METRICS OF LOGISTICS COSTS IN SLOVENIAN COMPANIES

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Abstract

Managing logistics costs become more and more important in business operations since they represent approximately ten and fifteen percent of sales revenue. In the research, we focused on the use of metrics of logistics costs in companies. We made a descriptive analysis based on a survey, where we observed the differences between the companies according to their size. We have found that Slovene companies fairly good measuring logistics costs. Most attention is paid to transport costs and inventory carrying costs. We also found that large and medium-sized companies better measure logistics costs as others. The possibility of further research is to determine how the chosen metrics affect the profitability of companies. In order to improve the competitiveness of companies in the future, it will be necessary to improve the metric of logistics costs, which are more difficult to control, as they represent an important item in the cost structure of the company.

Keywords: logistic, logistics costs, metrics of logistics costs, companies

1. INTRODUCTION

Logistics can be understood as a process of planning, implementing and controlling the efficient and economic flow and storage of goods, taking care of the customer service and all the information related to the use of the adaptations to the requirements of the client. Among the basic concepts of logistics, which consists of logistics chain flows, transportation, inventory management, warehouse management, production planning and cost management are classified. Logistics costs can be defined given the basic concepts of logistics, as well. The percentage of logistics costs amounts to approximately 10% of the gross domestic product (GDP) (Rantasila & Karri, 2012), for which reason the control and optimization of logistics costs are of the utmost importance for the company (Sternad & Knez, 2008).

The major obstacle in managing is encountered in setting up uniform and comprehensive enough frameworks to capture logistics costs. Therefore, clear frameworks should be created and all the items of the cost calculation must be predicted. This includes determining the sources of costs, allocation of costs, and the like.

Wherever a business process is employed, it is accompanied by costs. Costs are expenses of production sources, expressed as a price. In business operations, each team member has a greater or a lesser impact on the level of costs and on the change thereof, as well as on the causes for their emergence. There are, of course, differences between the impact of the person who prepares expert proposals for the management and the governing bodies and influences their most important business decisions, and the person who puts goods for storage or dispatch on pallets. However, both of them and everyone else in the company, can cause or prevent the costs and thus affects the existence, development, or business failure of a company, or jeopardizes his job and his own life. Every person one is a vital component of the whole and the same applies if one incurs or prevents the costs of the social community. Smart companies pay much attention to costs in their business decisions. Every moment of the work or non-work is therefore associated with the generation of costs (Sternad & Knez, 2008).

The generation of costs is permitted consciously because we believe that the work effects (goods and services) shall also be sold well, as it is assumed that there is decent demand for their market placement. With the achieved selling price of the work effects, the total income to cover costs and to set up funds is produced on the one hand, whereas on the other hand, the effects of our work generate costs at the customers' expense. The higher costs we incur to them, the higher costs they will incur to their customers. At the end of this chain, higher costs will again affect us. Therefore, in business operations, we are interested in the minimization of costs because this enables us to maximize the difference between the total revenue and the cost price of our products or services. This again allows us not only directly, but also indirectly to purchase elements of the business process at the lowest possible price. This is the goal, which every business enterprise would like to achieve.

By accurately monitoring costs, businesses can achieve competitive advantages in the market. Christopher (2005) says, that successful companies either have a cost advantage or they have a value advantage or a combination of the two. Achieving competitive advantages in the field of logistics is possible by measuring and controlling logistics costs.

Jonsson (2008) defines as a cost that can be attributed to logistics activities. These include direct costs for physical handling, transportation and storage of goods in the flow of materials, the cost for tied-up capital along this flow, and also administration costs for planning and controlling the flow of materials.

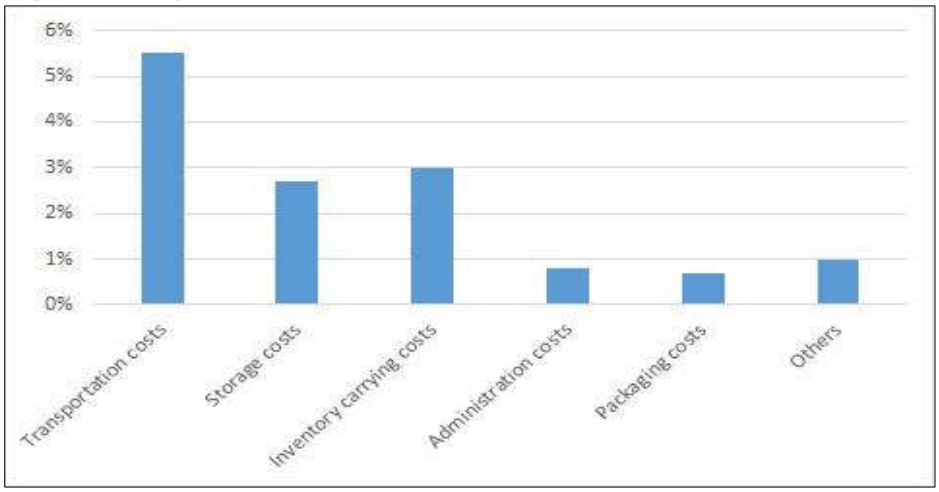
Total logistics costs can be broken into the following cost type (Jonsson, 2008):

- transportation and handling costs, which a are related to the moving of goods originate from internal and external freight transportation, packaging and damages to goods during handling;
- packaging costs include all costs related to packaging materials and the processes of packing and marking goods;
- inventory-carrying costs are costs for keeping good in stock;
- administrative costs include all costs which are associated with long-term planning and operative management of material flow;

- ordering costs can be attributed to the processing of purchase and manufacture orders;
- capacity-related costs are annual depreciation and cost of maintenance;
- shortage and delay costs;
- environmental costs.

In developed countries, logistics costs have been decreasing for many years, and this is also largely due to the reduction of transport costs, which is the result of the integration of logistics companies. International research suggests that transport costs in sales revenues are between 4 and 7%. In Poland, these costs are 4%, in Germany 5-6%, in Norway and Sweden 6% and in Lithuania 5% (Hovi & Hansen, 2010). Transport cost research in Finland shows an average of 5.5% of transport costs in total sales revenues (Ojala, 2009).

Figure 1. Logistics costs in total sales revenues



Source: Ojala (2009)

Capturing and controlling costs of the company is carried out in accordance with Slovenian and international accounting standards. Cost recovery does not yet allow an appropriate judgment of the performance of a particular company, especially in the field of logistics. Traditional costing often does not allow for full cost management of logistics costs. Bokor and Markovits-Somogyi (2015a) propose the introduction of activity-based costing (ABC costing) at logistics service providers. The authors found that ABC costing can be applied effectively to improve the cost calculation practically for companies. The advantages of introducing ABC costing are also the authors' findings in the transport sector. Nurminen et al. (2009) compared the cost of transporting timber where it was found that the ABC costing system suggested higher costs than the sums paid in reality. Bokor and Markovits-Somogyi (2015b) found that methodological improvement of transport cost calculation allows a more effective cost management of small and medium-sized road haulage companies. Baykasoglu and Kaplanoglu (2008) found that there is a considerable difference between the current cost assignment procedures of the company and the results obtained from

ABC. The present traditional accounting procedures of the company were not able to properly distribute overheads to its services.

The use of logistics metrics in companies is not yet sufficiently developed and does not allow the proper management of logistical costs. In most companies, there is no shortage of performance measures (Gunasekaran & Kobu, 2007). The purpose of the research is to determine how companies use a metric of logistics costs

Different authors suggest primary forms of measurement, which can be used to capture the performance of transformational processes (Mckinnon, 2009; Gunasekaran et al., 2001; Caplice and Sheffi, 1994):

- utilization (spending metrics, financial and nonfinancial performance, inventory measures),
- productivity (total factor productivity and financial productivity measures),
- effectiveness (quality of process output by comparing the actual output to the standards).

In research, we focused on utilization metrics. Gunasekaran and Kobu (2007) divided key performance metrics into two groups: financial and nonfinancial. Caplice and Sheffi (1994) categorized utilization metrics to three groups: spending measures, nonfinancial resource measures and inventory measures. Spending measures capture how much is spent on, and thus the cost of, either the entire logistics process or any portion of it.

Based on the presented issues, we answer the following research questions:
RQ1: Are companies measure logistics costs?
RQ2: Are there differences in measuring logistics costs between companies according to the size?

2. METHODOLOGY

Questionnaire-based studies seemed to be the most popular study approach for logistics performance measurement on a national level (EC, 2015). In order to identify a use of measurement of logistic expenses in Slovenian enterprises, a total of 500 randomly chosen Slovenian companies were surveyed from different statistical regions. The 120 questionnaires were appropriate for inclusion in our analysis. The 120 responses represent a 24 percent response rate. Compared to other studies (Green et al. 2008, Nahm et. al, 2004), the response rate is higher.

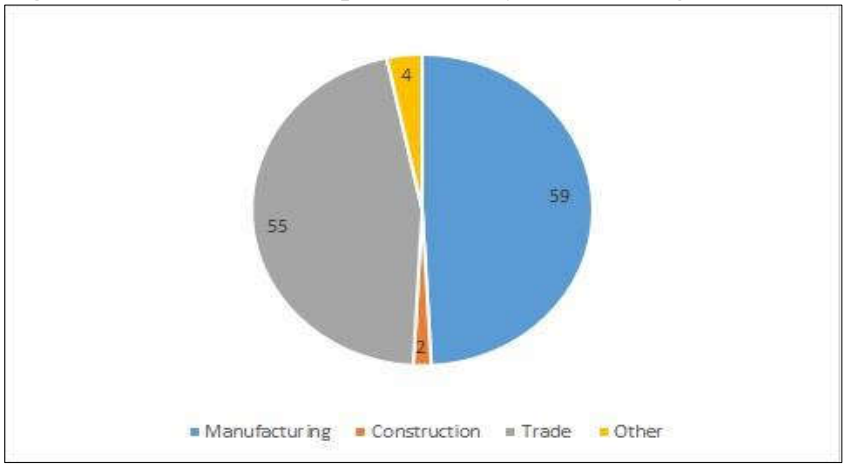
Overall, the final sample included 33 micro companies, 30 small companies, 30 medium sized companies and 27 large companies. To determine the differences in the use of measurement of logistic expenses, we used approx. the same number of companies from each group.

The questionnaire was completed by company leaders (in micro and small companies, since they do not have standalone logistics departments) or the head of logistics (in medium-sized and large companies), with the exception of companies with no, formally organized logistics departments or functions, where the head of purchasing or sales was asked to complete the questionnaire.

The questionnaire comprised two parts, each focusing on a different aspect of the research. The first part focused on logistics costs measures. Logistics costs included transport costs, storage costs, ordering costs, inventory-carrying costs and distribution costs. For each type of logistics costs, we determined whether companies account for the proportion of logistics costs in full costs. Individual claims are numbered from 1 to 5, where 1 means that the statement does not hold, 5 means that the claim holds.

The second part focused on the demographics of the companies surveyed. Demographic data covered the headquarters of the company according to the statistical region, the basic activity according to the SKD classification, the size of the company and the gender and age of the respondent. The respondents were male 53 percent and female 47 percent. Approximately 11 percent were less than 30 years old, 33 percent between 31 and 40 years old, 33 percent between 41 and 50 years old and 23 percent more than 50 years old.

Figure 2. Number of companies surveyed according to SKD classification



Source: author's research

Data obtained through the survey from March to May 2018 were edited and statistically processed using the Excel program, with which we made descriptive statistics for individual issues. We calculate an average value and standard deviation for each group.

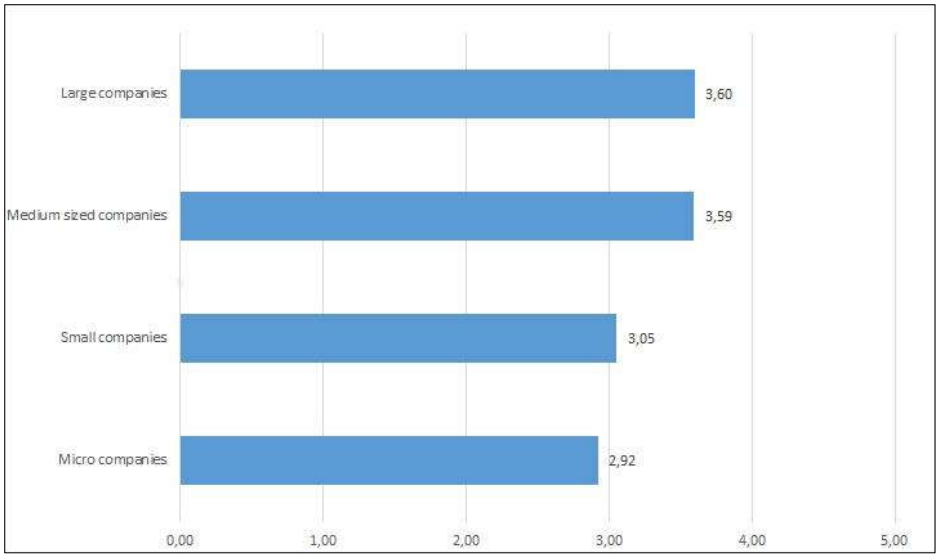
3. RESULTS

Caplice and Sheffi (1994) found, that many methods for reporting spending on the logistics process fallow the same pattern of monitoring logistics costs over a set period of time comparing them to some norm values, and analyzing variance from these norms. In our research, we include measures of logistics cost as a percentage of all cost in companies.

The surveyed companies agree with the average score of 3.52 that they count the share of logistics costs in full costs. Large companies (3.89) expressed the largest agreement, while the smallest were small companies (3.13).

Calculating the shares of individual groups of logistics costs is greatest in large companies and the smallest in micro companies. Figure 3 shows the differences between companies depending on the size of the company. The lowest standard deviation in the coverage of individual cost groups is micro companies and the largest are small companies.

Figure 3. Average score according to the size of the company



Source: author's research

Among the large companies (figure 4), the highest level of agreement with the calculation of individual logistic costs in total costs presents transport costs (4.39), followed by distribution cost (3.68), inventory carrying cost (3.54), storage costs (3.46) and ordering costs (2.93). The standard deviation between individual groups is 0.486.

Figure 4. Level of agreement in large companies

Source: author's research

Given the size of the business of large companies, they use transport services a lot, and it is necessary to control the transport costs of the company. The ordering

costs are mainly covered by the costs of the purchasing department; also, it is more difficult to determine the proportion of logistics costs.

Among the medium-sized companies (figure 5), the highest level of agreement with the calculation of individual logistics costs in total costs is transport costs (4.40), followed by inventory carrying cost (3.77), distribution cost (3.47), storage costs (3.33) and ordering costs (3). The standard deviation between individual groups is 0.478. Based on the results given, we can conclude that the large and medium-sized companies are very similar in using the logistics costs metric.

Figure 5. Level of agreement in medium-sized companies

Source: author's research

Among the small companies (figure 6), the highest level of agreement with the calculation of individual logistics costs in total costs is transport costs (3.83), followed by inventory carrying cost (3.23), distribution cost (3.13), storage costs (2.87) and ordering costs (2.20). The standard deviation between individual groups is 0.532. Small companies monitor the costs of transport and stocks, while less attention is paid to storage costs and ordering costs.

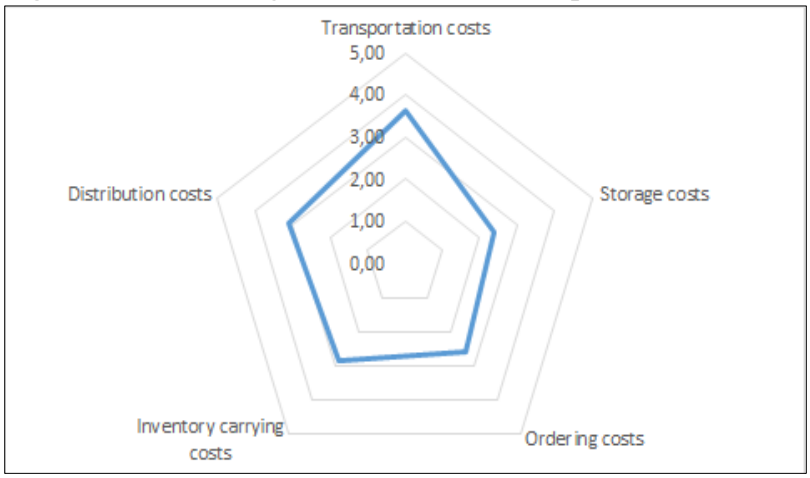
Figure 6. Level of agreement in small companies

Source: author's research

Among the micro companies (figure 7), the highest level of agreement with the calculation of individual logistics costs in total costs is transport costs (3.64), followed

by distribution cost (3.09), inventory carrying cost (2.88), ordering costs (2.61) and storage costs (2.39). The standard deviation between individual groups is 0.456. Micro companies monitor the costs of transport and distribution, while less attention is paid to ordering costs and storage costs.

Figure 7. Level of agreement in micro companies



Source: author's research

The comparison between companies shows that the highest level of agreement with the calculation of individual logistics costs in total costs presents transport costs (4.07) and the lowest presents ordering costs (2.68). The result is expected, as companies are best known for transport costs, while ordering costs are often included in procurement costs. The highest standard deviation is in a group of storage costs (0.487), while the lowest in a group of distribution costs (0.280). Micro and small companies often do not have large storage areas and costs do not have a major impact on business.

4. CONCLUSION

Logistics costs present between ten and fifteen percent of the sales revenue (Solakivi, et al., 2012). They are critical to the producer, and for the company's profits generated by the production of goods. This is especially true for the sale of consumer goods, where there are small price differences and the cost of logistics in the proportion of the selling price is one of the most important.

At the same time, we found that the impact of logistics costs on the business is high, and it is, therefore, necessary to constantly monitor and analyze them. Due to the large share of logistic transport costs in the structure of the total cost of companies, there are recently looking for alternatives to the organization of transport. One of the possible forms is the outsourcing of activities and also physical internet (Montreuil, 2011).

Today, the most developed companies in Slovenia combine purchasing, production, and sales logistic processes at the company level with the aim of seeking positive synergy effects. Connections are slowly developing, as many companies

believe that purchasing and sales flows are an entrepreneurial mystery, and therefore inter-company logistics cooperation is rejected.

The companies in the survey measure logistics costs. Most attention is paid to transport costs and inventory carrying costs, which are also the easiest to capture in accounting and are prescribed by accounting standards. The smallest value was that enterprises indicated the ordering costs, as they are more difficult to identify in the company and are part of the purchasing department.

The study found that large and medium-sized companies better measure logistics costs as others, which is expected, as these companies have different organizational structure and often include logistics as a formal organizational unit. Small and micro companies do not generally have independent logistics departments. Small and medium-sized enterprises should introduce a comprehensive system of monitoring and control logistics costs, thereby contributing to the greater competitiveness of the company. In order to improve the company's competitiveness, the future will require a more complete management of logistics costs. In future research, it is also necessary to analyze the use of different methods for cost analysis and their impact on the profitability of the company, as the use of ABC costing shows improved cost management in companies.

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