

## MODEL FOR THE COMPUTATION OF THE CUSTOMERS' PROFITABILITY ACCORDING TO THE REQUESTS OF THE SUSTAINABLE DEVELOPMENT

*ALBESCU Felicia<sup>1</sup>, DUMITRANA Mihaela<sup>2</sup> and JINGA Gabriel<sup>3</sup>*

*Bucharest Academy of Economic Studies, Bucharest, Romania*

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### **Abstract**

*The objective of our research is to imagine a model of computation of the customers' cost and consequently of their profitableness according to the information supplied by the managerial accounting concerning the costs and prices, taking into account the requests of the sustainable development. The model created can be also detailed on the products sold to the customers (customers/products). In our work we relied on the components of the customers cost, computed according to their nature using an adequate methodology to the type of expense. In this way we will be able to make a real analysis of the customers' structure by their efficiency with consequences on the advantages or disadvantages that can be granted to them.*

**Keywords:** *Customers; cost; profitability; accounting; sustainable development*

**JEL classification:** *L81; M41*

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### **1. Introduction**

We are living in an environment characterized by instability, turbulence, with components harder and harder to predict and solve, but that sometimes have even an opposite effect on the entities and people forming this environment. Moreover, the cyclical evolution adds up to the previously mentioned components and the crisis with its effects induce a reconsideration

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<sup>1</sup> *Professor, Faculty of Accounting and Management Information Systems*

<sup>2</sup> *Professor, Faculty of Accounting and Management Information Systems*

<sup>3</sup> *Assistant Professor, Faculty of Accounting and Management Information Systems, e-mail: Gabriel.Jinga@gmail.com*

of the priorities. We are living in a bounded space with limited resources where the present is affected by the past and more or less prepared for the future. We can say without being wrong that the present is a crossroad and like any other crossroad is blown by the winds, meaning that it is hard to control for the aimed direction.

Entities of all types exist and evolve in this environment for either a longer or a shorter period given the way they manage to find and control existence's direction, vision or goals. The ability to fit the changed circumstances becomes an existential factor supported by efficiency. In this context the creation of goods and services changes rapidly; the quality of goods and services but also the quality of the activity in general becomes the key element in a context of attractive prices for customers, producers and developers. From this point of view it becomes unconceivable for the producers not to know the costs of all types, both related to products and customers. The product-customer couple viewed from the cost and pricing perspective can determine the customers' efficiency and satisfaction.

Porter (1986) suggests that firms can be viewed as a flow of activities performed to provide products or services to customers. Porter focuses on the ability of activities to add value. The best performing companies in any industry are those which add value either cheaply or distinctively. Value-added activities contribute something that is worthwhile to the enterprise and its customers (Glautier & Underdown, 1988).

In increasingly competitive markets, it is critical to know customer, market and channel of distribution, profitability as well as product profitability. Companies should answer to some questions such as: "Which customer or market segment generates the greatest profit? How can we protect it? What are the maximum discounts allowed? Should we drop a customer?" In order to answer these questions we need to be informed about costs and prices. It is not enough to know the production cost but it is necessary to deeply analyze the non manufacturing cost or period cost and calculate their level for each customer. The best solution in our opinion is to identify and to analyze each type of cost by activity. What does this mean? First of all activities need to be identified. Secondly, a calculation of the total cost for each activity and a division of total cost per activity between all customers and products are required. This solution was applied by a series of foreign authors. Some theoretical attempts appear at some Romanian academics.

Without accurate customer information, a company may cause strategic errors making unsupported decisions (Horgren et al., 2006).

We make decisions every day. Some of them are simple, while others are not. Yet, all of them have something in common: an elementary decision process, logic that supposes gathering information, taking into account costs and future benefits, choosing an alternative, acting according to this choice and evaluating the results (Horgren et al., 2006).

As the authors mentioned emphasized, such information is extremely useful to the management in the decision making process, but is used by a small number of entities in Romania. As a consequence, the decisions of giving up on certain customers or on a certain market are relying less on the profitability and more on instinct and general data. Relying on these realities, we consider that it is necessary to organize a distinct department to analyze the couple customers – market under the conditions of profitability taking into account a detailed analysis of the customers. Why the analysis of the customers? Because the acquisition cost represents a major part of the total cost and will thus influence the profitability.

With the passing time customers profitability was also mentioned in the literature: Howell & Soucy (1990), Horngren et al. (2002, 2005, 2008), Dumitrana et al. (2007), Dumitru et al. (2008), Dumitrana et al. (2009). All models are based on the treatment of period expenses in order to calculate the total cost for customer, according to the possibility of identifying the costs elements on customers. For this reason different methods for cost allocation were presented.

The objective of our research is to present some methods for period cost allocation relying on the different elements of cost, that involve different approaches.

## **2. Brief retrospective of the sustainable development request**

Nowadays, the sustainable development concept obliges you to take into account also the conditions imposed by the use of the limited resources without compromising the needs of the future generations. This concept is a difficult one, and there are more than one hundred different definitions for it, according to the knowledge, ideas, political beliefs, without reaching consent. Briefly, the sustainable development represents the loyalty as to the next generations (Pearce et al., 1989).

The sustainable development concept was presented in the Brundtland Report by the World Commission for Environment and Development as follows: “The mankind has the ability to make the sustainable development – to assure the needs of the present without compromising the ability of the next generations to fulfil their needs”. This definition concerns two parts: the first one has to do with the present needs, and the second has to do with future generations (development over time). In this report the sustainable development was presented as a temporal concept (inter-generation dimension). Sustainable, as a new term, means “never-ending” or “lasting”.

In the definition two terms are connected: sustainable and development, and for us is important to understand development as the most relevant term. This opinion was detailed by Pearce and Warford, 1993. Sustainable development may be interpreted as developments that can continue forever (at least until the end of a politically relevant time horizon). So, the term development deserves the term sustainable and should have a positive quality. In all circumstances development may be a good or a bad term because we consider good or bad changes over time from different perspectives.

Development is analyzed and measured by economists in terms of increasing per capita income, or gross domestic product. A part of economists considers that because income is distributed so different between poor and rich people, development is not a positive term (is not development). An important part of development is considered to be composed by education, skills and capabilities.

The sustainable development represents a strategic fundamental axis of the European Union politics, while Amsterdam Treaty is placing the concept of sustainable development among the major objectives of the European Union. The UN Development Program (1994) defines development as processes that increase people’s opportunity of choice. Development may be also considered as an increase in well-being across the members of a society between two points in time. Well-being is often used as a synonym for welfare, but economists consider that between these two terms there are different formal meanings. For welfare there are a lot of definitions and economists agreed that the allocation of scarce resources and anything else deemed to be relevant for personal or social choice seems to be a good interpretation (Dasgupta, 2001). Regarding well-being, Dasgupta notes that it includes all benefits derived from things other than consumption, for example,

from the presence of fundamental human rights. Well-being also may include social relations and psychological fitness. For measuring sustainable development, well-being must be seen to be a function of consumption in the broadest sense possible. Consumption that means all goods and services that contributes to well-being. We may interpret sustainable development as a development for a long period of time, for several generations and also an increase in well-being over a very long time.

Sustainable development concerns also to ensure the potential for the well-being of future generations. In this world where we discuss about limited resources, the most important thing is to reconcile present and future needs and to ensure justice between generations. Based on this reality it is important for all of us, companies and individuals, to use resources efficiently in order to ensure their use for the next generations. Even though there are critics brought to the sustainable development (it might have unknown or dangerous effects – Baden, 2008; it hides protectionism of the developed countries on the expense of the underdeveloped ones; a response to the environmental issues can be the reduction of the production instead of the sustainable development – Cleimentin & Cheynet, 2008), we consider that the limited resources have to be used efficiently and efficaciously, which supposes from the point of view of the economic entities to assure a cost as low as possible for products, works, services, customers. So that, in this moment, our contribution is to calculate the cost of all resources used by companies and to try to reduce their level in the total cost. On the other hand, as cooperation between economists and technicians, it is necessary to replace scarce resources by other that are easy to obtain and are produced in large quantities.

From the accountants point of view, to know the level of the total cost, the elements of the cost, the real and the predetermined amount of different costs, represent goals that must be realized.

To understand the needs of all users, mainly companies, that means to satisfy them, by the quality of products and services, by an attractive price and by after sells goods and quick services. To offer goods at satisfactory prices those companies needs to know costs and margins that companies need to obtain. In this context, managers must be informed about all the available resources, their costs, possible constraints, scarce materials and other problems that should influence the normal activity. Costs and performances must be calculated not only for products and services but also for customers.

Why? Because if the customers are satisfied, the products can be sold by their producers.

The requests of the sustainable development are applied to all the types of entities, no matter the activity object, including the ones with commerce activity. The saving of the resources is needed in order to reduce the costs for the merchandise trading, but also the customers cost.

### **3. How to calculate the customers' profitability?**

To answer this question we want first of all to remind you that companies calculate profits for all cost objects as a difference between revenue and total cost. Total cost or cost of sales is composed by production cost of goods sold (acquisition cost of goods sold) and period cost. In our research we chose to calculate customer profitability for wholesale merchandises companies. Our model can yet be applied to any type of entity, with any activity object. For those companies the profit per customer (Pc) will be calculated as follows:

$$Pc = CAc - CTc \quad (1)$$

where

PC – profit per customer

CAc – sale revenue per customer

CTc – total cost per customer

The CAc can be easily calculated on the basis of the analytical developments in the financial accounting or on the information in the managerial accounting. This information can be also obtained from the operational statements concerning the sales prepared by the entity.

The calculation of the CTc may cause some difficulties because complete information about this cost can only be obtained after creating a computation methodology. In this case we also start from the components of the total cost on customer or customer/product, as follows:

$$CTc = CAVc + CPc \quad (2)$$

where

CAVc – cost of sales per customer

CPc – period cost per customer

The computation methodology for CAV on total merchandise sold or on customers, customers/products being already established, operational, a used and known practice, according to the organization way of the merchandise inventories (quantitative, quantitative – monetary, on groups and merchandise types), we will only focus on the period cost.

The period cost in our opinion has to be analysed on cost items that forms this structure and that can be detailed as follows:

- Storage cost;
- Handling cost;
- Transportation cost;
- Preselling cost;
- Selling (expenses) cost;
- After selling cost;
- Other general costs.

In our opinion other costs form a larger concept than selling and distribution costs because some elements of the costs are included in the administrative costs; e.g. storage cost.

The questions which we have made during the research arose from the need to locate these costs to customers or customers/products. Therefore we tried to meet the needs created by the model for calculating customer profitability. The essence of design methodology consists of adequacy treatment cost of the use, as follows: cost of storage and related product  $i$  sold to customer  $j$  can be assigned as the average volume of product  $i$  in storage and a month (after the default time stationary) to average total volume of products stored in storage per month, according to the relationship of calculation:

$$CS_i = V_i * CSd / V \quad (3)$$

where:

- $CS_i$  – cost storage product  $i$ ;
- $V_i$  – the average volume of product  $i$  per month;
- $CSd$  – warehouse storage cost;
- $V$  – average volume of all products stored per month.

The above calculation is based on the number of days of storage, usually monthly. Depending on the type of goods and the measure unit used a

standard unit of volume (USV) can be established for the cost of storage. In this case, the relationship of calculation will be:

$$CS_i = (30V_{0i} + V * T_i) * 1 \text{ USV storage cost / day in warehouse X} \quad (4)$$

where:

- $V_{0i}$  – initial stock of product  $i$ ;
- $V$  – input  $i$  per month;
- $T_i$  – the average storage duration of the product  $i$  = time between 2 supplies / 2 =  $(30/ k_i) / 2$ , where:  $k_i$  numbers and product supplies per month.

To determine the storage cost for product  $i$  for customer  $j$  we will use the following formula:

$$CS_{ij} = V_{ij} * (N_r V_{0i} + T_i) * 1 \text{ USV storage cost / day of storage} \quad (5)$$

Synthesizing the data concerning the storage cost for product  $i$  for customer  $j$ , we note the following:

- Identifying the standard unit of volume;
  - Calculating the cost of storage on 1 USV;
  - Computing the cost of storage of the product  $i$ , customer  $j$ .

The cost of handling deals with the inputs, outputs, inventories, reorganization etc. The hypothesis considered is that each product is handled at least twice in a store, once for the entry and once for the exit.

Handling cost for product  $i$  and customer  $j$  will be determined by the weight of the products handled in the store  $X$  per month as to the total weight of goods handled (inputs + outputs). As a first step we will calculate the cost of handling per product  $i$ , according to:

$$CM_i = (G_{i_i} + G_{i_e}) / \text{Total}(G_{i_i} + G_{i_e}) * CMX_i \quad (6)$$

where:

- $CM_i$  – cost of handling product  $i$ ;
- $G_{i_i}$  – weight of the entering products  $i$ ;
- $G_{i_e}$  – weight of the released products  $i$ ;
- $CMX$  – handling cost in warehouse  $X$  per month.

The cost of handling the product  $i$  / customer  $j$ , is calculated in a second step according to the weight of the products delivered to customer  $j$  as to the weight of the handled products  $i$  in one month in the deposit, as follows:



$$CM_{ij} = G_{ij} * CM \ 1 \text{ USG} \quad (7)$$

where:

$CM_{ij}$  – cost of handling product  $i$  / customer  $j$ ;

$G_{ij}$  – weight of the product  $i$  delivered to customer  $j$ ;

USG – the standard unit of weight (1 gram or multiples).

We consider that the transport costs would be apportioned according to the distance to the customer, the total quantity of goods delivered and the number of deliveries. Why these criteria? Since the same carrier can serve more customers it seems correct bearing by each customer a part of the cost of transport in relation to the quantity delivered. As a result, we started from the following assumptions:

- $N$  customers are allocated to a sales centre;
- Deliveries are made on a route of length  $L$  serving more customers;
- The route is made  $M$  times a month;
- Every customer receives  $K_i$  deliveries ( $K_i \geq M$ );
- Every customer can be reached on the shortest track  $D_j$ ;
- The weight of the transport vehicle ( $G_0$ ) is not negligible compared to the weight of the goods;
- The weight of the goods transported per month to the customer ( $G_j$ ) is not negligible compared to the vehicle weight ( $G_0$ ).

The notations used are:

- $G_j$  – the weight of all products delivered to customer  $j$ ;
- $K_j$  – the number of deliveries per month to customer  $j$ ;
- $D_j$  – the distance to the customer on the shortest path;
- USD – standard unit of distance – virtual km.

$$\text{USD} = \text{Actual route length} * \text{Number of attending per month} / \text{Length of a virtual route that would serve each customer (sum of distances on the shortest route round trip)} \quad (8)$$

Comments:

- If every customer should be served individually, it should be covered by  $K_j$  times  $D_j$  distance round trip;
- Real effort to deliver a customer  $j$  an amount  $Q_{ij}$  of product  $i$  per month is directly proportional to the weight of delivered plus a share

of the transport vehicle weight and distance to the customer on the route. Proportion of weight allocated to each customer's vehicle transport route.

Useful effort is commensurate to the following hypothesis: if every customer would be delivered the products individually on the road soon, then the efforts should be directly proportional to: the weight of the transport vehicle, the average weight of products shipped and the distance to the customer on the road on the shortest trip. Therefore, good effort is directly proportional to  $G_j + 2 \cdot G_0$  and  $D_j$ . So good effort will be equal to  $(G_j + 2 \cdot G_0 \cdot k_j) \cdot D_j$ .

The distribution of the transport cost on the route of transport, on the customer will be based on the useful effort:

Transport cost / customer  $j$  = Useful effort / Total amount of useful effort customer  $j$  \* amount of travel expenses on route  $R$  per month (9)

Proceeding as in the previous cases, the cost of transporting on the customer, can be computed according to USG unit cost per unit of USD, as follows:

Cost 1 USG/1km = Total cost of the carrier on the route  $R$  per month / (Average weight transported to a customer + Weight of a car carried  $M$  times per route) \*  $L$  route (10)

Cost 1 USG per 1 USD = Total carrier cost on the route  $R$  per month /  $(G_j + 2 \cdot G_0 \cdot k_j) \cdot D_j$  (11)

Transportation cost customer  $j$  = 1 USG cost per 1 USD \*  $(G_j + 2 \cdot G_0 \cdot k_j) \cdot D_j$  (12)

where:

$G_j$  – expressed in USG;

$G_0$  - expressed in USG;

$D_j$  – expressed in USD.

Transport costs can be also apportioned on each product delivered to a particular customer, but in our opinion it would not help very much the analysis oriented on the effectiveness of the customers.

Presales cost (marketing, tender offers etc.) can be assigned to products and customers, using the following methodology:

$$\begin{aligned} \text{Calculation of presales cost per unit of product } i &= \frac{\text{Total presales cost}}{\text{month/Outputs}(13)} \\ \text{Calculating the presales cost of the product } i \text{ to customer } j &= \text{Presales cost per} \\ \text{unit of product } i * Q_{ij} & \quad (14) \end{aligned}$$

where:

$Q_{ij}$  – quantity of products  $i$  sold to customer  $j$ .

Cost of sales (orders, deliveries, invoicing etc.) will follow the same methodology as for the cost of presales. In fact, the two categories of costs can be merged into a single structure, especially if entities have not developed suitable analytical nature of expenditure and are content with learning the overall level of such expenses.

The cost of after-sales (returns, loss, damage etc.) will be calculated in our concept, a product unit (returned, lost, damaged) by reporting the total cost resulting from the addition of after-sales costs in the amount of products in one of these situations. This charge will apply to the amount of products recalled each customer to establish the cost of aftermarket product and customer.

Other costs of a general nature covering the remaining costs of general administration, will allocate customers and products based on turnover. This criterion seems most appropriate for this category of expenditure allocation, to quantity as the ratio of sales value will assign each customer an appropriate share of costs. Rule by which we guide is: one that sells more than supports a larger share of expenditure.

#### **4. Model reporting customer profitability**

In order to use information about customer profitability by management, we designed a model for reporting on customer profitability or on customer / product. The structure of this report is presented in table 1:

**Table no. 1: Model of reporting customer profitability and product  $j$**

ELEMENTS	EFFECTIVE	% SALES	BUDGET	% SALES	DEVIATIONS		CAUSES
1. Sales							

2. Cost of sales							
3. Gross margin (1-2)	X	X	X	X		X	
4. Cost of storage							
5. Margin on the cost of storage (3-4)	X	X	X	X		X	
6. Cost of handling							
7. Cost of transport							
8. Margin on the cost of logistics (5-6-7)	X	X	X	X		X	
9. Presales cost							
10. Cost of sales							
11. Postsales cost							
12. Margin on cost of sales (8-9-10-11)	X	X	X	X		X	
13. Other general costs							
14. Operating profit or loss (12-13)	X	X	X	X		X	

In the report are also calculated the shares the margins hold in the turnover margins and we consider that management can make decisions based on these indicators. For the entities that have budgets allocated to the customers, this model can be completed with the deviations from the budget and with the causes that have generated these deviations. The proposed model can be assimilated to a balanced scorecard, which according to the reporting period is an operational management tool. The criterion by which we prepared the report was to identify costs per customer / product, without taking into account the variability of expenditure components of cost. With this management tool can be made decisions regarding dismiss of unprofitable customers, granting or not price allowances, accepting or not working with a customer.

## **1. Conclusions**

Knowing customer profitability is a goal of each entity, without which it can ensure the attainment of efficiency. Company's marketing efforts aimed at attracting and retaining profitable customers (Bhiman et al., 2008). In this way we can decide a price policy related to the types of customers and their characteristics, assessed in terms of loyalty, seriousness, and not least their profitability. Pricing aims granting or refusal to grant discounts on the selling price and thus affects margins or contributions.

Calculating the cost of each customer on each product developed; provide the manager the information necessary for their profitability and grounding decisions on measures to be taken for maintenance or not of the customer. As we have mentioned previously, to calculate the cost per customer is not easy being required special methodology adopted by the entity. So we built our model drawing on the experience of other countries, from literature and the Romanian practice. The originality of the model derived from: how to structure customers and the specific cost of each category of cost sharing. Not identify with the model-based calculation of activities, however having some common points (standard units of weight, length etc., which could be treated as inducers of cost).

The distribution of the costs may seem difficult, but we must take into account the existence of a computer system which facilitates the calculation.

The experience of other authors showed that there were other concerns in this area, concerns focused mainly on articulating the treatment cost calculation on business customers (Bhiman et al., 2008, Kaplan and Atkinson, 1998, Kaplan and Anderson, 2004; Bruggeman et al., 2005). The computation of the profitability of the customers is circumscribed in the preoccupations of the specialists in accounting concerning the application of the concepts of the sustainable development. By the information offered, the accounting supports the monitorization of the resources saving and as a consequence of saving the costs of their use. The accounting is also the one signaling the outflow of costs and imposes measures for the prevention and correction in the future.

Knowing the customers in every aspect and especially the maintenance of friendly ties with them is of influencing policy or production and sales with customers is an endless source of information on the structure of related supply with demand. Reporting on customer profitability, presented in a cumulative way, shows that quite often a small percentage of customers contribute with a high percentage of profit. Therefore, it is important for

entities to allocate sufficient resources to maintain and develop customer relationships that help to generate profitability.

Under the present circumstances, in which the information technologies are widely spread at the level of all of the companies (Dumitru, 2009; Ionescu et al., 2009), the opportunities for obtaining information about the customers are endless.

We consider that the life cycle of products is directly connected with the life cycle of customers. In support of this statement are those referred to in paragraph 1.

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