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## Calculations in Managerial Accounting

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### Abstract

Nowadays, managers like to use various tools in order to support the management processes. Cost calculations represent one of value management tools. They are also the oldest and most used tool. However, they are constantly evolving in order to reflect current business environment conditions. Cost calculations are used, to large extent, by managerial accounting. Managerial accounting replaces traditional cost calculation methods by more progressive ones. This paper deals with the ABC calculation and especially with benefits that it offers to management compared with traditional cost calculation methods.

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### 1. Introduction

Economic information system of a company comprises different special-purpose elements which according to their specialisation and content support company management performance in such a way that it fulfils its objectives on time. One of the most important elements is the cost subsystem, accounting information subsystem, cost calculation subsystem, controlling subsystem etc. All elements of economic system are interconnected and cooperate with each other.

In this context, managerial accounting plays an important role and existing financial accounting completes important information for decision making process in the accounting information subsystem. Therefore, company management has by Kral, (2001) a support tool for decision making concerning future orientation of the company.

In addition to traditional cost calculation method, a very important tool of managerial accounting is the activity-based cost calculation method (the ABC cost calculation method). This method has been developed from disadvantages of traditional cost calculation methods that have started to emerge at the beginning of the 80s.

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Emerging globalisation leads to the creation of intense global competition. As a consequence, active participants of global market started thinking about creating more precise and more objective cost calculation methods, about updating performance standards and competition strategies. Globalisation has brought by Majercak et al. (2001) many changes in manufacturing conditions and company management. The main determinants of these changes were by:

- Intensifying globalisation and competition pressure
- Substitution of manpower by automation of manufacturing and activities
- Continual performance and technology innovations
- Much attention given to quality and product customisation, shorter product life cycles
- Increase of support activities
- Cost structure changes – increase of indirect costs
- Orientation to customer.

Pioneers in the field of activity based cost calculations were Cooper and Kaplan from Harvard Business School. They invented new cost calculation method which was first published in 1988. Its main contribution is the capacity to eliminate disadvantages of cost calculation methods used up to that period. The ABC cost calculation method deals with matching overhead cost with outputs. Basically, it consists in matching used resources with activities, with gathering operations into activities and subsequently matching activities with cost objects.

Cooperation of facts incurring changes of cost calculation methods led to the necessity to search for link between cost creation and company existence. The closest link is between outputs whose realisation incurs specific activities and at the same time incurs resource consumption. This relationship is the main idea of ABC cost calculation method. The reason why costs incur is activities and not specific output. Practical use of the ABC cost calculation method requires detailed knowledge of different activities and processes in the company.

## 2. Methods

In order to evaluate different cost calculation methods, various literature sources were used. All relevant secondary information concerning development and basic characteristic of both cost calculation methods were used for the final comparison and conclusion about advantages and disadvantages of both methods. Concerning methods, we used analysis, synthesis, abstraction and deduction with application of specific mathematical calculations.

## 3. Comparison between traditional cost calculation method and ABC cost calculation

### 3.1. *Traditional cost accounting method (TCA method)*

When using the TCA method, the company in general carries out its activities within well defined organisational units. Organisational units can be distribution unit, sales units, production units, support units and other. In this case, it is necessary to transform company costs from the company level, in other words from financial accounting to organisational units. Organisational units represent cost calculation units. In managerial accounting and cost calculations costs are divided in direct and indirect ones. The problem comes with unambiguous matching of costs with specific outputs. In order to solve this problem, overhead costs contain a portion of direct costs in addition to all indirect costs. In addition to the breakdown of costs by categories in the case of overhead costs, it is necessary to introduce the following categories of overhead costs:

- Overhead costs generated by real produced quantity and structure of performed activities (overhead activities) which depend not only on capacities and technical characteristics but also on performance and discipline of workman working in the organisational unit.
- Overhead costs related to the existence of the organisational unit, e.g. insurance, depreciation, rent which are determined by the role of the specific organisational unit and can not be influenced by a particular employee of that organisational unit.

TCA method matches costs to specific products as to independent units. Costs that can not be linked to a specific product or service have to be matched as well. Costs that cannot be included equally, have to be distributed over all calculation units. As a typical example we can use the number of machine hours necessary to produce one product or the number of worked days. Advantages of the TCA method are as follows:

- Simplicity
- Cheaper access to necessary information and data
- Lower roll-out costs.

On the other hand, the TCA method has some disadvantages, e.g. it does not take into account company's activities. The accuracy of cost calculations is limited.

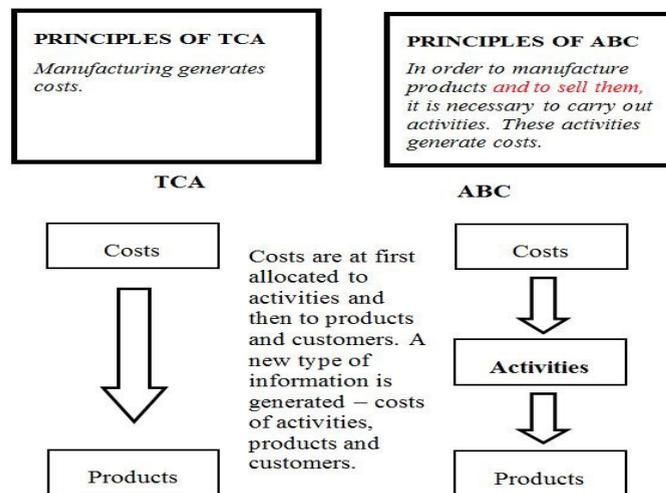


Fig.1 Comparison of TCA and ABC method

### 3.2. Advantages and Disadvantages of the ABC cost calculation method

ABC cost calculation method which is based on the relationship between costs and activities offers interesting points which can be also used in tactical and strategic decision making. It brings new information mainly for by Lazar, J. (2012):

- Process and activity management
- Product line management
- Organisational unit management.

Traditional view of management is to manage performance and according to hierarchical order. It does not pay much attention to the management of support activities, e.g. maintenance, transportation, sourcing etc. Support activities which are often uncoordinated, duplicated are carried out by organisational units placed at different levels of company hierarchy. New view of costs of activities through different contracts and organisational units is able to uncover not only these cacophonies and duplications. It also offers an opportunity to evaluate costs of these activities and compare them with benefits of these activities. In this logic, it creates a natural pressure to eliminate activities which do not produce any positive effect, e.g. material storage, unfinished product and finished product storage. It can even happen that the added value of these activities is even negative, e.g. customer complaints handling. In the long run, the ABC cost calculation method brings the following positive effects:

- ability to evaluate cost consumption and effects of activities generated by systemic interlinking of partial activities and
- ability to analyse these activities from the viewpoint of their coordination.

The objective of the ABC cost calculation method is to provide ideas for reengineering of necessary activities so they would be carried out in the most efficient way.

Compared to TCA where indirect costs are associated to final output (this approach is based on a principle the higher the volume of output the more overhead costs it generates), the ABC cost calculation method turns one's attention to non-standard activities carried out in small amounts and to costs these activities generate. Such information is useful for price negotiations and in the long run, it can catch the managers' attention to eliminate non-standard output and activities. In this logic, the ABC calculation method has a positive effect on process engineering and design activities, on management of sourcing, manufacturing and sales process and on coordination of support activities.

The second advantage of the ABC cost calculation method is based on a critical view on conclusions which are mainly achieved by short-term and middle-term managing: method of separate managing of fixed and variable costs. This approach says that market share and business effects can be increased mainly by maximum use of capacity which can be also achieved by price decrease of additionally sold volume and products up to the level of variable costs.

Alternative view of product costs offered by the ABC cost calculation method underlines the costs of additionally manufactured products. The reason why is that the effort to maximum use of capacity finally leads to higher share of non-standard activities because of introducing the products of lower volume. The price decrease of these products can also lead to the decrease of profit and profitability of capital.

The knowledge of partial activities which incur costs has a great importance in increasing the quality of budgets of overhead costs which are not related to the modification of produced output volume. The ABC method enables us to elaborate several budgets for different scope of partial activities, to measure performance of organisational units which ensure these activities and to influence their efficiency.

New view on causes of these costs led to the development of two budgeting methods, called activity based budgeting and zero based budgeting.

It is paradoxical that a great extent of different support activities and a large offer of output offered to different kinds of customers, as well as preconditions for efficient use of the ABC method at the same time cause difficulties to its practical application: the ABC method is very demanding in terms of data related to the number of activities which are being assessed and also in terms of information how many units of partial activity are related to a specific part of finished products.

In case we want to use this method as a basis for decision making about e.g. changes in volume and structure of output, it is necessary to distinguish the processes incurred by the quantity of output from the processes whose quantity is not influenced by the amount of output. The efficiency of use of these data is substantially influenced by the extent to which we would be able to quantify the proportion of costs depending and not depending on the volume of activity being assessed.

In more detailed analysis of partial activities, there can be certain difficulties related to the allocation of costs that are common for several activities.

Conceptual approach of the ABC cost calculation method not only enlarges the traditional view of business process but it also heads it to current direction from the viewpoint of its current characteristics. Difficulties related to practical introduction of the ABC cost calculation method are by Sukalova, V., Ceniga, P. (2013) more or less related to practical problems of quantification of necessary information.

### *3.3. The practical use of the ABC cost calculation method in relation to partial activities*

The advantages of the ABC cost calculation method mentioned above produce better results in fields where it is typical to offer a large range of output whose realisation requires a large amount of complex support services. The

best practical application of the ABC cost calculation method can be found in processing industry with heterogeneous production and assembling technology. However it is also possible to apply it in non-productive fields, e.g. sales, banking, insurance and transportation.

Fundamental differences between the ABC cost calculation method and other methods lies in operations where the development of activities incurring costs is in indirect relation to the volume of finished products. This relationship between costs, activity and the volume of finished products is typical for the following activities:

- Logistic operations ensuring mainly sourcing and selling phase of business (material purchasing, entry inspection, transfer to production, intracompany transportation, packaging, dispatching including the information support of these services).
- Operations ensuring the balance between resources and their usage (operational planning and control of sourcing, production and sales).
- Operations ensuring the implementation of changes (installation of equipment, design and process engineering preparation).
- Operations ensuring quality control of produced output (quality control, customer complaints handling, and costs of reparations of non-conformities).

From the viewpoint of decision making processes for which the ABC cost calculation method provides information, it is generally accepted that in the cost calculation field it brings better data to resolve tasks related to price calculation and better data for tasks dealing with the knowledge of full product costs. As a consequence, ABC cost calculation method is most suitable for tasks dealing with future capacities and ways to fill them (tasks dealing with questions “manufacture or buy”). In a similar way as in order to solve tasks dealing with the question “to buy or to produce in-house”, we can also use the information about variable and full costs of activities and processes.

Systematic monitoring of costs of different activities and overall activities in the case it is possible to separate costs influenced by activity volume from costs which are not influenced by activity volume, can be also used in so-called value creation analysis, e.g. Value chain analysis and Value Based Management.

#### 4. Results and discussion

##### *Example of cost calculation*

On the basis of a comparison between TCA and ABC method in a specific company, it is possible to identify activities that consume excessive amount of costs and bring little value. It is necessary to eliminate them or to limit them at least. Is such a measure necessary also in a company with following characteristics?

The company produces two products: product A and product B. Manufacturing one piece of product A takes 1 hour of work. Manufacturing of product B takes 2 hours of work.

##### **TCA method**

###### **Product A:**

Direct labour costs: 1 hour x 3 currency units/hour = 3 currency units

Volume of production: 100 pieces

###### **Product B**

Direct labour costs: 2 hours x 3 currency units/hour = 6 currency units

Volume of production: 950 pieces

Total overhead costs of the company: 3000 currency units

Number of hours worked: 2000

$3000/2000 = 1.5$  currency units/hour

If product A consumes 1 hour of work, then overhead costs are 1.5 currency units.

If product B consumes 2 hours of work, then overhead costs are 3.0 currency units.

Table 1 ABC cost calculation method

Activity	Costs	A	B
<b>Adjustment</b>	300.00 €	75.00 €	225.00 €
<b>Machine-tooling</b>	1 200.00 €	60.00 €	1 140.00 €
<b>Material receiving</b>	300.00 €	75.00 €	225.00 €
<b>Packaging</b>	300.00 €	75.00 €	225.00 €
<b>Managing</b>	900.00 €	450.00 €	450.00 €
<b>Total</b>	3 000.00 €	735.00 €	2 265.00 €

	Total	Number of pieces	Overhead cost per unit
Overhead costs for A	735.00 €	100	7.35 €
Overhead costs for B	2 265.00 €	950	2.38 €

### Product costs calculated according to TCA and ABC method

#### Product A

	TCA	ABC
Overhead costs	1.5	7.35
Direct costs	3	3
Total costs	4.5	10.35

#### Product B

	TCA	ABC
Overhead costs	3	2.38
Direct costs	6	6
Total costs	9	8.38

(Total costs = direct costs + overhead costs)

This simple example shows that there is a significant difference in costs of two products calculated according to TCA method and ABC method. Using the TCA method, the total costs of the product A were 4.5 p.j. and 9 p.j. for the product B. Overhead costs were matched to different products according to the number of hours needed to produce them. For the ABC method the total costs for the product A represented 10.35 p.j. and 8.38 p.j. for the product B.

### 5. Conclusion

Cost calculation carried out on the basis of matching costs with partial activities brings some new information not only for management of activities and processes, but also for traditional management according to output and organisational units.

New way of looking at costs of activities allows us to assess their costs and to compare them with benefits these activities bring. In this logic, there is a natural pressure to eliminate activities that do not bring any effect or their added value is negative. From the viewpoint from the top level, the ABC cost calculation method allows us to assess:

- Costs and benefits of activities which are viewed in a wider way and are created by connecting together partial activities.

- The analysis of these activities mainly from the viewpoint of coordination.

The main benefit of the ABC cost calculation method is the ability to calculate costs of non-standard output that is produced in small volume and to discover the costs of such activities. Such information can be very useful for managers in order to eliminate non-standard output.

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