

## **Cost Drivers. Evolution and Benefits**

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**Abstract.** *The purpose of this article is to capture the evolution of applying cost drivers in calculating costs since their initial occurrence until the present times. There are different conceptual approaches of cost drivers, and new insights from applying cost modeling techniques from the Activity-Based Costing method (ABC). The article looks at the typology, criteria for selection of cost drivers and their benefits. The cost allocation method is also presented with specific steps corresponding to the ABC calculation method. In the end, the authors conclusions on the benefits of cost drivers are presented.*

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## 1. Cost drivers. Conceptual approaches

Since the emergence of the concept of calculating the cost of activities based on a consumption view, cost drivers have been defined in various ways by specialists in the field, with many definitions being similar. Here are a few:

1. The strategic purpose of a *cost driver* means the factor which causes or produces a change at the cost level. This effect is illustrated by Michael Porter, referring to the long term efficiency factors of activities. Porter shows how “*cost behavior depends on a number of structural factors, called factor of development costs*”. A cost factor is the economic logic that explains the cost level for an activity and a certain level of functioning.

2. The accounting purpose of a *cost driver* means the cause factor changes the nature of costs to be allocated. The basic purpose of an *allocation base (or factor) – cost driver* is complementary to the first inductive effect. In accounting terms, the activities are consuming resources and activities are based on their underlying triggers (e.g., products, service-lines, customers).

3. The measurable effect by a *cost driver* means the measure unit of activity. Compared with the first two meanings, according to Brimson J.A. “*as the activity measure is the factor by which the cost of a process varies directly, but so far activity measure is not a cost driver*”<sup>(1)</sup>. In fact, a cost driver is the factor which generates occurrence of the consumption of resource (capacity) expenses.

### Traditional approach. Pre-cost drivers

Due to the lack of a proper causal relation between allocated indirect and shared expenses to cost objects<sup>(2)</sup> and the chosen basis of allocation criteria being non-causal, the costs were inaccurate and sometimes wrong; the result led to the so called pre-cost drivers. Pre-cost drivers were typically broadly selected factors, such as the number of units produced, amount of sales, or direct labor input hours.

Serving like a proxy, at a simplistic level these examples of drivers appeared somewhat reflective to cost accountants of how products consumed indirect costs, but they violated costing’s *causality principle*. If the quantity of those types of cost drivers increased or decreased it may have had little or no change in the amount of indirect or shared expense. Early in the 20th century traditional management accounting and cost calculation methods widely used these types of broadly averaging cost drivers. There were no detailed studies on their identification, use, accuracy and effectiveness. Ironically, industrial engineers applied causal cost drivers for manufacturing studies, but these applications were independent of the methods applied by cost accountants for financial reporting.

### **Modern approach. Contemporary cost drivers**

Until the emergence of the concept of *activity-based costing*, *cost drivers* were rarely questioned for several decades. Specifically, in 1987, Kaplan, Cooper and Johnson outlined such a system based on the book “The Hidden Factory”<sup>(3)</sup>, developed and published by Jeffrey G. Miller and Thomas E. Vollman. The traditional terms of “allocation base or factor” were replaced with the term “cost driver”. The most significant cost driver’s definition applies to the Activity-Based Costing method (ABC).

### **Specific approach of ABC method (Activity-Based Costing)**

With ABC, *cost drivers* are units that are used to causally assign and trace indirect and shared resource expenses related to activities (production, administration, sales, etc.) based on the consumption that cost objects (e.g., products, works executed, services, orders) place demands on resources. According to the Activity-Based Costing method, the products consume activities and activities consume resources. Hence, any factor that causes a change in the cost of an activity or how much of an activity’s cost is consumed can be called a cost driver.

### **Cost calculations derived from causes**

Cost allocation methods are used to calculate the cost of resource expenses that are consumed. They should comply with the costing’s *causality principle*. The cost drivers’ quantities are the cause of producing structural changes of activity costs and resource expenses.

## **2. Criteria for selecting cost drivers**

The two major categories of criteria underlying the description of different types of cost drivers are optional (of choice) and specifying (of determination). A description and advantages of the two categories of criteria are given below.

According to experts, the underlying criteria for selecting cost drivers are optional though they are still very important. They are:

1. *Easy identification, use and understanding*. To easily identify a cost driver we must investigate its relationship with indirect costs. After identifying all work activities (typically in an “activity dictionary”), a cost assignment model is constructed that contains complete information about the origin of resource expenses and their cost allocation methods.

2. *The existence of a direct relationship between indirect costs and cost drivers.* Starting from the correct identification of cost drivers that highlight the causal connections between indirect costs and cost drivers, this then allows for obtaining accurate and true actual costs of cost objects (e.g., activities, products, customers).

3. *Positive or negative influence on staff.* Explaining the concept of a cost driver to managers and employees creates the advantages for better understanding of the behavior of costs and what influences changes in them. This leads to an inner harmony within the enterprise between employees and management, thereby increasing business performances by providing visibility as to what factors drive the consumption of costs. For commercial companies it accurately reports layers of profit margins for analysis and actions.

According to experts, the criteria for determining and selecting cost drivers are particularly important. They are:

1. *Degree of complexity, diversity and variation of the product (e.g., number of colors, sizes, ranges).* There should be a sufficient number of cost drivers to reflect how the uniqueness (heterogeneity) of each cost object (e.g., product) consumes each activity cost. It is a one-to-one relation of the number of activity costs to their activity cost driver (See the typology of cost drivers and their allocation's levels below).

2. *Degree of accuracy of calculation.* A rational number of cost drivers should be selected. If too few are selected, then some products will likely be over-costed and the others *must* be under-costed. This is because it is a zero sum cost error model. If too many are selected, then the extra administrative effort to collect the cost driver data may not offset the informational value from the incremental increase in accuracy of the product cost.

3. *Degree of usefulness of information.* The level of costing detail and accuracy depends on the type of decisions that the information will be used for.

### **3. Typology of cost drivers. Allocation levels. Allocation method**

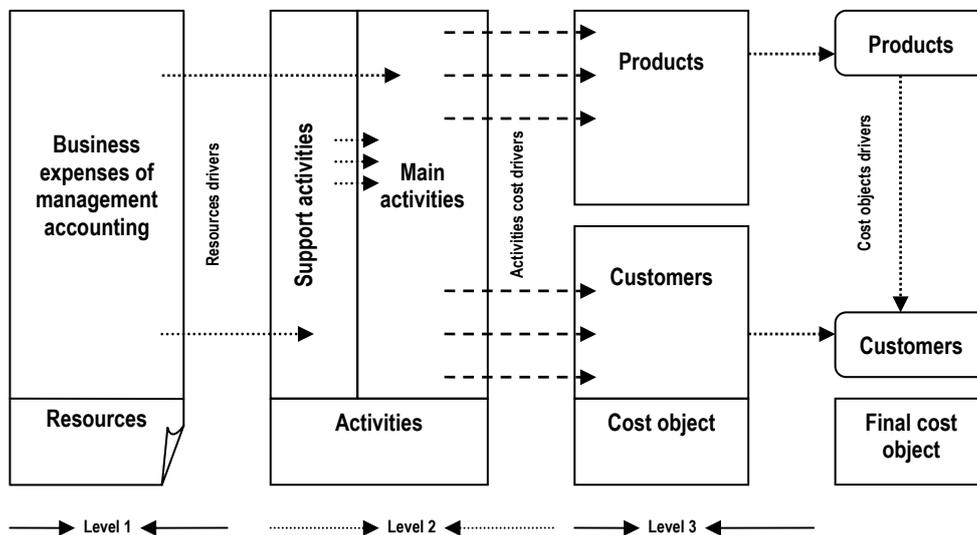
In terms of the level of allocation of indirect costs we find three types of cost drivers: *the resource level, activity level and cost object level.*

Resource drivers measure the consumption of work activities on resources (e.g., salaries, supplies). Activity drivers are defined according to specific units, reflecting activities as consumed by outputs. That is, activity drivers measure the consumption of cost objects on activity costs. The cost object drivers represent the sum combination calculation of other final cost objects (e.g., customer costs consume the mix and volume of product costs each customer purchased). Hence, there are three cost allocation levels:

Level 1. *Resources to activities*. Allocating resources to activities (main and/or support) applies resource drivers.

Level 2. *Activity to cost objects*. After re-concentration of support activities into the main activities (which is an activity-to-activity cost assignment as *intermediate* cost objects), the main activity costs are assigned and traced to costs objects using activity drivers.

Level 3. *Cost objects to final cost objects*. Cost object drivers are assigned and traced to other cost objects and ultimately sum into the *final* cost objects (e.g., customers) using final cost object drivers.



**Figure 1.** Scheme for the identification and allocation of expenditure according to drivers

Practical experience has shown that we can speak of two categories of activities: main activities and secondary activities (support). Many authors consider that the support activities are not anything else but resources available to serve the main activities and that, without them, main activities will not perform well. We believe that between main and the secondary activities (support) may be a relationship of concentration of several secondary activities in the main activity, concentration that can be made in whole or in part, based on different measure units. In most cases a number of 3-7 cost drivers can trace the majority of the total indirect costs. Choosing cost drivers should be done with caution, because wrong choices of them can lead to misallocated costs (i.e., errors) upon cost objects and ultimately flawed costs that are not reflecting reality.

After a careful selection of cost drivers for both main and support activities, then next proceed to measure cost driver quantities for the two types of activities. First are the quantities related to support activities (secondary), which are actually the standard measure for the volume capacity and outputs of cost centers. You can choose one of two possible methods<sup>(4)</sup>, either capacity-oriented planning or planning in restrictive conditions (sales plan). *The case of capacity-oriented planning* first determines the share occupied by the partial process in the total of activities, and then occurs the capacity to divide its value for a single ongoing of partial method. This thereby achieves volume that can be obtained on the secondary process. *The case of planning in restrictive conditions* determines planning-related values of each process.

#### ***Allocation method***

Common cost accounting literature refers to the allocation method that allocates indirect costs of both the products and the locations of cost centers. If we take the allocation mechanism of indirect costs and use cost drivers that are based on specific allocation criteria, then we can get a modern, useful method called *the allocation method*. In determining the share of indirect costs to be allocated (i.e., assigned and trace) to the cost objects, these steps should be followed:

1. Choose an allocation base and factor with the following conditions:
  - a) The cost driver established in the ante-calculation stage must not change in the post-calculation stage to avoid distortion of costs within the period or month to month within the financial year;
  - b) The cost driver must have common nature (using the same cost driver), but different quantity;
  - c) Between the activities costs to be allocated and cost driver must be a direct causal relationship of dependence, so that using it to create the possibility of obtaining accurate information in terms of selection allocation criteria and interpretation of obtained results from comparison at costs by activities;
  - d) The chosen cost driver must be recommended by the ABC project team that assumes full responsibility for the chosen criteria and the obtained results for use by company management.

2. Calculation of the allocation coefficient ( $A_k$ ):

$$A_k = \frac{E_A}{\sum_{c=1}^n A_{bc}},$$

where:

$E_A$  = expenditure on activities;

$A_b$  = allocation base (i.e., factor);  
 $n$  = number of calculated objects;  
 $c$  = calculation object.

3. Determination of each bearer share expenses (Share  $E_c$ ) is performed as follows:

$$\text{Share}(E_c) = A_k \times A_{bc}.$$

### **Example**

A unit is running two lots of products in the following amounts: A = 3,000 pieces, B = 2,000 pieces. Indirect expenses incurred during the month in the production process is 300 lei, consisting of expenditure of lots of launching the production of 50 RON depreciation expenses machinery used in the two amount of 150 RON and 100 RON electricity. Direct salary costs related to enforcement of the two batches of products are 1,500 RON (A = 140 hours, B = 160 hours).

### ***Traditional method***

Distribution of indirect costs of production on the two batches of products will be using as a basis for apportionment of direct salaries.

$$A = \frac{300}{700 + 800} \times 100 = \frac{300}{1.500} \times 100 = 20\%.$$

Share of indirect costs related to those two groups of products is as follows:

$$\text{Product A} = 20\% \times 700 = 140 \text{ lei} \quad \text{Product B} = 20\% \times 800 = 160 \text{ lei}$$

The total cost per product is as follows:

$$\text{Product A} = 700 + 140 = 840 \text{ lei} \quad \text{Product B} = 800 + 160 = 960 \text{ lei}$$

### ***ABC method***

Proceed to the first group of two activities (*launching in manufacturing, processing section*) in the *production process*. For each activity are selected different cost drivers, as follows:

Production process	
Activities	Cost drivers
1. Release into production	Number of products
2. Processing section	
- Equipment depreciation	The normal duration of use
- Electricity	Registered consumption

Centralized data situation we have is as follows:

Production process			
Activities	Sum (lei)	Cost drivers	Total
1. Release into production	50	Number of products (pieces)	5,000
2. Equipment depreciation	160	The normal duration of use (years)	5
3. Electricity	90	Consumption (kWh)	300
Total	300	-	-

Allocation costs in the manufacturing launch of the two groups of products will be using as cost driver, number of items (pieces).

$$A = \frac{50}{3,000 + 2,000} \times 100 = \frac{50}{5,000} \times 100 = 1\%$$

Share of expenses related to the production launch in two batches of products are as follows:

$$\text{Product A} = 1\% \times 3,000 = 30 \text{ lei} \quad \text{Product B} = 1\% \times 2,000 = 20 \text{ lei}$$

Distribution of depreciation expense on the two machines will be lots of products using cost driver, calculated monthly using the normal depreciation schedule for equipment. The share of machinery depreciation expense related to the two groups of products is as follows:

$$\text{Product A} = 90 \text{ lei} \quad \text{Product B} = 70 \text{ lei}$$

Distribution of electricity costs on the two batches of products will be using as cost driver, consumption in kWh recorded.

$$A = \frac{90}{130 + 170} \times 100 = \frac{90}{300} \times 100 = 30\%$$

Share of indirect costs related to those two groups of products is as follows:

$$\text{Product A} = 30\% \times 130 = 39 \text{ lei} \quad \text{Product B} = 30\% \times 170 = 51 \text{ lei}$$

The total cost per product is as follows:

$$\text{Product A} = 700 + 30 + 90 + 39 = 859 \text{ lei}$$

$$\text{Product B} = 800 + 20 + 70 + 51 = 941 \text{ lei}$$

#### 4. Cost drivers advantages

The most important advantages of applying contemporary cost driver concepts are the following:

1. *Improving enterprise performances.* Because many companies still use traditional management accounting and cost calculation methods using non-causal cost drivers, they produce unrealistic, inaccurate and flawed cost information. But based on new contemporary approaches to cost drivers and using advanced management accounting and cost calculation methods, as with the ABC method, reliable information is obtained that can be the basis for intermediate and long-term decisions.

2. *Improving employee and manager awareness.* Each employee or manager of a company can become aware of the benefits that the knowledge of the causes of costs has on obtaining improved performance. Managing enterprise performance based on cost drivers can contribute to individual wage gains, such as bonuses, premiums, etc.

3. *Periodically reviewing costs.* Understanding cost drivers and their effect on cost behavior can help in the analysis of production costs in the short-term as well as the long-term. Many resource expenses, typically considered as period costs or fixed costs in the short-term, may be examined to determine if some of the resources (and their capacity level) are adjustable up or down in as the planning horizon extends, thus resulting in classifying them as variable costs rather fixed costs. Thus all costs are subjected to a better control.

4. *Controlling costs with better calculations.* To have better control of costs we must control the causes, namely cost drivers. If one can reduce the quantity, frequency, or intensity of a cost driver, then its activity cost will be lowered. Using traditional cost calculation methods causal-based cost drivers are “hidden”. Consequently, with the desire to reduce indirect costs, managers and employees may be misled to reduce a non-causal cost driver (e.g., number of labor input hours) and have no impact on reducing the indirect costs. Using however causal-based cost drivers, the accountant will provide visibility to the work activities and their cost drivers that consume activity costs and in turn resource expenses.

5. *Eliminating costs.* Identification of cost drivers of non-value-adding activities (e.g., the number of inspections) facilitates the elimination of the activity cost if its purpose can be eliminated by removing the root cause. The indirect costs allocation method on products using cost drivers contributes to this effect.

6. *Actual costs to individual products.* Compared with traditional cost allocation methods (i.e., non-causal), the most important advantage offered by cost drivers is far more accurately calculating total and per-unit costs of

products, channels, and customers. Accurate determination of total and per-unit costs is invaluable when evaluating selling prices and profit margin layers to strategically rationalize types of products, channels, and customers to sell to.

## 5. Conclusions

We think that those cost drivers advantages aforementioned will better explain for those accountants and managers who interested in superior performance management accounting practices and consequently in obtaining more visibility of costs as well as more accurate costs.

In conclusion we can say that a cost driver is the *key element* around which revolves cost behavior. This then ensures the viability and accuracy of information obtained for aiding a company to make better long-term strategic decisions and intermediate-term operational decisions. Both types of decisions will improve the company's level of profitability and its success in future periods.

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## Notes

- (1) See Brimson, J.A., *Activity Accounting: An Activity-Based Costing Approach*, New York, John Wiley & Sons Inc., 1991, p. 52.
- (2) Cost objects are the actual result of realization of the manufacturing process, which consists in obtaining the products, the execution of works or services.
- (3) According to Miller, J.G., Vollmann, T.E. "The hidden factory", *Harvard Business Review*, 1985.
- (4) See Ebbeken, K., Possler, L., Ristea, M., *Calculation and cost management*, Teora Publishing House, Bucharest, 2000, p. 370.

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