

MODEL OF RATING IN ENERGY INDUSTRY

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Abstract: *The latest findings evidenced rating as an additional safety measure in the capital market. The financial crisis which affected thousands of companies and banks imposed as a necessity that as well as the annual financial reports the company's rating be a listed at the stock exchange. Although a company's rating is established in advance by rating agencies many papers try to find ways of evaluating risk by particular applicable to a certain field. The research that we have conducted aligns itself with such model of research in the field of energy. The paper presents a way of rating energy companies based on an aggregate model with three components: own model, a model of aggregate bank and a model of credit scoring aggregate. The model thus constructed was tested on two energy companies, namely: OMV Petrom SA and Romgaz SA.*

Keywords: *Rating; Scoring; Banking; Liquidity; Bankruptcy.*

JEL classification: *G24; G32; G33.*

1. Introduction

The issue of companies' rating is widely debated in the literature and is considered a central component of financial management and financial decisions based on the rating. Thus, some authors consider that "modern and efficient management of an entity must be evaluated using financial performance criteria, covering on one side operational activity and on the other side the actual financial activity conducted over a period of time determined usually by the financial exercise. With respect to this, many analysts have designed and developed an assessment model of the entity's business based on score, a model that highlights the financial standing of the entity at some point in time" (Csegedi, et al, 2011: 341-347).

Other papers show that "financial policies trigger the company's financial strategies and they are part of the general strategy of the company. Also, the financial policies are applied through decisions grouped into three categories: operational decisions, investment decisions and financing decisions. The implementation of these decisions and their consequences may track the flow of funds, which is revealed by the cash flow" (Găban, 2015: 434-439).

The rating is "connect in most of cases, in the regional analysis, by the indicators of income which reflect a certain level of income and the extent to which local and regional government holds control over regional and local revenues. These ratios can be use in the regional rating models based on the income statement" (Bătrâncea, et al, 2013: 296 – 305).

Modelling rating companies in general, and companies in the energy industry in particular is a concern especially CRA products which provide signals to investors in the capital market in the direction in which it moves energy industry and default

economy. Therefore in this paper we built a three-level aggregate rating model, own model; an aggregate banking model and an aggregate credit scoring model.

2. Literature review

In an important paper referring to financial crises it shown that “during 2007-2008, market participants relied heavily on the ratings that credit rating agencies assigned to financial instruments, including mortgage-backed securities, to determine creditworthy investment options. As mortgage holders began to default on their loans and many highly rated securities lost value, the poor quality of these ratings became apparent” (White, 2009). Csegedi (Csegedi, et al, 2012: 195-198). In another paper indicates that the performance of an enterprise is “a component of rating and depends on its financial structure and shows how much its activity is financed by equity and how much by debt”

On the other hand the rating agencies “are important components of the market competition and provide valuable credit information about 3,000 corporate most of them is located in the US. That is why some authors developed a model that tries to approximate agencies’ ratings by using solely financial data. This class of models is usually called shadow rating models” (Cardoso, et al, 2013: 51 – 58).

Others researchers connect the ratings to the “Basle regulations, and consider that the rating analysis is based on some of the indicators used for the financial analysis and can determine the financial soundness of the company. The rating determined for a company, together with guarantees rating, fundamentals the decision of granting a credit and its cost (interest percent). In order to be valid, the rating system has to be a unitary rating system within the group and elaborated in accordance to Basel II regulations regarding the internal approach of the rating system” (Bătrâncea, et al, 2007: 80-83; Bătrâncea M., Bătrâncea L: 2006:56). An important step in building a “shadow rating model is mapping the ratings from international agencies to relevant default probabilities. That is why some authors favoured the unsecured long-term issuer ratings, since they do not take in consideration possible credit risk mitigates and are consistent with the Basel Accord II” (Cardoso, et al, 2013: 51 – 58).

Before the financial crisis, some analysts “defined credit scoring as a technique that helps credit providers to decide whether to grant credit to consumers or customers. In their model, on the one hand it illustrates the use of data mining techniques to construct credit scoring models and on the other hand it illustrates the combination of credit scoring models to give a superior final model” (Hian, et al 2006: 96-118). In the same period, in another paper it is studied “the influence of the state on the business cycle and on credit ratings based on a model of rating that takes into account some factors which measure the business and financial risks of firms, and in addition to macroeconomic conditions” (Amatoa and Furfineb, 2004: 2641–2677).

3. Methodology and Results

In the construction of the aggregate rating model we considered three levels of rating:

- ▶ own rating model with a share of 30% in the final rating;
- ▶ an aggregated model-based bank rating methodology: BCR - ERSTE, Transylvania Bank and BRD - GSG, with a share of 35% in the final rating and

- an aggregate scoring model based methodologies: Altman, Stickney and Ivoniciu and with a share of 35% in the final rating.

The rating is based on its rates of liquidity, profitability and activities of companies. Rates method used in this model is a technical financial analysis of companies and is used most often in the analysis of financial standing. Thus, some authors show that "ratio analysis is the method or process by which the relationship of items or group of items in the financial statement are computed, determined and presented. Ratio analysis can be used both in trend and static analysis" (Moscviciov, et al, 2010: 600 – 603). Other researchers consider that the "investors are concerned about the company's ability to generate, maintain and increase profits, and that is why rates are useful tools of analysis that summarize large amounts of data in a form easier to understand, interpret and compare" (Bătrâncea, et al, 2013: 846 – 856). An important role in building financial returns rates has the informational system which needs to "ensure also the evaluation of the company's liquidity, which depends on the cash-on-hand resources and on the cash-on-hand which will be generated by the operational cycle of the company. The company's ability of repeating this cycle depends on its short-term liquidity and on its capacity of generating cash-in-hand, which represents its working capital" (Bătrâncea, et al, 2010: 54 - 59).

Relying on rates method, we awarded five grades A, B, C, D and E by reasoning own and provisions BNR regulations, as follows: "Very Good" and "Good" grade A "Above average" and "Average" grade B "Below average" rating C, "Poor " rating D and "Very poor " grade E. Thus, our rating model has seven financial ratios presented below:

- Quick ratio = (Current assets – Inventories) / Current debts * 100;
- Solvency Ratio = Total assets / Total Liabilities * 100;
- Debt Ratio = Total debts / (Total debts + Equity) * 100
- Return on Equity= Net profit / Equity * 100
- Return on Assets = Net profit / Total assets * 100
- Gross Return on Sales = Gross profit / Net sales* 100
- Days of collection= receivables / net sales * 360

Among the bank rating models we selected the following banks: BCR- Erste Bank, Transylvania Bank and BRD-GSG Bank because they are within the top 3 in Romania in terms of the value of bank assets. Also, we chose the scoring models: Altman, Stickney and Ivoniciu which are representative for the energy industry.

The credit scoring method aims to "provide predictive models for assessing risk of failure of an enterprise and is based on statistical techniques of discriminate analysis of information provided by the transformation of economic and financial indicators in a score able to predict the success or failure of a business. The scoring function obtained allows the issuance of a value judgment which estimates the likelihood of risk occurrence in the analyzed firms, allowing distinguishing the healthy firms from the ones in difficulty" (Bătrâncea, 2011).

Then we shall Romgaz and OMV Petrom rating companies through the three models and finally we aggregate the results to get the rating for each analyzed year.

In our model scores are awarded for each financial rate based on a confidence interval of each financial ratio, as shown in the table below.

Table 1. Assigning scores in their rating model

Ratings	A	B	C	D	E
Indicators/ Points	5	4	3	2	1
Quick ratio	>130%	>100%	>75%	>50%	<50%
Solvency ratio	>300%	>250%	>200%	>150%	<150%
Debt ratio	<20%	<30%	<50%	>50%	>70%
Return on Equity	>17%	11-17%	6-10%	0-5%	<0
Return on Assets	>11%	8-11%	4-7%	0-3%	<0
Gross profit on sales	>18%	13-18%	9-13%	5-9%	0-5%
Days of collection	<30	30-45	45-60	60-90	>90
Scoring (points)	28-35	21-27	14-20	8-13	<=7

Source: Own calculus

After applying our rating model, the situation of the companies is as follows:

Table 2. The scoring based on the own model

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
OMV Petrom								
Points	26	22	21	22	25	26	29	22
Ratings	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>B</u>
Romgaz								
Points	30	28	27	27	28	30	28	30
Ratings	<u>A</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>

Source: Own calculus

The aggregate bank model generated is presented below.

Table 3. The evolution of the ratings-based on banking models

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
OMV Petrom								
BCR –Erste								
Points	0,79	0,79	0,79	0,85	0,79	0,85	0,79	0,79
Ratings	<u>B</u>	<u>B</u>	<u>B</u>	<u>C</u>	<u>B</u>	<u>C</u>	<u>B</u>	<u>B</u>
Transylvania Bank								
Points	33	32	32	33	32	33	35	34
Ratings	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>
BRD –GSG								
Points	46,00	43,00	40,00	43,00	48,00	43,00	46,00	46,00
Ratings	<u>A</u>	<u>A</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>
Total points	13	13	12	12	13	12	12	12
OMV-Petrom SA Banking Ratings	<u>A</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>B</u>
Romgaz								
BCR –Erste								
Points	0,51	0,51	0,51	0,51	0,51	0,51	0,51	0,51
Ratings	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>
Transylvania Bank								

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
Points	44	39	37	35	36	35	36	38
Ratings	A	B	B	B	B	B	B	B
BRD –GSG								
Points	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00
Ratings	A	A	A	A	A	A	A	A
Total points	15	14	14	14	14	14	14	14
ROMGAZ Banking Ratings	A	A	A	A	A	A	A	A

Source: Own calculus

The aggregate credit scoring for Romgaz and OMV Petrom is described below.

Table 4. The evolution of credit ratings based on scoring

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
OMV Petrom								
Altman Model								
Points	2,43	1,90	1,35	1,31	1,95	1,97	2,37	1,65
Ratings	B	B	C	C	B	B	B	C
Stickney Model								
Points	1,3908	0,8153	0,1095	-0,2814	-1,2683	-0,5883	-0,0672	-0,5259
Bankruptcy Probability	0,25398	0,34713	0,4788	0,55428	0,72762	0,61201	0,51301	0,60047
Ratings	B	C	C	D	E	D	D	D
Ivoniciu Model								
Points	5,7861	5,2388	5,0934	5,3618	6,5604	5,8231	6,6984	6,0329
Ratings	B	B	B	B	A	B	A	A
Total points	12	11	10	10	10	10	11	10
OMV Petrom SA credit scoring ratings	B	B	B	B	B	B	B	B
Romgaz SA								
Altman Model								
Points	4,13	3,56	3,49	3,63	3,11	3,49	2,98	3,71
Ratings	A	A	A	A	A	A	A	A
Stickney Model								
Points	14,4368	15,3059	13,5952	12,4937	6,6119	9,0955	9,6026	10,6807
Bankruptcy Probability	0,00001	0,00001	0,00003	0,00006	0,00593	0,00087	0,00059	0,00025
Ratings	A	A	A	A	A	A	A	A
Ivoniciu Model								
Points	13,6469	13,5205	12,3695	11,7580	11,4504	13,3477	12,9003	14,2630
Ratings	A	A	A	A	A	A	A	A
Total points	15	15	15	15	15	15	15	15
ROMGAZ SA Credit scoring ratings	A	A	A	A	A	A	A	A

Source: Own calculus

Next, we proceeded to the classification of each grade from three models labeled A to E, a rating category, with scores shown in the table below.

Table 5. Ratings and scores models

Rating Models	Ratings and scores				
1. Own Model	A	B	C	D	E
Scores assigned its own model	15-13	12-9	8-6	5-3	< 3
2. Banking model	A	B	C	D	E
Scores assigned banking model	15-13	12-9	8-6	5-3	< 3
BCR –Erste model	5	4	3	2	1
Transylvania Bank model	5	4	3	2	1
BRD-GSG model	5	4	3	2	1
3. Credit scoring model	A	B	C	D	E
Scores assigned credit scoring model	15-13	12-9	8-6	5-3	< 3
Altman model	5	4	3	2	1
Stickney model	5	4	3	2	1
Ivonicu model	5	4	3	2	1

Source: Own calculus

Ratings graded from A to E of the three partial models are weighed in the general model, with 30% for own model, 35% for banking model and 35% for credit scoring model, as follows:

Table 6. Ratings and rating models adjusted scores

Rating models and weights	Ratings and scores				
Own Model	A	B	C	D	E
Scores of ratings	5	4	3	2	1
Scores adjusted by 30%	1,50	1,20	0,90	0,60	0,30
Banking model	A	B	C	D	E
Scores of ratings	5	4	3	2	1
Scores adjusted by 35%	1,75	1,40	1,05	0,70	0,35
Credit scoring model	A	B	C	D	E
Scores of ratings	5	4	3	2	1
Scores adjusted by 35%	1,75	1,40	1,05	0,70	0,35

Source: Own calculus

Based on the scores obtained we have assigned the following ratings:

Table 7. Aggregate rating scale model

Scoring	Rating
5 – 4,75	AAA
4,50 – 4,74	AA+
4,49 – 4,00	AA-
3,99 – 3,75	A
3,74 – 3,50	BBB
3,49 – 3,00	BB-
2,99 – 2,75	BB+

Scoring	Rating
2,74 – 2,50	BB-
2,49 – 2,00	CCC
1,99 – 1,75	CC
1,74 – 1,50	C
1,49 – 1,00	D
< 1,00	E

Source: Own calculus

Following the calculations aggregate the rating for OMV Petrom SA is as follows:

Table 8. The aggregate rating of OMV Petrom SA

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
Own model	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>B</u>
Points	4	4	4	4	4	4	5	4
Pointsx30%	1,20	1,20	1,20	1,20	1,20	1,20	1,50	1,20
Banking model	<u>A</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>B</u>
Points	5	5	4	4	5	4	4	4
Pointsx35%	1,75	1,75	1,40	1,40	1,75	1,40	1,40	1,40
Credit scoring model	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>	<u>B</u>
Points	4	4	4	4	4	4	4	4
Pointsx35%	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40
Total scores	4,35	4,35	4,00	4,00	4,35	4,00	4,30	4,00
OMV Petrom SA Ratings	AA-	AA-	AA-	AA-	AA-	AA-	AA-	AA-

Source: Own calculus

On the other hand, the aggregate rating for Romgaz SA is as described below.

Table 9. The aggregate rating of ROMGAZ SA

Fiscal year	2007	2008	2009	2010	2011	2012	2013	2014
Own model	<u>A</u>	<u>A</u>	<u>B</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>
Points	5	5	4	4	5	5	5	5
Pointsx30%	1,50	1,50	1,20	1,20	1,50	1,50	1,50	1,50
Banking model	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>
Points	5	5	5	5	5	5	5	5
Pointsx35%	1,75	1,75	1,75	1,75	1,75	1,75	1,75	1,75
Credit scoring model	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>	<u>A</u>
Points	5	5	5	5	5	5	5	5
Pointsx35%	1,75	1,75	1,75	1,75	1,75	1,75	1,75	1,75
Total scores	5,00	5,00	4,70	4,70	5,00	5,00	5,00	5,00
ROMGAZ SA Ratings	<u>AAA</u>	<u>AAA</u>	<u>AA+</u>	<u>AA+</u>	<u>AAA</u>	<u>AAA</u>	<u>AAA</u>	<u>AAA</u>

Source: Own calculus

The summary of the results in tables 8 and 9 indicates the following:

Table 10. Summary results

Ratings	2007	2008	2009	2010	2011	2012	2013	2014
OMV-Petrom SA Ratings	AA-	AA-	AA-	AA-	AA-	AA-	AA-	AA-
ROMGAZ SA Ratings	<u>AAA</u>	<u>AAA</u>	<u>AA+</u>	<u>AA+</u>	<u>AAA</u>	<u>AAA</u>	<u>AAA</u>	<u>AAA</u>

Source: Own calculus

We note therefore that the rating aggregate for OMV Petrom is constant throughout the program period, while ROMGAZ, during the financial crisis, marks a decrease in the rating class from AAA to AA + and then starting with 2011 the rating returns to the AAA rating.

We find that although there are similarities in the marks obtained by various models, is remarkable and significant differences. Thus, the BRD model is rated A and B, while the model Stickney registered low ratings ranging from D and E for OMV Petrom SA. In total OMV Petrom SA has recorded eight AA- ratings. Analyzing the three models we see that ROMGAZ get 6 ratings AAA and two AA + ratings.

4. Conclusions and limitations of model rating

From the ratings presented in the modules above we note both similarities and differences between the analyzed companies. Thus from the rating models we find that in the evolution and structure of assets, OMV Petrom recorded a more favourable situation, with a higher value of total assets compared to ROMGAZ and has an accelerated growth rate. In the case of OMV the structure assets is of approximately 80% fixed assets, while Romgaz has only 60% of current assets.

The equity of the companies has an upward trend during period and the share of capital in total resources is 85-90% for OMV and 90% for Romgaz.

Also liquidity, solvency and performance have an impact on the ratings of the two companies. All these factors measured by financial ratios reflect positively or negatively on the rating of the two leading energy companies during the analyzed period, ROMGAZ having a constant evolution, as seen in the light of the criteria used in the financial model components of aggregate rating.

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