Financial Risk Study of the Construction Sector SMEs

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1. Introduction

Generally, the concept of risk expresses the probability of a fact or event to have implications, direct or indirect, of company’s financial results. The risk occurrence can take the following aspects: the appearance of the inability to reach a critical threshold, to have sufficient liquidity to honour its debts or to reach a profitable situation.

The risk may also lead to the inefficiency of a result against the estimated value. It is the case of a return on equity lower than shareholders’ interests. This tone is reflected in the way that financial diagnosis takes into account the risks inherent of financial constraints. While solvency is naturally considered the risk of insolvency, profitability involves examining: the operational risk, economic, expressed by the probability of a negative result; the financial risk on the probability of return on equity to be lower than shareholders’ expectations.

These risks are not independent. Apparently, the financial equilibrium is analyzed from the balance sheet and the profitability determined on income statement. Correlations established are numerous. For example, a very important degree of debt will lead to stronger financial costs that reduce the profitability. Among other consequences, this will prevent obtaining of sufficient liquidity to honour its commitments. The various tools for risk analysis confirm inter-relationships between these concepts (Tabara et al. 2001).

The issue of risk, of certainty and uncertainty had preoccupied a long time the experts in all fields. Usually, it examines the risk and uncertainty as opposite to certainty. Business always involves a degree of risk (Boca 2011). The risk, inherent for any activity, means the outcome variability under the environment pressure. Generally, it can be defined, as an event uncertain and likely to cause harm, loss, etc.

The return of any activity not be appreciated only considers in relation to the risk that involves. Also, the companies assume the risk in making a business only in function of return that they are expecting to gain from that activity. The concept of risk is inextricably linked to the profitability. The results generated by a business depend on random factors that occur in all moments of the process of supply-production-distribution.

The risk becomes a brake on the development and expansion of any activity, whereas the decision process is difficult. Any efficient business can run effectively on conditions that those who carried out are protected from the negative effects of risk. In the Romanian literature, some authors consider that for any economic activity, the risk is an exogenous variable, opposite of profitability and that “the risk is the profit variability compared to the average return in some years” (Stancu, I., 1997) or “the variability of outcome, affecting the return on assets and therefore the invested capital” (Manolescu, P., 1999).

In forecasting, the risk expresses the profit variability relative to the hope of return. Its measure is given by the dispersion and the standard deviation of the profit according to the workload (Stancu, I., 1997). The risk of an asset is “probable variability of the future profitability” (Halpern et al, 1998), so the risk is likely to achieve a lower profitability than that predicted.

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The risk analysis of a business is to identify of inherent risks and assess their economic and financial consequences, direct and indirect. From estimating the business risk, the leadership must find effective solutions to reduce it and if is possible to eliminate it.

Many experts believe that financial risk characterizes the variability of results indicators under the company's financial structure. The capital of a company consists of: equity and borrowed capital which fundamentally differs in cost that it generates. A company that makes use of the loans had to pay the financial costs involved. The corporate borrowing, by its size and cost, drives to a variability of results and change the financial risk (Dalotă M. and Dalotă, S., 2000).

In theoretical literature, Lhabitant, F-S and Tinguely, O. (2001) provides a brief introduction to risk management for corporations, with a strong focus on financial risk management (Lhabitant, F-S and Tinguely, O., 2001). Also, Dowd, K. (1999) presents an integrated theoretical framework for guiding financial risk management decisions, using the principle of “shape rule” to assess prospective changes in a firms risk expected return profile and the maintenance of a constant probability of default, which determines the firms leverage (Dowd, K., 1999).

In empirical literature, we found that Vovk, L. B., Knopov, A. P. and Pepeljaeva, T. V. (2010) realized a study of credit risk management problem for insurance investment companies, their approach being based on regression analysis with the use of CVaR estimate (Vovk, L. B., Knopov, A. P. and Pepeljaeva, T. V., 2010). Landier, A., Sraer, D. and Thesmar, D. (2009) realized a model which shows that an increase in the convexity of trader compensation diminishes the likelihood that risk management successfully induces traders to pick the right asset and an increase in the risk of assets traded reduces the favourable impact of risk management independence (Landier, A., Sraer, D. and Thesmar, D., 2009).

The paper is divided into four sections: the first section have presented a short explanation of the concept of financial risk and a literature review related to theoretical and empirical financial risk literature; in the second section is described the methodology of the study; the third section aims to study the financial risk of the construction companies on the base of breakeven and the leverage methods; and the last section presents the conclusions drawn from the study.

2. Methodology

The aim of this paper is to analyze the evolution of financial risk on a sample of 11 companies acting in the construction sector, by two methods: breakeven point and leverage methods. The construction sector also provides for many workplaces and may be considered an important provider of work force in Europe, as the greater part of Romanian immigrants works in the construction sector (Bărbuță-Misu, N., 2009). I have chosen the construction sector because it plays an important role in the European economy. It generates almost 10% of GDP and provides 20 million jobs, mainly in micro and small enterprises. Construction is also a major consumer of intermediate products (raw materials, chemicals, electrical and electronic equipment, etc.) and related services. Because of its economic importance, the performance of the construction sector can significantly influence the development of the overall economy (European Commission, 2012).

In my study, the time period considered for data collection from the enterprises is of 11 years, that is 2001 – 2011, which means that we managed to grasp the time evolution of financial performance for the enterprises under study. One essential condition took into account when establishing the sample was that enterprises active in this sector show continuous activity during the chosen time interval. This condition greatly reduced the number of potentially sampled enterprises, as a great number of enterprises closed their activity while the other was just at the beginning.

The information used in this study was collected of the Financial Statements of enterprises, obtained from the Commerce Register of Galati Balance sheet, Profit and Lose Account and Explanatory notes as: The claims and debts situation, The fixed assets – gross values and depreciaitons situation. The sample has included companies specialized in construction of buildings or parts thereof, genius civil and other special works of construction, works of technical-sanitary installations and other works of finishing, the construction of highways, roads and rental of the equipment for building.

Data collected of these 11 enterprises were consolidated to the level of the construction sector, and all indicators for financial risk analysis are based on these consolidated data, in the case of both methods. For breakeven method were calculated: the position indicator towards the financial breakeven, the moment of achieving the financial breakeven and the coefficient of elasticity, and the results were interpreted in the scope of reflecting when the minimum financial risk occurred. In the same time, for leverage method was calculated: the return on assets, return on equity and financial risk for construction sector and then were identified the minimum financial risk. Finally, it was realized a comparative analysis of the results achieved from both methods of determination of financial risk.

3. Financial risk analysis

Financial risk arises when a company turn to loans to finance their activity. This risk depends on the company’s financial structure and its indebtedness. If the decision to invest determines the business risk, then the financing decision creates financial risk. To conduct any business, financial resources are necessary,
which may be own or borrowed. Equity, which belongs to shareholders, is paid in dividends and the
borrowed capital is remunerated by interest paid. The financial leverage appears only if the return on equity
obtained from using loans, is greater than return on assets.

This is the additional risk bear by shareholders as a result of corporate decision to use loans.
Theoretically, the company has a certain degree of risk inherent of its activities, which is a business risk, and
when they use loans is an additional risk to shareholders, the financial risk (Halpern, P. et al, 1998). The total
risk attached to equity yield resulting from the variability of the equity yield rate. A part of this risk is a risk of
exploitation explained by the variability of economic assets yield. The financial risk arises from the variability
of the difference between equity return, as total risk and return on economic assets, as operational risk
(Brezeanu, P. et al, 2003).

Thus, the financial risk exists only because of the sensitivity of operational results, so because of the
exploitation risk that multiply it. The more company is indebted, the financial risk is higher. Shareholders are
not exposed to the financial risk in the same way as financial creditors, who are less at risk because they have
priority in recovering of debts. Shareholders bear both financial risk and operational risk, i.e. the overall risk.
The influence of the financial risk on the overall risk can be seen in four aspects: the volatility of net profit
(net profit per share), covering the financial expenses, structural risk and the reduction of future financing
flexibility.

First, even if the return on equity is high, a substantial financial leverage causes a great instability in the
net profit, so a volatility of dividends distributed per share. Therefore, the shareholder will claim a "premium"
to cover the risk.

In the coverage of fixed financial commitments, if the projections are not realistic, the company may not
have sufficient cash to pay the interest and repay its debts. When future cash-flows are greater and more
stable, the company will have a higher capacity of debt (Keasey, K. et al, 2005). Since the financial risk
depends, in particular, on the enterprise ability to cover its fixed financial expenses, the analysis of debt
decision should be considered when formulating the plan for funding and the cash budget, to track weather
the anticipated cash-flows will be sufficient to cover the liabilities.

The most important factor in determining the enterprise capital structure is business risk. This is the
inherent change in the anticipated future incomes on assets used, if the company did not resort to loans for
financing. The business risk varies from one area of activity to another, and in the same area of activity, from
a company to another. The small enterprises or those who carried out a single product are the most affected
by the business risk.

The key factors of which business risk depends on are (Halpern, P. et al, 1998): variability of demand - a
stable demand for enterprise products lead to a reduced business risk; price variability – the prices of
products and services sold are more stable when the business risk will be lower; variability of factors of
production prices – the purchases prices are more volatile, the business risk is higher; capacity of sales prices
adjustment to changes in purchases prices - a high capacity for adjustment of prices to products sold at prices
of inputs means a lesser degree of business risk; this factor is influenced by inflation; extent that costs are fixed– given that demand decreases and the company faces a major proportion of fixed costs in the total cost,
the business risk increases to a such company.

Each of these factors is partly determined by characteristics of the activity field, but each of them is also
controlled in some degree by the driving factors. Business risk may be changed over time due to changing of
the competition structure in the economic branch concerned, to technological changes or changes in society
and those of the wider economy. Currently, the food industry and food retail trade are given as examples of
economic sectors with low business risk, while industries whose operations are cyclical, such as steel, are
perceived as having a high risk business.

In general, business risk is a direct function of capital allocation decisions (Jordan, B. J. et al, 2007). These
decisions affect the nature of enterprise business and its asset composition. If the business risk of a new
project differs from the risk of existing projects, the optimal ratio between debt and equity will be changed
and will trigger changes between business and financial risks (Elteman, D. K. et al, 2007).

The financial risk is a result of long-term financing decisions. It concerns, on the one hand, to increase the
variable of incomes of the holders of common shares and, on the other hand, to increase of financial
insolvency probability that hanging over the company if the owners choose to use the financial lever. It
follows from the fixed costs of borrowing or limited costs of preferential shares, which increases the potential
variability of the earnings incumbent to the common shareholders of the company, thus increasing the risk
that they support it.

The financial risk is dependent on two elements. The first is the greater fluctuation of gains on joint action
arising from pre-emption claims, fixed or limited, on the flow of revenue that have as holders the company
creditors. The second element concerns to the possibility of a limited flexibility, the financial constraints or, at
worst, a state of bankruptcy as a result of contracting such loans.

Financial risk analysis can be done both on the breakeven point and analysing of the changes in the return
on equity due to the financial policy, which can be followed by financial leverage effect (Eros-Stark, L. and
3.1. Financial risk study on the base of breakeven

Financial breakeven is the point where operating income covers the operating expenses and interest charges (Eros-Stark, L. and Pântea, I.M., 2001). Financial breakeven is quantified after the relationship:

\[ V_{PR} = C_f + C_{d} \]

where:

- \( V_{PR} \) = operating income related to financial breakeven;
- \( C_f \) = total fixed costs;
- \( C_{d} \) = interest charges.

The financial risk assessment on the base of breakeven is achieved by using the following indicators calculated on data of those 11 enterprises acting in the construction sector from Galati County (Annex no. 1):

a) the position indicator towards the financial breakeven, that can be calculated absolutely

\[ I_{poz} = V_e - V_{PR} \]

and relatively (Figure no. 1) \( I_{poz(\%)} = \frac{I_{poz}}{V_{PR}} \);

b) the coefficient of elasticity (Figure no. 1):

\[ k_e = \frac{V_e}{V_e - V_{PR}} \]

c) the moment of achieving the financial breakeven (Figure no. 2):

\[ P_m = \frac{V_{PR}}{V_e} \times 365 \].

\[ \frac{\text{Source: Performed by the author}}{} \]
In the period 2001-2002, our data lead to inconclusive results, because of the negative value registered by the rate of margin on variable costs. In 2003, breakeven is higher than operating income with 35.812.549 euros (the absolute position indicator is negative), which corresponds with the negative current result and net income, but also with the moment of achieving the breakeven by 622 days. The negative position indicator and coefficient of elasticity actually indicates a very high financial risk, reflected in the loss made in 2003 in the construction sector.

In the period 2004-2006, the breakeven is below the level of operating income, the situation being most favourable in 2005, when the moment of achieving breakeven is the lesser of 84 days. Consequently, the lowest financial risk was registered in 2005, demonstrated both by the higher position indicator (absolutely and relatively) and the lowest coefficient of elasticity, i.e. 1.30. In the period 2006-2011, this financial risk is increased, with fluctuating values, and the moment of achieving the financial breakeven having fluctuations between 144 and 223 days. The financial risk had increased after 2008, when the effects of financial crisis emerged.

### 3.2. Financial risk study on the base of leverage

The return on equity is the result of the efficiency of all commercial, operational and financial activities of the enterprise (Niculescu, M., 1997). Financial leverage or the increase in the financial efficiency, called the variation of the return on equity dependent on the return on assets and the cost of credit (interest rate). Financial leverage expresses also the impact of the financial expenses (due to loans) over return on equity of the enterprise (Brezeanu, P., 1999).

For a company which relies on credit to increase the return on equity, the return on assets must be higher as the interest rate paid for the credit. Otherwise, if the interest rate paid is higher than the return on assets, the result obtained is reduced, leading to reducing the return on equity, which becomes lower than return on assets. In this case it is said that the debt has an effect of “bat”, whereas the return on equity decreases (Stancu, I., 1997). Thus, financial leverage is based on financing decision of any company's activity.

If the return on assets is higher than interest rate, the situation is favourable for the shareholders and the return on equity is an increasing function of the indebtedness of the company. In the reverse situation, where the cost of credit is greater than the return on assets, the return on equity is a decreasing function of the indebtedness of the company. The leverage deteriorates the economic performance of the company, reason that is necessary to minimize the ratio between debt and equity. When the return on assets is equal to the interest rate, the company is characterized by stability in the financial structure.

When the economic context is unfavourable, the acquisition of fixed assets, that is the investments act, must be financed in a high proportion by the equity. In favourable circumstances, the investment act will be also, by the results, because the current capacity to create profit often affects future operations and profits.

Financial leverage is combined with the operating leverage. The combined effect is equal to the product of the operating leverage and financial leverage. To determine the financial risk, we need firstly to determine the values of return on assets (Table no. 1). It is defined as the ratio between the economic result and economic assets. We will use as economic result, the operating result value, whereas is more relevant as the operating gross surplus. The economic asset is the sum of gross value of fixed assets with the needs of working capital and availabilities.

<table>
<thead>
<tr>
<th>Year</th>
<th>Economic result</th>
<th>Economic assets</th>
<th>Return on assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>-23.580.576</td>
<td>-1.884.413</td>
<td>1,9842</td>
</tr>
<tr>
<td>2002</td>
<td>-8.354.014</td>
<td>-12.334.014</td>
<td>0,6773</td>
</tr>
<tr>
<td>2003</td>
<td>-2.060.700</td>
<td>-11.090.503</td>
<td>0,1858</td>
</tr>
<tr>
<td>2004</td>
<td>2.738.368</td>
<td>29.005.171</td>
<td>0,0944</td>
</tr>
<tr>
<td>2005</td>
<td>20.151.882</td>
<td>47.599.521</td>
<td>0,4234</td>
</tr>
<tr>
<td>2006</td>
<td>12.688.811</td>
<td>60.406.749</td>
<td>0,2101</td>
</tr>
</tbody>
</table>
Year | Economic result | Economic assets | Return on assets |
---|---|---|---|
2007 | 11,272,971 | 49,261,036 | 0.2288 |
2008 | 17,201,462 | 62,512,771 | 0.2752 |
2009 | 10,456,875 | 52,865,900 | 0.1978 |
2010 | 9,017,776 | 55,188,348 | 0.1634 |
2011 | 9,332,888 | 50,339,202 | 0.1854 |

Source: Performed by the author

For the period 2001-2003, the values of return on asset are inconclusive, because of the negative values of both the economic result and economic asset. Financial risk arises when there are variations between return on equity and return on economic assets, as a result of borrowing. And, in these conditions it was calculated the return on equity (Table no. 2).

Table no. 2. Determination of the return on equity

<table>
<thead>
<tr>
<th>Year</th>
<th>Net result</th>
<th>Equity</th>
<th>Return on equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>-25,269,448</td>
<td>-20,467,065</td>
<td>1,2346</td>
</tr>
<tr>
<td>2002</td>
<td>-9,245,776</td>
<td>-24,190,083</td>
<td>0,3822</td>
</tr>
<tr>
<td>2003</td>
<td>-3,329,202</td>
<td>-24,687,846</td>
<td>0,1349</td>
</tr>
<tr>
<td>2004</td>
<td>1.834,450</td>
<td>16,887,591</td>
<td>0,1086</td>
</tr>
<tr>
<td>2005</td>
<td>16,699,500</td>
<td>31,535,400</td>
<td>0,5295</td>
</tr>
<tr>
<td>2006</td>
<td>10,373,900</td>
<td>39,490,383</td>
<td>0,2627</td>
</tr>
<tr>
<td>2007</td>
<td>8,323,372</td>
<td>39,730,834</td>
<td>0,2095</td>
</tr>
<tr>
<td>2008</td>
<td>13,802,043</td>
<td>55,016,017</td>
<td>0,2509</td>
</tr>
<tr>
<td>2009</td>
<td>7,892,110</td>
<td>42,068,817</td>
<td>0,1876</td>
</tr>
<tr>
<td>2010</td>
<td>6,342,467</td>
<td>43,892,505</td>
<td>0,1445</td>
</tr>
<tr>
<td>2011</td>
<td>6,568,490</td>
<td>39,978,637</td>
<td>0,1643</td>
</tr>
</tbody>
</table>

Source: Performed by the author

As the economic return on assets for the period 2001-2003, and the return on equity have inconclusive values, because of the negative values of the net result and equity. Tables no. 1 and 2 shows that there are differences in the return on assets and return on equity, which shows the existence of the financial risk.

The financial risk is calculated as: \( \sigma(r_c - r_A) = \sigma(r_A) \times \left( \frac{D}{C} \right)^2 \), where:

- \( \sigma(r_c - r_A) \) = the variance of return on equity toward return on economic assets;
- \( \sigma(r_A) \) = the variance of return on economic assets;
- \( \frac{D}{C} \) = degree of debt.

In Table no. 3 we present the determination of financial risk for the period 2001-2011:

Table no. 3. Determination of the financial risk

<table>
<thead>
<tr>
<th>Year</th>
<th>( \sigma(r_A) )</th>
<th>( \left( \frac{D}{C} \right)^2 )</th>
<th>( \sigma(r_c - r_A) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2.44516</td>
<td>11.4244</td>
<td>27.93446</td>
</tr>
<tr>
<td>2002</td>
<td>0.06595</td>
<td>6.2500</td>
<td>0.41216</td>
</tr>
<tr>
<td>2003</td>
<td>0.05508</td>
<td>5.8564</td>
<td>0.32259</td>
</tr>
<tr>
<td>2004</td>
<td>0.10634</td>
<td>1.4641</td>
<td>0.15569</td>
</tr>
<tr>
<td>2005</td>
<td>0.00001</td>
<td>1.9881</td>
<td>0.00002</td>
</tr>
<tr>
<td>2006</td>
<td>0.04427</td>
<td>1.2996</td>
<td>0.05753</td>
</tr>
<tr>
<td>2007</td>
<td>0.03675</td>
<td>1.7276</td>
<td>0.06349</td>
</tr>
<tr>
<td>2008</td>
<td>0.02111</td>
<td>1.5990</td>
<td>0.03376</td>
</tr>
<tr>
<td>2009</td>
<td>0.04960</td>
<td>1.6234</td>
<td>0.08051</td>
</tr>
<tr>
<td>2010</td>
<td>0.06610</td>
<td>1.6439</td>
<td>0.10866</td>
</tr>
<tr>
<td>2011</td>
<td>0.05527</td>
<td>1.7145</td>
<td>0.09476</td>
</tr>
</tbody>
</table>

Source: Performed by the author
The evolution of financial risk in the period 2001-2011 is shown graphically in Figure no. 3.

![Figure no. 3. The financial risk](image)

It follows that once with reducing the indebtedness is reduced the financial risk. The lowest financial risk to the construction sector appears in this case in 2005, although the borrowing rate wasn’t the lowest, i.e. 1.41, as the variance of return on equity to return on assets of 0.002%. Thus, in 2005 was obtained the highest return on equity of 52.95%.

Therefore, the interpretation of the leverage that suppose the return on equity increase as the degree of debt increase is valid in the period 2004-2005 and the return on equity decrease as the degree of debt decrease is valid in 2008, given that the return on assets is higher than the average interest rate. Atypical situations exist in other periods. In 2006, return on equity increases while the degree of leverage decreases; in 2007 and 2009-2011, return on equity decreases while degree of leverage increases. Thus, the financial risk increases in the period 2006-2007 and 2009-2011, when the degree of leverage increases.

For the period 2001-2003, financial risk is very high may be due to the high degree of indebtedness. Also, taking into account the inconclusive values of the return on assets and return on equity, these are positive, but are determined by the negative values of the operating and net profit, on one hand, and economic assets and equity, on the other hand.

4. Conclusions

In conclusion, both methods to assess the financial risk in the construction sector have led us to approximately the same results in respect of the year when the financial risk was lowest, in 2005, when the breakeven is achieved most rapidly, in 84 days, the coefficient of elasticity is the lowest 1.30 and the relative position indicator is the high, i.e. 333.34%.

For the period 2001-2003, both financial risk assessment methods shows a very high risk of the construction sector, caused both the inconclusive positive values of the return on equity and return on assets, and the high indebtedness. The high financial risk is also reflected by the negative values of the operating and net income, economic assets and equity.

Financial risk assessment on both methods reflects the second minimum point of the financial risk in 2008, i.e. 3.376%, while indebtedness was small, but not the smallest (1.26). In 2008, the breakeven is achieved in 159 days, the coefficient of elasticity is 1.77 and the relative position indicator is 129.74%. A decreasing evolution of financial risk is also seen in 2011, of 9.476% when the breakeven is achieved in 220 days, the coefficient of elasticity is 2.51 and the relative position indicator is 66.10%.

Although the study conducted in this paper took into account a limited number of enterprises acting in the construction sector, it reflects the reality of the national level. The building companies have seen an exponential growth of business until 2008; also, it was the sector with the fastest growth rate (33% in the first half of 2008 for example). In 2009, the world crisis affected the Romanian economy, particularly the sectors with high indebtedness, the more exposed were the construction sector and real estate developments, which affect the economic growth.

The building companies faced with several problems, the most serious were the increasing the cost of raw materials, labour and credit costs. These are companies which own maximum 20% of financing, that have delays in selling buildings and run now by money from bank to bank for refinancing. After 2009, all companies of construction materials, interior design and all those working in buildings declined in turnover. This reduction of activity in the construction field has affected the economic growth.

\* figure does not reflect the abnormal value of financial risk obtained in 2001.
The companies acting in the construction sector are threatened in the highest degree of insolvency situation, slow down or delayed payments. So currently, the construction sector had to face a liquidity crisis, generating a chain reaction in the time of the payment incident. This situation increases the financial risk in this sector.

The same trend is also manifested in Europe. In the construction sector, seasonally adjusted production decreased by 1.1% in the euro area and by 0.6% in the EU27 in November 2009, compared with the previous month (Eurostat, 2010). The construction sector is one of the hardest hit by the financial and economic crisis: building and infrastructure works fell by 16% between January 2008 and November 2011 across the EU27.

References