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METHODS OF CALCULATING THE COSTS IN THE ROMANIAN MINING ENTERPRISES

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Key words: costs, methods, direct costs, gross contribution, THM.

CONCLUSIONS

Determining the cost-bearers takes place according to the physical form of the production and the requirements of the calculation method. In this sense, we could choose between the synthetic calculation methods using a single expense-bearer and analytical calculation methods implying the utilization of two or more expense-bearers and able to provide several necessary information for the economic-financial analysis of the enterprise in the purpose of fundamental economic decisions to be made by the operative leadership of the enterprise.

As stated above, we can also mention the expenditure sectors that serve the analytical character of programming and of following the expenses related to the production capacity of the enterprise. At determining expenses sectors, we will take into account: the number of departments and workshops in the enterprise, their size, the necessary production and responsibility centers, as well as the informational needs regarding the expenses of the technical-productive departments of the enterprise according to the manufactured production.

According to the pursued objectives, calculation methods can be grouped into two categories

- calculation methods with a single objective and determining the unitary cost: the phase method, the order method, G.P. method, the global method;
- the calculation method that follow and other objectives necessary to the management of costs: the direct-costing method, the normed cost method, T.H.M method, pret-cost method.

The enforcement of a calculation method in the mining industry has to take into account its integration into the field of the mining enterprise and the accomplishment of the requirements of a modern informational cost system, able to answer at any time to the continuous pressure exerted by the external factors of the enterprise.

ABSTRACT

Financial accounting has the role of providing the necessary information for the drawing up of financial situations, offering to the internal and external users of the enterprise data regarding its financial standing. Unlike financial account-

ing, administration accounting seeks to offer an analytical image concerning the internal products of the enterprise that create quantitative and qualitative changes in the shareholders' estate trusted to the managers for an efficient administration. The organizing of calculation works for costs is implicitly condi-

tioned by a series of factors, such as: manufacture, technology and production organization structure, the type of structure, etc. Approaching a method of calculating costs according to the above-mentioned factors implies: determining the cost-bearers, determining the expenses sectors; improving the informational system regarding the identification, data processing, the analysis and reporting the deviations from the previously calculated costs.

INTRODUCTION

For ensuring a real and exact content of the costs structure we will consider the following principles:

1. The principle of expenses separation regarding the obtaining of goods, works, services, from the expenses that aren't related to their acquisition, production or processing. This implies the fact that, on the level of calculation of objects determined by every legal entity, the expenses related to the respective objects should be separated from the expenses related to the rest of activities. The expenses that aren't involved in obtaining the mentioned calculation objects, such as: administration expenses, fixed administration not distributed to cost, sale expenses, financial expenses, extraordinary expenses etc aren't included in their cost.

2. The principle of separating expenses in time. This principle implies the fact that the inclusion of the expenses in costs is made during the administration period to which the respective expenses belong.

3. The principle of separating the expenses in space. This principle implies the fact that the separation of the expenses made in a certain period of administration according to the principal processes or other places of expenses that it produced, such as: supplying, pro-

duction, administration, sales and within the production sector, in departments, workshops, production lines etc. Within the above mentioned structures there can be built production centers, profit centers or other responsibility centers according to which the separation of the expenses widens.

4. The principle of separating the productive expenses by the unproductive ones. This principle implies the fact that the productive expenses which create values are separated from the unproductive expenses.

5. The separation of the expenses referring to end production from the expenses referring to the ongoing production. This principle is valid for those productive units the production of which is partially presented at the end of the administration period in several transformation studies, its quantity and value being different from one administration period to another.

MATERIAL AND METHODS

For calculating costs, the expenses recorded in financial accounting according to their nature can be grouped in administration accounting as follows:

- a) direct costs
- b) indirect costs
- c) general administration costs
- d) sale costs

Direct costs are those expenses which are identified for a certain calculation object (product, services, work, command, phase, activity, function etc), even from the moment of their making and thus, directly included in the costs of the respective objects.¹ Direct expenses include: purchase cost of the raw materials and directly consumed materials, the

¹ Baciu A. – Informational Costing System, Dacia Publishing, Cluj-Napoca, 1981, p. 14

energy consumed for technological purposes, direct manual labour (paychecks, insurances and social protection etc), other direct expenses.

Indirect expenses are those expenses that refer to the production of several products, the execution of several works, services or orders, respectively stages, activities as objects of calculations in a workshop, department etc, even the enterprise as a whole.

The indirect expenses include

- *the fixed overhead of production*, including those indirect production costs that remain the same irrespective of the volume of the production, such as: the pay off of the equipment and tools, the maintaining of the sections and equipment, as well as the expenses related to the management of the sections;

- *the variable overhead of production* includes those indirect expenses that vary direct proportionally or almost direct proportionally to the volume of the production, such as indirect costs for raw material, materials and manual labour.

The allocation of the fixed overhead over costs is made on the basis of normal production capacity.

Normal capacity of production represents the production estimated to be obtained for a certain number of periods or seasons in normal conditions taking into consideration also the loss of capacity resulted from the planned maintenance of the equipment.

The fixed overhead is recognized as an expense for the period = the fixed overhead x (1 – the real level of the activity/the normal level of the activity).

For determining the real level of the activity we can take into account the following issues: the volume of the accomplished production, the functioning hours of the equipment, the degree of utilization for the production capacities or other factors. The value of the fixed

overhead allocated to every unit produced doesn't increase after obtaining a low production or in the case of not using some assets. The fixed overhead that isn't allocated is known as an expense during the period when it appeared. In the exercises where an unusual (abnormal) large production is recorded, the value of the fixed overhead allocated to every unit produced cannot be larger than the actual fixed overhead, so that the stocks shouldn't be evaluated at a larger value than their cost. When the production costs cannot be identified distinctly, these are allocated for every product alone on the basis of a rational method consistently applied (for example, the procedure of simple division, the quantitative procedure, the procedure of equivalence indices, the procedure of quantitative equalizing of the secondary main product, the procedure of deducting the value of secondary products etc).² For example, a process of production can implicitly lead to the simultaneous obtaining of several products such as coupled products or the situation in which a product is principal and another is secondary. The allocation of production costs for every product can be accomplished on the basis of the report between the values of corresponding sales for every product, either in the stage of production when products become identifiable, or when the production process is finalized. By their nature, the majority of the secondary products have an insignificant value. In such cases they can be evaluated at the net accomplishable value and this value is deducted from the cost of the main product. Thus, the accounting value of the main product isn't significantly different from its cost.

² Dumbrava P., Pop A. – Managerial Accounting, Intelcredo Publishing, Deva, 1995, p.120

The net accomplishable value represents the estimated price of sale that could be obtained during the normal unfolding of the activity, less the estimated costs for finishing the goods and the costs required by the sale. The following costs do not have to be included in the cost of stocks

- a) material losses, manual work or other production costs recorded over the normally allowed limits;
- b) storage expenses;
- c) general administration overheads that do not participate to the bringing of the stocks into shape and in the place where they currently are; and
- d) sale costs;
- e) sub-activity costs.

These will be recognized as expenses of the period when they occurred.

The costs generated by administration and sale costs can be included in the cost of goods only if the specific exploiting conditions justify their taking into account. These costs can be included in the cost of the goods only if they represent costs for bringing goods into shape and at the place where they currently are. Financial expenses aren't included in the production cost with the exception of the situations stipulated by law (for example. Interests, differences in the value of foreign exchange currency for the investments with a long production cycle).

Debts costs can be included in the costs of goods only if they are directly related to the investment, construction or production of an asset with a long production cycle. The debts costs include interests and other expenses supported by the enterprise referring to funds borrowing. An asset with a long production cycle is an asset that necessarily requires an important period of time to be ready for the use to which it was designed or for sale. Storage expenses can be included in the cost of goods when this

kind of costs are necessary in the production process, for example, the storage previous to passing to another production stage.

Direct expenses together with the indirect expenses rationally distributed to the objects of calculation, form their *actual production cost (manufacture)*.

If the production cost is added to the general expenses for administration and sale expenses, we obtain their *complete cost*.

In the case in which in administration accounting, in the cost of production (manufacturing) there were included also other elements than those corresponding to the making of the respective stocks, on the occasion of the evaluation and recording of stocks in financial accounting, these elements will be excluded from the cost of production (manufacture), being considered as unincorporated costs.³ Among the calculation methods for costs, the more frequently used in mining industry are the direct-costing methods and THM which will be presented from now on.

The direct-costing method refers to the net separation of the production and sale expenses corresponding to their character according to the variation of the physical volume of the production and sale in variable expenses and the taking into account when calculating the unitary cost for product only of the variable expenses. The fixed expenses are deducted from the total of the gross financial result. According to this method, the variable expenses are identified and directly collected by the expenses bearers, since it is believed that only them depend on their production and sale increasing and decreasing according to the increase or decrease of the volume of

³ Pantea P. – Romanian Accounting Management, Intelcredo Publishing, Deva 1999, p.88

production and sale. Actually, variable expenses appear only in the case of performing of a production and sale activity. Fixed expenses are considered to be expenses of the period in which there are performed, irrespective of the volume of the production, and generally refer to the capacity of the unit to produce and sell, depending on time. Fixed expenses are globally scheduled and followed and not included in the cost of each product, but deducted directly from the gross financial results. Under these circumstances, nor the production stocks with execution in progress are affected by fixed expenses. They are evaluated only on the level of variable expenses. The unitary cost is calculated by reporting variable expenses to the amount of products manufactures, as follows:

$$ct = \frac{\sum_{i=1}^n Chv}{Q}$$

where

- ct** - unitary cost;
- Chv** - variable expenses;
- Q** - production.

By the direct-costing method, one doesn't primarily focus on the unit price for product, but the calculation and analysis of the results on the level of the entire enterprise. For every product it is calculated only the contribution good for profit called also limit, the gross limit or covering contribution. The gross contribution is calculated as the difference between the unitary sale price and the unitary cost calculated according to the variable expenses, as follows:

$$cb = pv - ct$$

where:

- cb** - unitary gross contribution (of covering);
- pv** - unitary sale price;
- ct** - unitary cost.

For determining the total financial result on the level of the entire enterprise,

that is the profit or loss, we multiply the sold amount of every product in the respective administration period (qv) with the unitary gross contribution (cb) and we obtain the total contribution to profit (cb) out of which we deduct the total of fixed expenses from the respective period. Mathematically, this is expressed as follows:

$$R(\pm) = (q \cup 1 \times cb 1 + qv 2 \times cb 2 \dots + qv n \times cb n) - Chf \\ = \sum_{i=1}^n (qx \times cb)_i - Chf$$

where:

- qx** - sold production;
- cb** - unitary gross contribution;
- Chf** - fixed expenses;
- I** - products;
- R(±)** - financial result (profit or loss).

In a narrower form, the financial result can be calculated as follows:

$$D - Chv = Cb \\ Cb - Chf = R(\pm)$$

where:

- D** - total sale volume at their sale price;
- Chv** - total variable expenses;
- Cb** - total gross contribution

On the basis of the gross contribution calculation, there can be determined for which of the manufactured and sold products are the variable expenses covered and it is ensured the participation to the covering of fixed expenses and for which the variable expenses are covered and thus results a loss for the enterprise.

The specific technique for *THM method*⁴ refers to the determining of two synthetic indicators related to administration, that is:

- price (cost) hour/equipment (THM);
- cost per unity to be produced.

Considering the equipment as a fundamental economic unit, we determine

⁴ M.Epuran, V.Babaita, C.Grosu – Accounting and Managerial Control, Economica Publishing House, Bucharest, 1999, p.306

the hourly price for its functioning as the sum of necessary costs for the respective machine functioning or for a group of machines from an enterprise during a period of one hour. The price includes all the direct and indirect costs resulted from the manufacturing of a product, the execution of a product, the execution of a work or service for a certain equipment or group of equipments, excepting the cost of materials. For calculating the processing cost for materials at an equipment or group of equipments we multiply the THM corresponding to the working time of the respective equipment. The processing cost per equipments and places is obtained by adding the cost of the materials to the mathematic processing cost, expressed through the relation:

$$C_t = (THM \times t) + C_{hm}$$

where:

C_t - the complete cost for processing;

THM - price hour-equipment;

T - working time;

C_{hm} - cost of materials

iar

$$THM = \frac{Ch}{t}$$

where:

Ch - processing expenses;

T - processing time expressed in hours.

In the THM method, unitary cost is based upon:

- processing costs that correspond to the product, work or service;
- raw material and direct material cost.

The processing costs corresponding to the time for processing are determined as follows:

$$C_t = \sum_{i=1}^n (t \times THM)$$

The cost of the raw material and direct material are determined by using the procedure of comparing quantities and prices. Thus it is determined the cost per

unit to be produced according to the following formula:

$$ct = \frac{\sum_{i=1}^n (t \times THM) + C_{hm}}{Q}$$

where:

ct - cost per unit to be produced;

C_{hm} - cost of the raw materials and materials;

Q - the quantity of manufactured products.

RESULTS AND DISCUSSION

When making decisions, in the case of direct-costing method, there have to be taken into account the following circumstances

- if the respective product contributes to ensuring the sale for the other products;
- if there is a new product the production and sale of which has favourable perspectives in the sense of decreasing the production expenses and increasing profit.

The direct-costing method determined a linear, direct connection between the costs, the amount of sold production and profit, a thing that allows a rigorous fundamenting for the decisions regarding production and sale policy. The emergence of the THM method has an objective premise determined by the expanding of the mechanization and automatization of the production processes as a result of the technical progress. The THM method is intended to solve a series of important issues concerning the circulation of costs, such as

- the judicious distribution of indirect expenses to the cost of products, works or services;
- the intention to efficiently use the production capacity;
- the orientation of the technic, economic and managing personnel to-

wards the production places of the expenses generating production equipment, which become objects of administration accounting;

- the rational use of labour.

The essence of this method consists of the fact that the most important place in cost calculation is held by the equipment or group of equipments called production centers respectively places that create expenses.

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