

# THE BREAK-EVEN POINT, KEY INDICATOR FOR THE ENTERPRISE MANAGEMENT

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## Abstract:

*The development of this paper started from the need to establish the break-even point in the cases when it is necessary to make a business planning of the entity's activity. The establishment of the break-even point is closely related to the level of the sales and of the constant consumption. The importance of the break-even point for the management of the entity lies in the fact that it separates the level of activity that generates profit from the level of activity that records loss. Based on this, this approach presents the methods for determining the break-even point, its usefulness, as well as the advantages and the limitations of using the break-even by the management of the entity.*

**Keywords:** break-even point, fixed costs, variable costs, gross contribution per unit, threshold turnover

**JEL Classification:** M41

## 1. Introduction

There are several problems related to the break-even point, such as:

- What is the break-even point?
- What is the use of the break-even point?
- How is the break-even point established?
- Who or what influences the break-even point?

To all these questions we try to answer as well as possible in the following.

## 2. The literature in the field

The subject approached is a modern one, of great interest in substantiating the decisions on the extension of the company's level of activity and it is commonly met in the literature.

One way of assessing the company's performance or that of a production division, based on the use of the physical units, but in close correlation with the value units, is the analysis based on the "physical units – value units relationship." In this case, the management decisions of sizing the production level can be rigorously established using the break-even point method (Narcis Eduard Mitu, Ioana Ecaterina Mitu, 2006).

An argument relating to the economic and financial balance, valid any time, is the one expressed by Professor Dumitru Mărgulescu according to which "the general state of balance includes both equalities of the elements and inequalities with their economic significance ("Economic and financial analysis of commercial companies" – supplement of the Economic Tribune, 1994). The break-even point may be a good tool to help establish the economic and financial balance of the entity by identifying the level at which the activity generates profit.

One method based on which both the operating risk and the financial risk can be estimated is the breakeven point (Silvia Petrescu, 2004)

## 3. Research methodology

The approach starts from the significance of the break-even point and it takes into consideration the way of establishing its level, as well as the mechanism for its calculation. Thus, the following aspects are analysed:

- the calculation of the break-even point in case of a homogeneous production;
- the calculation of the break-even point in case of a heterogeneous production;
- the factors affecting the level of the break-even point;

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- the advantages of using the break-even point in substantiating the decision making of the company's management;
- the limitations of using the break-even point in substantiating the decision making of the company's management.

#### 4. The significance and the usefulness of the break-even point

The break-even point represents the turnover or the production volume for which the enterprise covers all its expenses without recording profit or loss. The break-even is also called the balance point or the critical point or critical turnover.

The break-even point corresponds to the level of activity starting from which the company achieves a certain profit, namely it covers all the fixed and variable expenses.

The break-even point is variable in time, being influenced by the change of the variable unit costs, of the expenses conventionally constant and by the selling price of the products.

The break-even point is established when it is necessary to plan for an activity. Its analysis is very useful especially in the situations in which new products are introduced into production, the company expands its activity level or it invests in the modernization of the fixed production assets.

#### 5. The calculation of the break-even point

Establishing the break-even point can be done, according to the case, in physical or in monetary units. Furthermore, the break-even point can be established for a single product or for the entire activity of the enterprise.

The calculation of the break-even point differs according to the type of production pursued: homogeneous or heterogeneous production.

In the case of the homogeneous production the break-even point is established in physical units, according to the following relation:

$$Q_r = \frac{CFT}{CBU} \quad \text{where,}$$

$Q_r$  = break-even point in physical units;

$CFT$  = total fixed costs;

$CBU$  = unit gross contribution.

or in monetary units according to the relationship:  $CA_r = Q_r \times P_{vu}$  where,

$CA_r$  = threshold turnover;

$Q_r$  = break-even point in physical units;

$P_{vu}$  = unit selling price.

$$CBU = P_{vu} - C_{vu} \quad \text{where,}$$

$CBU$  = unit gross contribution;

$P_{vu}$  = unit selling price;

$C_{vu}$  = unit variable expense.

For a better understanding we analyse the situation in which S.C. Alfa S.A. achieved a homogeneous production of 20,000 pieces of product A under the following conditions:  $P_{vu} = 1,800$  u.m.,  $C_{vu} = 1,000$  u.m.,  $CFT = 1,200,000$  u.m.

$$CBU = 1,800 - 1,000 = 800 \text{ u.m.}$$

$$Q_r = \frac{CFT}{CBU} = 1,500 \text{ pieces}$$

$$CA_r = Q_r \times P_{vu} = 1,500 \times 1,800 = 2,700,000 \text{ u.m.}$$

The enterprise analysed reaches the break-even point when it produces and sells 1,500 pieces of product A, namely a turnover threshold of 2,700,000 u.m. Any amount of product sold over 1,500 pieces will generate a profit.

In the case of the heterogeneous production, the break-even point is established in physical units, according the relation:

$$Q_r = \frac{CFT}{CBUm} \quad \text{where,}$$

$Q_r$  = break-even point in physical units;

CFT = total fixed costs;

CBUm = average unit gross contribution

$$CBUm = \frac{CBT}{Q} \quad \text{where,}$$

CBUm = average unit gross contribution;

CBT = total gross contribution;

Q = total quantity of products

$$CBT = \sum q_i \times p_{vi} - \sum q_i \times c_{vi} \quad \text{where,}$$

CBT = total gross contribution;

$q_i$  = quantity produced of each product;

$p_{vi}$  = unit selling price of each product;

$c_{vi}$  = variable expense per unit of each product.

For a better understanding we analyse the situation in which S.C. Beta S.A. provides a heterogeneous production as follows:

- 100 pieces A,  $P_{vu} = 500$  lei/piece,  $C_{vu} = 400$  lei/piece;
- 300 pieces B,  $P_{vu} = 700$  lei/piece,  $C_{vu} = 500$  lei/piece;
- 600 pieces C,  $P_{vu} = 300$  lei/piece,  $C_{vu} = 250$  lei/piece;
- CFT = 60.000 lei.

$$Q_r = \frac{CFT}{CBUm}$$

$$CBUm = \frac{CBT}{Q}$$

$CBT = \sum q_i \times p_{vi} - \sum q_i \times c_{vi} = (100 \text{ pieces A} \times 500 \text{ lei/piece} + 300 \text{ pieces B} \times 700 \text{ lei/piece} + 600 \text{ pieces C} \times 300 \text{ lei/piece}) - (100 \text{ pieces A} \times 400 \text{ lei/piece} + 300 \text{ pieces B} \times 500 \text{ lei/piece} + 600 \text{ pieces C} \times 250 \text{ lei/piece}) = 440.000 \text{ lei} - 340.000 \text{ lei} = 100.000 \text{ lei}$

$Q = 100 \text{ pieces A} + 300 \text{ pieces B} + 600 \text{ pieces C} = 1.000 \text{ pieces}$

$$CBUm = \frac{100.000 \text{ lei}}{1.000 \text{ buc}} \quad ; \quad CBUm = 100 \text{ lei/pcs}$$

$$Q_r = \frac{60.000 \text{ lei}}{100 \text{ lei/buc}} \quad Q_r = 600 \text{ pcs}$$

To establish the structure of the break-even point we shall use the specific weight procedure:

$$gs = \frac{\text{allocation\_base}}{\text{sum\_of\_the\_allocation\_bases}}$$

$$gsA = \frac{100}{1000} \quad gsA = 0,10$$

$$gsB = \frac{300}{1000} \quad gsB = 0,30$$

$$gsC = \frac{600}{1000} \quad gsC = 0,60$$

$Q_r = 600 \text{ pcs}$ , out of which:  $600 \times 0,10 = 60 \text{ pcs. A}$

$600 \times 0,30 = 180 \text{ pcs. B}$

$600 \times 0,60 = 360 \text{ pcs. C}$

$$CA_r = \sum Q_{ri} \times P_{vi}, \text{ thus: } 60 \text{ pcs. A} \times 500 \text{ lei/pc} = 30,000 \text{ lei}$$

$$180 \text{ pcs. B} \times 700 \text{ lei/pc} = 126,000 \text{ lei}$$

$$360 \text{ pcs. C} \times 250 \text{ lei/pc} = 90,000 \text{ lei}$$

$$CA_r = 30,000 \text{ lei} + 126,000 \text{ lei} + 90,000 \text{ lei} = 246,000 \text{ lei}$$

The enterprise analysed reached the break-even point when it produced and sold 600 pieces of products in the established structure (A = 60 pieces; B = 180 pcs; C = 360 pcs), namely a threshold turnover of 246,000 lei from the sale the 600 pieces of products. Any quantity of product sold, of any variety (A, B or C) over 600 pieces will generate profit.

## 6. Factors influencing the level of the break-even point

The break-even point varies in time, and the main influence factors are chiefly represented by:

- changing the prices of the commodity and auxiliary materials;
- changing the structure of production;
- the variable costs of the marketing campaigns and of product promotion;
- changing the conventional constant costs (fixed costs of the enterprise);
- changing the selling prices of products;
- changing labour costs
- changing the labour force-related costs.

All of these, and not only, make the break-even point be variable in time and they establish its limits in terms regarding its usefulness, as we shall see below.

## 7. Advantages and limitations of using the break-even point by the management of the entity

The use of the break-even point by management of the enterprise presents a series of advantages, including:

- it has the nature of a relevant tool of information and substantiation of the decisions at the level of the enterprise's management;
- it allows monitoring and controlling the expenditure and revenues so that the management can track the level of activities from which the enterprise is profitable;
- it enables the management of the enterprise to differentiate the profits achieved as a result of the volume of activity from those obtained as a result of its efficiency;
- it enables to identify the products or activities that are not profitable, as well as to identify the opportunities for profit growth.

Just as any other instrument of information the break-even point also presents a number of limitations including:

- it provides information available on short term because any changes regarding the fixed or variable costs influence it too;
- dividing the expenses into fixed and variable is done according to criteria which are not very clear, sometimes purely conventional;
- the fixed costs are considered stable on long-term, which does not exactly correspond to the contemporary economic reality;
- the unit selling price of the products can be volatile, depending on the market evolution and any change in it also influences and the break-even point.

## 8. Conclusions

The break-even point is a useful tool for the management of the entity since, starting from its level, the activity carried out begins to generate profit. An entity that has high fixed costs and low variable costs will have a break-even point higher than one that has low fixed

costs and high variable costs. Thus, an entity that has high fixed costs and low variable costs must produce a greater quantity of products to reach the break-even point than an entity that is in the opposite situation. But once the break-even point is exceeded by this, the profit will grow faster than in the case in which it would have had low fixed costs and high variable costs. But the reverse situation is equally true in cases of recession when the sales decrease.

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