Financial consequences of the sales variation

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Abstract

The risk represents a continuously presence within the economical environment specific for one market economy, being an essential element for substantiating the economic decisions. The paper presents many analysis models for the operating risk based on studying the breakeven point, the positioning index and the elasticity coefficient. The analysis conclusions are stronger through studying the factors which influence the elasticity coefficient extend. The analysis is illustrated by an adequate study case

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Key Words: financial result, operating risk, elasticity coefficient, analysis, factor influences, flexibility

1. Introduction

As an expression of the economic situation in which there is a big difference of the obtained results as compared to the estimated level, the risk, could take several forms. The risk of economic agents that expresses results variation according to the conditions of the operating activity of an enterprise and particularly of a specific expenses structure is called *operating risk* or economic risk [Stancu: 2002]. In the case in which the vulnerability of an economic activity is in relation with a subsequent manifestation of some outside factors that act in a conjuncture situation, we could appreciate that obtained results variability depends on the quick response of a company to answer the challenges on the market (increasing demand, assortment changes, competition, price adjustments, appearance of the new technologies etc.) and will adapt its supply properly. The influences will be felt by the turnover, so that it could be considered that the economic risk of a company will correctly express using elasticity coefficient or other methods like flexibility coefficient, breakeven point, positioning index etc.

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The paper presents a case study which reveals the influences of some factors that influence the elasticity coefficient variation within the economic activity, namely: results variation, operating safety margin, flexibility coefficient, operating costs structure.

The enumerated factors exercise a direct action on the economic risk manifestation and give the possibility to identify some leading directions to orient the management of a company in order to achieve an efficient control of the economic risk manifested in the production activity.

2. The results of the sensitivity analysis based on the breakeven point

Analysis and interpretation of the economic risk starts with the idea that the operating results do not depend only on some general factors (modification of the acquisition prices or of the products sells prices, salaries increasing, sells reducing etc) but also, on the costs structure, that is on its variation depending on the extend of the firms' activity.

The structure of the factory costs and especially, the relation between the fixed expenses and the variable ones makes a direct influence on the profitability and its evolution facing the production extend. From this perspective the operating risk appears as depending on the level of the fixed expenses which could be easier absorbed by a higher production level.

The synthesis between the dependence of the operating result and the correlation of the fixed expenses and the variable ones, is expressed by the indicator named *the breakeven point*. This is a synthetic indicator for appreciating the operating risk, which expresses the activity level (production extend, operating incomes, turnover etc.) at which the expenses are equal to the incomes and the result is zero. Up to the level expressed by the breakeven point the company can obtain profit, and under this level, it could register capital loss. The breakeven point offers information necessary to the decision factors, concerning to:

- Establish an activity extend of which the enterprise's result is zero (revenues are equal to costs);
- Determine the certain activity extend (production level, turnover) necessary in order to obtain the wanted profit;
- Reveal the correlation between the production dynamic, that is, of the incomes dynamic, and the expenses dynamic, these being structured into variable and fixed expenses;
- Evaluate the operating risk calculating the 'positioning index" facing the breakeven point.

Determination of the breakeven point can be made in physical units or value ones, depending on the specific of the enterprise activity.

a) At the monoproduction enterprises (those which make a single type of product) the breakeven point can be calculated both in physical units as well as in value units. Using the physical expression, the determination of the breakeven point can be made on base of the following relations [Helfert: 2006]:

$$CA = CT$$
$$q \cdot p = CF + CVT$$
$$q \cdot p = CF + q \cdot cv \qquad (1)$$
$$q(p - cv) = CF$$
$$q = \frac{CF}{p - cv}$$

in which:

CA - represents the turnover;
CT - total expenses;
CF - fixed expenses;
CVT - total variable expenses;
q - production (breakeven point);
cv - variable expenses per product (mean level);
p - price per product.

The graphic representation of the breakeven point (figure 1) in physical units reveals the fact that simultaneously with the increasing of the production, the variable cost per product is reducing, and the firm becomes profitable at those production level from which the level of the cost per product goes down under the sell price per product.
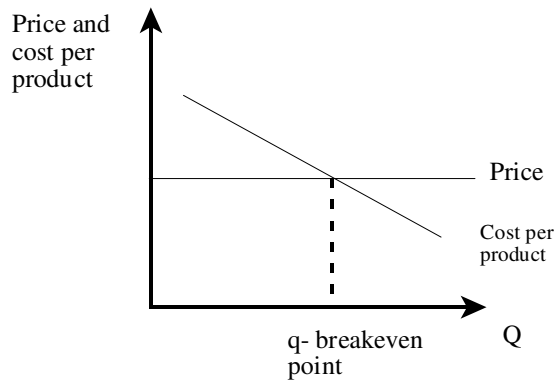

Figure 1: The breakeven point per product (physical units)

In value expression, the determination of the breakeven point (turnover) can be made starting from the relation of calculation of the breakeven point in physical units and, multiplying both relation terms by unit price it results:

$$p \cdot q = p \cdot \frac{CF}{p - cv}$$

(2)

$$CA_{pr} = \frac{p \cdot CF}{p \cdot \left(1 - \frac{cv}{p}\right)} = \frac{CF}{1 - \frac{cv}{p}}$$

where: $1 - \dfrac{cv}{p}$ represents the rate of variable expenses margin;

CA_{pr} – turnover concerning the breakeven point.

b) At the enterprises which execute a large kind of products, the breakeven point can be determined only in value expression starting from the relation:

$$CA_{pr} = CT = CF + CV$$

(3)

Supposing the main sell price and the main variable cost are constant, it also results that the correlation CV/CA is constant and in this case the previous relation becomes:

$$CA_{pr} = CF + \frac{CV}{CA} \cdot CA$$

$$CA_{pr}\left(1 - \frac{CV}{CA}\right) = CF$$

(4)

$$CA_{pr} = \frac{CF}{1 - \dfrac{CV}{CA}} = \frac{CF}{R_{mcv}}$$

where:

CA_{pr} – represents the turnover concerning the breakeven point;
CF – represents total fixed expenses;
CV – represents total variable expenses;
CA – represents the overall turnover;
R_{mcv} – represents the rate of variable expenses margin within the turnover.
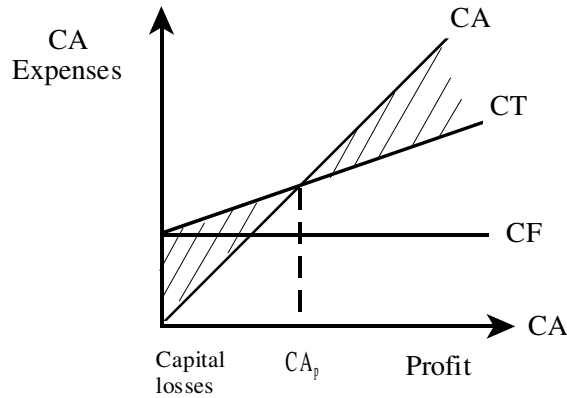
Figure 2: The breakeven point in value units

The graphic representation of the breakeven point in value units is illustrated in figure 2.

3. The analysis of the operating risk using the positioning index

The assessment of the operating risk can be made with the help of an indicator named "*positioning index*" which reflects the economic risk of the company through the distance that exists up to the critical extend of the turnover (concerning the breakeven point). The positioning index can be calculated in absolute units (the safety margin - *Ms*) or in relative units (safety index – *Is*) in the following manner:

$$Ms = CA - CA_{pr}$$

$$I_s = \frac{CA}{CA_{pr}} \cdot 100 \tag{5}$$

The relative deviation of the safety index is calculated like this:

$$\Delta I_s = I_s - 100 = \frac{CA - CA_{pr}}{CA_{pr}} \cdot 100 \tag{6}$$

The safety margin is also named, *"the absolute flexibility"* and it shows the firm's capacity to adapt to the market demands through modifying the level of the production. Certainly, whether the firm's flexibility is increasing, the operating risk is diminishing.

The safety index is known in speciality literature like "volatility coefficient" and the statistical surveys reveal that firms could be in one of the following situations,

appreciated from the operating risk point of view, calculated based on the safety index: [Mihai: 1999]:

- Insecurity, if the turnover is only up to 10 % over the breakeven point;
- Relative stable, in the situation in which the turnover has a value greater with 10-20 % than the value corresponding to the breakeven point;
- Comfortable, if the turnover is higher than the turnover corresponding to the breakeven point, with over 20 %.

In the case of an economic analysis, a specific signification results by calculating the breakeven point in days (*PRzile*), that is the time duration expressed in days, in which the enterprise performs the turnover corresponding to the breakeven point. It can be calculated similarly with a rotation speed indicator, like this [Vâlceanu et al: 2004]:

$$PR_{zile} = \frac{CA_{pr}}{CA} \times 365 \qquad (7)$$

Approaching the breakeven point expressed in days by the 365 value indicates the increase of the operating risk while contrary, if distancing from this value, it shows the diminishing of the risk.

In the manner in which it was defined, the breakeven point evidences the minimum objective that has to be achieved (CA_{pr}), which is necessary for an enterprise to function without capital losses. The measure for the risk resulted by performing this objective is revealed by the sensitivity of the operating result facing the activity level. This can be calculated as an elasticity coefficient (*e*), also named, the operating levier coefficient

4. Factor analysis of the elasticity coefficient

Due to the fact that *the elasticity coefficient* measures the profit variation depending on turnover variation, it expresses in a direct way the firm's capacity to give an answer to the new market requirements, so that a stronger variation of the profit facing the external conditions variation, that means the turnover variation, will offer an image of an increased elasticity of the economic activity but also an increased degree of the operating risk [Vâlceanu et al: 2004].

$$Ce = \frac{\frac{\Delta R_e}{R_e}}{\frac{\Delta CA}{CA}} \qquad (8)$$

where the symbols represent:

Re - profit;
CA - turnover.

At the breakeven point level, the operating result is zero ($R_{epr} = 0$) and in this situation the determination of the elasticity coefficient can be achieved in this way:

$$Ce = \frac{\dfrac{R_e - R_{epr}}{R_e}}{\dfrac{CA - CA_{pr}}{CA}} = \frac{1}{\dfrac{CA - CA_{pr}}{CA}} = \frac{CA}{CA - CA_{pr}} \tag{9}$$

According to the last expression it results that the value of the elasticity coefficient is higher than the turnover of the firm and is close to the critical turnover corresponding to the breakeven point. Depending on the value of this indicator, the enterprise can be in one of following cases [Mihai:1999]:
- unstable, with an operating risk higher, if e>11 ;
- relatively stable, if e ≈ 6;
- comfortable, with a low operating risk if e < 6.

Since the operating risk expresses the grade of risk resulted from the operating activity of a firm, in the financial analysis practice can be used instead of the turnover, the operating incomes.

Taking into consideration the base modality of calculation of the elasticity coefficient (Ce):

$$Ce = \frac{\Delta \text{Re}}{\text{Re}} : \frac{\Delta CA}{CA} \tag{10}$$

We can observe that the factor $\dfrac{\Delta CA}{CA}$ is the relative safety index deviation (ΔIs) which depends on the breakeven point (CA_{pr}) and ΔCA represents the economic safety margin.

The value expression of the breakeven point as we have seen depends on the extend of the fixed expenses and the share of the variable expenses in the turnover

In order to reduce the level of the operating risk there has to be chosen that economic advantage solution characterized by a specific structure of the costs which should permit a flexible performing of the activity. Only the conditions, in which the share of the fixed expenses is reduced, can ensure also reduced elasticity, so that the operating risk is diminished and the safety functioning increases.

Working on the base relation of the elasticity, we can reach an expression which stresses the factors with signification for modification of the elasticity coefficient of the economic activity, namely: results variation, operating safety margin, flexibility coefficient, operating costs structure [Burja: 2005].

$$Ce = \frac{\Delta \text{Re}}{\text{Re}} \cdot \frac{CA}{\Delta CA} = \frac{\Delta \text{Re}}{\text{Re}} \cdot \frac{\dfrac{CA}{CV} \cdot CV}{\Delta CA} = \frac{\Delta RE}{\text{Re}} \cdot \frac{CV}{\dfrac{CV}{CA} \cdot \Delta CA} \qquad (11)$$

Synthesizing the relation above becomes:

$$Ce = \frac{\Delta \text{Re}}{\text{Re}} \cdot \frac{CV}{F \cdot Ms} \qquad (12)$$

where:

F is the flexibility coefficient $\left(\dfrac{CV}{CA} \right)$;

Ms - operating safety margin (ΔCA).

The operating safety margin depends both of extend of the turnover and the breakeven point.

Consequently, it studies the use of the elasticity coefficient depending on the flexibility degree in order to assess the economic risk of an industrial enterprise. The elasticity coefficient plays the role of a real operating levier and quantifies the modality in which the operating risk affects the economic result [Buşe: 2005].

The incomes and expenses budget for the two financial periods, are presented in table 1.

Table 1: The incomes and expenses budget

INDICATORS (RON)	N-2	N-1	N
Turnover	109203	156412	239086
Operating incomes	115779	163903	242954
Operating costs, by which:	105045	146744	218525
Total variable expenses	94131	133272	198811
Total fixed expenses	10914	13472	19714
Operating result	10735	17159	24429

The evolution of the result, operating costs and those of the indicators which are necessary in the analysis for appreciating the risk grade, is presented in table 2.

Table 2: Determination of the elasticity coefficient

INDICATORS	N-2	N-1	N	N/N-1	
				+/-	%
Variable expenses in total costs, %	89,61	90,82	90,98	0,16	0,18
Flexibility coefficient %	86,2	85,21	83,15	-2,1	-2,4
Operating result, RON	10735	17159	24429	7270	42,4
Relative variation of	-	35,2	42,4	7,2	20,5

the operating result, %					
Operating safety margin, RON	-	65323	122435	57112	87,4
Breakeven point, RON	79087	91089	116651	25562	28,1
Elasticity coefficient	-	0,843	0,828	-0,015	-1,8
Operating commercial profitability,%	9,8	11,0	10,2	-0,8	-7,3

The analysis of economic elasticity modification for activity of an enterprise reveals many aspects which are important for assessment the operating risk.

The elasticity modification and in the meantime the risk grade modification due to the investment made are:

$$\Delta Ce = Ce_1 - Ce_0 = 0{,}828 - 0{,}843 = -0{,}015 \ ^2 \tag{13}$$

1. The influence of the profit relative variation:

$$\Delta Ce\left(\frac{\Delta \mathrm{Re}}{\mathrm{Re}}\right) = \left(r_1^{\mathrm{Re}} - r_0^{\mathrm{Re}}\right) \cdot \frac{CV_0}{F_0 \cdot Ms_0} =$$
$$= (42{,}4\% - 35{,}2\%) \cdot \frac{133272}{85{,}21\% \cdot 65323} = 0{,}172 \tag{14}$$

2. The influence of the variable expenses modification:

$$\Delta Ce(CV) = r_1^{\mathrm{Re}} \cdot \frac{CV_1 - CV_0}{F_0 \cdot Ms_0} = 42{,}4\% \cdot \frac{198811 - 133272}{85{,}21\% \cdot 65323} = 0{,}499 \tag{15}$$

3. The influence of the flexibility coefficient:

$$\Delta Ce(F) = r_1^{\mathrm{Re}} \cdot \frac{CV_1}{F_1 \cdot Ms_0} - r_1^{\mathrm{Re}} \cdot \frac{CV_1}{F_0 \cdot Ms_0} =$$
$$= 42{,}4\% \cdot \frac{198811}{83{,}15\% \cdot 65323} - 42{,}4\% \cdot \frac{198811}{85{,}21\% \cdot 65323} = 0{,}038 \tag{16}$$

4. The influence of the turnover modification facing the breakeven point (operating safety margin):

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[2] Note from 1 and 0 point the specific indicators of the activity after the investment has realized, respectively before to realize it

$$\Delta Ce(Ms) = r_1^{Re} \cdot \frac{CV_1}{F_1 \cdot Ms_1} - r_1^{Re} \cdot \frac{CV_1}{F_1 \cdot Ms_0} =$$

$$= 42{,}4\% \cdot \frac{198811}{83{,}15\% \cdot 122435} - 42{,}4\% \cdot \frac{198811}{83{,}15\% \cdot 65323} = -0{,}724$$

(17)

The analysis of the obtained results implies numerous *interpretations*.

The new structure of the factory costs in the last analysed year has imposed achieving a breakeven point about 116651 RON, thus representing an increase of the breakeven point facing the previous situation by 28,1 %. That situation favours the increasing of the operating risk grade, due to the fact that the firm should increase much of its sells in order to cover the higher extends of its total expenses and also, the higher breakeven point.

The efforts made by the enterprise for improving the resources management led to the growth of the productive capacity and generated an increase of the sells for the last year by 52,8 %; though on the entire level of the productive activity the commercial profitability decreased with 0,8 %.

These preliminary conclusions outline the image of a firm with a good level of economic stability which is in a situation less risky.

Diminishing the elasticity coefficient by 0,843 to 0,828 means a comfortable situation from an economical point of view (<6) and also reducing of the economical vulnerability of the firm (with 0,015).

Being interested in the action of the factors which are significant for the evolution of the economic risk degree, we can notice a favourable action (0,724 points) resulted from the variation of the operating safety margin which almost doubled.

The other influencing factors are due to negative consequences on the operating risk. The increasing rhythm of the operating result grows with 7,2 % but it is insufficient and this reason leads to stressing the economic risk degree with 0,172 points. Although the variable expenses increased in absolute expression, they reduced their weight within the turnover (with 2,1 %), and this demonstrates that the new production structure of the company is less flexible and contributes to increase the risk degree of the economic activity. This is why the unfavourably evolution of the flexibility coefficient produces also an increasing of the operating risk (0,038).

Only the more advantageous positioning of the company facing the breakeven point of each annual production capacity expressed through the operating safety margin could contribute to opposite the negative action of the others.

The main directions on which the management of a company has to orient in order to correctly administrate the economic risk along its productive activity are:

- improvement of the commercial policy by using an adequate marketing can lead to a strong increase of the turnover extend and a better positioning regarding the breakeven point;

- diminishing the share of the fixed expenses generates an increase of the flexibility and the answer capacity to the market requirements, through increasing the extend of the activity;

- improvement of the operating safety index through distancing the turnover by the breakeven point and in this manner, it realizes a diminishing of the risk degree;

- increase of the economic profitability and reducing of the operating results variability through reducing the factory costs, raising the prices if the market conditions allow this, increasing the sells, grow the production factors efficiency, increasing the decisions efficiency;

- increase the enterprise flexibility, which means the increase of the capacity to be profitable even in the case of the lower extend of activity (breakeven point reducer).

5. Conclusion

Making an anticipation and assessment of the supposed operating conditions, the decision-making factors can realize a prospective analysis of the economic activity both of the generally and specifically efficient indicators point of view as by the perspective of the risk implied, risk which if assumed can be diminished, with the condition of taking some prevention measures.

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