A COMPARATIVE STUDY REGARDING THE CALCULATION OF PRODUCTION COST BY THE TRADITIONAL-GLOBAL METHOD AND THE ABC METHOD ON AN ECONOMIC ENTITY IN ROMANIA

ILEANA-SORINA RAKOS [*]

ABSTRACT: *Through this paper, the author using the method of observation, economic analysis and empirical research tries to demonstrate the advantages and disadvantages of using modern methods versus traditional methods of calculating the costs. The specifics of the technological manufacturing process determine the method of calculating the costs that best correspond to it. The aim of the action taken is to highlight the advantages and limitations of applying the activity-based costing method compared to the traditional method currently applied by most economic entities. The objective of this study is to demonstrate that modern methods of calculating costs correspond more closely to the requirements of top management, by conducting an empirical study on the example of S.C. Raxela S.R.L. Brașov. The article concludes with the author's conclusions regarding the obtaining of more precise costs by using the ABC method of calculating costs that contributes to making the best managerial decisions.*

KEYWORDS: *ABC method, traditional method, calculation, production cost, indirect costs.*

JEL CLASSIFICATIONS: *G29, M41.*

1. INTRODUCTION

In the 21st century, the study of costs has had a considerable impact in terms of the fact that, today, modern management of accounting is no longer limited to simple financial calculations related to the assets and liabilities of an economic entity, but attention is focused on multilateral knowledge of production cost, by using methods appropriate to the specifics of each economic entity. The objective of any economic activity is to maximize the profit obtained, while maintaining a cost of production as low as possible.

[*] *Lecturer, Ph.D., University of Petroșani, Romania*, *nihilsinedeo_68@yahoo.com*

The traditional methods of cost calculation are characterized by the following aspects: they are based on the distribution of indirect costs on the cost carriers, respectively on determinants for the nature of the activity volume; inability to capture, in addition to resource consumption in production activity and other categories of resource consumption. The traditional method is applied in those economic entities in which a single product, work or service is manufactured, where there are no semi-finished products or unfinished production at the end of the management period, and if it exists, it is either constant, null, or insignificant.

The object of the calculation is represented by the production obtained, the work performed, the services provided. Direct costs are collected on a single product manufactured or globally for all products made from the same raw material and by the same technological process, and indirect costs are distributed globally on the analytical accounts where they were recorded.

The basic concept of the ABC method is that of activity - defined as the set of processes, methods, technologies, raw materials that compete to obtain a product, work, or service. The basic principle of the ABC method is the finer and more realistic distribution of indirect costs on the cost bearers, in relation to the functional methods. Within the ABC method, the activities can be grouped according to the nature of the decisions and their horizon, in four main categories, respectively: activities related to the existence of a production capacity; activities related to the very existence of the product; activities related to the form of organization and activities related to the production and marketing of the obtained products.

2. RESEARCH METHODOLOGY

The study does not aim to cover all aspects of costing, but only those that have been considered necessary to locate the research under consideration. Therefore, the research involved the observance of principles and rules specific to the research methodology, such as: review of the literature, data collection and processing, synthesis of theoretical aspects and obtained results. The methods used during the research were: deductive research, statistical grouping, observation, comparison, economic analysis, case study and interpretation of the obtained results. Theoretical research analyses and describes the current state of knowledge as a result of theoretical documentation at national and international level, and the applied one completes the theoretical research by transposing into practice the information on costing methods applied by economic entities.

3. ASPECTS REGARDING THE TRADITIONAL METHOD

Opting for one method or another of calculating the costs is determined by the close link between the type of production and the corresponding way of recording the consumption of that production. In general, the specifics of the technological process determine the method of calculating the costs. The global method is used by economic entities whose activity materializes in obtaining a single product and which at the end of the management period have no semi-finished products or production in progress.

The object of the cost calculation is the finished product, the provided work or service. If the activity of economic entities materializes in obtaining several products, works or services, which can be transformed by equivalence, into a single conventional product, work, or service, then the area of cost calculation can be extended. As long as the calculation is made with a certain delay compared to the moment of the economic processes that generated them, the operative information of the managers is not ensured, and the information provided by post-calculation allows only subsequent analyses compared to the cost budget.

The global method of calculating costs is specific to a series of grouping, calculation, and distribution procedures, which follow a sequence of steps that follow the logic of the production process. The full cost is obtained by integrating the costs as the production process progresses, all expenses being considered direct. Indirect expenses are those common to the sections, and general administrative expenses are recorded separately and allocated in cost at the end of the management period.

Taking into account the links between production costs and the places or products for which they were incurred, the actual cost of production is determined on the basis of the following steps:

(1) sectors of activity;

(2) the settlement of reciprocal deliveries of products, works and services between ancillary activities for their production needs;

(3) the calculation of the actual cost of the ancillary production and the distribution of the expenses related to that production, consumed for the needs of the basic activity and of the other sectors of activity within the economic entity; through these stages, in fact, the recording of operating expenses is recorded in the financial accounting of the economic entity and the ordering of expenses in management accounting;

(4) distribution of indirect production costs on products, works and services that are the subject of the basic activity of the economic entity, using the supplementation procedure, the classical form - differentiated or selective coefficients are used;

(5) the distribution of the general administrative expenses on the manufactured products, the executed works and the rendered services, using the supplementation procedure, the classical form - the variant of the unique or global coefficient;

(6) the distribution of sales expenses on the products, a stage necessary under certain operating conditions, through which the incurred sales expenses will be added to the production cost of the products; if their identification cannot be made on the product, they may be distributed in proportion to the weight or volume of the products delivered or using other criteria; adding to the cost of production the quotas of general administration and sales expenses, the full cost of production is obtained;

(7) the quantitative and value determination of the production in progress; from a value point of view, the evaluation of the production in progress is made at the actual cost considering the number of manufacturing phases completed and the

stage of processing in which it is; from a quantitative point of view, the production in progress is established based on inventory at jobs, warehouses, etc.;

(8) establishing the actual cost per unit of product, by relating the total actual production costs to the quantity of finished products obtained in the reference period.

Basically, the overall calculation consists in collecting the direct and indirect costs determined by the production process at the level of the entire economic entity and reporting at the end of the management period to the quantity of finished products obtained.

The calculation relation can be written in the form:

$$\text{Cui} = \frac{\sum_{i=1}^{n} Chpj}{Qi},$$

where: Cui = unit cost of product i; Chp = production costs; j = calculation articles; Q = quantity of finished product received; i = finished product category.

The cost of production is calculated by adding to the direct costs, a proportion of the indirect costs, considered to be correlated with the volume of production obtained. Indirect costs are charged to production obtained based on the production criterion, usually on the basis of direct labour hours (direct wages). In this costing system there is a hypothesis that all indirect costs are correlated first with the volume of production.

The actual unit cost is determined using the following calculation formula:

$$\text{Ctue} = \frac{\sum_{i=1}^{n} Chei}{Qe},$$

where: Ctue = effective unit cost; Chei = actual expenses on calculation items; Qe = physical volume of manufactured production.

The main feature of traditional methods of calculating costs vis-à-vis management accounting is the distribution of indirect costs based on randomly selected allocation coefficients, without them being directly linked to the causes generating the object of costs calculation.

4. ASPECTS REGARDING THE ABC METHOD

In order to make the allocation of indirect costs more realistic, various methods and techniques of cost calculation have been developed in recent decades, one of the most popular being Activity Based Calculating (CBA), originally Activity Based Costing (ABC). Basically, the application of this method leads to the change of the employees' mentality and implicitly to a better accountability of them, so that the managers can make the best decisions based on the information provided by the hierarchically lower-level managers coordinating the current activities. A sequence of accurate and timely information can generate economic growth.

According to the ABC method, expenses are allocated to activities based on cost inducers, and are subsequently included in the cost of the obtained products. Also, the costs are no longer differentiated by this method, directly and indirectly, as each of them has a direct link with the generating activities.

Activity management imposes the level of costs, which in turn will influence the good management of resources. The calculation of costs by the ABC method is practically a system of evidence and calculation of costs that aims to reduce the use of the coefficients of distribution of indirect costs on cost objects.

The trends of modern calculation methods are characterized by reducing the share of indirect costs and placing a high number of costs in the category of direct costs; establishing as a basis for allocating the cause-effect criterion of the activity; clear and homogeneous detailing of indirect costs, so that the cause-effect relationship is established as correctly as possible. The management of economic entities must explain the potential impact of changing the traditional method of calculating costs, the objectives pursued, the responsibilities and resources required.

The ABC method has a well-defined flow of procedures, and the stages of determining the various types of costs are:

(1) the primary distribution of expenses in financial accounting;
(2) the secondary distribution of expenses in the auxiliary section, if applicable;
(3) the application of the algorithm specific to the ABC method, respectively: - identification of activities and related costs; the establishing cost inducers for each activity; the regrouping centres setting up; the absorption of indirect costs;
(4) the calculation of production cost;
(5) the absorption of general and administrative expenses;
(6) the full cost calculation.

5. THE PARTICULARITY OF THE ABC COSTING METHOD COMPARED TO THE TRADITIONAL METHOD

The economic entity with an industrial profile, S.C. Raxela S.R.L. Brașov that produces shoes with and without heels for women. In March 2020, the entity obtained the following quantities of shoes, as follows: heeled shoes 605 pieces; flat-shoes 396 pieces. Next, we analyse the differences between the application of the two costing methods as a result of the distribution of the costs of the period (March 2020) on each obtained product. According to the first stage of cost calculation, the expenses from the financial accounting are distributed, by departments, the obtained results being presented in table 1. From table 1, as a result of the primary distribution, the direct expenses on each product can be identified, respectively:

Direct expenses of heeled shoes = 84,019.10 + 24,135.10 = 108,154.20 lei
Direct expenses flat shoes = 115,129.30 + 21,565.50 lei = 136,694.80 lei
Total direct expenses = 108,154.20 lei + 136,694.80 lei = 244,849.00 lei

According to the second stage of calculation of the production cost, the expenses occasioned by the operation of the auxiliary sections are distributed, respectively the thermal power plant and the repair and maintenance workshop.

Table 1. Primary distribution of financial accounting expenses by departments

Expenses item in financial accounting	Total, of which:	Production section A		Production section B		Indirect production expenses	Administrative department expenses	Sales department expenses	Expenses on auxiliary section 1	Expenses on auxiliary section 2
		Heeled shoes	Flat shoes	Heeled shoes	Flat shoes					
Expenses for raw materials	191950	79.970	111980	-	-	-	-	-	-	-
Expenses with consumables	11550	-	-	2090	1320	-	2420	2530	-	3190
Expenses for materials on the nature of inventory items	2343	-	-	-	-	253	-	2090	-	-
Expenses on energy and water	13365	-	-	-	-	10120	495	385	1760	605
Expenses with travel, secondments, transfers	2530	-	-		-	-	2530	-	-	-
Expenses with postal services and telecommunications fees	935	-	-	--	-	-	935	-	-	-
Expenses with banking and similar services	825	-	-	-	-	-	825	-	-	-
Other expenses with services performed by third parties	20570	-	-	-	-	13200	7370	-	-	-
Staff salary expenses	85360	3960	3080	21560	19800	5720	14960	3080	-	13200
Expenses for employment insurance contribution	1920,6	89,10	69,30	485,10	455,50	128,70	336,60	69,30	-	297
Operating expenses for depreciation of fixed assets	30404	-	-	-	-	22000	6050	649	880	825
Total	361752,60	84019,10	115129,30	24135,10	21565,50	51421,70	35921,60	8803,30	2640	18117

5.1. Auxiliary section 1 - thermal power plant

The thermal power plant supplies to the other departments the unheated thermal energy, by distributing the indirect expenses, on the surface of each heated space, with the help of a distribution coefficient, according to table 2.

Table 2. Calculation of the distribution coefficient

Department	**Area (sqm)**	**Distribution coefficient**	**Distribution of expenses of the auxiliary section 1 (lei)**
Production section A	88	6.4	563.20
Production section B	165	6.4	1056
Auxiliary Section 1	77	6.4	492.8
Administrative department	44	6.4	281.60
Sales department	38.50	6.4	246.40
Total	412.50		2640

The calculation of the distribution coefficient (k):

$$K = \frac{\text{expenses of the auxiliary department 1}}{\text{total area}} = \frac{2640 \text{ lei}}{412{,}5 \text{ sqm}} = 6{,}4$$

5.2. Auxiliary section 2 - repair and maintenance workshop

This workshop only performed operations on sewing machines, the expenses being fully distributed on them.

Table 3. Summary of the secondary distribution of expenses in the auxiliary sections

Explanation	Indirect production expenses	Administrative department expenses	Sales department expenses	Expenses on auxiliary section 1	Expenses on auxiliary section 2	Total (lei)
Total primary distribution of expenses	51421, 70	35921,60	8803,30	2640	18117	116903,60
Auxiliary section 1 thermal power plant	1619,20	281,60	246,40	-2640	492,80	-
Auxiliary section 2 repair and maintenance workshop	18609,80	-	-	-	- 18609,80	-
Total secondary distribution of expenses	71650,70	36203,20	9049,70	-	-	116903,60

5.3. Distribution of indirect expenses and preparation of the Cost Sheet in the case of the traditional method - the global method

In the case of the traditional method for allocating indirect costs, we use the total amount of direct costs as a basis for distribution. According to table 3, the indirect expenses are in the amount of 71650.70 lei, and the direct expenses are in the amount of 244,849 lei. Therefore, the distribution coefficient (k) is determined according to the following calculation relation:

$$K = \frac{\text{indirect costs to be allocated}}{\text{direct expenses}} = \frac{71.650{,}70}{244.{,}849} = 0{,}2927$$

Table 4 presents the results summarized after the application of the distribution coefficient to the value of direct expenses on each of the two products, as follows:

Table 4. Summary of results obtained after applying the allocation coefficient to the amount of direct expenses

Product name	Direct expenses	Distribution coefficient	Indirect expenses by product type (lei)
Heeled shoes	108154.20	0.2927	31656.73
Flat shoes	136694.80	0.2927	40010.57
Total	244849.00	-	71667.30

We determine the production cost for each type of product, and then we prepare the Cost Sheet by the traditional - global method.

Name of the cost element	Heeled shoes	Flat shoes
Expenses for raw materials	79970	111980
Expenses on direct consumables	2090	1320
Direct labour expenses	25520	22880
Direct expenses with insurance contribution for work	574.20	524.80
Total direct expenses	108154.20	136694.80
Indirect expenses distributed by the traditional method	31656.73	40010.57
Total production cost	139810.93	176705.37
Manufactured quantity	605	396
Unit production cost (production cost / total quantity manufactured)	231.09	446.22

5.4. Allocation of indirect costs related to production sections A and B, based on the activities in the production process of each type of product, by the ABC method

The calculation algorithm specific to this method involves the following steps:
I. Identification of cost-generating activities and related costs
Three centres of activity have been identified as a result of the transformation of the raw material into finished products, as follows:

a) the activity of launching into manufacture, the cost of which is the sum of the expenses with the inventory objects (253) and those with the services provided by third parties, services related to the framing of the patterns for the preparation of the production (13,200). Activity cost = 13,453 lei;

b) the processing activity - includes the expenses with indirect labour (5,720 lei) the afferent contribution (128.70 lei) and the expenses distributed from the auxiliary section 1 - the thermal power plant (1,619.20 lei). Activity cost = 7,467.90 lei.

c) the operation activity of the equipment which includes electricity expenses (10,120), depreciation expenses (22,000 lei) and indirect expenses distributed from the auxiliary repair and maintenance section (18,609.80 lei). Activity cost = 50,729.80 lei.
II. Establishing cost drivers for each activity, as follows:

a) The launching action - number of products launched in manufacturing:
- heeled shoes - 605 pairs;
- flat shoes - 396 pairs.

b) Processing activity - number of hours of direct labour:

- heeled shoes - 3.4 hours of labour / pair;
- flat shoes - 1.87 hours of labour / pair.

c) Operation activity of the equipment - number of operating hours of the equipment:

- heeled shoes - 2.75 hours of equipment / pair operation;
- flat shoes - 1.65 hours of equipment / pair operation.

III. The absorption of indirect costs by the ABC method:

The total volume of drivers' cost is determined as follows:

- total number of products: 605 pairs of heeled shoes + 396 pairs of flat shoes = 1,001 pairs;
- number of hours for direct labour = 605 pairs of heeled shoes x 3.4 hours + 396 pairs of flat shoes x 1.87 hours = 2,057 + 740.52 = 2,797.52;
- number of operating hours of equipment = 605 pairs of heeled shoes x 2.75 hours + 396 pairs of flat shoes without heel x 1.65 hours = 1,663.75 + 653.40 = 2,317.15

Next, the unit cost of drivers is determined according to table 6.

Table 6. Determining the unit cost of the drivers

Activity name	Total cost (lei)	Cost driver	Driver volume	The unit cost of the driver
Launching in production	13453	Number of pairs of shoes	1001	13.4396
Processing	7467.90	Direct labour hours	2527.80	2.9543
Equipment operation	50729.80	Equipment operating hours	2317.15	21.8932

Next, the indirect costs of the activities absorbed by the product type are calculated, by multiplying the unit cost of the drivers by the volume of the drivers consumed by each product.

Table 7. Calculation of indirect costs of activities on each type of product

Item name	Heeled shoes	Flat shoes	Total
Number of products - pairs (Qi)	605	396	1001
Direct labour hours - unitary	3	1.8	-
Direct labour hours - total	1815	713	2528
Equipment operating hours - unitary	2.75	1.65	-
Equipment operating hours - total	1664	653	2317
Launching activity cost in production	8131	5322	13453
Processing activity cost	5362	2106	7468
Equipment operation activity cost	36430	14296	50726
Total indirect costs by product type	49923	21724	71647

Next, in table 8, the Cost Sheet elaborated by the ABC method for the two products, heeled shoes and flat shoes is presented.

Table 8. Cost sheet - ABC method

Name of cost element	Heeled Shoes	Flat Shoes
Expenses on raw materials	79970	111980
Expenses on direct consumables	2090	1320
Direct labour costs	25520	22880
Direct expenses with insurance contribution for work 2.25%	574.20	524.80
Total direct costs = primary cost	108154.20	136694.80
Indirect expenses distributed by the ABC method	49923	21724
Total production cost Cp = Cdirect + Cindirect	158077.20	158418.80
Manufactured quantity	605	396
Unit production cost Cu = Production cost / manufactured quantity	261.24	400.05

Comparing the Cost Sheets developed by the two costing methods, namely the traditional / global method and the ABC method, it is observed that the level of unit cost per product is different for each of the two methods studied. Thus, for heeled shoes the unit cost calculated by the ABC method is higher by 30.15 lei compared to the unit cost calculated by the global method, and for shoes without heel, the calculated unit cost is lower by 46.17 lei. These differences can influence the analytical result - on each product.

Table 9 presents the comparative results regarding the use of the two cost calculation methods.

Table 9. Comparative results based on the global method and the ABC method

Cost element	The traditional method		ABC method	
Total production cost	139810.93	176705.37	158077.20	158418.80
Unit production cost	231.09	446.22	261.24	400.05

In the case of the traditional method of calculating costs, the distribution of indirect costs was made taking into account the distribution base represented by the consumption of raw materials and direct labour, a simplistic approach that does not allow a detailed analysis of the elements that generated costs. The difference between the ABC method and the traditional method is that the costs are broken down by activity, and the distribution of costs on each product that used that activity is ensured according to the allocation key established for each activity. The identified activities are: launching in manufacturing, processing and operation of equipment, and for these the respective cost drivers: hours of equipment operation, hours of direct labour and the number of products. With this method the distribution is more efficient as it allows a better analysis of the activities that have general costs.

6. CONCLUSIONS

In the conditions of the modern economy, indirect costs tend to have an increasing share in the total expenses of an economic entity and establishing a direct cause-effect relationship increases the veracity and usefulness of the calculated cost indicator, although both methods of calculating costs show both advantages and disadvantages. From the point of view of the traditional method of calculating costs - the global method has several advantages, such as: the essential feature is given by the fact that all production costs are directly identified on the process that caused them directly. A disadvantage of the global costing method is its narrow scope, performing two rows of calculations on the cost of production. The first row of calculations is the one that precedes the development of the production process and aims to determine the pre-calculated cost of production, materializing in the cost budget, and the second row of calculations is performed after the end of the production process, based on data recorded in management accounting. The two rows of calculations can compare, at the end of each management period, the pre-calculated costs with the actual ones, establishing the deviations. Therefore, the classical / traditional method - the global method has more of an ascertaining role, of verifying the data registered in the financial accounting, a comparison of the actual cost with the pre-calculated one.

Activity-based accounting is based on two fundamental principles:
(1) products consume activities, activity costs are transferred to the product, corresponding to generators or cost indicators;
(2) activities and not products consume resources or values that are productive factors, the costs being in fact the quantified expression, in monetary terms, of these resources consumed by activities.

Compared to the traditional - global method, the ABC method has several advantages: it distributes the direct and indirect costs on products, customers, areas of managerial responsibility using cost inducers; provides information to substantiate decisions at the strategic level; most indirect costs can be identified more precisely on the product; some of the indirect costs become direct, related to the generating activities. The advantages of the ABC method include a correct determination of the costs associated with the products, allows the calculation of process costs, supply chains and benchmarking. The application of the ABC method brings important advantages in the management of the company, by identifying the cost centres and the strategies of the cost information system.

As limits of the ABC method were identified: difficult collection of information related to the activities of production processes; the difficulty of defining the activities, of selecting the cost inducers; difficulty in determining the cost of each activity. The main disadvantage of the ABC method is that the entire system to be implemented requires dedicated resources, and the information can easily be misinterpreted. The compatibility of the management accounting system with the IT system and the computer-aided manufacturing technology is the essential condition for the implementation of the ABC method.

REFERENCES:

[1]. Alazard, C.; Sépari, S. (2016) *Contrôle de gestion*, Edition IV, Dunod, Paris
[2]. Bâtcă-Dumitru, C.-G.; Calu, D.A.; Ponorîcă, A.G. (2018) Contabilitate managerială, Second Edition, CECCAR Publishing House, Bucharest
[3]. Cagwin, D.; Bouwman, M.J. (2002) *The Association between Activity-Based Costing and Improvement in Financial Performance,* Management Accounting Research, Vol. 13, No. 1, pp. 1-39
[4]. Căpușneanu, S. (2005) *Metoda ABC și organizarea costurilor prin metoda ABC în industria textilă din România*, Economie teoretică și Aplicată, 9(504), pp. 89-96
[5]. Cokins, G.; Căpușneanu, S. (2010) *Cost drivers. Evolution and benefits Theoretical and Applied Economics,* 8, p.7-16
[6]. David, D. (2012) *Contabilitate de gestiune,* Cartea de Știință Publishing House, Cluj-Napoca
[7]. Dumitru, C.-G., Ioanăș, C. (2005) *Contabilitatea de gestiune și evaluarea performanțelor*, Universitară Publishing House, Bucharest
[8]. Fisher, J.G.; Krumwiede, K. (2012) *Product Costing Systems: Finding the Right Approach*, The Journal of Corporate Accounting and Finance, pp. 43-51, available at https://doi.org/10.1002/jcaf.21752
[9]. Hlaciuc, E. (2000) *Metode moderne de calculație a costurilor*, Polirom, Iași
[10]. Ionașcu, I. (coord.); Filip, A.T.; Mihai, S. (2001) *Control de gestiune*, ASE Publishing House, Bucharest
[11]. Tabără, N. (2006) *Modernizarea contabilităţii şi controlului de gestiune*, Typography of Moldovia, Iaşi