



## ACCOUNTING TOOLS VS. LOGISTICS COSTS CONTROL IN A TRADING COMPANY

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**ABSTRACT. Background:** Logistics costs constitute an important part of trading companies' costs. The main problem in logistics costs management is the fact that these costs are not included in financial statements. The profit and loss statement includes control accounts exclusively. This article discusses the accounting tools that may be used in trading companies in order to improve present logistics costs and the management thereof.

**Methods:** In the article, the author gives examples of how accounting tools are applied in trading companies operating in the same industry. On the basis of the financial statements from selected companies for 2013-2015, the way to use the basic tools of accounting in business management are presented. For this purpose a system of full-cost accounting with the use of analytical accounts of logistics is presented, along with a preliminary analysis of the balance sheet and an indicative analysis of costs for logistics.

**Results:** The article is based on a review of the literature and the financial statements of the companies surveyed. The model solutions for the cost analysis and cost management presented herein make it possible to create a detailed analysis of logistics costs and assess how effectively they are managed. In this way, the foundations for further analyses related to logistics costs management are laid.

**Conclusions:** The work presents the accounting tools that assist the decision-making processes in the management of logistics costs. In the article, an example of the plan of sub-accounts for the logistics costs of trading companies is presented. Furthermore, the cost accounting system for the accounts of group 4 and 5 in trading companies is shown, together with the benefits that this accounting system brings for the companies. The author also presents preparatory and index analyses as the basic tools that assess the effectiveness of logistics costs management.

**Key words:** costs, logistics, control, accounting tools.

### INTRODUCTION

Companies in all sectors of the market face fierce competition. The loss of a steady customer is the highest cost a company may pay. The management board, to improve their competitive edge, may group with other companies to form purchase groups or similar organizations. They may also try to optimize their costs. These two solutions, that is running a joint-venture business or cost reduction, have a major impact on the price, which is supposed to generate profit and attract buyers. There is no production in trading companies, so they

have fewer departments that would deal with cost reduction policies in manufacturing or providing services. Trading companies purchase goods on which they apply margin and in this way the price is calculated. Margin, in turn, must cover overhead costs that the company pays in relation to the activities of the management and sales departments. However, trading companies have a group of costs related to logistics, which is very often beyond control. It is caused by the fact that these costs are not included in their financial statements. Control accounts used to record costs do not list them as a separate category. Logistics costs are "hidden" within control accounts.

Therefore, it is important to introduce certain methods and tools that would allow these costs to be listed, which would have a beneficial effect on savings. For this reason it is worth employing simple tools used in accounting and finance. Once regularly used, they allow to thoroughly control this cost group, which should improve business and boost the competitive edge of companies. The aim of this article is to present the accounting tools that make it easier to control the logistics costs in trading companies.

## LOGISTICS COSTS

The Accounting Act defines costs as "probable decreases of economic benefits of a reliably estimated value, which may arise during a reporting period, in the form of decreases in the value of assets or increases in the value of liabilities and provisions, that will result in a decrease of the equity or an increase of the equity deficit in a manner other than through a withdrawal of funds by shareholders or owners" [The Accounting Act]. Costs provide an excellent source of information about the way in which the company is managed.

Logistics costs are a basic quantitative factor that determines the effectiveness and modernity of logistics processes [Twaróg 2003]. Therefore, it is very important to thoroughly report and control them. Logistics costs are also very often referred to as the costs of logistics. They may be defined as "the use of labour input, operating resources and subjects of labour expressed in money, financial expenses and other negative effects of exceptional occurrences which are caused by the flow of material goods (raw materials, materials, products, goods) within a company and among companies, as well as maintaining stock levels [Skowronek, Sarjusz-Wolski 2003].

There are many criteria that govern the division of logistics costs. One of them is the division into variable and fixed costs. Variable costs change together with the scale of production, or purchase in trading companies. Fixed costs are not affected by the changes in the volume of production or purchase. One of

the most important divisions of logistics costs is the division according to the basic components of logistical process into three groups:

- physical flow costs,
- inventory costs,
- information flow costs.

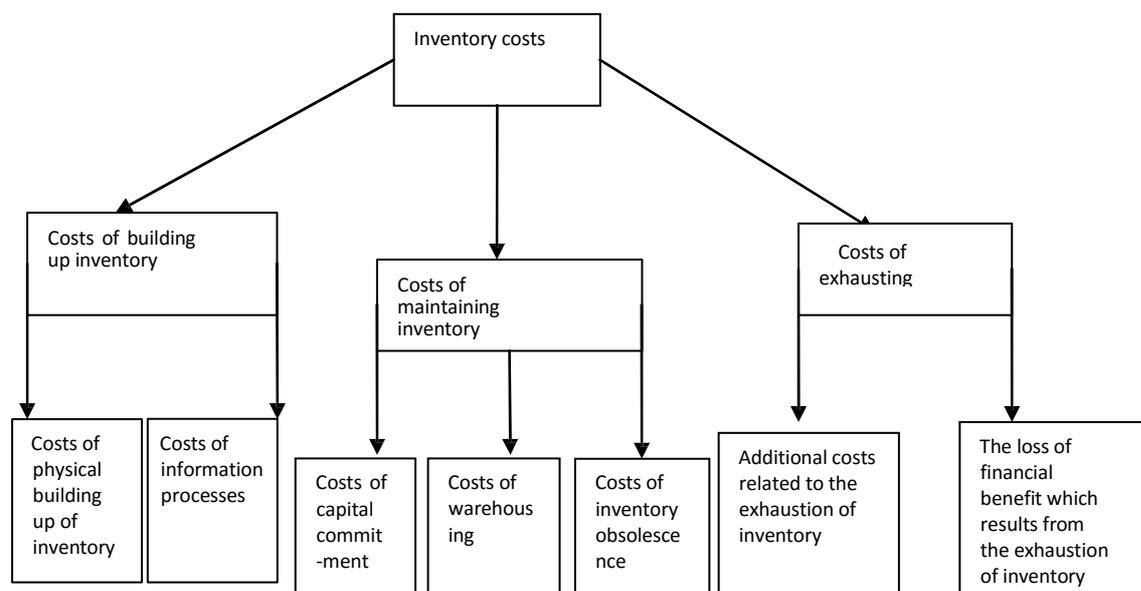
Physical flow costs constitute one of the most important cost categories. They are made of the following components [Twaróg 2003]:

- costs of the depreciation of assets,
- labour costs,
- costs of materials, fuel and energy,
- other flow costs, such as property tax, vehicle tax.

Material flow costs concern all the three stages of the flow: purchase, production and distribution. They primarily include the costs of external (external services) and internal transportation. An important function of these costs (as far as making records goes) is the fact that they are easy to assign to respective departments. For instance, external delivery costs are assigned to the purchasing department, distribution costs to the sales or internal transportation department and internal transportation and manipulation costs are included in operational costs [Skowronek, Sarjusz-Wolski 2003].

In order to reduce the high costs of external transport, providers are seeking an access for information about inventory levels of its customers. Next, they create the distribution plan for their customers and they use the VMI method [Archetti, Speranza 2016].

Inventory management costs constitute the basic component of logistics costs. Inventory costs are described as warehousing management costs, which result from the activities related to the building up, maintaining and exhaustion of the inventory [Karmańska 2000]. A detailed division of inventory management costs is shown in diagram no. 1.



Source: based on Skowronek, Sarjusz-Wolski

Fig. 1. The division of inventory management costs

Rys. 1. Podział kosztów zarządzania zapasami

The first group of costs is the costs of building up inventory. It includes the costs of physical building up of inventory and the costs of information processes related to the purchase of materials, goods and products. The information process costs of inventory include: the costs of choosing a supplier, the costs of purchase order preparation, negotiation costs and the costs of sales order preparation [Twaróg 2003].

Another cost group is the costs of maintaining inventory. In this group managers may gain most by employing proper methods of inventory management and aiming at the optimization thereof. Sales forecasts have a primary impact on the costs in this group, which affect the inventory level, thus influencing the costs. The most expensive component in this group is the cost of warehousing, also known as the storing cost. To reduce this type of cost the cheapest places for storage of inventory are looked for, and often, for this purpose the sellers are used [Jaber, Zanoni, Zavanella 2014].

The last cost group of inventory management costs is the cost of the exhaustion of inventory. They relate to the loss of financial benefit that the company would have in the event of a lack of inventory when the customer needs it. In other words, these are the costs of lost gains that the company may have if a sufficient level of inventory was there at the proper place and time [Karamañska 2011].

The costs of information processes may be divided according to two different criteria: the place where they appear and the type of cost. This division is a significant facilitation while designing the corporate chart of accounts that includes logistics costs. The division into the place where the costs appear usually includes the following groups [Skowronek, Sarjusz-Wolski 2003]:

- costs of information process of purchase,
- costs of information process of production,
- costs of information process of distribution.

As a part of the distribution logistics costs, the costs of customer service comprise an

important group [Christopher 2011]. Excessive savings in this area may lead to loss of contractors as customers are very sensitive to the level of these services [Jiang, Wang, Liu 2016].

## ACCOUNTING TOOLS TO SUPPORT CONTROL OF LOGISTICS COSTS

Trading companies in order to improve and increase control over logistics costs should use different types of tools from various areas of accounting:

### *Full cost accounting system*

Costs of operating activities include costs on manufacturing and selling products, providing services, buying and selling materials and goods as well as the management of the company. They may be grouped into two different sections, specified by nature of costs (accounts of group no. 4) and by function of costs (accounts of group no. 5), however, they are simplified cost accounting systems [Nowak 2003]. They provide general information on incurred costs. Cost accounting within group no. 5 is typical for production and service companies. Trading companies usually keep cost accounting records on accounts of group no. 4, i.e. classified by nature. These costs are grouped according to used resources, which are so called prime costs [Biernacki, Kowalak 2010].

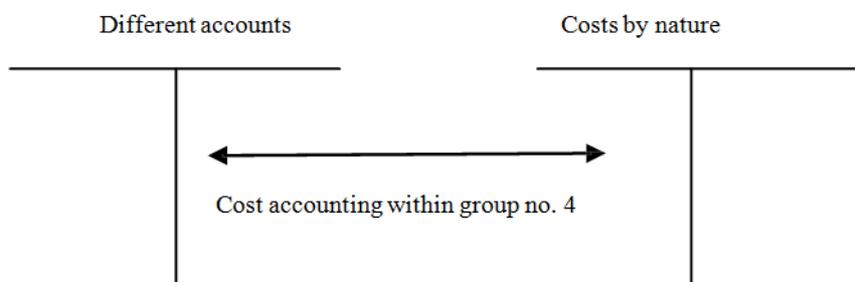


Fig. 2. Diagram of cost accounting within group no. 4  
Rys. 2. Schemat ewidencji kosztów na kontach zespołu nr 4

It is worth remembering that costs classified by their nature are treated as costs of both the current and the future reporting periods. In a profit and loss account in a single-step version, the corrections of costs relating to future periods are made by the change in products.

The third method described as a full cost accounting system with the use of groups no. 4 and 5 together is an accounting system which offers the most information. Companies keeping their cost accounting records this way

receive full information on costs. They know about the nature of costs and the departments where they appear. To group no. 4, i.e. costs classified by their nature, belong:

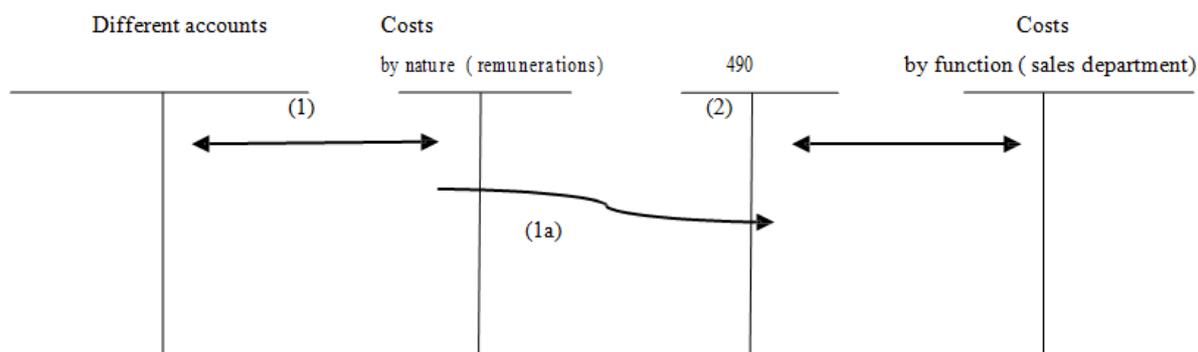
- Depreciation, capital allowances of fixed and intangible assets
- Materials and energy consumption, group of costs on consumed basic and auxiliary materials, fuel, stationery, etc.,
- External services, costs of works and services provided by others for the company, e.g. transport services, rental services, bank services and IT services,

- Taxes and charges, costs of stamp duties, administrative fees, notary fees, court fees, motor vehicle tax and property tax,
- Remunerations, costs of remunerations,
- Insurance and other benefits, costs of social security contributions in part paid by the employer, costs of obligatory contributions on Labour Fund, Guaranteed Employment Benefit Fund, Bridging Pension Fund and costs of worker training, deductions on social benefit fund, costs relating to occupational safety and health,
- Other costs classified by their nature are costs which cannot be put into groups described above, e.g. costs of business travels, costs of representation, costs of advertising, lump sum car allowance, costs on organisations to which it is obligatory to belong,

Within the presentation of costs, the group no. 5 is added which contains costs of production activity, costs of auxiliary production, trade costs, costs of sales and management costs. This option is used by companies which run disperse business activity to a great extent, which are characterised by a complex organisational structure, manufacturing products in several processes or stages, using modern management methods based on rich information service.

This system functions well in companies operating in purchasing groups [Zimon 2015].

This record provides basic information about the costs incurred. Below in figure 3 the records of accounting costs in trading companies operating in the fields of heating technology are presented.



1 - costs accounting according to the nature of costs

1a - transfer of costs classified by nature to account 490 - allocation of costs classified by nature

2 - transfer of costs according to their function

Fig. 3. Diagram of cost accounting within groups no. 4 and 5 together

Rys. 3. Schemat ewidencji kosztów na kontach zespołu nr 4 i 5 łącznie

#### Auxiliary accounts, i.e. analytical accounts

To keep records on analytical accounts requires only a single record. It is a copy of a record from a control account. Trade companies mainly use only accounts within group 4 while cost accounting. It is a simplified cost accounting form. In the table no. 1 below the typical accounts of group no. 4 are presented, for which sample solutions of

logistics cost accounting in trading companies are given.

Keeping cost accounting records this way would inform about their nature and function. The sample way of fuel consumption costs accounting in a trading company is presented in the figure 4.

Table 1. Typical chart of accounts of group no. 4 in trading companies including logistics costs  
Tabela 1. Typowy plan kont zespołu nr 4 w przedsiębiorstwie handlowym z uwzględnieniem kosztów logistyki

Control accounts	Logistics analytical accounts
Depreciation	<ul style="list-style-type: none"> <li>- Depreciation of motor vehicles</li> <li>- Depreciation of other fixed assets relating to logistics</li> </ul>
Materials and energy consumption	<ul style="list-style-type: none"> <li>- Consumption of logistics materials</li> <li>- Fuel consumption</li> <li>- Consumption of energy for logistics purposes</li> </ul>
External services	<ul style="list-style-type: none"> <li>- Transport</li> <li>- Loading and unloading</li> <li>- Leasing</li> <li>- Telecommunications services</li> <li>- Repair services</li> <li>- Other external services</li> </ul>
Remunerations	<ul style="list-style-type: none"> <li>- Drivers' remunerations</li> <li>- Warehouse workers' remunerations</li> <li>- Other logistics workers' remunerations - sales, procurement</li> </ul>
Social securities and other benefits	<ul style="list-style-type: none"> <li>- Social security and other benefits for drivers, e.g.</li> <li>- ZUS (Social Insurance Institution in Poland) contributions,</li> <li>- training, expenses on health protection,</li> <li>- Expenditure on Occupational Safety and Health</li> <li>- Social security and other benefits for other logistics workers', e.g.</li> <li>- ZUS (Social Insurance Institution in Poland) contributions,</li> <li>- training, expenses on health protection,</li> <li>- Expenditure on Occupational Safety and Health</li> </ul>
Taxes and charges	<ul style="list-style-type: none"> <li>- Motor vehicle taxes</li> <li>- Taxes on logistics property</li> <li>- Environment protection charges</li> <li>- Other charges, e.g. stamp duties, court fees</li> </ul>
Other costs classified by their nature	<ul style="list-style-type: none"> <li>- Insurance</li> <li>- Business travels of logistics workers</li> <li>- Advertising</li> <li>- Other costs</li> </ul>

Source: own work

Materials and energy consumptions (1000 PLN) - Control Account

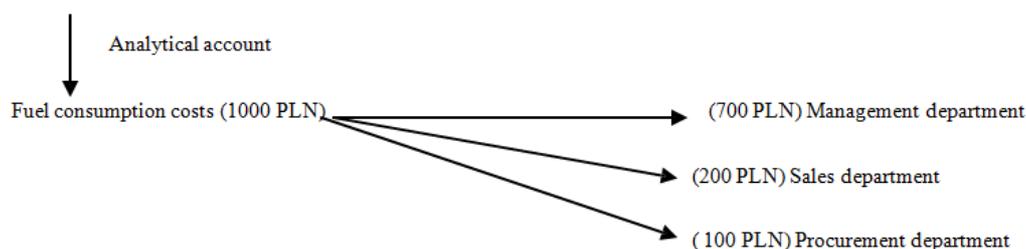


Fig. 4. Diagram of cost accounting within groups no. 4 and 5 together

Rys. 4. Schemat ewidencji kosztów na kontach zespołu 4 i 5 łącznie

While creating analytical accounts arises the problem with separation of costs within group no. 5. Warehouse costs are a classic example of this problem. They refer to both finished goods and materials that are to be used in the future production. In this case, it is

worth to split warehouse costs into supply and distribution stages [Filipiak 2013]. It is useful to split costs into two indirect departments: procurement and sales. In order to allocate costs accurately, appropriate allocation keys for indirect costs should be used.

An introductory analysis of financial reports is the first stage of a company's financial analysis and it includes within its scope generally two elements: balance sheet and profit and loss account. In order to analyse costs, an introductory analysis of profit and loss account should be conducted. It is based on listing, as a point of reference, currently received values of individual items with assumed amounts, which is usually the data from the past reporting periods or from financial plans for the future. This analysis is conducted regarding structure (vertical analysis). In reference to the analysis of logistics costs, it will inform of the share of individual costs in total logistics costs. In the table below an example of this type analysis of logistics costs on the example of distribution logistics costs in a trading company is presented.

Table 2. Horizontal analysis of logistics costs  
Tabela 2. Analiza pionowa kosztów logistyki

Structure of logistics costs	2015	2014	2013
Fuel consumption	10 %	9 %	10 %
Drivers' remunerations	76 %	75 %	80 %
Costs of transport	5 %	15 %	5 %
Other costs	9 %	1 %	5 %

Source: own work

An introductory analysis of costs is conducted regarding dynamics as well (horizontal analysis). It enables close examination of trends in individual items of costs incurred. An exemplary analysis of dynamics of logistics costs distribution is presented in table no. 3.

Table 3. Level of analysis of logistics costs  
Tabela 3. Analiza pozioma kosztów logistyki

Cost / Dynamics	2015/2014	2014/2013
Fuel consumption	110 %	105 %
Drivers' remunerations	120 %	101 %
Costs of transport	105 %	98 %

Source: own work

A detailed introductory analysis of costs may be conducted only when the company keeps records of logistics costs on analytical accounts and runs full cost accounting system.

Once an introductory analysis of company costs has been conducted and the initial information about the company has been collected, another part of the financial analysis is started, called the index analysis. It is based on the calculation of a series of indexes that show the dependencies between the individual data included in the financial reports. The results obtained in this way allow for a synthetic characteristics of all the economic aspects of the business activity. A common problem in this kind of analysis is to determine the choice of the grounds on which the comparisons of company results will be made. Most often they are compared against the planned or the previously reached levels. The structure of the indexes that show the financial situation of the company depends on its needs. To conduct the index analysis of costs and to employ the following cost meters.

The operating costs ratio (OCR) is the most important ratio in this group of ratios and it informs how much of operating costs is attributed to sales revenue. It is calculated from the relation:

$$\frac{\text{operating expenses}}{\text{sales revenue}}$$

The level of this ratio informs about the safety of the company. The lower the score, the lower the costs charged for the core business revenues from this activity [Wędzki 2006].

On the basis of this ratio, one can create an overall index for the logistics costs

$$\frac{\text{logistics costs}}{\text{sales revenues}}$$

This indicator will provide information how many logistics costs charge the generated revenue.

For more information, one can use the information on the cost from the analytical accounts e.g. payroll costs of logistics staff

$$\frac{\text{remuneration costs of logistics staff}}{\text{sales revenues}}$$

It tells how many costs of remunerations for the staff were deducted for the work out of the sales revenues.

A very good ratio informing about the management costs would be the rate of the sales department costs (department of distribution) for operating costs. In the companies involved in the provision of logistics services or trading units where the costs of logistics distribution can be separated, this ratio may inform about whether a department does not incur excessive costs

$$\frac{\text{sales costs( distribution logistics)}}{\text{operating costs}}$$

In addition, in trading companies it is possible to analyse the cost of procurement logistics.

$$\frac{\text{purchase costs( procurement logistics)}}{\text{operating costs}}$$

Operating costs in the given formula are the costs of the group no. 4 (these costs do not include - the value of goods sold in the purchase price). The results of the ratios on the example of three selected trading companies operating in the same industry (thermal engineering) are presented in Table 4.

Table 4. Ratio analysis of logistics costs in the selected companies in 2015  
Tabela 4. Analiza wskaźnikowa kosztów logistyki w wybranych przedsiębiorstwach w roku 2015

Ratio	Company A	Company B	Company C
Ratio of logistics costs in sales revenues	9%	11%	10%
Ratio of remuneration costs of logistics in sales revenues	5%	6%	6%
Ratio of logistic distribution costs in operating costs	58%	62%	60%
Ratio of logistics procurement costs in operating costs	10%	12%	11%

Source: own research

## CONCLUSIONS

The selected accounting tools applied in trading companies presented above allow the managers to easily get the information about the logistics costs and facilitate control over them. The companies that want to employ them need to keep strict costs records and create a database concerning logistics costs. To achieve it companies that collect, assign and record individual economic events need to spend extra time in comparison to simple costs reporting. It is a definite disadvantage, yet the use of new accounts for logistics costs and full costs recording allow for the creation of a comprehensive breakdown of logistics costs in a trading company. Consequently, it creates many opportunities for conducting analyses related to the incurred costs and maintaining control over them. Reliable and detailed information about costs is the foundation for

the introduction of changes that should bring economic profit to companies.

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## NARZĘDZIA RACHUNKOWOŚCI A KONTROLA KOSZTÓW LOGISTYKI W PRZEDSIĘBIORSTWIE HANDLOWYM

**STRESZCZENIE. Wstęp:** Koszty logistyki w przedsiębiorstwach handlowych stanowią ważną grupę. Głównym problemem w zarządzaniu kosztami logistyki jest fakt, że nie są one prezentowane w sprawozdaniach finansowych. W rachunku zysków i strat umieszczone są tylko konta syntetyczne. W artykule wskazano narzędzia z obszarów rachunkowości, które można zastosować w przedsiębiorstwach handlowych w celu poprawy prezentacji kosztów logistyki i zwiększenia kontroli nad nimi.

**Metody:** W artykule autor przedstawia przykłady zastosowania narzędzia rachunkowości w przedsiębiorstwach handlowych działających w tej samej branży. Na podstawie sprawozdań finansowych wybranych przedsiębiorstw za lata 2013-2015 przedstawiono, w jaki sposób można wykorzystać podstawowe narzędzia rachunkowości w zarządzaniu przedsiębiorstwem. W tym celu przedstawiono system pełnej ewidencji kosztów z wykorzystaniem kont analitycznych logistyki, następnie wykonano wstępną analizę bilansu oraz wskaźnikową dla kosztów logistyki.

**Rezultaty:** Artykuł został przygotowany na podstawie literatury z badanego obszaru oraz sprawozdań finansowych badanych firm. Przedstawione modelowe rozwiązania z zakresu analizy i zarządzania kosztami pozwalają na szczegółową ewidencję kosztów logistyki, kontrolę i ocenę ich zarządzania. Stanowi to podstawę do przeprowadzenia dalszych analiz związanych z gospodarowaniem kosztami logistyki.

**Wnioski:** Wynikiem pracy jest przedstawienie narzędzie rachunkowości, które wspomagają procesy decyzyjne w zarządzaniu kosztami logistyki. W artykule przedstawiono przykładowy dla przedsiębiorstw handlowych plan kont pomocniczych dotyczących kosztów logistyki. W artykule również zaprezentowano system ewidencji kosztów na kontach zespołu 4 i 5 łącznie w firmach handlowych oraz korzyści, jakie ten sposób księgowania przynosi zarządzającym przedsiębiorstwom. Autor przedstawił również analizę wstępną i wskaźnikową, jako podstawowe instrumenty oceniające efektywności zarządzania kosztami logistyki.

**Słowa kluczowe:** koszty, logistyka, kontrola, narzędzia rachunkowości.

## WERKZEUGE DES RECHNUNGSWESENS UND DIE KONTROLLE DER LOGISTIKKOSTEN IM HANDELSUNTERNEHMEN

**ZUSAMMENFASSUNG. Einführung:** Die Kosten der Logistik im Handelsunternehmen machen eine wichtige Gruppe aus. Das Hauptproblem im Management der Logistikkosten beruht darauf, dass sie nicht in den Finanzberichten aufgeführt werden. In den Gewinn- und Verlustrechnungen werden nur synthetische Konten angeführt. Im Artikel wurden die Werkzeuge im Bereich des Rechnungswesens gezeigt, die in Handelsunternehmen zur Verbesserung und zur Darstellung der Logistikkosten sowie zu deren Kontrolle verwendet werden können.

**Methoden:** In diesem Artikel stellt der Autor die Beispiele für die Verwendung der Werkzeuge des Rechnungswesens in den Handelsunternehmen, die einer und derselben Branche angehören, dar. Auf der Grundlage der Jahresfinanzberichte der Unternehmen in den Jahren 2013-2015 wurde es projiziert, auf welche Art und Weise die Hauptrechnungswerkzeuge im Bereich der Unternehmensführung verwendet werden können. Zu diesem Zweck wurde das System der vollständigen Kostenverzeichnisse unter der Anwendung von analytischen Konten der Logistik dargestellt, dann wurde auch eine vorläufige Bilanz- und Koeffizienten-Analyse für die Logistikkosten durchgeführt.

**Ergebnisse:** Der Artikel wurde auf der Grundlage der Literatur aus dem Forschungsgebiet und anhand der Finanzberichte aus den befragten Unternehmen ausgearbeitet. Die dargestellten Modelllösungen im Bereich der Analyse und Kostenverwaltung ermöglichen eine detaillierte Kostenevidenz der Logistik und die Kontrolle der betreffenden Kostenführung. Dies bildet eine Grundlage für weitere Analysen, die mit dem Management der Logistikkosten verbunden sind.

**Fazit:** Das Ergebnis der Arbeit ist die Präsentation der ausgewählten Werkzeuge innerhalb des Rechnungswesens, die die Entscheidungsprozesse im Management von Logistikkosten unterstützen. Der Artikel enthält einen beispielweisen Kontenplan für die Kostenführung innerhalb der Logistik in Handelsunternehmen. Der Artikel zeigt auch ein System für die Kostenevidenz auf den Konten der Gruppe 4 und 5 in den Handelsunternehmen sowie die Vorteile, die diese Buchhaltungsweise den Geschäftsführern in den einzelnen Unternehmen mit sich bringt. Der Autor projizierte auch eine einleitende- und Koeffizienten-Analyse als grundlegende Tools für die Bewertung der Effizienz des Managements von Logistikkosten.

**Codewörter:** Kosten, Kontrolle, Logistik, Werkzeuge des Rechnungswesens

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