Structural and Profitability Indicators in
Assessing the Risk of Bankruptcy

Madalin-Mihai Motoc
„Alexandru Ioan Cuza" University of Iaşi, Romania
madalin.mm995@gmail.com

Abstract

Financial rates are indicators used to assess the performance and financial position of a company. Most of these economic and financial indicators are calculated based on the information provided by companies in the financial statements. The usefulness of these economic-financial indicators consists both in highlighting a trend, and especially in the possibility that the analyzed company can be compared with other companies active in the same sector.

At the same time, there are financial indicators that help predict a possible bankruptcy in the future.

In order to determine the risk of bankruptcy based on the assets owned by a company, I performed an empirical study in order to examine the impact of tangible and intangible assets in companies with deficiencies revealed by external auditors, together with profitability indicators which can help in predictions regarding company evolution.

Key words: management indicators, fraud risk, insolvency, audit report, bankruptcy
J.E.L. classification: G40

1. Introduction

The bankruptcy risk case study deals with the main groups of economic-financial indicators taking into account the audit opinions issued by the certified members of the A.S.P.A.A.S. on the chosen sample (Bucharest Stock Exchange main listed companies), in order to observe notable differences in the annual financial statements of the entities that may lead to the assumption of a faster declaration of insolvency in the case of companies with and without risk of associated fraud.

The analysis and assessment of bankruptcy risk took into account the international directives on accounting and financial audit, the legislative basis on which our study is based given the ISA 240 rules approved by the European Commission (ISQC1), the standards issued by the I.F.A.C. through the Council for International Standards on Auditing and Insurance (I.A.A.S.B.), Accounting Law 82/1991, O.M.F.P. 1802/2014, O.M.F.P. 2844/2016 and Law no. 162/2017 regarding the statutory audit.

The target population chosen for the study is selected from among the entities listed on the Bucharest Stock Exchange, as the main capital market approved and regulated by law, which is under the aegis of the National Security Commission.

2. Theoretical background

The study is carried out over a period of three consecutive financial years (2018, 2019 and 2020), base of the study representing Mironiuc & Robu empirical study, modified with new indicators representatives for this period (Mironiuc, Robu, 2012).

The motivation underlying the choice of three consecutive financial years is that of the representativeness of the model taking into account aspects such as insolvency law, the number of entities listed on the Bucharest Stock Exchange, the complexity of current business, the opening of European markets (by increasing the value of exports in the previous subchapter) and the chosen study model, which dealt with two consecutive financial years. Significant changes in the annual

financial statements could be the answer to unfortunate events within a company that could (erroneously) conclude that an entity went bankrupt from one financial year to another. Thus, we consider that the analysis of the annual financial statements over a period of three consecutive financial years is representative of the proposed model (Veli, 2019).

3. Research methodology

The basis of the study was the audit opinions issued on the financial statements of the companies for the year 2020. Taking into account the type of audit opinion issued, the division of the sample took into account the classification of the sample companies into companies with and without risk of associated fraud . The consideration from which we start in this study is based on a multiple regression analysis through which we establish the following research hypotheses:

H0: companies classified by bodies authorized to issue audit opinions as having an associated risk of fraud are not prone to the risk of bankruptcy;

H1: companies classified by bodies authorized to issue audit opinions as having an associated risk of fraud are at risk of bankruptcy in the following financial years;

In addition to classifying the sample into the two categories according to the associated risk (with and without the associated risk of fraud), this study took into account the assumption and classification of audit opinions according to the general audit opinion (unreserved opinion, opinion with reservations and contrary opinion).

The sample formed totaled 64 entities divided into two risk groups, according to the audit reports analyzed, namely entities that do not present a risk of economic fraud and entities with an associated risk of fraud.

4. Findings

4.1. Management indicators in assessing the risk of bankruptcy

In order to establish the risk of bankruptcy among the companies that form the analyzed sample, we also considered the evaluation of the structure indicators of the entities, in order to establish their ability to finance assets based on equity and available loans.

Thus, in this group of indicators, the application of some economic reasoning was considered, for which we conclude that it is important to analyze these indicators in establishing the risk of bankruptcy:

1. Rate of fixed assets - because this category of assets represents resources for the production of goods / services available to entities in the production circuit;

2. Current assets rate - this category is integrated in the category of salable goods that can be easily converted into financial resources;

3. Trade receivables rate - it is necessary to establish the material resources that the entity can obtain from debtors, and the importance of estimating future revenues based on existing receivables is an important aspect in budgetary and cash flow analyzes;

4. Inventory rate - being in the category of the most salable goods available to the entity, they can be easily exchanged for financial resources and thus the inability to pay can be avoided;

5. The rate of treasury assets - the existence of financial resources is what governs the principle of profit-oriented private companies and the existence of liquidity is the most important aspect in the estimates of insolvency and bankruptcy;

6. Inventory financing rate - the ability of companies to finance their current activity is dictated by the calculation and interpretation of this indicator;

7. Capital ratio to fixed assets - is a calculation tool for estimating the ability of creditors to recover debts; it is mainly used in opening new lines of credit;

8. Share of current assets - determining the percentage of inventories in total current assets is one of the first steps in estimating future production, purchasing power and technical calculations in the production and supply of goods and services.

Each of the indicators chosen in this type of analysis plays a key role in respecting the principle of business continuity, the results obtained can be extrapolated later in establishing a risk of future bankruptcy.

From the point of view of the structural indicators, the analyzed sample knows the following values, according to Table number 1:

Table no. 1: Analysis of the structural and management indicators

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Act_imob_18	64	,07	,59	,66	,6269	,00189	,01511	,000	,783	,299	1,060	,590
Act_imob_19	64	,07	,59	,66	,6266	,00260	,02080	,000	,127	,299	-,380	,590
Act_imob_20	64	,07	,59	,66	,6231	,00270	,02159	,000	,167	,299	-,451	,590
Act_circ_18	64	,07	,34	,41	,3731	,00189	,01511	,000	-,783	,299	1,060	,590
Act_circ_19	64	,07	,34	,41	,3734	,00260	,02080	,000	-,127	,299	-,380	,590
Act_circ_20	64	,07	,34	,41	,3769	,00270	,02159	,000	-,167	,299	-,451	,590
Creante_com_18	64	10,34	,00	10,34	,2064	,16103	1,28824	1,660	7,973	,299	63,703	,590
Creante_com_19	64	11,36	,00	11,36	,2258	,17687	1,41497	2,002	7,981	,299	63,791	,590
Creante_com_20	64	9,05	,00	9,05	,1873	,14093	1,12747	1,271	7,956	,299	63,512	,590
Rata_stoc_18	64	21,87	,01	21,88	,4728	,34097	2,72777	7,441	7,919	,299	63,080	,590
Rata_stoc_19	64	15,86	,00	15,86	,3781	,24753	1,98022	3,921	7,835	,299	62,093	,590
Rata_stoc_20	64	13,69	,01	13,70	,3553	,21380	1,71038	2,925	7,790	,299	61,561	,590
Act_trez_18	64	2,09	,00	2,09	,0419	,03256	,26044	,068	7,966	,299	63,624	,590
Act_trez_19	64	1,55	,00	1,55	,0353	,02414	,19311	,037	7,904	,299	62,936	,590
Act_trez_20	64	1,80	,00	1,80	,0372	,02803	,22422	,050	7,960	,299	63,557	,590
Fin_stoc_18	64	438,81	-176,21	262,60	2,5330	5,87363	46,98907	2207,972	1,755	,299	17,998	,590
Fin_stoc_19	64	309,93	-166,57	143,36	,8963	5,46877	43,75014	1914,074	-,504	,299	7,156	,590
Fin_stoc_20	64	252,71	-161,19	91,52	,5884	4,06053	32,48425	1055,226	-1,477	,299	11,439	,590
Cap_prop_act_imob_18	64	143,67	-8,66	135,01	3,3559	2,11805	16,94437	287,112	7,674	,299	60,492	,590
Cap_prop_act_imob_19	64	136,54	-11,40	125,14	3,3031	1,98293	15,86341	251,648	7,411	,299	57,636	,590
Cap_prop_act_imob_20	64	100,25	-11,52	88,73	2,6834	1,43612	11,48898	131,997	6,889	,299	51,938	,590
Pond_stoc_act_circ_18	64	58,11	,02	58,13	1,2641	,90604	7,24835	52,539	7,912	,299	62,996	,590
Pond_stoc_act_circ_19	64	47,04	,01	47,05	1,0869	,73383	5,87063	34,464	7,866	,299	62,460	,590
Pond_stoc_act_circ_20	64	40,59	,03	40,62	1,0114	,63339	5,06715	25,676	7,830	,299	62,041	,590
Valid N (listwise)	64											

Source: own processing using SPSS 20.0

The fixed assets rate remains constant from one analysis period to another. With an average of 62% and a standard error in the range {0.00189; 0.00270}, we can conclude that the share of fixed assets falls within the limit established by economic theory and the operational and production process can take place under normal conditions. Also, the weight of this indicator represents a guarantee of recoverability of creditors' claims. The values of the flattening and vaulting indices refer to a platocurtic distribution, without significant deviations from the average.

Current assets are the second category of assets that make up the first part of the balance sheet. The aggregation of the two indicators creates further confirmation of the correctness of the data extracted from the annual financial statements. Similar to the fixed rate, the current assets rate provides a confirmation of business continuity to creditors, and the average of 37% shows a balanced asset management policy.

The rate of trade receivables varies in the analyzed period, observing an increase in the period 2018 - 2019 by 1.02% (11.36 - 10.34), followed by a decrease in the period 2019 - 2020 by 2.31% (11, 36 - 9.05). The decrease in 2020 is explained by the decrease in the trading capacity of the goods and services of the companies that make up the sample, attributed to the Covid-19 pandemic. The only "winners" of this period are companies that have been able to adapt to e-commerce platforms. The values of the flattening and vaulting indices show average values of the indicator that deviate significantly from the average, especially among companies classified as at risk of fraud, a topic detailed below.

The share of stocks in total assets decreases constantly during the analyzed period. The decrease takes into account the impact of two factors. In the period 2018 - 2019, the entities that make up the sample registered constant increases in sales, according to the registered turnover. This has led to higher stock turnover and reduced stock holdings over longer periods of time. Given that stocks are purchased for processing and resale, the policy of the entities was to introduce them into the production process as soon as possible. In the period 2019 - 2020, the Covid-19 pandemic stopped a

large part of sales, and the adaptation in this sense of the companies aimed at limiting the holding of stocks in the conditions in which they could not be transformed with the same ease in financial resources. The same observation is applicable to the indicator of the share of inventories in current assets.

To support the above assumption, the rate of treasury assets fluctuates in an increase in their growth in 2020. The forecast in the sales markets has forced companies to maintain a higher level of liquidity to cover unpredictable expenses and to and could retain employees and business partners. This result of the analysis is supported by the 0.19% increase in treasury assets (0.0372 - 0.0353).

Calculated according to the formula permanent capital - fixed assets / stocks, the financing rate of stocks shows the ability of companies to cope with the needs of maintaining and / or increasing production. During the period under review, this indicator is affected by a steady increase due to the influence of long-term debt and risk provisions, according to the database underlying this study. The current period faces the most diverse phenomena for which financial estimates are no longer relevant (natural phenomena - drought, floods, explosions, fires, health crises, economic crises, demographic crises - Romanian population migration, illegal emigration, etc.). Thus, increasing the value of provisions and long-term debt can be a challenge in financing the day-to-day running of businesses and resuming productive activity.

The equity ratio of fixed assets is an indicator that guarantees the recovery of receivables by creditors, this being the main category of users of financial information provided by companies (Asthana, 2010). The indicator decreases constantly in the analyzed period mainly due to equity. Detailed in the groups of indicators analyzed above, equity decreases due to the need to cover current debts by companies listed on the Bucharest Stock Exchange by issuing new shares and securities on the capital market, not fully covered. Also, the carried forward result representing the uncovered loss plays a key role in the decrease of equity, a decrease influenced by both companies at risk of fraud and those without risk of fraud. The leptocurtic distribution shows values of the indicator that deviate from the general average (the positive value representing positive deviations from the average that significantly influence the general average by increasing the average). However, the value taken by the indicator is above the limit dictated by economic theory and does not influence the future decisions of investors.

The division of the sample into the two already known groups creates a more detailed picture of the premise from which we start in our research, namely the fact that entities classified as at risk of fraud are heading for bankruptcy. The situation of the structure indicators on the two risk groups is detailed in Tables number 2 and 3:

Table no. 2: Analysis of structure indicators - no fraud risk associated

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Act_imob_18	36	,07	,59	,66	,6281	,00267	,01600	,000	,779	,393	,617	,768
Act_imob_19	36	,07	,59	,66	,6269	,00316	,01895	,000	,308	,393	,133	,768
Act_imob_20	36	,07	,59	,66	,6222	,00372	,02231	,000	,097	,393	-,619	,768
Act_circ_18	36	,07	,34	,41	,3719	,00267	,01600	,000	-,779	,393	,617	,768
Act_circ_19	36	,07	,34	,41	,3731	,00316	,01895	,000	-,308	,393	,133	,768
Act_circ_20	36	,07	,34	,41	,3778	,00372	,02231	,000	-,097	,393	-,619	,768
Creante_com_18	36	10,33	,01	10,34	,3389	,28602	1,71613	2,945	5,982	,393	35,849	,768
Creante_com_19	36	11,35	,01	11,36	,3692	,31422	1,88532	3,554	5,988	,393	35,902	,768
Creante_com_20	36	9,04	,01	9,05	,3019	,25036	1,50214	2,256	5,970	,393	35,742	,768
Rata_stoc_18	36	21,86	,02	21,88	,7747	,60499	3,62991	13,176	5,941	,393	35,490	,768
Rata_stoc_19	36	15,84	,02	15,86	,6078	,43881	2,63287	6,932	5,878	,393	34,928	,768
Rata_stoc_20	36	13,69	,01	13,70	,5472	,37903	2,27418	5,172	5,851	,393	34,680	,768
Act_trez_18	36	2,09	,00	2,09	,0686	,05783	,34696	,120	5,977	,393	35,805	,768
Act_trez_19	36	1,55	,00	1,55	,0567	,04282	,25693	,066	5,933	,393	35,437	,768
Act_trez_20	36	1,80	,00	1,80	,0603	,04978	,29867	,089	5,973	,393	35,774	,768
Fin_stoc_18	36	230,93	-176,21	54,72	-6,4217	6,43879	38,63276	1492,490	-3,135	,393	12,194	,768
Fin_stoc_19	36	231,11	-166,57	64,54	-5,9136	6,57114	39,42683	1554,475	-2,830	,393	10,310	,768
Fin_stoc_20	36	251,32	-161,19	90,13	-3,9844	6,22407	37,34441	1394,605	-2,088	,393	9,952	,768
Cap_prop_act_imob_18	36	143,67	-8,66	135,01	4,7014	3,75676	22,54057	508,077	5,828	,393	34,619	,768
Cap_prop_act_imob_19	36	136,54	-11,40	125,14	4,4158	3,50226	21,01354	441,569	5,711	,393	33,694	,768
Cap_prop_act_imob_20	36	100,25	-11,52	88,73	3,3036	2,50519	15,03115	225,936	5,504	,393	32,160	,768
Pond_stoc_act_circ_18	36	58,08	,05	58,13	2,0700	1,60747	9,64485	93,023	5,935	,393	35,441	,768
Pond_stoc_act_circ_19	36	47,00	,05	47,05	1,7561	1,30134	7,80803	60,965	5,901	,393	35,137	,768
Pond_stoc_act_circ_20	36	40,59	,03	40,62	1,5711	1,12336	6,74019	45,430	5,879	,393	34,939	,768
Valid N (listwise)	36											

Source: own processing using SPSS 20.0

Table no. 3: Analysis of structure indicators - with fraud risk associated

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Act_imob_18	28	,07	,59	,66	,6254	,00265	,01401	,000	,749	,441	2,274	,858
Act_imob_19	28	,07	,59	,66	,6261	,00440	,02331	,001	,024	,441	-,765	,858
Act_imob_20	28	,07	,59	,66	,6243	,00397	,02098	,000	,315	,441	-,072	,858
Act_circ_18	28	,07	,34	,41	,3746	,00265	,01401	,000	-,749	,441	2,274	,858
Act_circ_19	28	,07	,34	,41	,3739	,00440	,02331	,001	-,024	,441	-,765	,858
Act_circ_20	28	,07	,34	,41	,3757	,00397	,02098	,000	-,315	,441	-,072	,858
Creante_com_18	28	,17	,00	,17	,0361	,00622	,03292	,001	2,735	,441	9,850	,858
Creante_com_19	28	,18	,00	,18	,0414	,00712	,03768	,001	2,371	,441	6,749	,858
Creante_com_20	28	,17	,00	,17	,0400	,00626	,03311	,001	2,525	,441	8,405	,858
Rata_stoc_18	28	,25	,01	,26	,0846	,01132	,05991	,004	1,189	,441	1,878	,858
Rata_stoc_19	28	,21	,00	,21	,0829	,01026	,05429	,003	,614	,441	,501	,858
Rata_stoc_20	28	,52	,01	,53	,1086	,01832	,09694	,009	3,217	,441	13,470	,858
Act_trez_18	28	,02	,00	,02	,0075	,00132	,00701	,000	,392	,441	-,810	,858
Act_trez_19	28	,03	,00	,03	,0079	,00140	,00738	,000	,965	,441	1,657	,858
Act_trez_20	28	,02	,00	,02	,0075	,00132	,00701	,000	,392	,441	-,810	,858
Fin_stoc_18	28	293,72	-31,12	262,60	14,0461	10,30404	54,52386	2972,851	3,864	,441	16,854	,858
Fin_stoc_19	28	263,70	-120,34	143,36	9,6518	9,08252	48,06020	2309,783	,943	,441	4,461	,858
Fin_stoc_20	28	116,96	-25,44	91,52	6,4679	4,59287	24,30317	590,644	2,475	,441	6,669	,858
Cap_prop_act_imob_18	28	13,13	-,63	12,50	1,6261	,45480	2,40660	5,792	3,686	,441	16,103	,858
Cap_prop_act_imob_19	28	18,86	-1,21	17,65	1,8725	,62681	3,31676	11,001	4,250	,441	20,392	,858
Cap_prop_act_imob_20	28	20,99	-,92	20,07	1,8861	,70560	3,73370	13,941	4,578	,441	22,700	,858
Pond_stoc_act_circ_18	28	,67	,02	,69	,2279	,02982	,15777	,025	1,176	,441	1,879	,858
Pond_stoc_act_circ_19	28	,61	,01	,62	,2264	,02842	,15036	,023	,721	,441	,754	,858
Pond_stoc_act_circ_20	28	1,37	,03	1,40	,2918	,04820	,25505	,065	3,217	,441	13,435	,858
Valid N (listwise)	28											

Source: own processing using SPSS 20.0

The assumption of the risk of bankruptcy among entities classified as at risk of fraud is also respected in this situation.

The rate of fixed assets is similar in both categories of the sample, keeping a constant of 62% of total assets throughout the analyzed period. Applying the principle if it's successfull, don't change the formula, two thirds of the total assets represented by fixed assets represent the threshold established by the economic theory regarding the efficient management of a company. The structuring in the same way of the assets of both risky and risk-free entities creates the premises for a quick and complete recovery of receivables by investors, in case of liquidation of the business.

The first distinct aspect of current and future cash flows can be seen in the calculation of the trade receivables rate. The difference of 0.3061 (0.3838 - 0.0361) in 2018, 0.3278 (0.3692 - 0.0414) in 2019 and 0.2619 (0.3019 - 0.04) in 2020 is a certainty that companies classified as at risk of fraud have achieved inefficient management of trade receivables, presenting a low degree of recovery and a higher risk of declaring insolvency due to lack of customers. However, the difference will be reduced in 2020, atypical from all points of view, this variation being expected. Flattening and vaulting indices are higher in the case of companies without risk of fraud, which refers to an even higher indicator value in some companies that are an integral part of the sample. In the absence of liquidity provided by customers through the sale of goods and services on the market, companies at risk of fraud are targeted by insolvency and thus bankruptcy.

Stocks are one of the most important resources of companies. A satisfactory share of them does not jeopardize the production process, and their rapid conversion into money can save an entity in difficulty. The inventory rate for the two types of companies shows a substantial difference between companies with and without the risk of associated fraud. In the case of companies without the risk of associated fraud, the inventory rate occupies a significant share of total assets, which translates into a possibility to transform them into financial resources in a short time, which can prevent the declaration of insolvency of entities. The importance of stocks is given by the production activity of the sampled companies that rely on them for a good development of the activity and a constant cash flow path. Entities classified as at risk of fraud have a share of stocks that prevents the optimal development of the production process. To avoid confusion regarding belonging to a field of activity, out of the 28 companies classified as at risk of fraud, 21 belong to the field of industry.

A similar situation is encountered in the case of treasury assets. The difference of 0.0611 in 2018 (0.0686 - 0.0075), 0.0488 in 2019 (0.0567 - 0.0079) and 0.0528 (0.0603 - 0.0075) in 2020 confirms the fact that entities with an associated risk of fraud have lower liquidity and an inability to pay debts that have become due. The first stage of bankruptcy is that of declaring insolvency and entities classified as at risk of fraud are much closer to declaring this state.

Calculated as the difference between permanent capital and fixed assets in relation to the value of stocks, the rate of financing of stocks presents an atypical situation in this type of analysis. In the case of entities without risk of fraud, the values taken by this indicator during the analyzed period are negative, in contrast to the entities at risk where the indicator takes positive and very high values. This difference is due to a lower amount of permanent capital relative to fixed assets. Entities without the risk of associated fraud have fixed assets that allow them (in the event of liquidation) to cover outstanding debts to creditors, which makes them a much more attractive business partner than in the case of companies with an associated risk of fraud. A similar situation is applicable to the equity ratio of fixed assets.

3.2. Profitability indicators in assessing the risk of bankruptcy

Profitability rates are expressed as the ratio between the indicators of results (profit or loss) and those that show an activity flow (receivables, turnover, resources involved in the production process, etc.). These types of rates aim to express the degree to which the resources invested in the production process bring future economic benefits, thus reflecting the results of the activity in all stages of the activity circuit (Vladu, 2011).

Regarding the determination of an imminent bankruptcy risk, in our analysis the following indicators are used, each one being applied a distinct reasoning:

1. Rate of return (ROE) - due to the importance of investors knowing the profit resulting from the invested capital, they being the main users of this type of information;

2. Net sales margin - the importance of establishing the volatility of companies is the importance in the investment policy of shareholders / associates;

3. Asset rate of return (ROA) - the safety interval of the capital invested in the entity is one of the most important indicators in assessing the overall profitability of companies, investors being interested in this case by the profit obtained by the entity for each leu invested;

4. Receivables turnover rate (number of revolutions) - in assessing the continuity of a company's activity it is necessary to know the effectiveness of collecting its receivables, thus avoiding excessive provisions for receivables that can lead to decreased liquidity and difficulties in the production circuit.

Regarding the sample chosen for the study, the profitability indicators are presented according to Table number 4:

Table no. 4: Variation of profitability indicators - period 2018 - 2020

Descriptive Statistics

	N	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Rent_fin_18	64	-,0011	,05722	,45773	,210	-6,896	,299	52,559	,590
Rent_fin_19	64	-,0186	,03728	,29826	,089	-4,815	,299	30,288	,590
Rent_fin_20	64	-,0022	,03108	,24863	,062	-3,550	,299	20,458	,590
Marj_vanz_18	64	-,0162	,03692	,29532	,087	-2,499	,299	9,215	,590
Marj_vanz_19	64	-,0722	,04369	,34954	,122	-2,360	,299	7,128	,590
Marj_vanz_20	64	-,1275	,05121	,40965	,168	-2,531	,299	6,779	,590
Rent_act_18	64	,0102	,02256	,18052	,033	-1,149	,299	12,918	,590
Rent_act_19	64	,0136	,01931	,15444	,024	3,844	,299	25,552	,590
Rent_act_20	64	-,0273	,01765	,14122	,020	-3,391	,299	15,587	,590
Rot_crean_18	64	30,2727	5,21759	41,74068	1742,285	3,769	,299	17,896	,590
Rot_crean_19	64	27,6377	4,59348	36,74786	1350,405	3,369	,299	13,504	,590
Rot_crean_20	64	24,9517	4,22893	33,83146	1144,568	3,622	,299	15,664	,590
Valid N (listwise)	64								

Source: own processing using SPSS 20.0

The financial profitability at the level of the chosen sample takes negative values throughout the analyzed period. The negative values recorded by this indicator appear as a result of the influence on the one hand of the companies that record losses, and on the other hand, of those whose value of equity is negative and also of the companies that combine both influences.

A negative value of this indicator as a whole shows that at the sample level, companies are not profitable from the point of view of shareholders and the ability to recover their investments is very low.

The net sales margin also takes negative and continuously decreasing values during the analysis period, due to the unfavorable influence of the companies that record losses during the analysis period. A negative value of the indicator refers to an unstable situation in the sample in terms of the flow of goods sold, a low average labor productivity and a lack of profitability of the activity in general.

Shareholders are mainly interested in making a profit from investments made in an economic entity. In the absence of a profitability at the end of a management period, their main concern becomes the recovery of the amounts invested as a contribution to the capital of those entities. From this point of view, the return on assets has a variation in the analyzed period, characterized by an increase in 2018-2019 and a decline below the negative threshold in 2020. The change is explained by the influence of two factors. First of all, the increase from 2018 to 2019 is explained by a general increase in the value of assets held by the sampled companies as a result of the desire and need to increase the capacity produced and sold, the effect of increasing demand in the markets. The decrease from 2019 to 2020 is explained by the influence of the same pandemic that acted as a domino effect in the market, the limitation of circulation has the effect of decreasing sales, this translates into the impossibility of normal production circuits, which leads to layoffs, decreased liquidity from the market and the sharper decline in demand. The decrease occurs as a result of the numerous reports of economic loss made by the constituent entities of the sample.

The importance of debt recovery is crucial in self-financing the production activity and thus in maintaining a financial balance. At the sample level, the value of this indicator decreases continuously, a favorable aspect mainly influenced by the decrease in maturities for goods and services sold on commercial credit due to an increasingly acute need to finance the activity. The pandemic, on the other hand, dramatically reduced trade credits, with most of the entities in the sample having to request payment at the time of delivery of the goods and services.

The breakdown of the sample into the two categories, similar to the groups of indicators analyzed above, helps us to understand more accurately the difference between entities that are at risk of fraud and those that are not. Thus, the information regarding the rates of return on the two analysis groups is presented in Tables number 5 and 6.

Table no. 5: Analysis of profitability indicators - entities without risk of fraud

Descriptive Statistics

	N	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Rent_fin_18	36	,0397	,02299	,13791	,019	,026	,393	4,305	,768
Rent_fin_19	36	,0014	,03180	,19079	,036	-1,845	,393	5,648	,768
Rent_fin_20	36	,0306	,02738	,16430	,027	-,846	,393	4,586	,768
Marj_vanz_18	36	-,0914	,05969	,35816	,128	-2,071	,393	5,302	,768
Marj_vanz_19	36	-,1231	,07253	,43521	,189	-1,876	,393	3,869	,768
Marj_vanz_20	36	-,2161	,08459	,50756	,258	-1,933	,393	3,125	,768
Rent_act_18	36	-,0164	,03885	,23311	,054	-,654	,393	7,499	,768
Rent_act_19	36	,0125	,03291	,19745	,039	3,430	,393	17,647	,768
Rent_act_20	36	-,0550	,02893	,17356	,030	-2,904	,393	10,341	,768
Rot_crean_18	36	26,4436	5,27163	31,62980	1000,444	2,446	,393	6,639	,768
Rot_crean_19	36	25,3000	5,36293	32,17757	1035,396	2,875	,393	9,684	,768
Rot_crean_20	36	23,9242	5,02604	30,15627	909,400	2,671	,393	8,016	,768
Valid N (listwise)	36								

Source: own processing using SPSS 20.0

Table no. 6: Analysis of profitability indicators - entities with risk of fraud associated

Descriptive Statistics

	N	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Rent_fin_18	28	-,0536	,12805	,67759	,459	-4,935	,441	25,538	,858
Rent_fin_19	28	-,0443	,07540	,39897	,159	-4,471	,441	22,365	,858
Rent_fin_20	28	-,0443	,06152	,32555	,106	-3,395	,441	15,102	,858
Marj_vanz_18	28	,0804	,02673	,14143	,020	,882	,441	4,650	,858
Marj_vanz_19	28	-,0068	,03363	,17797	,032	-1,412	,441	2,032	,858
Marj_vanz_20	28	-,0136	,03469	,18355	,034	-1,258	,441	1,324	,858
Rent_act_18	28	,0443	,01110	,05872	,003	,505	,441	,692	,858
Rent_act_19	28	,0150	,01352	,07152	,005	-,488	,441	-,600	,858
Rent_act_20	28	,0082	,01357	,07180	,005	-,963	,441	,732	,858
Rot_crean_18	28	35,1957	9,86295	52,18980	2723,776	3,784	,441	16,131	,858
Rot_crean_19	28	30,6432	8,00025	42,33333	1792,111	3,603	,441	14,975	,858
Rot_crean_20	28	26,2729	7,29136	38,58223	1488,588	4,220	,441	19,884	,858
Valid N (listwise)	28								

Source: own processing using SPSS 20.0

The financial profitability calculated for the two categories of the sample is higher among companies without risk of associated fraud. The gap between the two groups in the sample appears as a result of a much higher profit in the case of companies without risk of fraud, corroborated with a value of assets that are perfectly balanced in the production process. As a result, in the case of the first category in the sample, the assets are not purchased in excess, are not recorded as conserved goods, participate in their entirety in the production process, and their annual depreciated value is less than the rate of return obtained by capitalization. goods and services sold in this category. In the mirror, the explanation is similar for entities with an associated risk of fraud.

As a result of the negative accounting result obtained by a quarter of the sample formed, the net sales margin is negative for the first category. Although they are not assigned a risk of fraud, the negative result recorded by some of them negatively influences the value of the indicator, which leads to the assumption of low profitability and lower profitability of entities in this category, which should not be but generalized, due to a low number of loss-making companies out of the total of this category (13 companies out of a total of 36). In the case of companies with associated fraud risk, this indicator has at least a higher value of the indicator for 2018, this being influenced by the non-recognition of all expenses and revenues (especially provisions, adjustments for depreciation, financial expenses, etc.). , in the following periods this indicator also taking negative values, as a result of a low profitability of the business in general and the consecutive losses reported in the financial period.

The rate of return on assets seems at first sight to be in favor of companies at risk of associated fraud. The higher values taken by this indicator in the case of the second category in the sample occur as a result of a lower value balance sheet asset than in the case of companies in the first category, corroborated with an operating result that is not presented accurately. The negative influence of companies with losses in the first category of the sample leads to a negative value of the indicator at the end of 2018 and 2020, but lower values of the indicator do not always reflect reality, due to lack of good practice among companies at risk of associated fraud.

Debt recovery policy, on the other hand, is better among companies without associated risk. In our analysis it is found that in 2018, the difference in the number of days between companies with and without risk of fraud is approximately 9 days (35.19 - 26.44 = 8.75), in 2019 it is 5 days (30.64 - 25.30 = 5.34), and in 2020 for two days (26.27 - 23.92 = 2.35). Although the difference in days becomes smaller in the period under review (tending to align in subsequent periods), a better debt recovery policy for the first category makes non-fraudulent entities have a better ability to finance debt. current activity from own resources, thus avoiding the temporary inability to pay. This aspect is also supported by the previous analysis of liquidity indicators.

4. Conclusions

The analysis undertaken on the main economic-financial indicators was based on a pre-established model developed in 1999 by Beneish, updated in 2007 by Penman and in 2011 by Romanian researchers Mironiuc and Robu.

The model we updated considers the addition of new variables in the analysis, given the complexity of current business, increasing consumption, telework, development of e-commerce platforms, market opening and interculturalization through globalization.

The model proposed by Beneish in 1999 was for two consecutive financial years, and we currently consider that two financial years are not sufficient to determine a risk of bankruptcy due to changes in insolvency legislation and the general legislative trend at the level of The European Union to give a second chance to the insolvent debtor, so our study is carried out over a period of three consecutive financial years (2018-2020).

The results of the study showed that entities with an associated risk of fraud have lower results on all groups of indicators analyzed, as follows:

- Structural indicators: Although the share of assets is similar for both categories and the proportions seem similar, the debt recovery policy is not easy for companies at risk of associated fraud, the financing rate of stocks is low, cash is more limited and the equity ratio of fixed assets does not encourage investors because the recoverability of their claims in the event of the declaration of insolvency of these companies is very low. Also, the share of stocks is lower in the case of these companies and presents non-performing or conserved fixed assets, aspects that refer to an inefficient management of these companies as a whole;

- Profitability indicators: the rate of economic return, the rate of financial profitability and the net sales margin were lower throughout the analysis period of the two groups in the sample. The lower values in the case of entities with associated fraud risk confirm once again the lack of attractiveness on the market, an aspect also proven by the analysis of the stock market capitalization in the period 2018 – 2020.

5. References

- Veli, V., Repousis, S., 2019. An investigation of the fraud risk and fraud scheme, *Journal of Money Laundering Control*, Vol. 22, pp. 53-61
- Vladu A. B., Groșanu A., 2011. Some insights regarding creative accounting in Romanian accounting environment – regulators, financial auditors, and professional bodies opinion*, Analele Universității din Oradea – Științe Economice*, 1(1), pag. 661-668
- Mironiuc, M., Robu, I-B., 2012. Misiunea de auditare a fraudei: identificarea unui profil al riscului de fraudă prin tehnica „Red flags"*, Financial audit magazine*, Vol 9, pp. 22-29