A Decision Model for Companies Debt Reduction in Economic Crisis Conditions

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Abstract. Businesses today face a dynamic economic environment transformed by the direct effects of economic crisis. In these circumstances managers of entities are forced to adjust their actions in the economic environment through various kinds of decisions. Attention is paid to important financial decisions. Financial issues touch every aspect of economic life of an agent. In this context, is fitting the management of debts. Debt management problem can be addressed through a decision-making model. In this paper we aim to develop a multidimensional decision-making model that would be more effective debt management to reduce them.

Keyword: decision-making model, crisis, reduction, crisis

JEL Code: M1 - Business Administration

1. Introduction

The decision is a cognitive process of choosing between several options[75]. In a competitive economy, the success of a business depends to a large extent on the quality of decisions taken by its managers. All managerial activities revolve around decision-making process, the manager is primarily a decision making factor. Managers felt that decision making is an art and management as an art was considered as an extensive array of individual styles have been used successfully in addressing and resolving the same types of management problems. Management styles are based on creativity, intuition, trial and expertise, but current economic conditions and changes in the system of decision-making process are very complex. Debt relief is an operation of a trader very useful to enhance the creditworthiness of that agent in order to fund further work by lending activity. Moreover, debt reduction reduces the risk of entry of default and increases the company's confidence in the ability of potential suppliers to meet contractual obligations. In this paper we aim to develop a decision-making model that provides the best solution for reducing the company's obligations under the financial crisis in Romania.

2. Support decision

To substantiate the information base is the source decision in times past, and the proper assessment and comparison of alternatives aimed at decision-making horizon, that relate to future consequences in the future will be achieved.

Methods and models used are extremely varied due to the variety of decision situations. The methods of substantiation decisions are different, having regard to:

- How important are the issues addressed, the result of the consequences of decisions to be approved;
- Certainty of information that can be used, factors that may influence, how big is the horizon making;
- Decision criteria and their number;
- Decision problem and its reflection in the company.

For each decision problem is developing a model that should include data about the accuracy of valuation substantiation and methods.

3. Dimensionality in decision making

To evaluate the lines of action to be taken into account both one and multiple criteria decision making. One decision criterion can be used to support decision throw when the criterion based on an important corporate goal. In the managerial decisions can be used single objective such as increased turnover, profit increase financial liquidity, reduce production costs, etc. And these criteria have different understandings regarding the expression modality and can be relative or absolute values. The decision on the horizon we can talk about criteria results in the short, medium or long term. Decision problems are multidimensional, with multiple consequences on the plans, but in practice most are one-dimensional. Thus, implementation of major decisions and consequences appear on the organization, which means that the earlier decision to revoke or major corrections can be made.

To substantiate the multidimensional decision be resolved estimate the relative importance of decision criteria. Reflecting the extent to which managers want to make the decision criteria is given by

[75] *E.G. Mallach, "Decision Support and Data Warehouse Systems", Irwin McGraw-Hill, Boston, 2000, p. 37*

the coefficients of importance. For this, we may use different methods that can be both direct estimation of the coefficients of importance of decision criteria based on subjective assessments, or calculating them by a system of comparison. When assessing coefficients (k_j) by the method of comparing a number of criteria people can use the relationship:

$$k_j = \frac{\sum_i N_{ij}}{\sum_j \sum_i N_{ij}}$$

where,

i= $\overline{i = 1,R}$, is the serial number of the person making the decision criteria hierarchy x_i; N_{ij} - the person is the score granted by "i" person to x_j criterion[76].

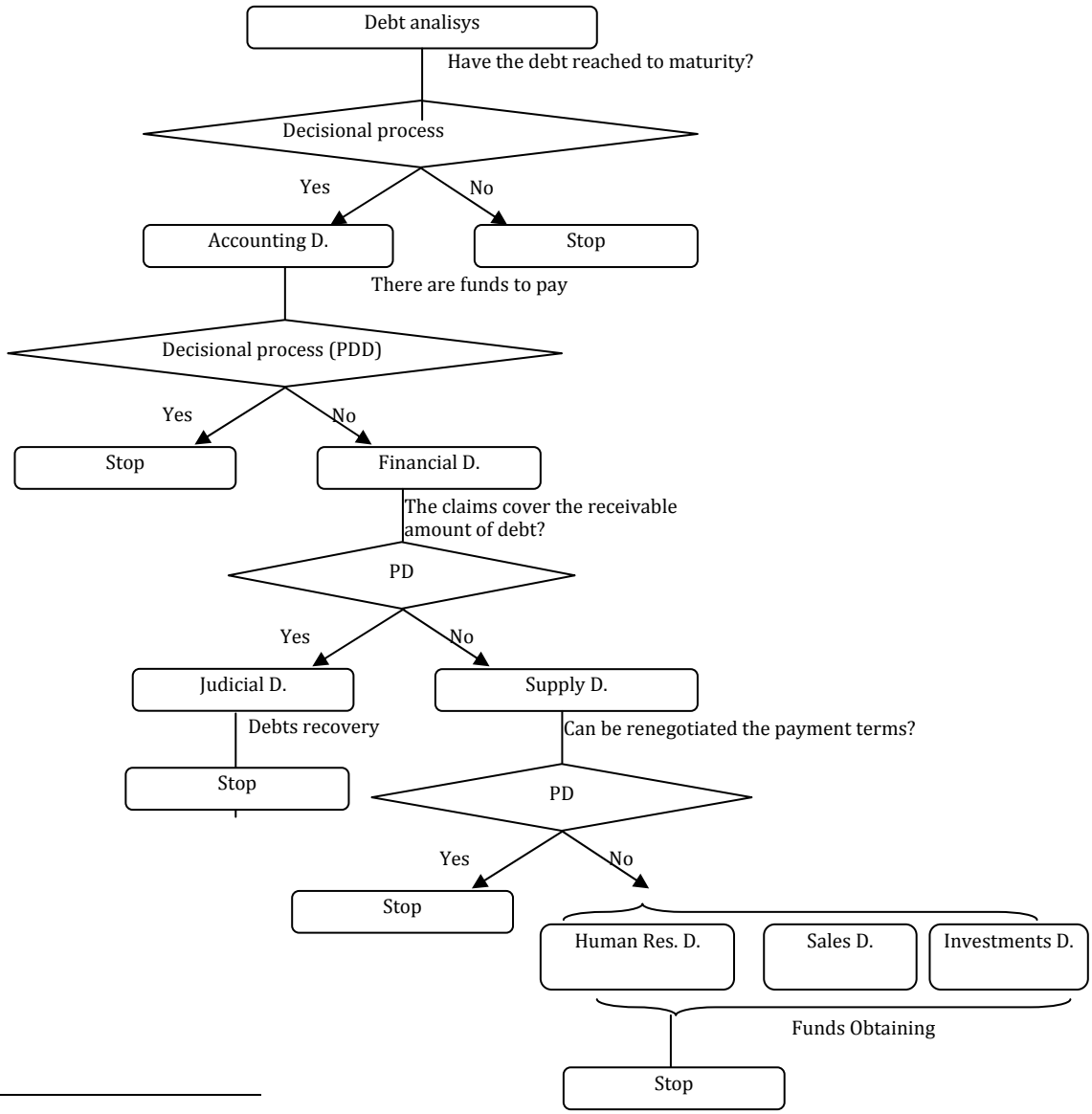
Comparison results are recorded in a matrix D, the items thus obtained d_{ij}:

- if x_i it is more important than x_j ($x_i > x_j$), then $d_{ij} = 1$;
- if $x_i < x_j$, then $d_{ij} = 0$;
- if $x_i \sim x_j$ have the same importance, the two criteria will be represented in matrix ***D*** by a single row and column;
- criteria themselves dominate so $x_i > x_j$ and $d_{ii} = 1$[77].

4. The develop decision model for debt reduction based on collected information from financial statements at CNFR NAVROM SA

Based on analysis of financial information, we developed the following flow chart model:

Fig. no. 1. Flowchart of decision-making model



[76] *Panaite Nica, Aurelian Iftimescu - Management. Concepts and Applications, SEDCOM Libris Publishing House, Iasi, 2008, p. 166*
[77] *Idem, p. 166*

There are established the decision criteria for the model and for departments participating in the process of estimating the relative importance of these criteria (according to the diagram above), as follows:

Table no. 1. Criteria presentation

Decision criteria		Departments that participate in decision making	
x1	The level (amount) in trade payables	P 1	Financial Department
x2	The level of trade receivables	P 2	Legal Department
x3	Stock Value	P 3	HR Department
x4	The level (amount) of financial liabilities	P 4	Supply Department
x5	The level (amount) of social debt	P 5	Marketing Department (sales)
x6	Liquidity (inv st + banks)	P 6	Accounting Department
x7	Distribution of profit (129)	P 7	Investment Department
x8	Cash flow	P 8	Management Department
x9	Net profit		Financial Department
x10	Turnover		
x11	Required working capital		
x12	The value of fixed assets		

Hierarchical relationships between decision criteria for each department are directly involved in decision making:

Table no. 2. Criteria ordering

	p1	p2	p3	p4	p5	p6	p7	p8
Order by degree of importance (descending)	x8	x10	x1	x12	x4	x9	x5	x3
	x1	x11	x11	x4	x5	x7	x11	x12
	x6	x12	x12	x5	x7	x8	x3	x5
	x11	x3	x2	x7	x12	x11	x4	x4
	x7	x8	x3	x9	x1	x12	x1	x1
	x10	x9	x4	x10	x6	x3	x2	x2
	x9	x6	x7	x8	x11	x5	x10	x11
	x3	x5	x8	x11	x3	x4	x8	x6
	x4	x7	x9	x2	x9	x1	x9	x8
	x12	x4	x10	x6	x10	x2	x7	x9
	x2	x1	x6	x3	x8	x6	x12	x10
	x5	x2	x5	x1	x2	x10	x6	x7

After calculating the **D** matrix and the importance coefficients k_j, we obtain the following data:

Table no. 3. Estimating the relative importance of decision criteria

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12
p1	11	1	3	2	1	10	7	12	5	6	9	1
p2	6	7	1	5	3	2	4	1	1	1	1	1
p3	1	1	1	1	7	6	2	3	4	5	1	1
p4	10	7	9	1	1	8	1	5	2	4	6	1
p5	3	10	6	1	1	4	1	9	7	8	5	2
p6	9	10	6	8	7	11	2	3	1	12	4	5
p7	5	6	3	4	1	12	10	8	9	7	2	11
p8	5	6	1	4	3	8	12	9	10	11	7	2
$\sum_i N_{ij}$	50	48	30	26	24	61	39	50	39	54	35	24
$\sum_j \sum_i N_{ij}$												480
$k_j = \frac{\sum_i N_{ij}}{\sum_j \sum_i N_{ij}}$	0,104	0,100	0,063	0,054	0,050	0,127	0,081	0,104	0,081	0,113	0,073	0,050
$0<k_j<1$												

For CNFR NAVROM SA, during 2005 - 2010 were recorded the following values concerning criteria selection:

Table no. 4. Criteria values

	The current prices	2005	2006	2007	2008	2009	2010
x1	The level (amount) in trade payables	11.054.002	11.458.073	14.037.300	14.536.670	14.319.245	19.028.166
x2	The level of trade receivables	17.999.076	27.143.266	36.146.362	43.446.509	46.005.115	55.142.576
x3	Stock Value	3.648.021	3.591.273	4.526.511	5.252.316	5.890.681	6.616.508
x4	The level (amount) of financial liabilities	17.977.894	59.125.121	56.830.039	50.629.833	47.072.673	39.052.700
x5	The level (amount) of social debt	1.820.677	6.380.754	3.893.107	3.837.074	2.720.614	3.312.738
x6	Liquidity (inv ts + banks)	12.435.972	12.668.710	18.403.632	8.252.498	16.181.048	14.882.566
x7	Distribution of profit (129)	33.368	25.000	120.000	340.000	300.000	80.000
x8	Cash flow	18.456.363	17.918.426	19.661.961	34.835.242	30.308.499	28.202.000
x9	Net profit	1.111.214	1.479.476	2.572.854	9.684.500	6.267.428	2.217.634
x10	Turnover	137.247.117	142.139.688	155.232.835	199.945.306	156.160.170	185.905.402
x11	Required working capital	20.454.612	21.295.137	15.652.671	28.089.995	28.179.528	34.577.108
x12	The value of fixed assets	182.153.082	208.144.996	282.141.102	295.228.535	288.920.626	280.377.947
xb	**Total liabilities**	**30.852.573**	**76.963.948**	**74.760.446**	**69.003.577**	**64.112.532**	**61.393.604**

By weighting the values of the coefficients k_j we obtain the following results:

Table no. 5. Determination of estimated values of "Debt" indicator based on decision model

	2005	2006	2007	2008	2009	2010
Debt	30.852.573	76.963.948	74.760.446	69.003.577	64.112.532	61.393.604
Debt Estimate	30.852.573	33.071.654	36.778.051	37.691.592	33.745.261	19.630.744
Debt (adjusted)	41.447.347	98.590.817	89.862.056	78.029.245	69.215.890	61.393.604
Quote liabilities (adjusted)	41.447.347	44.428.461	49.407.634	50.634.884	45.333.383	26.371.941

Figure no. 2. IPC unadjusted debts evolution and trend line determination

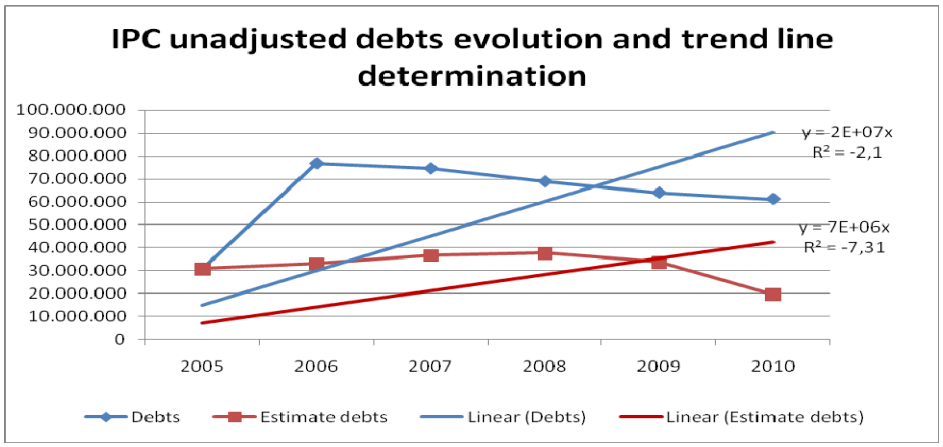
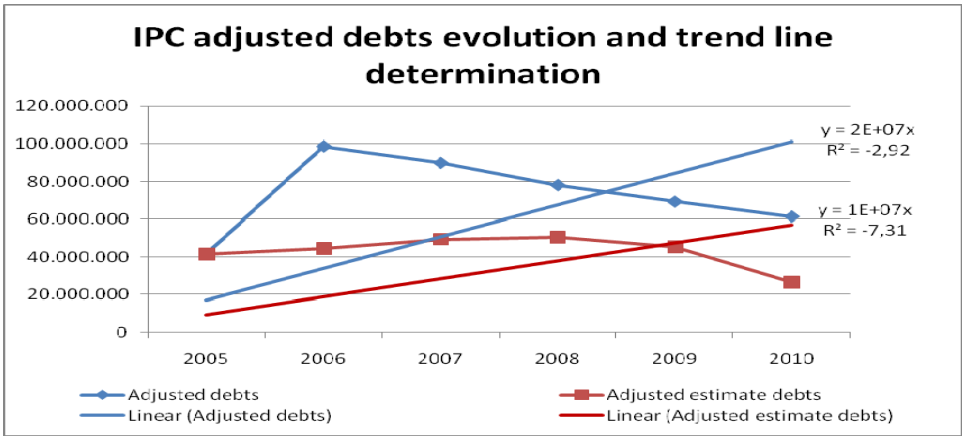


Figure no. 3. IPC adjusted debts evolution and trend line determination



Conclusions

By applying the decisional model we finds that the evolution of obligations in the analyzed period would had been quite different, supporting decreased adjustments so that in 2010 they had reached 19,630,744 lei to 61,393,604 lei as the amount of liabilities was accounted 31.12.2010. The decrease was calculated as 68%. We believe that by implementing such a model, many companies having financial problems, due to accumulation of obligations, could optimize their performance.

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