



# Economic Risk Assessment Taking Into Account the Volume Oscillator Indicators

Loredana Mihaela LĂPĂDUȘI\*

## ARTICLE INFO

### Article history:

Accepted June 2016

Available online September 2016

### JEL Classification

G32

### Keywords:

Economic risk, Margin of safety, Security index, Turnover, Total costs

## ABSTRACT

Economic risk can be assessed from many points of view, but generally speaking it means the firm's inability to match workload with cost structure. Expansion of production capacity, adaptation to new technologies, diversification of products are only a few factors influencing risk. These, along with financial risk and bankruptcy risk constitute the most important category of risk which presents a great interest for the banks, shareholders, managers, business partners, etc. The purpose of this article is to provide a brief overview of the oscillation of your company's activity from the point of view of economic risk. The main objective of this research lies in economic risk assessment by means of the margin of safety, the safety index and critical time point.

© 2016 EAI. All rights reserved.

## 1. Introduction

The economic risk is strictly related to the cycle of exploitation of the firm, being influenced by the total operating structure costs (structure) and variable costs (operational), i.e. the share of the two categories from the overall operating expenses. Economic risk will register a greater value when fixed costs are high, and will record a lower value if costs are reduced.

Economic or operational risk express the company's inability to adapt to time and with the least possible cost to the variations in economic and social environment and it reflects the variability of economic outturn depending on operating conditions. [1]

Risk evaluation of mining is done with the help of indicators which shows us to what extent work volume can oscillate, without incurring the risk of losses: safety margin or absolute flexibility, safety index and the moment of realising the critical point. [7]

The safety margin in absolute sizes expresses the value difference between the volume of activity effectively realised and the volume activity related to the critical point.

Safety index expresses the ratio between the actual revenue and the income related to the breakeven. It is also called volatility coefficient and it has the same informational value as the margin of safety.

The moment of creation of breakeven (also called neutral point) reflects the number of days that the enterprise needs to achieve the level of production corresponding to the critical point.

## 2. Theoretical approach regarding economic risk and indicators of oscillation of the activity of the company

Operating risk assessment shall be carried out based on interpretations given to values of indicators determined by the breakeven. When a company achieves a production and a turnover below the corresponding dead point, losses happen. Also, if the critical period is longer than the period involved in analytics, the company can no longer cover all the operating costs. For operating risk assessment we can use the data provided by the studies regarding the breakeven and the operating lever. [5]

On a short term, such a situation is not alarming, because it is possible that the company's policy may have experienced certain events that have altered the expected development (e.g., the achievement of an investment that has not led to outstanding performances in the same year, changing strategic decisions etc.).

On a long term, the perpetuation of a negative situation may increase the risk of exploitation, so that the financial autonomy of the company will decrease along with increasing indebtedness. The consequence will be increased financial risk and even bankruptcy risk. It follows that the analysis of economic risk (operational) illustrates the health state of the firm.

\*Constantin Brâncuși University of Tg-Jiu, Romania

In specialized literature, the breakeven level of activity represents that level of activity itself in which the firm, by means of income, fully covers the operating costs. This is the minimum efficiency requirement that any society must meet namely: profitability should be at least zero. This is also called neutral or critical point. [3]

Breakeven offers useful data to decision factors, regarding: [2]

- establishing a volume of activity in which the result of a firm is zero (incomes are equal to expenses);
- determining a volume of activity (production level, market turnover) in order to get a desired profit;
- illustrating the correlation between the production dynamics and incomes and costs dynamics classified as variable and fixed;
- operating risk assessment through the calculation of a "position indicator" to break even.

The same specialised literature indicates that considering the turnover position in correlation to breakeven, the situation of an enterprise shall be assessed as follows: [6]

- more than 10% above the critical point presents an unstable situation;
- 20% above the critical point indicates an unstable situation;
- above 20%, a comfortable situation.

The economic risk is directly affected by factors such as: [12]

- the extent to which external users depend on financial statements;
- the size of the entity makes financial statements useful to a number of users proportionately;
- the situation of entities listed on the stock exchange or on another market of real estate values;
- the nature and value of the firm's liabilities (interest form the part of creditors).
- the probability that an entity to deal with financial matters, after the date of issuance of the audit report.
- evaluation of the integrity management (if key members of senior management were convicted).

### 3. Methodology of analyzing and evaluating the economic risk through: safe margin of safety index and the critical point

To get to calculate the four indicators of economic risk assessment, we must determine the breakeven level, that is that level at which the revenues are equal to expenses, and profit is zero.

Break-even is recorded when turnover is equal to the total costs (fixed and variable). Thus, the threshold of profitability can be determined, both physically (physical critical volume of production) and in value, in the case of monoproducer companies and for companies that produce a wide range of products.

With the help of breakeven: [10]

1. we take decisions concerning the minimum sales structure, organization and optimization of company's activities according to the dynamics of the business, influenced by both internal and external factors.

2. we evaluate the capacity of the company relating to the maintaining the revenue and profitability of the business in a highly unpredictable business.

In the case of monoproducer companies, break-even is determined both in physical volume, and value volume, and in the case of companies that produce a wide range of products it is determined only in physical volume.

The physical critical volume of production is determined by the formula:

$$q_{\text{critical}} = \frac{\text{total fix expenses}}{\text{variable cost per unit margin product}} \quad (1)$$

where:

$q_{\text{critical}}$  – critical production;

variable cost per unit margin by product = sales price - variable cost per product

The volume of product value (critical turnover) is determined by the formula:

$$CA_{\text{critical}} = q_{\text{critical}} + pv \quad (2)$$

As regards the determination of the threshold of profitability for companies that produce a wide range of products, it shall be determined solely by the value expression (critical turnover) as follows:

$$CT = CV + CF \quad (3)$$

$$CA = \sum q \times p \quad (4)$$

$$\overline{CV} = \frac{CV}{CA} \quad (5)$$

$$MCV = CA - CV - \text{in relative sizes} \quad (6)$$

$$MCV\% = \frac{MCV}{CA} \cdot 100 - \text{in percentage sizes} \quad (7)$$

$$CA_{\text{critical}} = \frac{CF}{MCV\%} \quad (8)$$

where:

CF - total fixed expenses;

CV - total variable expenses;

CA - turnover;

q- production;

p - price;

$\overline{CV}$  - the average variable expense for a 1 RON turnover;

$1 - \overline{CV}$  - the average rate of variable expenses margin.

As an example we take a hypothetical case and suppose a firm records the following data:

Table no. 1 The indicators involved in determining the critical point

No. crt.	Indicators	2014	2015
1.	Turnover (CA)	16.000.000	19.500.000
2.	Total costs (CT)	14.900.000	16.800.000
3.	Fixed costs (CF)	9.600.000	10.700.000
4.	Variable costs (CV)	5.300.000	6.100.000

Graphical representation of the four indicators, are presented as follows:

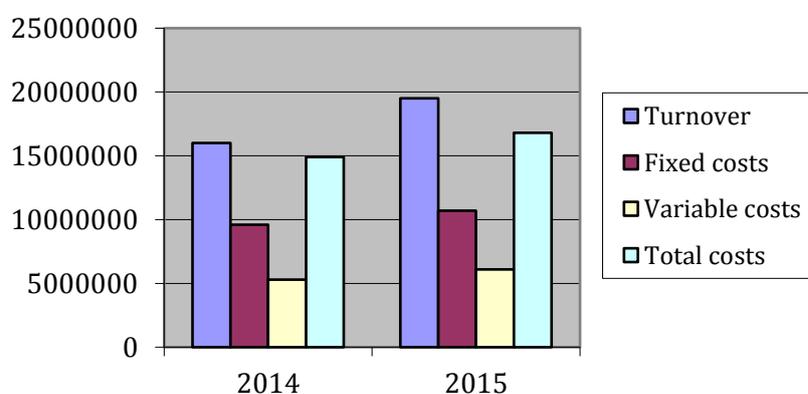


Diagram no. 1

Graphical representation of indicators involved in economic risk analysis

On the basis of the above variable cost margin we determine the critical operational and critical point total, as follows:

a) marja comercială: commercial margin:

- în mărimi absolute:

- in absolute sizes

$$MCV_{2014} = CA - CV = 16.000.000 - 5.300.000 = 10.700.000 \text{ lei} \quad (9)$$

$$MCV_{2015} = CA - CV = 19.500.000 - 6.100.000 = 13.400.000 \text{ lei} \quad (10)$$

- in percentage

$$MCV_{2014} = \frac{MCV}{CA} \cdot 100 = \frac{10.700.000}{16.000.000} \cdot 100 = 66,87\% \quad (11)$$

$$MCV_{2015} = \frac{MCV}{CA} \cdot 100 = \frac{13.400.000}{19.500.000} \cdot 100 = 68,71\% \quad (12)$$

b) the turnover corresponding to the critical point:

$$CA_{\text{critical}2014} = \frac{CFT}{MCV\%} = \frac{9.600.000}{0,6687} = 14.356.214 \text{ lei} \quad (13)$$

It follows that in a turnover of 14,356,214 lei revenues are equal to total expenditure, while the profit is equal to zero.

$$CA_{\text{critical}2015} = \frac{CFT}{MCV\%} = \frac{10.700.000}{0,6871} = 15.572.697 \text{ lei} \quad (14)$$

It follows that in a turnover of 15,572,697 lei revenues are equal to total expenditure, while the profit is equal to zero.

Considering the total turnover and the critical turnover of, we can determine the position of the operator toward the critical point, as follows:

$$\text{-for 2014: } \frac{CA}{CA_{criticală}} = \frac{16.000.000}{14.356.214} \cdot 100 - 100 = 11,45\% \quad (15)$$

$$\text{-for 2015: } \frac{CA}{CA_{criticală}} = \frac{19.500.000}{15.572.697} \cdot 100 - 100 = 25,22\% \quad (16)$$

From the results obtained, it can be seen that in 2014, turnover is just over 10 percent, by 1.45 percent, which means that the company is not in a very good situation. The specialised literature indicates that if the position of the turnover is below the 10% threshold, compared with company is in an unstable situation.

In 2015 the situation is much better, so that the turnover is 25.22% above break even, which means according to the literature that the firm is in a stable situation

Synthetically, the above data may be presented as follows:

Table no. 2 Indicators used in the calculation of indicators for assessing the economic risk

No. crt.	Indicators	2014	2015
1.	Commercial margin: - in absolute sizes (lei) - in percentage sizes (%)	10.700.000 66,87	13.400.000 68,71
2.	The turnover corresponding to the critical point (lei)	14.356.214	15.572.697
3.	Total turnover position vs critical turnover (neutral point - %)	11,45	25,22

In case CA is superior to the threshold of profitability, the company can calculate the work, called the margin of safety (MS), according to the formula:

$$MS = CA - PR \quad (17)$$

$$MS_{2014} = CA - CA_{criticală} = 16.000.000 - 15.356.214 = +643.786 \text{ lei} \quad (18)$$

$$MS_{2015} = CA - CA_{criticală} = 19.500.000 - 15.572.697 = +3.927.303 \text{ lei} \quad (19)$$

From the methodology of calculation it comes out that the margin of safety should be positive for the firm to obtain profit. The higher the value, the lower the risk of exploitation to which the firm is subject to.

The margin of safety (MS) represents an item bank units carefully analyse in the case of a credit account in the justification of fair decisions regarding development in perspective of the unit.

The security index (IS) measures the security margin as a percentage of turnover:

$$IS = \frac{MS}{CA} \quad (20)$$

$$IS_{2014} = \frac{MS}{CA} \cdot 100 = \frac{643.786}{16.000.000} \cdot 100 = 4,02\% \quad (21)$$

$$IS_{2015} = \frac{MS}{CA} \cdot 100 = \frac{3.927.303}{19.500.000} \cdot 100 = 20,14\% \quad (22)$$

When the company reaches break-even or critical turnover, it represents a critical period, i.e. the period of time during which the company carries out a critical turnover. It shall be determined as follows:

$$T_{critical} = \frac{CA_{criticală}}{CA} \cdot 360 \text{ days} \quad (23)$$

$$T_{critical2014} = \frac{CA_{criticală}}{CA} \cdot 360 \text{ days} = \frac{15.356.214}{16.000.000} \cdot 360 \text{ days} = 345 \text{ days sau } 11 \text{ month și } 12 \text{ days} \quad (24)$$

$$T_{critical2015} = \frac{CA_{criticală}}{CA} \cdot 360 \text{ days} = \frac{15.572.697}{19.500.000} \cdot 360 \text{ days} = 287 \text{ days sau } 9 \text{ month și } 25 \text{ days} \quad (25)$$

From these data, it appears that in 2014 the company has at its disposal 11 months and 12 days to record profit, and 2015 it has at its disposal 9 months and 25 days.

Synthetically, the above data may be presented as follows:

Table no.3

Indicators for the assessment of economic risk

Nr. crt.	Indicators	2014	2015
1.	Margin of safety (lei)	+643.786	+3.927.303
2.	Safety index (%)	4,02	20,14
2.	Critical period (days)	345	287

If we consider the order of calculating the indicators what in economic analysis and risk assessment, we can compare the three indicators expressed in absolute values. They can be synthetically represented graphically as follows:

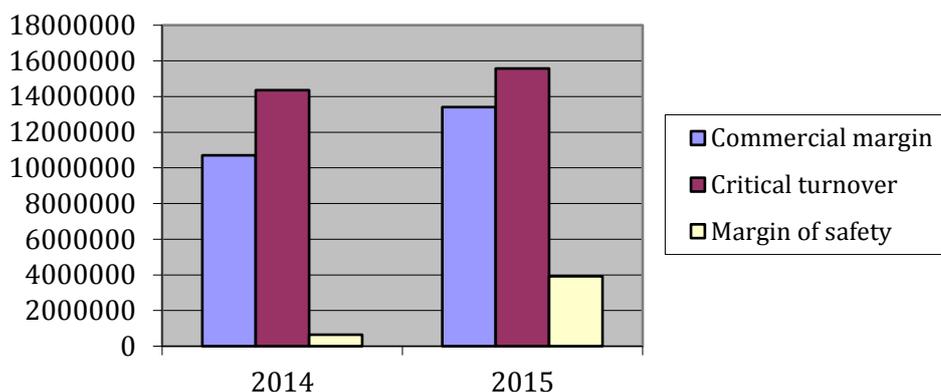


Diagram no. 2

Evolution of the commercial margin, breakeven and margin of margin of safety

The graph clearly indicates a positive evolution of the three indicators: trade margin with the 25% in 2015 compared to 2014, the critical turnover has increased by 8%, and the margin of safety with 510%. The growth of each indicator represents either a favourable aspect or an aspect less favorably. The growth of each indicator represents either a favourable aspect or an aspect less favorably.

The trade margin: [11]

-highlights the strategic commercial behaviour of the enterprise;

-a reduced trade margin involves rigorous cost-cutting, respectively cutouts concerning the staff and savings on expenditure for storage, transportation;

-promotion of a policy of high prices lead to a fall in sales but with maintaining high-margin commercial values;

-a declining trade margin rate with strong growth in sales means that the undertaking price policy, eventually conquering a new market segment;

-where the undertaking occupies a "forte" spot on the competitive market, increasing the commercial margin is accompanied by increased sales.

Increase in turnover to 15,572,697 lei represents an aspect less favourable so that this level represents the point at which the company can record profits and it is the consequence of an increase in the overall expenditure of the firm.

With regard to increasing the safety margins, this aspect is favourable to the company in the sense that higher value it has, the higher the enterprise flexibility is, i.e. the risk of exploitation will be lower.

#### 4. Conclusions

Sales volumes, resources consumed, the selling price, cost structure, the combination of products involved are management variables that influence the cost-volume-profit ratio. Any change to any of these variables may have an effect on profit, balance point and the economic risk of the company. [4]

Economic risk always shows the volatility of the economic outturn to operational conditions, and it can be influenced by the following factors:

- application flexibility is one of the factors leading to unpredictable revenue and makes the product demand to be higher and therefore it leads to a higher risk;
- sales prices on uncertain markets lead to a serious risk;
- acquisition costs of production factors may influence the total level of cost and the size of profit too;

- the ratio of fixed costs and total costs of a firm – a major weight always leads to a greater economic risk.

The main directions that should orient the management of a firm for a correct management of economic risk which accompanies the productive activity are: [2]

- improving the trade policy through an appropriate marketing strategy leading to a strong growth in the volume of turnover and a better positioning towards the threshold of profitability;

- reduction of fixed expenses share of what generates an increase in the flexibility and capacity of response to market requirements by increasing the size of the business;

- improvement of safety margin of activity by removing the turnover of critical point management and decreasing on this path of the risk;

- increasing profitability and reducing the economic exploitation of the results by reducing production costs, higher prices if market conditions permit, increasing sales, increased efficiency of production factors, increasing the efficiency of decisions;

- increase the flexibility of the enterprise that is the ability to be profitable and at a lower volume of activity (lower threshold of profitability).

## References

[1]Achim Violeta, *Analiză economico-financiară*, Ed. Risoprint, Cluj-Napoca, 2010

[2]Burja Carmen, *Analiză economico-financiară*, Ed. Casa Cărții de Știință, Cluj-Napoca, 2009;

[3]Hristea Anca Hristea, *Analiza economică și financiară a activității întreprinderii*, vol. 2, Ed. Economică, București, 2015, pag.173;

[4]Mironiuc Marilena, *Metodologia de analiză a riscului economic pentru întreprinderea multiprodus*, *Analele Științifice Ale Universității „Alexandru Ioan Cuza” Din Iași Tomul LII/LIII Științe Economice 2005/2006*

[5]Moroșanu Iosefina, *Analiza economico-financiară*, Ed. Fundației România de Măine, București, 2008;

[6]Păvăloaia Willi și colaboratorii, *Analiza economico-financiară. Concepte și studii de caz*, Ed. Economică, București, 2010;

[7]Popa Ion Lala, Miculeac Melania, *Analiză economico-financiară*, Ed. Mirton, Timișoara, 2009;

[8]Robu Vasile, Anghel Ion, Șerban Elena Claudia, *Analiza economico-financiară a firmei*, Ed. Economică, București, 2014;

[9]Siminică Marian, *Diagnosticul economico-financiar*, Ed. Universitaria, Craiova, 2008;

[10]\*\*<http://abctrainingconsulting.ro/blog-posts/analiza-pragului-de-rentabilitate/>

[11]\*\*<http://www.account.ro/indicatori/rata-marjei-comerciale/>

[12]\*\*[http://www.rdt-contabilitate.ro/component?option=com\\_glossary/id,2732/](http://www.rdt-contabilitate.ro/component?option=com_glossary/id,2732/)