triple in 2010 compared to 2008
2. According to the reports of the National Bank of Romania around 1% of the loans granted to SMEs in 2008 were delayed, while in 2010 this reached 10%. At large companies this rate raised from 0.3% to 3.2%
3. Banca Transilvania, Bancpost, BCR, BRD, CEC Bank, OTP, Raiffeisen Bank, Volksbank
4. Return on equity, Return on assets, Return on sales, Customer rotation speed, Customer rotation time, Equity ratio, Assets rotation speed, Indebtedness, Solvency, Liabilities cover, Fixed assets cover, Capital ratio, Current assets ratio, Liquid assets, Total Balance Sheet, Net income, Fixed assets return, Short term cover
5. Dummy variable: 0 value, if the company defaulted and 1 value, if the company didn't default
6. Independent sample T - test
7. The hypotheses: a H0: the standard deviations do not differ significantly in case of the two samples (defaulted and non-defaulted companies); H1: significantly differ
8. The hypotheses: a H0: the means do not differ significantly in case of the two samples (defaulted and non-defaulted companies); H1: significantly differ

## VII. References

- Abbas, Q., és Abdul, R., (2011), Modeling Bankruptcy Prediction for Non-Financial Firms: The Case of Pakistan, *MPRA Paper No. 28161*
- Andreica, M., E., Andreica, M., I., Andreica, M., (2009), Using financial ratios to identify Romanian distressed companies, *Economy Journal-Series Management*, Vol. 12, pp 46-55
- Aragon, A., (2007), Discriminant Analysis of Default Risk, Munich *Personal RePEc Archive Paper*, No.1002
- Bărbuță-Mișă, N., (2009), Modelling the financial performance of the building sector enterprises – The case of Romania, *Romanian Journal of Economic Forecasting* 4, pp 195-212
- Bărbuță-Mișă, N., (2010): Assessing of the SME's Financial Competitiveness, *Global Journal of Management and Business Research*, Vol.10, pp 140-147, February
- Bonfim, D., (2007), Credit risk drivers: Evaluating the contribution of firm level information and of macroeconomic dynamics, *Bancz de Portugal, Working Papers*, No. 7
- Bottazzi, G., Grazzi, M., Secchi, A., Tamagni, F., (2009), Financial and Economic Determinants of Firm Default, Laboratory of Economics and Management, *Working Paper Series*
- Cielien, A., Peeters, L. & Vanhoof, K. (2004) "Bankruptcy prediction using a data envelopment analysis" *European Journal of Operational Research*, Vol.154(2), pp. 526-532
- Kenneth, C., Jacobson, T., Lindé J., Roszbach, K., (2007), Corporate Credit Risk, Modelling and the Macroeconomy, *Journal of Banking and Finance*, Vol. 31, pp 845-868
- Laitinen, E. & Laitinen, T. (2000) "Bankruptcy Prediction: Application of the Taylor's expansion in logistic regression", *International Review of Financial Analysis*, vol.9 (4), pp. 327-349
- Madcom, S., Kwei, D., L., (2007), Industrial sector and financial distress, *Managerial Auditing Journal*, Vol. 22, No. 4, pp 376
- Trenca, I., Benyovszki, A. (2009), Riscul de credit. Aplicarea unui model macroeconomic în România, *Finanțe. Provocările viitorului*. An VII. Nr 7, Ed. Universitară Craiova, pp. 125-133

### VIII. Appendix

Table 3.: Significant variables on a 5% significance level, according to the T-test

	1999		2000		2001		2002		2003		2004		2005		2006		2007		2008	
	F*	T**	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T
ROA	0.03	0.02			0.20	0.05	0.08	0.01			0.47	0.01	0.73	0.00	0.04	0.00	0.00	0.00	0.00	0.00
	4.77	-2.46			1.62	-1.99	3.15	-2.45			0.52	-2.49	0.12	-3.05	4.13	-3.85	11.97	-6.26	2.24	-3.25
Assets rotation speed	0.00	0.00	0.00	0.02	0.06	0.02	0.05	0.04	0.05	0.01	0.03	0.00			0.06	0.00	0.00	0.00	0.39	0.05
	10.37	-5.28	18.26	2.45	3.51	-2.40	3.78	-2.11	3.87	-2.84	4.83	-3.94			3.57	-3.37	8.22	-7.96	0.76	-1.97
Own equity											0.80	0.02	0.81	0.00	0.94	0.00	0.62	0.00	0.31	0.00
											0.06	-2.36	0.06	-3.22	0.01	-3.95	0.25	-4.89	1.03	-2.85
Debt rate							0.07	0.05			0.53	0.01	0.45	0.00	0.30	0.00	0.61	0.00	0.36	0.01
							3.31	1.98			0.40	2.61	0.57	3.42	1.06	4.40	0.25	4.91	0.84	2.78
Current assets ratio			0.29	0.00							0.53	0.01	0.08	0.00	0.04	0.00	0.43	0.01		
			1.12	3.08							0.40	2.82	3.05	2968.00	4.38	4.25	0.64	2.46		
Liquid assets ratio	0.01	0.00									0.06	0.00	0.27	0.00	0.83	0.00	0.00	0.00		
	6.98	-3.20									3.67	-3.39	1.24	-3.41	0.05	-2.98	13.25	-4.74		
Total Balance Sheet	0.97	0.00	0.17	0.00	0.56	0.01			0.46	0.00	0.17	0.01	0.23	0.00	0.95	0.00	0.55	0.00		
	0.00	3.15	1.88	-3.29	0.34	2.48			0.55	2.64	1.88	2.65	1.43	3.51	0.01	3.40	0.36	4.47		
Total income			0.71	0.04																
			1.14	-2.05																

Source: Own editing

\* The significance level and the F-value of the F-test

\*\* The significance level and the T-value of the T-test