STUDY REGARDING THE NET PROFITABLENESS OF PRODUCTS ACCORDING TO "CRITICAL POINT" IN A VEGETAL FARM FROM IASI COUNTY

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Abstract

The breakeven is the critical point under which the degree of use of production capacity should not fall because the farm would come at a loss and could not recover, as, indeed, working capital, and would not able to pay salaries. This point is of great importance especially for large farms where the determination of the size of a minimum profit necessary and sufficient is vital for the functioning of the society.

Breakeven analysis is necessary: in the current activity as a way to foresee the profile when modifying the activity level, and production, in studying the consequences of increasing the sales or turnover (CA) and in the study of modernization programs and upgrading of production.

Production level in the culture of wheat, 3015 kg / ha marks the critical or breakeven point, where the amount of income obtained by selling the quantity of products at a price of 1.2 lei / kg, provides full coverage of the cost of production and at the culture of barley, production of 3397 kg / ha marks the critical or break-even point, where the amount of income obtained by selling the quantity of products at a price of 1.0 lei / kg, provides full coverage of the cost of production.

The main advantages offered by cost-effectiveness analysis method based on critical point are: to establish the size at which production becomes profitable, indicates production volume needed to achieve a profit, reveal correlations between the dynamics of production, income and dynamics that costs grouped by variable and fixed costs, allows determining the use of production capacity in conjunction with a desired profit.

Key words: break-even, economic profitability, farm, Iasi

MATERIAL AND METHOD

To determine the breakeven point (critical point) we used two methods: graphical method and algebraic calculation.

For break-even analysis and to illustrate the calculation method, using these methods, our studies were conducted for crops of wheat, barley and rapeseed on a vegetal farm from Iasi.

RESULTS AND DISCUSSIONS

The Agricola Moldova company is based in Ţigănaşi, Iasi county, located 25 km from Iasi. The unit is located in north-eastern county in the middle of the river basin representing the terminal part of Jijia – Prut river sector. Geomorphologically, the territory of the company is situated in the south – east part of Moldavian Plain.

According to EC Regulation 1257/1999 three types of disadvantaged areas were defined, Ţigănaşi commune being in the unfavoured zones with specific natural conditions.

Break even, also called **critical point** or balance point, marks that dimension of production where the overall costs are equal to the incashments from the sale of production and the result is null. The activity becomes profitable after the break-even. Up to this level of unit production losses.

The result of operation - profit or loss from exploitation is determined as the difference between operating revenue and operating expenses:

- $R_{e_{2008}} = V_{e_{2008}} - C_{e_{2008}} = 18237342 - 17642472 = 594\,870 \text{ lei}$

- $R_{e_{2009}} = V_{e_{2009}} - C_{e_{2009}} = 21023438 - 19281396 = 1\,742\,042 \text{ lei}$

- $R_{e_{2010}} = V_{e_{2010}} - C_{e_{2010}} = 24043527 - 20297142 = 3\,746\,385 \text{lei}$

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Result of research
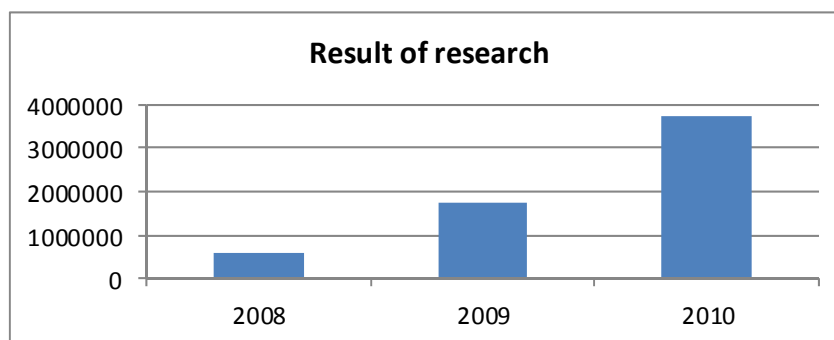
Operation result is represented graphically in figure 1.

It is noted that the farm registers profit from operating activities, the best value being recorded in 2010. So, 2010 was a good year for operations. After the analysis the conclusion is that the company carries out a profitable activity gaining profit in all three years 2008, 2009, 2010, resulting in the analysis that the profitability is a synthetic form of expression of efficiency of all economic activities of the company.

Determining the breakeven point can be made: for the entire business, of the company that manufactures and markets several agro products or one product (Brezuleanu S., 2008). This critical point is achieved when the turnover is equal to total expenditure: CA = CT.

Total expenditure (CT) consists of fixed costs (CF) and variable expenses (CV), so CA = CF + CV The greater CA, the lower is the risk of exploitation and the result is that the unit adapts quickly to environmental changes surrounding the quantity of production obtained.

This method makes provision to amend the activity profile.

Break-even point can be determined by graphical method and by algebraic calculation. The methodology for determining takes into consideration the direction of evolution of the costs and revenues to changes in production volume.

When changing the variable costs directly proportional to volume production using the *linear model of evolution* of variable costs and income, computing the breakeven point can be staged. Fixed costs (CF) have the form of a parallel to the axis of output.

The line of variable costs (VC) starts from the origin and is increasing, and total costs (TC) have a linear upward trend. If the sale price is unchanged during a period, the total revenues (CA) will be represented by a straight line with a slope greater than the total cost.

In point E, income (CA) are equal to total expenditure (CT), and the profit is zero, and represents the minimum level of activity (production) allowed.

$$V = CT \quad \text{şi} \quad P = 0$$
$$\text{sau} \quad Q_E \times P = CF + CV_E$$
$$Q_E = \frac{CF}{P - CV} \times 100$$

Q_E is the level of production for which the farm does not record profit, but from the sale of this quantity it is obtained only the recovery of fixed costs and variables.

For a production (volume of activity) greater than Q_E profit is made, while for a production smaller than Q_E, losses are obtained.

It results that the break-even production represents the level of production at which income ensures is only cost recovery, and the profit is obtained at higher productions (Brezuleanu S., 2009).

An example of calculating the critical point is the wheat crop is presented in table 1:

Breakeven must be updated along the changing of measures taken into account (Cv, P, CF).

From what has been presented it results the break-even represents the quantity of products or turnover beyond which the company gains profit, its determination is a management technique. This determination and the breakeven analysis is made together with the specific progress of costs and prices, due to short-term variability under conditions of transition and inflation, of information involved in the calculation.

Table 1

Determinign break-even at wheat

Nr. crt.	Indicators	UM	Symbol	Value
1.	Average production- wheat	kg/ha	Q	4000
2.	Unit variable cost	lei/kg	cv	800
3.	Selling price -wheat	lei/kg	P	1,2
4.	Income (CA)	lei	$V=Q \times P$	4.800
5.	Total variable costs	lei	$CV=Q \times cv$	3.200
6.	Total fix costs	lei	CF	1.200
7.	Gross profit of activity volume	lei	$P=V-(CF+CV)$	400
8.	Break-even	%	$Q_E=(CF/P-CV) \times 100$	48%

From statistical analysis we can say that the farm can be found in the following situations: (Vlad Mihaelaşi et al., 2007).

- *unstable* when CA ranges up to 10% more than break-even (MS <10%);

- *Relatively stable* when CA is less than 20% above break-even (MS <20%);

- *Comfortable* when CA exceeds by more than 20% break even (MS> 20%).

This method allows the foresseing the profile when changing the level of activity.

Margin of safety (MS) is an element carefully considered by banks in the event of a credit and fair decisions on the future development of the farm.

Table 2

Data necessairy for calculation of critical point

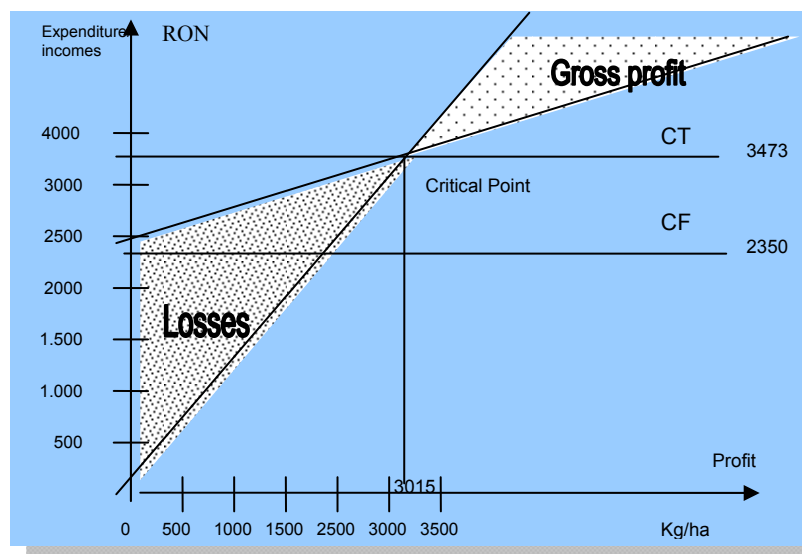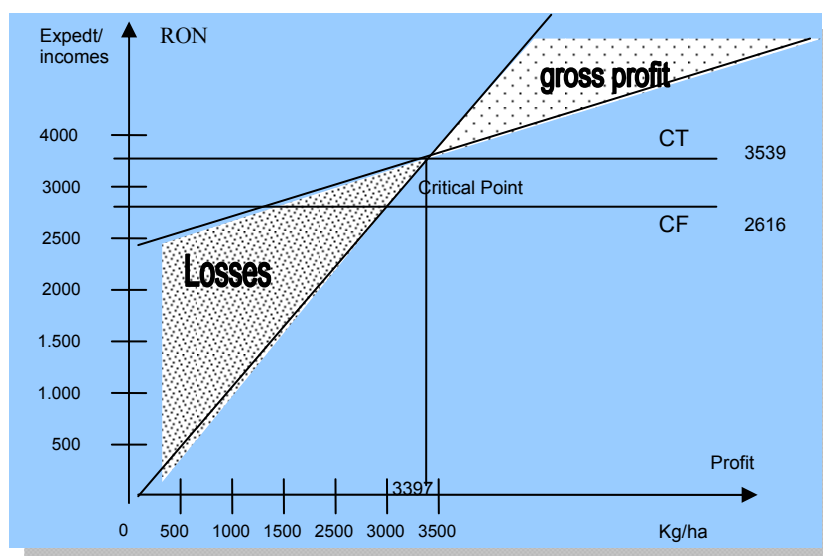| Indicators	Symbol	Wheat	Barley	Rapeseed
Total fix costs	CF	2350	2616	1280
Variable expenditures	Cv	1123	923	1337
Total expenditure	Ct	3473	3539	2617
Average production (kg/ha)	Q_E	3500	4000	1800
Selling price (lei/kg)	Pv	1,2	1,0	1,5

Figure 2 **Graphic of the critical point for wheat**

Figure 3 **Graphic of the critical point in barley**

Accoding to the formula we obtain the following values:

$$Q_E wheat = 1\frac{2350}{1200-1173} \times 100 = 3015 \text{ kg/ha}$$

$$Q_E Barley = \frac{2616}{1000-923} \times 100 = 3397 \text{ kg/ha}$$

$$Q_E Rapeseed = \frac{2130}{1500-487} \times 100 = 1109 \text{ kg/ha}$$

Production level in the culture of wheat, of 3015 kg / ha marks the critical or break-even point, where the amount of income obtained by selling this quantity of products at a price of 1.2 lei / kg, provides full coverage of the cost of production. Exceeding this level of production (of 3015 kg / ha) results in obtaining a profit and the fall below this level causes losses.

Production level in the culture of barley, 3397 kg / ha marks the critical or break-even point, the amount of income by selling the quantity of products at a price of 1.0 lei / kg, provides full coverage of the cost of production. Exceeding this level of production (of 3015 kg / ha) results in a profit and the fall below this level causes losses.

Figure 4 **Graphic of critical point in the rapeseed**

The production level at rape crop of 1109 kg/ha marks the critical or break-even point, the amount of income by selling the quantity of products at a price of 1.5 lei / kg, provides full coverage of the cost of production. Exceeding this level of production (of 1109 kg / ha) result in a profit and the fall below this level causes losses.
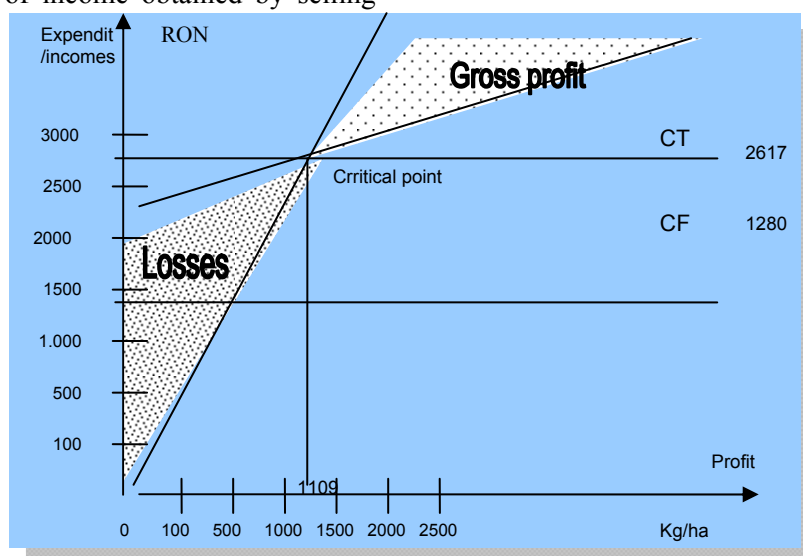
CONCLUSIONS

Knowing the breakeven point should be the preoccupation of all leaders, establishing itself not only in its determination but also in the break-even analysis. Breakeven is a way of risk assessment in relation to environmental fluctuations.

As the sizes taken into calculation change, the break-even point should be updated. Knowing the breakeven of the farm allows the calculation of the margin of safety on which are based the financial decisions - loans, credits.

The main advantages offered by analysis method of cost-effectiveness based on critical point are: allows the establishment of the size at which production becomes profitable, indicates production volume needed to achieve a profit, reveal correlations between the dynamics of production, income and dynamics that costs grouped by variable and fixed costs, allows determining the use of production capacity in conjunction with a desired profit.

Breakeven must be updated along the changes taken into consideration (Cv, P, CF). It results that profit of Agricola Moldova Ţigănaşi can be increased by handling cost and price variables in the following manner: **reduce fixed costs** (machinery, fuel, salaries TESA), through actions such as preventive maintenance of equipment, using equipment with lower specific consumption, establishing the necessary TESA staff and wages etc.; **reducing variable costs** (materials, direct wages) by reducing specific consumption of raw materials, purchase materials at lower prices, rationalization and rational organization of work processes; **price increase** is possible by increasing the quality and competitiveness of agricultural products obtained.

In order to increase the performance of this company the following proposals can be made: the practice of ecological agriculture because there is an increasing trend of demand for organic products, better organization by introducing a complementary system of sustainable agriculture, using funds from international organizations, investment in irrigation infrastructure.

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