

Use of financial analysis for credit rating of enterprises applying for a loan

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Abstract

The paper deals with a method of financial analysis applied by bank institutions in the Czech Republic used for assessment of reliability and solvency of a client applying for a loan. Clients are scored by financial ratios of financial analysis and according to the total sum a letter ranged from A to G is assigned. Further, the paper assesses 81 engineering and 112 construction enterprises according to the above mentioned methodology. An evaluation of the development of reliability and solvency in both sectors is discussed as well.

Keywords: bank, loan, business, financial analysis, reliability and solvency

Introduction

Credit risk is the risk of possibility of the client or bank partner's failure to meet obligations of the transaction and a bank's loss due to such failure (Revenda 2005). The financial ratio methods of the financial analysis assessing the profit/loss of the client (credit applicant) allow banks to evaluate the applicant's scoring. Each bank employs its own method of financial health evaluation. However, these methods are based on the same principle and their results are approximately the same. The paper discusses concrete examples of the credit score calculation and its development in the sample of eighty one engineering and one hundred twelve construction enterprises in the 7-year period between 2000 – 2007.

Methodology and aim

Assessing the financial health is based on the balance sheet and the profit loss statement items. The analysis uses the following financial analysis ratios: current ratio (%), cash ratio (%), debt-to-equity ratio (%), debt ratio (%),

return on sales (%), return on assets (%), average collection period (days), inventory turnover ratio (days), interest coverage (days) and equity. After the calculation a score of the ratio is assigned according to the conversion table (table 1).

Table 1: Sample methodology of client's financial health evaluation

Indicator	Interval		Score	Indicator	Interval		Score
	From	To			From	To	
Cash ratio (%)	0	40	-50	Current ratio (%)	0	100	-30
	40	60	-30		100	110	-15
	60	80	0		110	120	0
	80	100	15		120	140	10
	100	120	35		140	150	20
	120		50		150		30
Debt-to-equity ratio (%)	0	110	50	Debt	0	70	35
	110	160	30		70	90	15
	160	210	0	ratio (%)	90	130	0
	210	250	-30		130	150	-15
	250		-50		150		-35
Return on sales (%)		loss	-40	Return on assets (%)		loss	-35
	0	2	-20		0	3	-15
	2	4	0		3	6	0
	4	6	20		6	9	15
	6		40		9		35
Average collection period (days)		30	20	Inventory turnover ratio (days)	0	20	20
	30	60	10		20	40	10
	60	90	0		40	60	0
	90	120	-10		60	90	-10
	120		-20		90		-20
Interest coverage (days)	0	1	-50	Equity (adjusted in mil. CZK)		0	-15
	1	2	-25		0	1	0
	2	3	0		1	10	5
	3	4	25		10	100	10
	4		50		100	1,000	15
					1,000		20

Source: internal materials of a bank, not available for public use

According to the total score based on the sum of financial analysis ratios, a degree of client's reliability and solvency is assessed and further dealt with by bank managers. Table 2 shows that the assessment is rated in seven degrees from A to G.

The financial assessment of the credit applicant is not the only factor used in decision-making. Other factors such as a business sector, market in which a client participates, sensitivity of input prices and development of output

Table 2: Assessment of the reliability and solvency

Degree of reliability	A	B	C	D	E	F	G
Score range	Above 350	151 to 350	1 to 150	0 to -150	-151 to -300	-301 to -450	Less than -450

Source: internal materials of a bank, not available for public use

prices, are taken into account as well. However, the above mentioned simplified financial analysis is the most important as it has the highest score and it means that in fact it decides about the success of the credit application.

The paper assesses the engineering and construction companies. Data were purchased from PhD. grant co-ordinated by Ing. Petr Zeman at the University of South Bohemia, Faculty of Economics.

Results and discussion

A simplified financial analysis used by a bank for an assessment of credit application is outlined within the data of a sample enterprise from the region of South Bohemia (Czech Republic).

The profit and loss statement included the following data (in thousand CZK):

Financial assets (FA)	5,314 thou.CZK
Short-term receivables up to maturity date (STR)	8,249 thou.CZK
Short-term liabilities (STL)	12,711 thou.CZK
Current assets (CA)	34,750 thou.CZK
Receivables and other liabilities (RAL)	47,979 thou.CZK
Share capital (SC)	44,000 thou.CZK
Bank loans and assistance (BLA)	14,046 thou.CZK
Issued bonds (IB)	0 thou.CZK
Equity (E)	62,385 thou.CZK
Profit/loss from operations (PLO)	3,608 thou.CZK
Sales (S)	66,314 thou.CZK
Ordinary income (OI)	1,600 thou.CZK
Extraordinary income (EI)	-759 thou.CZK
Total Assets (TA)	110,364 thou.CZK
Accounts receivables (AR)	9,910 thou.CZK
Inventory (I)	18,227 thou.CZK
Income before tax (IBT)	2,163 thou.CZK
Interest expense (IE)	2,008 thou.CZK

A calculation of financial analysis ratios necessary for the assessment of reliability and solvency followed. The following financial analysis ratios were calculated [1, 2, 3]: cash ratio in % (CAR), current ratio in % (CUR) debt-to-equity ratio in % (DER), debt ratio in % (DR), return on sales in % (ROS),

return on assets in % (ROA), average collection period in days (ACP), inventory turnover (IT), interest coverage in days (IC) and adjusted equity (AE).

A specific calculation of financial analysis ratio and assessment according to table 1:

Cash ratio in %	$CAR = \frac{FA + STR}{STL} * 100 = 106.70$	35 points
Current ratio in %	$CUR = \frac{CA}{STL} * 100 = 273.38$	30 points
Debt-to-equity ratio in %	$DER = \frac{RAL}{SC} * 100 = 109.04$	50 points
Debt ratio in %	$DR = \frac{BLA + IB}{E} * 100 = 22.51$	35 points
Return on sales in %	$ROS = \frac{PLO}{S} * 100 = 5.44$	20 points
Return on assets in %	$ROA = \frac{OI + EI}{TA} * 100 = 0.76$	–15 points
Average collection period in days	$ACP = \frac{AR}{S} * \text{number of days} = 54.5$	10 points
Inventory turnover in days	$IT = \frac{S}{I} * \text{number of days} = 100.59$	–20 points
Interest coverage in days	$IC = \frac{IBT + IE}{IE} = 2.07$	0 points

Total score of financial analysis ratios amounted to 145 points, i.e. the C-grade in the assessment of reliability and solvency of the client.

Table 3 and 4 revealed the distribution of the development of reliability and solvency of engineering and construction enterprises in 2000 – 2007. It is obvious that no enterprise either in the engineering or in the construction sector had the greatest score (the A-grade) in any year of the research. On the contrary, there were two cases of the lowest score (the F-grade) in the engineering sector in 2005 and in 2007. In both cases, the same enterprise was scored (Ingersoll – REM CR, s. r. o.). Regarding construction enterprises, there were three enterprises with the lowest score; one in 2005 and two in 2007. The F-grade is unusual and not typical within both sectors.

Table 4: The reliability and solvency of construction enterprises in 2000 – 2007

Table 3: The reliability and solvency of engineering enterprises in 2000 – 2007

	2000	2001	2002	2003	2004	2005	2006	2007
A	0	0	0	0	0	0	0	0
B	30	31	27	27	21	25	26	28
C	26	28	31	36	31	22	29	34
D	17	14	15	13	29	27	24	14
E	1	4	5	2	4	4	1	0
F	0	0	0	0	0	1	0	1
N.S	7	4	3	3	5	2	1	4
Total	81	81	81	81	81	81	81	81

Source: own calculation

	2000	2001	2002	2003	2004	2005	2006	2007
A	0	0	0	0	0	0	0	0
B	52	47	39	31	30	48	31	36
C	33	42	39	40	48	28	36	43
D	18	17	21	30	26	24	38	21
E	0	1	0	2	0	10	2	0
F	0	0	0	0	0	1	0	2
N.S	9	5	13	9	8	1	5	10
Total	112	112	112	112	112	112	112	112

Source: own calculation

The distribution of reliability and solvency of engineering enterprises showed an increase of the C-grade in 2000 – 2004 at the expense of the D-grade and also the B-grade in part. In 2004, a significant decrease of the profit of engineering enterprises appeared followed by a massive shift into the D-grade at the expense of the B and C grades. This decreasing tendency was not confirmed in the following years as the D-grade weakened in comparison with the increase of the B and C grades.

The development of reliability and solvency of construction enterprises was different. In 2000 – 2004, the decrease of the number of enterprises with the A-grade was almost linear; the contrary increase of the number of enterprises with the C and D grade appeared. A massive transition from the C-grade to the B-grade appeared in 2005 while the D-grade remained almost unchanged. Since 2005, the profit of enterprises significantly improved as there was an increase of enterprises with the B and C grades and a decrease of the D-grade (the most significantly in 2007).

Table 5 showed absolute changes in the assessment of reliability and solvency in 2000 – 2007. The vertical axis corresponded to the assessment in 2000; the horizontal corresponded to the shift in the assessment in 2007. Enterprises located below the coloured line are those whose assessment of the reliability and solvency by the financial analysis was improved. On the other hand, enterprises located above the line declined compared to 2000. As seen

in table 5, the profit increased in 20 enterprises compared to 18 enterprises with a decrease of profit. Due to such an almost balanced score any conclusion regarding the increase or decrease of the engineering sector can not be made. The majority of enterprises did not report any change of their score.

Table 5: Absolute changes in score of engineering enterprises in 2000 – 2007

	A	B	C	D	E	F	G
A	0	0	0	0	0	0	0
B	0	14	11	3	0	0	0
C	0	7	12	4	0	1	0
D	0	4	8	5	0	0	0
E	0	0	0	1	0	0	0
F	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0

Source: own calculation

Table 6 showed a significant calculation as presented in table 5; however the assessment is relative regarding the year 2000. As an example, the second line means that within the B-grade score, 50 % of enterprises kept its position while 39.28 % shifted to the C-grade and 10.71 % shifted even to the D-grade.

Table 6: Relative changes in score of engineering enterprises in 2000 – 2007

	A	B	C	D	E	F	G
A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
B	0.00%	50.00%	39.28%	10.71%	0.00%	0.00%	0.00%
C	0.00%	29.17%	50.00%	16.67%	0.00%	4.17%	0.00%
D	0.00%	0.23529	0.47059	29.41%	0.00%	0.00%	0.00%
E	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
F	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
G	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Source: own calculation

Table 7 revealed absolute changes in the scoring of construction enterprises. 10 enterprises improved their score (below the line), 27 enterprises shifted from their position. A certain decline of the situation in the construction sector in 2007 compared to 2000 is obvious; on the other hand figure 2 reported a positive tendency of the development in this sector.

Table 8 reported that more often there were no changes of scoring of construction enterprises compared to the engineering sector. The value above 70 % appeared two times on the diagonal axis, i.e. more than 70 % with the C and the D grade remaining with the same score.

Table 7: Absolute changes in score of construction enterprises in 2000 – 2007

	A	B	C	D	E	F	G
A	0	0	0	0	0	0	0
B	0	26	19	5	0	1	0
C	0	5	22	2	0	1	0
D	0	3	2	14	0	0	0
E	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0

Source: own calculation

Table 8: Relative changes in score of construction enterprises in 2000 – 2007

	A	B	C	D	E	F	G
A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
B	0.00%	50.98%	37.25%	9.80%	0.00%	1.96%	0.00%
C	0.00%	16.66%	73.33%	6.66%	0.00%	3.30%	0.00%
D	0.00%	15.78%	10.52%	73.68%	0.00%	0.00%	0.00%
E	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
F	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
G	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Source: own calculation

Conclusion

The assessment of the reliability and solvency by the financial analysis is an important factor of the decision making in the process of authorizing a loan. Engineering and construction enterprises were assessed according to the methodology of a bank. There was a similar development in both sectors – a decrease of enterprises with a good-quality score (the B-grade) to 2004 and a reverse and boost of this score in the following year. The bank methodology revealed that engineering and construction enterprises ranged an average of better scores (B, C and D grades).

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Výsledovky a rozvahy – 81 engineering and 112 construction enterprises

Použití finanční analýzy pro úvěrové hodnocení podniků žádajících o úvěr

Příspěvek se zabývá metodou finanční analýzy používanou bankovními institucemi v České republice pro posouzení spolehlivosti a solventnosti klienta žádajícího o úvěr. O klientech jsou zaznamenány poměrové ukazatele finanční analýzy a na základě celkového součtu je přiřazeno hodnocení v rozmezí od A do G. Příspěvek taktéž hodnotí 81 strojírenských a 112 stavebních podniků podle uvedené metodiky. Hodnocení vývoje spolehlivosti a solventnosti v obou sektorech je v příspěvku také diskutováno.

Klíčová slova: banka, úvěr, podnikání, finanční analýza, rentabilita a solventnost

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