

# BENEFITS OF INDIRECT COSTS ALLOCATION WITH COST DRIVERS

**Delia MANEA**

Spiru Haret University, Brasov, Romania  
tausdelia@yahoo.com

**Mircea BARBU**

Spiru Haret University, Brasov, Romania  
mirceabarbu@yahoo.com

**Abstract:**

*Due to the technological developments that has occurred in recent years within the business entities, the cost structure was affected, so that the largest share of the production cost is held by the indirect cost. Traditional management accounting and cost calculation methods allocate indirect cost based on an item which serves as a criterion, key or core distribution. The allocation of indirect cost has the disadvantage of an arbitrary distribution, depending on some basis subjectively chosen.*

*The ABC method allocates indirect cost directly to products starting with the activities done for their production rather than through some inaccurate and arbitrary quotas, thus achieving a relevant production cost.*

*The paper will present models of allocating indirect costs to products, both through traditional management accounting and cost calculation methods and with cost drivers.*

**Keywords:** indirect cost, Activity-Based Costing (ABC) method, cost driver

**JEL Classification:** M<sub>41</sub>

## **1. Introduction**

The automation of production is the main trend of progress in technology. More and more projects are realized through automation and processes controlled by computer. Technological changes influence the current cost structure, modifying the ratio in favour of those which are not directly related to the actual manufacture of products. Indirect costs will be much higher than direct ones due to reduced labour costs, because of the automation of the production; they occupy a significant share in the production cost.

In the past, direct cost accounted for 80% of the total costs, so the analysis of the activity could have been based on them. Indirect costs represented only 20%; thus their conventional distribution did not influence the costs. Today indirect costs represent 75% of the total costs and maintaining the same allocation base distorts the company's costs. Labour costs represent only 15% of the total costs, materials 50% and structure costs 35%. Production costs do not have a prominent place as 70-90% of costs are design costs and maintenance and service costs.

Indirect costs are those costs "which at the time when they are performed they can not be identified on the subject of business activity, but only on the places of production or activity that generated it; hence, the need to allocate them on the basis of some conventional criteria, to form the cost of the products". (Iacob, C., Ionescu, I., Goagară D., 2007, p. 40).

This category includes the equipment maintenance and operating costs, the general cost of the department which together form the indirect production costs and general administrative costs. Indirect production costs are direct towards the products made in those sections, and the overheads are indirect both to the production sections and to the products resulting from them.

The current method of cost calculation used in Romanian business entities, which causes a historical cost, used to settle post factual production costs and which allocates indirect costs according to some subjectively chosen basis, can not provide the management with the possibility of satisfying the need for information as well as the fact that in today's changing technological conditions the calculated cost of production is not a real cost. Thus, it is required to adopt some methods of management accounting and cost calculation to enable a more rigorous allocation of indirect costs and to be operational in order to meet the information needs of management in decision making.

## ***2. Traditional methods of cost calculation***

The object of cost for the cost calculation method on production orders is represented by one or more separate units of a product or service called production order.

The allocation of indirect costs on the orders that they are related to is carried out using the share bases. Horngren, C., Date, S., Foster, G., (2006, p. 107) define the cost-sharing base as "a factor that consistently makes the link between an indirect cost or a group of indirect costs ... and an object of cost...".

Indirect cost is that cost that is required for the execution of orders but cannot be directly attributed to it. The main indirect activities are: "research-development, supply, logistics,

scheduling, work preparation, planning and production management, quality control, marketing, development of contracts and orders, accounting, finance” (Ebbeken, K., Possler, L., Ristea , M., 2000, p. 60). As the costs of these activities can not be attributed to an order, they should be distributed on all orders executed in an organized and rational way among different orders that are related, since they require different amounts of consumption of indirect resources.

To illustrate the choice of bases for allocating indirect costs on the order and identify the indirect costs associated with each share base we consider the following hypothetical example:

A company runs two lots of products in the following amounts:

Product A = 1 850 pieces and product B = 3 520 pieces. The indirect costs incurred during the month in the production process is of 702 lei, consisting of 202 lei launch production costs, used equipment maintenance costs of 380 lei and 120 lei for electricity (total consumption to produce the lots of products 115 kWh). Direct labour costs related to the production of the two lots of products are of 3 600 lei (A = 180 hours, B = 220 hours).

The allocation base of indirect costs on the order will be the number of direct labour hours in production, because it is an indicator of how different individual orders use all the resources common to their production. Between the number of direct production labour hours required for an order and the indirect production resources used for that order there is a strong cause-effect relationship.

The actual share of allocation of indirect costs is calculated as a ratio of a sum of the total indirect costs and the total quantity of the cost allocation base.

$$K_{Chi} = \frac{Ch_t}{\sum_{y=1}^n K_{xy}} \quad (1)$$

where:

$K_{Chi}$  – actual share of allocation of indirect costs ;

$Ch_t$  – total indirect costs;

$K_x$  – allocation base;

n – number of objects of cost;

y – calculation object.

$$\begin{aligned} K_{Chi} &= \frac{702}{\left(\frac{180}{400} \cdot 3.600\right) + \left(\frac{220}{400} \cdot 3.600\right)} \times 100 = \frac{702}{(0,45 \cdot 3.600) + (0,55 \cdot 3.600)} \times 100 \\ &= \frac{702}{1.620 + 1.980} \times 100 = \frac{702}{3.600} \times 100 = 19,5\% \end{aligned}$$

The indirect cost of an order is calculated by multiplying the actual value of each allocation base associated to the order with the appropriate share of indirect cost corresponding to the allocation base.

$$A, B = \sum_{i=1}^n Ch_d \times K_{Chi} \quad (2)$$

where:

A, B – products;

Ch<sub>d</sub> – direct costs;

$K_{Chi}$  – actual share of allocation of indirect costs;

Product A = 1 620 x 19.5% = 315.9 lei

Product B = 1 980 x 19.5% = 386.1 lei

The total cost of the order is calculated by adding all direct and indirect costs related to that order.

$$CT = \sum_{i=1}^n Ch_d + \sum_{y=1}^m Ch_i \quad (3)$$

where:

CT – total costs;

Ch<sub>d</sub> – direct costs ;

Ch<sub>i</sub> – indirect costs .

Product A = 1 620 + 315.9 = 1 935.9 lei

Product B = 1 980 + 386.1 = 2 366.1 lei

Cost calculation on production orders is synthetically presented in Figure no. 1.

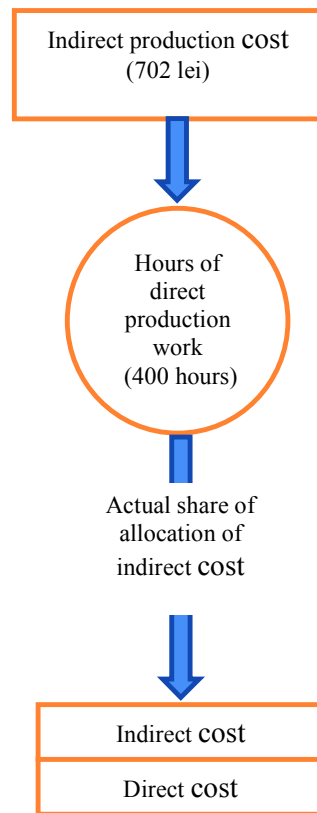


Figure no. 1. Cost calculation on orders

Source: Horngren, C., Datar, S., Foster, G., 2006, p. 113

### 3. The cost calculation method based on activities

In the context of the current economic environment, business entities require a cost calculation system to allow their correct finding. Starting from the shortcomings of the traditional cost calculation methods, various specialists (Miller, J. G., Vollmann, T. E., 1985, pp. 142-150) tried to identify some appropriate methods for allocating costs, methods that are useful to business leaders in the process of establishing the product cost. The solution found to overcome the limits of traditional management accounting methods is called ABC (*Activity Based Costing*).

Caraianii C. (2004, p. 199) considers the ABC method as “an alternative to the traditional accounting. It is a cost calculation model that identifies areas of cost or activity centres within an

organization and allocates costs to products, services based on the number of events or transactions involved in obtaining a product or service”.

The steps that should be taken to organize the cost calculation with the activity-based method are: establishing cost carriers (items of costing), identifying activities and processes, both at a general level and at each cost carrier level; determining the cost drivers or the factors that explain variation in resource consumption, cost allocation on activities, calculating the unit cost of cost drivers, allocating to cost carriers the specific cost or driver, full product cost calculation.

In the phase of choosing the cost drivers for the allocation of costs on products it is necessary for each activity to identify the specific cost driver, i.e. that factor that explains variation in consumption of resources and allows allocation (imputation) of indirect cost on the activity and on the calculation objects (goods, work, orders). In other words, cost drivers are factors that, on the extent of their development, involve use of resources by the activity and, consequently, generate costs.

In order to determine the optimal number of cost drivers one should take into consideration the cost-benefit rapport of obtaining information because a large number of cost drivers, although leading to more accurate information, also increases the effort and time necessary to obtain information. For complex products it is necessary to establish a greater number of cost drivers, because a reduce number of them could result in damaging the cost.

Cost drivers should meet a range of demands, such as: easy to identify and use, to be the cause of the variation in consumption of resources, not to influence in a negative way the staff's behaviour.

Taking into consideration the above mentioned example, we can establish the following activities and their cost drivers, as follows: the cost driver for the activity “launching in production” is “total number of pieces, product A and product B”; the cost driver for the activity “maintenance of equipment” is “total number of hours of equipment use”; the cost driver for the activity “electric energy” is “consumption of electric energy kW/h”.

The allocation of the indirect costs regarding launching in production for product A and product B, taking into account the already established cost driver is as follows:

$$K_{ip} = \frac{Ch_{ip}}{Q_A + Q_B} \times 100 \quad (4)$$

Where:

$K_{ip}$  - the actual share of indirect cost allocation regarding launching in production;

$Ch_{ip}$  – indirect costs for launching in production;

$Q_A$  – quantity of A products;

$Q_B$  - quantity of B products.

$$K_{ip} = \frac{202}{1.850 + 3.520} \times 100 = \frac{202}{5.370} \times 100 = 3,76\%$$

Product A =  $K_{ip} Q_A = 3.76\% \times 1\,850 = 69.6$  lei

Product B =  $K_{ip} Q_B = 3.76\% \times 3\,520 = 132.4$  lei

The allocation of the indirect cost regarding the maintenance of the equipment for product A and product B, taking into account the already established cost driver is as follows:

Product A =  $\frac{180}{400} \times 380 = 0.45 \times 380 = 171$  lei

Product B =  $\frac{220}{400} \times 380 = 0.55 \times 380 = 209$  lei

The allocation of the indirect cost regarding the consumption of electric energy for product A and product B, taking into account the already established cost driver is as follows:

$$K_{es} = \frac{Chl_{es}}{kWh_A + kWh_B} \times 100 \quad (5)$$

Where:

$K_{es}$  - the actual share of indirect cost allocation regarding the consumption of electric energy;

$Chl_{es}$  – indirect cost for consumption of electric energy;

$kWh_A$  – number of kWh used for products A;

$kWh_B$  - number of kWh used for products B.

$$\begin{aligned} K_{es} &= \frac{120}{\left(\frac{180}{400} \cdot 115\right) + \left(\frac{220}{400} \cdot 115\right)} \times 100 = \frac{120}{(0,45 \cdot 115) + (0,55 \cdot 115)} \times 100 \\ &= \frac{120}{51,75 + 63,25} \times 100 = \frac{120}{115} \times 100 = 104,3\% \end{aligned}$$

Product A =  $K_{es} kWh_A = 104.3\% \times 51.75 = 53.9$  lei

Product B =  $K_{\text{eff}} kWh_B = 104.3\% \times 63.25 = 66.1$  lei

Total cost of products A and B is:

$$CT = \sum_{i=1}^n Ch_{d_i} + \sum_{y=1}^m Ch_{i_y} \quad (6)$$

Where:

CT – total costs;

Ch<sub>d</sub> – direct cost;

Ch<sub>i</sub> – indirect cost.

Product A = 1 620 + 69.6 + 171 + 53.9 = 1 914.5 lei

Product B = 1 980 + 132.4 + 209 + 66.1 = 2 387.5 lei

#### **4. Conclusions**

The order method determines an integrated unit cost and therefore the emphasis is on grouping the production costs in direct and indirect, which does not allow their analysis in relation to the production volume. From the economic point of view, costs are analyzed by their direct relation to the production volume, which requires in their calculation the use of grouping production costs in variable and fixed, grouping that is used by all modern methods of management accounting and cost calculation.

Indirect costs are allocated using the order method on share bases, thus forcing the choice of some share phases; if they are not objective, the costs will be altered. From the example above, we can notice the phenomenon of support between the full costs that have a common share base (number of direct production labour hours), according to which the costs related to a product are attributed to another, making the latter less profitable than in reality.

Through the ABC method indirect costs are no longer distributed to the products via some inaccurate and arbitrary shares, but are directly distributed to the products starting from the carried out activities for their production; hence, the activity-based costing method is most suitable, taking into account the high degree of automation and mechanization of production.



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