Comparative Study of the Analytical Methods of the Reliability of Economic Operator used by the Main Commercial Banks

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Abstract: *Credit activity involves taking risks related to the given loans and credit analysis must provide assurances that such risks may be accepted under certain risk conditions and warranties or risks are too high and significantly influence the financial position of the bank and assuming them is not recommended. Banks must ensure customer creditworthiness, which is defined as a state of confidence and expresses the quality of activity performed by it in a previous period, at present, especially in view, namely its ability to repay the loan at maturity and related interest. The development of models able to provide a fair and objective assessment of the financial and nonfinancial of the credit applicant is a major concern of banks both from theoretical and practical plan.*

Keywords: lending policies, system of indicators, financial standing, customer creditworthiness, quantitative indicators (measurable), qualitative indicators (non measurable)

JEL Classification: G00

1. Introduction

In banking practice, there is no unitary policy on lending policies of banking institutions, namely the system of indicators used by them to determine the financial standing of loan applicants, so that an economic operator can be classified in different performance categories, according to the requirement of conditions set by banks to grant loans.

In order to illustrate how to determine the credit worthiness of loan applicants, we will analyze a possible client of banks through the system of indicators analyzed by the major commercial banks to determine the credit rating based on quantitative indicators (measurable) and qualitative indicators (non measurable), which can form the basis of making lending decisions.

2. Determination of financial performance indicators by the method BCR Erste Bank, BRD- GSG and its Own Model

In order to achieve the comparative case study on analysis models on loan applicant 's credit worthiness used by major commercial banks, namely: BCR Erste Bank, Raiffeisen Bank and BRD -GSG and proposed model, we will consider the case of a trader, SC Sigma SA with production profile, a company with a good reputation both nationally and internationally, whose object is implementation, upgrading, reconditioning of mechanical equipment for power packs as well as manufacture of equipment for metallurgy. Not incidentally we selected for the study case, a trader in the production industry, which has a special importance in creating added value and hence in the development of national economy in order to identify the eligibility criteria set by banks analyzed on access to finance of this type of credit applicant.

The evolution of this market segment is marked by some events, namely: the need for companies in the production of electricity and heat to periodically repair facilities under current programs of maintenance and repair, the need of Romanian energy industry to apply new techniques in order to improve and comply with national and international standards.

Since the company is an entropic system, subject to influence both of internal and external factors, to estimate the financial performance it is necessary to look at the analysis made by the bank in addition to non-financial criteria and calculation and interpretation of quantitative indicators to be determined based on information from the balance sheet and profit and loss account in order to determine the final credit rating.

This case study is to determine Sigma SA client's credit worthiness in terms of analysis systems of the main players in the banking market, namely: BCR Erste Group, BRD – GSG and Own Model.

- **Determination of financial performance indicators by the method BCR Erste Bank**

BCR Erste Bank considers the customers who use credit into a category of performance according to the scoring of measurable criteria in conjunction with the analysis results of quantifiable criteria. Financial indicators (measurable) used by BCR Erste Bank for the company Sigma SA are presented in Table no.1:

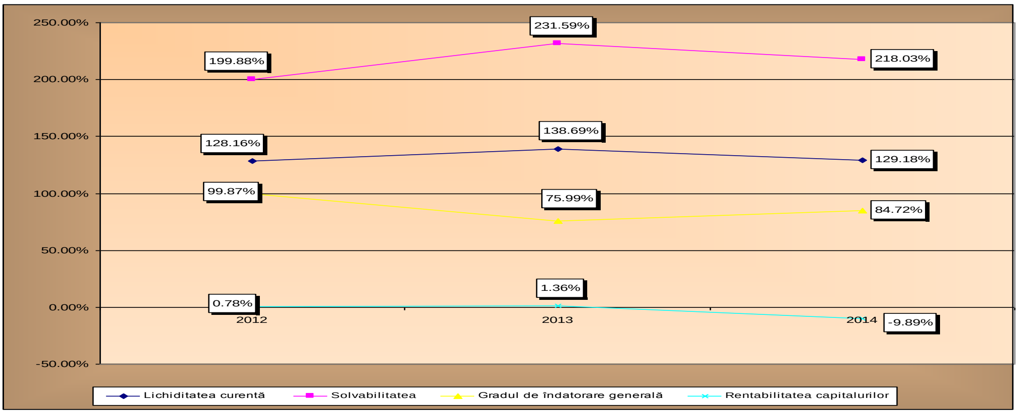
Table 1. The evolution of the company Sigma SA according to the model establishing the customer creditworthiness used by BCR Erste Bank (Lei)

No.	Denomination of indicator/Year	2012	2013	2014
1	Assets	5.735.056	6.099.240	5.635.798
2	Equity	6.272.872	7.088.502	6.438.706
3	Floating assets	6.818.284	6.375.963	6.258.126
4	Stock	3.874.238	3.569.409	3.955.558
5	Advance expenditures	0	0	0
6	Current assets (3+5)	6.818.284	6.375.963	6.258.126
7	Total assets (1+6)	12.553.340	12.475.203	11.893.924
8	Debts < 1 year	5.319.972	4.597.164	4.844.344
9	Income in advance	0	0	0
10	Current debts (8+9)	5.319.972	4.597.164	4.844.344
11	Debts > 1 year	919.292	748.333	569.670
12	Provisions	41.204	41.204	41.204
13	Total debts (10+11+12)	6.280.468	5.386.701	5.455.218
14	**Turnover**	**11.023.749**	**9.038.628**	**10.198.938**
15	Gross result of financial year	49.421	97.074	-636.850
16	**Current liquidity (3:8)**	**128,16%**	**138,69%**	**129,18%**
17	**Solvency (7:13)**	**199.88%**	**231.59%**	**218.03%**
18	**Overall indebtedness (13:2)**	**99.87%**	**75.99%**	**84.72%**
19	**Return on equity (15:2)**	**0.78%**	**1.36%**	**-9.89%**

Source: Own calculations based on data from balance sheet and profit and loss account of SC Sigma SA

Evolution of financial indicators used by BCR Erste Bank in making the lending decision is presented in chart no. 1.

Chart no.1. ***Evolution of quantitative indicators calculated by BCR Erste Bank for the client Sigma SA*** *(%)*



Source: Projection based on data from its own balance sheet and profit and loss account of SC Sigma SRL

Analysing the evolution of indicators presented in the chart 1, the following conclusions can be drawn :

- the company has the ability to convert floating assets into cash to pay its short-term debts; this aspect results from the fact that the economic operator has a good situation in terms of *current liquidity*, even if the trend of the indicator is oscillating, registering an increase of approx.8% in 2013 (138.69 %) compared with 2012 (128.16 %), when the indicator reveals a high liquidity, then in 2014 (129.18 %) again to record a decrease of approx.6.8 % compared to 2013, when the current liquidity is considered a good one. Fluctuations of the indicator may be due to the following factors: • irregular supply of raw materials ; • jumps in sales ; • fluctuations in short-term loans. Fluctuations can be avoided by adjusting the supply of raw materials based on sales or through proper marketing. It would also be appropriate to give up credits to cover the differences recorded between the duration and payment of suppliers and customers during collection, the company can call on trade credit from suppliers, but by negotiation without affecting the working relationship with them.The branch the client operates in, liquidity problem is more sensitive and as such, it requires proper management;

- *solvency* reflects general capacity of the company to transform all its assets in money to pay the debts. By analyzing this indicator, banks seek shareholders' share of co-participation in debt financing. The analysed company registers very good values of reliability, even if for this indicator the trend is oscillating, values hovering well above the best level acceptable to backer in the sector in which the client operates, namely 130 %.The observed values of this indicator for the client under analysis are of 199.88 % in 2012 , rising to 231.59 % in 2013 , a slight decrease in 2014 (218.05 %) on account of disposal of fully depreciated equipment and equipment which no longer corresponded to use in the production process. Higher values of this indicator for SC Sigma SA are due to the fact that it has tended to accumulate assets as part of the " definite wealth " of the company, leading to a high value of total assets;

- *indebtedness ratio* represents a ratio of total debt of the company and equity. Banks shall ensure that this indicator does not exceed 100 % , in order to maintain the company's debt level to a funded level. Analyzing the values recorded by the indicator, indebtedness, it can be concluded that SC Sigma SA has made very good values in the time frame under review. The trend of the indicator is a swinging one, with values of 99.87 % in 2012, dropping to 75.99 % in 2013, due to the decrease of total debt volume, slightly increasing to 84.72 % in 2014 based on the decrease in the volume of fixed assets, maintaining debt volume around the value recorded in 2013. In all three analyzed periods the share of total debt, recorded by SC Sigma SA, lies below 50 % (maximum accepted), respectively (49.5 % in 2012, 43.2 % in 2013 and 48.2 % in 2014);

- *profit level* is relatively low in 2012 and 2013, in 2014 the company recording loss from operations as a result of lower margin obtained from commercial contracts, due to competitive pressure on product prices that the company has participated in some auctions organized by the beneficiaries. The gross final results of the analysis period were affected by the financial result, financial income being 5-6 times lower than the financial costs. Levels of the gross financial years have negatively influenced the profitability indicators of capital which in turn have been low, unsatisfactory, namely 0.78 % in 2012, 1.36 % in 2013 and -9.89 % in 2014, indicating low and unstable profitability. The company must take urgent measures to improve profitability by identifying new beneficiaries to negotiate contracts that ensure the company comfortable profit margin , reduce production costs by identifying new suppliers to negotiate better commodity prices for raw materials and materials necessary for the production, rehabilitation and modernization of a part of the technical and material basis (machinery and equipment) with impact on reducing production costs, reducing operating expenses of the company.

Determination of credit rating for the company Sigma SA in 2012-2014 , according to the scoring obtained from the analysis of financial and nonfinancial criteria is shown in Table nr.2 .

Table 2. Determination of credit rating for the company Sigma SA in 2012-2014 according to the model establishing customer creditworthiness used by BCR Erste Bank *(percents)*

No.	**Rated indicators**	**Specific weight**	**2012**	**2013**	**2014**
1	Trend of turnover	0,1	2	4	3
2	Current asset liquidity	0,06	1	1	1
3	Patrimonial solvency	0,07	2	1	2
4	Profitability expressed as return on equity	0,08	4	4	5
5	Indebtedness degree	0,06	1	1	1
6	Share of exports in turnover	0,02	2	2	2
7	Source of repayment	0,1	2	2	2
8	Quality of shareholders	0,08	2	2	2
9	Quality of management	0,1	1	1	1
10	Eligibility conditions	0,09	2	2	2
11	Market conditions in which they operate	0,09	2	2	2
12	Business strategy	0,08	2	2	2
13	Reality of accounting reports	0,03	2	2	2
14	Received collaterals	0,04	2	2	2
	Weighted score	**-**	**1.98**	**2.11**	**2.16**
	Credit category	**-**	**In observation**	**In observation**	**In observation**
	Performance category	**-**	**B**	**B**	**B**

Analysis of financial indicators in conjunction with the analysis of weighted non-financial criteria with the specific weight allocated to each indicator leads to the determination of customer's creditworthiness that is a very important element in making the decision lending.

CR_{2012} = 0,1x2 + 0,06x1 + 0,07x2 +0,08x4+ 0,06x1 + 0,02x2 + 0,1x2 + 0,08x2 + 0,1x1 + 0,09x2 + 0,08x2 + 0,09x2 + 0,03x2 + 0,04x2 = **1,94**

CR_{2013} = 0,1x4 + 0,06x1 + 0,07x1 + 0,08x4 + 0,06x1 + 0,02x2 + 0,1x2 + 0,08x2 + 0,1x1 + 0,09x2 + 0,08x2 + 0,09x2 + 0,03x2 + 0,04x2 = **2,07**

CR_{2014} = 0,1x3 + 0,06x1 + 0,07x2 + 0,08x5 + 0,06x1 + 0,02x2 + 0,1x2 + 0,08x2 + 0,1x1 + 0,09x2 + 0,08x2 + 0,09x2 + 0,03x2 + 0,04x2 = **2,12**

Taking into account the quantitative and qualitative indicators used in the analysis of BCR Erste Bank, the company Sigma SA was classified as **B performance category** (**under observation)** within the analysis period 2012-2014, category which includes loans to customers with good or very good financial performance but they cannot maintain this level in a longer term perspective.

The Bank will finance the company under the conditions of a relatively higher risk premium, which is why the client is imposed some restrictive credit condition , which will be included in the credit agreement and may include: maintaining bank predetermined levels of key indicators, namely: turnover, indebtedness degree, leveraged financial debt and interest coverage, the restriction to hire loans to other banks without prior agreement of BCR Erste Bank, as well as personal guarantees endorsement, consisting of promissory notes by manager of the company and shareholders of the company.

- **Determination of financial performance indicators by the method BRD – GSG**

In the case of the company Sigma SA the situation of creditworthiness indicators calculated by BRD- GSG, in the last three years is shown in Table no.5:

Table 5. Evolution of indicators of the company Sigma SA according to the model used by BRD-GSG in establishing customer creditworthiness *(Lei)*

No.	Denomination of indicator/year	2012	2013	2014
1	Assets	5.735.056	6.099.240	5.635.798
2	Equity	6.272.872	7.088.502	6.438.706
3	Floating assets	6.818.284	6.375.963	6.258.126
4	Stock	3.874.238	3.569.409	3.955.558
5	Advance expenditures	0	0	0
6	Current assets (3+5)	6.818.284	6.375.963	6.258.126
7	Total assets (1+6)	12.553.340	12.475.203	11.893.924
8	Debts < 1 year	5.319.972	4.597.164	4.844.344
9	Income in advance	0	0	0
10	Current debts (8+9)	5.319.972	4.597.164	4.844.344
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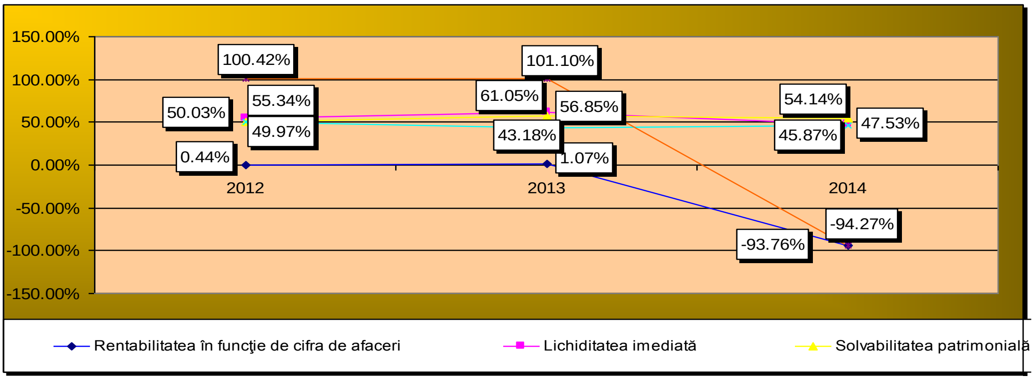
12	Provisions	41.204	41.204	41.204
13	Total debts (10+11+12)	6.280.468	5.386.701	5.455.218
14	**Turnover**	**11.023.749**	**9.038.628**	**10.198.938**
15	Gross result of financial year	49.421	97.074	-636.850
16	Total incomes	11.669.924	8.828.461	10.486.481
17	Total expenditures	11.620.503	8.731.387	11.123.331
18	**Profitability based on turnover (15:14)**	**0,44%**	**1,07%**	**-93,76%**
19	**Immediate liquidity (6-4):10**	**55,34%**	**61,05%**	**47,53%**
20	**Patrimonial solvency (2:7)**	**49,97%**	**56,85%**	**54,14%**
21	**Indebtedness (13:7)**	**50,03%**	**43,18%**	**45,87%**
22	**Coverage of costs of revenues (16:17)**	**100,42%**	**101,1%**	**-94,27%**

It can be seen that indicators calculated by BRD -GSG had fluctuated during the time under review.

Graphically, the development of indicators computed by BRD-GSG for SC Sigma SA is shown in the following figure:

Chart no.3 ***Evolution of quantitative indicators calculated by BRD-GSG for the client Sigma SA*** (%)



Source: own projection based on data from balance sheet and profit and loss account of SC Sigma SRL

Depending on the scores given by the bank for each level of selected indicators, we can follow the classification of the company Sigma SA in performance categories previously described in Chapter 3, as follows:

Table 4. Determination of credit rating for the company Sigma SA in 2012-2014 according to the model used by BRD-GSG *(percents)*

Indicators	**2012**	**2013**	**2014**
1. Patrimonial reliability	8	10	10
2. Indebtedness	5	8	8
3. Immediate liquidity	2	2	0
4. Profitability based on turnover	2	2	0
5. **Coverage of costs of revenues**	8	8	0
Total score	**25**	**30**	**18**
Performance category	**C**	**B**	**C**
Credit category	**Below standard**	**In observation**	**Below standard**

After giving scoring we notice the damage of perofrmance categories for the company Sigma SA, which in the case of the method for setting the indicator of creditworthiness by BRD-GSG situates this client in performance categories C in 2012 and 2014, with an improvement of performance category in 2013. This unfavorable evolution is mainly due to illiquid and oscillating evolution of this indicator in the considered period.

Analysing the evolution of the indicator ”reliability according to turnover”, we notice that the values are unsatisfactory, the cause being represented by the result of very low operating activities in 2012 and 2013 and the loss incurred by the company from operating activities in 2014. This result is due to the fact of spending growth was faster than revenues, highlighting the low marginal productivity in the years 2012 and 2013, culminating with the loss in 2014 ,determined by advancing the level of total expenditure to total revenue.

In conclusion, according to the model for determining the credit rating of BRD - GSG, in the period under review the company SC Sigma SA falls in performance categories B in 2013, when the company reported a slight revival, but in 2012 and 2014, the financial situation of the company has deteriorated gradually, sliding to performance category C with unfavorable prospects, which can highlight serious difficulties in repaying credit and current interest rates.

- **Own model for the quantitative and qualitative evaluation of the loan applicant Sigma SA**

Referring to a previous case study on determining credit rating according to the rating systems used by the commercial banks : BCR Erste Bank, Raiffeisen Bank and BRD- GSG, we propose below to deepen research by proposing a Model for analyzing the creditworthiness of clients which can be used by commercial banks to assess the financial standing of customers seeking loans.

Table 5. Model proposed for assessing the creditworthiness of a loan requesting customer

Indicators	Grade	Score	Weighting coefficient
1.Current liquidity	- under 100%	0	2
	- between 100-120%	1	
	- between 120-150%	2	
	- over 150%	3	
2.Patrimonial reliability	- under 100%	0	2
	- between 100-120%	1	
	- between 120-150%	2	
	- over 150%	3	
3.Interest cover	- between 0-1	0	2
	- between 1-2	1	
	- over 3	2	
4.Overall indebtedness	- over 100%	0	2
	- between 60-100%	1	
	- under 60%	2	
5.Financial reliability	- under 0%	0	2
	- between 0-10%	1	
	- between 10-30%	2	
	- between 30-50%	3	
6.Turnover	- under 4.500.000 lei	1	2
	- between 4.500.000-65.000.000 lei	2	
	- between 65.000.000 – 220.000.000 lei	3	
7. Gross result of financial year	- loss	0	2
	- under 100.000-1.000.000 lei	1	
	- between 1.000.000-5.000.000 lei	2	
	- over 5.000.000 lei	3	
8.Activity sector	- unsustainable sector	0	1
	- weak perspective	0,5	
	- good development perspective	1	
9. The position of the company in the branch	- reduced capacity	0	1
	- average capacity	1	
	- great capacity to influence the market	1,5	
10. Market size	- local	1	1,5
	- national	2	
	- international	3	
11. Situation from the	- weaker	0	1,5
	- comparable	1	

competition	- better	2	
12. The relationship with the bank	- weak	0	1,5
	- new client	1	
	- good	3	
13. Dependence on customers	- critical (if a customer represents more than 50 % of claims)	0	1,5
	- high (if a customer represents more than 25 % of claims)	1	
	- reduced	2	
14. Dependence on suppliers	- critical (if a supplier is more than 50 % of debt providers)	0	1,5
	- high (if a supplier is more than 25 % of debt providers)	1	
	- low	2	
15.Assessment of financial situations	- unknown, financial statements non accompanied by the opinion of an external auditor	0	1,5
	- financial statements accompanied by the opinion of an external auditor	1	
	- financial statements audited by one of the five largest recognized audit companies (PWC, EY, KPMG,DELOITE,BDO)	2	
16. Risk of ownership	- high	0	1,5
	- average	1	
	- low	2	
17.Management quality	- satisfying	0	1,5
	- good	1	
	- very good	2	

Following the granting of the scores for each quantitative and qualitative indicator, the customer is classified in the appropriate performance category, according to the table below:

Table 6. Framing the credit on performance categories according to the proposed Model for determining credit ratings

Scoring Scoring	Financial performance	Credit type
Over 60 points	A	Standard
Between 45,1-60 points	B	In observation
Between 30,1-45 points	C	Below standard
Between 20,1-30 points	D	Doubtful
Below 20 points	E	Loss

To illustrate the proposed model, we will determine the credit rating for the company Sigma SA, according to the evaluation criteria presented in the table below:

Table 7. Determination of credit rating for the company Sigma SA in 2012-2014 according to the proposed the model *(percent)*

Criteria	Specific weight	2012	2013	2014
1.Current liquidity	2	2	2	1
2.Patrimonial reliability	2	3	3	3
3.Interest cover	2	1	1	0
4. Overall indebtedness	2	1	1	1
5. Financial reliability	2	1	2	0
6.Turnover	2	2	1	2
7. Gross result of financial year	2	1	1	0
8.Activity sector	1	1	1	1

9. The position of the company in the branch	1	1	1	1
10.Market size	1,5	3	3	3
11. Situation from the competition	1,5	2	2	2
12. The relationship with the bank	1,5	3	3	3
13. Dependence on customers	1,5	2	2	2
14. Dependence on suppliers	1,5	2	2	2
15. Assessment of financial situations	1,5	1	1	1
16. Risk of ownership	1,5	2	2	2
17. Management quality	1,5	2	2	2
Weighted score	**-**	**50**	**50**	**39,5**
Credit category	**-**	**In observation**	**In observation**	**Below standard**
Performance category	**-**	**B**	**B**	**C**

Credit rating according to the proposed model is determined by summing the scores between 1 and 3 points assigned to calculated quantitative and qualitative indicators. As shown in the table no.9, quantitative indicators have a weight of up to 42 % of the total score, while qualitative indicators were allocated a maximum rate of 58 %.This demonstrates the growing importance given to non-financial aspects in making the decision regarding the credibility of customer as psychological element, essential to the formation of the Bank's beliefs on moral qualities and professional management of its customers, but also other aspects related to customer market, sector of activity, its position relative to the competition, customers and suppliers portfolio and customers dependence of credit requesting customer but also to its suppliers.

The final score given according to the values of the financial and nonfinancial indicators determines the classification of the borrower in performance category B in 2012 and 2013, but in 2014 the company's financial situation deteriorated falling in performance category C, with negative perspectives, which can highlight serious difficulties in repaying credit and current interest rates.

Table 8. Framing client in performance classes after determining credit rating according to the presented models

	2012	**2013**	**2014**	**Weight indicators**
BCR	B- In observation	B- In observation	B- In observation	50% quantitative indic. 50% qualitative indic.
BRD	C-Below standard	B- In observation	C-Below standard	100% quantitative indicators
Proposed model	B- In observation	B- In observation	C-Below standard	42% quantitative indicators 58% qualitative indicators

3. Conclusions

In conclusion, the purpose of determining internal credit rating is to ensure fair representation of credit risk in the loan portfolio of a bank and meet Basel II criteria ;

- credit rating is the basis for approval or rejection of loan applications and subsequently for continuous monitoring of the efficiency - risk relationship on each industry and each client;

- we consider that the banks should give more importance to **nonfinancial analysis** in client selection, on the one hand by taking into account a larger number of qualitative indicators and on the other hand by increasing the weight of qualitative criteria in the total client weighted risk;
- improving the quality of the loan portfolio by determining the credit rating is essential for the Bank to carry out sustainable and successful business.Therefore it is necessary that the credit decision process to pay particular attention to both customer creditworthiness analysis and overall assessment of credit risk based on financial indicators .

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