

# Logistic costs in competitive strategies of enterprises

## *Náklady logistiky v konkurenčních strategiích podniků*

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**Abstract:** The thesis focuses mainly on primary logistic strategies as well as the place and structure of logistic costs in the accounting system of an enterprise. The final element was an analysis of logistic costs on the example of 50 enterprises specialising in agricultural production. The obtained results of empirical studies prove that costs of logistic infrastructure form a significant part of general costs, which can be reduced through proper management. Consequently, as far as the creation of the competitive edge is concerned, it is important to identify and control these costs precisely and continuously in the structure of enterprise operation costs.

**Key words:** logistics, strategy, logistic costs, competition

**Abstrakt:** Příspěvek je změřen na primární logistické strategie a na postavení a strukturu nákladů logistiky v účetnictví podniku. Základním prvkem je analýza nákladů logistiky na příkladu 50 podniků specializujících se na zemědělskou produkci. Získané výsledky empirické studie prokazují, že náklady logistické infrastruktury představují významnou část celkových nákladů a mohou být sníženy správným managementem. Je tudíž důležité, pokud jde o získání konkurenční výhody, přesně identifikovat a kontrolovat tyto náklady v rámci celkové struktury provozních nákladů podniku.

**Klíčová slova:** logistika, strategie, náklady logistiky, konkurence

Logistics is increasingly often regarded as a key factor of the creation of the competitive edge by Polish enterprises. The use of logistics is gradually beginning to go beyond the operating level, and enterprises that are aware of the threat created by strong competitors are beginning to use it on the strategic level. The presence of logistics on the strategic level is reflected by the fact of its strict connection with all aspects of management in an enterprise. In such a case, logistics becomes a determining factor of the most important decision-making processes.

Today, perfect logistics is one of the decisive advantages in market competition. There are no domestic markets anymore; all markets are international, and many of them tend to assume a global form. We can observe more and more frequently the competition between supply chains rather than enterprises. These challenges must be met by logistics, which is no longer treated as a set of methods useful for the solving of

operational problems. Most enterprises, including a large group of Polish enterprises, treat logistics as a strategic opportunity (Szulc 2004).

Logistics is defined in many different ways; most often, however, it is understood as a method of the supply chain management. Therefore, logistics consists of planning, performance and control of an efficient flow of raw products and materials for production, finished products and relevant information from the point of origin to the point of consumption for the purpose of satisfying the customer's requirements. Sometimes logistics is also defined as the management of the processes of movement of property and people and actions supporting these processes in the systems where they occur (Dictionary 2006). It is assumed that the main purpose of logistics is the minimisation of the cost of the product flow in a supply chain, on the condition that the profit of the enterprise increases and the level of customer service are maintained in the market.

Experiences of many European countries show that logistic costs can form a basis for the acquisition of the competitive edge by enterprises. On the competitive strategy level, logistic costs are often the basic strategy or an important element supporting the basic strategy. The relations between the logistic costs and enterprise strategies play a very important role in strategic management and have a very strong influence on the development and implementation of new competitive strategies. However, there are few analytical studies in the literature on the subject that could be useful for the analysis of the possibility of the use of logistic costs for the creation of the competitive edge of enterprises. Therefore, the aim of the thesis is to present the cost aspects of the formulation of competitive strategies of enterprises. The obtained results of studies and their analyses will confirm the essence of the academic problem under consideration.

## LOGISTIC STRATEGIES OF ENTERPRISES

The strategy of an enterprise is defined and understood in many different ways. This results from the essence of this concept, which refers to the behaviour of various organisations in various environments and with various impacts of the environment on these organisations. According to Ciesielski (1999), the strategy of an enterprise is a concept of systemic activities consisting in the formulation of a set of long-term goals of an enterprise and their modification depending on the changes in its environment, the specification of resources necessary for the achievement of these goals and the procedures ensuring the optimum

distribution and use of resources for the purpose of a flexible response to market challenges.

Dynamic environment, where the agricultural companies are operating in the Slovak Republic after the accession to the European Union, requires continuity in increasing the efficiency of production process to the preservation and growth of the domestic producers' competitiveness in the single agrarian market in the EU (Bielik et al. 2010).

Any enterprise that wants to survive in a competitive environment and to develop must formulate and implement strategies on various levels and in many specialist management profiles. According to this principle, strategies refer to the individual areas of operation of an enterprise and its function. These strategies include:

- strategy of an enterprise – formulated on the top management level and defining what types of operations must be carried out to achieve a strategic advantage;
- strategy of the method of operation – formulated on the medium level for the particular types of operations (for the groups of products, markets, groups of customers);
- functional strategy – formulated with reference to the particular functions of an enterprise (marketing, production, sales, financial, logistic and other strategies) (Ciesielski 1999).

Among the functional strategies, a very important role is played by the logistic strategies, which must be subordinated to the strategy of an enterprise and guarantee the achievement of its logistic goals. They should also be co-ordinated with other functional strategies of an

Table 1. Relations between competitive strategies and logistic strategies

Dominant competitive strategy					
Cost leadership	Creation of uniqueness for the customer	Time-oriented competition	Development of key competencies	Acquisition of the competitive edge thanks to co-operation	Competing for the future
Dominant logistic strategy					
Minimisation of logistic costs	High and differentiated logistic level of customer service	Shortening of operating cycles	Lean logistics	Integrated supply chain	Virtual and flexible logistics
Key concepts of logistics and main relations between logistic strategies					
Minimisation of physical distribution costs, consolidation, standardisation	Time of delivery and quality of service (customer service)	JIT, customer service standards	Outsourcing	Responsiveness, ECR, ECI	Efficiency, virtuality, synergy

Source: prepared on the basis of: Thoung T.L (1995): Logistics strategies and competitive advantage. Journal of Business Management, (5), quoted after: Ciesielski M. (1999): Logistyka w zarządzaniu strategicznym. Wydawnictwo Naukowe PWN. Warsaw

enterprise and adapted to its internal situation and the environment. Relations between competitive strategies and logistic strategies are shown in Table 1.

Logistic strategies can be analysed in the context of the Porter's model (1993), which contains three basic strategies: cost leadership, differentiation and concentration. The strategy of cost leadership is implemented through the reduction of costs of the enterprise's operations, whereas the strategy of distinction is implemented by offering products or specific services that are apparently different from other products or services of the competitors. The strategy of concentration is based on the assumption that an enterprise which focuses on a specific segment of purchasers or range of products can provide a better service for its narrow segment than the competitors acting on a more extensive scale.

Kay's conception (1996) is also interesting, as it defines the competitive edge as the distinguishing ability of the company put into use and introduced into the market. According to Kay, distinguishing abilities include innovation, reputation, strategic resources and "architecture", i.e. the relations between people in the company and the company's relations with its customers, suppliers and other companies in the industry. This interpretation allows for a more flexible understanding of the relation between the competitive edge and competitors. Additionally, it is very useful for the analysis of the relation between logistics and the company competitive edge.

In many enterprises, management started to recognise logistics as a strategic opportunity for their companies a long time ago. Logistics can determine the method of acquisition of the competitive edge, either independently or in combination with other types of operations, in terms of competitive actions, negotiations or bidding processes.

#### **PLACE AND STRUCTURE OF LOGISTIC COSTS IN THE ACCOUNTING SYSTEM OF AN ENTERPRISE**

The costs of logistics constitute a basic quantity criterion of the efficiency and modernity of logistic processes; therefore, it is very important to identify them precisely and to specify them in detail according to the current needs. These costs have a large impact on the total result of the enterprise business activity and the formation of the total financial result determining the enterprise's profitability.

The problem of logistic costs and various aspects of quality changes in logistics that affect the amount of these costs are raised in the document "Opinion of the

European Economic and Social Committee" (Brussels 2007) published in Brussels on February 15, 2007 by the European Economic and Social Committee. This document draws a special attention to the fact that "... logistic costs in the economy of the EU countries are not recognised to a sufficient extent, and, consequently, significant logistic decisions are taken on the basis of incomplete information. For these purposes, it is necessary to prepare models for the needs of calculation of actually incurred costs. This is because logistic costs should constitute one of the significant indicators of economic efficiency of enterprises..."

Ficoń (2001) stated that the costs of logistics are one of the main criteria of the evaluation of effectiveness of the logistic technologies being used and only superior standards of the customer service are more important. Minimisation of these costs is a basic operating requirement implemented in market enterprises. In order to minimise the amount of logistic expenses, it is necessary to define precisely the formula which can be studied and analysed with the use of accurate methods of economic calculation.

The problem of logistic costs is one of the most difficult and complex issues, due to their elaborate and vague structure and difficulties in their identification. Systems that can be used for the identification of logistic costs are very complex and strongly interdependent, which makes it difficult to evaluate them according to the analytical criteria. In cost accounts, costs are traditionally grouped into wide and aggregated categories, and logistic costs are shown in other sections. For this reasons, the identification of the actual logistic costs is difficult, if not impossible. This is well illustrated by the results of studies published by Christopher (2000) and Pfohl (2001), which concern the share of logistic costs in sales revenues in the selected European countries and the USA. The biggest differences, which can amount even up to 100%, occur for the costs of transport, storage and maintenance of inventories. The problem becomes even more important in the case of significant differences in the evaluation of the share of logistic costs in the gross domestic product. Logistic costs are dependent on the economic branch and the level of economic development of the particular countries. For example, the share of logistic costs in the gross domestic product of less developed countries is 20% and in industrialised countries, it varies from 3 to 5% (Logistics and forwarding service 2007).

The starting point for making decisions necessary for logistic cost management is the knowledge of the structure of these costs. It is also necessary to know the factors that determine their amount and share in the structure of the total costs. The cost structure is

analysed in enterprises according to the rules applied in accountancy. It must be borne in mind, however, that the number and type of the criteria of the logistic costs differentiation must be adapted to the nature of the enterprise's operations and the mechanism of recording these costs. Ciesielski (1999) specifies the following criteria of the division of logistic costs:

- criterion of the type of costs,
- criterion of the cost flow phases and cost centres,
- criterion of logistic processes,
- criterion of the variability of costs vs. the amount of the material flows or stocks kept.

From among the aforementioned criteria, the division of logistic costs according to the kinds of logistic processes is an important and commonly used criterion of classification of these costs. According to this criterion, the following costs are distinguished: costs of physical movement of tangible goods in logistic processes, costs of stock maintenance and costs of information flows. Speaking in different terms, only the costs of logistic infrastructure are taken into account in the adopted classification of costs. In view of the fact that logistic processes cannot be implemented without a specific technical and telecommunications base, it is necessary to analyse the state and use of elements of the logistic infrastructure in terms of the efficiency of processes and costs. This is because the knowledge of the proper systems of classification and structure of logistic costs is a prerequisite for effective actions aimed at their minimisation, whereas the prerequisite for the reduction of costs is the knowledge of factors determining their level and their current amount and share in the structure of the total costs of the enterprise operation.

## **COSTS OF LOGISTIC INFRASTRUCTURE IN AGRICULTURAL ENTERPRISES**

In market economy, logistic processes determine the conducting of business activity in time and space, and the costs of their implementation affect significantly the financial result of the enterprise. Logistic operations are an inseparable part of this activity and constitute an important determinant of its economics and the ability to create the competitive edge. An enterprise's infrastructure should ensure: fast and efficient flow of goods, protection of stocks and finished products, gathering and processing of information and its quick transmission aimed at optimum control of logistic processes. On the other hand, costs of the logistic infrastructure are a serious burden for every enterprise, irrespective of the extent of its operations, and the share of these costs in the structure of the total

costs is significant. Therefore, the precise identification of such costs in the enterprise cost structure is a very significant issue (Cieślak and Krasnodębski 2000; Tabor and Kuboń 2004; Kuboń 2007; Szelaż-Sikora 2008). In spite of its huge importance, the process of the comprehensive presentation of logistic costs is not covered appropriately in the economic literature and, still more so, in the practical activity of enterprises and market entities. There are no empirical studies, particularly in the field of agricultural and processing enterprises and entities providing food economy services that are, due to their specific nature, mainly located in rural areas. This gap was bridged to a limited extent by the studies carried out by the author in years 2006–2007 on the example of 50 enterprises specialising in agricultural production. The aforementioned studies helped to identify the amount and structure of the logistic infrastructure costs as well as their share in the total administration costs. Indexes of the evaluation of the effectiveness of use of logistic infrastructure (Kuboń 2008) were also prepared; they reflect the impact of values and infrastructure costs on the final amount of the financial result, which is expressed in terms of gross final production and commodity production.

The studies were carried out in enterprises specialising in field crops (Group A), in breeding of animals fed in the grazing system (Group B), in breeding of animals fed with nutritive fodders (Group C), in various crops and breeding of various animals (Group D) and horticultural crops (Group E).

The highest costs of the logistic infrastructure were recorded in farms specialising in horticultural crops (Group D) – 13 210 PLN/ha UR, whereas the lowest costs were recorded in farms specialising in field crops (Group A) – 1 710 PLN/ha UR. The biggest share in the structure of these costs, both in Group A and D, is represented by the costs of maintenance and use of technical facilities (respectively 78% and 75.8%), and the smallest share is represented by the costs of package management (respectively 6.6% and 1.8%). The aforementioned studies confirmed the author's research assumptions (Kuboń 2007) that the costs of the logistic infrastructure represent a significant part of the total costs of the enterprise operations (Figure 1).

The share of the logistic infrastructure costs in the total costs of the enterprise operations varied in the range of 36.4–69.4% (Figure 1). The highest share was recorded for the enterprises from Group D, whereas the lowest share was recorded for the enterprises from Group A. The presented results of studies stress the importance and role of the logistic infrastructure in the functioning of agricultural enterprises. The obtained values prove that the logistic infrastructure has a big

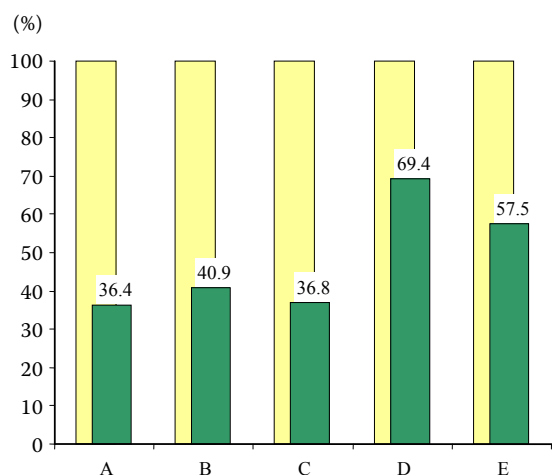


Figure 1. Share of the logistic infrastructure costs ( $K_{II}$ ) in the total production costs [%]

influence on the final financial result determining the enterprise's profitability. Figure 2 presents the index of activity of logistic resources ( $W_A$ ), the effectiveness of the use of logistic infrastructure ( $W_E$ ) and the logistic investment attractiveness ( $W_I$ ) in agricultural enterprises under examination.

The activity index shows the efficiency of the use of the enterprise's logistic infrastructure. It is expressed as a ratio of the value of gross final production to the replacement value of the logistic infrastructure. The highest index was recorded in the farms from Group A and E (0.6), whereas the lowest index was recorded for Group D (0.2). This means that every 100 PLN invested in the logistic infrastructure made it possible to generate the commodity production of the value of 60 PLN. The efficiency index determines the relation between the effects (value of gross final production) and expenses (logistical infrastructure costs). In the

groups of enterprises under examination, the highest index of efficiency of the use of logistic infrastructure characterised the facilities from Group A (3.2), whereas the lowest index was recorded for Group D (1.2). In this case, every 1 PLN spent for the maintenance and use of the infrastructure generated production of the value of 3.2 PLN. The last index, i.e. the logistic investment attractiveness index, determines the relation of the value of the logistic infrastructure to the value of the commodity production. The highest index was recorded in the enterprises specialising in mixed production (19.4), whereas the enterprises specialising in field and horticultural crops had the lowest share (1.7). This means that in the case of farms specialising in field production, 1.7 PLN must be invested into the logistic infrastructure to manufacture 1 PLN of the commodity production, whereas in the case of farms from Group D, a 11 times higher amount, i.e. 19.4 PLN, is needed (Kuboń 2008).

The presented indexes stress the role and importance of the logistic infrastructure in the functioning of enterprises and make it possible to use the logistic costs for the creation of the competitive edge of enterprises. The determination of these indexes resulted from the need to rationalise the logistic processes, which necessitate the current measurements and evaluation of the efficiency of logistic processes to be done on their basis.

## CONCLUSION

Logistics has played a significant role in competitive strategies based in particular on cost leadership and the differentiation in terms of the logistic service. The matter of key importance for logistics is the

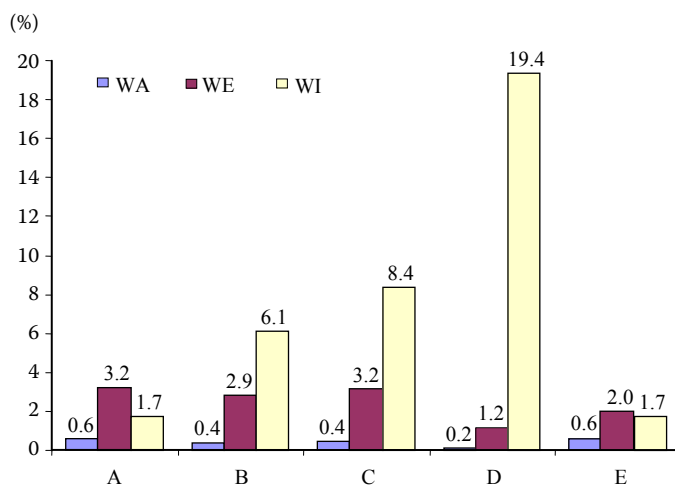


Figure 2. Index of activity of logistic resources ( $W_A$ ), efficiency of use of logistic infrastructure ( $W_E$ ) and logistic investment attractiveness ( $W_I$ ) in agricultural enterprises under examination

Source: Kuboń 2008

combination of the costs and quality characteristics that determine the market service level. These dependencies are connected by the logistic system with production, supply, sale, marketing etc. The existence of these dependencies means that the logistic management must cover not only an enterprise, but also its environment. The management-oriented integration of all functions and logistic processes is not only a pre-requisite for an efficient restructuring and modernisation of an enterprise, but it also opens new opportunities to use the potential effects in operating and strategic activity.

In order to generate large savings, the management of an enterprise should analyse and compare on a continuous basis the real costs with assumed costs or the implementation of the plan. The presented results of empirical studies prove that the costs of the logistic infrastructure form a significant part of the general costs, which can be reduced through a proper management. Consequently, as far as the creation of the competitive edge is concerned, it is important to identify and control these costs precisely in the structure of the enterprise operation costs. There are many possibilities to generate better results arising from the decision-making process. The management should choose between the alternatives such as: rental of the storage area or the construction of its own warehouses, hiring of the additional transport or the expansion of its own transport base, an increase of deliveries or goods, or the automation of the order and information processing system. In order to make such decisions, it is necessary to have the information concerning the segments such as sellers, recipients, products, territory, distribution channels. The currently existing integrated management systems make it possible to receive the information quickly and to perform detailed analyses and evaluations of the enterprise's operations, and the obtained results make it possible to use alternative solutions in the management process.

## REFERENCES

Bielik P., Hupková D., Vadovič M., Benda V. (2010): Agricultural basic industry subjects productivity develop-

ment examination in region Trnava (SR) by adopting the Malmquist indexes. *Agricultural Economics – Czech*, 56: 108–115.

Ciesielski M. (1999): *Logistics in the Strategies of Companies* (in Polish). PWN, Warszawa.

Cieślak J., Krasnodębski A. (2000): Logistic of purchases and quality management in a company. In: *MVD 2000: Trends in Agricultural Economics and Management*. I diel, SPU, Nitra.

Christopher M. (2000): *Logistics and Supply Chain Management* (in Polish). Polskie Centrum Doradztwa Logistycznego, Warszawa, p. 73.

Kay J. (1996): *Basics of an Enterprise's Success* (in Polish). PWN, Warszawa

Kuboń M. (2007): Methodological aspects of estimating the costs of logistic infrastructure of agricultural enterprises (in Polish). *Problemy Inżynierii Rolniczej*, 1: 123–133.

Kuboń M. (2008). Logistic infrastructure cost of agricultural enterprises (in Polish). *Inżynieria Rolnicza*, 108: 125–138.

*Logistics and forwarding service* (2007) (in German). Fraunhofer Institut Integrierte Schaltungen. Arbeitsgruppe fuer technologien der Logistik-Dienstleistungswirtschaft ATL. 30-04-2007.

*Dictionary of Logistics* (2006) (in Polish). Biblioteka logistyka, Poznań.

Opinion of the European Economic and Social Committee on the topic "European logistics policy" (2007). Brussels, 15 February.

Obłój K. (1998): *Organization Strategy* (in Polish). PWE, Warszawa:

Porter M.E. (1993): *Competitive Strategy* (in Polish). PWN, Warszawa.

Pfohl H.C. (2001): *Logistics Systems* (in Polish). Podstawy organizacji i zarządzania. I LiM, Poznań.

Szeląg-Sikora A. (2008): Measures of economic and technical factors of agricultural holdings (in Polish). *Inżynieria Rolnicza*, 108: 237–244.

Szulc R. (2004): *Logistics in the Competing Strategies of Firms* (in Polish). Maszynopis.

Tabor S., Kuboń M. (2004): Methodological aspects of costs estimating of agricultural production mechanization (in Polish). *Inżynieria Rolnicza*, 59: 241–248.

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