

## **THE IMPLICATIONS OF CHOOSING THE METHOD OF COST CALCULATION IN RELATION TO THE PROFITABILITY OF A PRODUCT**

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**Abstract:** The article presents an analysis of the rates of return of a company whose costs vary depending on the method of calculation used. The rates of return are synthetic indicators that present the profitability situation or the ability of the company to produce profit.

The calculation methods used in our article are the method of general calculation and the method of calculation in stages, what makes the difference between the two is the cost. From the study case you can observe a higher cost regarding the method of calculation in stages than the method of general calculation. Calculation is a tool that links the technical and the value part of the activity of production, as means of knowledge and leadership of this activity.

The calculation study gives us information about the production potential of an enterprise that depends on how it manages to recover the cost of manufacturing through retail sales and its development is conditioned by the amounts that are earned from the sales of products and by the costs of obtaining and manufacturing them. The analysis of the rates of return intends to provide information to managers, shareholders and creditors.

**JEL classification: G30, G32**

**Keyword: rates of return, method of general calculation, method of calculation in stages, cost**

### **1. INTRODUCTION**

Determining the cost of production has an important role due to the functions that this economic indicator has in companies in order to optimize business decisions. Maintaining the production potential of a company depends on the manner in which it manages to recover, through retail sales, the cost of produced use values, and its prosperity and rhythm of development are conditioned by the quantum of the difference between the amounts received from the sale of the products and costs of obtaining and selling them.

At present, the cost has an important role in organizing and guiding the production, the operational and accurate determination of the cost indicator of production being important.

Therefore, to calculate the cost of production is to determine the expenses to be made at the level of the company for the manufacture and retail sale of a product unit and, respectively, of the entire production.

Providing information on the value of the production process, the calculation of the cost facilitates knowing a part of the costs in each company in order to achieve production and marketing.

The cost of production is influenced by the continuous improvement of the technological processes, innovations, inventions introduced in the process of manufacturing, scientific organization of labor and production, their reduction expressing, in value terms, the efficiency in promoting them in the economy of the company.

By calculating the cost, a division takes place, within the process of sale, of that part of the value of the production of goods which compensates for normal consumption of means of production, labor costs, profit of the manufacturing company and turnover tax, movement of goods, providing therefore the demand for ensuring a value control over the consumption of production and over the way in which the profit is divided within the company, taking into account both the individual and collective interests.

The cost is an important instrument, both at the overall level of the management of the company and at the individual level of the sections or workshops, creating, on the principle of self-management, the possibility of the dynamic traceability of the overall value and also of each of the manufactured products in order to guide the production, the organization of the activity, the technical equipment, the improvement of the skills of the workforce, etc. .

**The cost of production**, in the specialized literature, is defined as a monetary value of all the materialized and actual labor expense undertaken by the company for the production and retail sale of goods, execution of works and services.

The notion of *cost* is not synonymous with the notion of *expense*, because the range of the notion of *cost* is narrower than that of *expense*. A cost may be at most equal to an expense, unless, at the same time, the entire quantity of purchased material is released for general use, which cannot actual happen because the company must always have supplies of materials needed to ensure the continuity of the manufacturing process. In terms of content, cost is not and may not be subject of cost calculation, since it does not generate the manufacture of a product.

Consumption of values, being performed in order to obtain a product, a work or provide a service, led to a calculation in order to sum them, and the result is a synthetic indicator known also as "**cost of production**".

From a practical perspective, the consumption of values, in most companies, are not made in order to obtain only one product unit, work or service, but for a specified quantity, depending on the specific of the technological process and of the organization of the production process. In this context, the cost per product unit is an indicator based on a mathematical calculation, the ratio between the monetary value of the consumption of values (the costs) that a company carries out in the process of obtaining and selling its production for a certain period and quantity of goods, works or services.

The expenses of the economic operator are divided, based on their destination, in three categories, as shown by the profit and loss account, plus the income tax as an item whose amount is determined by legislation, as follows:

- **operating expenses**, mainly generated by the consumption of the fundamental factors that facilitate the development of a business activity;
- **financial costs**, consisting of adjusting the value of financial assets and financial investments held as current assets; other financial expenses (receivable losses related to contributions, expenses related to disposed financial investments, foreign exchange expenses, interest expenses, expenses on debtors, banks or customer discounts);

- **extraordinary expenses**, represented by those expenses that are not related to the work of the patrimonial unit which consist of expenses on disasters and other extraordinary events (disaster loss and expropriation of assets);
- **corporate tax**

## 2. METHODOLOGY

Implementing methods of calculation:

- ✓ The cost per product unit through:
  - the method of general calculation;
  - the method of calculation in stages, the variable with semi-fabricated products;
- ✓ The performance indicators are calculate and analyzed.

## 3. METHOD OF GENERAL CALCULATION

The method of general calculation, also known as the method of simple division or the method of direct calculation, represents the assembly of all the production costs during the relevant accounting period, costs generated by the production, generally at the level of the workshop, the section, the company, based on the calculation article: the cost per product unit results from the total costs (direct and indirect) reported to the quantity of manufactured products ( $Q_f$ ), expressed in natural units, using the relation:

$$C_u = \frac{\sum C_d + \sum C_i}{Q_f}$$

The method is used on the units that manufacture one product, work or service such as those producing energy, oxygen extraction units (coal, oil), cement, bricks, transport units, etc. where there are no semi-fabricates or undetermined production, at the end of the period, and if it exists, it is constant or semi-fabricated. It also applies to sorto - dimensional and coupled production, where, using the same raw materials and the same technology, equipment and labor several kinds, types or sorto-dimensions of products are made. It also applies to auxiliary production sections in the industrial companies which have homogeneous production: power, heat, water plant.

The main characteristic of this method is the fact that all the production costs are directly identified taking into account the product or product group made.

## 4. METHOD OF CALCULATION IN STAGES

The method is intended for mass-production companies, where the final product is the result of a homogeneous technological process, developed in some successive processing stage or phases.

The subject of calculation is each product and each product processing stage, the assembly of the costs being made according to calculation articles in monthly opened accounts for each phase so that at the end of the relevant accounting period, through the assembly of the costs in the last manufacturing phase, the actual cost of the end-product is presented.

Being a method of absorption, the method of calculation in stages involves the same successive stages of the development of cost calculation processes as other absorption type methods, namely:

- collecting the direct costs in phases and collecting indirect ones in expenses sectors;
- allocation of indirect costs divided according to the sectors which correspond to the manufacture phases;
- determination of the cost per product (semi-fabricated or not).

The cost generated by the administration is collected at the level of the company, its division depending on the kind of expenses, expenses divided by nature.

At the end of the month, the indirect costs collected are distributed according to the phases and product type through the supplementation process.

The model of general calculation of the cost per product unit, in the case of "full-costing" methods is shown by the relation:

$$cu = \frac{\sum Cd + \sum Ci}{Q}$$

*The variable with semi-fabricated products* is used in the situation when a semi-fabricated product is obtained in every processing phase, which is stored for further processing in the unit or sold to third parties, whose cost must be known. The cost according to this variable is settled taking into account the calculation articles for each phase, the cost of the last phase being the cost of the end-product. The cost of the first phase is transferred to the second and through the addition to it of the cost of that phase, results the section cost of the semi-fabricated products obtained in the second phase, and so on.

Assuming that we have three manufacturing phases, in each of them obtaining a semi-fabricated product, the cost can be determined by the formula:

$$cus_1 = \frac{\sum Cd_1 + \sum Ci_1}{Q_1} \quad (1)$$

$$cus_2 = cus_1 + \frac{\sum Cd_2 + \sum Ci_2}{Q_2} \quad (2)$$

$$cus_3 = cus_2 + \frac{\sum Cd_3 + \sum Ci_3}{Q_3} \quad (3)$$

in which:

**cus1, cus2, cus3** it represents the cost per semi-fabricated unit in each of the phases;

*The variable without semi-fabricated products* has a large utility in industrial companies, the cost of the product resulting from the adding to the consumption of materials (M) the processing costs of the phases in which the product is involved, without taking into account, so without translocation, the cost of the semi-fabricated products from one phase to another. The cost of the end-product, taking into account the calculation articles, is determined in the last phase.

**S.C. TEXTIL S.A** has the following data:

<i>Non-current assests</i>	7661
<i>Current assests (supplies)</i>	2590
<i>Equit capital</i>	22300
<i>Loan interests</i>	8730
<i>Borrowed capital</i>	72860
<i>Raw material expenses</i>	5430
<i>Maintainance expenses</i>	3250
<i>Rent expenses</i>	1500
<i>Staff expenses</i>	2300
<i>Amortization expenses</i>	6230
<i>Production</i>	350

It aims to analyze the profitability of product *CARPET* if it would be produced by the method of general calculation or by the method of calculation in stages.

**The production of product *CARPET* using the method of general calculation:**

$$C_u = \frac{\sum C_d + \sum C_i}{Q_f} = \frac{18710}{350} = 53 \text{ um/buc}$$

**The selling price** is 10% higher than the production costs and therefore the price of the product *CARPET* is of **58 m.u.**

$$V_e = CA + V_{ps} + V_{pi} + A_{ve} = 350 \cdot 58 + 7661 + 2590 = 30671$$

$$C_e = 18710$$

$$P_e = V_e - C_e = 30671 - 18710 = 11961$$

$$P_f = V_f - C_f = -8730 = -8730$$

$$R_a = \frac{P_e + P_f}{A_i + A_c} * 100 = \frac{11961 - 8730}{7661 + 2590} * 100 = \frac{3231}{1025} * 100 = 31.51\%$$

$$R_e = \frac{P_b}{K_{pr} + K_{imp}} * 100 = \frac{20691}{22300 + 72860} * 100 = \frac{20691}{95160} * 100 = 21.74\%$$

$$R_f = \frac{P_n}{K_{pr}} * 100 = \frac{2714}{22300} * 100 = 12.17\%$$

$$R_g = \frac{P_e - D_{ob}}{K_{pr} + D_{tml}} * 100 = \frac{11961 - 8730}{22300 + 72860} * 100 = \frac{3231}{95160} * 100 = 3.39\%$$

$$R_{ce} = \frac{P_e}{C_e} * 100 = \frac{11961}{18710} * 100 = 63.93\%$$

$$R_{com} = \frac{R_e}{CA} * 100 = \frac{11961}{20420} * 100 = 58.57\%$$

**The production of product *CARPET* using the method of calculation in stages:** in phase 1 40% of the presented quantity and expenses are accomplished, in phase 2 the same amount and in the last phase 20% of the presented quantity and expenses are accomplished.

	EXPENSES	QUANTITY
- stages 1	18710*40%= 7484	350*40%=140
- stages 2	18710*40%= 7484	350*40%=140
- stages 3	18710*20%= 3742	350*20%=70

$$\text{Cus1} = \frac{\sum Cd1 + \sum Ci1}{Q1} = \frac{7484}{140} = 53 \text{ um}$$

$$\text{Cus2} = \text{cus1} + \frac{\sum Cd2 + \sum Ci2}{Q2} = \frac{7484}{140} + 53 = 106 \text{ um}$$

$$\text{Cus3} = \text{cus2} + \frac{\sum Cd3 + \sum Ci3}{Q3} = \frac{3742}{70} + 106 = 159 \text{ um}$$

**The selling price 175 (159\*10%)**

$$\text{Ve} = \text{CA} + \text{Vps} + \text{Vpi} + \text{Ave} = 350 * 175 + 7661 + 2590 = 71501$$

$$\text{Ce} = 18710$$

$$\text{Pe} = \text{Ve} - \text{Ce} = 71501 - 18710 = 52791$$

$$\text{Pf} = \text{Vf} - \text{Cf} = -8730 = -8730$$

$$\text{Ra} = \frac{\text{Pe} + \text{Pf}}{\text{Ai} + \text{Ac}} * 100 = \frac{52791 - 8730}{7661 + 2590} * 100 = \frac{44061}{10251} * 100 = 429.82\%$$

$$\text{Re} = \frac{\text{Pb}}{\text{Kpr} + \text{Kimp}} * 100 = \frac{44061}{22300 + 72860} * 100 = \frac{44061}{95160} * 100 = 46.30\%$$

$$\text{Rf} = \frac{\text{Pn}}{\text{Kpr}} * 100 = \frac{37011}{22300} * 100 = 165.97\%$$

$$\text{Rf} = \frac{\text{Pe} - \text{Dob}}{\text{Kpr} + \text{Dtml}} * 100 = \frac{44061}{95160} * 100 = 46.30\%$$

$$\text{Rce} = \frac{\text{Pe}}{\text{Ce}} * 100 = \frac{52791}{18710} * 100 = 282.15 \%$$

$$\text{Rcom} = \frac{\text{Re}}{\text{CA}} * 100 = \frac{52791}{61250} * 100 = 86.18\%$$

As noted above, using the method of general calculation the cost of product is of 53 lei and using the method of calculation in stages the cost of product is of 159 lei (a cost 3 times bigger).

Therefore, it can be also seen that the operating profit is of 11 961 by applying the method of general calculation as opposed to the operating profit of 52 791 by applying the method of calculation in stages, the difference between them being made by  $\text{CA} = 350 * 58 = 20\,300$  related to the method of general calculation and by  $\text{CA} = 350 * 175 = 61\,250$  related to the method of calculation in stages.

The rate of the economic profitability of assets by applying the first method is of 31,51%, unlike the second situation when the rate of the economic profitability of assets is of 429,82%. This aspect is favorably interpreted for the second method due to the fact that the profit is bigger, therefore demonstrating an efficiency of use of total assets.

Regarding the rate of economic profitability of the invested capital, the high level of it means an effective management of the invested capitals and therefore the highest value is related to the method of calculation in stages (21,74%) as opposed to the method of general calculation (46,30%).

The rate of financial profitability of the equity capital is of 12,17% by applying the method of general calculation and of 165,96% by applying the method of calculation in stages. It can be observed that the net profit using the method of calculation in stages is of 2 714 and using the method of general calculation is of 37 011, which shows the fact that the method of calculation in stages has a higher profitability rate which is a positive element because the net profit grows faster than that of the equity capital.

The rate of financial profitability of the revolving working capitals using the method of general calculation is of 3,39% and using the method of calculation in stages is of 46,30%. The growth in operational profit by applying the method of calculation in stages has also led to an increase of the rate of financial profitability of the revolving working capitals.

The rate of profitability of the operational expenses represents the relation between the operational profit and the operational expenses and is of 63,92% when using the method of general calculation and of 282,15% when using the method of calculation in stages. Therefore the more efficient use of resources is by applying the method of calculation in stages.

The rate of commercial profitability shows the efficiency of the commercial activity which is bigger by using the method of calculation in stages (86,18%) as opposed to using the method of general calculation (58,57%).

## 5. CONCLUSIONS

Obtaining a minimal cost production is the ultimate goal of the management in terms of organization, analysis and timely decisions;

Maintaining the production potential of a company depends on how it manages to recover, through retail sales, the cost of produced use values;

The growth of profitability:

- regarding the raw material expenses and the material expenses is achieved by: (the reduction of specific consumption of raw materials and energy; the improvement of manufacturing technologies, the improvement of negotiation with the suppliers;)
- regarding the financial expenses: (the efficient management of the liquidities, the acceleration of the average duration of collecting receivables; the realistic indebtedness policy;)
- regarding the supply expenses: (the current optimization and security expenses, the insurance of rhythmicity of supply, the acceleration of the speed of rotation of supplies)

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