

## **Logistics Cost Accounting Based on The Example of A Logistics Company: A Case Study of A Company In Poland\***

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### **Abstract**

The article contains theoretical considerations on logistics costs and cost accounting, supplemented by the results of an analysis of the possibility of implementing the principles of keeping Group 5 cost accounts to build a logistics cost account in a selected company. The first part defines logistics costs and provides a broad description of the breakdown of these costs. These considerations are combined with the statutory and practical accounting records of costs in Group 5 accounts. A numbering system and name for the logistics cost account for the Alma Alpinex company are proposed. The basis for the construction of this group of accounts was an analysis of the logistics processes taking place in the selected company.

**Keyword:** logistics costs, cost accounting, Group 5 cost accounts, logistics processes, management accounting

### **Introduction**

The views presented by experts from the world of science and economic practice on the role of logistics in enterprise management indicate its growing importance. Logistics processes generate costs that burden groups of entities in the logistics sector to varying degrees and in different ways. In order to fully and correctly determine logistics costs on a global or micro scale, it is necessary to keep full records of costs and to know the rules for their calculation at the level of an individual enterprise. The Accounting Act and executive acts specifying the rules for recording costs omit logistics costs without defining them and omitting them in the profit and loss account. Therefore, the aim of this article is to present a method of organising accounting accounts for recording logistics costs as a proposed layout for a selected logistics company. The research method consisted of analysing the locations and types of logistics costs and, based on the results of the study, constructing a model logistics cost account using Group 5 accounting accounts.

### **Definitions of logistics costs**

When characterising logistics cost accounting, we should first clarify the concept of logistics costs, because in literature as well as in practice it is difficult to define the scope and content of this concept in an unambiguous and conclusive manner. Different authors define this concept in different ways, interpret its essence and scope, and evaluate individual elements of logistics costs.

M. Kufel was the first to address the issue of logistics costs, referring to the costs of material flow in an enterprise. These costs are the main category in management based on the flow of material and information streams within an entity. He defined logistics costs as a detailed cost category that represents the monetary reflection of the deliberate consumption of an enterprise's assets, which is caused by the planning, implementation and control of non-technological processes of movement in time and space of all forms of materials.

B. Szałek classified logistics costs according to various criteria, identifying the following costs:

- Direct costs (transport, warehouses, stocks, communications) and indirect costs;
- Fixed and variable costs;
- Procurement, production and distribution costs;
- Tangible and intangible costs;
- Logistics development costs and costs of projects commissioned by logistics;
- Strictly logistical costs.

Logistics costs according to C. Skowronka are the purposeful consumption of labour, resources and work items, expressed in monetary terms, as well as financial expenses and other negative effects of extraordinary events caused by the flow of material goods, i.e. raw materials, materials, finished products and goods within and between enterprises, as well as the maintenance of inventories.

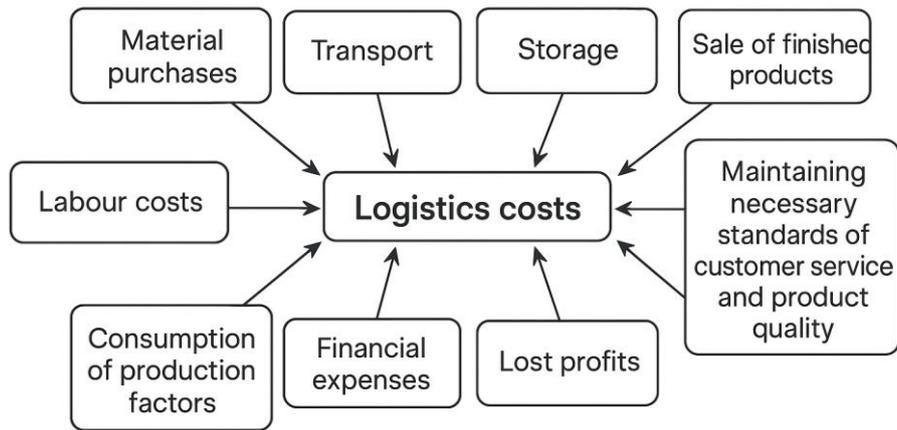
The complexity of the issue of logistics costs is pointed out by M. Nowicka-Skowron. In her opinion, in order to identify logistics costs, their sources should be indicated in individual production phases, such as:

- procurement of materials, semi-finished products and other products from suppliers,
- external and internal transport;
- production planning determining the intensity of material flow through the production phase;
- storage of semi-finished products, finished products, materials and technological waste;
- delivery of finished products to customers.

Logistics costs in the strict sense (Figure 1) are directly related to the implementation of specific logistics processes such as: material purchases, transport, storage, sale of finished products, as well as maintaining the necessary standards of customer service and product quality, and maintaining the company's appropriate market position, labour costs, consumption of production factors and financial expenses. Logistics costs also include the costs of extraordinary events that are related to items affecting the company's financial results, associated with inadequate standards and quality of materials and products, resulting in losses, discounts and rebates. The figure below shows that logistics costs also include the costs of lost profits, which are primarily related to the lack of adequate stock to meet market or production demand, as well as non-compliance with customer service agreements and the weakening of the entity's market position.

## **Classification of logistics costs**

Correct classification of costs is essential for understanding their internal structure and for ongoing control of the production process. For this reason, the classification of costs, i.e. understanding their structure and dividing total costs into components according to the adopted classification criteria, is of significant theoretical and practical importance. A typical breakdown of costs is presented in Table 1.



**Fig. 1. Logistics costs**

**Table 1. Classification of costs in a company**

Cost allocation criterion	Cost groups
Due to the internal structure of costs	Simple costs – indivisible; Complex costs – consisting of several simple costs;
Due to the degree of dependence on production volume	Fixed costs – costs that are fixed in the current period and in subsequent periods, the amount of which does not depend on the volume of production, e.g. property tax; - absolutely fixed costs; - relatively fixed costs; Variable costs;
Due to the settlement period	Costs for the current reporting period; Costs attributable to future reporting periods, for example, two years' rent paid in advance for office space;
Due to the type of costs incurred	Consumption of materials; Energy consumption; External services; Taxes; Official and postal fees; Social security; Depreciation; Salaries; Advertising and representation costs; Lump sums;
Due to the nature of the business	Normal operating costs; - core business costs - ancillary business costs - general administrative costs Other operating costs; Financial transaction costs;
Due to the phases of activity	Supply costs; Production costs; Sales costs; General administrative costs;
Due to their relationship with the revenues generated	Tax-deductible costs – which, under the Income Tax Act, are considered to correspond to the income earned; Expenses that are not tax-deductible;
Due to the manner of association with the	Direct Indirect

manufactured products	
Due to its significance in the decision-making process	Significant costs (decision-making); Insignificant costs (non-decision-making)

As can be seen from the table above, the costs incurred by an economic entity in the course of its activities vary depending on a number of factors, including:

- economic content,
- place of origin,
- purpose of incurring them,
- possibility of referring to specific work products,
- extent of the economic entity's influence on their amount

Knowledge of the relationship between cost levels and production volumes is essential for business management. It provides the basis for effective decision-making in a company and for control, especially in conditions of underutilised production capacity [Sobańska I., Warszawa 2003, p. 64]. Therefore, unit costs in financial accounting are grouped according to various criteria. The most important of these are:

- costs by type (depreciation, consumption of materials and energy, external services, taxes and fees, salaries, social security and other benefits, other costs),
- costs by type of activity (core business costs, core business departmental costs, auxiliary business departmental costs, management costs, purchase costs, sales costs),
- costs by relationship to the product (direct costs, indirect costs),
- costs by purpose (purchase costs, production costs, management costs, sales costs),
- costs by period to which they relate.

Organisational units may record costs in different ways, depending on their needs, size, organisational structure and type of activity:

- simple, broken down by type,
- by place of origin, grouped into complex groups,
- so-called full accounting.

Logistics costs are classified differently due to their complexity and the fact that they cover many components of expenditure: financial, material, personnel and time. The classification of logistics costs proposed by various authors is presented in Table 2.

**Table 2. Breakdown of logistics costs**

Author	Logistics cost allocation
B. Szałek	<ul style="list-style-type: none"> <li>• direct and indirect costs</li> <li>• fixed and variable costs</li> <li>• procurement, production and distribution costs</li> <li>• tangible and intangible costs</li> <li>• costs of logistics development and projects commissioned by logistics</li> <li>• strictly logistics-related costs</li> </ul>
J. Twaróg	<ul style="list-style-type: none"> <li>• transport costs for deliveries to the company's warehouse and the customer's premises</li> <li>• costs of maintaining warehouses and warehouse management departments</li> <li>• costs of data flow concerning materials and products, transport and control</li> <li>• costs of product disposal, transport and operating capacity</li> <li>• costs of capital tied up in fixed and current assets</li> </ul>
S. Abt	<ul style="list-style-type: none"> <li>• costs according to the phases of goods flow and places where costs arise</li> <li>• costs according to logistics activity complexes</li> </ul>
O. Duck, H. Krause,	<ul style="list-style-type: none"> <li>• material costs</li> <li>• annuity capitalisation costs</li> </ul>

C. Schulte	<ul style="list-style-type: none"> <li>• material overheads</li> </ul>
P. Blaik	<ul style="list-style-type: none"> <li>• costs by type</li> <li>• costs by flow, phase and place of origin</li> <li>• costs related to basic types of logistics processes</li> <li>• costs of variability in relation to the volume of material flows or inventories</li> </ul>

Source: own work based on: Gmińska R., *Rachunek kosztów logistyki jako narzędzie zarządzania kosztami*, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 252, 2022, p. 126*

## Recording costs in logistics cost accounting

Difficulties in separating logistics costs in companies also result from the lack of properly structured systems for recording, accounting for and reporting logistics costs, i.e. creating and maintaining systematic accounts of these costs. The subsystem of cost accounting, whose task is to collect, classify, settle, calculate and analyse costs related to logistics, is referred to as logistics cost accounting. The development of such an account in an enterprise may boil down to extending the existing traditional cost account with elements enabling the identification and recording of logistics costs.

By analogy with other traditional, precisely characterised cost accounts, a logistics cost account should contain the following elements in order to fulfil its functions:

**Table 3. Elements of logistics cost accounting**

	Characteristic
Logistics cost accounting system	It enables the recording of operations involving logistics costs in accounting accounts. In general, costs can be recorded in accounts 4 and 5. However, none of the accounts in these groups allows for the direct recognition of logistics costs. Therefore, extensive analytics are necessary, which will not always allow for the identification of logistics costs, as a single logistics cost may be disclosed in several accounts. It is therefore necessary to determine and present these costs outside of the accounting records, within the framework of management accounting.
Classification of logistics costs	It determines which accounts will be created for the logistics cost account, which will be calculated outside the cost records, and how they will be used for decision-making.
Settlement of logistics costs	It is charged to cost centres and calculated using the company's billing rates, which are determined individually.
Calculation of logistics costs	It involves calculating the unit cost of the cost driver to which they are assigned. For this purpose, you can use a surcharge calculation or a calculation based on activity-based costing.
Logistics cost reporting system	The Accounting Act does not require logistics costs to be disclosed in financial statements. These costs may therefore be presented in additional reports.
Logistics cost analysis	Allows for the assessment of logistics costs over time and cost structure

Source: own work based on: Cieciora M., Czaja-Cieszyńska H., *Konstrukcja systematycznego rachunku kosztów logistyki w kontekście tworzenia wartości przedsiębiorstwa*, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu nr 252, 2015, p.76*

Traditional cost classifications result from the reporting obligations of each economic entity – not only logistics or transport companies. In order to determine the financial result and value inventories, economic entities record costs according to their type and place of origin. Hence, in their accounting, they use the ‘4’ and ‘5’ account systems. Group ‘4’ records cost operations taking into account the type of cost, in accordance with the division of operating costs in the comparative version of the profit and loss account. Group ‘5’, on the other hand, allows

costs to be recorded according to where they arise and the cost of sales necessary in the profit and loss account in the calculation version to be determined.

The model company plan and statutory rules for keeping accounts in business entities do not provide for any other method of recording basic operating costs in group 4 accounts than the one described above. The flexibility in the organisation of group 5 allows for the simultaneous recording of costs in the traditional way and the identification of these costs in the logistics cost account.

For this purpose, group 5 can be expanded with new analytical accounts that will allow cost information to be grouped by phase and/or by area of the logistics process. In this way, the first level of classification, with minor organisational adjustments, will enable the separation of costs for individual phases of the logistics process in the form of costs for the phases of procurement, production and distribution, and storage and waste recycling. In turn, the second level of logistics cost allocation will allow logistics costs to be assigned to three areas. The first is the so-called area of physical movement of goods, the second concerns warehouse management, while the third is related to the costs of logistics information .

First level of logistics cost accounting according to logistics process phases [Cieciura M., Czaja-Cieszyńska H., 2015, s.76]:

· Procurement phase:

- costs of transporting purchased materials and goods,
- costs of inspecting and accepting deliveries of purchased inventory,
- costs of organising orders,
- costs of planning and managing the procurement process,
- costs of handling information processes related to the flow of materials.

· Production phase:

- costs of physical movement of materials,
- costs of collecting and maintaining material inventories,
- costs of processing information that controls the flow of materials and products within the company.

· Distribution phase:

- costs of the flow of finished products from the manufacturer to the buyer,
- costs of organising and operating distribution channels,
- costs of handling information processes related to distribution.

The second level of logistics cost accounting according to the logistics process areas:

· Physical movement of tangible goods

- costs of depreciation of fixed assets involved in logistics processes,
- costs of materials and energy consumed in logistics processes,
- costs of external services, e.g. transport, warehousing,
- labour costs including payroll surcharges related to the handling of logistics processes,
- all taxes and fees, e.g. on real estate, means of transport.

· Warehouse management

- costs of stockpiling, e.g. order preparation costs,
- costs of maintaining stocks, e.g. costs of occupying storage space,
- costs of stock depletion, e.g. costs of disruptions in distribution channels,
- costs of warehouse management, e.g. costs of protecting and securing stocks.

· Logistics information

- costs of materials and energy used in information processes,
- costs of depreciation of computer equipment,
- costs of software updates,
- costs of maintenance and ongoing training,
- costs of external information services,
- labour costs including overheads.

By applying the principles of creating a logistics cost account and calculating these costs to traditional cost accounting (records in accounts 4 and 5), a simple and clear logistics cost account was proposed for a selected logistics company.

## Practical aspect

The company for which cost logistics records in a calculation system were proposed is Alma Alpinex, a wholesale food trading company. Alma Alpinex used traditional cost accounting principles. The company's chart of accounts distinguished the following costs:

- in group '4':

400-01	depreciation
400-02	consumption of materials
400-03	external services
400-04	salaries
400-05	employee benefits
400-06	taxes and fees
400-07	other costs

- in group '5':

500-02	management costs
500-03	accounting department costs
500-04	warehouse costs
500-05	customer service department costs
500-06	purchasing department costs
500-10 1	May facility costs
500-11	sales department costs
500-12	IT department costs.

Alma Alpinex is a trading company, therefore the production phase was omitted in the organisation of logistics cost accounting and, in order to maintain the double-entry principle and to settle logistics costs, account 580 *Settlement of production costs* was used.

Account 510 Logistics costs has been separated with the following analytics:

510-01	procurement costs
510-02	distribution costs

In the analytics, the above accounts have been divided into:

<b>510-01</b>	<b>procurement costs</b>
510-01 -01	transport costs of purchased materials and goods,
510-01 -02	costs of inspection and acceptance of delivery,
510-01 -03	costs of order organisation,
510-01 -04	costs of planning and managing the procurement process,
510-01 -05	costs of information process handling
<b>510- 02</b>	<b>distribution costs</b>
510- 02 -01	costs of deliveries to the buyer,
510- 02 -02	costs of organising and operating distribution channels,
510- 02 -03	costs of information process handling.

Therefore, operations identified as logistics will be recorded in three groups of cost accounts. For example, the depreciation of a forklift truck used for loading and unloading will be recorded in the following accounts:

400-01	Depreciation
500-04	Warehouse costs
510-01-01	Transport costs of purchased materials and goods

Contra accounts:

07	Write-offs
490	Settlement of costs
580	Settlement of logistics costs

Account 580 will record the logistics costs incurred by the company. By analogy, accounts can be created and in this way a logistics cost account structure can also be created for other logistics activities or accepted logistics cost classification systems.

## Conclusion

Cost management is based on information provided by cost accounting. A properly developed and implemented logistics cost accounting system should enable, among other things: the analysis and forecasting of logistics costs, the assessment of the impact of logistics costs on the company's financial results, the control of logistics costs, and the reduction of logistics costs.

The use of existing traditional cost accounting structures (group 5 accounts) allows for the quick and efficient development of a logistics cost accounting system tailored to the needs of the company and the acquisition of information necessary for the proper management of logistics costs.

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