

SYNERGIC EFFECT OF THE ACTION OF OPERATIONAL AND FINANCIAL RISK

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ABSTRACT: *This paper allows us to understand the complex action of total risk at microeconomic level, taking into account several factors: the area in which it acts: the operating activity, generating an economic risk, and the financing activity, generating a financial risk; the nature of the observed indicators: the nature of the profit and the nature of the cash; the synergic effect of the action of operational and financial risk, resulting the total risk. We consider that the innovative value of the article resides in the suggested model of correlation between the activity volume and the capital structure, because different approaches give different results, that is why we suggest a unitary approach, a more pragmatic one of the phenomenon. Also, we established the phases observed in order to establish the global profitability threshold of an international corporation which develops activities in several sectors, through several branches. In this article we have used the method of real leverage which measures the total risk of a company by mixing the operating leverage with the financial leverage.*

KEY WORDS: *Threshold of total indifference, effect of total leverage, real leverage.*

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1. INTRODUCTION

The risk signifies the variability of the result obtained under the action of internal and external factors of the company, representing the potential prejudice the company's patrimony and activity are exposed to.

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The total risk results from the synergic action of the economic risk, relative to the operating activity, and the risk relative to the financial activity.

The economic risk is influenced by three main parameters:

- turnover, which at its turn depends on the market demand;
- cost structure, which depends on the organisation of the main activity;
- proximity of the critical point to the level of effective production.

The elasticity coefficient or the effect of operating leverage (e) measure the relative increase of the operating result which results from the relative increase of the activity measured through turnover (Lala-Popa & Miculeac, 2012).

The further the real level of production to the critical point (low elasticity) and the lower the fixed expenses, the lower the operating risk and vice versa. The higher the variability of turnover and the lower the margin of variable expenses, the higher the economic risk.

In order to appreciate the financial risk the method of financial leverage (f) is used, which consists in analysing the point of financial indifference and the coefficient of financial leverage. The financial leverage quantifies the impact of appealing to credits (in order to finance an investment) on the financial profitability.

The effect of financial leverage, respectively the variation of own capitals profitability ratio, depend on the correlations, on the one side, between the economic profitability ratio and the interest ratio (the cost of debt), and on the other side, the debt level.

The further the real level of activity to the critical point (low elasticity) and the lower the fixed expenses, respectively the interests, the lower the risk and vice versa.

2. ESTIMATION OF TOTAL RISK ON THE BASIS OF TOTAL LEVERAGE

In order to choose the optimum structure of financing sources, the analysis of net profit indifference on share compared to the activity level is useful, especially in the case of joint stock companies.

2.1. The threshold of total indifference

The indifference threshold represents the turnover level where the net profit on share is identical, no matter the financing source (own or borrowed) used by the company.

This point is determined starting from the equality:

$$PNA_1 = \frac{CA_i - CV - CF - DOB_1}{N_1} = \frac{CA_i - CV - CF - DOB_2}{N_2} = PNA_2 \quad (1)$$

where:

$PNA_{1,2}$ – net profit on share for two different ways of financing;

CA_i – turnover at the indifference threshold;

CV – total variable costs;

CF – total fixed costs;

DOB_{1,2} – financial expenses with interests for different levels of debts;
 N_{1,2} – number of shares for different levels of financing.

Thus, the turnover in the indifference threshold is calculated by the relation:

$$CA_i = \left[\frac{(N_2 - DOB_1) - (N_1 - DOB_2)}{N_2 - N_1} + CF \right] \cdot \left[\frac{1}{\left(1 - \frac{CV}{CA}\right)} \right] \quad (2)$$

thing that can be expressed as:

$$CA_i = \frac{CF + DOB \cdot \left(1 + \frac{CPR}{DAT}\right)}{1 - \frac{CV}{CA}} \quad (3)$$

where:

CA – total turnover;

CPR – own capitals;

DAT – financial debts;

$\frac{CV}{CA}$ – share of variable costs in the turnover.

If when calculating the indifference threshold we will use the two extremes, the first representing a financing exclusively from own capitals, and the latter representing a financing in proportion of 50% from own capitals and 50% from credits (maximum allowable degree of global debts) then:

- DOB₁=0, because the company has no debts;
- N₂=N₁/2, because only a smaller number of shares is needed (only a half) of the same value because at the same level of invested capital, the own capital is needed only in proportion of 50%, the rest being financed from debts.

By replacing the previous relation, the indifference threshold becomes:

$$CA_i = \frac{CF + 2 \cdot DOB}{1 - \frac{CV}{CA}} \quad (4)$$

Considered through the net profit on share, we have the following situations:

- CA > CA_i then PNA > PNA_i and thus it is more advantageous to appeal to borrowed capitals, they leading to the increase of PNA;
- CA = CA_i then PNA = PNA_i and thus the financing modality is indifferent;
- CA < CA_i then PNA < PNA_i. and thus it is more advantageous to appeal to own capitals, they leading to the increase of PNA.

Note: In point CA_i it is recommended the financing from own resources, because at the same level of net profit on share, appealing to credits increases the financial risk.

2.2. The effect of total leverage

Total leverage (L_T) measures the total risk of a company by mixing the operating leverage (e), which measures the economic risk, and the financial leverage (f) which measures the risk relative to the financial activity (Van Horne & Wachowicz, 2005).

$$L_T = e \cdot f = \frac{\frac{\Delta RE}{\Delta CA} \cdot \frac{PNA}{RE}}{\frac{CA}{RE}} = \frac{\frac{\Delta PNA}{\Delta CA} \cdot \frac{PNA}{RE}}{\frac{CA}{RE}} = \frac{CA - CV}{CA - CV - CF - DOB} = \frac{MV}{MV - CF - DOB} = \frac{MV}{RC} \quad (5)$$

where:

ΔRE – increase of operating result;

RE – operating result;

ΔCA – increase of turnover;

MV – margin of variable costs;

RC – current result.

This relation shows us that for a given level of the variable costs margin, the higher the coefficient of financial leverage, the higher the fixed operating expenses and the higher the financial expenses with interests.

If a company has a high coefficient of leverage, the moderate changes in turnover will cause big changes in the net profit on share. Also, if in this case, the turnover decreases, the negative effects on the net profit on share are significant.

3. PROPOSED MODEL THROUGH THE CORRELATION OF THE ACTIVITY VOLUME WITH THE CAPITAL STRUCTURE

Because different approaches give different results we propose a unitary and more pragmatic treatment of the phenomenon.

The leverage effect of debt can be also expressed in terms of activity volume.

In the point where we have equality between the economic profitability ratio (R_e), the financial profitability ratio (R_f) and the ratio interest (R_d), that is $R_e = R_f = R_d$, the turnover volume which defines the indifference threshold to the financing modality, can be defined by the relation:

$$CAi = \left\{ CF + DOB \cdot \left[1 + \frac{1}{\left(\frac{DAT}{CPR} \right)} \right] \right\} : \left(1 - \frac{CV}{CA} \right) \quad (6)$$

and for

$$\hat{G}_{i\max} = 50\% \Rightarrow CAi = \frac{CF + 2 \cdot DOB}{1 - \frac{CV}{CA}} \quad (7)$$

The relation shows us that if the level of debts increases, the level of the critical turnover increases, level which ensures the coverage of operating expenses, interest expenses and the realisation of a minimum level of current profit which ensures at least a neutral (indifferent) leverage effect.

The indifference threshold recalculated on the basis of the debt leverage effect on the financial profitability is superior to the one calculated only with the expenses with debts, because it implies the realisation of a minimum profit which ensures at least the equality between economic profitability, financial profitability and the average cost of the borrowed capital, because only from this point further the debt no longer acts negatively on the financial profitability.

If we note this additional safety profit with π_s , then the real profitability threshold, which covers the economic risk as well as the financial one, is given by the relation:

$$CAi = \frac{CF + DOB + \pi_s}{1 - \frac{CV}{CA}} \quad (8)$$

where the additional safety profit is:

$$\pi_s = DOB \cdot \frac{CPR}{DAT} = K \cdot CPR, \quad (9)$$

and $K = DOB/DAT$ is the average cost of the borrowed capital.

This minimum profit must be realised no matter the activity volume, its level depending on the ratio of the financial autonomy (CPR / DAT) and the level of expenses with interests. Also, the level of this profit is comparable to the return of own capital if it would have been borrowed in full.

3.1. The synergic effect of mixing the operating activity with the financing activity

The synergic effect of mixing the operating activity with the financing activity can be measured with the help of real leverage (real elasticity coefficient). The real leverage (L_R) measures the real risk by mixing the operating leverage with the financial one (which measures the economic risk, respectively the financial one), but taking into account the additional safety profit, being calculated as it follows:

$$\begin{aligned}
 L_R = e \cdot f &= \frac{\frac{\Delta RE}{\Delta CA} \cdot \frac{PNA}{RE}}{\frac{CA}{RE}} = \frac{\frac{\Delta PNA}{\Delta CA}}{\frac{CA}{RE}} = \\
 &= \frac{CA - CV}{CA - CV - CF - DOB - \pi_s} = \frac{MV}{MV - CF - \left\{ DOB \cdot \left[1 + \frac{1}{\left(\frac{DAT}{CPR} \right)} \right] \right\}}
 \end{aligned} \tag{10}$$

This relation shows us that for a given level of variable costs margin, the higher the fixed operating expenses and the financial expenses with interests, respectively the level of debts, the higher the real leverage coefficient (and thus the real risk).

On the basis of real leverage we can draw the following conclusions:

- the higher the operating leverage coefficient (e) (that is the fixed costs are higher), the more sensitive the operating result to the change of turnover volume;
- the higher the financial leverage coefficient (f) (that is the expenses with interests are higher and the level of debts is higher), the more sensitive the current profit to the change of the operating result.

If a company has a higher leverage coefficient, the small changes in the turnover will cause significant changes in the current result and implicitly in the financial profitability. Also, if in this case there is registered a decrease of the turnover, the negative effects on the net result and implicitly on the financial profitability will be significant.

3.2. The positioning of real turnover to the real indifference threshold

In the positioning of real turnover to the real indifference threshold, there are the following situations:

- a) If the real turnover registered by a company is higher than the real indifference threshold, the company covers the economic risk as well as the financial one, resulting a positive leverage effect of debts, the higher the level of debt, the higher the positive leverage effect of debts:

$$\begin{aligned}
 CA > CA_i &\Rightarrow CA > CV + CF \Rightarrow RE > 0 \text{ and } RE > DOB \Rightarrow RC > 0 \text{ and } R_{re} > 0 \text{ respectively} \\
 &R_{rf} > 0 \text{ and } R_{rf} > R_{re} \text{ because } R_{re} > R_d
 \end{aligned}$$

- b) If the turnover is at the level of real indifference threshold, the company covers the economic risk as well as the financial one, resulting a neutral leverage effect of debts, no matter the level of debt.

$$\begin{aligned}
 CA = CA_i &\Rightarrow CA > CV + CF \Rightarrow RE > 0 \text{ and } RE > DOB \Rightarrow RC > 0 \text{ and } R_{re} > 0 \text{ respectively} \\
 &R_{rf} > 0 \text{ and } R_{rf} = R_{re} \text{ because } R_{re} = R_d
 \end{aligned}$$

- c) If the turnover is below the level of real indifference threshold, the following consequences can be noticed:

c.1.) If the turnover is situated between the financial critical threshold (CA_{pcf}) and the real indifference threshold, then the company covers the operating expenses and the interest expenses and it results a current profit whose level is not sufficient to counteract the negative leverage effect of the debts, the higher the debts, the higher the negative leverage effect of the debts:

$$CA \in (CA_{pcf}, CA_i) \Rightarrow CA > CV + CF \Rightarrow RE > 0 \text{ and } RE > DOB \Rightarrow RC > 0 \text{ and } Rre > 0 \\ \text{respectively } Rrf > 0 \text{ and } Rrf < Rre \text{ because } Rre < Rd$$

c.2.) If the turnover is situated at the level of the financial critical threshold (CA_{pcf}), then the company covers the operating expenses and the interest expenses and it results an operating profit but the current profit is null, activating the negative leverage effect of the debts, the higher the debts, the higher the negative leverage effect of the debts:

$$CA = CA_{pcf} \Rightarrow CA > CV + CF \Rightarrow RE > 0 \text{ and } RE = DOB \Rightarrow RC = 0 \text{ and } Rre > 0 \text{ respectively} \\ Rrf = 0 \text{ but } Rrf < Rre \text{ because } Rre < Rd$$

c.3.) If the turnover is situated between the operating critical threshold (CA_{pce}) and the financial critical threshold (CA_{pcf}), then the company covers the operating expenses, but it does not cover the interest expenses and it results an operating profit, but the current profit is negative, activating the negative leverage effect of the debts, the higher the debts, the higher the negative leverage effect of the debts:

$$CA \in (CA_{pce}, CA_{pcf}) \Rightarrow CA > CV + CF \Rightarrow RE > 0 \text{ and } RE < DOB \Rightarrow RC < 0 \text{ and } Rre > 0 \\ \text{respectively } Rrf < 0 \text{ and } Rrf < Rre \text{ because } Rre < Rd$$

c.4.) If the turnover is situated at the level of the operating critical threshold (CA_{pce}), then the company covers the operating expenses but it does not cover the interest expenses, the operating profit is negative, activating the negative leverage effect of the debts, the higher the debts, the higher the negative leverage effect of the debts, that is:

$$CA = CA_{pce} \Rightarrow CA = CV + CF \Rightarrow RE = 0 \text{ and } RE < DOB \Rightarrow RC < 0 \text{ and } Rre = 0 \text{ respectively} \\ Rrf < 0 \text{ but } Rrf < Rre \text{ because } Rre < Rd$$

c.5.) If the turnover is situated below the operating critical threshold (CA_{pce}), then the company covers neither the operating expenses nor the interest expenses, and the operating result and the current result are negative, activating the negative leverage effect of the debts, the higher the debts, the higher the negative leverage effect of the debts, that is:

$$CA < CA_{pce} \Rightarrow CA < CV + CF \Rightarrow RE < 0 \text{ and } RE < DOB \Rightarrow RC < 0 \text{ and } Rre < 0 \text{ respectively} \\ Rrf < 0 \text{ but } Rrf < Rre \text{ because } Rre < Rd$$

4. MODEL FOR THE COMPANIES WITH MULTIPLE ACTIVITY OBJECT

In order to determinate the real (indifference) critical threshold of companies with complex activity object, the specific mechanism to develop an activity will be taken into consideration. It is difficult to estimate the global profitability threshold of an international corporation which develops activities in several sectors (industrial production, tourist industry, finance) through several branches. This is the most general case. For these companies it is recommended the separated determination, on steps of the critical threshold.

The phases which are followed are:

1. To establish a working monetary unit, which conventionally is the currency of the country where the parent society is located;
2. To determine at each branch the real critical threshold for each activity;
3. To partially centralize, fact which implies:
 - to determine the critical threshold for each society by summing up those on activities:

$$CA_i^0 = \sum_{j=1}^m Ca_j^0 \quad (11)$$

- to determine the threshold on each activity by summing up those from companies:

$$CA_j^0 = \sum_{i=1}^n CA_i^0 \quad (12)$$

4. To determine the global critical threshold, on the whole company, by summing up the partial results.
 - to determine the critical threshold on company by summing up those on activities:

$$CA_0 = \sum_{j=1}^m CA_j^0 \quad (13)$$

- to determine the threshold by summing up those from companies:

$$CA_0 = \sum_{i=1}^n CA_i^0 \text{ sau } CA_0 = \sum_{i=1}^n \sum_{j=1}^m Ca_{ij}^0 \quad (14)$$

where:

CA_0 – company's global profitability threshold;

CA_j^0 - global profitability threshold of activity "j";

CA_i^0 - global profitability threshold of company "i";

Ca_{ij}^0 - profitability threshold of activity "j" at a company "i";

$j = 1, m$ number of activities developed by the company;

$i = 1, n$ number of companies in a corporation.

Note: If the corporation has several branches in a country, the quantification of each country's contribution to the real critical threshold is operational.

Besides the classical methods to approach the risk, in this case it is recommended a more specific analysis of the critical threshold, namely on companies and activities. The way an activity or a company brings its contribution to the global profitability threshold can be appreciated (Emery, et al., 2004).

5. CONCLUSIONS REGARDING THE TOTAL RISK

The total risk of a company, studied from the point of view of the economic and financial risk, points out the following aspects:

- the indifference threshold calculated in terms of cash will always be inferior to the one of profit, because it excludes from fixed costs the depreciation costs, while the indifference threshold calculated by including the financial expenses with interests will always be superior to the operating one, because it increases the value of fixed costs;
- the indifference threshold recalculated on the basis of debt leverage effect will be superior to the one calculated only with the interest expenses, because it implies to make a minimum profit which ensures at least the equality between economic profitability, financial profitability and average cost of the borrowed capital;
- the more the operating leverage coefficient (it means that the fixed costs are higher), the more sensitive the operating result to the change in the turnover volume, and thus the economic risk is higher, and the more the financial leverage coefficient (it means that the expenses with interests are higher), the more sensitive the net profit on share to the change in the operating result volume, and thus the financial risk is higher;
- if the economic profitability rate is lower than the interest rate (average cost of debt), then the leverage effect of debt is negative and if the debt rate is higher, the financial rate is lower than the economic profitability rate, increasing the financial risk;
- for a given level of variable cost margin, the higher the fixed operating expenses and the financial expenses with interests, the higher the total leverage coefficient (and thus the total risk is higher).

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