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THE DIAGNOSIS OF FINANCIAL BALANCE IN SMALL AND MIDDLE SIZE ENTERPRISES (SME) IN TIMES OF ECONOMIC CRISIS

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Abstract: *Small and medium-size enterprises have a high vulnerability to changes in the environment they operate that increase in times of economic crisis. Determined by the onset of symptoms of depreciation, diagnosis analysis should focus on issuing messages with clarity, brevity, opportunity and relevancy. This will enable managers to apply operative corrective plans with high chances of success. Because the first symptoms of depreciation occur in the financial balance, we propose a diagnosis method based on five financial equilibrium criteria. This method mainly aims to increase the objectivity of conclusions. It allows the enterprise to assess the situation through a financial balance score DEF, establishing the strategic corridor with the greatest chance of success and so increasing the rate of success of corrective plans and reducing the risk of the return imbalance. The paper includes a case study to illustrate how to apply the method to a company.*

Key words: *economic crises, financial balance, diagnosis, scoring note, patrimony.*

1. INTRODUCTION

The "economic crisis" term is usually associated to the time periods when aggregate demand for goods and services fall below the offer in the conditions of full employment of labor. According to specialists the last economic crisis was generated by an overestimation of market processes, and is "exacerbated by anxiety and lack of trust in the financial market and in businesses in general" [14].

As result of pessimistic climate among the owners of capital, economic crisis time is characterized by low consumption inputs, sharp decline in investment and rising unemployment. On the financial market, following the "loss of confidence within the financial system" [5] capital is moving towards temporary protection areas (gold, stable currencies, bonds with high safety) and removes the economic cycle. In these conditions the ability of SMEs to access finance is important for funding started investment in order to preserve competitiveness or to facilitate new investments even if additional costs can generate cash flow problems and damage businesses' survival prospects [15].

Regarding the sources of financial capital, some economic theories [8] show a tendency in companies to use a large part of their own capital to fund investment projects when the concept of the funders regarding the gain coincides with the beneficiaries. There is also a tendency to use mainly attracted funding (loans) if foreign funders' vision differs significantly from the beneficiaries' one. In times of economic crisis, foreign funder's vision is usually pessimistic but company's vision is optimistic regarding length of the downturn. Pessimism of the foreign funders is reflected by prudential risk mitigation measures like those that cause a broadening of companies' financial responsibility through various specific instruments such as letters of credit and surety bonds, cash accounts and certificates of deposit for reduce credit risks [6]. But these are additional barriers imposed to companies in raising capital. On the other hand, enterprises, optimistic of rapidly overcoming the crisis, have high expectations on the supply of capital from foreign funders for continuing investment projects and increase production. However the demand for capital by firms depends on the interest rate required by the bidders of capital: "the higher this required rate of return (specific to crises), the lower will be business demand for capital" [1]. Companies are thus in a position to choose between refusing the foreign funds and using only equity capital in funding, with restrictions, the two cycles (production and investment). This presumes decline in productivity or accepting the offer from foreign funders with high costs in terms of responsibility, expansion and to continue as normal production and investment cycles. The phenomenon is more pronounced in developing countries where post-boom overhang has a significant impact on demand for SME credit [11].

The level of equity capital is very important in choosing the founding source because in case of giving up foreign funds, equity must ensure both the operation and development of company and protection against bankruptcy risk under crisis conditions [7]. In time of crisis some companies with a low level of equity capital choose a prudent strategy which leads to a tendency towards preserve it. This has consequences on limiting production and investments that mean radical measures that include reducing stocks (sometimes below the safety

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stock level), reducing personnel and salaries and pressuring customers for debts collection although they face the same problem of lack of capital and stopping investments. So, if the period of crisis is prolonged, it can lead to failure of investments projects, decrease of competitiveness and market share of the company.

Accepting foreign financing allow companies to continue activity but with higher costs and assuming an increased rate of degradation of the financial balance. However, it preserves competitiveness and market share status. But, if some limits are exceeded, it may cause serious risks on the very existence of the company.

The study of the impact of economic crisis on SMEs is particularly important because there is a large number of companies' people affected and because of the mitigation possibilities due to shortening of the duration of crises by intervening at the level of these companies. Recent statistical studies on entrepreneurial environment [13] confirm that entrepreneurs do not ignore decline of productivity in time of economic crises. Moreover, they tend to improve productivity and innovation thus giving an impulse to economy. So, if SMEs have a high immunity to crises, they are a good source of stability and growth during downturns [16].

On the other hand, in times of crisis, especially in SME, financial constraints are emphasized. Thus bank financing, the most important source of foreign finance to SMEs [17] is affected so enterprises get more and more difficult access to foreign funding and increasing costs. In addition, the supplier credit is also affected due to the same constraints that affect their lending capacity.

Regarding the flow of financial capitals, in the beginning of crisis a slowdown of speed can be observed affecting the decrease of company's liquidity and solvency. Studies of specialists [12] show dramatically increases of incidences of solvency problems in time of crisis. In Finland for example, the peak of the crisis was reached in September 2009, when 10 per cent of SMEs reported major financing difficulties and 21 per cent had solvency problems [12]. To SMEs effects are amplified because, in general, SMEs have less access to foreign finance compared to large enterprises [2]. Enterprise studies, conducted by the World Bank, show that "SME face more severe financing constraints than do large firms". According to these, this phenomenon is more pronounced in low-income countries [17].

In conclusion, in crisis time SMEs have to face, in addition to reducing demand for goods and services, the tightening of access to foreign finance, which is often treated with a double strike, severely affecting their cash flow [16]. In these conditions, on medium or short time, in the absence of appropriate strategic plans, financial stability can affect businesses, sometimes irreversible, to financial insolvency. Therefore it requires strongly the early diagnosis of the level and the rate of deterioration in the financial balance of the SME. This is an essential component of preventive financial management in conditions of economic crisis. Present work highlights the importance of diagnostic analysis in the management of financial imbalances in the SME and proposes a simple and efficient evaluation of its state and dynamics.

2. MODELS AND METHODS OF DIAGNOSIS

Over time experts have proposed different models for assessment of the crisis situation. Most of them are considering the establishment of macroeconomic crisis manifested by the effects of macroeconomic financial flows [3]. These models generate evidence of instilling macroeconomic crisis and not estimations regarding its propagation at the microeconomic level. At this level many companies are affected while others have a high degree of immunity to the negative effects of the crisis and some even are progressing in these periods while making it impossible to generalize the effect of crises on all enterprises. So, it appears the need for microeconomic models, specific designed to each company.

The main object of the proposed model is to highlight as quickly as possible symptoms that damage the business and to anticipate their impact on the financial balance. The main criteria included in the model are: financial balance, net patrimony, working capital, working capital requirements and net treasury.

Customizing a model at each enterprise involves heightening the degree of importance of each criterion according to the specific enterprise activity, the level of capitalization, the stage of business or the position funders. Thereby it generates a "*very important criteria*" for the operation of the enterprise, without which activity cannot continue, the "*major criteria*" that can generate significant problems to certain activities and are hard to balance and a "*secondary criteria*", though with no immediate effect, they may affect medium or long-term competitiveness.

The proposed diagnosis model is as type of scoring. Scoring models have known a great development in the banking sector and they are used to assess the creditworthiness of lenders, due to the subjectivity and high operability. In fact, credit scoring models "have revolutionized lending" by diminishing the risk of borrower default, rising the speed of data processing and reducing the human involvement in the decision-making process [9].

Regarding the assessment of creditworthiness, in the diagnosis tests, the scoring note is determined based on the financial indicators. It is recommended that only quantitative aspects of the phenomenon are concerned, excluding those managerial, less perceptible in this phase. We insert so the assumption that organizational structures grouped around the main functions of the enterprise operate with maximum efficiency. This assumption has a high degree of validity in times of economic crisis when a high level in the mobilization of resources is established.

3. TECHNICAL BASIS OF MODELING

Companies often choose to devote increasing resources to finance assets: fixed assets, stocks of goods, receivables, in order to maintain the old customer trust and attract new customers. They rely on increasing sales volume and closing on profit the current production cycle thus achieving financial balance at increasing levels of assets and resources.

Depending on the level of capitalization, financial balances are established at different levels determined by the ratio between equity and foreign capital. Also, depending on the stage of business development, capitals are directed primarily to the production cycle or investment which causes an imbalance in the working capital or working capital requirements, as appropriate. The positions of the shareholders towards patrimony are also different from one company to another ranging from total availability to finance business growth up to a maximum tilt towards receiving profits. So, patrimony can be in the state of growth or conservation.

In times of economic crisis, especially in the beginning, on the background of declining sales, there is a cyclical asset growth especially to the stocks and receivables together with a reduction of available resources in order to finance other cycles, in this case the investments. While maintaining and sometimes diminishing sales' prices, enterprises, hoping to re-launch sales, continue to fund priority cyclical assets including from the permanent resources (equity and foreign) even if production cycles are closing in loss. So, it generates a shortfall in current resources that extends to the permanent and that manifests at first by slowing investment cycles, up to their cessation. If the crisis is prolonged, the imbalance is emphasized and, in increasing proportion, production activity is financed with equity that consistently depreciates. In the financial balance sheet, due to the decrease of profits, the share of equity in total resources decreases, while enterprises have the foreign funding secured before the crisis (loans, leases). This situation leads to a depreciation of financial balance and worsening of company's creditworthiness indicators (indebtment degree, financial autonomy). At the level of patrimony the situation worsens on the background of declining profits and may be accelerated if the shareholders position is inflexible in terms of receiving dividends.

At the level of SMEs, the limited equity and their concentration around the production and commercial functions determine the onset of early stages of economic crisis by the emergence of symptoms of deterioration in the cyclical assets that blocks much of the financial resources. Moreover, lacking in most foreign capital protection, SMEs feel, since the beginning of the crisis, the negative effects revealed as cash availabilities that are operatively targeted to continue production cycles.

Taking into account the above mentioned, the SME financial balance diagnosis is considered a priority, by monitoring financial indicators and assessing funding sources cyclical assets (especially necessary working capital and the net treasury).

4. DESCRIPTION OF METHOD

According to the method proposed for diagnosis, five criteria are considered [4]:

- DF_1= financial balance;
- DF_2= net patrimony;
- DF_3= working capital;
- DF_4= working capital requirement;
- DF_5= net treasury.

Based on these criteria, a financial balance score DEF is determined (1).

Table 1

Criteria weighting coefficient of importance

Level of importance of criteria	Consequences failure to fulfill criterion	Weighting coefficient of importanc e
Very important (I)	Extremely serious empowers the entire enterprise	5
Major (M)	Serious sectoral effects	2
Secondary (S)	Isolated effects	1

$$DEF = \frac{\sum_{i=1}^{5} Pdf_i \cdot f_i}{\sum_{i=1}^{5} f_i}, \qquad (1)$$

where Pdf_i – scores assigned to each criterion as a five point scale set, according to the current situation and the trend in the analyzed period. The levels are usually assessing a situation between total maladjustment to the demands of a market economy (one point) and the total satisfaction of the requirements (five points); f_i – criteria weighting coefficient of importance, according to Table 1 [10].

For very important and major criteria (Table 1) we defined a "critical threshold" below which appears the risk of quick deterioration of the situation, independent of the scores obtained for the other criteria in the field. According to the method, the threshold is declared when two conditions are simultaneously met:

- the score to a very important criterion (I) is less than 2, or 1 for a major criterion (M), on the scale of five steps;
- the imminence occurrence of a major risk recorded by analysts according to the actual situation and interdependence of diagnosis criteria.

Establishing critical thresholds allows the increase of significance of the analysis by focusing on the recovery strategy major aspects of business activity.

Financial balance is evaluated based on the calculated value DEF, indicating on a scale of 1 to 5, the financial equilibrium and its contribution to the overall results of the company. In this respect, it is rated as "power of the enterprise" financial balance for score above 4 points, respectively "weakness of enterprise" for score below 2 points. Values between 2 and 4 points define a normal financial balance which do not present an imminent danger (risk) for enterprise but nor can it be used as leverage to recovery. It has no potential to generate competitive advantages (opportunities) to business.

Synthesis of the diagnosis assumes framing company in one of the five predefined classes, each corresponding to a type of real situation requiring specific decisions for restructuring or improving business. For each of these classes, a certain overall strategy to be followed by the company with the highest chance of success is suggested, as shown in Table 2.

Table 2

Overall strategies recommended

DEF	Overall strategy recommended
1	Concentration of activities in profit centers and splitting the company. Insolvency proceedings for the rest of the enterprise.
2	Radical restructuring, measures to overcome the critical thresholds: restricting activities, stopping of investments, administrative reorganization, capitalization, capital injection.
3	Important restructuring, new targets on short/medium time: stimulation of sales, management improvement, capital injection.
4	New strategic objectives: preferential funding of activities, development of new activities, moderate capital injection.
5	Offensive strategy of development: entering new markets, assimilation of new products, technical and technological investments; Fusion, absorption, sale of business.

5. CASE STUDY

The enterprise subject of the case study is located in Romania making intermediate products for the packaging industry. The product market is limited, specialized and divided. The economic crisis is felt in the market at the end of 2008 and is manifested by maximum intensity in 2009 by a general decline in demand, followed by a slight recovery in 2010. In 2008, company began investments to modernization of production capacity.

Primary general data for diagnosis are:

- share capital: 5.773.350 RON [2];
- number of shareholders: 3, none of major;
- average number of employees: 51;
- the evaluated period is 2008–2010.

Diagnosis analysis aims the company's ability to continue the investment program or to stop it because of the impossibility of ensuring financial balance. It is confirmed the shareholders availability of reinvestment of 100% of the profits earned in previous years.

Enterprise sales turnover trend, in equivalent present values is presented in Table 3.

Justification for the criteria weighting coefficients of importance is done in Table 4.

Table 3

Enterprise sales turnover trend

Indicators	MU	2008	2009	2010
Net sales turnover	ron	71973650	64164340	84165448
Weighted average selling price	ron	0.2326	0.2014	0.2419
Average rate of exchange [3]	ron/eur	3.6827	4.2373	4.2099
HICP(2005=100) [4]	%	108.56	109.63	111.91
Turnover in equivalent values	eur	18002688	13812589	17864595

[2] Romanian currency (ron).

[3] notified by National Bank of Romania.

[4] average European index of consumer prices, notified by Eurostat.

Table 4

Criteria weighting coefficients of importance

Criteria	Weighting coefficient of importance	Justification
Financial balance	1	Enterprise has a strong capitalization level compared with the competitors. At the time of analysis foreign capitalization is secured by firm contracts. However, problems may occur in the medium and long term due to decreased repayment capacity.
Net patrimony	1	Common patrimony rights for only three shareholders without majority gives a high patrimonial risk due to shareholding high rates. However, due to the business high attraction level, effects of possible shareholder withdraw can be quickly isolated.
Working capital	2	Located in full process of development and modernization, which were provided by foreign financing sources before the crisis, working capital deficiency may affect up to suspending ongoing investment cycle. Current activity is not affected.
Working capital requirement	5	Preserving the competitiveness in a very competitive market determines the need to ensure priority cyclical asset even with decreasing current resources. Failure to achieve this goal can permanently damage the competitiveness of the company by the loss of major clients.
Net treasury	2	At the time of analysis the net treasury is secured by firm contracts. However, changes in banks position to funding business can generate serious problems in current activity.

5.1. Diagnosis financial balance

Indicators of financial balance are presented in Table 5. According to their values and trend, the score P_{df1} =3 is assigned to criterion. The justification for this score is:

- Financial balance is at limit due to the decision to restart investments in 2010, after it was stopped in 2009, without providing additional permanent capital.
- Asset structure is worsening (rate fixed assets loss from 72% to 56%) due to less efficient management of current assets (rise of rates inventory and receivables).

Table 5

Indicators of financial balance

Indicators	2008	2009	2010
Fixed assets (tangible)	27170038	24095994	28556090
Current assets: stocks receivables net treasury	17964480 7168279 10769425 26776	9211905 4651701 12032903 -7472699	22214768 9921698 19968692 -7675622
Prepaid expenses	144304	159697	152806
Total assets	45278822	33467596	50923664
Equity	10075013	12434417	13698701
Debts due up one year	20333852	11776848	25045197
Debts due in more than one year	14777725	9256331	12133406
Total debts	35111577	21033179	37178603
Rate fix assets	60	72	56
Rate current assets	40	28	44
Rate stocks	16	14	19
Rate receivables	24	36	39
Financial stability rate	55	65	50
Global autonomy rate	22	37	24
Indebtedness rate	78	63	73
Rate short term debt	45	35	49

- Financial stability first time decreases up to 50% as a result of the current loans causing global decrease autonomy. It also increases the rate short-term debt; the enterprise is still counting on credit suppliers.
- Strategy of double indebtedness (loans and suppliers) is effective but risky regarding the provision of current resources.

5.2. Diagnosis net patrimony

Indicators of net patrimony are presented in Table 6. According to indicators values and trend, the score assigned is $P_{df2} = 3$. The justification for this score is:

- Net patrimony increased by 10% but well below the increased of assets, 52%.
- Rate of net patrimony is at the level of average interest rate on bank deposits.
- Total debts increased by 77% over the assets increase.

Main indicators of working capital are presented in Table 7. According to their values and trend, the score $P_{df3} = 2$ is assigned to criterion. The justification for this score is:

- Negative working capital is slowly decreasing (11%).
- Long term capital although increases by 19% is insufficient to finance the entire investments.

Table 6

Indicators of net patrimony

Indicators	2008	2009	2010
Total assets	45278822	33467596	50923664
Total debts	35111577	21033179	37178603
Allowances for risks /expenses	92232	0	46360
Net patrimony	10075013	12434417	13698701

5.3. Diagnosis working capital

Table 7

Indicators of working capital

Indicators	2008	2009	2010
Equity	10075013	12434417	13698701
Debts due in more than one year	14777725	9256331	12133406
Allowances for risks /expenses	92232	0	46360
Long term capital	24944970	21690748	25878467
Fixed assets	27170038	24095994	28556090
Current assets	18108784	9371602	22367574
Current resources	20333852	11776848	25045197
Working capital	−2225068	−2405246	−2677623

Table 8

Indicators of working capital requirement

Indicators	2008	2009	2010
Stocks	7168279	4651701	9921698
Receivables	10769425	12032903	19968692
Prepaid expenses	144304	159697	152806
Assets to be founded	18082008	16844301	30043196
Net current resources	20333852	11776848	25045197
WCR	−2251844	5067453	4997999

- Current assets increase substantially 139% over the growth of current resources which increase by 113%.

There is a deficit of resources, both long term and current.

5.4. Diagnosis working capital requirement (WCR*)*

Main indicators of WCR are presented in Table 8.

According to their values and trend, the score $P_{df4} = 3$ is assigned to criterion. The justification for this score is:

- From negative values (2008) WCR grow significantly in 2009 due to increased stocks and receivables.
- Current resources, rise in 2010 by 113% while assets to be founded rise only by 78%. In 2009 due to stopping of the investments, company uses a part of long term capital to finance production activity. The status maintains in 2010 even if the investments where slightly resumed.
- Company may have problems to financing current activity if receivables and stocks continue to growth.

5.5. Diagnosis net treasury

Main indicators of treasury are presented in Table 9. According to their values and trend the score $P_{df5} = 1$ is assigned to criterion. The justification for this score is:

- In 2009, to balance cash flow, enterprise draws a line of credit to finance production activity. The enterprise agrees to operate with sizeable lack of cash by using at maximum the credit of suppliers.
- In 2010, the enterprise uses cash from credit line to finance investments which gives a high financial unbalance risk.

Table 9

Indicators of net treasury

Indicators	2008	2009	2010
Cash and bank	26776	0	0
Credit line cash	0	7472699	7675622
Net treasury	26776	−7472699	−7675622

5.6. Assessment of the results

- The financial balance score DEF, calculated by formula (1) is 2.67 defining a difficult financial balance state.
- Score P_{df5} = 1 assigned to the net treasury criterion, which is major according to Table 1, defines a critical situation in term of providing cash to current payments.
- Investment flow is unbalanced due to the high value of fixed assets acquired in recent years over the permanent resources available. This can lead to reduction investment in the next period.
- Net patrimony is preserved. The economic activity generates owners' property rights to become obligations, without benefits. The may cause changes in executive management.
- Share of current assets in financial balance sheet is high and increasing, held that negative phenomenon. Therefore, it requires strategic plans to reduce stocks to the safety level and receivables.
- Financial balance sheet has unfavorable structure of obligations based on the short term which causes a high risk of financing current activity.

6. CONCLUSIONS

In times of economic crisis, SME have to face two shocks, sometime simultaneous: reducing of demand for its products and shrinking of access to foreign finance. Both have a major impact on the financial balance. Therefore, ensuring financial balance is an essential condition for crossing over the crisis as best is possible.

One of the main company's strategic decisions refer to the sources of funding activities (own capital or foreign founds). Considering that the impact of these decisions on enterprise are very high, due to the unpredictability of business environment specific to economic crises, it follows that decisions must be justified by scientific evaluation of financial balance.

The proposed model provides quality and opportunity of evaluation by objectivity, relevance, completeness and speed of determinations. So, the scoring method that we used provides objectivity by the mathematic calculation and increases the speed of data processing. The five diagnosis criteria considered cover a complete portfolio of internal and external resources involved and their weighting largely solve the relevancy by approaching the model to the business. Finally, through predefined strategic recommendations, according to the calculated score, it shortens the time necessary to develop strategy.

Once established, the diagnosis model can be used in monitoring enterprise's financial balance after the strategic decision in order to evaluate its reaction. If these are not according to the expectations, adjustments may be made to improve financial balance.

We expect that the proposed method will become a useful tool in managerial decision by increasing the scientific level and reducing hazard and therefore diminishing the risk of wrong decisions with so significant impact in time of crisis.

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