

# THE BANKRUPT RISK IN FEED DISTRIBUTION BRANCH IN DOLJ DISTRICT – FDR MODEL

PhD Student Ovidiu CĂPRARIU  
University of Craiova

## *Abstract:*

*In this article, we are intending to present a score function in order to calculate the bankrupt risk for a special domain: feed distribution.*

*All analysis models of the bankruptcy risk have at their basis a score function according to which it is determined with approximation whether the company would get bankruptcy or would have performing economic results, in a period immediately following the analysis.*

*Having a personal analysis in feed distribution branch, I elaborated a score function for counting bankrupt risk, based on financial and non-financial studies of many companies and we called this model "Feed Distribution Risk Model" (FDR). The target was to obtain a high level of precision, so I choose the feed industry and more specific only feed distribution branch and I analyzed statistics about the evolution of the feed distribution companies in Romania and about the normal level of some financial or non-financial indicators for these companies.*

*I have choose five feed distribution companies and I counted two international score functions and two Romanian score function with FDR function. Finally, I concluded that the three main differences between the classic models and this one are that the FDR model is for a specified branch – the feed distribution, it uses an important number of indicators and uses non-financial indicators, which explain the shareholders bonity. As directions to continue the investigations, I propose the elaboration of another models for other branches and adjust the financial information with true dates.*

*Keywords: bankrupt risk, score function, financial indicators, non-financial indicators*

## **The analysis of bankrupt risk – limits of classic score functions**

The bankrupt risk represents the possibility of incapability to pay overdue liabilities, arisen from previous engagement and from current operations, indispensable for continuity of the activity. The study of the risk has become very important in the last years, due to the increase of the competition on the Romanian market and due to the consolidation of the market economy mechanisms that have determined the augmentation of the number of bankruptcies in Romania.

The companies' difficulties may have different causes, which can derive

from economic and social medium, so on: increasing of competition, apparition of substitution products, the bankrupt of an important supplier or of an important customer, new laws and so on. In addition, the companies may have internal financial, strategically or organizational difficulties, which can generate insolvency or bankrupt [Niculescu, 1997]. There are some financial causes, like the lack of financial resources control, financing of investments from current liabilities and the lack of short terms liquidities, the absence of credits survey, reducing of cash flow, reducing of financial stability, incapacity to recuperate the debts from

customers, the reducing of efficiency and increasing of loss or covering the loss by previous reserves.

Speaking about strategically difficulties, the factors can be the lack of objectives, the wrong decisions about the chosen market, the weak flexibility during the economical changes and chosen incompatible projects and so on. In addition, there are some organizational causes, like lack of experience, wrong organizational structure, difficult relations between managers and employers or political influences in business.

All this factors have resonance in information given by financial rappers. Some of them are easy to explain and correct, but some of them are very difficult to identify and diagnose. Through problems that are easy to identify, we can mention reducing of cash & equivalent, increasing of some categories of costs, reducing of sale price, increasing of stocks, increasing of debts and of the liabilities level and so on.

According to Altman's opinion, the decline of a company advances five stages [Ciolacu, 1996]:

- The appearance of the signs of decline, what, in many cases, are disregarded: the decrease of profitability, the decrease of the total turnover and the increase of debts and the decrease of liquidity;
- The existence of the clear signals for which no measure is adopted hoping that they would disappear without intervention;
- Powerful action of declining factors with aggravated financial situation;
- The collapse and the managerial team's impossibility to act through correction measures;
- The intervention, either through recovering measures, or bankruptcy declaration.

The bankruptcy risk was and is under managers' attention. They are interested in the good going of the

production cycle and the investors in recuperating the respective credits and interests. Many investigators and financial bodies have been dealing in elaborating prediction methods of bankruptcy risk. The manner used is the statistical technique of analyzing the financial features of normally functioning societies and of the companies with difficulties in economic and financial administration. All analysis models of the bankruptcy risk have at their basis a score function according to which it is determined with approximation whether the company would get bankruptcy or would have performing economic results, in a period immediately following the analysis [Pahone, 2005].

The score function represents an external diagnostic method in order to count the bankrupt risks for investors, creditors and company. In order to build such a model, we have to pass next steps:

- Choosing the financial indicators, which reflect the health of a company;
- comparing the evolution of this indicators on two categories of companies (healthy and with difficulties) from same branch;
- Elaborating Z predictive function by combination of the indicators with a permanent and powerful action;
- Establishing the intervals for Z function based on the observation upon the presence of bankrupt risk.

It is important to use financial indicators (efficacy indicators, equilibrium indicators or solvency indicators) in order to overdue the bankrupt risk because a systematic depreciation of them is reflecting in management of that activity [Balcaen, Ooghe, 2006]. We have chosen two most representative international models and two Romanian models, applying them for five feed distribution companies [www.mfinante.ro].

Altman model [Altman, 1977] realized a multi-variable analysis of bankrupt using a discriminate multiple

analysis. Altman choose 33 companies with problems and 33 healthy companies and he analyzed their evolution between 1946 and 1965. His research started with 22 indicators, but finally he kept only five of them, in order to reflect the short and long time equilibrium and efficiency, so on:

$$Z = 0.717X_1 + 0.847X_2 + 3.107 X_3 + 0.420 X_4 + 0.5 X_5$$

During the time, there were tentative to apply Altman model in Romanian economy, but the score obtained has a low signification, because it is a very strong relation between the level of the chosen coefficients and the characteristics of the business environment.

Conan and Holder model for en-gross trade companies [Conan et Holder, 1979] is:

$$Z' = 0.0136 r_1 + 0.0197 r_2 + 0.0341 r_6 + 0.0185 r_7 - 0.0158 r_8 - 0.0122$$

In Romania, during the period of transition, it was difficult to apply the international models, because we have no enough information for a long period and the indicators are not relevant because of the fluctuation of the economy. Although, in Romanian theory there are permanent investigations in order to adjust the score method to Romanian economical context. There were many studies and investigation of the specialists, trying to adjust the score function to Romanian economical structure.

In that sense, Băileşteanu, the author of B Model, considers a function:

$$B = 0,444G_1 + 0,909G_2 + 0,0526G_3 + 0,0333G_4 + 1,414$$

( $B < 0,5$  – bankrupt;  $0,5 < B < 1,1$  – limited zone;  $1,1 < B < 2,0$  – intermediary zone;  $B > 2,0$  – favorable zone).

The score function proposed by Ion Anghel [Anghel, 2002] is:

$$A = 5,676 + 6,3718X_1 + 5,3932X_2 - 5,1427X_3 - 0,0105X_4$$

The mean limit of all these models is generality, because there are particularities for every branch of economy and the precision, which can

be influenced by the way of choosing the analyzed companies before the bankrupt. In our opinion, the most important limit for Romanian companies to apply international Z score functions is that the significance for some indicators may be different for our economy.

Taffler shows in 1980 that «every country needs an owner score function» [Taffer, 1980]. In practical, it is accepted the idea of limited application of a score function just for the economy for which it was created, even if it was demonstrated that some of the models have a high level of universality.

Speaking about the mean limits of applying the Romanian models there are some coordinates. The selection of the sample for built the score function is not based on a statistical relevance of the bankrupt situation in Romanian economy. The reason is that in Romania exists a high number of “de facto” bankrupts and a lower level of “de jure” bankrupts, so choosing or not real bankrupt company, but non-declared may influence directly the precision of the prediction of that score model.

The lack of a long analysis period before the bankrupt may be a factor of a possible reducing of a predictive ability of that model, because of the short period of capitalist economy and of the high level of instability in Romanian economy.

The last concerns upon the general character of the score functions revealed that there was many tentative to build a general application function for the entire Romanian economy, but is unanimous acceptable that a bankrupt model to forecast the bankrupt is limited on industries for that it was created.

The inclusion of non-financial variables, which conceives the characteristics of the branch economy, generates limited models, more than the models based exclusively by financial indicators. However, it is very important to create a score function for a representative branch, in order to

consider the mean social and economical factors upon the companies, which can influence the results, through increasing of the precision of the predictability.

Not in the last row, it is important to use limits minimum – maximum in order to establish values for the indicators for calculate the score function in order to counterbalance the negative effect of the period of transition and of the absence of credible and relevant information for a long period. I think that is very important to have specific models created for specific branches of economy in order to increase the accuracy of the score function. In this article, we choose to present a score function for feed distribution branch because we can use some specific financial and non-financial indicators, representatives for this domain.

Feed industry, one of the most important branches of the economy, has an important percent in PIB, increasing in last years, but more because of the imports [[www.insse.ro](http://www.insse.ro)]. Because of actual economical context, it is a challenge to build a score function in order to forecast the bankrupt risk for Romanian companies, that because the bankrupt process has still different dimension than in advanced economies.

All analysis models of the bankruptcy risk have at their basis a score function according to which it is determined with approximation whether the company would get bankruptcy or would have performing economic results, in a period immediately following the analysis [Bodie, Merton, 2000].

### **The presentation of FDR model**

Having a personal analysis in feed distribution branch, I elaborated a model for counting bankrupt risk, based on financial and non-financial study of many companies and I called this model “Feed Distribution Risk Model” (FDR). I

considered 10 financial indicators and 5 non-financial indicators. I started the study considering that is necessary to count not only financial aspects, but also the non-financial aspects, which influence in a great measure the bankrupt risk. I will present in table 1 these 15 indicators and the score for each of them, telling that the points are between 1 and 10.

The target was to obtain a high level of precision, so I choose the feed industry and more specific only feed distribution branch and I analyzed statistics about the evolution of the feed distribution companies in Romania and about the normal level of some financial or non-financial indicators for these companies. Of course, there are some differences in every department from Romania, because the level of progress is different, but I choose to analyze only companies from Dolj district because it was easier to obtain information about them. Also, in order to reduce the sample area, I choose 40 medium companies, with a turnover between 1.000.000 Euro and 10.000.000 Euro [[www.mfinante.ro](http://www.mfinante.ro)].

The following methodological instruments were used in order to analyze the risk of these enterprises: for the analyze of the failure risk, an own score function was used, determined relying on the discriminate analysis, as a linear combination between ten financial ratios and five non-financial ratios; the aim of the study is identifying the main features of the risk that the feed distribution enterprises from the Dolj District deal with and pointing out the connections between the analyzed categories of risks, relying on the instruments used to assess them. The score functions are an external diagnosis method and they are elaborated relying on the discriminate analysis, allowing to evaluate and to appreciate the bankruptcy risk of the company using a set of relevant financial ratios.

The score is a grade assigned to an enterprise and reflects, globally and unitary, the degree of vulnerability or of financial wealth. Depending on its score, a firm can be classified as bankrupt or non-bankrupt. As the score functions are usually elaborated relying on the statistical methods, including a company into one of the two groups cannot be considered to be doubtless, but it is made with a specific probability. In this study, primary, I analyzed over 20 financial indicators, but because some of them had a similar signification or their signification is not very important for feed distribution branch, I stopped upon 10 financial indicators, so on: current liquidity, acid test, equity ratio, financial structure, interest coverage, operating cycle, operating income ratio, NET ROE, productivity and assets efficiency.

In addition, I choose five non-financial indicators, so half of financial indicators, considering that are normal

to ponderate in this way the indicators. The non-financial indicators are: management quality, history of banks' relations, history of state's relations, market conditions and shareholders' debts.

After that, I compared the evolution during three years of this indicators on two categories of companies (healthy and with difficulties) from same branch. For every of these indicators, I studied the companies and I compared the results with the statistics of feed distribution branch indicators in Romania. For every indicator, I choose a score, between 1 and 10, depends of the performances obtained.

Finally, I elaborated Z predictive function by combination of the indicators with a permanent and powerful action, establishing the intervals for Z function based on the observation upon the presence of bankrupt risk. The indicators system is presented in next table:

**Table 1**

**The system of indicators for FDR model**

1. Current liquidity ratio (Lc) = Current assets / Current liabilities	Lc >= 200%	10
	160% <= Lc < 200%	9
	130% <= Lc < 160%	8
	110% <= Lc < 130%	7
	95% <= Lc < 110%	6
	80% <= Lc < 95%	5
	65% <= Lc < 80%	4
	50% <= Lc < 65%	3
	30% <= Lc < 50%	2
	Lc < 30%	1
2. Acid test (At) = (Current assets - Inventory) / Current liabilities	At >= 100%	10
	90% <= At < 100%	9
	80% <= At < 90%	8
	70% <= At < 80%	7
	60% <= At < 70%	6
	50% <= At < 60%	5
	40% <= At < 50%	4
	30% <= At < 40%	3
	20% <= At < 30%	2
	At < 20%	1
3. Equity ratio (Er) = Shareholders' Equity / Total Assets	Er >= 45%	10
	40% <= Er < 45%	9
	35% <= Er < 40%	8
	30% <= Er < 35%	7

	25% ≤ Er < 30%	6
	20% ≤ Er < 25%	5
	15% ≤ Er < 20%	4
	10% ≤ Er < 15%	3
	5% ≤ Er < 10%	2
	Er < 5%	1
4. Financial structure (Fs) = Shareholders' Equity / (Equity+LT Liabilities)	Fs ≥ 90%	10
	80% ≤ Fs < 90%	9
	70% ≤ Fs < 80%	8
	60% ≤ Fs < 70%	7
	50% ≤ Fs < 60%	6
	40% ≤ Fs < 50%	5
	30% ≤ Fs < 40%	4
	20% ≤ Fs < 30%	3
	10% ≤ Fs < 20%	2
Fs < 10%	1	
5. Interest coverage (Ic) = PBIT / Interest expense	Ic ≥ 2.2%	10
	2.05% ≤ Ic < 2.2%	9
	1.9% ≤ Ic < 2.05%	8
	1.75% ≤ Ic < 1.9%	7
	1.6% ≤ Ic < 1.75%	6
	1.45% ≤ Ic < 1.6%	5
	1.3% ≤ Ic < 1.45%	4
	1.15% ≤ Ic < 1.3%	3
	1% ≤ Ic < 1.15%	2
Ic < 1%	1	
6. Operating cycle (Oc) = Receivables period + Days inventory held	Oc ≤ 60	10
	60 < Oc ≤ 90	9
	90 < Oc ≤ 120	8
	120 < Oc ≤ 150	7
	150 < Oc ≤ 180	6
	180 < Oc ≤ 210	5
	210 < Oc ≤ 240	4
	240 < Oc ≤ 270	3
	270 < Oc ≤ 300	2
	300 < Oc	1
7. Operating income ratio (Oi) = Operating profit / Turnover	Oi ≥ 10%	10
	8% ≤ Oi < 10%	9
	7% ≤ Oi < 8%	8
	6% ≤ Oi < 7%	7
	5% ≤ Oi < 6%	6
	4% ≤ Oi < 5%	5
	3% ≤ Oi < 4%	4
	2% ≤ Oi < 3%	3
	1% ≤ Oi < 2%	2
Oi < 1%	1	
8. NET ROE (R) = Net profit / (Equity +	R ≥ 50%	10
	45% ≤ R < 50%	9
	40% ≤ R < 45%	8

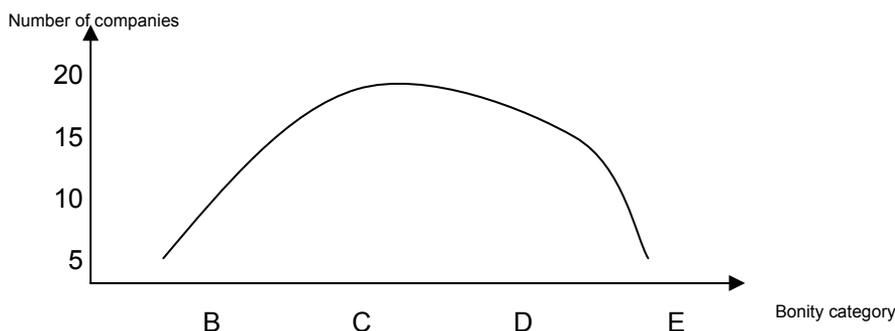
Loan from shareholders)	35%<=R<40%	7
	30%<=R<35%	6
	25%<=R<30%	5
	20%<=R<25%	4
	15%<=R<20%	3
	10%<=R<15%	2
	R<10%	1
9. Productivity (Pr) = Turnover / number of employees	Pr>550000	10
	500000<= Pr<550000	9
	450000<= Pr<500000	8
	400000<= Pr<450000	7
	350000<= Pr<400000	6
	300000<= Pr<350000	5
	250000<= Pr<300000	4
	200000<= Pr<250000	3
	150000<=R<200000	2
	R<150000	1
10. Assets efficiency (Ae) = Turnover / Total assets	Ae>=420%	10
	380%<= Ae<420%	9
	340%<= Ae<380%	8
	300%<= Ae<340%	7
	260%<= Ae<300%	6
	220%<= Ae<260%	5
	180%<= Ae<220%	4
	140%<= Ae<180%	3
	100%<= Ae<140%	2
Ae<100%	1	
11. Management quality	Domain experience over 12 years	10
	Domain experience between 10 and 12 years	9
	Domain experience between 8 and 10 years	8
	Domain experience between 6 and 8 years	7
	Domain experience between 5 and 6 years	6
	Domain experience between 4 and 5 years	5
	Domain experience between 3 and 4 years	4
	Domain experience between 2 and 3 years	3
	Domain experience between 1 and 2 years	2
	Domain experience between under one year	1
12. History of banks' relations	Customers without payment delays to banks in last 6 months and without CIP incidents in last 6 months.	10
	Customers with payment delays to banks under 30 days in last 6 months and without CIP incidents in last 6 months.	9
	Customers with payment delays to banks under 30 days in last 6 months and without CIP incidents in last 1 year.	8
	Customers with payment delays to banks under 30 days in last 6 months or without CIP incidents in last 1 year.	7

	Customers with payment delays to banks over 30 days in last 6 months and without CIP incidents in last 6 months.	6
	Customers with payment delays to banks over 30 days in last 6 months or without CIP incidents in last 1 year.	5
	Customers with payment delays to banks over 30 days in last 6 months or without CIP incidents in last 6 months.	4
	Customers with payment delays to banks over 60 days in last 6 months and without CIP incidents in last 6 months.	3
	Customers with payment delays to banks over 60 days in last 6 months or without CIP incidents in last 1 year.	2
	Customers with payment delays to banks over 60 days in last 6 months or without CIP incidents in last 6 months.	1
13. History of state's relations	Without state's duties	10
	State's duties under 10 % from monthly average profit	9
	State's duties between 10 % and 20 % from monthly average profit	8
	State's duties between 20 % and 30 % from monthly average profit	7
	State's duties between 30 % and 40 % from monthly average profit	6
	State's duties between 40 % and 50 % from monthly average profit	5
	State's duties between 50 % and 60 % from monthly average profit	4
	State's duties between 60 % and 70 % from monthly average profit	3
	State's duties between 70 % and 80 % from monthly average profit	2
	State's duties over 80 % from monthly average profit	1
14. Market conditions	Rising in last 5 years	10
	Rising in last 3 years	9
	Rising in last year, after a hold-up period	8
	Rising in last year, after a decline period	7
	A hold-up period in last 5 years, but with rising expectations	6
	A hold-up period in last 5 years	5
	A hold-up period, but with decline expectations	4
	A decline period in last 3 years, but with rising expectations	3
	A decline period in last 3 years	2
	A decline period, without rising expectations	1

15. Shareholders' debts	Shareholders without debts to banks in last 12 months.	10
	Shareholders without debts to banks in last 6 months	9
	Shareholders with debts to banks over 7 days in last 12 months	8
	Shareholders with debts to banks over 7 days in last 6 months	7
	Shareholders with debts to banks over 30 days in last 12 months	6
	Shareholders with debts to banks over 30 days in last 6 months	5
	Shareholders with debts to banks over 60 days in last 12 months	4
	Shareholders with debts to banks over 60 days in last 6 months	3
	Shareholders with debts to banks over 90 days in last 12 months	2
	Shareholders with debts to banks over 90 days in last 6 months	1

If we will sum the scores for these 15 indicators, we will obtain a total score. The companies are classified in five categories: E category – loss, for values between 15 and 45; D category – questionable, for values between 45 and 75; C category – substandard, for values between 75 and 100; B category – under observation, for values between 100 and 125; A category – standard, for values between 125 and 150.

Analysing these 40 companies, we can observe the level of their healthy. Therefore, 18 of this companies (45 %) have a C bonity indicator in 2007 and 11 of this companies (27,5 %) have a D bonity indicator in 2007. In 2007, there are only six very good companies (with B bonity indicators – 15 %) and five very bad companies (with E bonity indicators – 12,5 %). So we can represent this situation through a Gauss curve, like in the figure 1:



**Figure 1. The graphic distribution of companies' bonity**

I conclude that 60 % of the feed distribution companies from Dolj District have a reasonable level of bonity indicator, but 27,5 % of them may have problem in the future and 12,5 % of

them are almost in bankruptcy. Analysing the evolution during three years, we classified companies in four categories: 22 of them (55 %) had a relative constant level of bonity

indicator, seven companies (17,5 %) had an increasing of bonity indicator in last three years, but 11 companies (27,5 %) had a decreasing of bonity indicator in last three years.

### A comparative analysis between the result of classis score function and of FDR function

In this paragraph, I choose five representative feed distribution

companies with a turnover between 1.000.000 Euros and 10.000.000 Euros [www.mfinante.ro]. For each of these companies, I count two international score function and two Romanian score function and finally I used FDR function for the same companies.

I tried to apply Altman for this five Romanian companies from feed distribution branch and I obtained the results from table 2:

**Table 2**

**Altman Z function for five feed companies**

Name of indicator (31.12.2008)	E Group	P Com	S Trade	V Com	H Trade
X <sub>1</sub> Assets structure	0,8453	0,8157	0,8122	0,5996	0,7920
X <sub>2</sub> Financing contribution	0,0390	0,0032	0,0606	0,0085	0,0633
X <sub>3</sub> Assets performance	0,0452	0,0059	0,0634	0,0085	0,0967
X <sub>4</sub> Liability level	1,6804	0,7592	5,2157	0,6479	1,7894
X <sub>5</sub> Assets randament	3,5877	2,0114	1,2956	2,1215	6,6245
Z = 0.717X <sub>1</sub> + 0.847X <sub>2</sub> + 3.107 X <sub>3</sub> + 0.420 X <sub>4</sub> + 0.5 X <sub>5</sub>	3,2793	1,9305	3,6690	1,7963	4,9857

Counting the Altman score function for these five companies, I obtained the best result for H Trade, S Trade and E Group, which are over the limit of 2,99 for bankruptcy. However, the companies P Com and V Com have obtained results under 2,67 and that mean it is about a high level of bankruptcy.

In table 3, I counted Conan and Holder Z function. The best result has been obtained by H Trade, but also: E Group, S Trade and V Com have obtained acceptable results, between -0,03 and 0,2, with a bankruptcy probability between 35 % and 65 %; in change, P Com has obtained a result under -0,3, with a bankruptcy probability under 65 %.

**Table 3**

**Conan and Holder Z function for five feed companies**

Indicator name (31.12.2008)	E Group	P Com	S Trade	V Com	H Trade
r <sub>2</sub> = Solvability	0,0642	0,1056	0,1492	0,0552	0,2308
r <sub>3</sub> = Assets efficiency	0,0530	0,0126	0,0170	0,0159	0,1534
r <sub>6</sub> = Own capital / Total assets	0,0603	0,0955	0,1298	0,0523	0,2307
r <sub>7</sub> = Profit / Total assets	0,0472	0,0299	-0,0031	0,0707	0,0967
r <sub>8</sub> = Working capital necessity / Turnover	0,4168	21,6346	10,8791	10,864	0,0166
Z' = 0.0136 r <sub>2</sub> + 0.0197 r <sub>3</sub> + 0.0341 r <sub>6</sub> + 0.0185 r <sub>7</sub> - 0.0158 r <sub>8</sub> - 0.0122	-0,0139	-0,3485	-0,1773	-	0,0033

Therefore, comparing these two models, the company H Trade has obtained the best results for every model and companies S Trade and E Group has almost the same result for both of them. However, speaking about V Com Company, we have differences between Altman model, when the score is very low and so the bankrupt risk is very high and Conan-Holder model,

when the score is acceptable. P Com has bad results for both of models. In conclusion, these two models have some differences, so we have to consider more score function in order to have a more exactly precision.

In the next two tables, I counted two Romanian models for each of these five companies: Bailesteanu model and Anghel model:

**Table 4**

**B function – Băilesteanu, for five five feed distribution companies**

Indicator name	E Group	P Com	S Trade	V Com	H Trade
$G_1$ Current ratio = Current assets / Current liabilities	0,9352	1,0474	0,9608	0,6913	1,2903
$G_2$ Solvability = (Net profit + Depreciation) / Credit rates + interests	1,7856	0,5782	4,1166	0,9911	3,5040
$G_3$ Customers recovery = CA / Customers	6,6060	8,1362	1,8151	7,2169	21,4706
$G_4$ Costs' efficiency = (profit / cost) * 100	1,0818	0,1579	4,6379	0,3965	0,9601
$B = 0,444G_1 + 0,909G_2 + 0,0526G_3 + 0,0333G_4 + 1,414$	3,8358	2,8378	5,8326	3,0147	6,334

V Com has a current ratio under limit of 0,75 and P Com has a solvability under 1. Talking about receivables period, the worst result has obtained by S Trade and P Com has the lowest level

of efficiency. In conclusion, the B coefficient for all the company is in favorable zone, but P Com and V Com are near the limit.

**Table 5**

**Model Ion Anghel for five feed distribution company**

Indicator name	E Group	P Com	S Trade	V Com	H Trade
$X_1 =$ Net profit / revenues	0,0109	0,0016	0,0468	0,0040	0,0095
$X_2 =$ Cash flow / Assets	0,0530	0,0126	0,0170	0,0159	0,1534
$X_3 =$ Duties / Assets	0,9397	0,9045	0,8702	0,9480	0,7693
$X_4 =$ (Liabilities/Turnover)*360	26,1922	44,9686	67,1621	44,6848	41,8055
$A = 5,676 + 6,3718X_1 + 5,3932X_2 - 5,1427X_3 - 0,0105X_4$	0,9235	0,6305	0,8860	0,4427	2,1686

The best score has been obtained by H Trade, which has a value over 2,05, being in non-bankrupt zone, but the other 4 companies are in incertitude zone, P Com and V Com being near limit of zero.

Therefore, comparing these two Romanian models with the international models presented before, I conclude that the level of precision of Romanian models is lower, because Bailesteanu model and Anghel model reflect that companies P Com and V Com obtained the worst score, but that companies are in an intermediary zone and not in a limited zone.

After the counting of financial indicators and of the non-financial analysis for these five companies, I have obtained next results for FDR model, presented in table 6.

**Table 6**  
**FDR score function for five feed distribution companies**

Indicators	E GROUP		P COM		S TRADE		V COM		H TRADE	
	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score
1. Current ratio	93,53%	5	104,74 %	6	96,08%	6	69,17%	4	28,93%	10
2. Quick ratio	66,21%	6	33,69%	3	86,46%	8	35,76%	3	82,34%	8
3. Solvability	6,03%	2	11,83%	3	11,09%	3	8,18%	2	23,08%	5
4. Financial ratio	87,87%	9	62,69%	7	68,73%	7	43,16%	5	43,16%	5
5. Interest coverage	198,59%	8	117,30 %	3	1139,23 %	10	113,36 %	2	519,73 %	10
6. Operating ratio	68,20%	9	144,54 %	7	190,86 %	5	98,85%	8	31,47%	10
7. Operating profit ratio	2,61%	3	2,18%	3	2,11%	3	2,76%	3	1,46%	2
8. ROE	65,04%	10	3,34%	1	46,71%	9	16,20%	3	27,42%	5
9. Productivity	303.156	5	592.860	10	359.433	6	200.132	3	194.551	2
10. Assets turnover	358,77%	8	201,14 %	4	129,56 %	2	212,08 %	4	662,45 %	10
11. Management quality	8 years	8	17 years	10	11 years	9	13 years	10	13 years	10
12. History of bank relations	Yes	8	Yes	10	Yes	9	Yes	10	Yes	10
13. History of state relations	Yes	8	Yes	10	Yes	9	Yes	10	Yes	10
14. Market conditions	Yes	8	Yes	10	Yes	9	Yes	10	Yes	10
15. Shareholders bonity	Yes	8	Yes	10	Yes	9	Yes	10	Yes	10
<b>TOTAL SCORE</b>		<b>105</b>		<b>97</b>		<b>104</b>		<b>87</b>		<b>117</b>
<b>BONITY CATEGORY</b>		<b>B</b>		<b>C</b>		<b>B</b>		<b>C</b>		<b>B</b>

V Com has obtained the worst result, more exactly 82 points, and the score increasing in 2008 to 87 points. Less than 100 point has obtained P

Com also, but S Trade and E are less over 100 points. The strongest company is H Trade, which obtained 117 points in 2008.

In table 7, I will present a comparison of the results for each of these five companies for five models.

**Table 7**

**Comparison of results for five score function**

Score	Altman	Holder	Bailesteanu	Anghel	FDR Model
H Trade	4,9857	0,0033	6,334	2,1686	117
S Trade	3,669	-0,1773	5,8326	0,886	104
E	3,2793	-0,0139	3,8358	0,9235	105
P Com	1,9305	-0,3485	2,8378	0,6305	97
V Com	1,7963	-0,1797	3,0147	0,4427	87

Therefore, the FDR model reflect that the strongest company is H Trade, which has obtained similar scores for each of the other four models we discussed about. Through FDR model, a medium score has obtained S Trade and E, result that are similar using Altman and Anghel function, but quite different using Holder or Bailesteanu function. FDR class P Com Company in C category, less under limit of 100 points and V Com Company, with only 87 points. The results are similarly more with Altman and Anghel model and less with Holder and Bailesteanu Model. We conclude that Altmal models remains one of the best international general models and Anghel model is quite relevant for Romanian feed distribution companies.

In conclusion, the three main differences between the votive models and this one are that the FDR model is for a specified branch – the feed distribution, it uses an important number of indicators and uses non-financial indicators, which explain the shareholders bonity.

In my work, I achieved an analysis of the bankruptcy risk, I tried to adjust Altman and Conan & Holder score functions to the existing realities in

Romania, specially in feed distribution branch. I found this adjustment necessary as their application in the case of Romanian companies leads to paradoxical results, not the converging ones.

The assessment of the risk that a company deals with can be made both by using the score functions (regarding this issue, the Romanian literature has enriched in the last years with several such instruments) and by using the degrees of operating and financial leverage. The bankruptcy risk, appreciated with the help of the score functions, is caused by factors located also in the operating and financial activity. Despite all these, a company may post a low score, sign of a bad financial state, but also a low level of the leverage coefficients, sign of a low operating and financial risk. It results that, in order to correctly appreciate the risk dimension that a company faces, the simultaneous use of these instruments must be made with precaution.

As directions to continue these investigations, I propose the elaboration of such models for other branches and to adjust the financial information with true dates.

## REFERENCES

- Altman E., Haldemon, Narayanan, Zeta Analysis (1977), "A new model to identify bankruptcy risk of corporations", *Journal of banking and finance*, June.
- Altman, Edward I. (2002), "Revisiting Credit Scoring Models in a Basel 2 Environment." *Finance Working Paper Series* . May. Stern School of Business.
- Anghel I. (2002), "*Falimentul, Radiografie și Predicție*", Editura Economică, București.
- Balcaen S., Ooghe H. (2006), 35 years of studies on business failure: an overview of the classic statistical methodologies and their related problems, *British Accounting Review*, 38, pp. 63–93.
- Bodie , Z., Merton (2000), R.C. *Finance*, Prentice Hall, Inc.
- Ciolacu O.S., (1996), Analiza situatiei economico-financiare a firmei, *Adevarul Economic*, no. 32-33. Caiete de Management, p. 4.
- Conan et Holder (1979), "Variables explicatives de performances et controle de gestion dans les P.M.I", Universite Paris Dauphine.
- Monthly statistical gazette 9/2008, [www.insse.ro](http://www.insse.ro)
- Niculescu, M. (1997), *Diagnostic global strategic*, Editura Economică, București.
- Pahone C. (2005), *Situatii financiare anuale*, Ed. Sedcom Libris, Iasi.
- [www.bizoo.ro](http://www.bizoo.ro)
- [www.mfinante.ro](http://www.mfinante.ro)