CONSIDERATIONS REGARDING THE PART PLAYED BY VARIABLE COSTS IN MANAGEMENT WITH A VIEW OF IMPROVING THE RESULT OF THE COMPANIES' ECONOMIC ACTIVITY

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ABSTRACT: A company's activity should permanently occur within the balanced relation between incomes and expenditures. During the present stage of strengthening market economy, Romanian mining units do not manage to maintain this balance; the expenditures determined by exploiting the coal largely overpass the incomes resulting after selling the production. Under such circumstances, the problem managers have to face is to find out certain methods that enable them to estimate and control the previously mentioned balancing relation. The preoccupations regarding the finding out of calculation methods able to provide the operative determining of production cost and the settling of certain indices having an increased informing power needed in order to substantiate decisions that lead to an efficient management of the companies' economic activity determined the issuing of the method of variable costs.

СЪОБРАЖЕНИЯ ОТНОСНО РОЛЯТА НА ПРОМЕНЛИВИТЕ ЦЕНИ В УПРАВЛЕНИЕТО С ЦЕЛ ПОДОБРЯВАНЕ ИКОНОМИЧЕСКАТА ДЕЙНОСТ НА ФИРМИТЕ

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РЕЗЮМЕ: Фирмената дейност трябва постоянно да балансира между приходите и разходите. Понастоящем румънското минно дело не успява да осъществи такъв баланс. Разходите при проучването на въглищни находища далече надхвърлят приходите при продажбата на въглищата. При тези обстоятелства проблема, с който се сблъсква мениджмънтът е да се намерят определени методи за оценка и контрол на посочените балансиращи фактори. Описан е методът на променливите цени, състоящ се в отделяне на производството и разходите според техните характеристики срещу промяната на цената на продукцията и възстановяването на разходите. Описаният метод може успешно да бъде прилаган с цел подобряване на икономическата дейност на фирмите.

INTRODUCTION

The essence of the method of variable costs consists in the clear separation of production and retail expenditures according to their characteristics against the variation of the physical amount of production and retail; accordingly, variable costs deal with variable expenditures and fixed expenditures and when calculating the unitary cost per product variable expenditures are the only ones to be considered; fixed expenditures are subtracted as a whole from the gross financial result of the company. Unitary cost (Uct) is calculated according to the concept of this method, by reporting the total variable expenditures (Vex) to the amount of the finite production obtained (Qf) as follows:

$$Uct = Vex / Qf \quad (1.1)$$

This method does not mainly seek to determine the unitary cost of the product, but the calculation and analysis of total profitableness at the level of the whole company. Only gross margin is calculated for each product. Unitary gross margin (Ugm) is calculated as a difference between unitary selling price (Usp) and unitary cost (Uct):

$$Ugm = Usp – Uct \quad (1.2)$$

Total gross margin (Gm) is determined by subtracting the total variable expenditures of the sold products from the sales figures (the total amount of sales at selling price) (D). Then the total financial result (R) at the level of the company can be calculated by subtracting fixed expenditures (Fex) of the period from the total gross margin:

$$Gm = D – Vex \quad (1.3)$$

$$R = Gm – Fex \quad (1.4)$$

THE PART PLAYED BY THE RELATION PRICE-COST-VOLUME WITHIN THE COMPANY'S MANAGEMENT

The management of modern companies is capable of adopting rational decisions that can provide the obtainment of optimum results on the condition that fixed expenditures and variable expenditures are permanently correlated with the amount of the activity, namely with the degree of using production capacity and with the production selling price. This correlation is expressed by certain indices such as: balance point (or profitableness margin), point of optimum activity, covering factor, dynamic safety coefficient, and safety margin.

Balance point (Bp) expresses that level of production for which the incomes obtained out of selling the production are equal

with the expenditures, meaning that they are balanced, and profitableness is zero. It shows the point from which any increase of the amount of the sold production brings a profit to the company, and its activity becomes profitable; it is also evident that any decrease of the amount of the sales brings losses to the company, and its activity becomes non-profitable; these are true providing the noticing of the correlation among costs, selling prices and production type.

$$Bp = Fex / Ugm \quad (1.5)$$

In order to exemplify the above data, let's suppose that a company produces and sells, during its administration period, 60000 tons of coal; its selling price is 10 mu/ ton (mu = monetary units, „lei" in Romania). Unitary cost is 6 um/ ton, and fixed expenditures of the period represent 90000 mu. Introducing these data within the above relation, one gets a balance point equal with 22500 tons.

$$Bp = 90000 / (10 – 6) = 22500 \text{ tons}$$

It means that the company should produce and sell during the period 22500 tons, that is 37.5% of the amount of extracted coal in order to entirely cover its variable and fixed expenditures so that the total financial result at the level of the company is zero. Any ton of coal sold over this amount will bring a profit of 4 mu, as any ton of coal not sold and not extracted will bring a loss of 4 mu.

The point (margin) of optimum activity (*Po)* represents the point where both production and expenditures have a normal level, a fact that allows the obtainment of the programmed result, namely of the desired profit (standard, planned, included in the budget). Any increase of the production over the optimum amount will bring a supplemental profit, over the one planned according to the budget; at the same time, any decrease of the production under the optimum amount will determine the decrease of the profit and of contractual obligations regarding the sales including all the resulting consequences. The decrease of production under the optimum margin may reach the balance point; after reaching it, any continuation of the decrease is going to determine losses for the company. Mathematically, *Po* is calculated as a ratio between the *total fixed expenditures* of the period (Fex), and the difference between the *standard* (programmed, included in the budget) *unitary cost* (Suct) and the *unitary cost calculated according to variable expenditures* (Vect):

$$Po = Fex / (Suct – Vect) \quad (1.6)$$

In order to exemplify, let's admit standard unitary cost of 8 mu/ ton of coal. The rest of the data are those shown when settling the balance point. Introducing these data within the above relation, one concludes that the Po is expressed by the amount of 45000 tons of coal:

$$Po = 90000 / (8 – 6) = 45000 \text{ tons}$$

Accordingly, the management of the company finds out the minimum limit as well as the optimum one of production and sale, namely the limit from which one should start and which one should reach in order to get a profitable activity.

Covering factor (Cf) is an index showing how many percents of the amount of the sales are necessary in order to cover fixed expenditures and to get a profit. The calculation of this index is extremely important in order to adopt current decisions regarding the sale of production as it shows how many percents of the amount of the sales are required in order to cover fixed expenditures and to get a profit. This means that a mining company should direct its policy of coal extraction towards those types of coal having the highest covering factor. Mathematically, one may calculate it as a ratio between *total fixed expenditures (Fex)* and the *sales figures at the level of the balance point (d):*

$$Cf = (fex / d) \times 100 \quad (1.7)$$

$$Cf = (90000 / 22500 \times 10) = 40 \%$$

Accordingly, this index shows potential profitableness and that's why it represents the foundation of all decisions regarding sales. At the same time, owing to it one may calculate unitary production price as a selling price, and the management of the company may adopt rapid decisions regarding the price policy too.

Dynamic safety coefficient (Sc) shows how much sales may relatively decrease so that the company attains the balance point. Any decrease over this coefficient is going to determine the company to face losses. Accordingly, all decisions regarding the decrease of the sales should be taken within the margins of this index. Mathematically, one should calculate it by subtracting out of the *maximum activity degree of 100% (D)* the *degree of activity at the level of the balance point (d)*:

$$Ks = D – d \quad (1.8)$$

$$Ks = 100\% - 37.5\% = 62.5\%$$

Accordingly, the sales may decrease with 62.5% so that the company does not face losses. A decrease of the sales of 62.5% will provide the balance point for the company; any other supplemental decrease over this coefficient is going to determine losses.

Dynamic safety margin (Ds) has the same signification as the Ks; nevertheless here data are displayed in absolute sizes and not in relative ones. Mathematically, it is the difference between the *total sales figures (D)* and the *sales figures at the level of the balance point (d):*

$$Ds = D – d \quad (1.9)$$

$$Ds = 600000 – 225000 = 375000 \text{ mu}$$

Consequently, according to an absolute model, sales may decrease by 375000 mu so that the company does not face losses and maintains at the level of the balance point. Any decrease of the sales over this sum is going to determine a loss equal with the decrease.

POSSIBILITIES OF IMPROVING THE RESULT OF ECONOMIC ACTIVITY

The calculus and analyses done according to the relation price – cost – amount represent an important instrument at hand of the management of the company in order to improve the result of the economic activity. This is done by determining the influence it has upon profit, the modification of the factors that represent the foundation of price establishing: sales price, amount of production and sales, variable expenditures, fixed expenditures, and the structure of production and sales. Accordingly, let's suppose the initial data of the bellow table where the total profit obtained out of selling the „type M coal"

products and the "type N coal" products is of 140000 mu; the balance point is to be found at a level of the sales figures of 588275 mu, the covering factor is of 34%, and the dynamic safety coefficient is of 41.23%.

Table 1
Calculations for improving the final result of the method of variable costs

Explanations	Initial Data	Improvement factors					
		Increase of the selling price	Increase of the physical amount of production and sales	Decrease of variable expenditures	Decrease of fixed expenditures	Modification of the structure of production and sales	Final data as a result of the influence of all the factors
1. Amount of sales at their selling price (total sales figures):							
- prod. M:60000 t × 10m.u.	600.000	720.000	660.000	600.000	600.000	1.000.000	1.320.000
- prod. N: 50000 t × 8 m.u.	400.000	500.000	440.000	400.000	400.000	80.000	110.000
Total	1.000.000	1.220.000	1.100.000	1.000.000	1.000.000	1.080.000	1.430.000
2.Variable expenditures:							
- prod. M: 60000t × 6 m.u.	360.000	360.000	396.000	300.000	360.000	600.000	550.000
- prod. N: 50000 t × 6 m.u.	300.000	300.000	330.000	250.000	300.000	60.000	55.000
Total	660.000	660.000	726.000	550.000	660.000	660.000	605.000
3.Gross contribution to the profit:							
- prod. M: 60000t × 4 m.u.	240.000	360.000	264.000	300.000	240.000	400.000	770.000
- Covering factor	40%	50%	40%	50%	40%	40%	58,83%
- prod. N: 50000 t × 8 m.u.	100.000	20.000	150.000	150.000	100.000	20.000	55.000
- Covering factor	25%	40%	37,5%	37,5%	25%	25%	50%
Total	340.000	380.000	450.000	450.000	340.000	420.000	825.000
4. Covering factor	34%	45,90%	45%	45%	34%	38,88%	57,69%
5.Fixed expenditures	200.000	200.000	200.000	200.000	140.000	200.000	140.000
6. Profit	140.000	360.000	250.000	250.000	200.000	220.000	685.000
7. Sales amount at the level of the balance point (sales figures at the level of the balance point)	588.275	435.730	588.235	444.444	411.765	514.403	242.676
8. Dynamic safety coefficient	41,23%	46,54%	46,54%	55,55%	58,82%	52,37%	83,03%

The company's management targets a profit of 685000 mu and is going to act upon optimizing factors within the margins of production and sales terms. With this in view, the management will decide the following:

1. A certain percent raise of the unitary selling price or a certain sum (Pvu^m), let's say 2 lei/ ton, added to whatever „i" product that is going to determine a supplemental profit;
(Spr) equal with the product between the sold quantity (Sq) and the price raise

(Spr = $\sum_{i=1}^{n} Qv_i Pvu^m$), namely (60000 tons x 2 mu) + (50000 tons x 2 mu) = 220000 mu. Accordingly, the covering factor increases up to 45.90%, the balance point is to be found at a sales amount (sales figures) of 435730 mu, meaning that it is going to move downwards, to the origin point; the dynamic safety coefficient is going to raise up to 64.28%;

2. An increase of the physical amount of production and sales either with a certain percent or with a certain quantity, let's say 10% added to each product, that will determine a

raise of the profit equal with the product between the supplemental sold amount and the unitary gross contribution to the profit (Spr = $\sum qv_i^m Cbu_i$), namely (6000 tons x 4 mu) + (5000 tons x 2 mu) = 34000 mu. As a result of this modification, the covering factor and the balance point are going to remain unchanged, but the dynamic safety coefficient will raise up to 46.54%;

3. A diminishing of variable expenditures as a result of certain work improving actions with a certain percent or sum ($Chvu^r$); let's say with 1 mu/ ton added to each type of coal that will determine a supplemental profit equal with the product between the sold amount and the diminishing of variable expenditures (Spr = $\sum Qv_i\ Chvu_i^r$), namely (60000 tons x 1 mu) + (50000 tons x 1 mu) = 110000 mu. As a result, the covering factor will raise up to 45%, the balance point is going to decrease towards the origin point corresponding with a sales amount (sales figures) of 444.444 mu, and the dynamic safety coefficient will increase up to 55.55%;

4. A decrease of fixed expenditures through closing a storehouse, diminishing the number of employees, etc. with a certain percent or sum (Chf^r), let's say of 60000 mu, that will determine a supplemental profit equal with the diminishing (Spr = Chf^r), that is 60000 mu. This modification will maintain unchanged the covering factor, but the balance point will move downwards to the origin point, corresponding to an amount of the sales (sales figures) of 411765 mu; the dynamic safety coefficient will grow up to 58.82%;

5. A change of the structure of production and sales according to products, stimulating the product having the highest covering factor; accordingly, the promotion of differential sales of the two types of coal will determine a raise of the profit equal with the difference between the amount with which sales has grown in case of a certain type of coal multiplied by the gross unitary contribution to the profit and the amount with which the sales of another type of coal decreased also multiplied with the corresponding gross unitary contribution that is going to be determined as follows:

$$\text{Spr} = (Q_{ri}^1 - Q_{ri}^0)^{+Fa} Cbu_i - (Q_{rj}^0 - Q_{rj}^1)^{-Fa} Cbu_j$$

where: i , j - the two categories of products (types of coal); 0,1 - the initial structure and the changed structure; +Fa, -Fa - the highest covering factor and the lowest covering factor.

In case we assume that we are going to grow sales up to 100000 tons of type M coal that has a higher covering factor, and we reduce them down to 10000 tons in case of type N coal that has a lower covering factor, we obtain a supplemental profit of 80000 mu, namely:

Type M coal: (100000 tons – 60000 tons) x 4 mu = 160000 mu

Type N coal: (50000 tons – 10 000 tons) x 2 mu = 80000 mu

The result is a difference of 80000 mu. Under such circumstances, the covering factor will grow up to 38.88%, the balance point will move downwards to the origin point, corresponding to sales figures of 514403 mu; the dynamic safety coefficient will grow up to 52.37%.

Acting upon all these optimizing factors owing to the decisions adopted as shown previously, the managers of the mining company will get the envisaged result, namely a profit of 685000 mu. At the same time, the covering factor will substantially improve rising up to 57.69% consecutively with a downward movement of the balance point to the point of origin, corresponding to an amount of the sales (sales figures) of 242676 mu; the dynamic safety coefficient will raise up to 83.03% showing a positive condition of the company.

The company might also adopt decisions regarding the negative influence of these factors in order to determine their influence upon profit. The knowledge of such an influence is extremely important in order to be counteracted through an acting decision favorable to one or another of the other factors.

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