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LOGISTICS IN ESTONIAN BUSINESS COMPANIES

Ain Kiisler

Tallinn University of Technology, Department of Transportation, Ehitajate tee 5, 19086 Tallinn, Estonia
E-mail: ain.kiisler@gmail.com

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Abstract. The article describes logistics survey in Estonia carried out in 2007 as a part of the *LogOnBaltic* project. The level of logistics in Estonian manufacturing, trading and logistics companies is explored through logistics costs, performance indicators, outsourcing, ICT use and logistics self-estimation of the companies responded. Responses from 186 Estonian companies were gathered through a web-based survey (38% of manufacturing, 38% of trading and 24% of logistics sector). Logistics costs as the percentage of turnover make in average 13.8% in manufacturing and 13.3% in trading. Transportation and inventory carrying cost form around 70% of overall logistics costs. Considering the logistics indicators surveyed, Estonian companies show up with relatively low perfect order fulfillment rates, short customer order fulfillment cycles and effective management of cash flows. The most widely outsourced logistics function is international transportation followed by domestic transportation, freight forwarding and reverse logistics. By 2010, the outsourcing of IT systems in logistics followed by inventory management, warehousing and product customization is expected to increase more substantially. The awareness of logistics importance is still low among Estonian companies. Only 27–44% of those agree that logistics has a considerable impact on profitability, competitive advantage, top management or customer service level.

Keywords: logistics, Estonian logistics market, *LogOnBaltic*, logistics costs, ICT systems, outsourcing.

1. Introduction

The purpose of this article is to give an overview of logistics market in Estonia. This overview is based on the results of logistics survey carried out among Estonian manufacturing, trading and logistics companies in January–February 2007. This is the first comprehensive survey made about Estonian logistics market.

The above mentioned Estonian logistics survey is a part of the *LogOnBaltic* (hereafter LOB) project (Logon Baltic… 2008). The LOB project was approved within the Baltic Sea Region (BSR) INTERREG III B Neighborhood Programme sponsored by the European Regional Development Fund (ERDF) as a part of the Structural Funds and co-financed by the national project partners. The overall purpose of the LOB is to present solutions for improving the interplay between logistics & ICT (information & communication technology) and spatial planning and strengthening the competitiveness of Small and Medium-sized enterprises (SME-s) in the Baltic Sea Region. The regions of South-West Finland, Östergötland, Hamburg, West-Mecklenburg, North-East Poland, Lithuania, Latvia, Estonia and St. Petersburg participated in the project.

Logistics survey is one of the LOB tools for data gathering and reflects the current status and needs for logistics in the business community of the region. Three versions of the survey focusing on the following three types of companies have been used:

- manufacturing/construction companies;
- trading companies;
- logistics services providers (LSP-s).

The questionnaire consists of two parts: one part includes general questions (the same for three types of companies) and the other part covers specific questions concerning the type of the companies mentioned above. The same questionnaire has been applied in all the above mentioned regions and used translated into native languages. The survey has been conducted as a web-based study.

In Estonia, a total of 2960 manufacturing, trading and logistics companies were sent an email asking them to take part in the survey. This sample was built up of the members of Estonian Chamber of Trade and Industry, the members

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Table 1. The share of manufacturing, transport & storage and trade sectors in Estonian value added 2000–2005 (at current prices) and the share in the sample and among the respondents.

Economic activity	2000	2001	2002	2003	2004	2005	Average, %	% in sample	% of respondents
Manufacturing	17.8	18.4	18.1	17.7	17.1	16.8	17.7	43	38
Transport, storage and communication	14.6	13.7	13	12.8	12.3	12.1			
Of which transport and storage (LSP-s)	*10.2*	*9.6*	*9.1*	*9.0*	*8.6*	*8.5*	*9.2*	*23*	*24*
Wholesale and retail trade	12.3	13.1	13.8	14.2	14.5	15.2	13.9	34	38
The total share of manufacturing, transport, storage and trade	**40.3**	**41.1**	**41.0**	**40.9**	**40.2**	**40.5**	**40.7**	**100**	**100**

of the local professional associations and companies belonging into TOP 100 and Turnover to TOP 500 1999-2005 rankings of the local business newspaper *Äripäev*.

The proportion between manufacturers, traders and LSP-s in the sample was the same as their average proportion in Estonian 2000–2005 Gross Value Added (GVA). Table 1 presents the shares of manufacturers, traders and LSP in the sample and among the respondents. Estonian Statistics Office is looking transport, storage and communication altogether. About 35% of GVA in the Baltic States is produced in transport, 35% in storage and the remaining 30% in communications (Ojala *et al.* 2005). Proceeding from this, the share of LSP sector in Estonian GVA was derived deducting 30% from the share of transport, storage and communication sectors.

The number of participants reached 146 having in mind that return rate was 4.9%. In addition, the survey questionnaire was available on a public website and information about it was spread to the members of the local logistics association. Altogether, 40 persons filled in the survey questionnaires via the public website.

Thus, in total, 186 Estonian respondents were involved in this survey 38% (69) of which represented manufacturing and construction, 38% (70) trade and commerce and 24% (43) LSP sector.

The following fields were analyzed within the survey:

- logistics costs;
- key indicators in logistics;
- information systems in logistics;
- logistics competence;
- outsourcing of logistics activities;
- self-estimating logistics in the companies responded.

Further, the main survey results are presented.

2. Logistics Costs

The following logistics costs were investigated as % of company turnover: transportation, warehousing, inventory carrying, logistics administration and other logistics costs.

According to the survey results, the average logistics costs of Estonian manufacturers make 13.8% and that of traders is 13.3% of turnover (Fig. 1) (Kiisler and Solakivi 2007). Transport and inventory carrying costs form the largest part of total logistics costs (ca 70%) the share of transportation cost of which is around 40% (43% in manufacturing and 40% in trading) and the share of

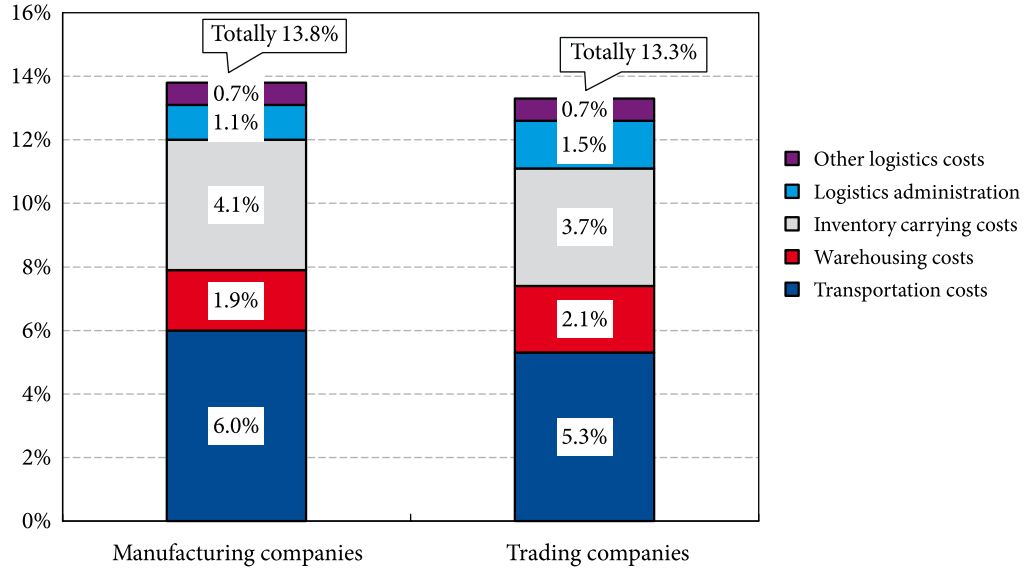

Fig. 1. Logistics costs of Estonian manufacturing and trading companies expressed as % of turnover

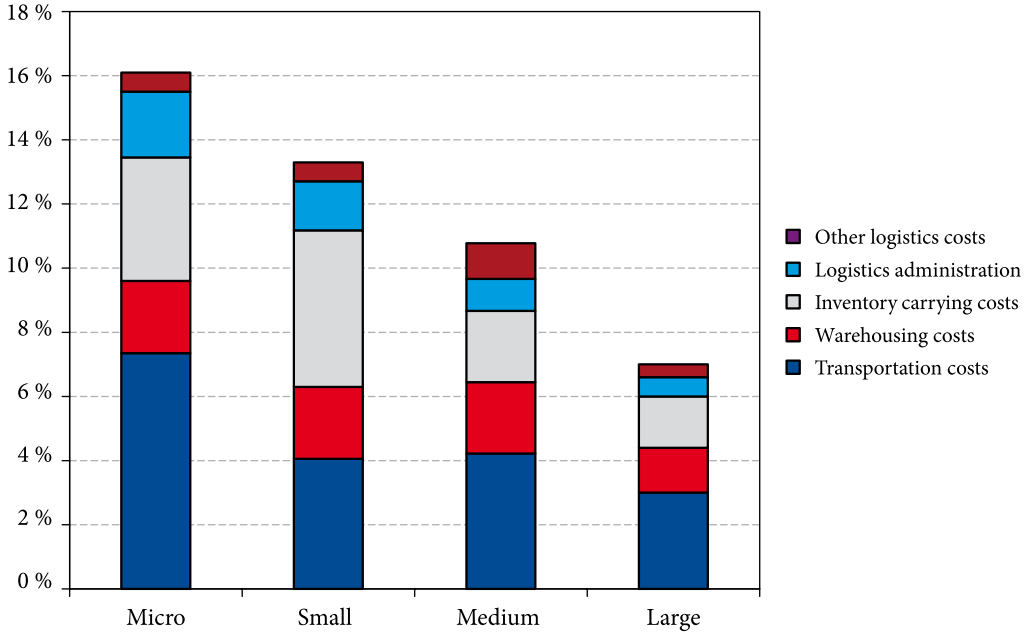

Fig. 2. Logistics costs as the percentage of turnover by size of surveyed Estonian trading companies'

inventory carrying costs make ca 30% (30% and 28% respectively).

The results showed clear relationships between company size (by financial turnover) and logistics cost level (% of financial turnover) in the trading sector (Fig. 2). The responded companies are divided into micro (annual turnover up to 2 million euros), small (2–10 MEUR), medium (10–50 MEUR) and large size (above 50 MEUR) ones. According to the results of the survey, the impact of a size of the trading companies on total logistics costs is quite impressive – the costs of logistics in micro and large companies differ more than twice (2.3 times) ranging from 16.1% of micro size traders to 7.0% of the larger ones.

In the sector of manufacturing, the number of valid answers about logistics costs received from medium and large size companies was too limited and scattered for making objective conclusions. Therefore, it was possible to compare only micro and small size companies. Such situation clarifies that the total logistics costs of micro size firms are ca 15% higher than those of the small size ones due to higher transportation and inventory carrying costs.

A small size of the manufacturing companies responded could also explain their higher logistics costs compared to those of traders. 56% of the responded Estonian manufacturers are micro size companies against 39% of the responded traders. In general, the logistics costs of the trading companies tend to be somewhat higher than those of the same size manufacturers due to their logistics peculiarity – more complicated and therefore more expensive distribution. In comparison with other Baltic Sea regions, the surveyed logistics costs of Estonian manufacturers are among the highest (3rd among 8 regions surveyed, after Mecklenburg–Vorpommern, DE and Pomerania, PL) mainly due to significantly above average inventory carrying costs (30% against average around 20% (Ojala *et al.* 2007). At the same time, the logistics costs of Estonian trading companies are the lowest ones in the surveyed regions (according to the *LogOnBaltic* Master Report, the logistics costs of Latvian trading companies are significantly lower compared with other regions studied. But this is due to the fact that the respondents in Latvia had a different conception of logistics costs than the respondents in other countries – inventory carrying costs are perceived as being unrealistically very low in comparison with other regions surveyed.

The respondents were asked to assess changes in logistics costs, expressed as % of their companies turnover since Estonia's accession to the European Union (EU) in May 2004. Ca 60% of the responded manufacturers and traders expressed an opinion that transport costs increased. Ca 20% of the respondents reported on a decrease in transportation costs.

There is a distinctive difference in manufacturers and traders' estimations about the dynamics of warehousing costs. Considering the opinion of ca 60% of the respondents from the manufacturing companies, warehousing costs did not change in 2004–2007, whereas 35% of the surveyed participants suppose those did. Ca 55% of the responded traders reported on an increase in warehousing costs and ca 40% of those found costs stable. The differences in the manufacturers and traders' opinions could be explained by a different character of their warehousing operations.

There are two major warehousing cost elements – labor and warehouse space rent costs which have behaved differently in last years. Labor cost has significantly risen since Estonia joined the EU. Warehouse space cost has been rather stable because of an increase in supplying modern warehouse space to the local market within the last years and an increase in competition between rent

Table 2. Logistics indicators of manufacturing and trading companies in some Baltic Sea regions

		Estonia	Germany (Hamburg)	Germany (M-V)	Finland (SW)	Latvia	Sweden (Östergötland)
Perfect order fulfillment %	Manufacturers	84.6	90.0	89.8	91.5	86.8	89.7
	Traders	86.2	93.4	89.4	91.8	86.6	90.8
Customer order fulfillment cycle, days	Manufacturers	21.9	31.6	44.5	21.5	34.9	36.4
	Traders	6.9	14.3	15.2	9.2	11.4	6.6
End-product inventory, days	Manufacturers	13.9	66	32.4	40.0	45.0	11.9
	Traders	42.1	44	46.6	44.9	37.0	48.4
Days of sales outstanding, days	Manufacturers	30.2	29.1	25.4	25.9	25.8	38.9
	Traders	23.6	22.2	13.8	14.9	32.5	31.8
Days of payables outstanding, days	Manufacturers	32.7	20.9	19.7	26.0	29.3	35.3
	Traders	36.5	21.9	18.7	22.5	33.2	37.0

and storage services providers resulting thereof. As the warehouse operations of the trading companies are usually more labor intensive (e.g. more picking), rise in labor price have had more influence on traders rather than on manufacturers' overall warehousing costs.

Estonia's accession to the EU and an accelerated movement of goods due to disappeared border crossing delays has not involved a decrease in inventory carrying costs. Only 17% of the responded manufacturers and 10% of traders have reported on lowered inventory carrying costs. According to ca 45% of manufacturers and traders, these costs have risen.

The respondents were also asked to estimate their further logistics cost developments (expressed as % of turnover) up to 2010. The majority of the respondents (60–80%) presume a further increase in all categories of logistics costs, whereat the trading companies are more pessimistic than manufacturers. Ca 80% of manufacturers and traders expect a further increase in transportation costs. Ca 80% of traders and 60% of manufacturers are ready for warehousing costs growth. Ca 70% of traders and 60% of manufacturers assume a further growth in inventory carrying costs. A further decrease in inventory carrying costs is expected only by 17% of manufacturers and 10% of traders.

3. Logistics Indicators

The surveyed logistics indicators were largely based on the SCOR model established by the Supply Chain Council in the USA (Naula 2006). The respondents from the manufacturing and trading companies were asked to assess the following key indicators in logistics:

- perfect order fulfillment %: the percentage of customers' orders delivered by the requested day and time in complete and perfect condition including all documentation;
- average customer order fulfillment cycle time: the average number of days required from customer order to delivery;
- days of end product inventory supply: the average number of days of end-product inventory held in company's stock;
- days of sales outstanding: the average number of days between customer order delivery to receipt customer payment;
- days of payables outstanding: the average number of days between supplier order receipt to order payment.

Table 2 shows the averages of the above mentioned logistics indicators in Estonia and in some other Baltic Sea regions. Compared to other regions, Estonian companies show up with low perfect order fulfilment rates and short customer order fulfilment cycles. One third (33%) of Estonian trading companies responded fulfils customer orders within 1 day / 24 hours, whereas 55% of those need 2 days / 48 hours. In manufacturing, these shares are 7% and 16% respectively.

The average end-product inventory of Estonian manufacturers is significantly lower than the average of all regions. Along with higher than average inventory carrying costs such situation indicates a small size of Estonian manufacturing companies and shows they are mainly acting as subcontractors producing according to concrete orders from their clients geographically located close to them.

Also, Estonian companies show up with the effective management of cash flows. In average, manufacturers receive their client payment 2.5 days and traders 13 days earlier than they pay to their supplier(s).

4. Logistics Outsourcing

The outsourcing of the following logistics activities was investigated in the survey: transportation (separately international and domestic), reverse logistics, freight forwarding, order processing, invoicing, warehousing, inventory management, product customization / finalization, logistics IT systems.

According to Fig. 3, the above introduced logistics activities in Estonia can be divided into three groups by the extent of outsourcing. There is no significant outsourcing difference between manufacturers and traders.

Widely outsourced logistics activities are transportation and transportation related functions like freight forwarding and reverse logistics. Such activities are out-

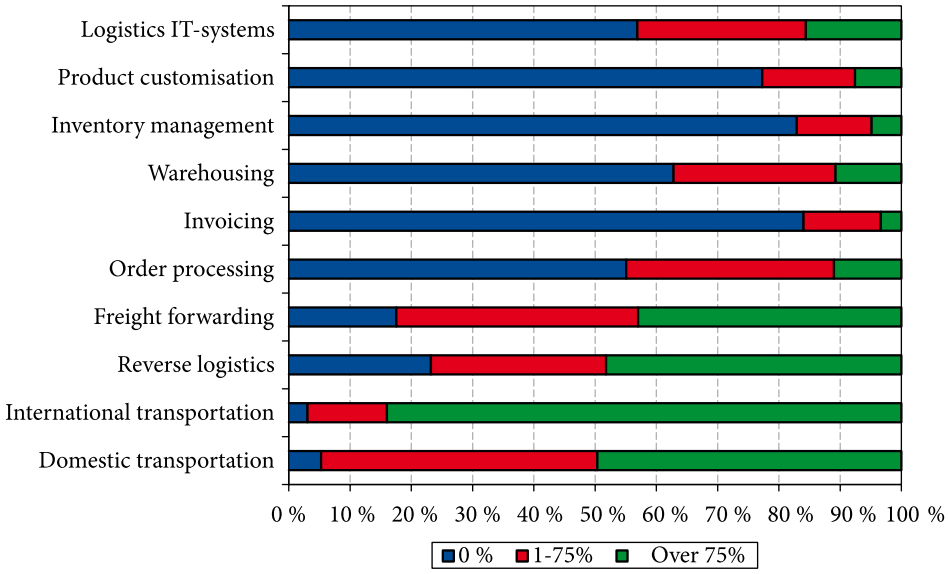

Fig. 3. Logistics outsourcing in Estonian manufacturing and trading companies

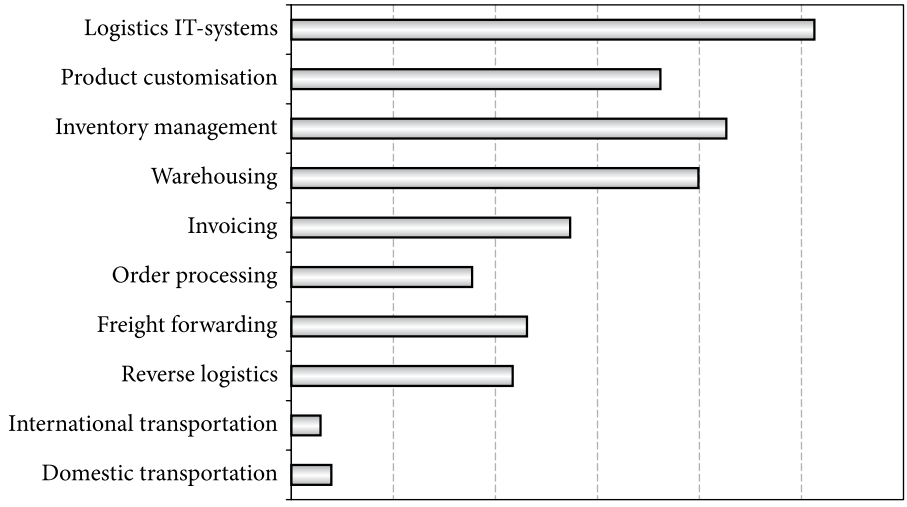

Fig. 4. Relative trends of outsourcing among Estonian manufacturing and trading companies up to 2010

sourced at least to some extent by 77–97 % of companies. Order processing, logistics IT systems and warehousing are moderately outsourced (37–45%). Product customization, invoicing and inventory management are still less outsourced (17–23%).

The respondents from the manufacturing and trading companies were asked to forecast the outsourcing of logistics functions in their companies by the year 2010. The results are shown in Fig. 4. The respondents generally foresee a further development of logistics outsourcing. The outsourcing of IT systems in logistics is presumed to be the fastest expanding field of logistics outsourcing as 26% of the respondents currently not outsourcing IT systems in logistics intend to do it by 2010. This is followed by inventory management, warehousing and outsourcing product customization functions.

Besides, there is an exception to logistics outsourcing expansion by 2010. The share of trading companies outsourcing international transportation over 75% is supposed to be decreased in the future (currently 85% against 74% in 2010). The explanation could be that some Estonian trading companies expect to reach the volumes at which the use of individual lorries for some international routes (e.g. Pan-Baltic connections) will be economically more beneficial than buying road haulers / freight forwarders' services.

5. Using ICT Systems in Logistics

Fig. 5 shows the use of different information and communication technology (ICT) systems in Estonian companies providing manufacturing, trading and logistics services. Modern ICT solutions are most widely introduced in Estonian trading companies – at least 1/3 of the responded traders use the Intranet / Extranet solutions, Web-based portals and EDI while more than 1/4 of those use barcode systems. Almost a half of LSP-s have setup their Web-based portals, 1/4 use EDI. Also, 40% of man-

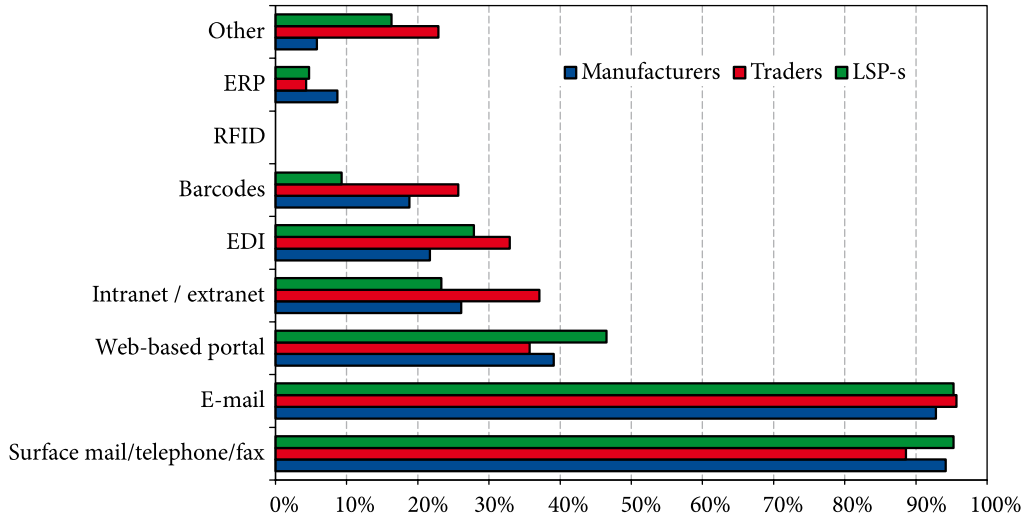

Fig. 5. The use of different ICT systems in Estonian companies

ufacturers have introduced Web-based portals and 1/4 of those use the Extranet / Intranet solutions.

ERP systems are not very common because of a prevailingly small size of Estonian companies.

6. Self-estimating Logistics in the Companies Responded

The purpose of this part of the survey was to find out how respondents assessed the quality of logistics operations in their companies in comparison with their competitors, the strategic role of logistics in the company, the measurement of logistics performance, internal and external collaboration in logistics operations etc. The results were received asking respondents to fill in the questionnaire containing different statements including the options 'agree', 'disagree' and 'neutral position'. A 5 point evaluation scale was applied.

The most surprising result is that Estonian companies find the strategic role of logistics in their companies' operations very low and is that is much lower than their counterparts in the other regions surveyed.

The respondents from the manufacturing and trading companies were asked to express their position on the statements showed in Table 3. Besides, the opinions of Estonian respondents are presented in the table (Estonia). For comparison, the averages of the results of similar surveys conducted in 2 German (Hamburg and Mecklenburg-Vorpommern), Latvian and Swedish Östergotland regions (Average) are presented in this table.

44% of the respondents agreed with the statement that logistics had a major impact on their companies' customer service level. This is the only statement where the share of the respondents having a positive opinion ('agree') exceeds the share of those who disagree with the statement (24%). However, the average share of the respondents who agree about the statement and represent other 4 regions is almost twice more. 33% of the surveyed participants agreed that logistics was a key source for a competitive advantage in their firms, whereas 36% of those disagreed (the percentage of such respondents was twice less than the average of 4 regions).

Only 27% of the respondents agreed that logistics had a major impact on their profitability and 29% agreed that logistics was a top management priority in their firm. The percentage of those who disagreed was 42% in both cases. The share of the respondents in this case is respectively 2.9 and 1.8 times less than the average of that in other 4 regions.

It can be concluded that the majority of Estonian manufacturing and trading enterprises still see logistics

Table 3. Self assessment of logistics importance for companies' operations

		Disagree	Neither agree nor disagree	Agree
Logistics has a major impact on our profitability	Estonia	42%	31%	27%
	Average	7%	16%	77%
Logistics has a major impact on our customer service level	Estonia	24%	32%	44%
	Average	4%	13%	82%
Logistics is a key source of competitive advantage for our firm	Estonia	36%	31%	33%
	Average	12%	23%	65%
Logistic is a top management priority in our firm	Estonia	42%	29%	29%
	Average	19%	30%	51%

as an operative arrangement of daily transport and warehousing tasks instead of a strategic function coordinating the most important business process – order fulfillment.

The assessment reveals that Estonian companies find their logistics performance quite good – depending on the factors surveyed, 58–74% of the respondents estimate their logistics performance better than that of their main competitors. Estonian companies see their main relative logistics competitive advantage in flexibility (for manufacturers and traders these are the abilities to respond to the needs and wants of the key customers and to modify order size, volume or composition during logistics operations while for LSP-s – the ability to accommodate service delivery times for specific customers and to respond to the needs and wants of the key customers). The main relative logistics disadvantages were unanimously rated by manufacturers, traders and LSP's ability to notify customers in advance of delivery delays or other complications and the ability to reduce the time between customer order receipt and the delivery of fulfilled orders to as short as possible.

7. Conclusions

1. Transportation and inventory carrying costs form around 70% of overall logistics costs in Estonian companies (transportation costs make ca 40% and inventory carrying costs – ca 30%.) Estonia's accession to the EU and the accelerated movement of goods due to disappeared border crossing delays have not involved the decrease in inventory carrying costs (expressed as % of turnover). The majority of Estonian companies (60–80%) participated in the survey and presumed the increase in all logistics costs up to the year 2010.
2. According to logistics indicators, the surveyed Estonian companies show up with relatively low perfect order fulfillment rates, short customer order fulfillment cycles and effective management of cash flows.
3. Transportation and transportation related logistics functions are extensively outsourced by Estonian manufacturing and trading companies. By 2010, the outsourcing of IT systems in logistics, followed by inventory management, warehousing and product customization is expected to increase more substantially.
4. The awareness of logistics importance is still low among Estonian companies. Only 27–44% of the surveyed manufacturing and trading companies considered logistics as having a significant impact on profitability, competitive advantage, top management priorities or customer service level.
5. Estonian companies see their main relative logistics competitive advantage in flexibility. The main relative competitive disadvantages in logistics are the ability to inform clients in advance about the delivery related problems and too long order fulfillment cycles.

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