

# The Liquidity and Indebtness Indicators in Evaluating Bankruptcy Risk Assessment and Insolvency Risk

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## Abstract

*In a world dominated by continuous growth, the cash and cash equivalents represents one of the most important criteria in establishing the business success. In order to understand the importance of the cash and cash equivalents in the accounting principles (especially in the continuity activity principle), I performed a statistical evaluation of the companies listed on Bucharest Stock Exchange in order to determine the effect of the liquidity and indebtedness indicators in the day-by-day activity of the most important romanian entities.*

*This set of indicators shows the ability of companies to meet their short-term debts, and their importance is given by the possibility of covering a continuous flow of goods and services necessary for the pecuniary activity. A low level of liquidity is the first signal of a downturn in the near future and the generation of financial problems that can later lead to the declaration of insolvency.*

**Key words:** insolvency procedure, fraud risk, indebtedness, accounting principles, bankruptcy

**J.E.L. classification:** G40

## 1. Introduction

One of the objectives of the annual financial statements is the accurate presentation of information on the financial position, performance of a business and possible changes in financial position from time to time, useful information for the decision-making process of for-profit companies.

The financial position reflects a company's ability to adapt to changes in the financial paradigm, the correlation between the value of the asset and the structure of equity and debt.

Phenomena and economic processes that may affect profit-oriented businesses are reflected either in the result for the year (affecting income and expenses) or in the balance sheet (by affecting the balance sheet structure (fixed assets, current assets, debt, equity, etc.).

The balance sheet includes information on the ability of companies to generate future cash flows (or cash equivalents), information on future financing needs and the ability to honor those present, on relations with trading partners and shareholders. This information is reflected by means of economic-financial indicators of liquidity, solvency and financing.

In this study I aim to determine if the liquidity and indebtedness indicators may offer a clearer view of a company risk of insolvency and bankruptcy based on audit opinions.

## 2. Theoretical background

The concepts of liquidity and solvency appear with different meanings and definitions in financial theory and practice, which is an impediment in conducting a relevant analysis of the current financial position and performance of the analyzed companies (Trif, 2015).

Yves Bernard and Jean Claude Colli consider solvency as "the ability of a business to meet its commitments with all the resources that make up its assets or assets, and liquidity as" the ability to meet a financial commitment quickly "or" immediately available amount ". which can honor a current or future financial commitment" (Colli, 1995).

This set of indicators is most often used in modern portfolio theory, a concept introduced in 1952 by Nobel Prize winner in Economics Harry Markowitz. This theory is a mathematical model by which a portfolio of investments or financial assets is designed, chosen and traded in a way that maximizes relative gain (average return) and reduces financial risk. This model was later taken on most of the world's stock exchanges, and is now known as investment funds or mutual funds.

In the analysis of the risk of bankruptcy with the help of financial indicators, it is important to visualize the chosen sample as a whole, and then to better understand the risk of fraud and bankruptcy with the help of the division of financial indicators into groups (Tillman, 1995).

### 3. Research methodology

In the study below, the companies used on the Bucharest Stock Exchange were used, the sample being divided into audit opinions with and without the risk of associated fraud. At the beginning of my analysis, I propose to find out if the companies qualified by the auditors as having an associated risk of fraud have lower values (below the minimum established by the specialized literature) of the liquidity and financing indicators.

For a good understanding from the beginning of the sample we want to analyze, it is necessary to create an overview of the companies listed on the Bucharest Stock Exchange, then following the separate analysis of the same sample, divided by audit and risk opinions. of fraud detected, according to the audited audit reports.

### 4. Findings

#### 4.1. Liquidity indicators in assessing the risk of bankruptcy

According to the data published by the companies that are listed on the Bucharest Stock Exchange, at the end of 2020 the liquidity indicators presented the following average values, according to Table no. 1:

Table no. 1: Liquidity indicators  
One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	90% Confidence Interval of the Difference	
					Lower	Upper
Rata_lich_gen_2018	3,468	63	,001	3,83047	1,9867	5,6742
Rata_lich_gen_2019	1,699	63	,094	6,96656	,1223	13,8108
Rata_lich_gen_2020	4,211	63	,000	1,48250	,8948	2,0702
Rata_lich_red_2018	2,479	63	,016	2,46687	,8054	4,1284
Rata_lich_red_2019	,753	63	,454	3,47609	-4,2297	11,1819
Rata_lich_red_2020	3,854	63	,000	,78391	,4443	1,1235
Rata_lich_imd_2018	2,819	63	,006	,12187	,0497	,1940
Rata_lich_imd_2019	1,671	63	,100	,45891	,0005	,9173
Rata_lich_imd_2020	4,411	63	,000	,03500	,0218	,0482

Source: Own processing in SPSS 20.0

Analyzed at the level of the entire population, it can be seen that the average of the analyzed indicators takes favorable values at the level of the sample in the last three financial years analyzed, a discordant note making the year 2020 in view of the Covid-19 pandemic.

According to the student T test in Table number 2, the general liquidity rate oscillates in the analyzed period (2018 - 2020) in all the companies listed on the Bucharest Stock Exchange. Starting from two general hypotheses (hypothesis H0: population average is not different and hypothesis H1: population average is different), with the help of the Student test we can determine if there are significant deviations from the average in terms of liquidity indicators. In the event that the H0 hypothesis is rejected, the Student test in this case cannot help us formulate a model for detecting the risk of bankruptcy.

In 2018, the liquidity rates take T values of 3,468 in the case of the general liquidity rate, T = 2,479 in the case of the reduced liquidity rate and a T value of 2,819 for the immediate liquidity rate. Correlated with a value of the sig indicator below the limit set by the 90% confidence interval for all three indicators analyzed (0.01 for the general liquidity rate, 0.016 for the low liquidity rate and 0.006 for the immediate liquidity rate), it can be concluded that the financial liquidity indicators take positive values and the sample represented by the companies listed on the Bucharest Stock Exchange has the ability to pay their current debts on time.

The year 2019 shows a significant improvement in the values of the analyzed indicators. Thus, the general liquidity rate takes the value T equal to 1,699 correlated with a sig value of 0.940, below the initially set threshold of 10%. This indicates a better overall liquidity than in 2018 and a significant increase in current assets at the sample level, correlated with a decrease in short-term debt. This indicates an increased degree of financial autonomy, the possibility of developing the business through loans for the investment segment and an increase in the consumer market as a whole.

As for the low liquidity rate, the T indicator is 0.753, which at first sight indicates an improvement over the previous year in terms of temporary payment capacity. However, correlated with the value taken by the sig indicator of 0.454, the value of the low liquidity rate indicates suspicions regarding the ability of companies to pay their debts on time, in case of elimination of stocks. The correlation between the two values shows a higher allocation of financial resources for the acquisition of stocks, in a market that has been ambitious for 10 consecutive years of financial growth and 'unprepared for the unforeseen'.

The immediate liquidity rate shows signs of improvement compared to 2018, the difference in value of the T indicator (1,671 in 2019 compared to 2,819 in 2018) is not as significant as in the case of the other indicators analyzed, referring here to the difference between the value between the first and second year of analysis (2,819 - 1,671 = 1,148). The sig value for this indicator is at the limit of the 90% confidence threshold, which shows that there are no significant deviations from the average and the sample has sufficient immediate payment resources to avoid default.

In 2020, the overall liquidity rate stands at 2.66 times the total population, which shows that the current assets cover, at the level of the whole sample, 2.66 times the value of current debts, a favorable aspect in terms of business continuity, and the risk of insolvency, given that the entities under study are able to cover their current liabilities without compromising material resources.

The reduced liquidity rate is on the same better position in 2020 (value T = 3,854, sig = 0.00) compared to 2018 (value T = 2,479, sig = 0.016) but lower than in 2019 despite the calculated risk (value T = 0.753, sig = 0.454), similar to the general liquidity rate. The value of 1.70 recorded by the indicator at the end of 2020 shows that the value of stocks in total current assets is 0.96 (2.66 - 1.70), which translates into an avoidance of companies listed on the Stock Exchange Bucharest to block its financial resources in stocks, the impact of this policy being the pandemic effect of Covid-19 and the increase of reluctance on the part of buyers.

As in the case of the indicators analyzed above, the immediate liquidity rate follows the same evolutionary trend. In 2020, the immediate liquidity rate takes the T value of 4,411 and at an assumed risk of 10% the sig value is 0.000. The increase in the indicator resulting from the Student test shows a decrease in the immediate liquidity of the companies listed on the Bucharest Stock Exchange, correlated with an increase in short-term debts in the case of almost all the companies that make up the sample. This is due to the isolation measures at home, the closure of non-essential activities, the increase in unemployment and the lack of capital in the market, effects of the Covid-19 pandemic.

A crucial contribution in estimating the risk of bankruptcy with the help of liquidity indicators is the audit reports that classify the entities listed on the Bucharest Stock Exchange into entities with risk and without risk of fraud. Thus, the classification of the sample according to this criterion forms

a more detailed picture of the risk detection procedure. Information on liquidity indicators according to the criterion with and without risk of fraud is presented in Tables 2 and 3.

Table no. 2: Descriptive analysis of liquidity indicators - period 2018 - 2020 - without associated fraud risk

		Statistics									
		Risc_frauda	Rata_lich_ge n_18	Rata_lich_ge n_19	Rata_lich_ge n_20	Rata_lich_red _18	Rata_lich_red _19	Rata_lich_red _20	Rata_lich_im d_18	Rata_lich_im d_19	Rata_lich_im d_20
N	Valid	36	36	36	36	36	36	36	36	36	36
	Missing	0	0	0	0	0	0	0	0	0	0
Mean			3,7261	3,5878	2,64	1,6839	-2,0442	1,3936	,1175	,4989	,0622
Std. Error of Mean			1,15889	1,01214	,557	,79385	4,15867	,32882	,03786	,40117	,01237
Median			1,4800	1,6050	1,47	,9950	,9850	,9700	,0350	,0400	,0300
Std. Deviation			6,95332	6,07283	3,340	4,76313	24,95202	1,97292	,22716	2,40700	,07422
Variance			48,349	36,879	11,153	22,687	622,603	3,892	,052	5,794	,006
Skewness			3,418	3,196	2,243	,797	-5,729	,577	3,145	5,948	1,449
Std. Error of Skewness			,393	,393	,393	,393	,393	,393	,393	,393	,393
Kurtosis			12,361	10,202	5,131	4,335	33,866	1,849	10,348	35,558	1,148
Std. Error of Kurtosis			,768	,768	,768	,768	,768	,768	,768	,768	,768
Minimum			,04	,04	0	-11,20	-145,56	-3,68	,00	,00	,00
Maximum			34,57	27,28	15	16,42	17,09	6,23	1,08	14,50	,27

Source: Own processing in SPSS 20.0

Table no. 3: Descriptive analysis of liquidity indicators - period 2018 - 2020 - with associated fraud risk

		Statistics									
		Risc_frauda	Rata_lich_ge n_18	Rata_lich_ge n_19	Rata_lich_ge n_20	Rata_lich_red _18	Rata_lich_red _19	Rata_lich_red _20	Rata_lich_im d_18	Rata_lich_im d_19	Rata_lich_im d_20
N	Valid	28	28	28	28	28	28	28	28	28	28
	Missing	0	8	8	8	8	8	8	8	8	8
Mean			3,9646	11,3107	2,69	3,4736	10,5736	2,0968	,1275	,4075	,0661
Std. Error of Mean			2,06544	9,31108	,796	2,04108	9,02744	,72942	,08704	,36572	,02600
Median			1,9000	1,9850	1,83	1,2550	1,4200	1,2300	,0300	,0350	,0300
Std. Deviation			10,92928	49,26960	4,211	10,80039	47,76873	3,85975	,46055	1,93521	,13758
Variance			119,449	2427,493	17,733	116,648	2281,852	14,898	,212	3,745	,019
Skewness			5,201	5,287	4,565	5,221	5,288	4,724	5,238	5,288	4,654
Std. Error of Skewness			,441	,441	,441	,441	,441	,441	,441	,441	,441
Kurtosis			27,330	27,965	22,601	27,475	27,972	23,790	27,604	27,975	23,296
Std. Error of Kurtosis			,858	,858	,858	,858	,858	,858	,858	,858	,858
Minimum			,27	,24	0	,17	,17	-,33	,00	,00	,00
Maximum			59,43	262,64	23	58,35	254,26	21,09	2,47	10,28	,74

Source: Own processing in SPSS 20.0

The classification of the sample into the two categories (with and without the risk of associated fraud), according to the audited audit reports, shows more accurately the deficiencies found by the auditors engaged in the mission of analyzing the annual financial statements.

Thus, the general liquidity rate in 2018 takes average values of 3.7261 and a deviation from the average of 1.15889 in the case of companies without risk of associated fraud and 3.9646 in a deviation from the average of 2.06544 in the case of companies at risk. This suggests an overvaluation of current assets in the case of companies at risk of fraud. In addition, the value of the indicator is able to lead to the conclusion that the entities on which a risk of fraud is planning have a slower movement of stocks, correlated with their seniority of more than one year and higher uncollected receivables, especially to intra-group partners, which have not been reclassified, which represent non-performing assets but which are still retained by the company for the "beautification" of the annual financial statements. The holding of non-performing assets by the company is also an impediment to the recovery of debts by creditors because they have a high moral and physical wear and tear, and their revaluation can lead to significant differences between their carrying amount and the revalued amount.

In 2019, the difference between those indicators increases significantly, reaching 3.5878 in the case of entities without risk of fraud, together with an average deviation of 1.01214 and 11.3107 in the case of companies with an associated risk of an average deviation of 9, 31108. The significant difference is due, in the case of risk-free companies, by increasing the turnover rate of stocks and improving internal and external trading policies (this is also supported by the analysis in Chapter 1 on the value of exports coupled with the number of declared insolvencies). ). Improving the turnover rate of stocks plays a key role in the development of companies and in preventing fraudulent events (regarding the theft of stocks, their devaluation, declining market demand, fictitious recognition of

stocks, etc.). In the case of companies with an associated risk of fraud, the significant increase in the indicator is due to the continued storage of high value current assets to increase the attractiveness of financial partners (mainly creditor banks), coupled with a decrease in overall productivity. found in the significant decline in short-term debt, average annual labor productivity and the number of employees). An important aspect of this variance is the analysis of audit reports that present specific cases, in which items of fixed assets are reclassified as current assets at the time of sale, oversized revaluation of current assets and non-adjustment for impairment of inventories. significant impact on the growth of this indicator.

The year 2020 is an atypical year from all points of view. Regarding the general liquidity rate, it can be observed a decrease to 2.64 by 0.557 average deviation in the case of companies without risk of fraud and 2.69 by 0.796 in the case of companies with risk of associated fraud. The general decline in this indicator can be easily explained by the economic effects of the Covid-19 pandemic, but there are a number of peculiarities here as well. In the case of non-fraudulent companies (considered to be "in good faith"), the decrease can be easily explained by measures to restrict movement and stop non-essential activities that have led to a rapid increase in short-term debt. higher than current assets. In the case of companies at risk of fraud, on the other hand, in addition to the deficiencies found previously, a peculiarity is that of declaring insolvency in greater numbers than in the case of companies without associated risk. Audit opinions for these companies show an increase in the number of days of short-term debt payments and constant delays in payments.

The low liquidity ratio retains the same explanations as for the general liquidity ratio, with the exception that, excluding stocks, the deviation from the average is higher for entities with an associated risk of fraud. The mean deviation is important in the analysis of the groups of indicators, which indicates how much the values of the sample vary from the analyzed average. In the case of companies classified as having a risk of fraud, the deviation from the average is much higher than in the case of risk-free companies, and this means that most of the values calculated for each entity in the sample deviate from the values recommended by economic theory. a risk of insolvency due to either overvaluation of assets or non-recognition of current liabilities in full.

The immediate liquidity rate shows the ability to pay on the spot of current debts from existing liquidity. In the case of companies without risk of fraud, this indicator has values that reflect a better ability to pay than in the case of companies at risk.

In 2018, the immediate liquidity rate measures 0.175 at a deviation from the average of 0.03786, compared to 0.1275 at a deviation of 0.08704. Although initially the liquidity rate is higher in the case of companies at risk, the deviation from the average is higher in the case of the latter category, which reflects that entities at risk of fraud have a lower ability to pay debts.

In 2019, this indicator takes the value of 0.4989 at a deviation of 0.40117 in the case of the first category of entities and 0.4075 at a deviation of 0.36572. The increase in the ability to pay debts in the liquidity of companies reflects a better degree of debt recovery at the same time as a better management of current debt in the case of the first category of entities. The second category shows significant deviations from the average, which refers to an impossibility of immediate payment of current debts mainly due to lack of liquidity.

The year 2020 shows a significant decrease in the liquidity of both categories of the sample, the values of 0.0622 to a deviation of 0.01237 in the case of risk-free companies and 0.0661 to a deviation of 0.026 in the case of risk companies supporting the unfavorable financial impact of the pandemic of Covid-19. Again, the average deviation is higher for high-risk companies than for non-risk companies, which supports the assumption we initially made, namely a higher risk of default on current debts in the case of the second category.

At the same time, the values of asymmetry (Skewness) and flattening (Kurtosis) indices are also of interest in this type of analysis. In the three periods analyzed, it can be seen that in the case of companies that do not present a risk of fraud, the values taken by this indicator are lower than in the case of companies at risk of fraud.

In the case of the asymmetry index, there is a right (positive) asymmetry in both categories of the sample, in the case of entities at risk of fraud this asymmetry is more pronounced, which reinforces the previously stated conclusion that deviations from the average are more large in the case of companies at risk. A pronounced positive asymmetry lies in a higher risk of fraud for these companies and resonates with the audit opinions analyzed.

The vaulting index (flattening or Kurtosis) has a leptocurtic shape because the values taken by it are higher than the nominal value of 3. This index, together with the asymmetry, has the role of showing the shape of a distribution of variables. As in the case of the Skewness Index, the Kurtosis Index shows a higher excess for fraudulent companies than for non-fraudulent ones, an additional reason to support the initial hypothesis that companies classified as fraudulent have a lower capacity. payment of current debts.

#### 4.2. Debt indicators in bankruptcy risk assessment

Debt indicators measure the ability of companies to contract financial resources to finance planned operations and investments, which are hedged with their own capital (in this case, it assesses the ability of an economic entity to meet its financial obligations using its own capital. which disposes) (Smith, 2017).

In order to create an overview of the situation of indebtedness indicators at the level of the entire sampled population, we analyzed the global population without taking into account the classification of companies as risk-free or risky. The analysis of debt indicators can be found in Table number 4.

Table no. 4: Descriptive analysis of risk 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
Lev_fin_18	64	80,81	-7,75	73,06	1,3127	1,16139	9,29109	86,324	7,512	,299	58,968	,590
Lev_fin_19	64	89,30	-7,16	82,14	1,4839	1,29724	10,37794	107,702	7,671	,299	60,567	,590
Lev_fin_20	64	78,47	-6,29	72,18	1,3958	1,14135	9,13078	83,371	7,611	,299	59,928	,590
Aut_glob_18	64	89,58	-5,40	84,18	2,0973	1,32089	10,56712	111,664	7,668	,299	60,426	,590
Aut_glob_19	64	90,06	-7,11	82,95	2,1442	1,31138	10,49102	110,062	7,476	,299	58,329	,590
Aut_glob_20	64	66	-7	59	1,73	,947	7,580	57,456	6,999	,299	53,114	,590
Indat_glob_18	64	9,16	,00	9,16	,8703	,20795	1,66359	2,768	3,888	,299	16,051	,590
Indat_glob_19	64	10,68	,00	10,68	,9667	,24309	1,94473	3,782	3,899	,299	16,213	,590
Indat_glob_20	64	13	0	13	1,08	,266	2,131	4,541	4,020	,299	18,694	,590
Indat_term_18	57	8	-6	2	,05	,141	1,066	1,137	-3,590	,316	19,067	,623
Indat_term_19	56	7	-5	2	,07	,126	,940	,884	-2,829	,319	14,835	,628
Indat_term_20	55	7	-4	2	,08	,124	,919	,845	-2,690	,322	13,029	,634
Valid N (listwise)	55											

Source: Own processing in SPSS 20.0

Risk indicators have variations that could easily be predicted during the analyzed period. Specifically, in the case of leverage, there is an increase in the period 2018 - 2019 (from an average of 1.3127 to a standard error of 1.16139 in 2018 to 1.4839 to a standard deviation of 1, 29724 in 2019), followed by a decrease in 2020 (from 1.3958 to a standard deviation of 1.14135), the decrease being attributed mostly to the negative effects of the Covid-19 pandemic. The values taken by this indicator, however, show a supra-unit value in the analyzed period, which refers to a high degree of indebtedness, but not critical (the reference threshold of this indicator is 2.33, the equivalent of 70% of total assets which is assigned to bank loans). The standard deviation for this indicator is also much higher than the general average, reinforced by the flattening and vaulting indicators (Skewness and Kurtosis). In this case, it can be stated that there are values of this indicator that vary greatly from the general average, in the sense of a very high degree of indebtedness that may call into question the principle of business continuity in the following periods. Coincidentally or not, entities that know the values of these indicators with significant deviations from the overall average are labeled by audit firms as presenting a risk of fraud, which we will return to.

The global autonomy shows similar oscillations as in the case of the indicator stated above. Starting from an average value of 2.0973 at a standard deviation of 1.32089 in 2018, it reaches 2.1442 at a standard deviation of 1.31138 in 2019 and stopping at 1.73 with a deviation 0.947 in 2020. The general decrease in 2020 on all indicators analyzed cannot be attributed to a widespread risk of fraud, given that for at least 3 calendar months, any non-essential activities were stopped and the Romanian economy fell by about 10% this year. The decrease in this indicator is attributed to a significant

decrease in the equity of the companies that make up the sample, which translates into accounting losses reported in 2020, along with a decrease in investment subsidies, facilities and grants supported from the state budget. The standard deviation for this indicator is similar to the financial leverage indicator, which translates into very large deviations from the general average, and the previous explanations remain valid in this case as well.

When we refer to the global debt indicator, unlike the previous indicators, it has steady increases from one analyzed period to another. In 2018, the average value of the indicator is 0.8703 at a standard deviation of 0.20795 and a flattening of 3.888, close to the economic theory of 3. These values show that although the overall indebtedness is high overall, it does not show values that deviate significantly from the average and does not at first sight create the premise of a risk of fraud. In 2019, the average value of the global debt indicator reaches 0.9667 at a standard deviation of 0.24309 and a flattening indicator of 3.899, slightly higher than the previous period. The growth of the global economy, the increase of production capacity and exports (detailed in Chapter 2) are factors that contribute to the increase in the current need for financing and business development by attracting investment capital. Although the Bucharest Stock Exchange has seen progressive increases in traded capital since its inception, the main source of financing for Romanian companies remains investment credit, a capital instrument very well developed by banking financial institutions in this geographical area ( of Central and Eastern Europe).

In 2020, the indicator continues its upward trend, with an average value of 1.08 at a standard deviation of 0.266 and a flattening of 4.020. This year, the increase in the value of global debt is no longer attributed to the increase in turnover, but on the contrary, to the need for current financing as a result of stopping production and avoiding the declaration of insolvency.

Also, the gradual increase in flattening and vaulting indices refers to a discrepancy between the average value taken by the indicator and its extremes.

The analysis of risk indicators becomes more eloquent if we add to the equation the division of the sample into two distinct categories, depending on the audit reports, annexes to the annual financial statements. Thus, the breakdown of the risk indicators according to the criterion without associated fraud risk and with associated fraud risk is visible in Tables number 5 and 6.

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

	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
Lev_fin_18	36	11,84	-6,95	4,89	,0178	,31112	1,86669	3,485	-1,573	,393	6,264	,768
Lev_fin_19	36	11,35	-7,16	4,19	,0450	,29441	1,76645	3,120	-2,062	,393	8,197	,768
Lev_fin_20	36	10,10	-5,26	4,84	,1353	,27764	1,66587	2,775	-,953	,393	4,225	,768
Aut_glob_18	36	89,58	-5,40	84,18	2,9394	2,34281	14,05684	197,595	5,823	,393	34,576	,768
Aut_glob_19	36	90,06	-7,11	82,95	2,9019	2,31823	13,90939	193,471	5,743	,393	33,946	,768
Aut_glob_20	36	66	-7	59	2,16	1,657	9,941	98,817	5,556	,393	32,544	,768
Indat_glob_18	36	9,16	,00	9,16	1,1303	,34951	2,09708	4,398	3,148	,393	9,561	,768
Indat_glob_19	36	10,65	,03	10,68	1,2136	,40021	2,40125	5,766	3,362	,393	11,026	,768
Indat_glob_20	36	13	0	13	1,46	,447	2,684	7,206	3,228	,393	11,315	,768
Indat_term_18	36	5	-3	1	,03	,122	,731	,534	-2,857	,393	11,678	,768
Indat_term_19	36	4	-3	1	,04	,112	,670	,449	-3,164	,393	14,652	,768
Indat_term_20	36	4	-3	1	,06	,115	,689	,475	-2,649	,393	10,659	,768
Valid N (listwise)	36											

Source: Own processing in SPSS 20.0

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

	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
Lev_fin_18	28	80,81	-7,75	73,06	2,9775	2,61723	13,84906	191,796	5,144	,441	26,995	,858
Lev_fin_19	28	88,45	-6,31	82,14	3,3339	2,93348	15,52254	240,949	5,203	,441	27,381	,858
Lev_fin_20	28	78,47	-6,29	72,18	3,0164	2,57802	13,64158	186,093	5,179	,441	27,219	,858
Aut_glob_18	28	8,19	-.40	7,79	1,0146	,28327	1,49891	2,247	3,692	,441	16,135	,858
Aut_glob_19	28	11,76	-.75	11,01	1,1700	,39026	2,06507	4,265	4,270	,441	20,551	,858
Aut_glob_20	28	13	-1	13	1,18	,440	2,326	5,410	4,579	,441	22,710	,858
Indat_glob_18	28	3,11	,01	3,12	,5361	,14026	,74217	,551	2,740	,441	7,342	,858
Indat_glob_19	28	4,74	,00	4,74	,6493	,20393	1,07908	1,164	2,930	,441	8,512	,858
Indat_glob_20	28	4	0	4	,59	,170	,902	,813	3,039	,441	8,838	,858
Indat_term_18	28	8	-6	2	,06	,244	1,291	1,666	-3,687	,441	18,747	,858
Indat_term_19	28	7	-5	2	,09	,209	1,104	1,219	-2,772	,441	15,003	,858
Indat_term_20	28	7	-4	2	,08	,196	1,037	1,076	-2,827	,441	15,188	,858
Valid N (listwise)	28											

Source: Own processing in SPSS 20.0

The breakdown of the sample into the two groups shows a clearer picture of the risk of associated fraud of the entities listed on the Bucharest Stock Exchange.

The financial leverage ratio is significantly lower in the case of entities without the risk of associated fraud. Thus, in 2018, the indicator takes the average value of 0.0178 at a deviation of 0.31112 in the case of risk-free companies and 2.9775 at a standard deviation of 2.61723. The year 2019 brings an average value of 0.045 in the case of companies without associated risk, at a deviation of 0.29441 and an average of 3.3339 in a deviation of 2.93348 in the case of companies with associated risk, and in 2020, the average value it is slightly higher in the case of companies without associated risk, reaching a value of 0.1353 at a deviation of 0.27764, compared to 3.0164 at a deviation of 2.57802 in the case of companies at risk. The average difference of 2.9597 (2.9775 - 0.0178) in 2018, 3.2889 in 2019 (3.3339 - 0.045) and 2.8811 in 2020 (3.0164 - 0.1353) is attributed to a much higher degree of indebtedness in the case of risky companies, a constant need to finance current and investment activity and often negative equity (in terms of uncovered loss). A significantly higher degree of indebtedness than economic theory reflects future debt problems and the inability of creditors to cover their debts on the basis of the debtor's assets, a crucial aspect in detecting the risk of bankruptcy. Also, the flattening (Skewness) and vaulting (Kurtosis) indicators show serious deviations from the general average, which results in a higher risk of bankruptcy in this area and values of indicators that deviate far from the average, according to the previous tables.

Global autonomy is also more pronounced in the case of companies without associated risk, to the detriment of the second category. Significant differences in value on average and standard deviation refer to the inability of fraud-prone companies to sustain their normal operating capacity from their own resources. The average difference of 1.9248 (2.9394 - 1.0146) in 2018, 1.7319 (2.9019 - 1.17) in 2019 and 0.98 (2.16 - 1.18) in 2020 shows a slight harmonization of the discrepancy between the global financial autonomy of companies with and without the risk of associated fraud. As can be seen, the overall autonomy of entities without risk of associated fraud follows a downward trend in the period under review, due to two distinct factors from one financial year to another. Between 2018 and 2019, the indicator shows decreases due to the increase of total liabilities (by contracting new sources of financing - on the stock market or by bank loans) in a ratio higher than equity. At the same time, the issuance of new shares on the stock exchange had the impact of decreasing their nominal value and not in all cases the newly issued shares were also traded, which led to a slight decrease in share capital within the companies in this group. The second factor appears in the period 2019 - 2020 where the decrease of global autonomy occurs as a result of the Covid-19 pandemic which limited the right to free movement and decreased sales in 95% of the Romanian stock market.

With regard to the second group in the sample (the one with the associated risk of fraud), an increase in global financial autonomy is visible, mirrored by the first category. This gradual increase between 2018 and 2020 is due to the non-recognition of all provisions, the increase of subsidies received from the state budget and local budgets (to cover the need to finance) and the non-recognition of interest on loans received from intercompany partners, according to audit reports .



Also, the flattening and vaulting indices are higher in the case of the first group in the sample than in the case of the second, which indicates higher values that deviate from the average in the case of companies without risk of associated fraud. Therefore, even if they are not assigned a risk of fraud, not all of these companies are within the limits imposed by economic theory.

The overall indebtedness indicator is also higher for non-fraudulent companies than for those with an associated risk of fraud. The difference of 0.5942 (1.1303 - 0.5361) in 2018, 0.5643 (1.2136 - 0.6493) in 2019 and 0.87 (1.46 - 0.59) in 2020 show a higher degree of global indebtedness in the case of companies without associated risk to the detriment of companies classified as risky. The explanations regarding these variations are the same as in the case of the global autonomy indicator, the companies that present a risk not recognizing all the losses of value or the financial loans within the group. Also, the increase in the need for financing the current activity was more pronounced in companies without associated risk due to the Covid-19 pandemic and the cessation of non-essential activities.

The flattening and vaulting indices are also higher in the case of the first group in the sample than in the second, which leads to the idea of indicators that deviate more from the average in the case of the first category.

Long-term debt, on the other hand, is better for non-fraudulent companies than for those with an associated risk of fraud. The difference of - 0.3 (0.3 - 0.6) in 2018, - 0.5 (0.4 - 0.9) in 2019 and - 0.2 (0.6 - 0.8) in the year 2020 shows a debt situation of more than one year better in the case of the first category, with the real future possibility of contracting new loans and the limitation of future defaults. Higher equity ratios can cause problems in attracting funds from the profile markets (either attracting new investors or opening new lines of credit) and make it easier to conclude a future default in the case of companies at risk. associated fraud. The flattening index also has negative values for both categories in the sample, which translates into several values close to the average.

## 5. Conclusions

Following the analysis, we found that a company that will inevitably go bankrupt in the next reporting period has a very low or even negative liquidity level, a significantly lower return on assets than risk-free companies, a solvency and profitability rate. which does not encourage investors to contribute capital to the development of the company, low investment and production potential, inefficient asset management and a very low degree of recoverability of receivables, notions corroborated and low yield on the stock market and low marketability of actions.

Determining the values of these indicators, we can formulate a forecast regarding the economic future of a company, the investment policy rallying depending on the results obtained.

The importance of predicting bankruptcy and understanding the causes of financial failure lies in its pragmatic aspect. The costs of insolvency or liquidation (lawyers', auditors' and accountants' fees, legal fees, etc.) are much lower than the losses that investors and / or creditors may incur as a result of economic failure. Also, indirect costs such as losses for business partners, managers, financial institutions and the state are usually considerable (Țăndăreanu, 2017).

All these aspects have been fully felt in the Romanian economy in recent years. Any progress in identifying the causes and predicting bankruptcy can significantly minimize the costs discussed.

## 6. References

- Colli, J-C., 1995. L'exemple du financement de l'eau et de l'assainissement : Colloque du GIFS : Développement économique et dimension territoriale, *Revue d'économie financière*, H-S 5, pp. 199 – 200
- Trif, V., 2015. Differences between tax avoidance and tax evasion charged as a crime, *ed. Universul Juridic*, Vol. XI, pp. 127-140
- Tillman, R., Pontell, H., 1995. Organisations and fraud in the savings and loan industry, *Social Forces*, Vol. 73, pp. 1439-1463
- Țăndăreanu, N., 2017. The effects of bankruptcy, *Judicial Courier Journal*, Vol. 7, pp. 377-398
- Smith, M., Johari, A., 2017. Predicting fraudulent financial reporting using artificial neural network, *Journal of Financial Crime*, Vol. 24, pp. 362-387