

УДК 657.1

N.V. Khoteyeva

**ACTIVITY BASED COSTING
IN TRANSPORT ENTERPRISES**

The article presents the analysis of distribution of overhead costs in the process of calculation of a cost value of a transport enterprise. Different kinds of various cost drivers are analyzed taking into account their change during the accounting period.

The purpose of this research is to analyze theoretical bases and then develop practical recommendations which would allow allocate overhead cost in the transport business.

Keywords: overhead cost, Activity – Based Costing, transport enterprises, cost driver.

В статье проанализированы существующие подходы к распределению накладных затрат при формировании себестоимости услуг транспортных предприятий, а именно, возможности использования различных баз распределения затрат для включения в себестоимость услуг и их изменения в течение отчетного периода.

Ключевые слова: накладные затраты, учет затрат по видам деятельности (ABC), транспортные предприятия, фактор затрат.

У статті проаналізовані різні підходи щодо розподілу накладних витрат в процесі формування собівартості послуг транспортних підприємств та зміни протягом звітного періоду часу.

Ключові слова: накладні витрати, облік витрат за видами діяльності (ABC), транспортні підприємства, фактор витрат.

Problem statement. A country's economy depends on various service sectors and transportation is one of them. The venturing of the corporate sectors into service industries launches competition. Such situation allows provide a qualitative customer service at reasonable cost. Nowadays the restructurization of service firms have resulted into bankruptcy of a number of the enterprises, what can be explained at account of a poor control conduct over escalating overhead cost. Thus, the survival of a service industry firm largely depends on the availability of timely and reliable information which facilitates decision-making processes and on the ability to keep the operation cost at a marginal level.

Consequently, cost, management accounting concepts and techniques are not solely applied in manufacturing sectors but as well in service sectors with the aim of providing cost information necessary for decision-making evaluation. A study by Horngren [1] found that the focus of cost management should be on decisions and various cost management techniques, systems and measurements that spur and help managers to make wiser economic decisions. Of the many available cost management systems, research reveals that a bigger number of companies' uses Activity-based costing (ABC) method in comparison with the traditional costing system for providing timely and quality cost information [2].

For the forwarding enterprises usage of ABC method is connected with less difficulties than for those of port sector. As a rule, the list of expenses of the transport enterprises is not diverse what makes easier comparability of concrete cost drivers.

Analysis of the last research and publications. A significant contribution to solving the mentioned problems have domestic and foreign scholars, namely I. Belousov, Borodkin A., Y. Veryha, K. Drury, Hornhrehn CH.T., Napadovska L., Tkach, Goncharenko and many others. However, the study of distribution of indirect costs business services in today's demands additional studies, including clarification of a number of theoretical and practical aspects of determining the cost drivers, accumulation and distribution methods overhead cost in the fields of business and types of services.

Tasks of research. The purpose of this research is to analyze theoretical bases and then develop practical recommendations which would allow allocate overhead cost in the transport business.

Basic material of research. There are a lot of authors studied ABC costing systems. Sum of them considered both possibilities of use different cost drivers and opportunity of the usage of this system in particular calculation of cost value of the services enterprises. For the entities of a sea transport this problem is studied insufficiently.

J. Maurice Clark coined the phrase ‘different costs for different purposes’. However most of the companies use only one costing system for all the purposes: stock valuation, planning, control and decision-making [6]. Prior to the introduction of ABC costing system, a number of companies, particularly manufacturing sectors, used a traditional costing system called ‘volume-based’ costing system, which implies such volume-based cost drivers as direct-labour hours, direct labor cost, or machine hours. Most carefully the cost are classified into two main parts. These are: Product cost and Period cost. Product cost is a cost assigned to goods that were either purchased or manufactured for resale while Period cost is where administration and selling are recognized as expenses during the period in which they are incurred.

The conventional or traditional accounting system allocates the manufacturing overhead cost to the products either on overhead rate or on two-stage allocation system. The former allocates cost on a single activity base for the entire factory but the latter assigns manufacturing overhead cost based on departmental activities.

Thus, the allocation of manufacturing cost depends on the types of resources that the products consume. The greater the products consume the resource, the higher the overhead attached to the products. It based on one particular activity base such as direct labour hour, machine hour or direct labour cost. Furthermore, this system allows for cost distortions, which will be greater in business units with a higher proportion of overhead costs [3]. Researchers note that

this system failed to reflect other resource or cost of activities that added value to the production [4].

Other than that, Copper and Kaplan assert that traditional cost and management accounting systems such as those based on standard costing and absorption costing have measured company performance imperfectly because they have not kept up with the developments in production technology and consumerism.

Therefore, to avoid biased cost reporting, the allocation of overheads to cost objects should not be based on a common volume-related measure, such as direct labour hour but on the groups of activities which generate those overheads [3].

An overhead allocation based on activity centers avoids a common consequence of traditional output-based costing system particularly under cost low volume products. A study conducted by Innes and Mitchell [2] found that overheads based on activity centers facilitate the targeting of unnecessary, wasteful, resource usage and the costly effects of over-complex ways of running a business process. This technique, which is popularly known as Activity-Based costing (ABC), is a ‘system that focuses attention on the costs of various activities required to produce a product or service’ [2]. This system is in favor of many organizations in order to provide “true” cost information for their strategic decision-making.

The ABC, first developed by Cooper and Kaplan is a system that will reduce the level of arbitrary cost allocations associated with “traditional” costing systems and result in more accurate product cost.

In the beginning, ABC cost management system was common in the manufacturing environment where the identification of activities associated with the products was still less complex and in some instances the activities were direct. However, now even the service sectors adopt ABC cost management, acknowledging the importance of cost information for survival in the increased competition. A number of researches revealed successful applications of ABC in private as well in public service sectors, such as financial institutions, hotel sectors, health centers, transport companies, and

telecommunication [2]. Thus, the service sectors shift the cost management focus from conventional costing system to the ABC system.

Cooper and Kaplan [2] assert that service firms can benefit from using ABC as they have the same set of issues as manufactures, e.g. analyzing operating expenses and performing service activities that demand resources. They further noted that Contemporary Management Research is also an effective tool in service firms for tracing cost to services produced and a helpful tool in implementing total quality thinking in service firms as it encourages management to analyze activities and determine their value to the customers. For instance, the application of ABC system in hospital helps managers to better assess operational efficiency, establishes more meaningful comparisons of financial performance with other hospitals, and optimizes the mix of service offered to patients (King et al., 1994, cited in Adams, 1996). The research further revealed that ABC generates information that enables managers to identify opportunities for cost savings and provides them with an improved basis for budget constructions. Therefore, the costing system based on ABC model would help service sectors to understand the cost and value of service activities that are essential to control escalating operational costs.

ABC cost system also helps to eliminate non-valued added activities that consume organizations' resources without any benefits for the organizations. With this analysis, the service sector could focus its resources on activities that add value to a customer and provide economic benefits. However, this does not mean that understanding the activities that drive cost and eliminate non-value added activities compromise the service quality rendered to its customers. Kock (1995) asserts that customers demand services that often drive business expenses up without a corresponding increase in revenue and, thus, firms that could quantify these costs are in the best position to control them. All in all, the objective is to eliminate any activities that do not add to the service provided and with this, costs can be reduced without compromising the service offered to the customers. This research paper explores the application of Activity-Based Cos-

ting in a higher learning institution particularly in a University and how it contributes to its business and operational strategic decision-making. To maintain the anonymity of the subject in this

The environmental change has forced many organizations to change and rethink their business and competitive strategies, particularly cost management system, in order to achieve the competitive edge in the marketplace. Successful organizations are those that are able to improve quality, lower costs and efficiency of operations and eliminate products and services that incur losses. An organization costing system is a system that helps the management with the strategy planning while the system plays an important role in providing accurate cost information about the products and customers. ABC is a useful decision making-framework for economic analysis in service sectors, particularly in the areas of planning, control and decision-making. To achieve this, many organizations shift their focus from conventional or traditional costing system to an increasingly popular cost methodology system that is Activity-Based Costing (ABC). This system simply collects cost in functional activity cost pools and then applies costs to products/services using individual cost drivers [1]. When this system was introduced, it was only popular among the manufacturing context; however, now it also pulls attention of the service sectors. A number of research and studies reveal how the ABC system in the service sectors has effectively kept the operational cost at marginal level and still be able to provide better customer service at the same time. How an ABC costing system that improves operations

However, the implementation of such system is costly and often the idea of implementing the system is dropped as a result of time consumption and lack of expertise. In some cases, the cost for carrying out the ABC analysis is higher than the returns. On the other hand there is a growing number of literature, which argues that, compared to the traditional costing systems, Activity-Based costing (ABC) offers important advantages to organizations [3].

They underline that Activity-based costing (ABC) is a costing methodology that identifies activities in an organization and

assigns the cost of each activity with resources to all products and services according to the actual consumption by each. This model assigns more indirect costs (overhead) into direct costs compared to conventional costing.

Methodology of ABC focuses on cost allocation in operational management. ABC helps to segregate:

- fixed cost;
- variable cost;
- overhead cost.

The split of cost helps to identify cost drivers, if achieved. Direct labor and materials are relatively easy to trace directly to products, but it is more difficult to directly allocate indirect costs to products. Where products use common resources differently, some sort of weighting is needed in the cost allocation process. The cost driver is a factor that creates or drives the cost of the activity. For example, the cost of the activity of bank tellers can be ascribed to each product by measuring how long each product's transactions (cost driver) takes at the counter and then by measuring the number of each type of transaction. For the activity of running machinery, the driver is likely to be machine operating hours. That is, machine operating hours drive labour, maintenance, and power cost during the running machinery activity.

ABC has helped enterprises to become more efficient. ABC provides a clear picture of where resources are being spent, customer value is being created, and money is being made or lost. ABC offers a better alternative to labor-cost-based services costing. ABC identifies value-added activities. ABC eliminates or reduces non-value added activities.

Although using ABC brings many advantages from the view point of management, implementation of ABC to service organization especially to logistics pose several challenges which do not generally exist for ABC applications in manufacturing.

There are several reasons of this challenge of ABC implementation to logistics which are (Rotch, 1990):

- Output is harder to define.

- In many cases determining activities and cost drivers are not straightforward.

- Data collection and measurements are more complicated than manufacturing.

- Activity in response to service requests may be less predictable.

- Joint capacity represents a high portion of total cost and is difficult to link output related activities.

In other words, the output of the processes of the logistics organizations can not be represented as easily as the outputs of manufacturing organizations. Activities performed in a manufacturing organization are generally known with certainty, but they can not be easily defined in many services and logistics organizations. Another challenge of the application of ABC to logistic organizations is the complexity of logistic work processes. The complexity of the business processes increases the load of ABC calculations.

To calculate with an absolute accuracy prime cost in the conditions of continuous changes of the internal environment of the enterprise, namely modernization, development of new technologies of freight handling, growth of separate types of expenses and other subjective factors of influence on process of calculation is impossible. As researches show, at the most positive scenario of process of calculation of prime cost the error can make 5-10 %. Calculation of prime cost represents iterative process, and the result accuracy demands more financial resources. Directors have to determine the necessary accuracy of calculations of prime cost depending on the financial opportunities. [5].

It should be noted that at many enterprises among heads still it is considered that product cost can be calculated absolutely precisely.

In the majority of cases basically for distribution of indirect expenses are taken into the account the following economic indicators:

- salary of the main production workers;
- cost of fixed assets;

– sum of a factor cost, etc.

Traditional approach is founded on seeing as base of distribution a constant, invariable indicator within one year in the course of two-stage distribution. Consequently when at the first stage there is a distribution of indirect expenses on the centers of expenses, and at the second stage — on enterprise products. Within a year factors with which bases of distribution are connected, change: the number of workers, cost of fixed assets. Therefore the share of manual and machine time in the general labor input of a product will change, floor spaces increase, the new technology, etc. is entered. According to accounting policies of the regulated account appointed to the beginning of year the base of distribution thus has to be invariable.

Therefore, the insufficient accuracy of results of calculations of prime cost is connected also with such factor, as inopportuneness of reaction of the managers on change of these indicators in time.

One of the ways of formation the most exact prime cost requires a timely revision and a choice of the base of distribution which is the most adequate at present. The major factor among many is a frequency of revision of the chosen base of distribution of indirect expenses. At the enterprises conducting port activity, for example, when forming prime cost of overloaded freights independently on types of cargo, the same base of distribution is used. The technology of an overload of different types of freight forms different structure of expenses that has to be considered at distribution of laid on expenses, when making choice of a factor of expenses. Thus the choice of base of distribution to all reporting period is established, as a rule, on the only criteria: the maximum size of expenses corresponding to these bases during the reporting period.

Even more definitely consider a choice of base of distribution wellknown economists E.Yu.Voronova and G.V. Ulina. They point out: "The choice of suitable base of distribution is difficult and in certain cases is based on any decisions. The chosen base of distribution has to: first, to be rather simple in use; secondly, reflect the profit got by concrete divisions; thirdly, meet requirements of economic feasibility; fourthly, be adaptive to changing conditions. Thus, a fac-

tor recognized as criteria for distribution of indirect expenses, the actual or expected opportunity must content in itself these expenses (the carrier of expenses)".

Conclusion. Basing on the conducted research it can be argued that the current system of overhead cost allocation developed for accounting product costs at the sea port enterprises does not take into account many aspects which have a significant influence on the cost of production. After analyzing the current practice of overhead cost allocation, we can conclude, that application of a unified cost driver leads to inaccurate calculation of the cost of certain types of services, in particular, types of cargo. Rejection of the allocation of costs does not give an opportunity to form the cost in the processing of management decisions. Perhaps at the enterprises it is expedient to use not one, but a range of differentiated cost drivers separately for the pool of overhead costs. Methodical recommendations for accounting of the indirect costs at the enterprises will contribute to the formation of an integrated information system, which will be used not only for control of processes of the enterprise at all levels, but also will participate in the ability to generate reliable new information depending on the needs of the management system and the set principle of its adequacy. The availability of sufficient operational information on the various types and methods of work of each Department and costs at different stages allows qualitatively and systematically accumulate the information for making administrative decisions in the management of economic activities.

REFERENCES

1. *Brignall S. A contingent rationale for cost system design in service / S. Brignall // Management Accounting Research. – 1997. – № 8. – P.325-346.*
2. *Adams M. Activity-based costing (ABC) and the Life Insurance Industry / Adams M. // The Service Industries Journal. – 1996. – № 16 (4). – P. 511-526.*

3. Baird K.M. *Adoption of activity management practices: a note on the extent of adoption and the influence on organizational and cultural factors* / K.M. Baird, G.L. Harrison, R.C. Reeve // *Management Accounting Research*. – 2004. – № 15. – P. 323-399.
4. Cagwin D. *The association between activity-based costing and improvement in financial performance* / D. Cagwin, M.J. Bouwman // *Management Accounting Research*. – 2002. – № 13. – P. 1-39.
5. Compton T.R. *Implementing activity-based costing* // *The CPA Journal*. – 1996. – № 66 (3). – P. 20-27.
6. Estrin T.L., Jeffrey K. & David A. (1994). *Is ABC suitable for your company* // *Management Accounting*. – № 75 (10). – P. 40-45.
7. Horgren C.T. (1995). *Management accounting: this century and beyond* // *Management Accounting Research*. – 1994. – № 6. – P. 281-286.
8. Сльозко Т.М. *До питання розподілу непрямих витрат* / Т.М.Сльозко // *Вісник СумДУ серія економіка*. – 2007. – № 1. – С.144-146.
9. Бачинський В.І. *Особливості обліку та розподілу загальновиробничих витрат підприємств сфери послуг* / В.І. Бачинський // *Вісник ЖДТУ Економічні науки*. – 2010. – № 3 (53).

Стаття надійшла до редакції 11.06.2013

Рецензенти:

доктор економічних наук, професор, завідувач кафедри
“Економічна теорія і кібернетика” Одеського національного
морського університету **Г.С. Махуренко**

доктор економічних наук, старший науковий співробітник
відділу ринку транспортних послуг Інституту проблем
ринку та економіко-екологічних досліджень НАН України
О.А. Ліпінська