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Finland State of Logistics 2006

Abstract

This Survey is commissioned by Ministry of Transport and Communications Finland, and it is a continuation of similar surveys published in 1993, 1997 and 2001. The level of logistics in Finnish manufacturing, wholesale and retail and logistics firms is assessed through logistics costs, performance indicators, IT usage, competence, development needs, outsourcing and choice of location.

2,255 firms´ responses were gathered through a web-based survey (manufacturing 44 %, wholesale & retail trade 35 % and logistics firms 21 %). It is probably the largest database of its kind in the World.

Logistics costs were on average 13 % of the turnover (equivalent of 26.4 billion euros), which is a relatively high figure in international comparison. The figure is higher than in the 2001 Survey, mainly for two reasons: (i) the number of small and micro firms was higher, and (ii) the market of Finnish firms has become more international. The net value added of Finnish logistics firms was 8 billion euros in 2004.

Logistics costs in internationally operating firms were several percentage point lower than in domestically operating firms. Small and micro firms had higher costs than large firms irrespective of their industry; the latter are able to exercise economies of scale and their market leverage in supply chains.

On average, Finnish firms scored well against international logistics performance indicators. Firms exposed to international competition scored far better than those operating domestically. IT usage in logistics has not increased much since 2001; except for the now ubiquitous e-mail.

Awareness of the importance of logistics is generally good. Firms assess their competence in logistics as relatively good, especially in large firms, retail trade and in logistics firms. The most important development needs are: supply chain visibility (large and international firms); competence of staff (SMEs); and partner networks and customer service (logistics firms).

Outsourcing of warehousing, invoicing and inventory control are expected to increase substantially. Retail and wholesale firms were very much more satisfied with their location than manufacturing firms.

Keywords

Logistics, Supply Chains, outsourcing, competitiveness, transport, industry structure, IT systems

Miscellaneous

To access source data of the Figures please visit www.tukkk.fi/markkinointi/log/LS/ls.htm

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

FOREWORD

The Ministry of Transport and Communications Finland is implementing an action programme to improve logistics, in accordance with a government programme. Companies are responsible for how efficient, effective and viable their logistics is, but public authority, inasmuch as it establishes infrastructure, regulates the market, and provides funding for education, training and research, has a fundamental influence on the logistics environment.

One of the Ministry's objectives is to lower the costs of logistics. To take the right decisions and plan measures it needs accurate data on the position with regard to logistics. There have been three previous surveys – in 1990, 1995 and 2001 – on the state of logistics in Finnish manufacturing and trade, and the costs involved. Reports have been commissioned, and they have helped increase competence in the area and speeded up developments and improvements.

In order to evaluate the current state and the changes that have taken place, a fourth logistics survey has been conducted. This survey is broader in scope than the previous ones in its examination of the position of small and medium-sized companies and logistics service companies. The results are now more comprehensive, and at the same time new useful data has been obtained. The survey is globally relevant and pioneering in its approach.

The work was financed by the Ministry of Transport and Communications and conducted by the Turku School of Economics. The project coordinator was Tapio Naula, and the work group that participated in it in consisted of Tomi Solakivi, Juuso Töyli, Lotta Häkkinen, Matti Takalokastari and Maiju Rantanen. The work was overseen by Professor Lauri Ojala of the Turku School of Economics.

At the Ministry the work was guided by a small steering group consisting of the Chairman, Lassi Hilska, Senior Advisor on Goods Transport, Jari Gröhn, Senior Engineer and Ministry guest Kari Litja, CEO and Executive Vice President, Finnish Association of Logistics (Logy).

I wish to thank all the representatives of companies who replied to the survey questionnaire, took part in interviews and attended meetings. The Finnish Association of Logistics (Logy) and the Federation of Finnish Enterprises deserve special thanks for providing the research team with necessary contact details of key personnel. The input from company experts was a key factor in the survey's success.

July 2006

Lassi Hilska
Senior Advisor on Goods Transport

Key concepts

3PL, TPL	Third party logistics services are operations undertaken by an external company covering at least the preparation of the management of a number of logistic services. These services are offered as a package, and not separately. The arrangement is intended as a long-term partnership.
ASP	(Application Service Provider) means an operator which provides software services from a service centre for a service charge.
ATO	(Assembly-to-order) is production based on assembly on receipt of a customer order.
Company operating in the domestic market	(in this context) means a company 90% of whose sales are in Finland.
EDI	(Electronic Data Interface) is the transfer of data between organisations.
ERP	(Enterprise Resource Planning) is an operations control system.
ETO	(Engineering-to-order) manufacture and production of products based on orders from specific customers.
Export company	(in this context) means a company at least 10% of whose sales are outside Finland.
Extranet	Electronic information network for dealing with organisations, which requires log-in and password.
International company	(in this context) means a company with production facilities outside Finland.
Intranet	Internal electronic information network, which requires log-in and password.
Large company/ business/enterprise	A company with a turnover of more than €50 million a year.
LOG4	Logistics Survey 2006 (forth in order survey by the Ministry of Transport and Communications Finland)
Logistics	The management of material**,** capital, and information flows between companies operating in supply chains and networks.
Medium-sized company /business/enterprise	A company with a turnover of €10 - 50 million a year.
Micro company	A company with a turnover of less than **€**2 million a year.
MTO	(Make-to-order) is order-based production.
MTS	(Make-to-stock) is the manufacture of goods for stock.
Productivity	The relationship between output the input needed to achieve it.
Quick ratio	The share (percentage) of short-term debt accounted for by liquid assets.
Small company /business/enterprise	A company with a turnover of €2-10 million a year.

SUMMARY

The fourth national Logistics Survey examines the state of logistics in the Finnish economy and the factors affecting the competitiveness of Finnish business. The survey focuses on the logistics solutions and costs applicable in industry, construction and trade and commerce.

The following fields were analysed: 1) logistics costs, 2) key logistics indicators, 3) logistics information systems, 4) logistics competence, 5) logistics operating environment and 6) outsourcing of logistics activities. The results of the analysis are compared with international material.

A total of 2,255 companies operating in Finland replied to the survey. Of those, 44% operated in manufacturing and construction, 35% were engaged in commerce and trade and 21% were logistics firms. It is thought that the material represents the largest such database in the world.

Key observations in brief:

- Logistics costs accounted for 13% of companies' turnover, which represents an increase.
- Logistics costs accounted for about 17% of GDP, a high figure in international comparison.
- Increasing the transparency of the supply chain is a critical requirement in terms of competitiveness.
- The logistics sector remains dispersed, with ongoing global structural reform.
- Companies operating internationally are clearly more competent than those operating in the domestic markets or in export.
- The majority of the companies are satisfied with the operating environment and transport infrastructure in their location, while the majority of the internationally active companies are dissatisfied with their location in relation to their competitors.

Principal survey results: The survey indicates that logistics costs in Finnish business and industry amount to about 26.4 billion euros. This is 17% of GDP. In relation to the levels in the countries with which we compete, the figure is high: typically logistics costs account for 10–17% of GDP in industrialised countries.

Compared to the results of the 2001 survey, the share of logistics costs in the turnover of companies operating in Finland has increased slightly. In particular, the share of costs incurred in inventory and warehousing and logistics administration has risen. On the other hand, the share of transport costs has decreased. This trend is reflected in the estimates emerging from other European countries in recent years.

Irrespective of the operating sector, major companies have lower logistics costs than SMEs. It would appear that the larger companies have been able to transfer some of their logistics costs to goods suppliers and distributors. Similarly, companies that have production facilities abroad, as well, have smaller logistics costs than those operating in the domestic market.

In an international comparison of key logistics performance indicators, Finnish companies generally fare well. The companies are well aware of the significance of logistics and give themselves fairly good or good marks for competence in all the principal sectors.

In the case of major companies, the key development goal is to increase transparency. For small companies, it is to improve staff competence. In logistics companies, partnership networks and customer service require attention.

Key performance indicators in the logistics markets: In developed countries, including Finland, overall logistics costs account for 10–17% of the gross domestic product. As there is no standard method of computation for logistics costs in the accounts of either businesses or the economy, the figure is an estimate.

Globally, logistics costs amounted to an estimated 6,400 billion euros (13.8% of global GDP) in 2002, to which Europe contributed about 1,230 billion euros. In Finland, the equivalent figure was 26.4 billion in 2005, which was 17% of GDP. Almost one-half of the costs are company internal, which means that in 2002 the logistics markets amounted to about 3,000 *(sic)* euros. (Table 1)

Table 1 ***Key indicators of the Finnish logistics markets (in 2006 prices) in relation to results from previous surveys***

Indicator / year of comparison	**1990**	**1995**	**2000**	**2005**	**Internat-ional compara-tive value**
Logistics costs in industry and trade	€19.1 billion	€15.4 billion	€19.6 billion	€26.4 billion	-
Logistics costs, share of turnover	11.0%	10.3%	10.2%	11.5%	OECD 7% - 10%
Transport costs, share of turnover	4.8%	4.7%	4.5%	5.0%	3% - 5%
Logistics costs in relation to GDP	17-18%	14-15%	14-15%	17%	10-17%

The logistics costs of Finnish companies account for 13% of company turnover on average. This survey differs from previous surveys in that two new cost components have been taken into account. However, even if we discount the new components, the share of logistics costs in company turnover has still increased slightly (10.2% à 11.5%). This trend is reflected in estimates emerging from other European countries in recent years.

The result is explained by the fact that in 2001 the survey covered relatively fewer small and micro-businesses and by the fact that many Finnish companies have significantly expanded their operating and market areas in the last five years. One consequence of this globalisation process has been that an ever larger proportion of the companies' logistics costs is generated outside Finland, and this makes comparison more difficult.

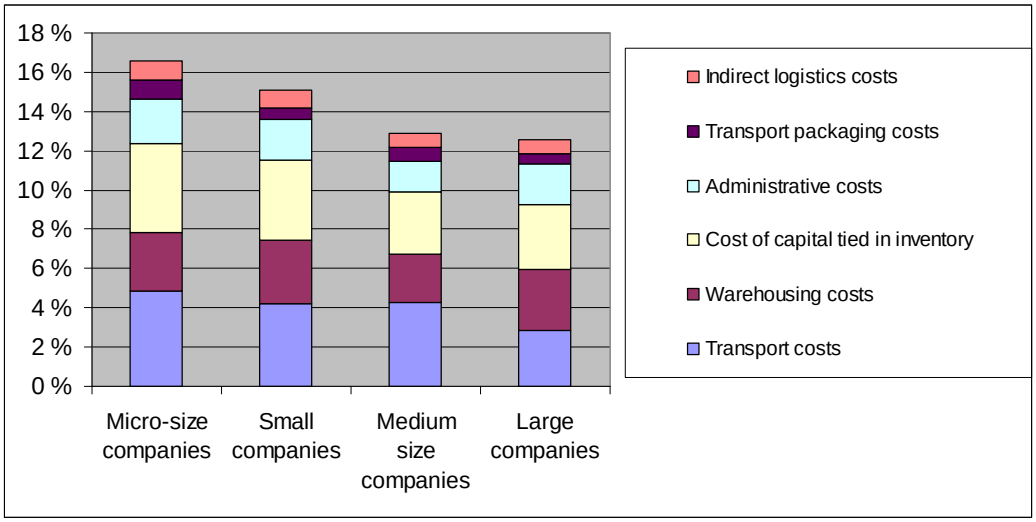


Figure 1 Logistics costs in commerce and trade by size of business, n=618

The logistics costs incurred by internationally operating Finnish companies are significantly lower than those of companies operating in the domestic markets. Major companies have smaller logistics costs than SMEs irrespective of the industry. Larger companies have been able to transfer logistics costs on to suppliers and distributors.

Transport costs account for 5% of turnover on average; this represents about one-third of total logistics costs. Transport now accounts for a slightly smaller percentage of logistics costs than in previous surveys.

The uncertainty surrounding the cost of oil as well as other factors with an impact on transport reflected on the forecast concerning future logistics costs: transport costs form the only logistics cost item that is expected to grow significantly. Companies are able actively to control the development of all other cost items, which are consequently expected to decrease or remain the same.

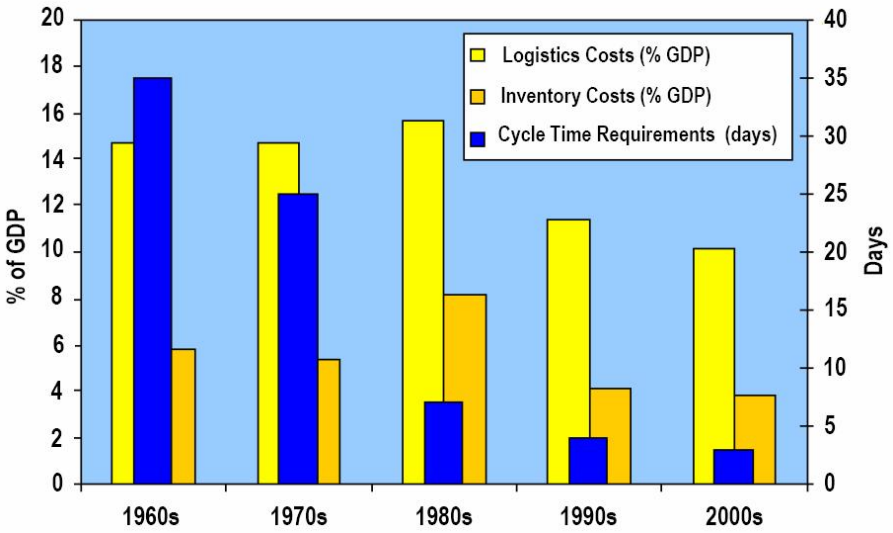


Figure 2 Development of logistics costs in relation to GDP. Source: Hesse et al. 2004, 175.

Logistics indicators: The survey focuses on those key logistics indicators of industrial and commercial companies that relate to faultless customer deliveries by the target companies and to the period of time for which cash is tied up. Major companies as well as those that engage in production abroad fare well in international comparisons, so far as these indicators are concerned. The same companies also state that they are able to exploit the said indicators as well as other logistics indicators in their operation.

Information systems deployed in logistics: Large and medium-sized companies utilise advanced information system solutions (ERP, EDI, extranet, intranet). In small companies, the internet and traditional methods of transferring data relating to orders and deliveries still predominate. Only few exploit RFID (radio frequency identification) technology, but in the next five years its utilisation is expected to increase significantly.

Logistics competence was assessed as 'high' in less than one-third of the small and micro-businesses, while two-thirds of the large companies evaluated their own competence as 'high'. The competence of logistics service providers and goods suppliers was generally rated higher than the competence of the company itself.

Medium-sized and smaller companies are fairly well aware of the significance of logistics, but have only limited opportunities to develop their operations in this field. Conversely, large and internationally-oriented companies have been very successful in this respect. The gap between these two groups seems to be growing.

In major companies, the greatest need for development relates to increasing transparency in the supply chain. This means improved advance information concerning demand and suppliers' ability to deliver.

In smaller companies, the key area for development is staff competence. Companies which operate under pressure from international competition are considerably more competent in managing the supply chain, for instance by using indicators, than companies operating in the domestic markets, irrespective of company size or operating sector.

Outsourcing logistics: The outsourcing of every aspect of logistic services is expected to gather pace. The greatest degree of outsourcing can be found in transport services, and in this field outsourcing has almost come up against its limits. On the other hand, there appears to be a great need to outsource "information logistics" services (logistics information systems, invoicing, order processing) and warehousing activities.

The providers and buyers of logistics services appear to have similar views on the reasons for outsourcing logistics activities. Of the buyers of logistics services, 60% believed that the reason for outsourcing is the need to focus on core competence, 50% cited the need for a flexible service capacity and 40% the need to cut logistics costs. Over 60% of the respondents in logistics companies cited these same reasons.

There are some differences in the views on obstacles to outsourcing. About 30% of industrial and commercial businesses doubt the ability of outsourcing to improve levels of service or to lower costs. They also believe that it is difficult to evaluate and monitor the service provision.

Half of the logistics companies believed that the greatest obstacle to outsourcing is the increased dependency on service providers, while about 40% believed that companies find it difficult to purchase logistic services or that purchased services would result in less control over the logistics operation.

The regions of Uusimaa, Häme and Päijät-Häme provide the best general and logistical, regional **operating conditions** for manufacturing industry. It was not possible to identify similarly decisive regional differences in the operating conditions of trade and commerce. The Helsinki-Oulu axis, on the other hand, provides the best operating conditions for logistics companies.

In comparing their location with those of their competitors, internationally active industrial companies were clearly less satisfied than export companies or companies operating in the domestic markets. This is a significant factor in the competitiveness of companies located and operating from Finland.

The role of logistics as a competitive factor in companies' operations continues to grow. The significance of logistics becomes particularly pronounced when operating in international markets.

The share of logistics costs in companies' turnover shows no sign of decreasing in Finland; on the contrary, since the 2001 survey the percentage share has grown. There has been an increase in both the volume of logistics activity and the quality requirements imposed by customers.

The logistics sector has been the target of global structural reform. As a result of corporate acquisitions, some major Finnish operators have been taken over by foreign players. Structural reorganisation is ongoing in the sector.

Available comparative material indicates that competence in logistics in medium-sized and major industrial firms in Finland is of a good international standard. Furthermore, several companies were identified that apply some of the most efficient logistics solutions in their sector anywhere in the world.

It is becoming ever more important for companies to have the capabilities to operate in an increasingly challenging business environment. Up to now, Finnish companies have kept fairly well abreast of the "moving goal posts", and their flexible solutions have given them the competitive edge, particularly when operating from Finland. However, keeping that competitive edge depends on enhancing their logistics competence. The companies concerned appear to have understood this point. This was reflected in the emphasis that the survey results place on the need for advanced multiple logistics skills.

1 INTRODUCTION

1.1 Finland at a glance

Finland is one of nine countries with shores that open onto the Baltic Sea. The others are Sweden, Denmark, Germany, Poland, Lithuania, Latvia, Estonia and Russia, and today all, except Russia, are member states of the European Union. In many respects the Baltic Sea might be called an inland sea of the EU, even more so than the Mediterranean. And for the EU the Baltic Sea is also a very important transport route to Russia, and through Russia to the Far East.

Shipping plays a vital role in Finland's economy; more than 80% of Finnish foreign trade is based on sea transport. Sweden is the only EU member state to have a land border with Finland, and even that border is located in the sparsely populated far north. The "maritime cluster" of shipping and shipping-related activities in Finland employs some 47,000 people, directly or indirectly. This is about 2% of the country's total workforce.

Transport costs within Finland are over twice the average of those in EU countries. And because of the country's relative remoteness and its long hard winters, the logistics costs of Finland's foreign trade are distinctly higher than those incurred by other countries in the EU.

Constant efforts are needed to lower logistics costs and to increase logistics efficiency. In the new competitive situation that is unfolding with globalisation, economic growth in Russia and stiffening competition in the Baltic Sea region, it is imperative that a long-term and systematic effort is undertaken to strengthen Finland's logistics position. This will also require flexible customs and other official procedures at different stages of the transport chain.

Road transport is the most important mode of transport within Finland. Because of Finland's production locations and structures, railways take a bigger share than in other EU countries. One important aim is to improve productivity in logistics, particularly by making good use of ICT-based technologies.

In 2005, domestic freight traffic totalled 41 billion tonne-kilometres. Of this, road transport accounted for 28.7 billion tonne-kilometres (70%), rail transport for 9.7 billion tonne-kilometres (23.7%), and waterway transport for 4.6 billion tonne-kilometres (6.3%).

A key challenge for Finland's infrastructure and logistics policy is to make sure there is access to reliable and moderately priced international routes to and from Finland's major export and import markets. Another major challenge is to maintain Finland's logistics position as Russia's neighbour, at the same time as the position of Estonia, Latvia, Lithuania and Poland continues to strengthen. The EU is committed to promoting closer EU-Russian integration and to achieving strategic partnership. It is in Finland's best interests actively to promote that partnership.

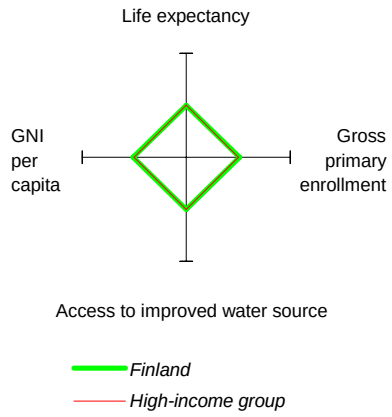
The following tables from the public domain website of the World Bank show the key macro economic indicators of Finland (World Bank).

Finland at a glance

8/25/05

POVERTY and SOCIAL	Finland	High-income
2004		
Population, mid-year *(millions)*	5.2	1,001
GNI per capita *(Atlas method, US$)*	32,790	32,040
GNI *(Atlas method, US$ billions)*	171.0	32,064
Average annual growth, 1998-04		
Population *(%)*	0.2	0.7
Labor force *(%)*	-0.2	0.5
Most recent estimate (latest year available, 1998-04)		
Poverty *(% of population below national poverty line)*	..	..
Urban population *(% of total population)*	61	77
Life expectancy at birth *(years)*	78	78
Infant mortality *(per 1,000 live births)*	3	5
Child malnutrition *(% of children under 5)*	..	..
Access to an improved water source *(% of population)*	100	99
Literacy *(% of population age 15+)*	..	>95
Gross primary enrollment *(% of school-age population)*	102	99
Male	102	100
Female	102	100

Development diamond*

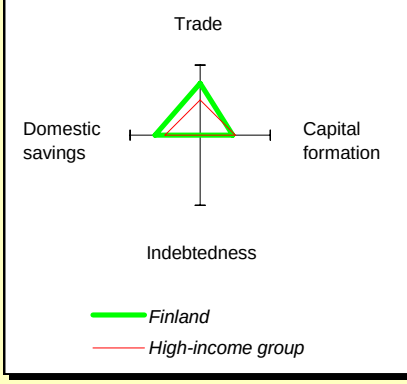


KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1984	1994	2003	2004
GDP *(US$ billions)*	51.5	100.0	161.9	186.6
Gross capital formation/GDP	26.0	17.2	18.5	..
Exports of goods and services/GDP	30.3	34.9	37.0	..
Gross domestic savings/GDP	28.4	23.0	25.5	..
Gross national savings/GDP	26.0	18.2	24.3	..
Current account balance/GDP	0.0	1.1	4.0	4.2
Interest payments/GDP	..	..	..	..
Total debt/GDP	..	..	..	..
Total debt service/exports	..	..	..	..
Present value of debt/GDP	..	..	..	..
Present value of debt/exports	..	..	..	..

	1984-94	1994-04	2003	2004	2004-08
(average annual growth)					
GDP	0.8	3.6	1.9	3.7	..
GDP per capita	0.4	3.4	1.6	3.6	..
Exports of goods and services	3.4	8.2	1.3	..	..

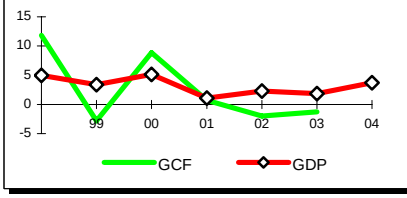
Economic ratios*



STRUCTURE of the ECONOMY

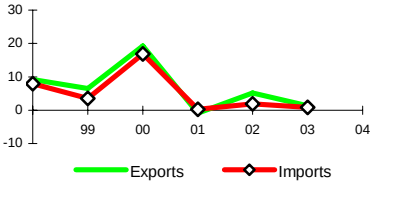
	1984	1994	2003	2004
(% of GDP)				
Agriculture	7.9	5.3	3.5	..
Industry	37.2	32.1	30.5	..
Manufacturing	26.2	24.4	..	..
Services	54.9	62.5	66.0	..
Household final consumption expenditure	51.9	53.5	52.4	..
General gov't final consumption expenditure	19.7	23.4	22.1	..
Imports of goods and services	27.9	29.1	30.0	..

Growth of capital and GDP (%)



	1984-94	1994-04	2003	2004
(average annual growth)				
Agriculture	-2.8	1.5	-0.7	..
Industry	0.8	4.8	-0.1	..
Manufacturing	1.4	6.3	..	..
Services	1.1	3.6	2.1	..
Household final consumption expenditure	1.7	2.8	3.4	..
General gov't final consumption expenditure	1.7	2.0	0.7	..
Gross capital formation	-3.0	4.7	-1.3	..
Imports of goods and services	2.9	6.7	0.9	..

Growth of exports and imports (%)

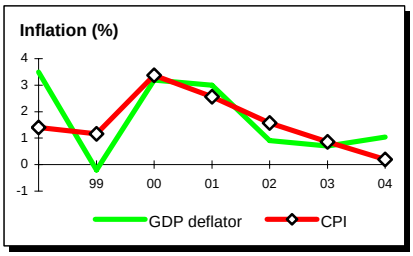


Note: 2004 data are preliminary estimates.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

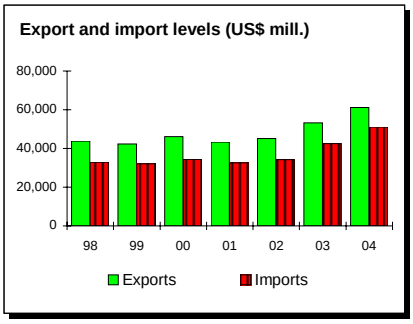
PRICES and GOVERNMENT FINANCE

	1984	1994	2003	2004
Domestic prices				
(% change)				
Consumer prices	7.1	1.1	0.9	0.2
Implicit GDP deflator	8.4	1.8	0.7	1.0
Government finance				
(% of GDP)				
Current revenue	28.1	32.2	..	..
Current budget balance	1.5	-8.7	..	..
Overall surplus/deficit	-1.0	-11.2	..	..



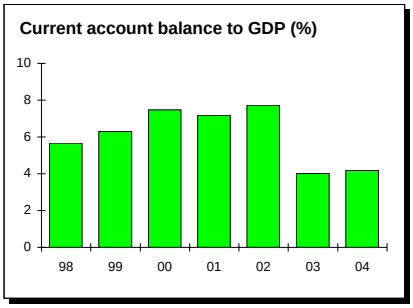
TRADE

	1984	1994	2003	2004
(US$ millions)				
Total exports (fob)	13,472	29,703	53,171	61,144
Food and agricultural raw materials	2,313	3,758	4,366	..
Fuels, ores, and metals	1,228	1,636	3,642	..
Manufactures	9,922	24,297	44,768	..
Total imports (cif)	12,433	23,275	42,513	51,043
Food	774	1,624	2,539	..
Fuel and energy	3,101	2,696	5,210	..
Manufactures	7,537	16,833	30,189	..
Export price index *(2000=100)*	..	..	..	..
Import price index *(2000=100)*	..	..	..	..
Terms of trade *(2000=100)*	90	103	92	..



BALANCE of PAYMENTS

	1984	1994	2003	2004
(US$ millions)				
Exports of goods and services	15,525	35,371	60,630	69,793
Imports of goods and services	14,279	29,493	49,846	59,606
Resource balance	1,245	5,878	10,784	10,187
Net income	-1,095	-4,314	-3,297	-1,336
Net current transfers	-171	-453	-990	-1,041
Current account balance	-21	1,110	6,497	7,810
Financing items (net)	1,845	3,552	-7,006	-6,904
Changes in net reserves	-1,824	-4,663	508	-906
Memo:				
Reserves including gold *(US$ millions)*	3,146	11,430	11,173	13,010
Conversion rate *(DEC, local/US$)*	1.0	0.9	0.9	0.8



EXTERNAL DEBT and RESOURCE FLOWS

	1984	1994	2003	2004
(US$ millions)				
Total debt outstanding and disbursed	..	..	..	..
IBRD	..	..	..	..
IDA	..	..	..	..
Total debt service	..	..	..	..
IBRD	..	..	..	..
IDA	..	..	..	..
Composition of net resource flows				
Official grants	..	..	..	..
Official creditors	..	..	..	..
Private creditors	..	..	..	..
Foreign direct investment (net inflows)	136	1,496	3,436	4,662
Portfolio equity (net inflows)	..	..	..	..
World Bank program				
Commitments	..	..	..	..
Disbursements	..	..	..	..
Principal repayments	..	..	..	..
Net flows	..	..	..	..
Interest payments	..	..	..	..
Net transfers	..	..	..	..

Long distances from the main markets form a definite disadvantage, reducing speed and adding to costs. Long transport journeys involving multiple legs are time-consuming – and time is often the most critical scarcity factor in logistics. One way to reduce the impact of distance is to accelerate speed at all stages of the order-delivery chain.

Logistics is a recognized factor of competitiveness. In Finland logistics is based on efficiency, good transport markets and the development of transport connections. In their decision-making business firms and the authorities take account of the needs of sustainable and competitive logistics.

Education and research in logistics are well respected. Finland has in place a comprehensive education system in logistics which produces competent and knowledgeable people for logistics jobs at all levels. Logistics research is of an internationally high standard. Logistics businesses have considerably stepped up their investment in research and development.

Finland's logistics know-how contribute to the trade and logistics between the EU, Russia and Asia. Finland has taken advantage of its strengths since the Russian market opened up. Logistics has a key role to play in this partnership. Strong logistics boosts competitiveness, economic growth, employment and welfare. The European Union has in recent years been working to open up its transport services market, and the common market will continue to expand as new members come on board.

The main theme of Finland's Presidency of the EU in the field of transport will be logistics. The European Commission published a communication about logistics in June 2006, and Finland will lead the EU member states' discussions about it. The communication responds to the demands posed by the Lisbon strategy by proposing the means whereby logistics can be improved in the EU. Finland has already taken the initiative in suggesting measures that the EU should take to improve logistics:

1) There are still areas of the logistics markets that do not function as they should. The EU should continue to deregulate the logistics services markets.

2) Impact assessments of all relevant proposed EU regulations should also be made from the logistics point of view.

3) At present, there are no systematically collected key indicators to describe the state of logistics in Europe. Suitable indicators need to be identified and specified, and a decision then made as to how, and by whom, they will be monitored and kept up to date.

4) The EU should invest more in logistics research, training and education, in order to improve levels of know-how and achieve more efficient and sustainable logistics.

5) The public sector plays a significant role in the development of logistics. There should be new, more effective and faster procedures in international decision-making with regard to creating standards and implementing ICT-based technologies. There should also be public funding for development work for the public good.

1.2 The fourth logistics survey in Finland

The main themes of the fourth Logistics Survey are:

- logistics costs
- logistics indicators
- logistics information systems
- logistics competence
- logistics operating environment
- outsourcing of logistics

In 1992 the Ministry of Transport and Communications published its first survey on the status of logistics in Finnish industry, trade and construction. Similar reports came out in 1997 and 2001. The surveys commissioned reflected the growing importance of logistics as a factor in companies' competitiveness.

The previous logistics surveys resulted in a higher regard for the value of logistics and more effort to develop logistics generally. In the same way, this 2006 Logistics Survey, carried out by the Turku School of Economics, focuses on the status of logistics in Finland, trends in the field and the need for development and improvements.

The 2001 survey examined in particular future developments, trends in the way Finnish companies approach the issue of logistics and needs for development and improvements. This survey brings up-to-date some of the methods applied, especially regarding the international competitiveness of companies. The investigation also highlights the importance of the efficiency and transparency of the supply chain, rather than individual logistics technologies.

The challenge that logistics presents for Finnish companies is mainly seen in the change that has taken place in the international business environment. But these influences are also felt by companies operating in the domestic market. The response to this challenge comes via the following themes identified within the area of logistics: 1) costs, 2) indicators, 3) information systems, 4) competence, 5) the operating environment, and 6) the outsourcing of logistics.

Companies assess how well their operations fare taking account of five factors: 1) the general operating environment, 2) logistics efficiency, 3) the transport infrastructure, 4) the location of production facilities, and 5) the location of competitors.

Special attention was paid to how representative the sample of companies was and the sample size. For the first time micro and small companies are well represented. The data was mainly collected by means of an on-line questionnaire. This meant that the respondents could be sent a tailor-made summarised report.

The methodology applied in LOG4 forms the basis of the Logon Baltic[1] Interreg project that was begun by the Turku School of Economics in spring 2006. This project will produce international reference data for comparison on the countries in the Baltic Sea region.

[1] Logon Baltic=Developing Regions through Spatial Planning and Logistics & ICT Competence. More information on the project is available at www.logonbaltic.info

The diagrams (Figures) in the report are an attempt to condense the immense amount of data into a form that is as clear as possible to discern the main trends easily. The data the diagrams are based on can be found in Excel file format from July 2006 at the Turku School of Economics website: http://www.tukkk.fi/markkinointi/log/LS/ls.htm.

2 SURVEY DESIGN

- The target groups in the survey: manufacturing, trade and logistics services
- More than 2,200 respondents, all sizes of company and sectors well represented
- Broadest range of data globally
- Indirect costs and alternative costs taken into account

2.1 Target group and sample

The three target groups in the survey are:

(1) Finnish manufacturing companies (includes construction sector)
(2) Finnish trading companies
(3) Finnish companies offering logistics services

These will be known here as the 'main sectors'. In this report they are divided up further in accordance with the Finnish Standard Industrial Classification system (TOL 2002), which adheres to the Nace Rev. 1.1 system of classification, which is used by the European Union.

The data in the survey was collected over the period March-April 2006. The main method used was an on-line questionnaire. Each questionnaire consisted of 25-28 (depending on the main sector) groups of questions in Finnish. The groups of questions were structured so as to establish the best possible comparability with international data.

A total of 16,231 persons were sent an email asking them if they would take part in the survey[2]. The number of those who agreed to take part was 2,255, i.e. the response rate was 13.9%. Each respondent received a personal link in an email to an on-line questionnaire. A reminder email was sent to those who had not replied after a week. The respondents had a month in all from the time of the initial request to complete the survey.

Of the respondents, 44% (985) represented manufacturing and construction, 35% (788) trade and commerce and 21% (482) logistics companies (Attachment 1 and Attachment 2). The data in this report has generally been categorised according to the size of a company and the extent to which it might be considered an international concern. Company sizes are defined as micro, small or medium-sized in accordance with the European Commission's recommended system of denoting a company's size by its turnover in 2005, as follows (European Commission 2003):

[2] The exceptionally large number of potential replies was possible because the researchers were able to send the questionnaire to the personal email addresses of all the members of the Finnish Association of Logistics and the Federation of Finnish Enterprises. Information on the survey was also included in the electronic newsletter sent to members of the Confederation of Finnish Industries.

- Large companies: more than €50 million
- Medium-sized companies: €10 – 50 million
- Small companies: €2 – 10 million
- Micro companies: €0 – 2 million

To ensure that there was good regional coverage, in April 2006 106 telephone interviews were conducted with medium-sized manufacturing companies and trading companies[3]. The same questionnaire was used.

When the questionnaires were completed, a preliminary analysis was made of the data and this formed the basis of two group discussions. The first was attended by 10 members of the Logistics Committee of the Confederation of Finnish Industries (EK). The second group discussion focused on logistics in small and medium-sized companies, and that was attended by eight representatives of SMEs. The aim of these meetings was 1) to validate the main findings of the survey, 2) to identify factors that would explain the findings 3) to innovate ways of improving the status of logistics in Finland. In addition to the group discussions, supplementary interviews were conducted with big trading chains (three companies) and five companies in the technology manufacturing industry.

The company size and main sector were generally used as background parameters. In the case of manufacturing, the degree to which the company was considered to be international was also taken into account[4].

Table 2 Respondent companies by size and classifications applied in the survey

	Manufacaturing and construction				Trade	Logistics service providers	N
Size	Domestic	Export	International	Total			
Micro	473	72	38	583	523	227	**1333**
Small	91	58	21	170	149	119	**438**
Medium-sized	21	46	43	110	63	68	**241**
Large	19	30	69	118	53	68	**239**
Total	**604**	**206**	**171**	**981**	**788**	**482**	**2251**

2.2 Main themes of the survey

The LOG4 survey examined the fields (themes) of logistics mainly at the three upper levels shown in Figure 3. The investigation was mainly concerned with the following areas: 1) logistics costs, 2) key logistics indicators, 3) logistics information systems, 4) logistics competence, 5) the logistics operating environment, and 6) the outsourcing of logistics.

[3] The telephone interviews were conducted by a group of logistics students: Matti Takalokastari, Tuire Pernaa, Marjo Kalske, Jukka Mäkiranta, Mirja Ajanko, Anssi Lappalainen, Maija Katila, Eeva Aarnio, Petri Murto, Kati Kenttä, Mikko Taipale and Aku Lehtimäki. Maiju Rantanen was responsible for the sections on productivity in the transport sector and the structure of the market.

[4] International company = at least one production unit abroad.
Export company = at least 10% of turnover comes from exports; no production facilities abroad
Company operating in the domestic market= at least 90% of turnover is sales is in Finland; no production facilities abroad

The large number of replies also makes it possible to examine general and logistic operating conditions in companies regionally. The results are set out by region (not Åland). Information on the companies' main place of business was gathered by postcode, which also allows a more detailed analysis to be made than would be possible by just referring to the Finnish regions.

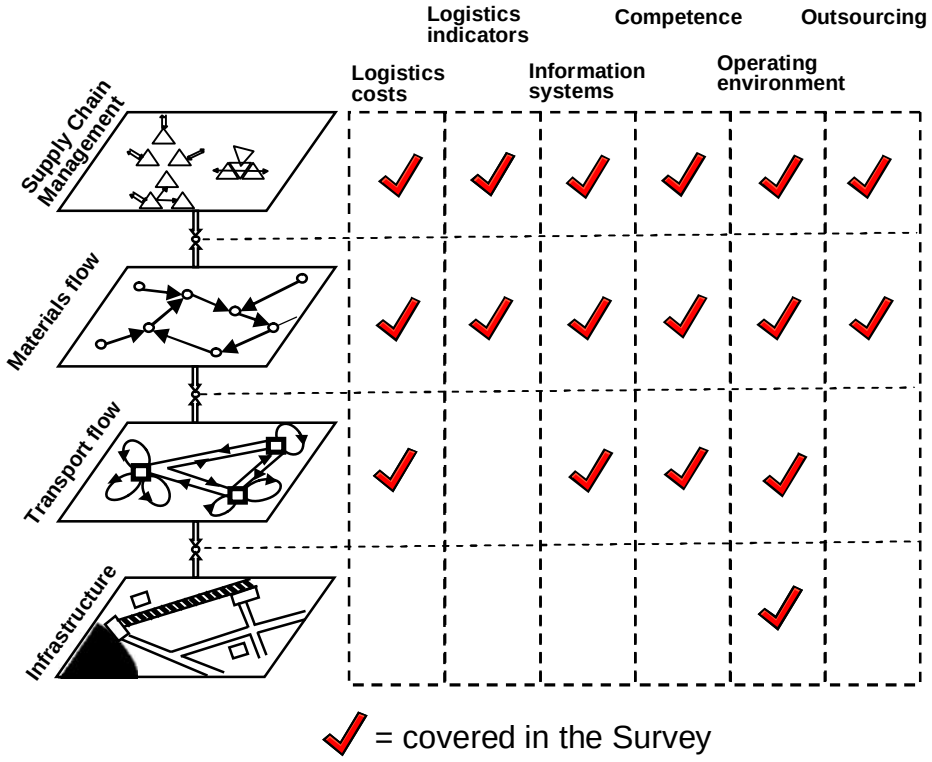


Figure 3 Themes covered by the survey

2.2.1 Logistics costs

How logistics costs are viewed varies from one company to another, even within the same sector. Traditionally, companies have taken account of logistics costs, in particular those categorised as direct and operational costs, such as transport and storage. Tangible operational costs are generally relatively easy to measure, whist on the other hand some of the costs are 'hidden'. In these cases there is frequently a margin for a company's own operational costs and the internal costs of operations can therefore be difficult to determine or perceive as a logistics cost. Logistics costs may also incorporated into production and/or marketing costs.

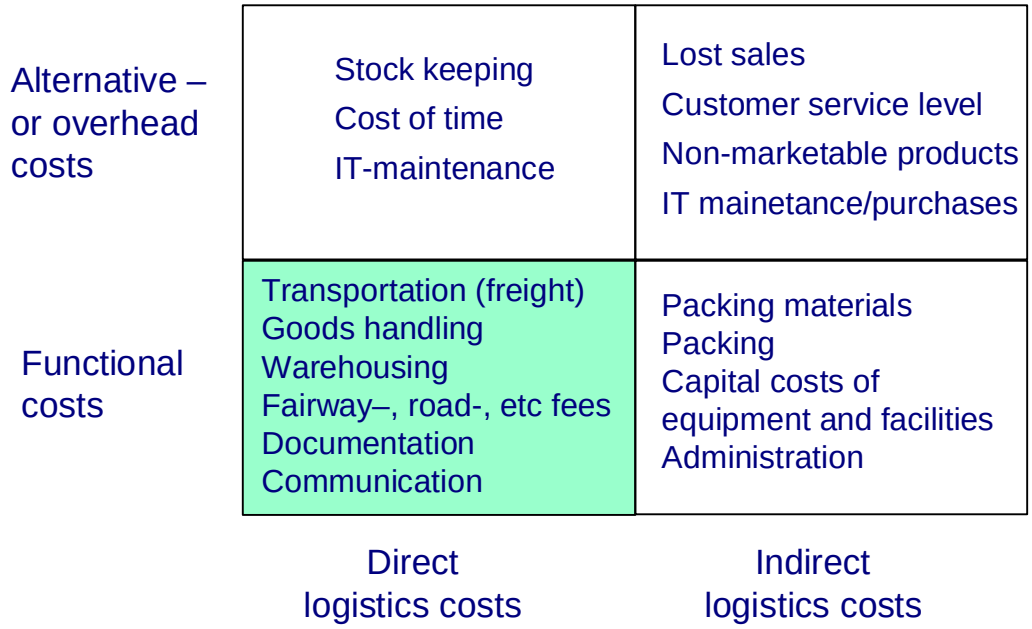


Figure 4 ***Taxonomy of logistics costs: the arrows depict priorities for indirect and optional costs under pressure from the competition***

2.2.2 Key logistics indicators

The survey used open-ended questions to discover to what extent companies used certain key logistics indicators and absolute values. The indicators were largely based on the SCOR model established by the Supply Chain Council in the United States.[5] Logistics indicators highlight a company's ability to gather logistic data and use it to its advantage in order to boost its logistic efficiency. International comparability has been taken into account in the range of indicators selected.

Companies' logistics indicators were dealt with in the survey both qualitatively and numerically. The use of indicators was dealt with qualitatively by asking the question: 'How well is your company able to use the following indicators to steer its operation?'. The indicators covered were warehouse replacement rates, costs per delivery, faultless customer deliveries, the punctuality of supplier deliveries, and the period of time for which cash is tied up. The respondents were given four alternative answers ranging from 'not at all' to 'very well'.

2.2.3 Logistics information systems

Logistics information systems in this survey refer to any such systems that the main sectors which are the target groups use or can use as part of their logistics operation. It is a purposely wide area because the investigation aimed to obtain a general picture of the information systems used and the importance of their role in the companies surveyed. In this survey data on the use of information systems is processed with the emphasis on the importance of the dissemination of infor-

[5] http://www.supply-chain.org/index.ww

mation with other members of the supply chain (suppliers, customers, suppliers of logistic services).

There is fairly limited use of computerised systems, in small companies at least. For example, Hoffmann et al. (2005) examined the use of information systems in 261 companies in the Turku area. The results show that in SMEs traditional methods of sending messages in (phone, fax) are still prevalent. Even the use of email has only recently started to become more common in small companies. Large companies more frequently rely on customised IT solutions, whist SMEs often do not have the necessary preconditions for increasing the use of electronic systems and services.

2.2.4 Logistics competence

To examine logistics competence, this survey uses the 'Professional Qualifications in Logistics' analysis of logistic competence established by the training unit of the European Certification Board for Logistics (ECBL), which was founded by the European Logistics Association (ELA).

The analysis contains a detailed list of different areas of logistic competence which are attained with courses in logistics certified by the ECBL offered around Europe. In this survey the analysis is used in simplified format, borrowing the basic elements of the subject areas in the training programmes for 'Junior', 'Senior' and 'Master' levels, as follows:

- Transport
- Warehousing
- Materials management
- Inventory management
- Logistics management

2.2.5 Outsourcing of logistics

There has been much research into the subject of outsourcing logistics operations and there is a good deal of data available internationally. In general it could be said that third party logistics is gradually changing from the service concept that focuses just on transport and storage to one that caters for the entire supply chain. The growth in demand is moving away from transport and storage and towards more demanding services, such as inventory management and customer services, whilst at the same time logistics companies are trying to improve their technical facilities and services. There is more effort being made to understand the customer's needs and cooperation more often takes the form of long-term partnerships.

2.3 International reference data

2.3.1 ELA / AT Kearney Excellence in Logistics 2004

The European Logistics Association (ELA[6]) and the consulting firm A.T. Kearney have published a logistics survey which, in principle, covers Europe as a whole since the year 1998. The data in the survey is based on information pertaining to around 200 large companies. It partially covers the same areas as LOG4, such as logistics costs, logistics indicators and outsourcing. As regards logistics costs, this survey employs a distribution framework that aligns fully with the ELA/A.T. Kearney survey.

2.3.2 Langley's survey on third party logistics

The survey by Langley et al. (2005) on third party logistics is the tenth in the series. Geographically, the survey covers North America, Western Europe, Asia's Pacific region and Latin America. Its data is based on the responses of 1,091 companies in these regions. It is globally the most comprehensive study of the available surveys on the subject of third party logistics. The findings on the outsourcing are comparable with those in Langley's report.

2.3.3 Reference data based on the SCOR model

The SCOR model (Supply Chain Operations Reference Model) is a process reference model developed by the Supply Chain Council[7] to analyse and develop supply chains. SCOR consists of standardised process descriptions, supply chain performance indicators, and methods of working that have been found to be successful. This present survey mainly covers elements of the top level referred to in the model. These include the period of time for which cash is tied up (cash to cash cycle time) and faultless customer deliveries (Perfect Order Performance).

The international reference data based on the SCOR model is available to its members at the Supply Chain Council's website. One of the banks of data used most often in this present survey is Bordeaux École de Management's 'European Benchmarking with the SCOR Model' (Neser 2002 and Supply Chain Council 2003), which consists of data from 69 large European companies.

2.3.4 The use of information systems in companies offering logistic services

The survey by Kee Hung Lai et al. (2005) gives an interesting reference data for comparison on the use of information systems by logistics companies in Hong Kong with customers and sub-contractors. The study examines how commonly more advanced systems such as EDI and ERP are used. Their data covers 187 logistics companies in different sectors. Of these, 69% were business operations units in companies that operate internationally.

[6] http://www.elalog.org/
[7] http://www.supply-chain.org/index.ww

2.3.5 Macro-level logistics costs

A study by Rodrigues et al. (2005) makes estimates of macro-level logistics costs globally. This present survey uses the results to make key comparisons between countries.

2.4 Reliability of the survey

The study's reliability can be examined either in terms of the investigation as a whole or in part. It is connected with how valid, general and useable the data obtained is. The reliability of the indicators applied needs to be evaluated in terms of how accurately phenomena are measured (reliability) and their validity. It is essential from the point of view of the findings that the indicators used measure what is intended, i.e. that the findings in the study are valid and that they are not arbitrary, i.e. that they are reliable.

Among all the Finnish companies that replied to the survey, large companies are somewhat over-represented numerically. The significance of sector is taken into account in the analysis of results. Inter-sectoral differentials are taken into consideration in determining average logistics costs for the main sectors at macro level by weighting sectors on the basis of their share of turnover with reference to general data produced by Statistics Finland.

The study data was processed to highlight as much as possible the effect of various background parameters on the findings. The data was mainly examined by grouping it according to (company) size, sector, methods of production or some other variable. Findings within such groups were mostly treated as having equal value, so the results are largely based on averages or totals for the different groups.

For example, the analysis employed several different methods with regard to logistics costs. In the investigation between the categories for company size the companies were all given the same importance in determining average costs. In the inter-sectoral investigation a company's importance was determined on the basis of its turnover.

The survey was carried out in the form of a questionnaire, so there may have been errors made before the data was collected, e.g. the respondent misunderstood a question or an answer was fed in by mistake. Before it was analysed, any findings that were patently unusual or useless and their error sources were eliminated, based on earlier empirical data and theoretical background data.

Most of the questions were 'closed' and the respondents had to choose given optional answers or select numerical values from a dropdown menu. The only 'open' questions were connected with company-specific indicators, such as orders, payment terms and material flows.

Each component of a company's logistics costs were asked about separately, and the size of each cost item in a dropdown menu had to be selected in terms of a percentage (0.1, 2 - 50) of the whole. Overall logistics costs are shown as a to-

tal of these components. For small cost items (often, for example, transport packaging costs or indirect costs), the use of whole percentage points is not quite exact. The method is nevertheless valid for such a large sample of respondents because there is no unambiguous definition of logistics costs.

It is to be noted that the respondents did not necessarily have to hand all the information they would have liked when answering the survey. Instead, the answers are, at least partly, based on their personal impressions. The answers might therefore partly reflect their hopes and fears in addition to objective points of view. The personnel group distribution of respondents (Attachment 1) suggests, however, that those answering the survey can be assumed to have an excellent general idea of the subject of the survey.

In exchange for their views, the respondents were promised a tailor-made report, which itself increased motivation to answer the questions in the survey as truthfully and carefully as possible. This was also suggested by the fact that the surveys were completed with the utmost care and the multi-choice questions were hardly ever left blank.

The heterogeneous nature of the companies that took part should not be viewed as a negative factor or one that impairs the study's reliability. The diverse range of respondents gives a more realistic picture of the position of logistics in Finnish business than would be the case if the survey had merely covered companies that were advanced in the area of logistics.

When the numerical results in particular are examined, it has to be realised that they are based on the survey and not on any exact quantitative analysis, such as an analysis of yearly financial statements. The data, however, is uniquely extensive and represents Finnish business well in terms of sector, company size and geographical location.

To our knowledge, there is no published literature in the field internationally which presents findings on the subject backed by such extensive data. Given the size of Finland in particular, the claim might be made that this is the most comprehensive set of data on company logistics that exists in the entire world.

3 THE ROLE OF LOGISTICS IN MANUFACTURING AND TRADE

Key obeservations:

- The development of logistics has been the integration of dispersed functions
- In developed countries logistics costs are approx. 10 %-17 % of GDP
- The share of logistics costs in developed countries has diminished whilst the volume of logistics activity has grown
- At the level of the logistics environment there is a strong correlation with a country's national income

3.1 Logistics cost drivers in different industries

The term 'business logistics' is generally used of logistics in manufacturing and trade. Some logistics functions and operations have traditionally been organised internally by a manufacturing or trading company, although if customer's requirements are to be met with no increase in expenditure there needs to be better integration of these functions and operations (Figure 5). Fiercer competition, technological developments and global business strategies have been the main reasons why companies have wanted to coordinate their supply chain from the suppliers of raw materials up to the end users.

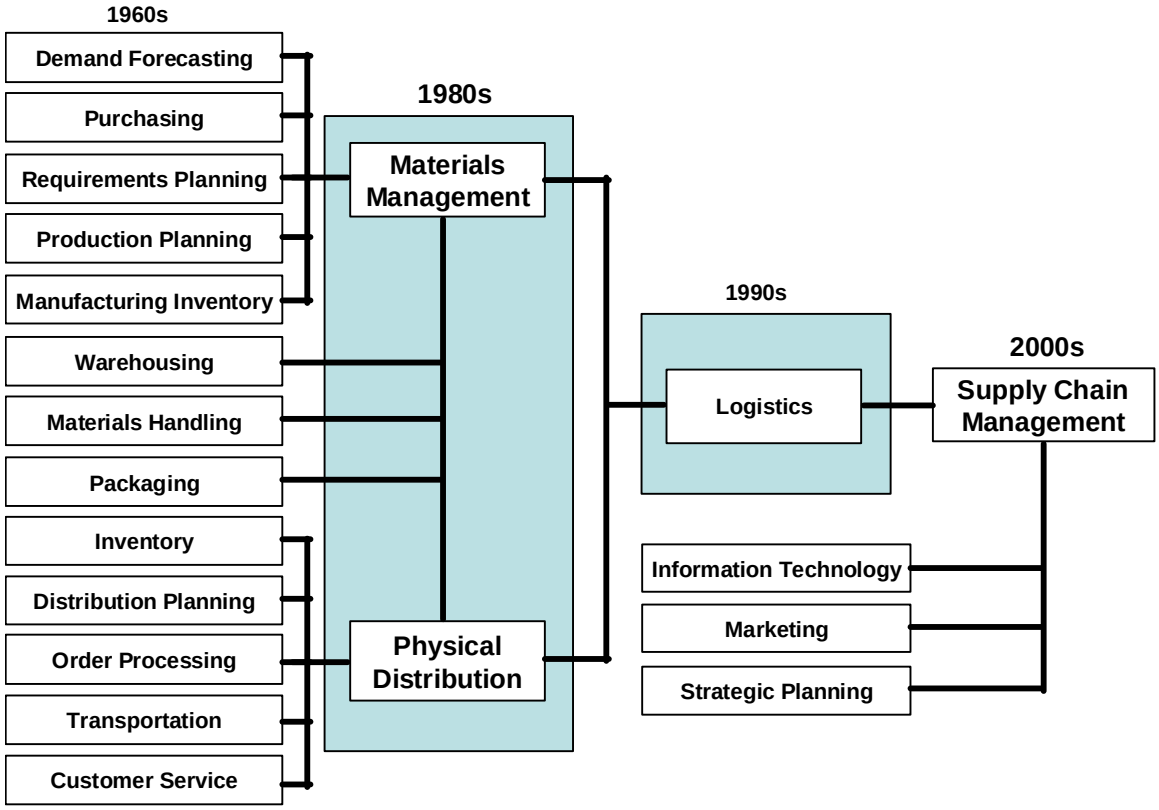


Figure 5 ***The trend in the development of logistics integration, from individual functions to management of the supply chain; the years mark the timespan involved***

Firstly, in principle at least, if the management of the supply chain is to be effective, the logistics functions throughout the chain need to be coordinated, so that information and material flows can be made to run seamlessly through the chain. Secondly, management of the supply chain needs to focus on minimising costs incurred by the end user. Thirdly, effective management of the supply chain requires the dissemination of information and the spread of risk between the various components of the entire supply chain. Fourthly, the number of suppliers should normally be cut to create effective and efficient chains of cooperation and partnership.

It is extremely difficult to achieve these goals fully. Sharing information on supply and demand between partners in particular, can prove impossible, for reasons of competition, even if this could be a way to cut logistics costs. This was also demonstrated from the results of the LOG4 survey.

The development in logistics operations has been rapid, especially in assembly plants in, for example, the electronics and car industries, where component costs are high. The higher the share of costs of materials components are in relation to the end product, the more important the compatibility of logistic functions becomes. Sectors can vary very much in this area. Figure 6 illustrates the value added achieved in four industries.

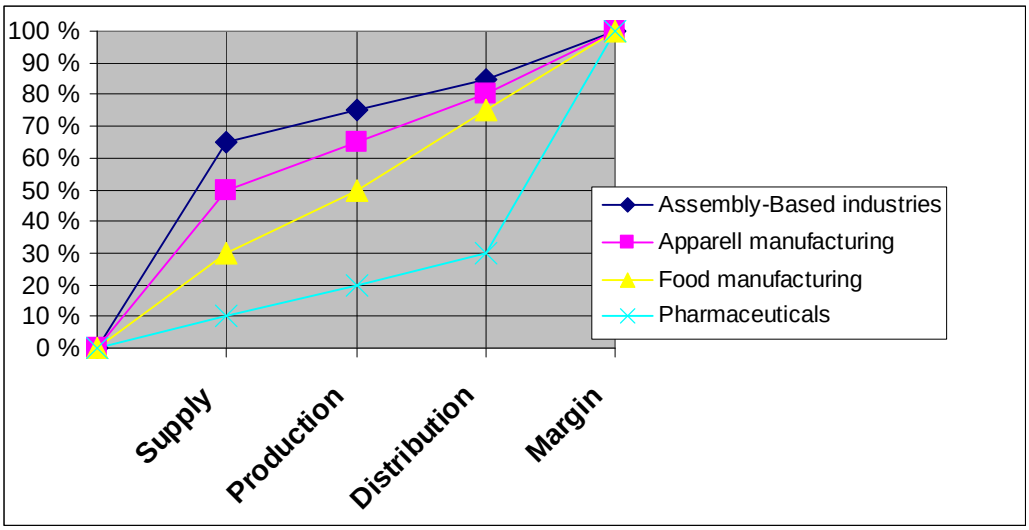


Figure 6 ***Value added at different stages of the supply chain in four example industries. The diagram is for reference and not based on the data in this survey.***

The indirect costs of logistics may be very high, but it can be hard to measure them. For example, none-marketables in the high quality product assembly industry is often a considerably greater cost item than transport.

When the costs of materials are high, companies generally keep the supply cycle of products short in order to minimise the costs of storage and price erosion. For example, in the electronics industry the components needed for the products

might account for over 70% of the value of the end product. The lifecycle on the market of such products as these is frequently short.

On the other hand, in the pharmaceutical industry, for example, raw materials account for a small part of the end product's price, research and development accounting for a major share of costs. Similarly, the profit margin on sales is large, especially when the drugs are patent-protected. In the food industry, costs divide up fairly evenly between the purchase of raw materials, production and distribution.

3.2 Logistics value chain and globalisation

Globalisation, shorter response times and outsourcing have resulted in a situation where there is greater pressure on manufacturing businesses to engage in more efficient, effective and cheaper logistic activity. The integration of the supply chain is a means for companies of gaining a competitive edge.

As they also adapt to these changes in the business environment, logistics companies are trying to offer even wider packages of services and operate in a geographically wider area. As well as firms that offer transport and storage services those that provide IT and consultation services have also become a fixed feature in the logistics market.

One consequence of the changes in the business environment is the development of 'third party' logistic services and the companies that provide them. Logistics is one of the most frequently outsourced components of a business, and many companies have established long-term partnerships with these third party firms that offer external logistics services. With globalisation the control of business is becoming ever more complicated. At the same time, logistics has become a fundamental part of the global value chain.

Whilst companies try to cut costs, developing countries have become competitive producers of many commodities. This has led to increased goods flows from countries where costs are low to production and assembly units and the close proximity of production sites to consumers. The rapidly growing transport market, especially with regard to global container traffic and air cargo will in a very short time have reduced the transport costs of general cargo (individual items) significantly.

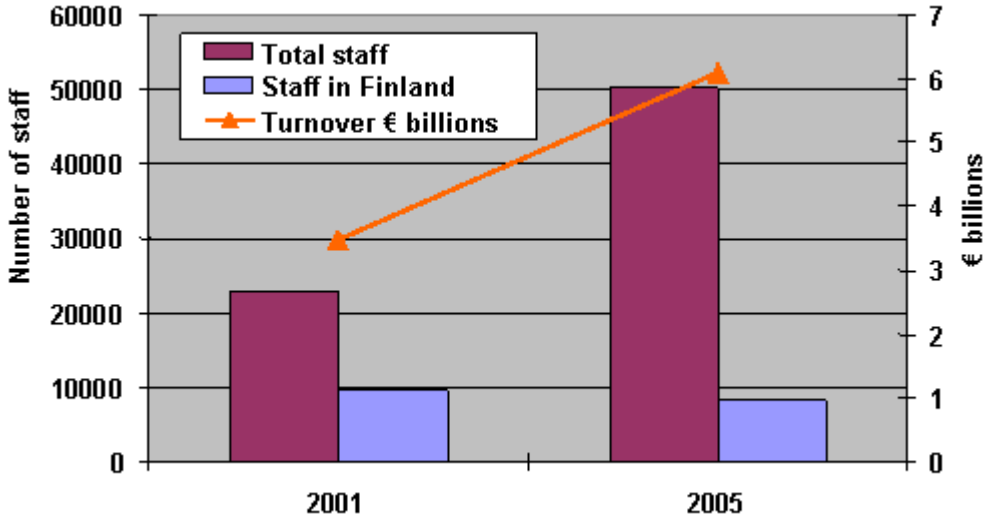


Figure 7 ***Turnover in 11 Finnish electronics contract manufacturers[8] and number of staff employed in Finland 2001 – 2005. Source: Companies' annual reports***

For example, the cost of container sea freight from East Asia to Europe is very low in absolute terms. The cost of transportation by container of, for example, one microwave oven to Europe is less than €1, while that for a T-shirt is 1-2 cents per product. Onward distribution and handling of products to a destination in Europe is often many times more expensive than ocean freight.

The trend observed with Finnish contract manufacturers in the electronics industry is a good example of how the focus of production has moved geographically closer to the main markets. Turnover in the sector has more than doubled in five years whilst the number of staff employed in Finland has fallen (Figure 7).

There are different requirements for different types of commodity flows in terms of the logistics chain, which naturally affects the planning of deliveries. When planning transport flows attention needs to be paid to long distances, complicated customs and trade regulations, and the inadequate infrastructure in many places. Security threats have also meant there are many new checks on cargo and documents required in international logistics operations.

3.3 International comparison of macro level logistics costs

In developed countries overall logistics costs account for 10 % - 15 % of GDP. The figures are based on different types of estimates as there is no established method of estimating logistics costs in the accounts of either businesses or the economy.

Compared internationally, logistics costs have been seen to drop since the 1980s when the point of reference has been GDP. This decrease has coincided with a dramatic fall in turnaround times. The fall in logistics costs is largely due to the management of more efficient supply chains.

[8] Elcoteq, Perlos, Salcomp, Aspocomp, Scanfil, Elektrobit, Savcor, Efore, Foxconn Suomi, Incap and Gencorp.

An examination of logistics costs at the level of the national economy is somewhat hampered by the lack of any consistent system of keeping records, access to information and differences in the quality of source data[9]. The figures given in different sources can differ considerably from one source to another. Enough data is normally available from EU and OECD countries to make an estimate.

The latest comprehensive survey on the subject is the econometric model by Rodrigues, Bowersox and Calantone (2005)[10]. It states that logistics costs globally in 2002 stood at $6,700 billion (approximately €6,450 billion). This would correspond to around 13.8% of global GDP. Costs had risen by 32% by 1997 and around 5 % by 2000.

In the model proposed by Rodrigues et. al (2005), logistics costs fell in most developing countries outside Europe. Costs in North America were the lowest of all (Table 3). In Europe, on the other hand, costs rose in countries like Germany, the UK, Belgium and Denmark, which engage in a good deal of foreign trade (Table 4). The share of foreign trade may help explain the findings, because in the model it receives a fair amount of attention[11]. The article itself does not analyse reasons for the changes in costs.

Table 3 Global logistics costs in different areas of the world in 1997, 2000 and 2002. Source: Rodrigues, Bowersox and Calantone (2005)

	1997		2000		2002	
	Log. costs		Log. costs		Log. costs	
Region	US$ bill.	% GDP	US$ bill.	% GDP	US$ bill.	% GDP
Europe	884	12.2 %	1,100	12.8 %	1,229	13.3 %
N. America	1,035	11.0 %	1,240	10.6 %	1,203	9.9 %
Pacific region	1,459	14.5 %	1,989	15.3 %	2,127	15.7 %
S. America	225	14.3 %	280	14.4 %	272	14.3 %
Other areas	1,492	15.4 %	1,778	15.7 %	1,902	16.0 %
Whole world	5,095	13.4 %	6,387	13.7 %	6,732	13.8 %

According to Rodrigues (2005), logistics effectiveness in developed countries has risen, but no equivalent rise is discernible on the global scale. Estimates such as those presented in the Rodrigues model may be criticised for being inexact, but the study does show fairly reliably how vitally important investment in the infrastructure is and its connection with logistics costs.

The Council of Supply Chain Management Professionals (CSCMP[12]) estimates India's logistics costs as 11% of its GDP and as much as 21% in the case of China. In the USA the figure is thought to have fallen in 25 years from 14.5% to a current level of 8%.

[9] Key factors include how the costs of the transportation infrastructure and public sector logistics costs have been taken into consideration. The figures in the Logistics Survey 2006 do not include these.
[10] Rodrigues, A. M., Bowersox, D. J. & Calantone, R. J. (2005) Estimation of Global and National Logistics Expenditures: 2002 Data Update. *Journal of Business Logistics*, Vol. 26, No: 2, pp. 1-16.
[11] According to the OECD, the value of German trade in 2003 (exports + imports) was 57% of GDP, while that for the USA was 17% of GDP. (OECD in Figures, Supplement 2005/1, Paris)
[12] See www.cscmp.org

Table 4 ***Comparison of logistics costs in European Union countries. Source: Rodrigues, Bowersox and Calantone (2005)***

	1997		2000		2002	
	billion USD	% of GDP	billion USD	% of GDP	billion USD	% of GDP
Belgium	27	11,4 %	33	11,6 %	35	12,1 %
Denmark	16	12,9 %	20	13,0 %	23	13,6 %
France	158	12,0 %	177	11,9 %	186	11,6 %
Germany	228	13,1 %	323	15,3 %	374	16,7 %
Greece	17	12,6 %	24	12,9 %	26	13,0 %
Irland	8	14,0 %	19	15,3 %	21	14,9 %
Italy	149	12,0 %	167	11,8 %	186	12,2 %
Holland	41	11,9 %	50	11,8 %	56	11,8 %
Portugal	19	12,9 %	24	13,6 %	25	13,4 %
Spain	94	14,7 %	107	13,3 %	124	14,1 %
UK	125	10,1 %	157	10,7 %	174	11,3 %

This estimate differs somewhat from that proposed by Rodrigues (Table 3). It is the dramatic fall in costs of capital tied up in stock that has mostly brought about the change in the USA. The CSCMP estimates that logistics costs in Europe account for at least 11 % of GDP (The Economist, 2006).

3.4 Companies' logistics costs compared at European level

The European Logistics Association (ELA) has been conducting surveys on trends in logistics in Europe since 1982 in conjunction with consulting firm A.T. Kearney. The ELA has produced such a report every five years.

The results of the 2004 survey are based on answers by representatives of companies in manufacturing and trade. The respondents, almost 200 large European companies, represent the most advanced approach to logistics in their sector. Accordingly, it is not very easy to generalise about the findings. The surveys were nevertheless conducted using the same method, so their time series gives valuable information on changes in the business environment.

As a result, costs are presented here as a frame of reference and there is no reason to make a direct comparison with the findings of the LOG4 survey: the level of costs in the ELA/A.T. Kearney survey for 2003 would appear to be about half those of the companies taking part in the LOG4 survey. In practice logistics costs may be this low only if the value added of the respondent companies is relatively high (Figure 8).[13]

[13] The 2003 figures give a separate presentation of transport packing and packaging costs. This had been included in transport costs in earlier surveys.

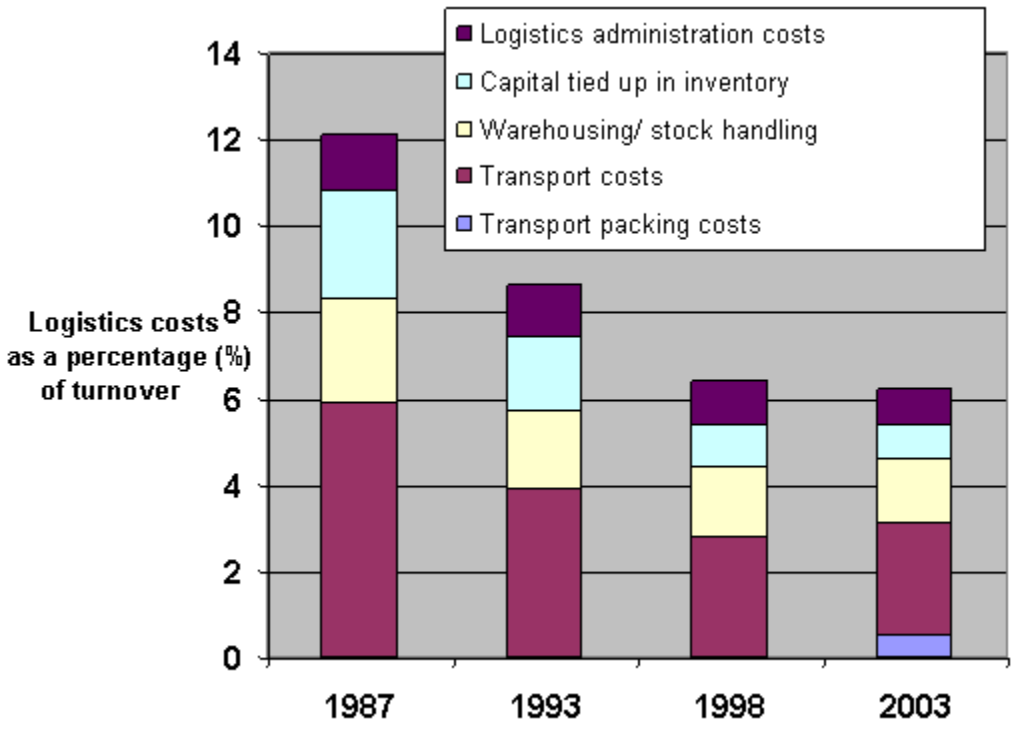


Figure 8 ***Logistics costs as a percentage of companies' turnover in the ELA/A.T. Kearney survey. Source: European Logistics Association and A.T. Kearney (2004)***

According to the time series in the ELA/A.T. Kearney survey, logistics costs have fallen significantly in the last few decades, whilst companies' logistic operations have become more complex with the rapid rise in globalisation and product variations, etc. More efficient data processing methods have, on the other hand, lowered logistics costs. It is mainly large companies which invest in information systems, which partly explains the falling trend in the ELA's data.

3.5 Role of logistics in developing countries

Finnish companies tend to operate more and more in countries where levels of logistics developments are low and logistics costs are higher than in Finland. There is a huge variation in the degree to which logistics functions and the logistics environment are developing from one country to another.

In most developing countries the logistics market is small and levels of competence low, which of course makes it difficult to engage in business in these countries or via them. In many such countries the general economic and political situation is extremely problematic, and their own resources are insufficient to correct the situation[14].

Direct international investment by companies often has a key part to play in helping developing countries to improve their logistic business environment. It can trigger a virtuous circle where the location of production and logistic ser-

[14] One of the most problematic regions in this connection is Central Asia. See, for example, the Human Development Report in Central Asia, UNDP 2005, www.undp.org

vices follow and reinforce one another, resulting not only in international investors but also local companies being able to exploit the improved business environment[15]. Development is expedited though cooperation between the national authorities and the business community to do away with the barriers to international trade and transport. The initial impetus often starts on an initiative from players in global development.

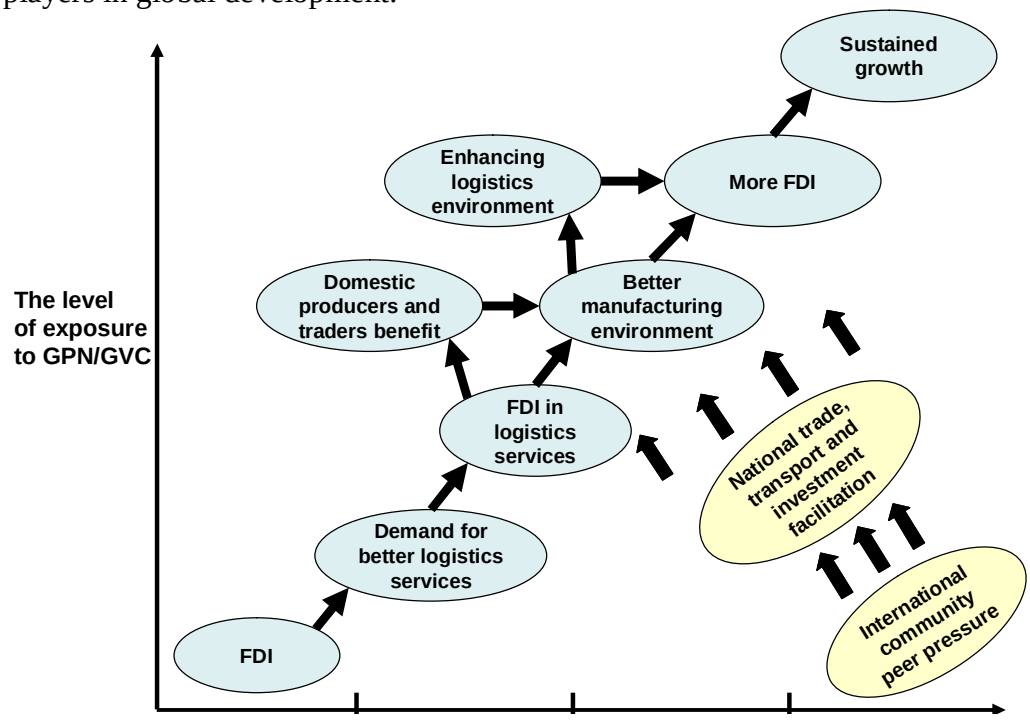


Figure 9 ***Foreign investment as a force for change in the logistic environment of developing countries. Source: Ojala et al. 2006***

The new EU countries have managed in a short period of time significantly to improve their logistic environments. Logistics players have overcome problems with the infrastructure by being able to develop logistics concepts. A consistent approach on the part of governments, direct foreign investment and considerable financial support from the EU have been crucial for the rapid positive development in the new EU countries.

The round of EU enlargement in 2004 meant significant changes for the 10 new Member States, particularly in the areas of customs control, checks on goods and border control. On the other hand, official practices within the EU can vary considerably between the different countries. Among these are practices to do with VAT, for example. Such a situation led *inter alia* to changes in the Baltic countries in transit goods flow routes from Latvia to Estonia and Lithuania.[16]. EU enlargement has thus increased competition in transit flows between Member States and the countries' authorities need to monitor the competitiveness factors obtaining in the business environment more vigilantly than they used to.

[15] China's economic growth, for example, would not have been possible but for rapidly developed logistics activity. Relatively still faster developments have taken place in Vietnam, which has gone from being one of the world's poorest countries to a major producer of textiles and electronics. There has been no comparable development in any of its neighbouring countries.

[16] This is discussed in the World Bank report by Ojala et al. (2005) called 'A Trade and Transport Facilitation Audit of the Baltic States'.

How ‘logistically friendly’ the logistics infrastructure is in different countries viewed as trading partners can be examined in many different ways. Many players from both the public and private sector are involved in trade and transport operations. Included in the process could be banks and insurance companies as well as various companies providing logistic services. In addition, the parties involved in trade often assess practical measures on a case-by-case basis.

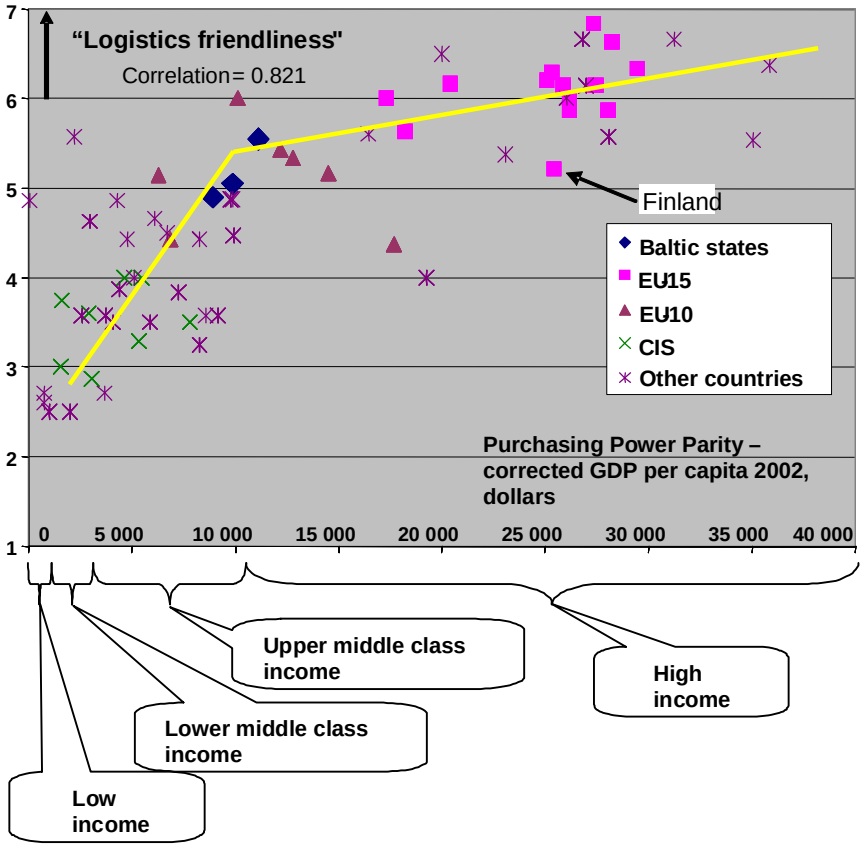


Figure 10 ***Investment by different countries on the Logistics Friendliness 2003 index, which measures the general logistics environment, in relation to the purchasing power parity adjusted economy in 2002.***

A survey conducted with some 100 international forwarding agents in over 20 countries found that there was a significant correlation between national income and a country’s ‘logistics friendliness’ (Ojala et al. 2004). The higher the per capita income is, the ‘friendlier’ the country is from the point of view of logistics. The findings are not in themselves surprising, but there was a highly significant positive correlation. The diagram does not allow one to draw conclusions regarding how much logistic friendliness and GNI impinge on one another, but merely demonstrates the dynamics of their coexistence (Figure 10).

Investments by countries are based on the perceptions of forwarding agents from each country, and on the subjective views of those active in the field. The study on the other hand showed that a highly developed logistic environment might be seen as problematic if transport costs are high owing to such factors as long distances and high overheads. That would seem to be the case in Finland (for the figures, see Attachment 9). In Finland the findings are probably also affected by the transport-intensive production structure.

4 THE MARKET OF LOGISTICS SERVICES

Key observations:

- The global market in logistics services in 2002 was worth some 3,000 billion euros. Companies' logistics costs came to around 6,400 billion euros
- The value added from logistics production in Finland was worth around 8 billion euros in 2004
- The demand for logistics services increases with the growth in international trade; the fastest growth is in third party and express freight services markets

4.1 Different levels of logistics functions

Goods traffic and logistics systems can be shown using a four-level format. The levels interconnect via three different markets. The lowest level, the traffic infrastructure, provides the transport market with capacity, which the transport operator's vehicles use. A considerable portion of the supply of the transport infrastructure is produced with public money, and the users of the infrastructure do not often pay directly to use that capacity (Figure 11)[17].

The needs of customers of transport systems at the following levels help create demand for the transport market, which is where those providing (transport) services and those paying for them meet. The diagram in addition illustrates the main focus of companies' needs in different countries at different stages of development.

The fourth level depicts control of the supply chain by companies that purchase logistic services. Depending on the type of logistic solutions chosen, the logistics buyers need different types of services relating to material and information flows, logistic organisation and distribution channels. Companies that provide such services aim to produce them as competitively as possible.

[17] Cf. Tolls on privately funded motorways, which are often based on the distance driven and the type of vehicle involved.

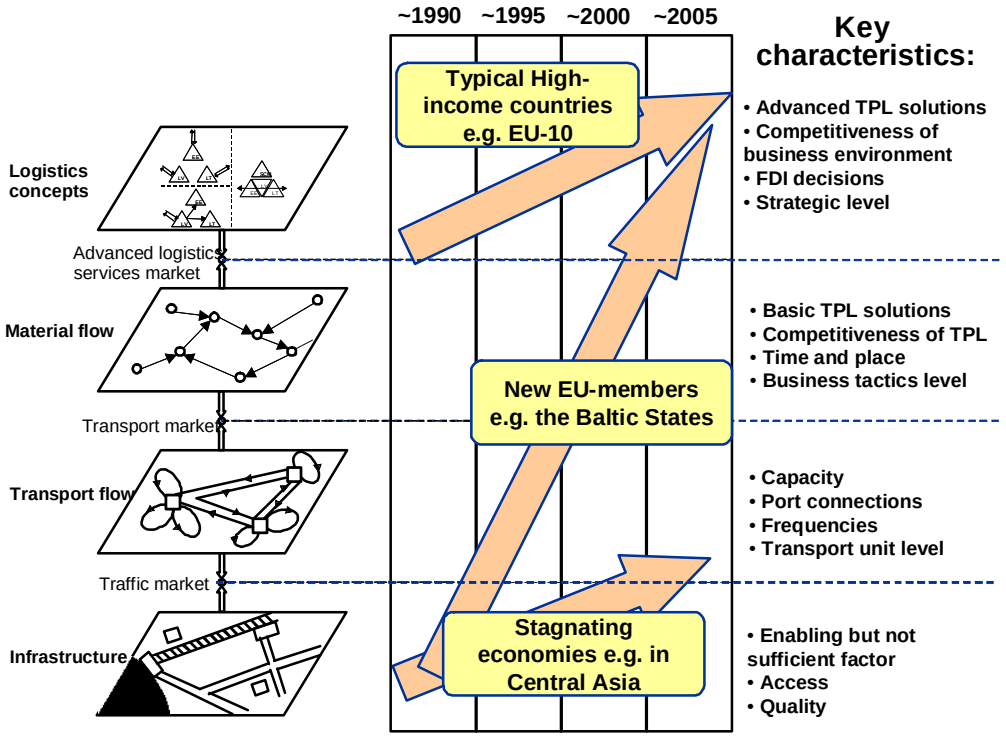


Figure 11 ***The movement of companies' needs away from the development of the infrastructure to control of the supply chain. Yearly figures for reference. Source: Ojala, Andersson and Naula (2006)***

For it to work, logistics in the international supply network needs a company's internal resources, an adequate transport infrastructure and successful logistics services. Logistics functions in global supply networks are often concentrated in countries where the transport market is well developed and where first-rate services are available at a competitive price.

4.2 Market size estimates

On the basis of the findings presented earlier, total costs were estimated to be approximately €6,700 billion (around €6,400). This figure includes companies' logistics costs in respect of operations they have themselves produced, i.e. which they do not purchase on the logistic services market.

How the individual components of logistics costs relate to one another is very much the same from one study to another. Roughly speaking, around 1/3 of the costs are transport costs, around ¼ storage costs, and the other ¼ or so are the costs of capital tied up in stock. The rest – around 15% - represents other logistics costs.

With this as a basis, transport costs in 2002 were around €2,100 billion. Going by the figures for outsourcing, of this some ¾ represents purchased services on the market and about ¼ produced internally. The global market in goods traffic would therefore have been worth approximately €1,600 billion.

Global costs for storage were worth around €1, 675 billion, of which around ½ is internal costs and the rest purchases on the market. The size of the market in storage would therefore have been around €840 billion.

If these figures are combined with the estimated share of other logistics costs a rough figure of €3,000 billion is obtained for the global logistics market.

Besides air freight and courier services, the share of the market which is growing the fastest internationally is third party logistic services. The size and rate of growth of this market is difficult to estimate, as it is unclear what companies should be included in any evaluation of the size of the industry and how much of various companies' turnover should be seen as relating to the sector (Table 5).

The extent to which third party services are used would appear to vary considerably from one country to another. One explanation for this is the different approaches to defining the concept. For example, in Europe a third party service is understood to be a long-term solution, unlike in the USA or Australia. Nevertheless, the use of third party services is felt to be more of a strategy than an operational solution.

In a study by Langley (2005), the respondents were asked whether they considered themselves to be users of third party services. (According to the findings), the rate of growth in the use of third party logistic services has been particularly fast in Asia. The number of users of services among the respondents rose from 58% in 2002 to 83% in 2005. In Asia the outsourcing of logistics has mainly been concentrated in the industrialised countries, such as Japan, Singapore, South Korea and Taiwan (Knee, 2003).

Table 5 Selected indicators regarding the size of the logistics market in various countries

Logistics expenditure 2003, $billion*	USA	936
	Japan	400
	China	300
	Germany	150
	France	97
Size of third party Logistics market, $billion	USA and Canada**	104
	Europe***	37 - 63
	China****	12
The nature of third party Logistics market	USA and Canada**	Dispersed. 20 % of companies make up 40 % of industry's total turnover.
	Europe	Dispersed. 20 % of companies make up 33% of industry's total turnover.
	China	Very dispersed. Barely any players whose annual turnover is more than $25 million.

* Data for Germany and France is from 2002. Source: Eye for transport, 2005.

** 2004. Source: Armstong, 2005.

*** 2003. Source: EFT, 2003

**** 2004. Source: Latitude Capital Group, 2005

The trend in outsourcing has, however, gradually spread to other countries in the region, especially China, where the dramatic advances in industrialisation have pushed up demand for external logistic services (Eye for Transport 2005).

Europe would seem to be ahead of the other regions in the matter of international outsourcing of logistics. This trend is, for example, reflected in the fact that a larger portion of the logistics budgets of European companies is allocated to outsourced services than is the case elsewhere. On the other hand, the share of outsourced services in the logistics budgets of American companies is the smallest of all.

4.3 Structure of the third party logistics market

The term 'third party logistics services' has been used in a number of ways, from describing one single service, e.g. the outsourcing of transport to describing the outsourcing of a set of complex processes. For those firms that provide third party logistic services, however, there are a number of established definitions, which have been discussed by such people/organisations as Virum (1993), Van Laarhoven and Sharman (1994), Berglund et al. (1999), Langley et al. (1999), and Protrans (2003). From the point of view of the buyer of these services, third party logistics can be seen as a combination of the following elements:

- An external agency provides all or a considerable number of the logistics services
- The shipper uses a limited number of service providers
- Long-term and close business relations between service provider and customer in place of single business transactions
- Integrated logistics functions
- Both parties try to exploit the synergic benefits the partnership offers

The principle reasons why companies use third party services are a need to focus on core activities, to cut costs, and at the same time provide their customers with better standards of service. Outsourcing gives companies the opportunity to concentrate their resources, spread their risks and focus on matters which are vitally important fore their survival and future growth (Sink and Langley, 1997).

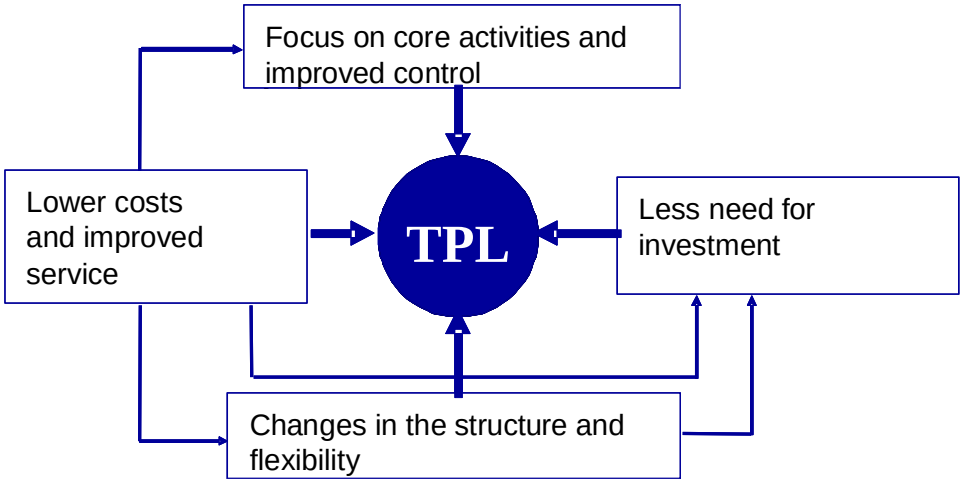


Figure 12 Third party logistics drivers

Lower logistics costs and improved services are the commonest reasons for using third party logistic services. When successful, outsourcing logistics activities and operations has meant savings of 10% - 30% on costs. Furthermore, going by indicators that measure standards of service, outsourcing has been responsible for improvements in this area. Most savings on costs are normally achieved in those relating to capital tied up in stock and storage/warehousing costs (Anderson 1997).

Immediately any outsourcing is organised for the first time it is possible that costs will at first rise and standards of service temporarily suffer, as the new service provider and its staff get used to the customer's systems. Overlap in the utilisation of resources too might at first incur additional costs.

But the basic assumption is that the provider of logistics services can exploit the economies of scale involved in providing the same service to more than one customer (see, for example, Fernie 1989, La Londe and Cooper 1989). One has grown accustomed to the notion that improved efficiency is a precondition of long-term financial benefit and better standards of service. Better efficiency can, for example, be achieved by improving the expertise of existing staff or by recruiting new skilled personnel.

Planning the distribution network, developing logistics systems, warehouse management and production planning are the kind of logistics services that are least likely to be outsourced. Conventional logistics functions, such as transport and storage are the most common areas for outsourcing. Although the providers of these services may offer a competitive service in their own field, they might be unable to operate at the strategic level.

Outsourcing can also lead to more transparent ways of measuring performance in the context of costs and service (Andersson 1998). Other benefits of outsourcing include less need for tied capital and a higher yield from capital. An outsourcing company can buy just the capacity it needs, with flexibility. Outsourcing logistics functions and operations to third parties may also be a way of lessening the risk attached to the geographical expansion of companies.

Third party solutions may be applied to most industries, but they do not necessarily suit all companies. Companies whose logistics operations are well organised with logistic functions working well do not necessarily see the need for outsourcing. Other reasons for dealing with logistics themselves include the fear that outsourcing will result in too great a dependence on the service provider, that it will reduce contact with customers / suppliers of goods, that it will incur high switching costs and that it will lead to job losses, poor compatibility of IT systems, a deterioration in in-house competence or leaks of vital data outside the company (Aertsen 1993, Lieb et al. 1993, Sink et al. 1996, Sink and Langley 1997, Razzaque and Sheng 1998, Berglund 1997, Andersson 1995).

Customers might also believe that outsourcing leads to higher costs. Generally, however, the assumption that higher costs will be incurred is based on the fact that the company has no accurate perception of its own logistics costs, especially since some of the costs due to logistic operations are included in the calculation for company overheads.

Globalisation of the business environment has in practice meant for companies a broader geographical distribution of suppliers and customers, compelling them to look for global logistics solutions (see, for example, Bagchi and Virum 1998, Sheffi 1990). So far, however, there has not existed one global provider of third party logistics services which might offer not only a proper global geographical location but also a truly comprehensive package of services anywhere in the world.

Globalisation has also resulted in company acquisitions and mergers in many sectors, including logistics. Virtually worldwide logistics companies have emerged in the sector offering a comprehensive range of services, with the special emphasis on container traffic, forwarding and air freight (Song et al. 2005, Midoro et al. 2005).

In the late 1990s the privatisation of national postal services brought a new dimension to the sector's development. TNT Post Group and Deutsche Post are among Europe's biggest logistics companies. Among the big company mergers in the logistics industry are the acquisition by German National Railways in 2002 of Stinnes Group (Schenker), and that by Deutsche Post in December 2005 of the British firm Exel. According to DHL, the takeover made it the industry's biggest in sea transport, ocean-going transport and logistics under contract. At the start of 2006 the Danish firm DFDS acquired possession of the Dutch company Frans Maas. The takeover resulted in a logistics group worth more than €5 billion, which also operates widely in Finland.

Although customers try to keep the number of service providers they use as small as possible in the name of cost-effectiveness, there are still a lot of service providers. The market in logistics services is still fairly fragmented, despite the recent mergers. For example, in the USA in 2004 the combined turnover of the 10 biggest companies in the field was just 30% of that for the entire industry and that for the 20 biggest 42% (Table 6).

Table 6 Twenty biggest third party logistics providers and service users in the USA in 2004. Source: Armstrong, 2005.

30 largest third party (3PL) logistics service providers in US.				Largest 3PL customers in US.	
Company	**Turnover (milj. USD)**	**Market share (%)**	**Cumulative market share (%)**	**Company**	**Number of logistics service - providers in use**
UPS Supply Chain Solutions	5 300	5,1	5,1	General Motors	43
C. H. Robinson Worldwide	4 342	4,2	9,3	DaimlerChrysler	32
Exel plc - Americas	3 400	3,3	12,5	Ford Motor	30
Expeditors Int'l of Washington, Inc.	3 318	3,2	15,7	Volkswagen	28
Penske Logistics	3 250	3,1	18,9	Hewlett-Packard	26
EGL Eagle Global Logistics	2 589	2,5	21,3	Unilever	24
BAX Global Supply Chain Mnt.	2 441	2,3	23,7	Procter & Gamble	22
UTi Worldwide	2 300	2,2	25,9	General Electric	21
Kuehne + Nagel	2 233	2,1	28,1	Siemens	19
Schneider Logistics, Inc.	2 153	2,1	30,1	BMW	17
Caterpillar Logistics Services, Inc.	2 000	1,9	32,0	Georgia-Pacific	16
Ryder System, Inc.	1 860	1,8	33,8	IBM	16
DHL Logistics	1 474	1,4	35,3	Nestlé	16
Hub Group, Inc.	1 427	1,4	36,6	Royal Philips	16
Schneider Dedicated Operations	1 322	1,3	37,9	Toyota Motor	16
Menlo Worldwide	1 300	1,3	39,1	Home Depot	15
Werner Dedicated	806	0,8	39,9	Sara Lee	15
TNT Logistics North America	780	0,8	40,7	Altria Group	14
J. B. Hunt Dedicated Contract Services	760	0,7	41,4	Coca-Cola	13
FedEx Supply Chain Services	700	0,7	42,1	Nissan Motor	12

According to predictions regarding developments in the sector, the industry will grow, particularly in the areas of value added and data management services. It would be natural for many of the various logistics service providers to try over time to become companies offering comprehensive solutions. This does not appear to be happening, however, as only a few companies have the resources and technical expertise for this.

4.4 Transport sector in the Finnish economy

In the figures for the Finnish economy, transport, warehousing and storage and information traffic is a main sector unto itself and the information is logged, in accordance with international statistics practice, very uniformly. Internal logistics operations in industry and trade on the other hand are included in the figures for the above-mentioned industries.

Whether logistics services needed outside Finland are recorded in the figures for the Finnish economy depends, for example, on agreements between trading partners regarding transport and storage costs and the practices of production and distribution units abroad. On the other hand, the transit services through Finland are normally recorded in the figures for the Finnish economy, even if the goods in question do not pass through customs.

Owing to the largely intangible nature of the services, the way they are recorded as far as overseas business is concerned differs slightly from the practice followed in the trade in goods[18]. Total figures nonetheless indicate that since 2000 there has been a deficit in foreign trade in freight traffic services in excess of €1 billion. This is partly explained by the change in the structure of the logistics industry and the attendant growth in foreign ownership and partly by the fact that industry is moving more and more into global markets (Fig 13).

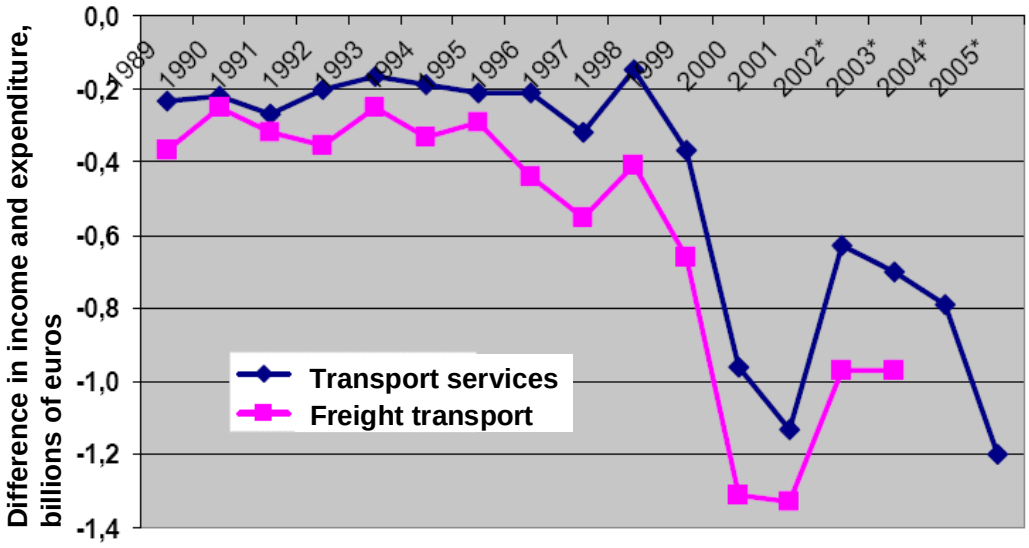


Figure 13 Balance of foreign trade for Finnish transport and freight traffic services (difference between income and expenditure) in billions of euros 1989-2005, at current prices. Source: Statistics Finland

[18] See, for example, Statistics Finland at http://www.stat.fi/til/pul/index.html

Of the countries which border onto the Baltic Sea, Denmark (especially the Maersk Group), Norway (navigational) and the Baltic countries (transit traffic) are some of the main net exporters of transport and storage services. Besides Finland, only Germany is a net importer of transport services. For Finland, which is dependent on foreign trade, an effective logistics market is nevertheless more important than foreign currency earnings.

There have been rapid developments in the value added[19] component of production in the Finnish transport sector[20]. According to Statistics Finland, in 2004 the value added for the entire sector stood at €14.3 billion, or 10.8 % of that for production as a whole (€132.2 billion). Value added for companies in the transport sector (private sector) stood at €12.3 billion.

With reference to the general structure and cost distribution of the logistics market, it can be estimated that value added in logistic services[21] stood at approximately eight billion euros in Finland in 2004. This is therefore not the same as the combined turnover for the industry as semi-finished products in the production process have been deducted from the figure.

Value added in telecommunications services included under transport services has grown the fastest of the industries in the group. The figure stood at €3, 702 billion in 2004.

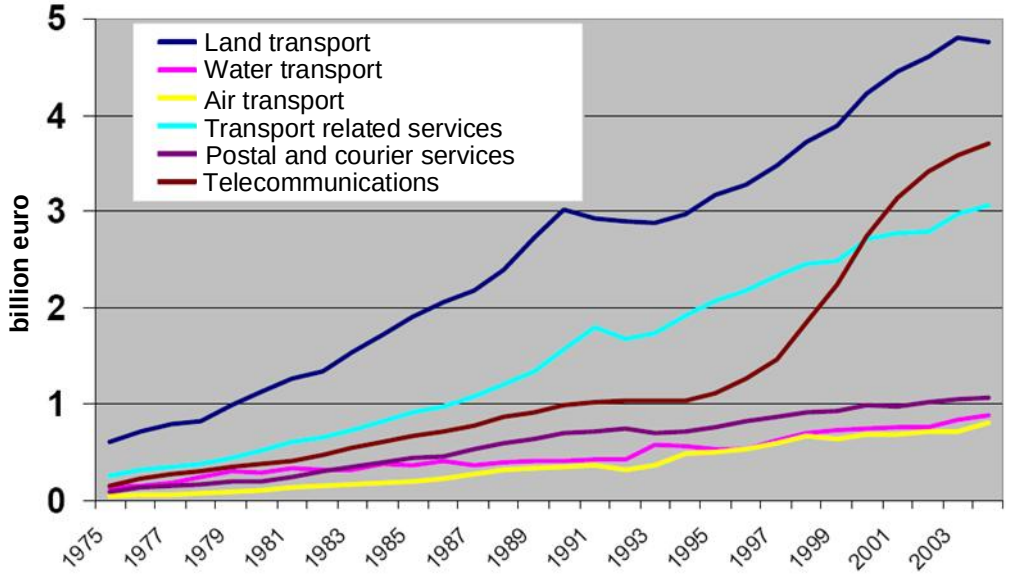


Figure 14 Value added for transport and transport- related services in Finland 1975-2004 in billions of euros at current prices, including the public sector. Source: Statistics Finland

19 Value added (gross) means the value generated by a unit of production. It is calculated in market production by subtracting the semi-finished products (goods and services) used in production from the unit's yield and in non-market production by adding together employees' salaries, the erosion of fixed assets and any production or import taxes. See, for example, http://www.stat.fi/til/ntp/kas.html

20 The transport sector consists of passenger and freight services in both the public and private sector. Related services mainly include storage and goods handling, forwarding and freightage/chartering. Included too, though, are travel agencies, etc.

21 Exclusing passenger transport and non-market production in the private sector; cf. chapter 3.2.

Of the other industries the fastest to grow have been land transport and transport-related services (Figure 14). Value added for land transport in 2004 stood at €4,760 billion. The figure includes road and rail transport and a very small volume of pipeline transport. The figure for value added in transport-related services was €3,063 billion in 2004, which is mainly made up of storage, freighting/chartering and forwarding services.

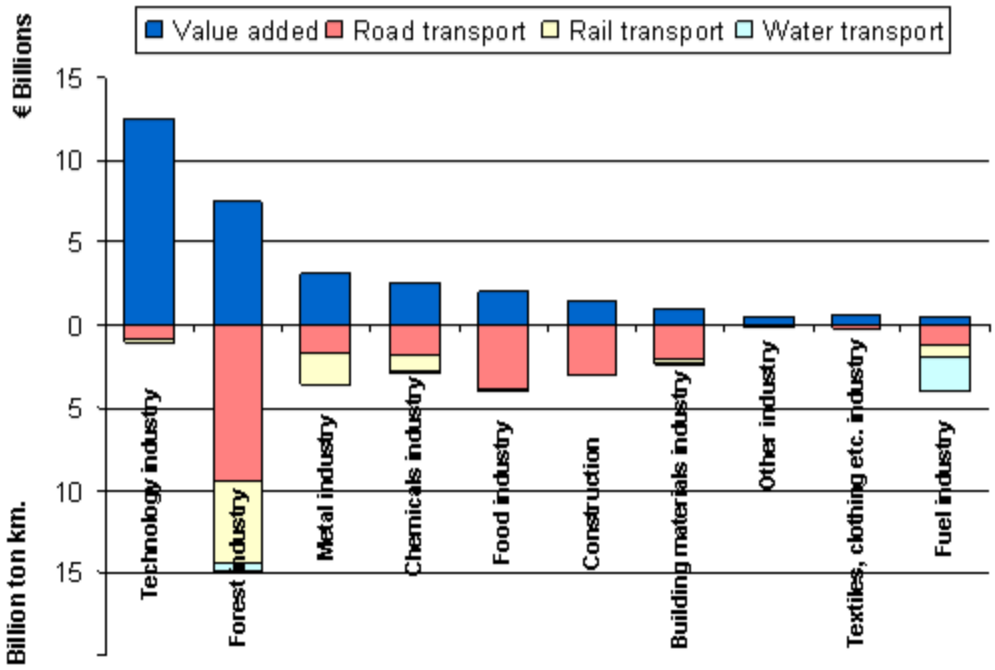


Figure 15 Value added and outputs for different modes of transport in 2002. Source: Sectoral Transport Intensities, Ministry of Transport and Communications, 2004

Value added in the field of postal and courier services in 2004 was €1,065 billion and the industry is slowly growing, as are the water and air transport industries. Value added for water transport in 2004 was € 883 billion, and for air transport €803 billion.

The importance of road transport is also highlighted when sectoral transport outputs in industry and value added in these fields are examined for the year 2002 (Figure 15). The figures refer to transport outputs in Finland and do not include transport relating to foreign trade. Sea and air transport thus do not count for much. Over 10% of the entire value of Finnish exports is recorded in the foreign trade statistics as air freight[22], which is used a good deal, especially by the technology industry.

Road and rail transport was mostly used by the forest industry, which in 2002 accounted for 24% of industrial production. On the other hand, the technology industry, which produces the greatest value added, generates very little demand for transport.

[22] Air freight refers to foreign trade conducted with an air consigment document. A considerable amount of this makes at least part of the journey to or from key air frieght nodes as land frieght.

4.5 Road transport and freight forwarding

Data on the number of staff employed in haulage, forwarding and freight companies and turnover per company was compiled from a database held by Statistics Finland on companies by sector for the period 1995–2004. Turnover was linked to the wholesale price index for the base year 1995 to improve comparability (Attachment 5).

The number of companies in the road goods transport sector grew up until 1998, since when it has slowly declined. Turnover per company has increased during virtually the entire period investigated (1995-2004[23]).

The number of companies in the forwarding and freighting/chartering industry has grown throughout the period for investigation, except in 1999 and 2001. From 1995 the number of companies increased by a factor of 1.7 times up to the year 2004. Average turnover per company has remained at the €5.3-5.6 billion mark in recent years. Staff numbers rose, however, to reach more than 6,300 in 2004, whilst in 2000 the figure was just 4,750.

4.5.1 Economic indicators

Indicators were compiled on lorry transport and the forwarding and freight industries for the period 1999–2004 from accounts statements for transport held by Statistics Finland. Value added in production was linked to the wholesale price index for 1999 (Attachment 5).

The operating margin in lorry transport went down from 16.5% in 1999 to 31.1% in 2004, whilst net profits declined slightly. The Quick Ratio, which measures short-term solvency/liquidity, remained at a level of 0.9, i.e. satisfactory.

The industry's equity ratio rose from 24.7% in 1999 to 30.7% in 2003. During the period of investigation that was also at a satisfactory level. According to guideline values for companies engaged in production, relative indebtedness in lorry transport improved from satisfactory to good. In 1999 overall debt accounted for 46.3% of turnover, which figure fell over the period up till 2003, reaching 39.2% in 2004. A level of less than 40% can be regarded as good. Solvency in the industry thus improved during the period for investigation. Value added in production in the lorry transport industry rose from €1,503 billion in 2000 to €1,746 billion in 2004. At the same time general value added in the industry grew.

The operating margin in the forwarding and freight industry was 3.1% in 1999 and 4.6 % in 2004. Likewise, net profit rose from 0.9 % to 2.5 %. Liquidity (Quick Ratio) was good during the relevant period.

The equity ratio in the forwarding and freight industries was at a satisfactory level. It increased, and overall debt as a proportion of turnover fell over the period up to 2003. Relative indebtedness in the industry was good and solvency

[23] Prices for 1995.

slightly improved. Value added in production grew during the period and stood at €302 billion in 2004.

4.5.2 Concentration of markets

The Finnish road transport sector mainly comprises small companies. The number of companies in the forwarding industry is even smaller and the business mainly dealt with by large companies.

In the lorry transport sector there were 10,519 micro companies employing fewer than 10 staff, and their share of the industry's turnover was almost 50%. There were 548 small companies (employing 10 – 49 staff) and their share of the industry's turnover was approximately 22%. There were 37 medium-sized companies (50–249 staff) with a share of 10% of total turnover, i.e. relatively little. There were 24 large companies (at least 250 staff) and they were responsible for around 18% of the business.

There was a large number of micro companies in the forwarding sector, but their share of the industry's total turnover was small. Large companies are responsible for most of the turnover in the industry. There were 255 micro companies (fewer than 10 staff) and their share of turnover was 11.5 %. There were 44 small companies with a share of 15.6 %. There were 17 medium-sized companies and their share of business yield was 32%. There were 34 large companies and their share of the industry's turnover came to almost 41%.

Most companies own just one vehicle. Companies with more than 20 vehicles only account for 0.55 of the total. The number of companies would seem to be inversely proportional to the number of vehicles. The larger the number of vehicles the fewer companies there are.

The external operating environment seems to have an influence on a sector's structure. For example, the level of service demanded by customers and the diverse forms that demand can take have increased the need of transport companies to network, create partnerships and expand through company takeovers. In an analysis of the effect of takeovers on the road haulage industry and other transport agency concerns the share of the market was calculated for the three biggest players in groups of companies[24]. First the combined turnover for companies in the same group was estimated and then the total market share for the three largest groups. The data was gathered from a database of the profits for the 20 largest companies in terms of turnover for the period 2000–2004. Companies in the same group were in both sectoral categories and to obtain a comprehensive picture road haulage firms and other transport agencies were treated as belonging to one sector.

The road haulage sector is largely made up of small companies, which have been forced into a fiercely competitive environment. Competition in the sector has eased off slightly as there has been fall in the number of companies operating in the sector, whilst at the same time companies' turnover has increased. Loss-making companies have at the same time been eliminated. In the forwarding sector the competition seems to have increased slightly.

[24] The 'Concentration Ratio 3' (CR3 value).

4.5.3 Productivity of the sectors

Profitability in the road haulage sector fell slightly up to the year 2004, liquidity remained satisfactory and solvency improved. In forwarding profitability and solvency improved, whilst liquidity remained good (Attachment 5).

Productivity was examined mainly from the angle of partial productivity. This was calculated in terms of fixed capital, staff, purchases and other costs for a six-year period. The data was divided up into that for small and medium-sized companies and large companies. As each element of partial productivity was being calculated, at least slightly greater relative changes in the large companies were observed than with the SMEs.

Fixed capital productivity in the partial productivity items examined varied most in the haulage and forwarding sectors. As procurement productivity improved, that for other costs worsened. This suggests a costs structure where the choice of allocation of available but limited resources is made between materials procurement or purchases of external services and expenditure under other costs.

Fixed capital productivity trends changed more in forwarding than in road haulage. With SMEs in forwarding fixed capital productivity fell dramatically after the year 2000. In contrast, fixed capital productivity in large companies in the sector began to decline two years later. Moreover, in road haulage productivity in large companies declined after 2002 whilst that for SMEs remained more or less the same. The fact that fixed capital productivity in both sectors was seen to improve in large companies while that for SMEs declined supports the general notion that outsourcing is becoming more and more common.

As large companies reduce, for example, the amount of equipment they have, so SMEs add more and sell their services to large companies. The use of subcontractors is common among large transport companies.

External services account for a fair portion of overall purchases in large haulage firms and in SMEs and large companies in forwarding. The volume of external services fluctuated substantially during the period of investigation. Large forwarding companies use external services far more than SMEs in the sector. By varying how much they use external services, companies can respond to the needs of a changing operating environment, for example, as regards demand.

The ratio of procurement to the value of output is greatest in both categories of forwarding company and in large haulage firms. Purchases for these categories of company are the most crucial productivity factor as even a small improvement in procurement productivity can dramatically improve a company’s profits. Fixed capital, on the other hand, is the most significant productivity factor for SMEs in road haulage. But the ratio of fixed capital to the value of output is smallest in large companies in the sector and in both categories of company in the forwarding sector.

5 FINDINGS FROM MANUFACTURING AND TRADE

Key observations:

- Logistics costs in manufacturing and trade have risen, especially those relating to capital tied up in stock and logistics management
- Large and international companies have lower logistics costs
- Transport costs account for roughly 5% of turnover and that share is thought to be growing
- Other logistics costs are staying more or less the same or falling
- Outsourced logistics operations are cheaper than the rest
- Outsourcing becoming more common mostly in storage and 'information logistics'
- Development needs of large companies in information logistics, of small companies in staff (competence)
- Key needs for skills in large companies in business strategy
- Key needs for skills in SMEs: staff and customers
- Those operating under pressure from global competition monitor indicators best
- Transparency of the supply chain still poor; large companies most advanced in this area

5.1 Companies' logistics costs

According to this survey, the overall costs of logistics in industry vary from 13.3% (of turnover) in large companies to 15.9% in micro companies. When the main sectors are examined as a whole, the differences between small, medium-sized and large companies are, however, small. The differences in logistics costs between the companies answering the survey are a lot greater when they are examined by sector (Attachment 6).

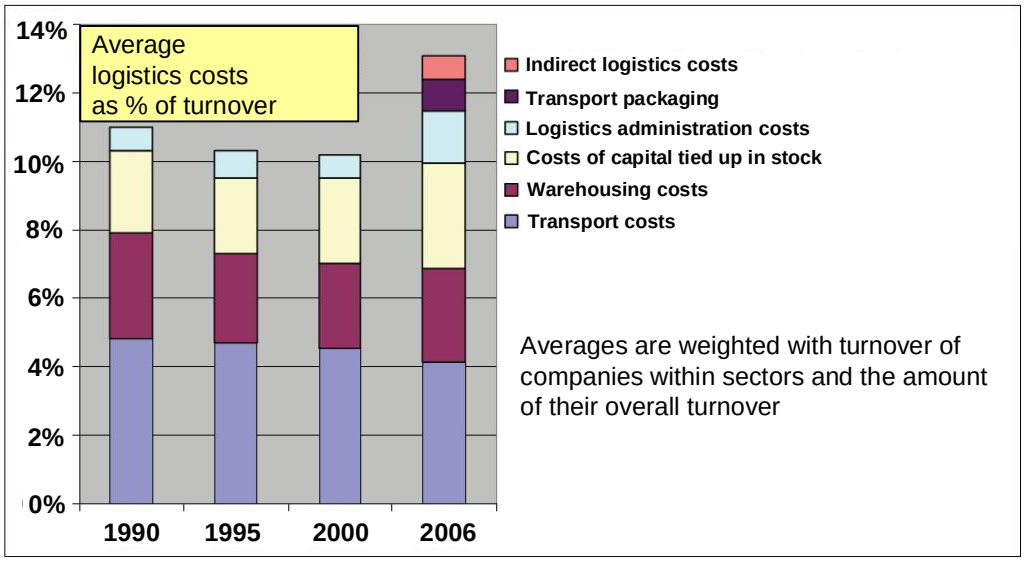


Figure 16 ***Logistics costs in industry and trade 1990-2006 according to logistics surveys 1990 N=112, 1995 N=156, 2000 N=125, 2006 N=1434.***

Compared to the findings in previous logistics surveys, logistics costs in industry and trade have risen slightly. The falling trend in costs that began in the 1990s seems to have come to a halt, going by the results of comparable surveys (Figure 16). There is, however, no completely reliable data as the earlier surveys did not cover micro or small companies and the numbers of replies were relatively small to make generalisations about the situation in Finland as a whole. An accurate comparison is furthermore hard to make owing to the nature of such a survey.

Transport costs in industry and trade are around 5% of turnover, regardless of company size. Transport as a share of turnover seems to have fallen slightly.

The share of costs of capital tied up in stock is quite large. In micro companies it is on average almost 4% of turnover. This costs item as a share of turnover has grown considerably when compared to the previous surveys. In this survey, however, in large industrial companies capital costs as a share of turnover are much les than with other sizes of company. Furthermore, the share represented by management/administration costs has grown (Figure 17).

Only the four lowest costs components shown in the diagram are directly comparable with the results of previous surveys. They are transport, storage handling, capital tied up in stock and management costs. The general level of logistics costs in the main sectors of trade and industry would appear to have remained the same (11.5%) compared to previous average values, which vary between 10.2 and 11.0.

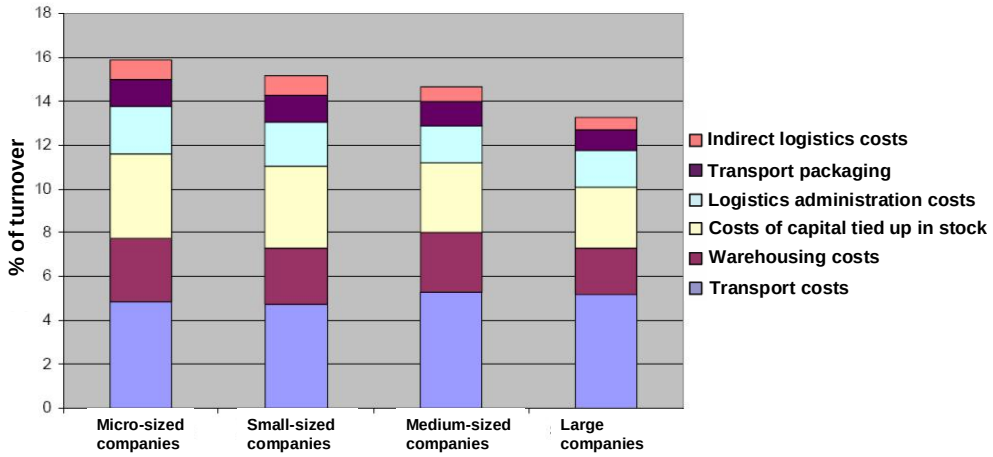


Figure 17 Average logistics costs in manuufacturing by cost component and company size (N=816)[25]

The logistics costs in trade also appear to depend considerably on the size of the company. Transport costs and the costs of capital tied up in stock in particular seem to be lower in large companies (Figure 18). Differences in company sizes, on the other hand, are probably due to the general structure of the trade sector, which is much more concentrated than, for example, manufacturing.

[25] More excat data available at http://www.tukkk.fi/markkinointi/log/ls/kuviot/kuvio9.pdf

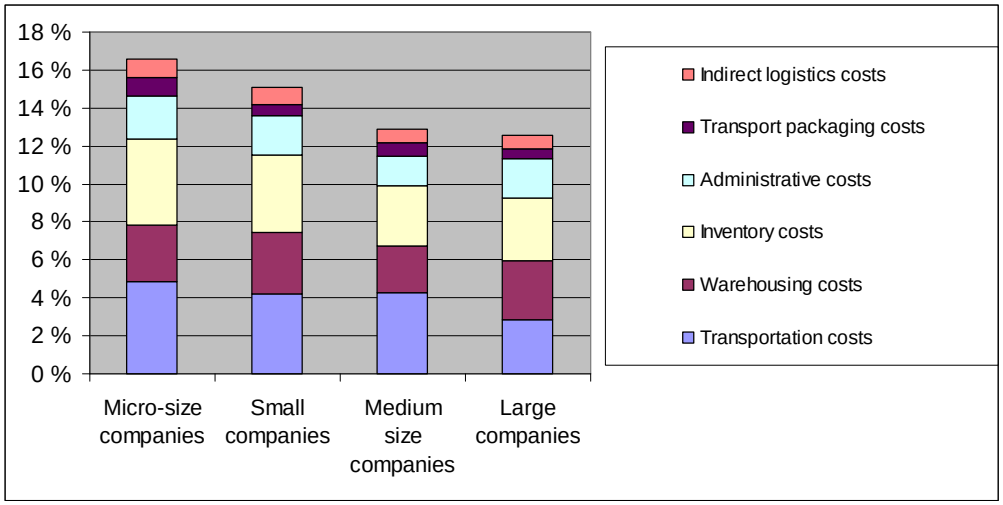


Figure 18 Average logistics costs in trade by cost component and company size (N=618)

Overall costs in large manufacturing companies and construction companies seem to be slightly higher than in large trading companies. Major differences are found in the costs structure. Transport costs in large trading companies are considerably lower, however.

The extent to which manufacturing companies are internationalised/globalised seems to have a great effect on logistics costs. The logistics costs for companies operating outside Finland[26] (13.4 %) are 2.5% less than those for companies operating in the domestic market[27] (15.9 %). The costs for export companies[28] are midway between the two at 13.9% (Figure 19). Micro companies are not included in this aspect of the survey as costs in these companies varied widely.

Foreign production units and a large share of exports add to a business's structural complexity, which one would assume would increase logistics costs. International companies are nevertheless able to control storage and management/administration costs obviously more successfully than companies in the domestic market and export companies.

[26] 'International company' = at least one production unit abroad.

[27] 'Company operating in the domestic market' = at least 90% of turnover is sales is Finland; no production facilities abroad

[28] 'Export company' = at least 10% of turnover comes from exports; no production facilities abroad

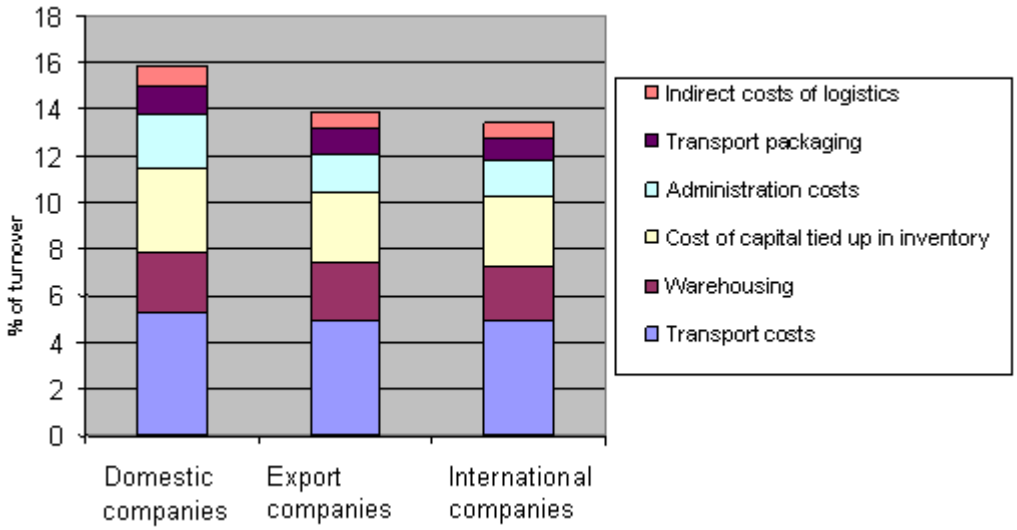


Figure 19 Effect of internationalisation on the logistics costs of industrial companies. No data given for micro companies (N=814)

The logistics costs for export and international companies appear to fall the larger the company is. Average costs for medium-sized companies operating in the domestic market are as much as 1% higher than for micro and small companies. Medium-sized companies operating in the domestic market presumably do not gain the advantages offered by large-scale production in logistics in the same way that large companies do. What is more, many medium-sized companies need to invest heavily in such areas as IT systems, even though they may be unable to take full advantage of them. The third reason for their high level of costs may be that there is not the same great pressure in the home market environment to reduce logistics costs as there is operating in global markets (Figure 20).

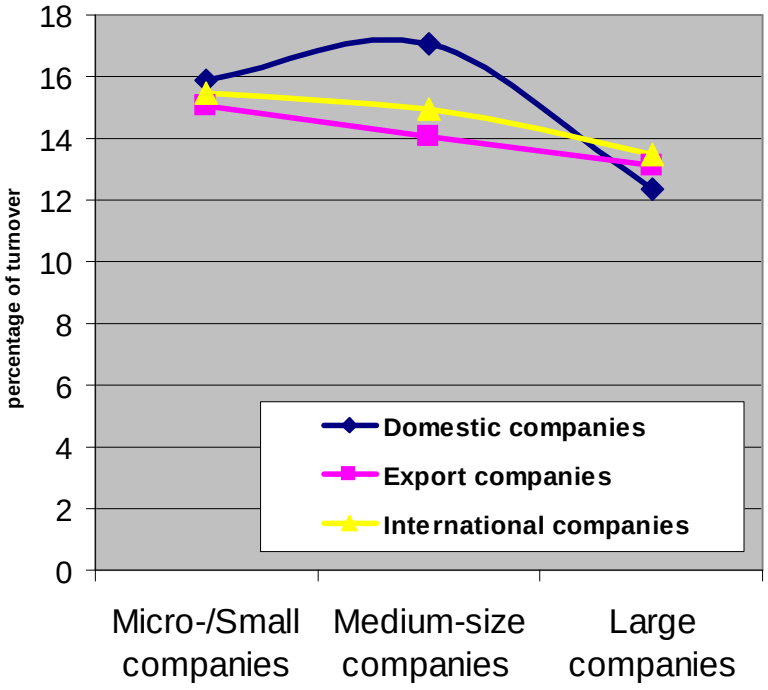


Figure 20 Logistics costs by company size and degree of internationalisation as a percentage of turnover (N=814).

Logistics costs in manufacturing companies seem to be geared not only to company size but also very much on the type of production the company is involved in. Cost levels in companies which make-to-stock would seem to fall fairly steadily the larger the company. This is only natural as these are typically companies that can take advantage of economies of scale.

With some types of production, logistics costs appear to be higher in larger companies than in small ones. These tend to be industries where customised products are more in demand. On the other hand, large companies where production is based on assembly on receipt of customer orders seem to have the lowest costs of all. Such companies would tend to be, for example, manufacturers of electronic equipment.

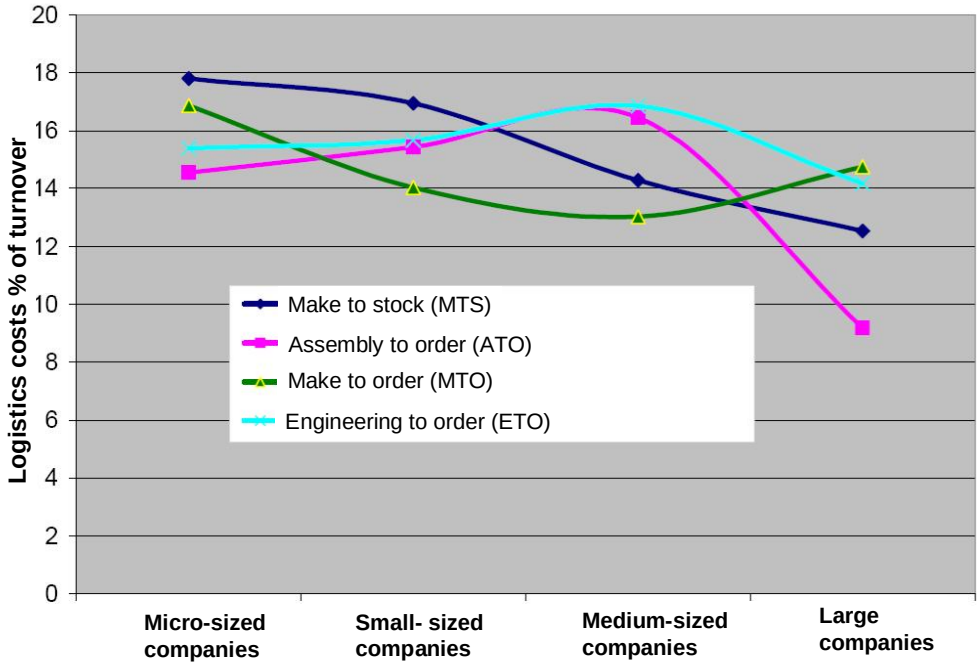


Figure 21 Average logistics costs in industry by production type and company size. Manufacture for stock n=104, assembly on receipt of customer order n=78, order-based production n=328, manufacture of customer-specific products from order n=265.

The highest logistics costs in the data in the survey are for micro companies which make-to-stock, with an average of 17.8% (of turnover).

The high logistics costs in medium-sized companies that manufacture and produce products based on orders from specific customers (ETO) are explained by their higher than average degree of internationalisation. Four-fifths of these companies export goods and nearly a half had production facilities abroad. Management of logistics costs would therefore seem to be a special challenge for international manufacturing companies and those that make products that are highly customised, the latter presumably being unable to take advantage of the benefits of large-scale production to any significant degree.

The difference between sectors in trade are also worth noting. The highest logistics costs are in wholesaling, other than in the food industry, and the lowest in food retail trade (Attachment 7).

Figure 22 shows how respondents estimate future trends for various cost components in relation to turnover up to the year 2010. All respondent groups predicted a rise in the share of transport costs. As many as 70% of export and internationalised companies thought it would grow to some extent or substantially. The size of the company also seemed to make a difference. Large manufacturing and construction companies and small trading companies were more pessimistic in their estimates for rises in transport costs. Only a small number of companies believed the share of costs represented by transport would diminish.

Uncertainty over trends in the price of oil was the main reason for the expectations that transport costs would go up. Other significant reasons are likely to be found in general trends in the approach to logistics. Pressure from the competition means that companies have to adopt a more customer-oriented approach to logistics, which in practice probably means smaller batch sizes, shipping goods more frequently, and possible further concentration of production and logistic operations.

The respondents claim that there is room for improvement in making logistics a more efficient exercise, especially in the areas of storage costs and capital tied up in stock. This was the opinion especially of international companies, export companies and large and medium-sized companies in general. The conclusion that can be drawn from this is that, firstly, companies in the not too distant future will probably centralise their logistic operations more than before in order to make savings. The other conclusion to draw is that micro and small companies would not seem to be able to reduce these costs so easily, lacking as they do the advantages of mass production.

With regard to administration and transport packaging costs, the situation seems similar. It was large and international companies which thought they would be able to cut these costs most of all. It was thought, however, that these costs would increase generally. The indirect costs of logistics, however, were expected to fall; this was the opinion of large companies especially.

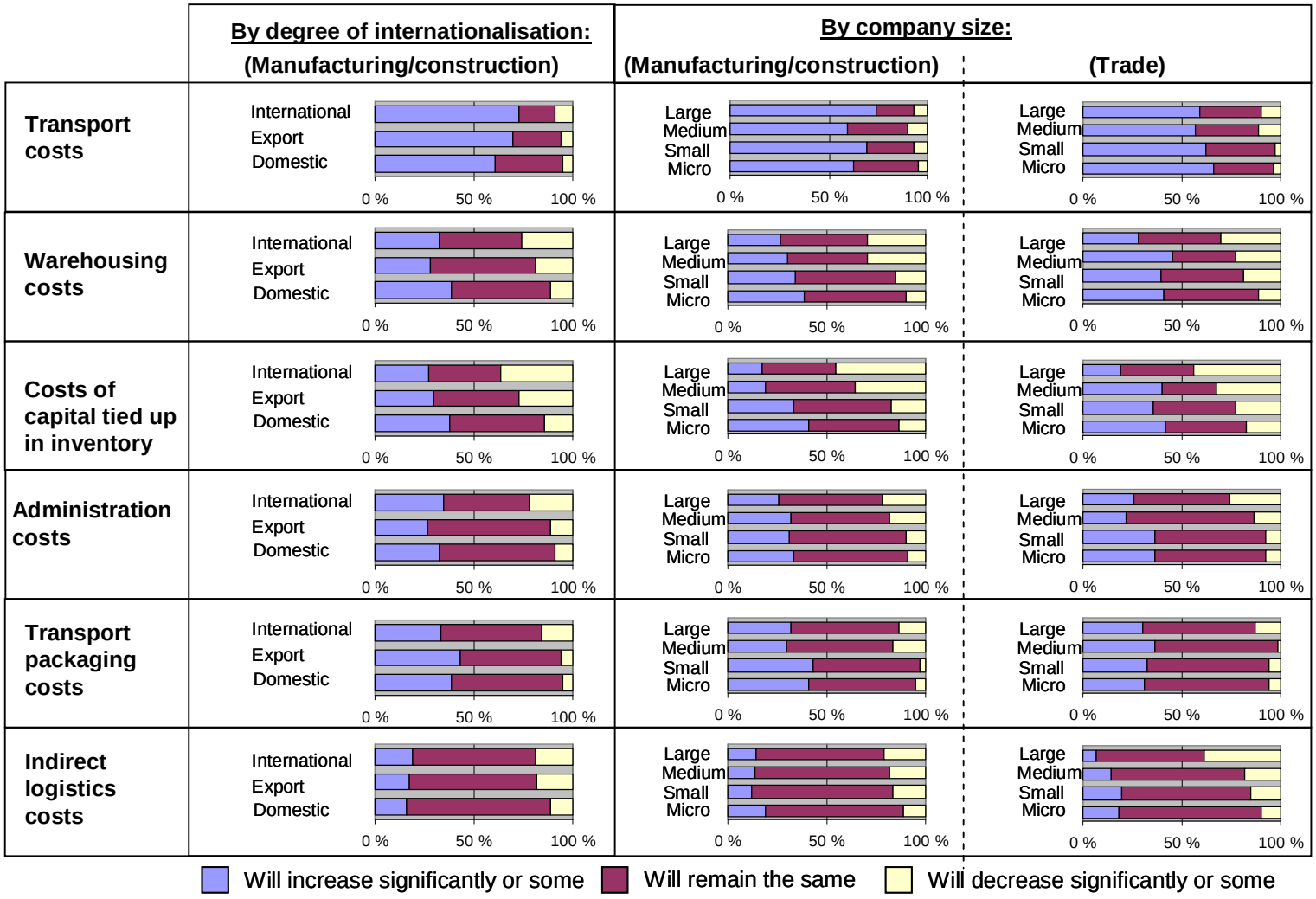


Figure 22 ***Estimates by respondents of the trend in cost components in relation to turnover up to the year 2010: manufacturing/construction and trade, % of respondents. International companies n=165, export companies n=201, companies operating in the domestic market n=586, large companies n=165, medium-sized companies n=171, small companies n=319, micro companies = 1,072.***

5.2 Logistics indicators

The respondents were asked to rate certain indicators numerically. The diagrams below show two of these from each sector of industry. They are: the percentage of deliveries that are faultless customer deliveries and the period of time for which cash is tied up. The figures given are quintiles (upper and lower fifth of the total sample). The limit of the upper quintile indicates that 20% of the companies in the sector have received a higher score than the figure for that variable (Figure 23). The limit of the lower quintile indicates that 20 % of the companies in the sector have received a lower score than the figure for that variable. The period of time for which cash is tied up in the best 20% is less than 20 days, irrespective of sector. In the global context, the figure is very low. Average periods for tied up cash in the lowest fifth vary considerably from sector to sector, from publishing and printing (40 days) to manufacture of mineral/rock products (140 days).

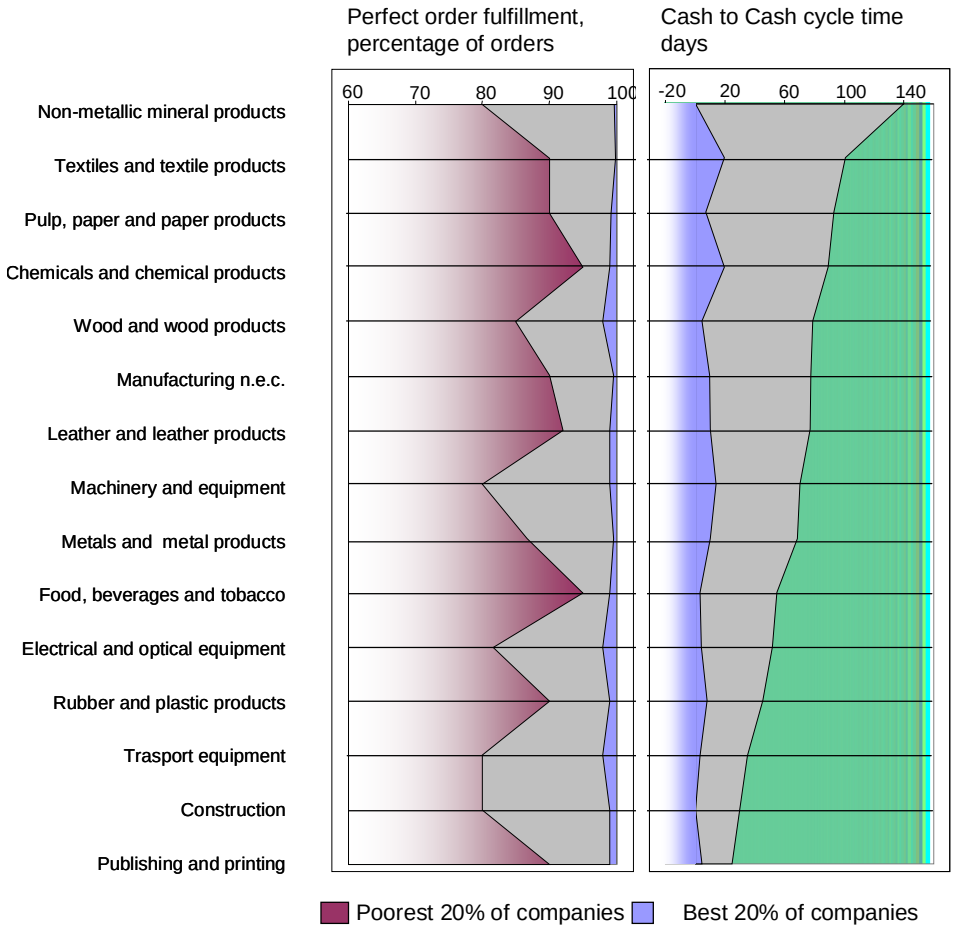


Figure 23 ***Cash to cash cycle time in days and perfect order fulfilment as a % of all deliveries; the best and poorest fifth of companies (n=834)***

More than 95% of all deliveries are faultless, regardless of sector. Beyond the top values, the differences between sectors are greater. An interesting finding, for example, is that almost 95% of deliveries in 80% of the companies in the food and chemical industries are faultless. Rather surprisingly, the equivalent figure for the electronics industry is only some 80% of deliveries. Of the indicators, companies seem to be able to make best use of their share of faultless customer deliveries and least use of the costs of single deliveries. The ability to exploit the different indicators increases the larger a company is and the greater its degree of internationalisation.

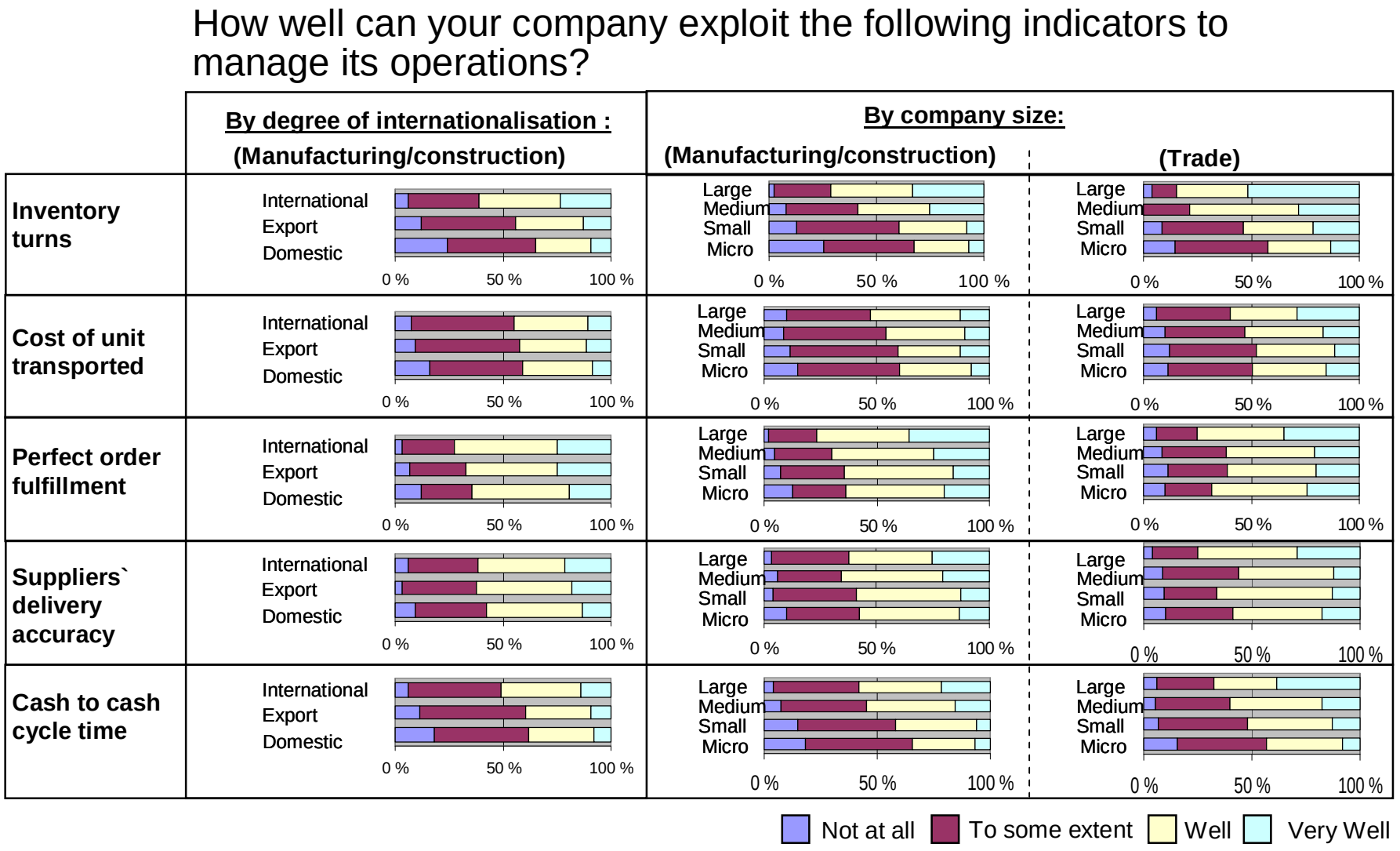


Figure 24 ***Respondents' assessment of their ability to exploit logistics indicators in their business by degree of internationalisation and company size, % of respondents.***

5.3 Logistics information systems

Several different types of questions were used to chart how well costs in the supply chain and order/delivery data were monitored (Figure 25). Logistics costs are monitored fairly actively within companies, but monitoring of the supply chain as a whole and the way information is distributed and disseminated are limited. Surprisingly, more than a quarter of companies operating in the domestic market do not monitor their logistics costs closely. It is rather more common to monitor costs internally in international companies.

It is still considerably rarer to monitor logistics costs in cooperation with suppliers and customers. It would seem that companies operating abroad, under pressure form global competition as they are, need to distribute information along the supply chain to boost efficiency. The size of the company is also relevant: the bigger the company the more information needs to be distributed along the supply chain.

Roughly 70% of large companies use logistic data to control their enterprise resource planning (ERP). But only less than 40% have arranged, for example, access for their suppliers to the company's inventory balances. It is also quite rare for the companies to have access to their customers' inventory balances. The transparency of the supply chain in the main sector of trade is in this respect still poorer, rather surprisingly.

Transparency of the supply chain cannot come about by just applying technical solutions, because there are many barriers involved that are connected with the principles upon which a company operates and factors relating to competition. Management of a seamless supply chain requires not only information management among the players involved but also an approach to business where data that has traditionally been seen as confidential is distributed amongst the partners in the chain. In practice this is very hard to achieve, and it is not even always an objective as far as the companies involved are concerned.

Regarding information systems the previous survey dealt with the use of different systems to a rather greater extent. Elements in common between this and the previous survey were: intranet / extranet applications, internet marketplaces, EDI systems and ERP systems. As the previous survey focused on medium-sized and small companies, a comparison of results only makes sense in connection with these.

In the previous survey just under 40% of companies in industry and trade used some sort of intranet / extranet application for the control of logistic data. In this survey, over 60% of respondents from large companies and almost 50% from medium-sized companies (more than 50% of which were trading companies) used an intranet / extranet application. These applications seem to be rather more common compared to the findings in the previous survey. Some sort of EDI application was in use by approximately 45% of the respondents in the previous survey. This survey shows that that figure has remained more or less the same.

The use of ERP systems, on the other hand, has become rather more common since the last survey. Just over 30% of the respondents in the previous survey said that their company used an ERP system. The corresponding figure for this study was just over 40% in industry and trade.

The 2001 survey revealed that logistics is becoming a very information-intensive process. The survey predicted an 'electronic breakthrough' for the future. The findings in this survey suggest that an electronic breakthrough is still a future goal. In small companies, in particular, the use of communications technology is often restricted to the phone, fax and email. More advanced technologies, such as EDI and ERP, are used by quite a small number of companies. However, around 50% of large and of international companies have begun to use such systems. In terms of this group of companies as a whole, 50% is quite a low proportion. The use of advanced systems nevertheless demands huge resources, and the benefits of such systems to small companies do not always match the kind of time and effort that needs to go into adopting them.

An ASP (Application Service Provider) is an operator that provides software services from a service centre for a service charge. The customer can use this software over the internet for a reasonable capital outlay. Although ASP services are available on the market, they are not very conspicuous in the survey findings.

Traditional ways of sending messages are still the most common for communicating logistics data. Micro and small companies just do not have the electronic tools available, except for internet-based services. The use of EDI and ERP is still very rare in companies in this size category. On the other hand, the results of the survey show that even large companies are active users of extranet and intranet services. The services of the electronic marketplace might also be a potential means of controlling logistics for smaller companies for pretty minimal outlay.

International companies make use of more advanced information transfer technologies than export companies and companies operating in the domestic market. This is only natural as the control of logistics for production units abroad is difficult without electronic systems. The need for such systems is therefore greater.

The most common means of communication in companies are the more traditional options, such as the letter, telephone, fax or email. These findings, however, are partly explained by the distribution of sizes of company chosen for the survey. The respondents tend more to be small companies, which have no good reason necessarily to utilise more advanced systems. There would be much more evidence of the use of such systems, for example, EDI and ERP, had the study been restricted to medium-sized and large companies.

”Please indicate the extent to which you agree or disagree with the following statements”

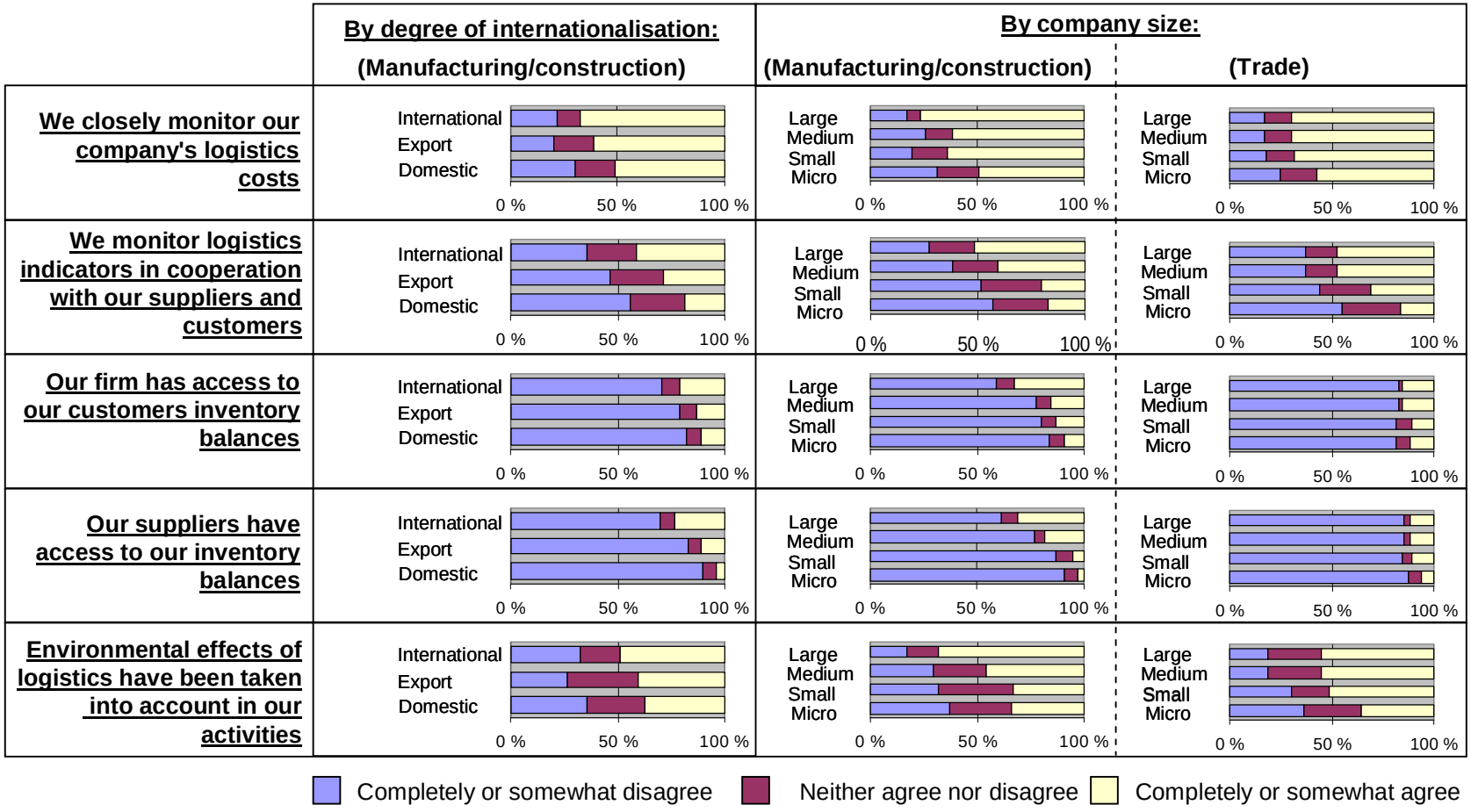


Figure 25 ***Transparency of the supply chains in industry and trade and attention to environmental issues by degree of internationalisation and company size, % of respondents. International companies n=168, export companies n=202, companies operating in the domestic market n=586, large companies n=177, medium-sized companies n=170, small companies n=310, micro companies n=1,066***

The use of RFID technology is still minimal. In the survey, people were also asked to comment on the statement "In five years' time we will be using radio frequency identification (RFID) technology". 18.3% of manufacturing companies and 11.7% of trading companies agreed completely or partly with the statement. Almost 50% of the international and large companies indicated that they would be using the technology within five years.

It has long been anticipated that RFID technology would revolutionise logistics. This survey indicates that it is only very rarely used as yet, but there is strong pressure to start using it and expectations are high. Before long, RFID may well replace bar code technology. One view is that RFID will quite quickly become a common means of identifying pallets and unit loads, although it should taker much longer for the breakthrough to impact on individual consignments.

RFID Lab Finland is a publicly-funded project whose purpose it is to help companies and organisations apply RFID in the initial stages. It is possible to test this technology in a state-of-the-art laboratory in a lifelike environment[29].

There are major differences between sectors in the matter of transparency of the supply chain. The questionnaire presented the statements "Our suppliers have access to our company's inventory balances" and "Our company has access to our customers' inventory balances". The results show that of the manufacturing industries (Attachment 10), the pulp, paper and paper product manufacturing sector has the greatest transparency both backwards and forwards along the supply chain. The least transparency is found in the textile and leather industries. Of the sectors in trade (Attachment 11), the best transparency in the supply chain would seem to be in the food retail sector and fuel trade.

The main conclusion drawn from the 2001 survey was that companies were extending their approach to logistics outside the business and that the related supply network was becoming more transparent. The same was true of the surveys in 1992 and 1997. The results of this survey show minimal transparency in respect of customers and suppliers. There is a general awareness of the need for greater transparency, but it is hard to bring about in practice.

This sluggish progress with regard to transparency is partly explained by the unequal status of the separate parts of the supply chain. If there is a company in the chain which is more dominant in terms of its size and market position, individual companies might feel tempted to keep their corporate information to themselves, thus controlling how the chain operates. The problem is not so much a lack of the necessary technological resources but the difficulties involved in sharing benefits and risks among companies.

[29] http://www.rfidlab.fi/

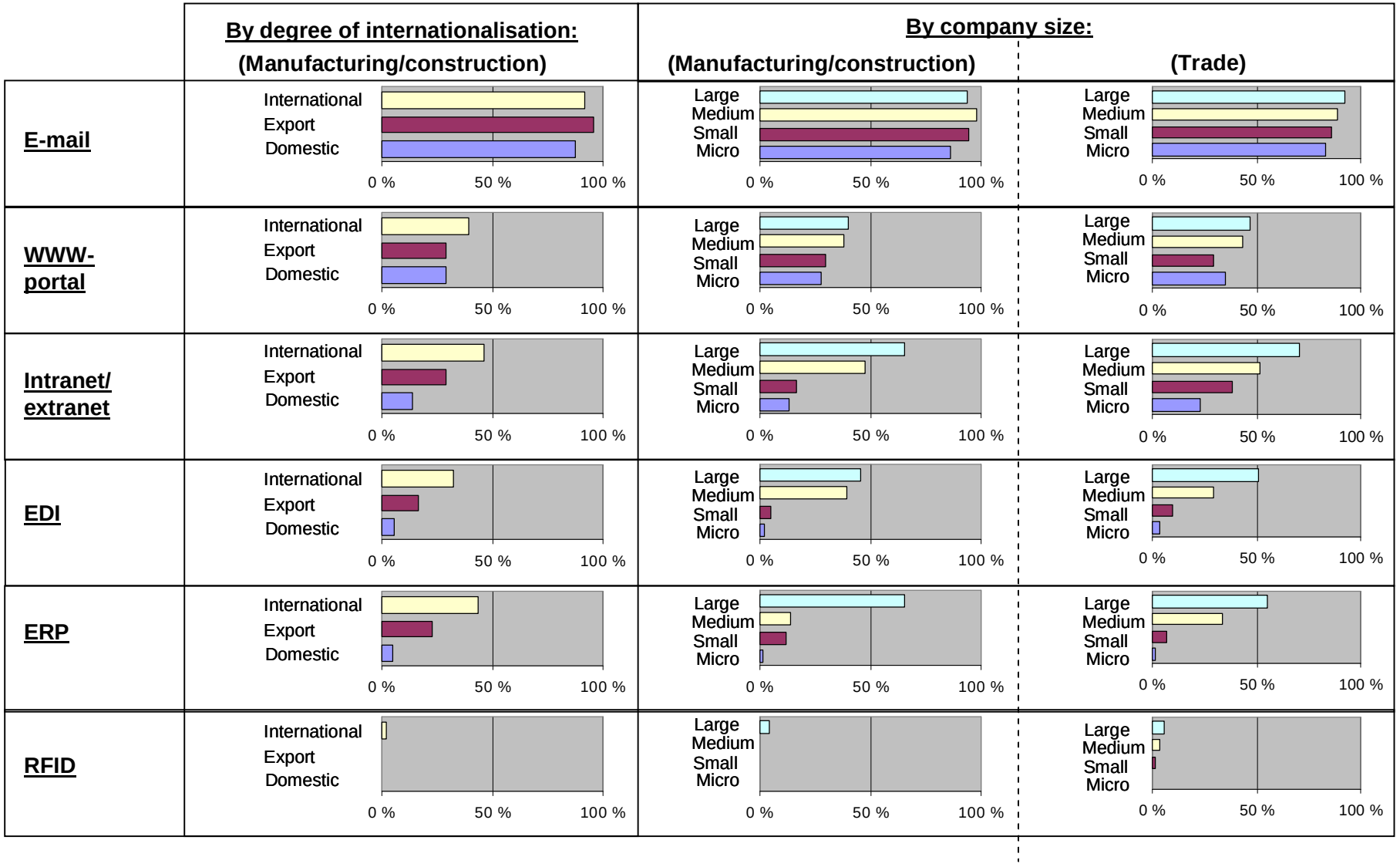


Figure 26 ***Use of technologies in industry and trade to control and manage logistic data by degree of internationalisation and company size, % of respondents. International companies n=172, export companies n=206, companies operating in the domestic market n=604, large companies n=168, medium-sized companies n=172, small companies n=316, micro companies n=1,100***

” Please indicate the extent to which you agree or disagree with the following statements”

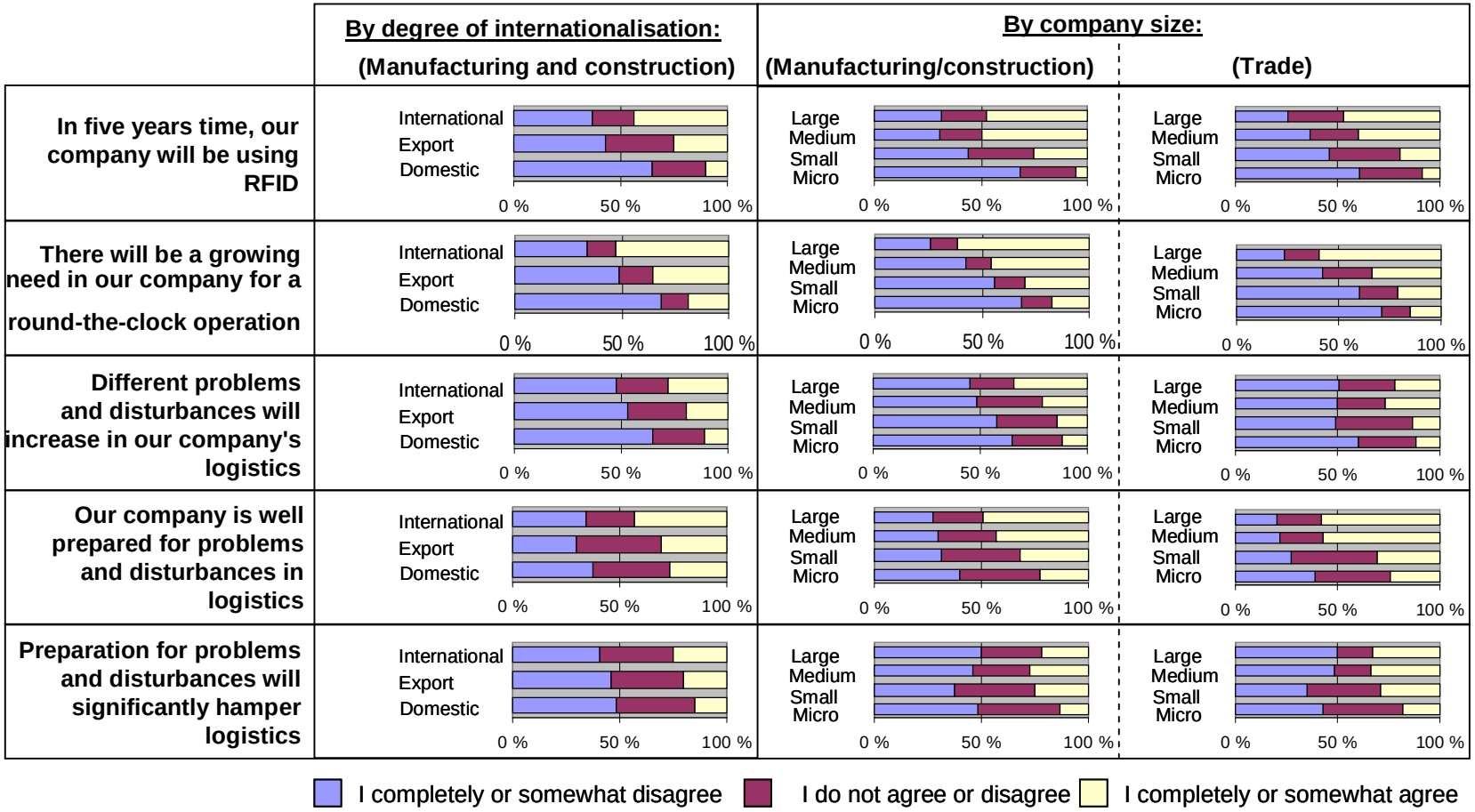


Figure 27 ***Views in industry and trade of the future of the supply chain by degree of internationalisation and company size. % of respondents. International companies n=168, export companies n=202, companies operating in the domestic market n=586, large companies n=177, medium-sized companies n=170, small companies n=310, micro companies n=1,066***

5.4 Logistics competence

The companies responding to the survey were asked their opinion of the levels of competence within their company and among various stakeholders (Figure 30). Large and international companies are more satisfied with their levels of skill than smaller companies and those operating locally. Self-evaluation would appear to be reasonably reliable if the results are compared with how successful the various groups of companies have been in the way they deal with logistics. For example, companies operating in the domestic market would generally seem to have most room for improvement in the area of logistics and these companies also rate themselves as weak. Self-evaluation among these particular companies may nevertheless be 'too positive'.

Trading companies, and large ones in particular, were the most satisfied of all regarding their competence in logistics. These findings are very understandable as this group includes chains of stores throughout the entire country, and these are able to benefit from substantial economies of scale, for example by effective use of IT systems. It is interesting to observe that the ratings these extremely competent companies give their suppliers of logistic services are also the highest of the groups compared in the diagram. It would therefore appear that a skilled and sound purchaser of logistic services is able significantly to impact on the quality of the services bought and the competence level of the service provider.

The very positive scores the trade sector gives to their suppliers of logistic services is explained by the structure of the trade sector. Very often the purchaser of logistic services and the service provider are parts of the same organisation. However, respondents in industrial sectors also considered the levels of competence among their suppliers of logistic services high. More than 80% of the large and medium-sized companies in industry and trade judge the competence level of their suppliers of logistic services to be either fairly high or very high. This is significant because the typical profile for the outsourcing of logistics tends to relate to quite simple kinds of service, such as transport. The outsourcing of demanding operations does not seem to be the result of a lack of logistics providers' skills.

The logistic competence of customers was rated generally at the same level as the companies' own competence. The responding company's background also impacted somewhat on these results.

The ratings the respondents give their suppliers are virtually a mirror image of their own levels of competence. Large and international companies show themselves to be more critical of the skills of their suppliers. Small and micro companies rate their suppliers' competence levels even higher than their own.

Companies were also asked to assess the main areas for staff development in the future (Figure 28 and Figure 29). Manufacturing and trade seem to share similar views. Respondents from industry thought that staff competence was the major area for improvement, especially in the area of supervision of production planning.

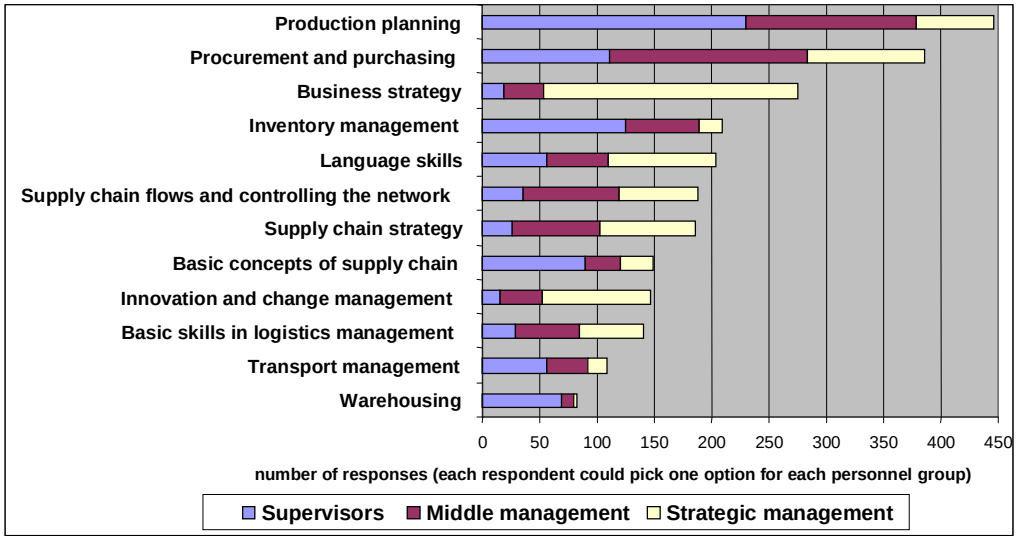


Figure 28 Areas for staff development in industrial companies, n=861.Each respondent had to choose one vital area for staff development for each personnel group

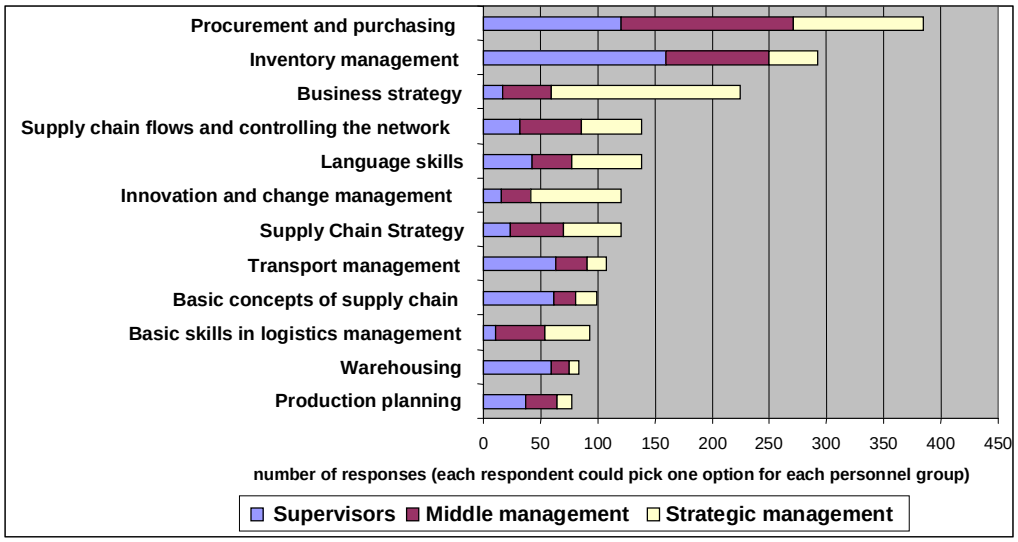


Figure 29 Areas for staff development in trading companies, n=659.Each respondent had to choose one vital area for staff development for each personnel group

On other areas for development the respondents were fairly unanimous, regardless of sector. Procurement, buying and inventory management were among the main areas for improvement in companies in both industry and trade, especially at supervisor and mid-management level. Business strategy was felt to be the main area for development among senior management, and with good reason.

Surprisingly, little importance given by the respondents to language skills as an area for skills development, especially at mid- and senior management level. There may be a number of reasons for this. Firstly, language skills among those involved in international operations in companies are already at a fairly high level, at least one assumes so with regard to the languages spoken in the main Western markets. Secondly, language skills for companies operating in the domestic market may well of course be a less important issue.

A third explanation for language skills being judged less important as an area for development related to trade with Russia. In a survey produced in 2004 on areas for development in logistics information in respect of goods traffic between the

EU and Russia, it emerged that in Finnish-Russian trade there was very infrequent control of transport, particularly in cases of direct sales to Russian actors. So the need for staff with a knowledge of Russian was not so great. Many large companies had furthermore set up subsidiaries in Russia, where the language of business in dealing with parent companies was often English (TEDIM 2004).

Although there appears to be little need to develop language skills, the fact that Finnish is a minority language may be a problem for companies. In an international supply chain, countries where the major languages are spoken may be at an advantage, especially when decisions are being taken about where to locate central operations.

Very recently Finnish companies have been given the opportunity to use new on-line tools to improve their logistic competence. For example, the Finnish Association of Logistics offers its members a free logistics development tool, the SCM Score Card, which can be used to identify a company's situation with regard to the supply chain (Finnish Association of Logistics[30] and Aaltonen 2005). Another innovation is the Logistics Strategy Selection Tool[31] (Finnish Centre of Expertise for Logistics).

[30] www.logy.fi
[31] www.uudenmaanosaamiskeskus.fi/logistics/default.cfm?dept0=10267&cd=10267&depth=1

" What is the level of logistic competence: a) in your company, b) among your customers, c) among your suppliers, d) among your suppliers of logistic services, and e) among your competitors?"

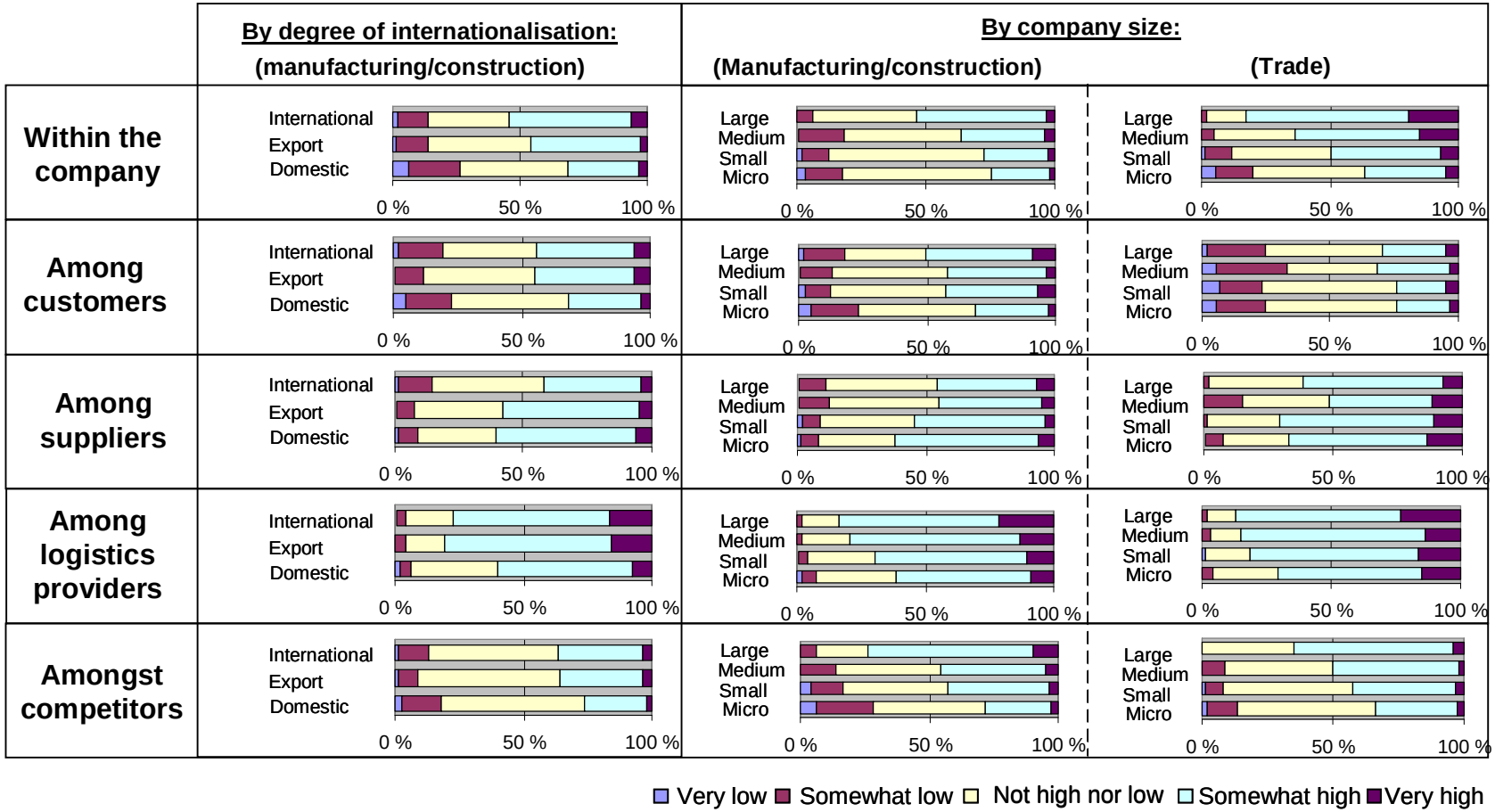


Figure 30 ***Logistic skills ratings in industry and trade within the company and in stakeholder groups by degree of internationalisation and company size, % of respondents. International companies n=168, export companies n=202, companies operating in the domestic market n=588, large companies n=168, medium-sized companies n=164, small companies n=300, micro companies n=1,012***

5.5 Operating environment

Companies were asked to rate the operating conditions in the area in which they were based[32] from the point of view of (i) business generally, (ii) logistic efficiency, (iii) infrastructure, (iv) locating centres of production, and (v) location of competitors.

The results are presented in such a way that the regions have been divided into five categories based on the mean value of the replies. Absolute differences between categories are small.

More than 70% of all the respondents were fairly or very satisfied with the general business climate and operating conditions where they were based. It is interesting that only less than 50% were fairly or very satisfied with their location with respect to competitors. With regard to the three other parameters (ii, iii, and iv), around 60% were fairly or very satisfied with their location.

In industry and construction, companies in south and south-west Finland are most satisfied with their location. This is as to be expected as distances to the country's main markets, ports and airports are short. Least satisfied are companies in north and east Finland.

Trading companies are also on average fairly satisfied with where they are based. Geographically, however, the findings for trade seem to be almost the opposite of those for industry. The trading companies most satisfied with their location would appear to be in north and east Finland, and, to some extent, in central Finland.

It is not possible to draw direct conclusions from findings regarding the business climate relating to Finland's status as country where production companies might locate in the future. It should be noted, however, that satisfaction was lowest with reference to location of competitors, which suggests that market factors have a different and perhaps greater significance compared to, for example, the general business climate. When we add to this the notion that large companies want to cut the costs of capital tied up in stock it may be concluded that these savings will perhaps go towards the centralisation of production and logistic operations.

[32] Main place of business postcode

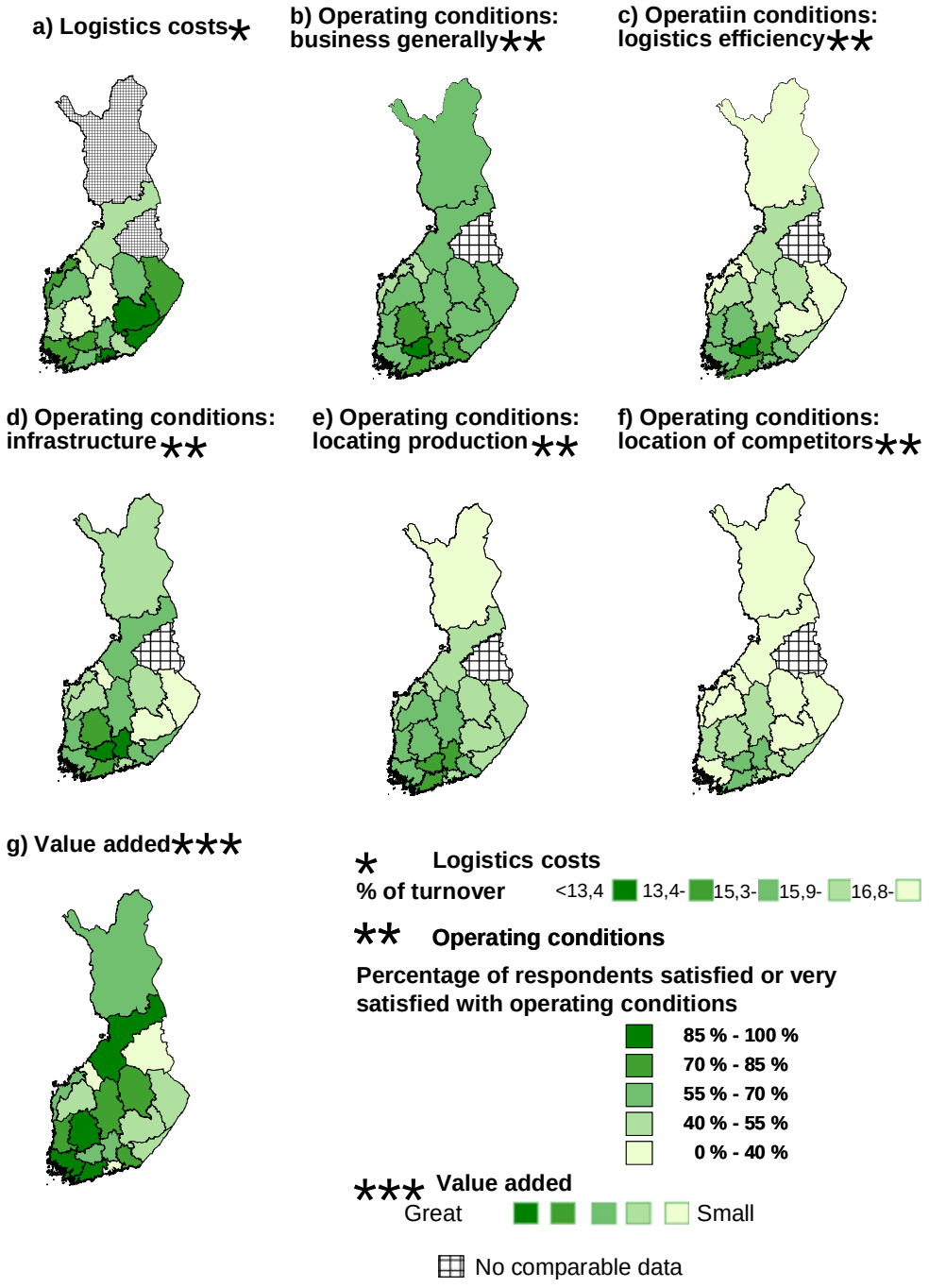


Figure 31 *Regional comparison of operating conditions (business climate) in industry, N=814. Source for companies' value added: Statistics Finland 2006.*

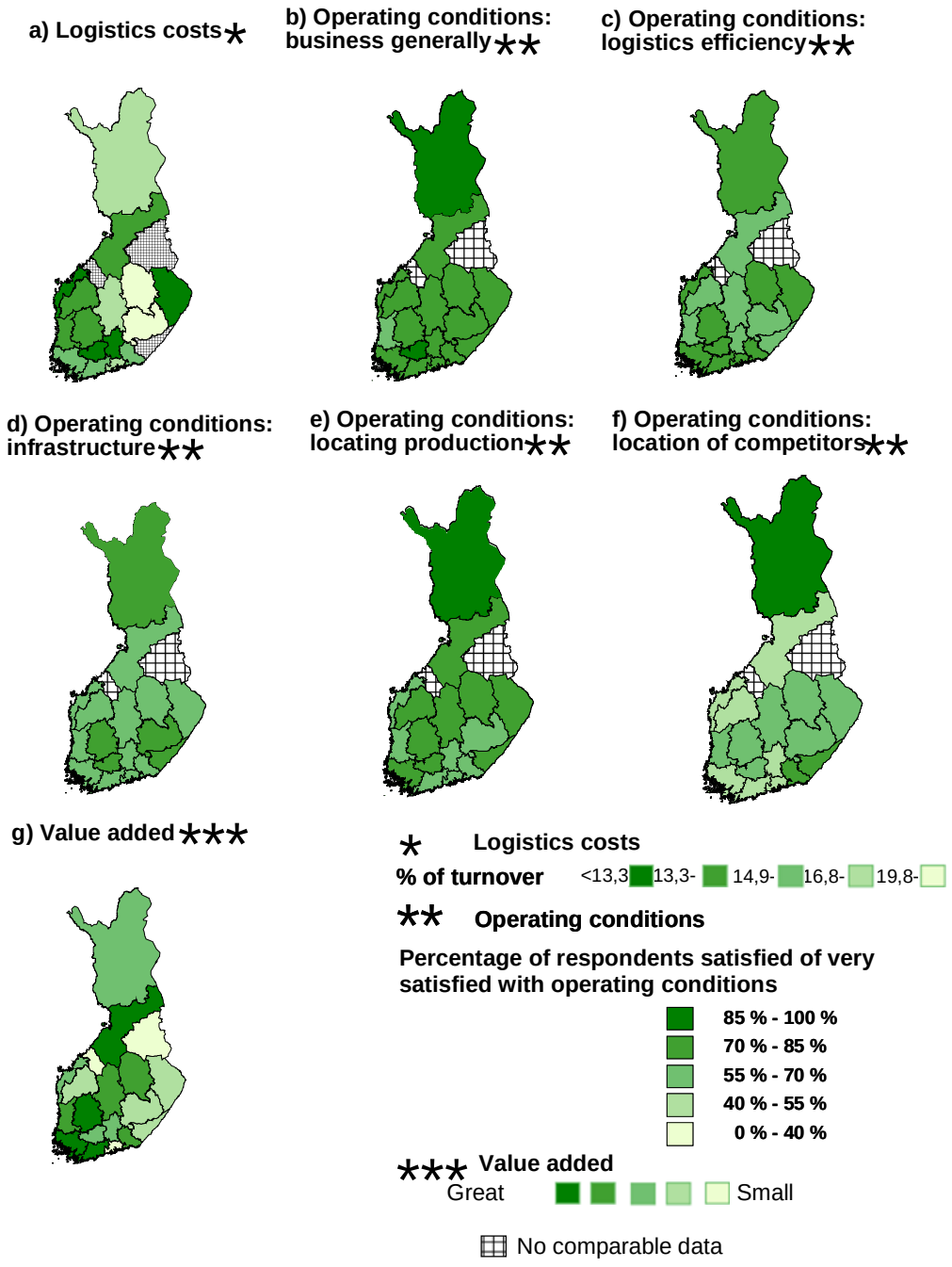


Figure 32 *Regional comparison of operating conditions (business climate) in trade, N=618. Source for companies' value added: Statistics Finland 2006.*

The map images presented represent the sum total of subjective ratings by respondents and may thus contain illogicalities.

Table 7 ***Operating conditions (business climate) in industry with regard to location of competitors, companies operating in the domestic market n=575 , export companies n=190, international companies n=162.***

Operating conditions (business climate) with regard to location of competitors Good or very good, % of respondents			
Region	**Companies operating in the domestic market**	**Export companies**	**International companies**
Uusimaa	62 %	50 %	41 %
Varsinais-Suomi	42 %	38 %	26 %
Pirkanmaa	56 %	49 %	42 %
South Ostrobothnia	41 %	23 %	17 %
Satakunta	43 %	69 %	58 %
Central Finland	47 %	50 %	38 %
Pohjois-Savo	26 %	20 %	33 %
Päijät-Häme	60 %	55 %	71 %
North Ostrobothnia	47 %	33 %	30 %
Lapland	36 %	0 %	43 %
Kymenlaakso	58 %	40 %	50 %
All Finland	44 %	42 %	39 %

Ratings for location in respect of competitors provide important information on companies regarding their global competitiveness. Although the differences between companies operating in the domestic market, export companies and international companies are small throughout the data, the trend is clear. While 44% of industrial companies operating in the domestic market were satisfied or very satisfied with their location, only 39% of international companies felt the same (Table 7).

Differences are highlighted when one examines the regions where there are a greater number than average of companies operating in global markets. These are Uusimaa, Varsinais-Suomi and Pirkanmaa[33]. The numbers for other regions should be viewed cautiously owing to the rather small number of respondents. The conclusion is that the majority of industrial companies are not satisfied with their location with regard to the competition. Location is deemed worse the more international the company's area of operations is.

Trading companies cater mainly for a local market and the importance of location is viewed very differently from that in industry. Trading companies are fairly/very satisfied with their location with respect to all the parameters examined.

[33] Total no. of respondents: Uusimaa = 145; international companies = 39; Varsinais-Suomi = 138; international companies = 27; and Pirkanmaa = 113; international companies = 19. respondents in other regions were fewer than 100, of which there were between 6 and 12 international companies in each.

5.6 Outsourcing of logistics operations

Transport, returns logistics and forwarding stand out as the most commonly outsourced logistics operations in manufacturing companies, construction and trade. These functions are only entirely organised by the company itself in around 30% of respondents. The least outsourced functions at present are billing, taking delivery of orders and inventory management.

There is a greater tendency to outsource logistics the more international a company is. This seems to be true for almost all logistics operations. The biggest differences are to be found among those companies which have outsourced 75% or more of their transport needs. It should also be noted that the outsourcing of storage is considerably more common in international companies than in export companies or companies operating in the domestic market.

In the 2001 survey, outsourcing was examined by subject area (procurement logistics, production logistics, distribution logistics and management of the supply network). For the sake of global comparison, this survey examined the outsourcing of single functions. In the previous survey the operation most commonly outsourced was distribution logistics, which 66% of the respondents said was outsourced. Next came procurement logistics (34% of respondents). The least commonly outsourced areas were production logistics and management of the supply network, which only just over 25% of respondents said they outsourced.

The most commonly outsourced function according to the 2006 survey was transport, which about 90% of respondents said was outsourced totally or partially. When it is taken into account that the majority of respondents in this survey were small companies it may be assumed that the outsourcing of logistics has become more common since the previous surveys, at least in the area of transport.

According to the survey, the fastest trend in the outsourcing of logistics will be in IT systems and storage. Taking delivery of orders, inventory management and billing will mainly continue to be the responsibility of the company.

With regard to production logistics, this survey examined the outsourcing of the finishing/refinement or customisation process of products. Just over 20% of respondents in this survey said they outsourced this function either wholly or partly. Production logistics is therefore still mainly under the control of the companies.

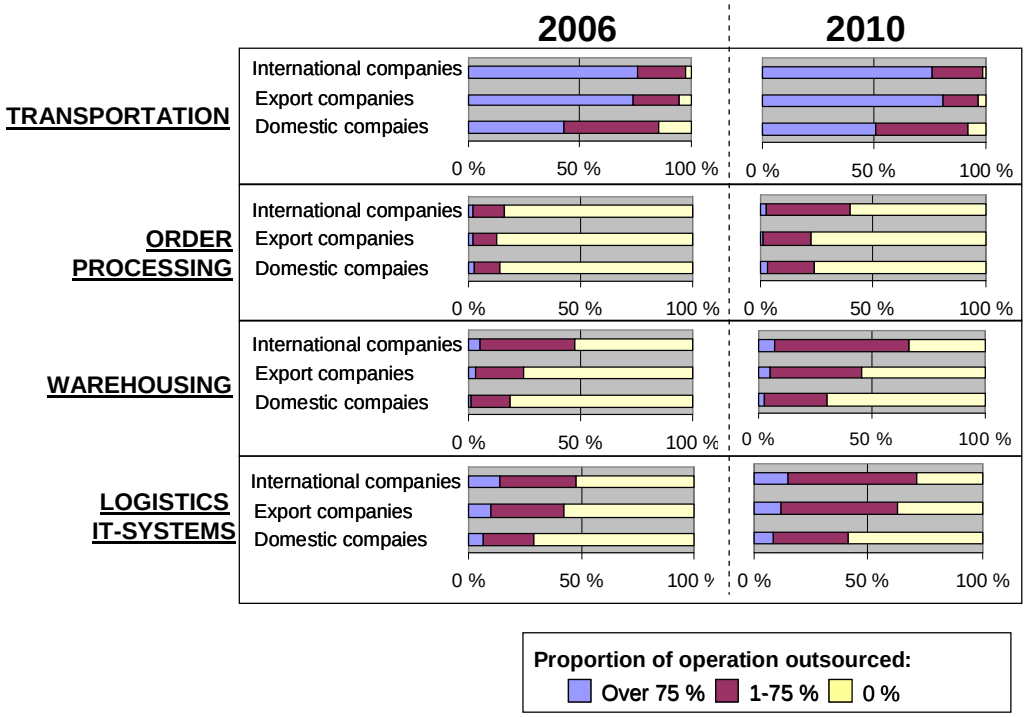


Figure 33 ***The influence of internationalisation on outsourcing in industrial companies shown in three divisions - over 75 %, 1<75 % and 0 % - in four selected areas of logistics (transport n=586,taking delivery of orders n=550, storage=557, logistics information systems =554)***

The 2001 survey suggested that outsourcing of logistic operations was rising and covering wider areas of services instead of focusing on single operations.

In this survey logistic services suppliers were asked to say what they thought turnover was composed of in terms of different types of services at present and predict trends regarding what share of the operation would be accounted for by different types of services in the future. Most of the turnover of service providers at present still consists of single services or standardised service packages. Service companies say, however, that in the future the share of different types of service packages will grow substantially. It would seem that service providers have understood customers' views of the nature of the logistics service market of the future.

As regards motives for outsourcing, it would appear that the most common in companies in both trade and industry is the desire to concentrate on core skills and expertise. Fundamental to this too is the fact that just around 40% of companies say their motive is to reduce logistics costs. But the results suggest that outsourcing may be due more to an aim for flexibility than mere costs. Overall, the motives for outsourcing among manufacturing, construction and trading companies are fairly similar (Figure 34).

The findings in the 2001 survey regarding motives for, and barriers to, outsourcing are partly similar to those in this survey. The main motives were the need for flexibility and a cut in fixed costs. In this survey too a need for flexible service capacity and reduction in costs were among the three main motives given.

Regarding barriers to outsourcing, the results differ somewhat. In 2001 the greatest barriers to the use of external logistic services were explained this way: (i) logistics functions were already outsourced sufficiently, (ii) logistics functions are part of a company's core operations, and (iii) there is the fear of losing control of the operation. In this survey, on the other hand, the notion of logistics as being a part of core operations and fear of losing control were not thought to be very significant factors.

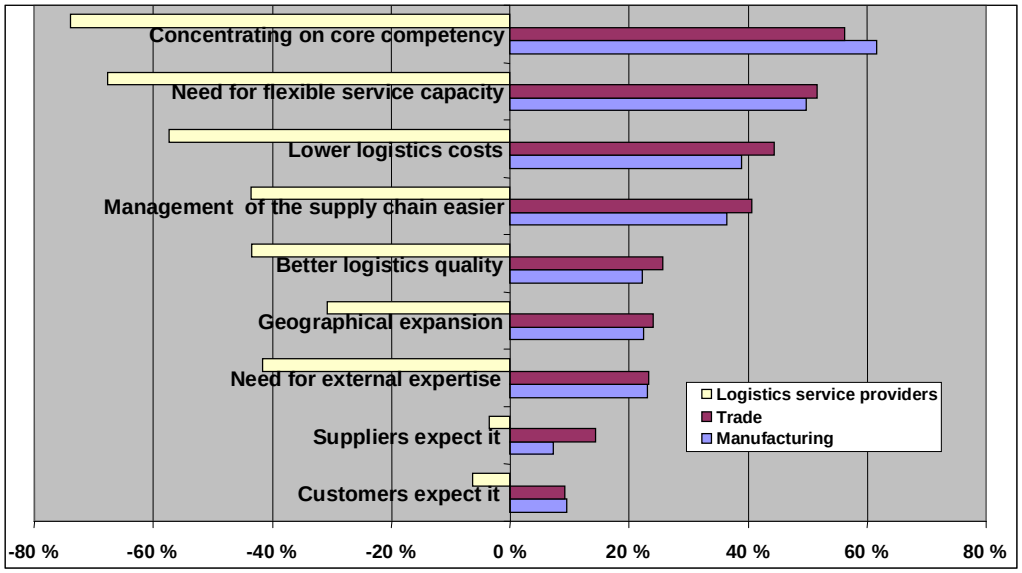


Figure 34 Motives for using external logistics service providers, % of respondents manufacturing/construction n=985, trade n=788, logistic services companies n=482)

The demands of suppliers and customers does not appear in the findings to be a significant reason for using external service providers, which could be a sign too of a fairly low level of coordination along the entire supply chain. Significant barriers to the outsourcing of logistics include companies' doubts about the standards of services provided and their opportunities to control standards of service. Doubts about the cost savings made by using outsourced services were one of the most common barriers to outsourcing mentioned.

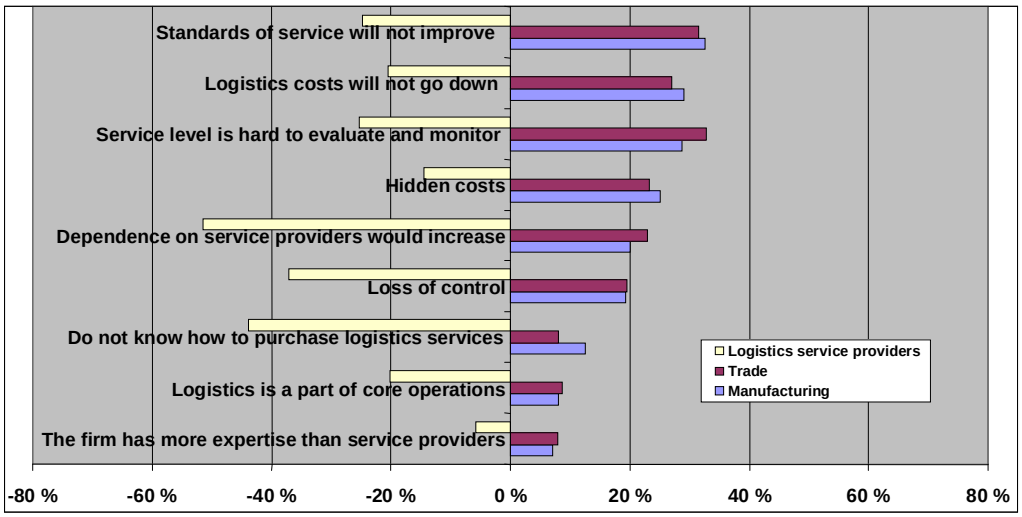


Figure 35 Greatest barriers to using external logistics service providers, (industry n=985 , trade n=788, logistics service companies n=482)

There were clearly more positive than negative aspects to using external logistics suppliers in both industry and trade. Company practices varied greatly, depending, for example, on sector and company size. Many sectors feature logistic activity that is thought more in terms of a structural arrangement within the company than logistic services to be outsourced, which makes it awkward to measure the extent to which external logistic services are used. The findings therefore only give a general picture of the structure regarding use of external logistic services, which seems to be slowly changing its nature and heading in the direction of more advanced logistic services that call for more technological know-how.

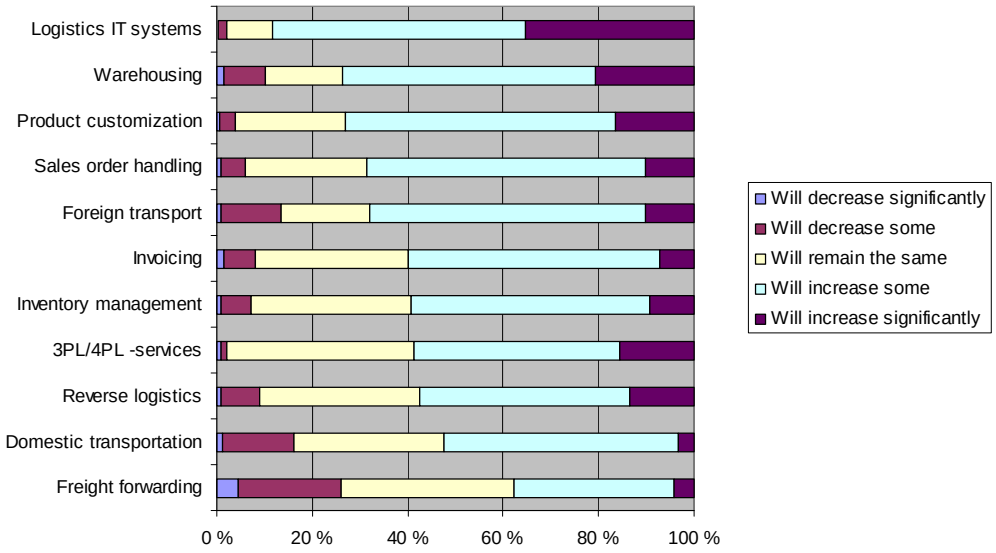


Figure 36 The view of logistics services companies on the trend in the demand for different logistic services in the next five years n=459)

Figure 36 shows how logistic services companies see demand developing in the future. Outsourcing in the areas of logistics information systems, storage and product finishing/refinement is expected to grow most. The views of service providers and customers are fairly close to one another. Manufacturing and trading companies also think that the outsourcing of logistics information systems and storage will grow most in the future.

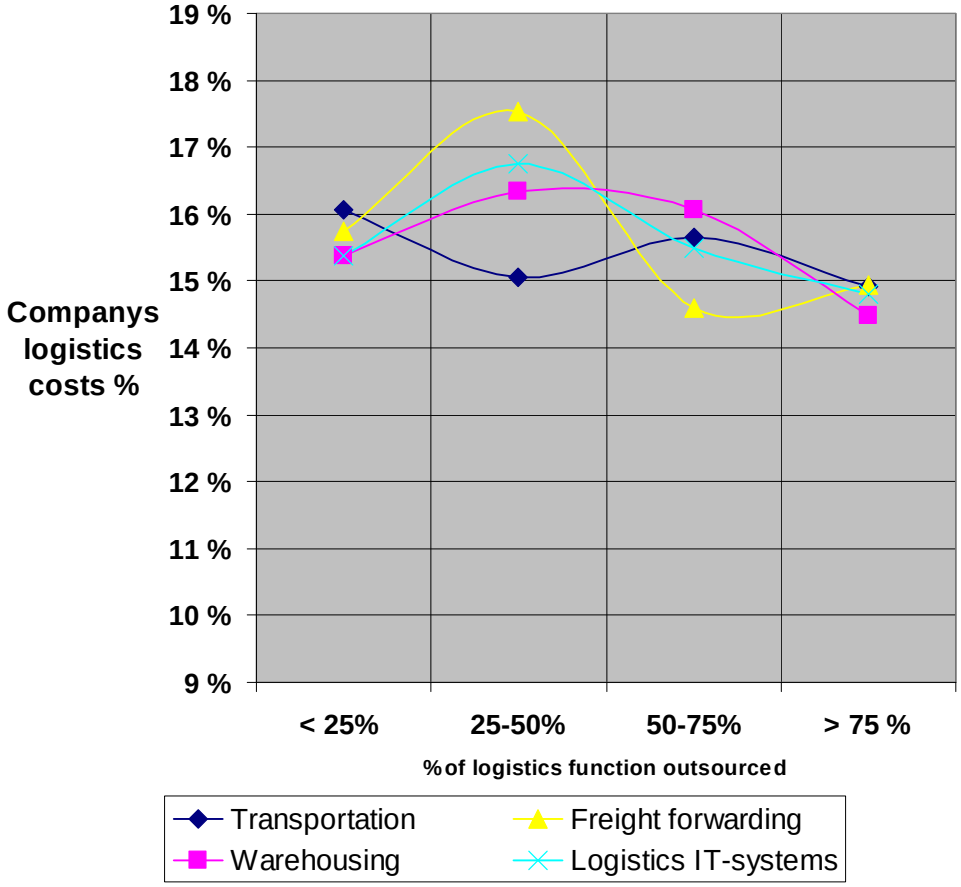


Figure 37 Rate of logistics outsourcing in relation to average logistics costs, (transport n=1,699, forwarding n=1,370 , storage/warehousing n=1,620 , inventory management n=1,622 , logistics information systems n=1,606)

Figure 37 illustrates the link between the outsourcing of some logistic services and companies' logistics costs. The degree and cost of outsourcing would seem to be in some way inversely dependent on each other. Despite the differences, the main trend would appear to be that the more logistics are outsourced the lower cost levels are.

5.7 Development needs

The respondents were asked to name three main areas in their company that needed developing. The answers were condensed into one parameter by establishing an index series, so that most important area for development received a weighting of 1, second most important 1/2 and third most important 1/3. The different groups of respondents were made mutually comparable so that the most important factor received the value 100 and thereafter values of less than 100.

The main area for development in industrial companies was improved customer service. In manufacturing companies staff skills development was thought to be almost as important as customer service, whilst in trading companies the second most important area for development was better information systems.

Large and international companies see the transparency of the supply chain as the most important area for development for the future and in second place is development of information systems. With export companies the most important area for improvement is improved staff competence and with domestic market companies it is better customer service.

Each respondent had to choose three main areas for development from a set list

Answers are indexed in the diagrams with the following weightings:

Most important area for development = 3

2. Most important area for development = 2

3. Most important area for development = 1

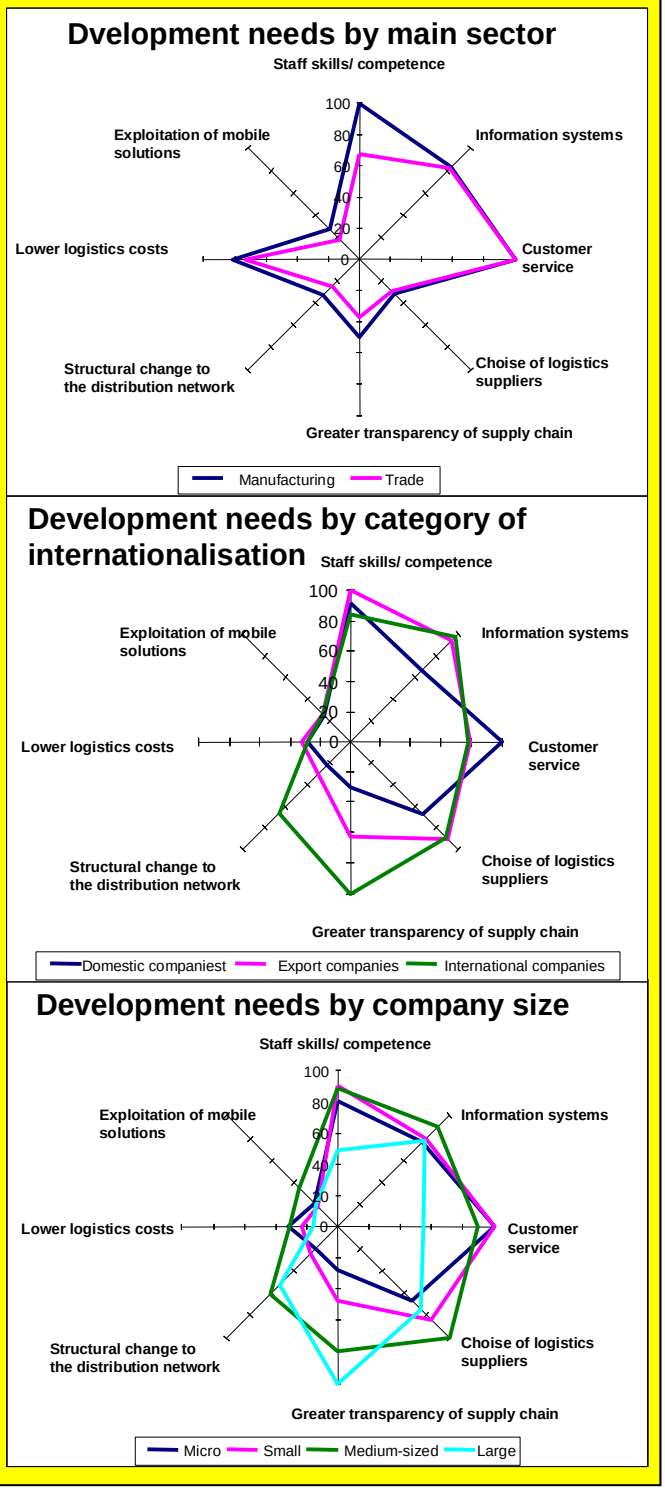


Figure 38 ***Areas for development in companies in trade and industry. Industry n=906, trade n=739 , companies operating in domestic market=556 , export companies n=196, international companies n=154, micro companies n=1,032 , small companies n=298, medium-sized companies n=158, large companies n=157***

6 FINDINGS FROM LOGISTICS SERVICE PROVIDERS

Key observations:

- Greatest threats are the challenging market situation and availability of skilled staff
- Larger service packages still the aim of logistics companies
- Electronic systems generally used internally; around half also use them with stakeholders
- Customers relatively concentrated in large logistics companies; biggest customer in half of micro companies responsible for at least 50% of turnover

6.1 Client structure

With medium-sized and large companies offering logistic services, the degree of centralisation would seem to be decreasing. Medium-sized companies estimated that their 10 biggest customers were now responsible for about 50% of turnover, whilst by 2010 it was thought that the figure would be on average 45% (Figure 39).

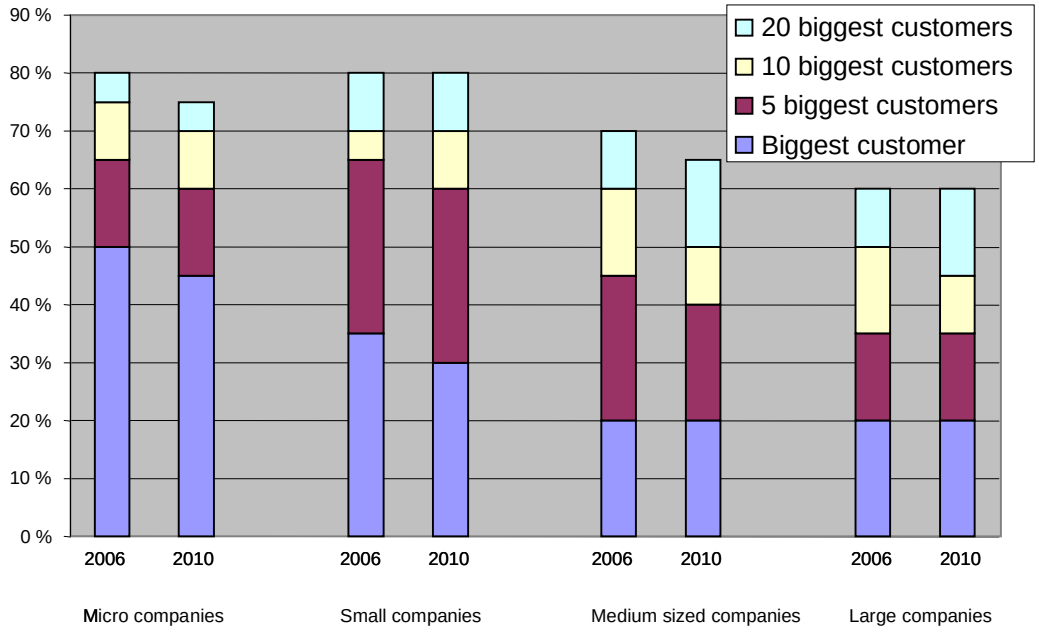


Figure 39 ***Distribution of turnover in logistics providers with respect to the 20 biggest customers 2006 and 2010 (estimated) , average values for respondents shown (n=482)***

Of micro companies, those engaged in road transport are by far the largest respondent group (over 60%). Typically, this group had fewer than 20 customers.

The importance of the five biggest companies is surprisingly great in the client structure of companies, and accounts for 35% in the largest companies. Overall it is believed that the share of turnover represented by the 20 biggest companies will not have changed by 2010. It appears that the market strength of the biggest logistics customers is significant and will furthermore probably remain unchanged.

The share of the market represented by transport and storage services alone is at present considerable, but it is falling in logistic services companies of all sizes. Instead of single services more and more in the way of service packages are being offered/provided.

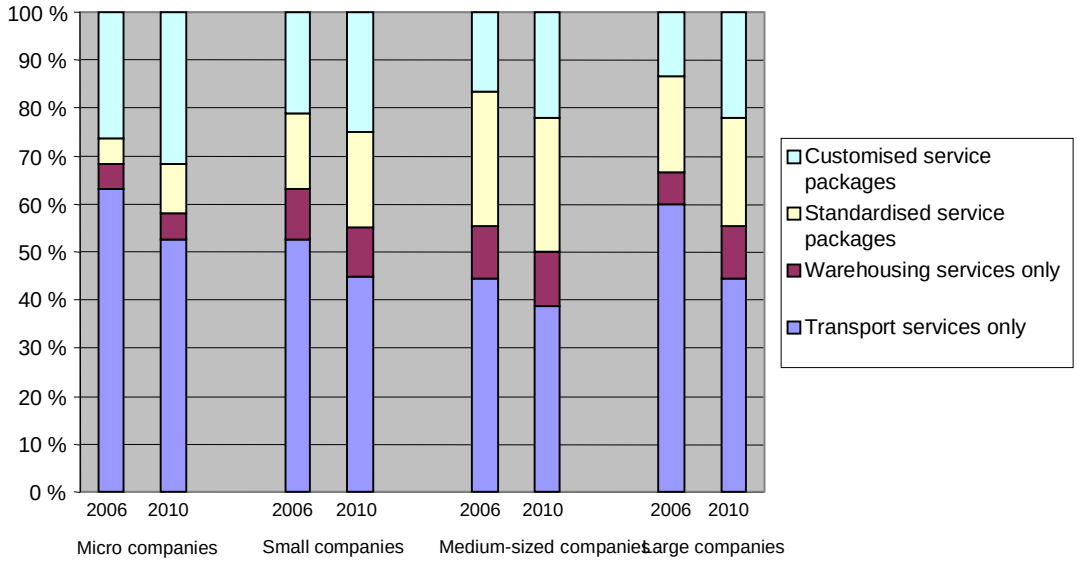


Figure 40 Distribution of turnover in logistics providers for different types of service 2006 and 2010 estimated), average values for respondents shown (n=482)

6.2 Share of international operations

The following diagram shows the distribution of turnover geographically in logistic services companies of varying sizes. It can be seen that just around 60% of the turnover in large logistic services companies comes from Finland, the corresponding figure in micro companies being almost 85%. Most of the companies' turnover from outside Finland comes from Europe, including non-EU countries such as Russia.

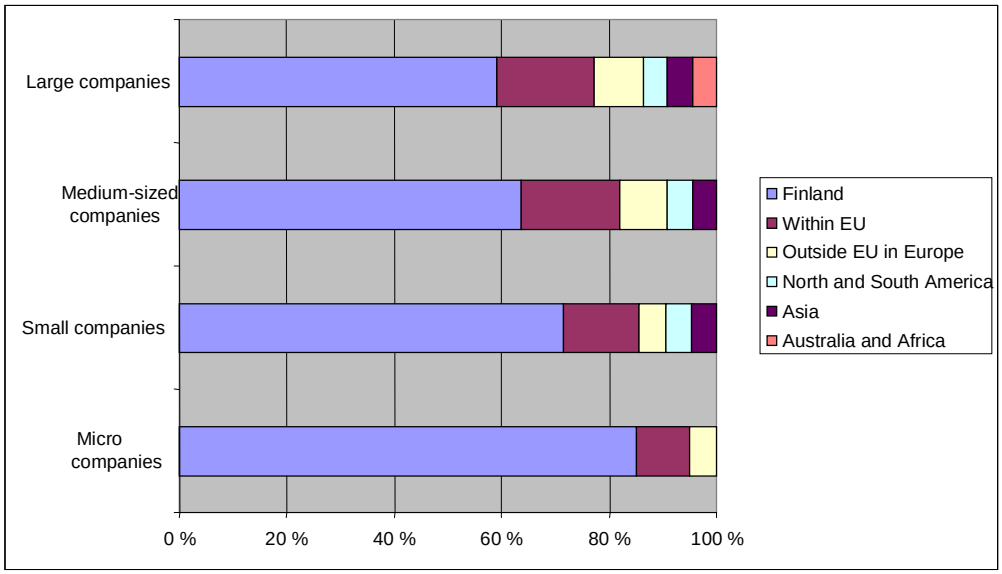


Figure 41 Distribution of turnover in logistics providers for different regions of the world (n=482)

Finnish companies offering logistic services also have operations outside the EU. Although this represents a relatively small part of the turnover it could still be claimed that some Finnish logistic companies have operations in almost every continent.

Finnish transport and logistics companies mainly cater for Finnish business and foreign trade and are not actively involved in the global logistics market.

Figures for the Finnish economy show that Finland is the only country in the Baltic region besides Germany that is a net importer of transport services (World Development Indicators 2005; see also chapter 3.4). In 2004 imports of fright transport services were approximately €1 billion more than exports in this sector. This represents 0.66 % of GDP.

6.3 Information systems

It is clear that the larger a company is the greater use is made of electronic systems. More than 40% of companies use an ERP system and as many as 75% EDI in their production of services (Attachment 12).

The use of such systems with customers, suppliers and the authorities is less frequent. The use of EDI in dealings with the authorities is, on the other hand, surprisingly common (approx. 30% of medium-sized companies).

It is rare for companies to use an ERP system in dealing with the authorities. Just 27% of large companies have an ERP link with customers, but just under 2% have one with the authorities.

In the 2001 survey, about 60% of logistic services companies used an intranet / extranet system. The findings in this survey suggest that in companies in almost all sectors the use of such systems was as common or slightly more common than in the earlier survey. Taking account of the size distribution of the companies responding to this survey, it is to be supposed that use of intranet and extranet has become more common in the last five years. But almost 80% of the companies have not as yet lived up to the optimistic expectations expressed in the previous survey.

Especially worthy of note is the fact that intra/extranet solutions in water transport are used by almost 90% of the companies, which is the largest figure for all modes of transport, including postal and courier services. This is a very big number in international terms and is explained by the use of the Portnet system. This is a vital, functional and unique system and its future development and institutionalised use should be ensured.

With regard to EDI systems, this survey did not produce such high numbers as the earlier one. In the previous survey around 60% of companies said they used an EDI system. In this survey the figure was well under 50%, except in rail transport, forwarding and postal services. The result may well reflect the trend for companies to switch to more flexible solutions for their information systems, which are better suited to dealing with the rapidly changing situation regarding suppliers and customers than EDI is.

Which of the following does your company use to control and manage production of services at least once a week?

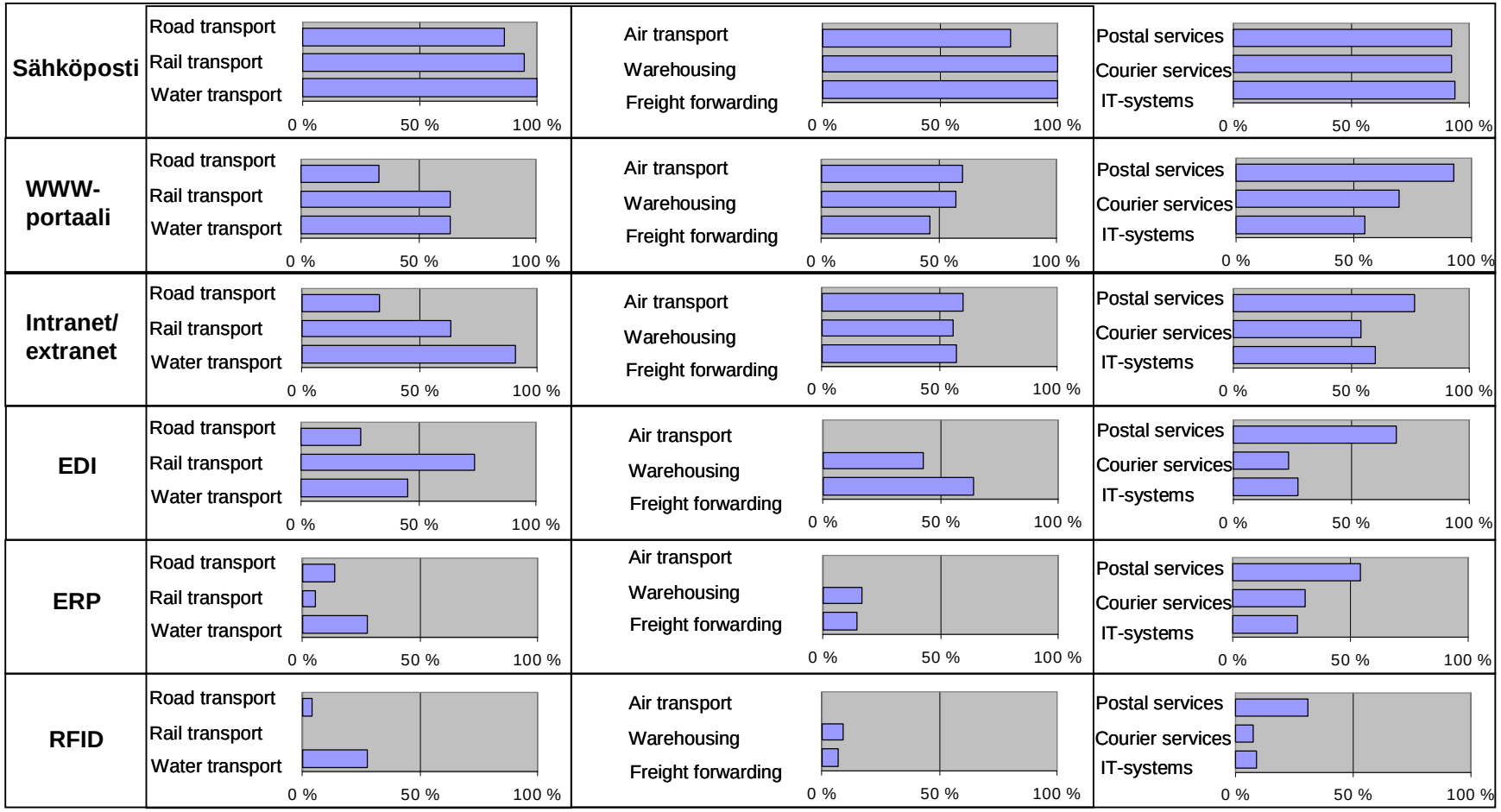


Figure 42 ***Use of technologies in logistics service providers for controlling and managing service production by sector, % of respondents. Road transport n=225, rail transport n=19, water transport =11, air transport n=5 , cargo and storage n=54, forwarding and freight n=28, postal services n=13, courier services =33 , IT and others n=91.***

ERP systems were not in very frequent use in companies offering logistics services five years ago, and there has not been a lot of advance in this area between surveys. In almost all sectors the number of users is still fairly small.

This is something of a surprise as this type of solution has also been made available to smaller companies via Application Service Providers (ASPs). The small number of uses is nevertheless explained by the large number of small and micro companies among the respondents. The use of ERP systems is common in large companies and in the supply chains they control, especially in the assembly industry and trade sector.

6.4 Logistics competence

In general, companies offering logistic services think their competence levels are high. Almost 80% of companies considered that their skills in logistics were either at a high or a very high level. Companies offering courier services rated their competence highest (Figure 43).

Companies representing waterway transport rate their skills the lowest. Only just over a half of respondents said their competence was at a high level.

Companies' ratings of stakeholder groups were not as positive as those for their own levels of competence. Only a majority of representatives of rail transport thought logistics competence among their customers was at either a high or a very high level. No more than half the companies in other sectors thought the levels of competence amongst their customers was high or very high.

An observation more alarming than poor customer competence is the idea that companies have of the levels of logistics competence of their subcontractors. Less than half of companies rated these skills high or very high.

Figure 44 illustrates the view of respondents regarding the main areas for development of competence among different personnel groups: staff, mid-management and senior management. In the diagram the alternatives are laid out round a clock face, going from development needs relating to operations, through tactical improvements to strategic developmental needs.

Areas for development for staff tend, understandably, to be in the area of practical operations, such as storage and transport management. The fact that there is a large number of haulage companies in the data is evident from the volume of responses concerning transport management.

With senior management the replies regarding need for improvement tend to congregate in the area of strategic activity, such as business strategy, innovation and change management.

” What is the level of logistics competence a) within your company, b) among your customers, c) among your subcontractors, d) among your competitors?”

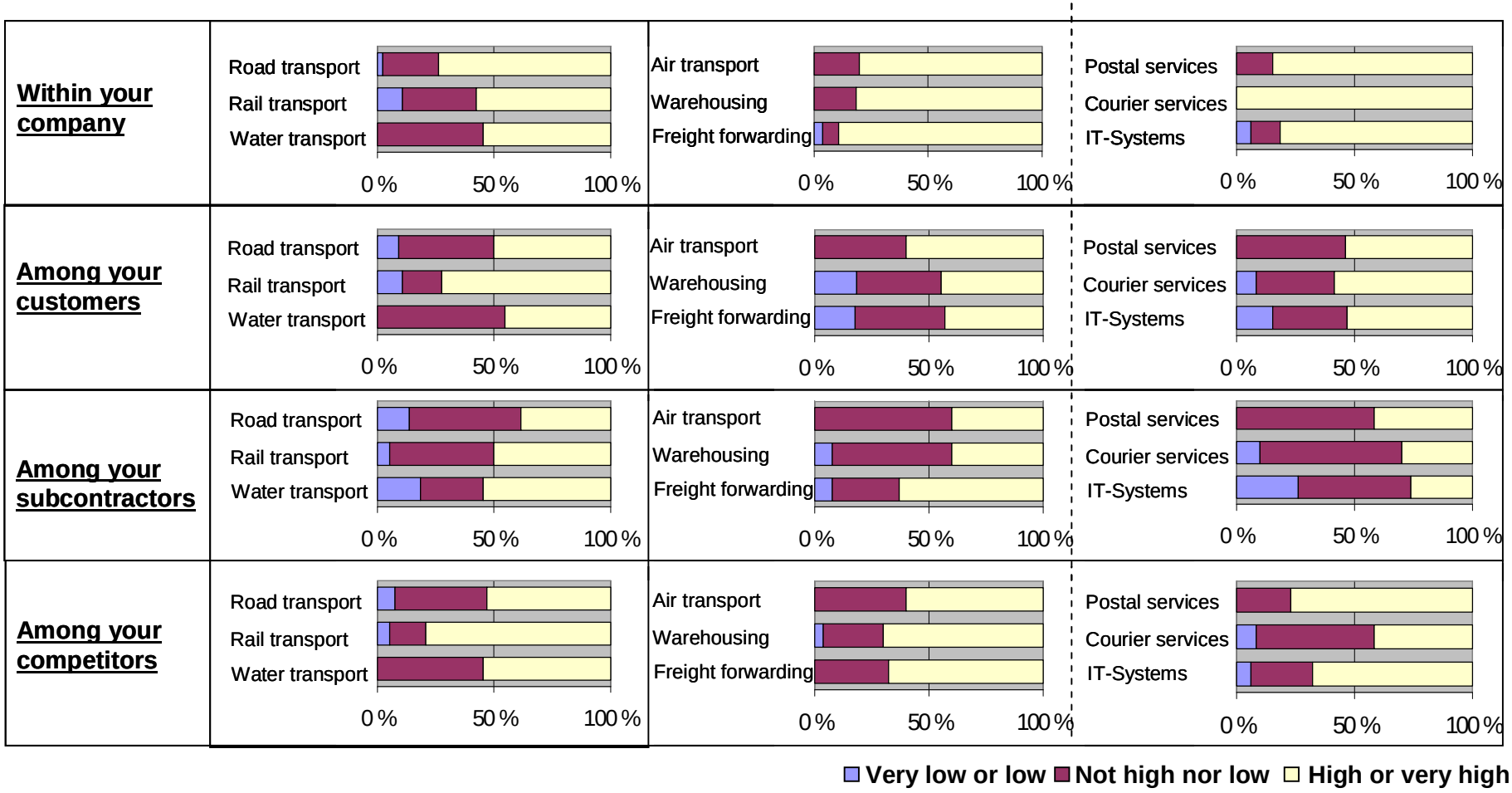


Figure 43 *Ratings by logistics service providers for competence within the company and with stakeholders by sector, % of respondents. Road transport n=224, rail transport n=19, water transport =11, air transport n=5 , cargo and storage n=54, forwarding n=28, postal services n=13, courier services =12 , logistics IT n=32.*

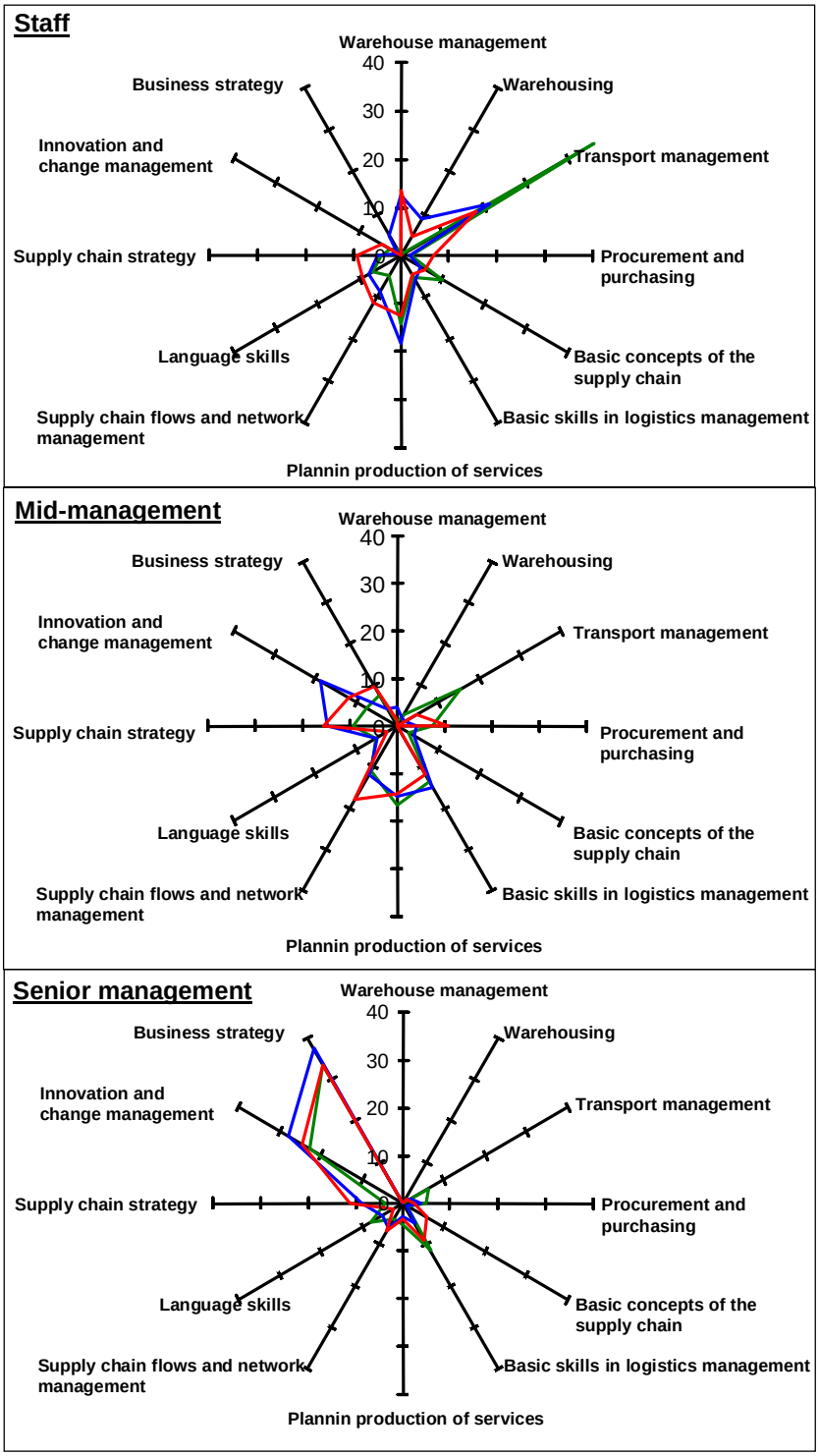


Figure 44 ***Areas for development in the competence of logistics service providers, % of respondents per personnel group. Respondents could select one area for development from a list for each personnel group. Transport n=246, cargo, freight agency services, postal services and courier services =104, information management and others n=90***

With mid-management, the replies divide up fairly evenly among the different components of the diagram, which reflects the very diverse nature of job descriptions at this level and the need to have a wide range of skills.

6.5 Operating environment

Companies offering logistic services were asked about their operating conditions where they were based, using the same set of questions as with companies in industry and trade. Logistic services companies are also on average fairly satisfied with the operating conditions obtaining in their own location.

In this sector, however, not quite such unambiguous conclusions can be drawn as with industry. The regions showing the greatest levels of satisfaction are concentrated along an axis from Uusimaa in the south to Lapland in the north. For example, regarding the question of infrastructure, companies in Lapland and North Ostrobothnia would seem to be the most satisfied 20% in the country.

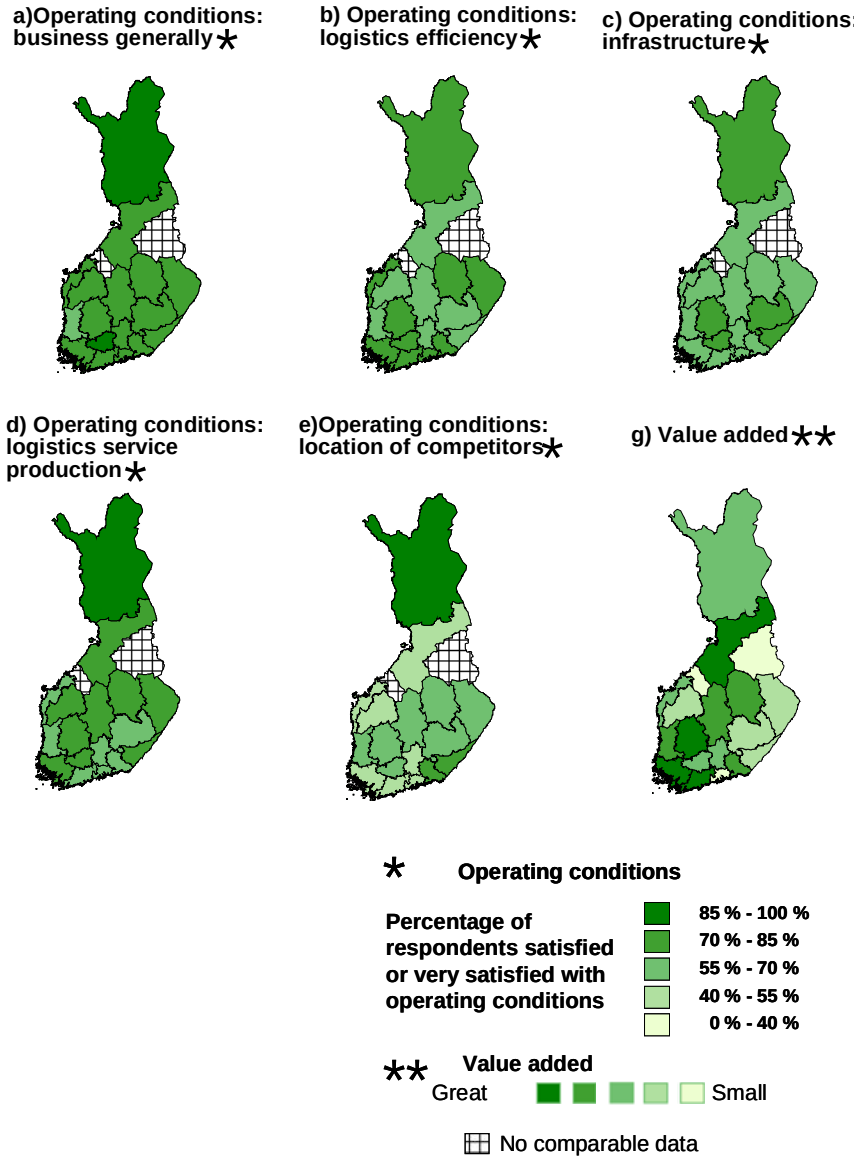
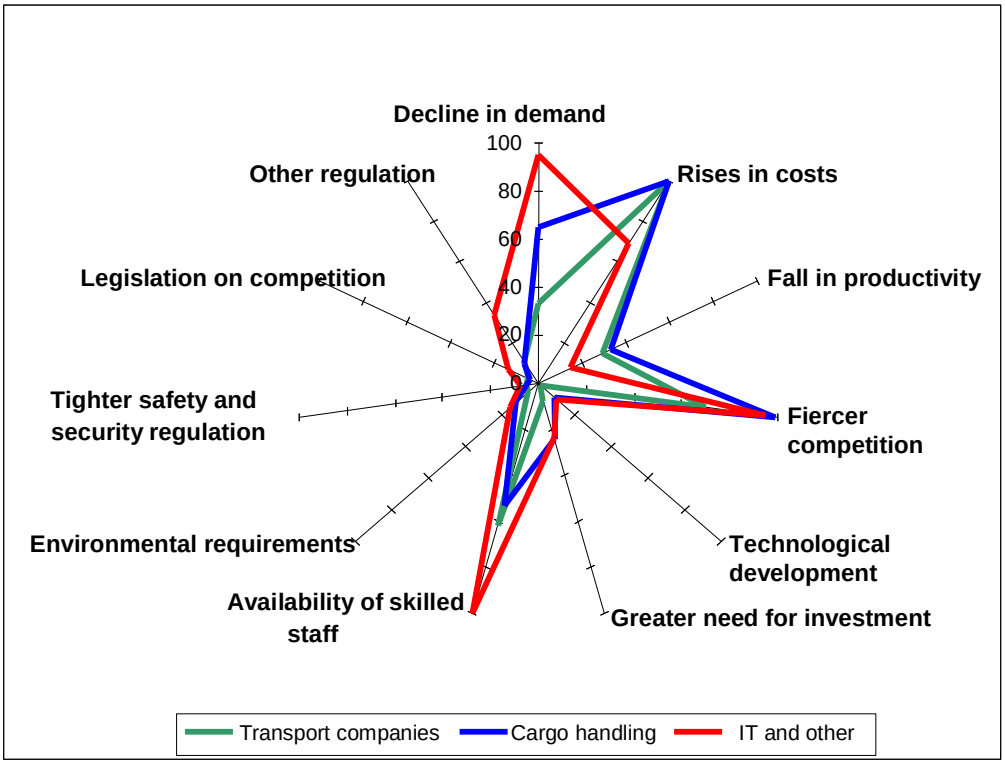


Figure 45 Regional comparison of operating conditions in logistic services providers. Source for companies' value added: Statistics Finland 2006.

6.6 Development needs

Transport companies were asked what the three biggest threats were to the future of their business. The biggest were clearly rises in costs and fiercer competition. These can be partly linked to one another because fiercer competition in practice makes it harder to pass costs onto customers and so companies are forced to adjust to a scenario of higher costs. Companies thought that the third biggest threat was problems of availability of skilled personnel. Areas such as legislation on competition, tighter safety and security regulation and technological developments received least attention (Figure 46).



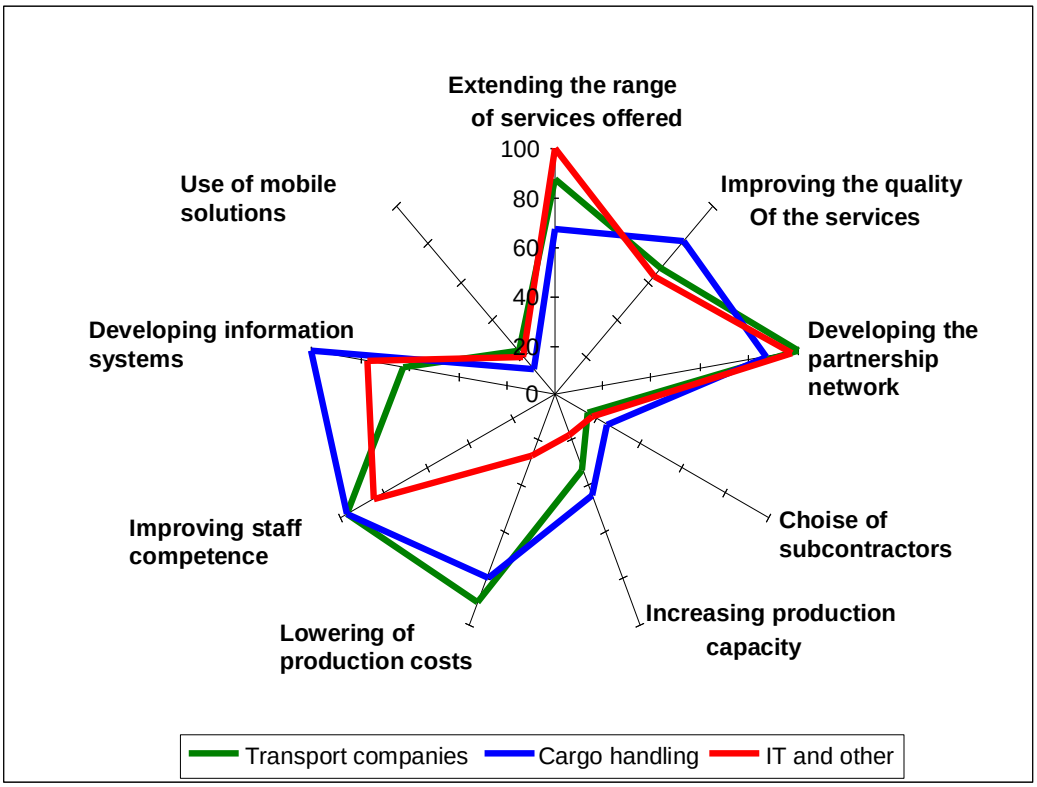
Each respondent could select what they thought were the three biggest threats from a set list. In the diagram the replies are indexed as follows:

- Biggest risk =weighting of 3
- 2. Biggest risk =weighting of 2
- 3. Biggest risk =weighting of 1

Figure 46. Threats to business as perceived by logistics service providers (n=482)

Threats envisaged by companies tend to congregate in the areas of basic business concerns. The results are highly concentrated, and indirect threats barely enter the picture (Figure 47). These would have included such areas as environmental factors and competition legislation. Furthermore, tighter safety and security regulation has attracted a lot of attention globally, but the companies responding to the survey do not appear to see these as threats. The reason is the large proportion of companies operating in the domestic market: the issue did receive some attention in answers from international companies.

Among the main areas for improvement proposed by transport companies, cargo handling companies and companies providing information management services was development of the partnership network.



Each respondent could select what they thought were the three most important areas for development from a set list. In the diagram the replies are indexed as follows:

- Most important are for development = weighting of 3
- Second most important area for development = weighting of 2
- Third most important area for development = weighting of 1

Figure 47 Areas for development in logistics service providers (n=470)

In addition to the partnership network, the most important areas for development were thought to be extending the range of services offered, developing information systems, improving staff competence and lowering production costs. Choice of subcontractors and use of mobile solutions were hardly seen as significant at all. Neither did the respondents think there was any substantial improvement needed in the quality of their services or their production capacity.

7 THE STATE OF LOGISTICS IN FINLAND

Key observations:
- Logistics competence is a key contributing factor in competitiveness
- Logistics costs in manufacturing and trade stand at €26.4 billion
- Logistics costs account for 13% of companies' turnover and that share is growing
- The highest logistics costs are in small and micro companies and they are increasing
- Key indicators globally at a good average level
- Use of information systems among companies offering logistics services behind international levels
- Areas for development among users of logistics lie in internal processes, increased transparency among the big players and customer services and staff competence among others
- Main areas for development among companies offering logistic services are development of the partnership network and customer service

Summarising, logistics costs in Finnish business according to this survey would appear to be around the €26.4 billion mark. This is 17% of GDP. This is a high figure in the global context: logistics costs in industrialised countries are typically 10% - 17% of GDP.

Compared to the survey conducted in 2001, logistics costs as a share of turnover in companies operating in Finland have risen slightly. This is particularly true of stock keeping, storage and logistics management. The share of transport costs has fallen slightly, however. A similar trend is also conspicuous in Europe generally, going by estimates made in recent years.

Logistics costs in large companies are lower than in SMEs, regardless of sector. High logistics costs would seem to have been passed on to suppliers and distributors of goods. Costs for companies with production facilities abroad are also lower than those for companies operating in the domestic market.

Going by logistics indicators, Finnish companies fare well, on average, in the international context. Companies are well aware of the importance of logistics and rate their competence in this area as fairly good or good in all main sectors.

The main area for development perceived in large companies is increased transparency, whilst for small companies it is staff competence/skills. The main areas for improvement in logistics companies are development of partnership networks and customer service.

The next sections deal with the main observations highlighted and a comparison with international data in greater detail.

7.1 Macro level logistics costs

In terms of overall logistics costs this survey uses a system of distribution that differs from previous surveys. In those the costs components were for transport, storage, capital tied up in stock, and logistics management. This survey includes these but also asked respondents about logistics packaging costs and the indirect costs of logistics. The result of including these new cost components is that the findings in this survey regarding costs as a proportion of turnover are not completely comparable with those in earlier surveys.

Unlike previous surveys, this survey also includes micro and small companies, whose logistics costs would appear to be higher than those of medium-sized and large companies. Owing to these factors, the criteria for making calculations and estimates in this survey and the results slightly differ from the earlier surveys.

As in the earlier surveys, this survey restricts the examination of logistics costs to those incurred directly in industry, trade and construction. Public organisations, investment projects and the maintenance of the public infrastructure, for example, the costs of winter navigation, fall outside the scope of the survey. The survey therefore does not give estimates of the logistics costs pertaining to the entire Finnish economy but is limited to estimates for Finnish industry, trade and construction.

Findings in the earlier surveys give logistics costs in 1999 as around 10.2% of companies' turnover, in 1995 10.3%, and in 1990 11.0%. This has worked out as 14% - 18% of GDP for the year in question (in industry, trade and construction).

In this survey, logistics costs at macro level have been calculated on the basis of the research data in such a way that a weighting for turnover has been given to the logistics costs of the respondents. Weighting with reference to turnover and groupings of sector, the logistics costs for each sector have been arrived at.

The impact different sectors have on total costs has been calculated by weighting the logistics costs of each sector with reference to the statistics for turnover by sector published in 2004 by Statistics Finland using the share of turnover each industry has of the total turnover for the main sector (manufacturing, construction and trade).

On the basis of the answers in this survey, logistics costs in Finnish industry, construction and trade average 13.5 (11.5) of turnover. Costs expressed as an absolute sum total 30.0 (26.4) billion euros. Costs are divisible into different cost components, as follows.

Table 8. Logistics costs and the percentage distribution of costs 1990 – 2006 at current prices and prices in 2006. Sources: previous logistics surveys.

Logistics costs in €billions (at current prices)				
	1990	1995	2000	2006
Transport	6.0 (44 %)	6.0 (46 %)	8.0 (45 %)	9.5 (36 %)
Storage	3.9 (28 %)	3.4 (26 %)	4.4 (25%)	6.2 (24%)
Capital tied up in stock	3.0 (22 %)	2.9 (21 %)	4.4 (25 %)	7.2 (27%)
Management costs	0.8 (6 %)	1.0 (7 %)	1.2 (5%)	3.5 (13%)
Total €billions	**13.7**	**13.3**	**18**	**26.4**

Logistics costs in €billions (at prices in 2006)				
	1990	1995	2000	2006
Transport	8.4 (44 %)	7.0 (46 %)	8.7 (45 %)	9.5 (36 %)
Storage	5.4 (28 %)	3.9(26 %)	4.8 (25 %)	6.2 (24 %)
Capital tied up in stock	4.2 (22 %)	3.3 (21 %)	4.8 (25 %)	7.2 (27 %)
Management costs	1.2 (6 %)	1.2 (7 %)	1.3 (5%)	3.5 (13 %)
Total €billions	**19.1**	**15.4**	**19.6**	**26.4**

In addition to the costs shown in the tables, transport packaging costs according to the survey totalled some €2.1 billion and the indirect costs of logistics some €1.5 billion.

From the findings it would appear that transport costs in relation to turnover have fallen since the previous surveys. Rather than an actual fall in transport costs, the explanation may also be that cost awareness in companies and general logistics competence have improved. Logistics costs may have been seen previously largely as transport costs purely and simply, whilst nowadays companies are possibly better able to identify and itemise costs that are more difficult to perceive and break down.

7.2 International comparison of the findings

This section deals with selected findings in the survey in relation to available comparable global data. There is a good deal of research data on logistics management and management of the supply chain, although there is a need to be cautious when evaluating comparisons as there may be differences in the way the surveys were conducted.

7.2.1 Logistics costs

In 2004, the European Logistics Association (ELA) published a survey on the latest European comparative data. Its findings are based on a survey of just under 200 European large companies which represent the most advanced logistics systems employed in their sectors. Accordingly, it is very hard to make generalisations from the findings. The methods employed in surveys have remained very much the same, so their time series gives valuable information on changes in the operating environment.

There is no need to make direct comparisons with the LOG4 survey: the levels of costs given in the ELA/A.T. Kearney survey in 2003 would seem to be around half those suggested by respondents in LOG4 (Attachment 8). In practice

logistics costs can only be so low if the company's value added in production is relatively high.

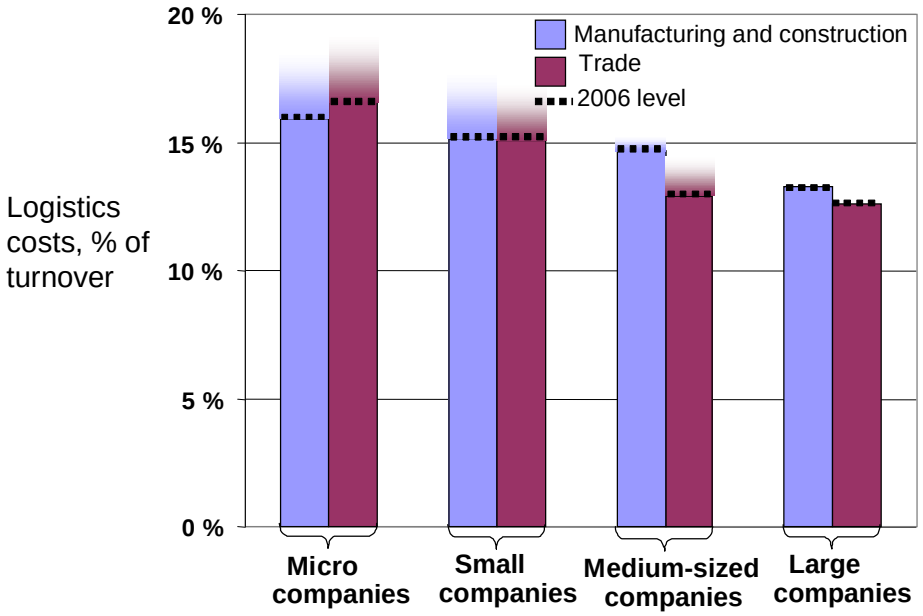


Figure 48 Average logistics costs in companies in trade and manufacturing as a % of turnover in 2006 and as estimated for 2010, n=1434

The findings in the ELA/A.T. Kearney survey support the claim made earlier that logistics costs have fallen substantially in the last 50 years, whilst logistics in companies has become more complex with globalisation, the fast growth in product variations, etc. The fall in logistics costs has managed to come about through more efficient handling of logistic data. Companies which invest heavily in information systems are often bigger in size and the fast falling trend in the compared data is partly explainable this way.

In the compared data it is transport costs that seem to have fallen particularly dramatically. The results of this survey show that companies estimate that transport costs will rise significantly in the next five years. Compared to earlier surveys, the share of costs represented by transport has nevertheless fallen. If the price of oil continues to go up, thereby raising absolute logistics costs, companies will have to put much greater effort into looking for ways of controlling their supply chains cost-effectively. With regard to this, more effective use of IT systems has increased and in the future will most likely boost logistic productivity substantially.

The combined effect of future rising transport costs and the growth that is assumed will take place in logistic productivity growth is difficult to forecast. In this survey, micro and small companies predicted that their logistics costs would grow substantially more than medium-sized companies. Large companies were of the opinion that their logistics costs would stay at the same level.

If the price of oil remains high or goes up even more, it is possible that overall logistics costs for micro and small companies in particular will rise, as these companies, unlike the larger organisations, are unable to pass on their costs to other contracted parties. The potential for small companies to take advantage of logistics information systems to cut costs is also probably slighter than in medium-sized and large companies.

7.2.2 Cash to cash cycle time

The SCOR (Supply Chain Operations Reference Model) is a process reference model developed by the Supply Chain Council[34] for analysing and developing supply chains. SCOR consists of standardised process descriptions, indicators of supply chain performance, and methods of working that have been found to be successful (Löfgren et al. 2003, 2). This present survey mainly covers elements at the top level referred to in the SCOR model, which reflect how efficient a company's business is in terms of its logistic activity is in a fairly condensed format.

The time cash is tied up indicates how long it takes for resources tied up in raw materials to be recouped as part of the company's cashflow. The period of time for which cash is tied up is obtained by adding together the actual average time it takes for payment to be made for items sold and the average warehouse holding time and subtracting from the result obtained the average actual time agreed to pay suppliers. These elements give information on a company's position and negotiating powers with suppliers and customers. The shorter the period of time cash is tied up the less the company needs liquid assets to operate and the more efficiently the operation works.

Figure 49 gives a comparison of how long cash is tied up in Finnish companies compared to global data in four different sectors. The timescale for payment of accounts payable is marked in the diagram as a negative value as this element shortens the time cash is tied up.

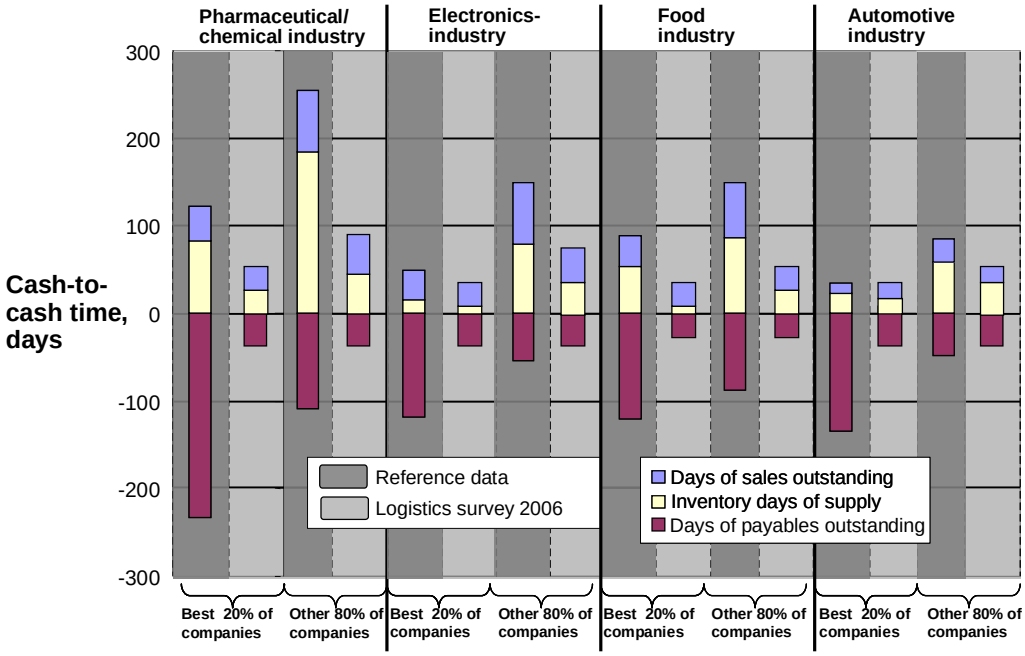


Figure 49 ***Average cash to cash cycle times by elements in selected sectors compared to international reference data. Pharmaceutical and chemical industry n=32, electronics industry n=53, food industry n=54, vehicle manufacture n=14. Data for comparison N=69.***

[34] http://www.supply-chain.org

What stands out immediately is that payment times in Finnish companies are much shorter than the average global values, which means more efficient use of capital and lower logistics costs. In the methodology of the survey, the equivalent logistics costs component is chiefly that pertaining to capital tied up in stocks. How significant the value of the period for which cash is tied up obviously depends on interest rates.

It is interesting to note that in all four sectors the best fifth of companies in the compared global data have a payment time for accounts payable which is manifestly longer than that for receivables on sales and warehouse holding time added together. The value for cash tied up in the business is therefore negative: liquid assets are freed up for the business to an extent that may give the company a competitive edge. Similarly, the period of payment of receivables on sales in these companies is considerably shorter than in the other 80% of the companies surveyed. The top 20% seem to be in a very strong position with regard to customers, but more especially, suppliers in the supply chain. In fact, the companies in this survey were found to have negative values for cash tied up in the business.

Traditionally, the objective of companies is to lengthen payment times to suppliers to free up cash for the business. In the supply chains today this strategy, however, is losing its impact, because suppliers, quite understandably, cannot consider slow payers to be strategic partners, which in turn might prove to be an obstacle to other seamless forms of cooperation.

The period of time for which cash is tied up in Finnish companies in all four sectors is positive, i.e. cash is tied up in the running of the operation. The period in question is actually much shorter than in the 80% group of companies in the global comparison. On the whole, it appears that the period of time cash is tied up in Finnish firms is better than average in the global context. Account also needs to be taken of the fact that the respondents in the survey are very largely micro and small companies, which does not reflect longer average periods for which cash is tied up in the operation, at least not significantly.

The comparison shown helps illustrate the market environment of export and international companies, which in this respect seems a more challenging prospect than the domestic market in terms of effective use of capital. Companies which are just starting to export goods in particular need to adjust to considerably longer payment times from customers than in the home market, even though payment times for purchases are still at short home market levels. On the other hand, if the ‘quick’ payment culture than exists in Finland were introduced into a global supply chain it might well be a way of boosting the competitiveness of the entire chain.

Figure 50 gives a comparison of the length of time cash is tied up in Finnish and Southeast Asian companies in seven selected sectors. Finnish companies appear to be in a good position in this area, although there are big inter-sectoral differentials.

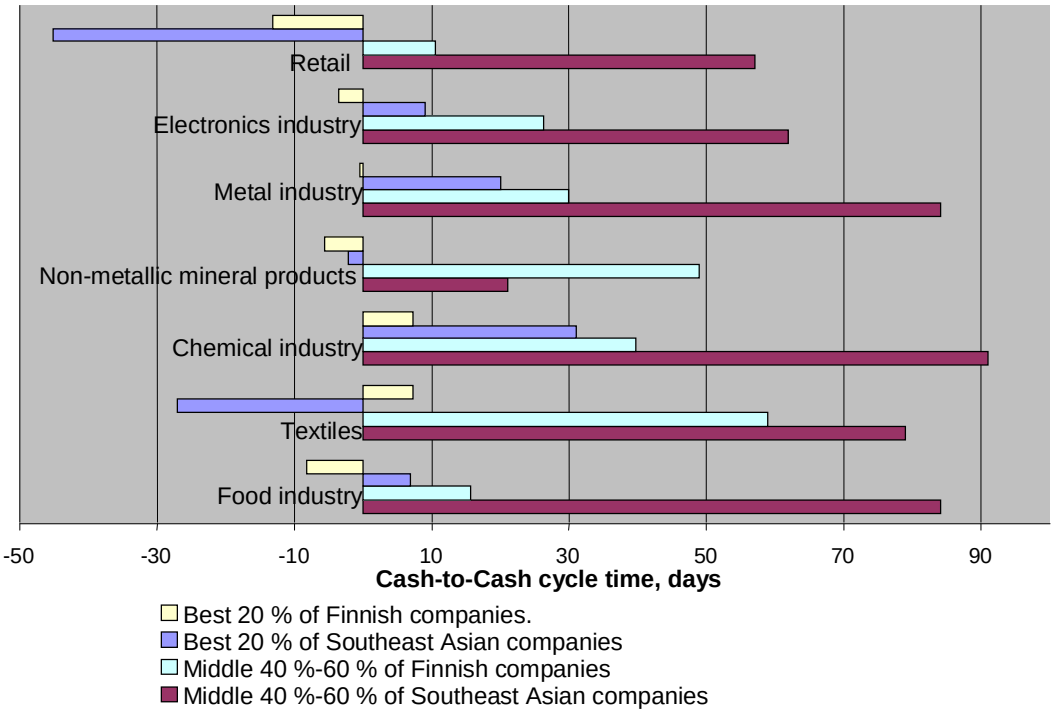


Figure 50. ***Cash to cash cycle time of the respondent companies compared to companies in the same sectors in Southeast Asia. The data is based on average figures (median values) for the best 20 % and the middle 40 %-60 % companies. Source for Southeast Asian companies: Kremers, 2005.***

It is gratifying to see that in four important sectors periods of time for which cash is tied up in Finnish companies are shorter than in companies in Southeast Asia both in the best 20% and the middle range company groups compared. These sectors are electronics, the metal industry, the chemical industry and the food industry.

There seems to be much greater variance between periods for tied up cash in companies in Southeast Asia compared with Finland. For example, in retail trade the Finnish mean level is substantially healthier than that for the Asian companies, although the top fifth of companies lags significantly behind Asian levels. It is the same situation in industry.

7.2.3 Outsourcing

The outsourcing of logistics in Finland is fairly common, although outsourcing of different logistic operations differs greatly in terms of how universal it is in the light of global statistical data. In this context the material in the LOG4 survey is compared to the global study conducted by Langley et al. (2005) on the use of third party logistic services.

Finnish companies appear to have been outsourcing transport and forwarding far more than other countries compared. With regard to more demanding operations, such as product warehouse management, there is generally a rather low rate of use of external logistic services and the figures vary very greatly.

Table 9 ***International comparison of the percentage of companies outsourcing logistics functions and operations; survey sample: n=1773 ; source for compared data: Langley et al., 2005***

Logistics operation	Companies in Log4 survey n=1532	Langley:s comparative data			
		Western - Europe n=339	USA and Canada n=516	Asia-Pacific n=53	Latin-America n=144
Transport	91 %	88 %	78 %	96 %	84 %
Freight forwarding	68 %	53 %	56 %	49 %	45 %
Order processing	14 %	8 %	7 %	15 %	8 %
Warehousing	25 %	72 %	63 %	88 %	55 %
Inventory management	12 %	23 %	17 %	30 %	9 %
Product finalisation	22 %	16 %	16 %	18 %	0 %
Logistics IT-systems	36 %	21 %	15 %	18 %	19 %

In the area of storage/warehouse management, by contrast, it can be seen that Finnish companies have been clearly outsourcing less than the groups compared. On the other hand, there is a higher rate of the outsourcing of logistics information systems.

Rather surprisingly, and unlike companies in the compared data, the respondents in the LOG4 survey did not think that lower costs was the prime motive for outsourcing. It also appears to be the case that the Finnish respondents believe that other general costs and overheads, such as staff costs are a more significant cost item than logistics costs, and it is thought that lower costs will stem from a diminishing need for permanent workforce. This might also be assessed from the point of view of the flexibility of a logistics workforce and the availability of the workforce in particular. There is poor availability of a qualified workforce for basic jobs and companies might prefer to solve the problem by buying logistics services rather than trying to hire additional staff. In a way such a modus operandi also means focusing on core skills, which was the main motive mentioned.

Table 10Global comparison of motives for outsourcing logistics; sample survey: n=1773; source for comparative data: Langley et al., 2005

Motives for outsourcing	Companies In the survey n=1053	Langley comparable data			
		Western-Europe n=339	USA and Canada n=516	Asia-Pacific n=53	Latin-Amerikka n=144
Concentration on core competence	59 %	40 %	29 %	43 %	38 %
Need for flexible service capacity	51 %	21 %	16 %	9 %	20 %
Lower logistics costs	42 %	74 %	72 %	71 %	65 %
To improve quality of logistics	24 %	55 %	61 %	51 %	64 %
Need for external expertise	23 %	14 %	24 %	17 %	10 %

The quality of logistic services proved to be a lot less significant a factor than with the compared global group. The findings can hardly be interpreted as a tendency to underrate quality, but the difference is rather surprising. The findings might suggest that many are of the opinion that that it is an outdated way of thinking to suggest that one should aim to deal with as many of the company's operations in-house.

Somewhat along the same lines, the companies in the LOG4 survey believe that unsatisfactory standards of service are the biggest obstacle to outsourcing. There are many differences of opinion with regard to barriers to outsourcing between this survey and Langley's data.

Table 11 Global comparison of barriers to outsourcing logistics; LOG4 sample: n=1,773; source for comparative data: Langley et al., 2005

Barrier to outsourcing	Companies in the survey n=1773	Langley Comparative data n=1091	Eyefortransport Comparative data n=312
Standards of service will hardly improve	32 %	13 %	-
Hard to evaluate and monitor	31 %	-	27 %
Logistics costs will not go down	28 %	33 %	-
Hidden costs	24 %	-	39 %
Dependence on service providers will increase	22 %	23 %	17 %
Loss of control	19 %	23 %	20 %
Don't know how to purchase services	10 %	-	50 %
Logistics is a part of core competence	8 %	40 %	-
We know more about logistics	8 %	30 %	-

Outsourcing should not automatically be regarded as the solution in dealing with logistics, as its advantages depend on many factors. It is frequently thought that outsourcing logistics is a way to eliminate factors of inefficiency which are due to internal procedures for dealing with logistic flows. If the operational structure remains inefficient after outsourcing there may perhaps be no benefit at all to outsourcing. If the number of logistic contact interfaces diminishes on the company, outsourcing may even increase inefficiency.

7.2.4 Perfect order fulfilment

The SCOR model developed by the Supply Chain Council incorporates, among other things, a whole host of indicators for delivery reliability. Figure 51 gives estimates by companies in industry of perfect order fulfilment[35] in relation to all customer deliveries. Reliability of delivery among Finnish companies compared with the global data would seem to be at a very high level.

[35] Perfect order fulfilment: on time, at the right place, with the right documetation, with the right volume and undamaged

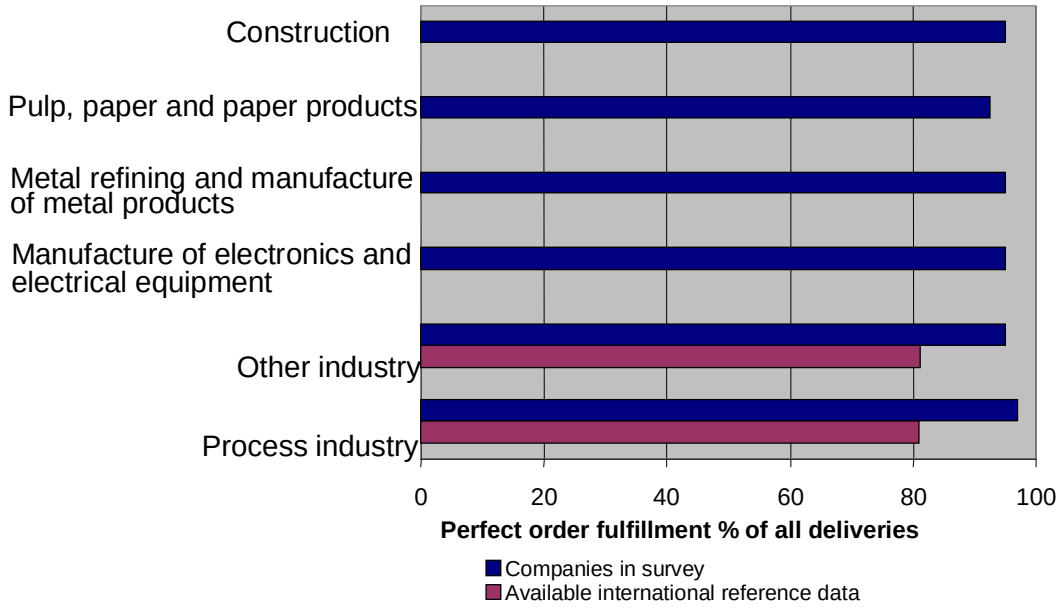


Figure 51 International comparison of perfect order fulfilment rate; sample data: n=834

The findings should be interpreted with care. The data gathered in the survey could not be checked to se how truthful it was. It is possible that respondents failed to comprehend the question properly and did not take into consideration the fact that a faultless delivery as a concept entails the simultaneous presence of several criteria. If they had, the number of faultless deliveries among Finnish companies would in fact be fewer.

There is no apparent statistical link between logistic performance and financial results in companies. This is what, for example, Kremers et al. (2005) found with companies in Southeast Asia. Although LOG4 did not examine companies' accounts in any details, the findings would probably be along the same lines. For example, there was no clear correlation by sector between levels of logistics costs, indicators and transparency. The most obvious differences can be found by comparing data according to size of company.

7.2.5 Use of information systems between companies offering logistic services and stakeholder groups

Finnish companies offering logistic services fare rather badly when it comes to how universal the use of electronic information systems is with customers and suppliers alike, when the results of the survey are compared to findings for companies in Hong Kong (Figure 52). The comparative data covers 187 logistics companies from various sectors. Of these, 69 % were business units of companies operating internationally.

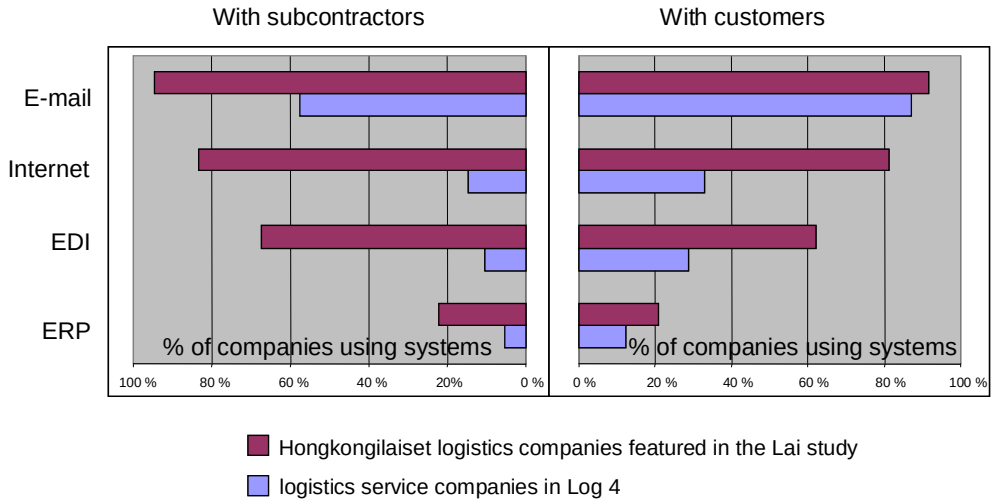


Figure 52 ***comparison of the use of IT systems: logistics service providers in the Survey vs. logistics companies in Hong Kong; percentage of companies using systems with subcontractors and suppliers; source for global comparative data: Kee Hung Lai et al. 2005.***

7.3 State of logistics in Finnish companies

In summary, it would seem that companies in industry are well aware of the importance of logistics and rate their competence in the field as moderately high. In trade, however, companies rate their logistic skills clearly more highly than industry. As in earlier studies, logistics companies also rate their levels of competence as good.

The use of IT systems has not grown significantly since the 2001 survey, except in the areas of email, small companies included. This may mean that Finnish companies had reached a very advanced stage in the use of such systems earlier on.

With regard to logistics information systems, it is not easy to find global data for comparison as there are a considerable number of small and micro companies among the respondents to this survey.

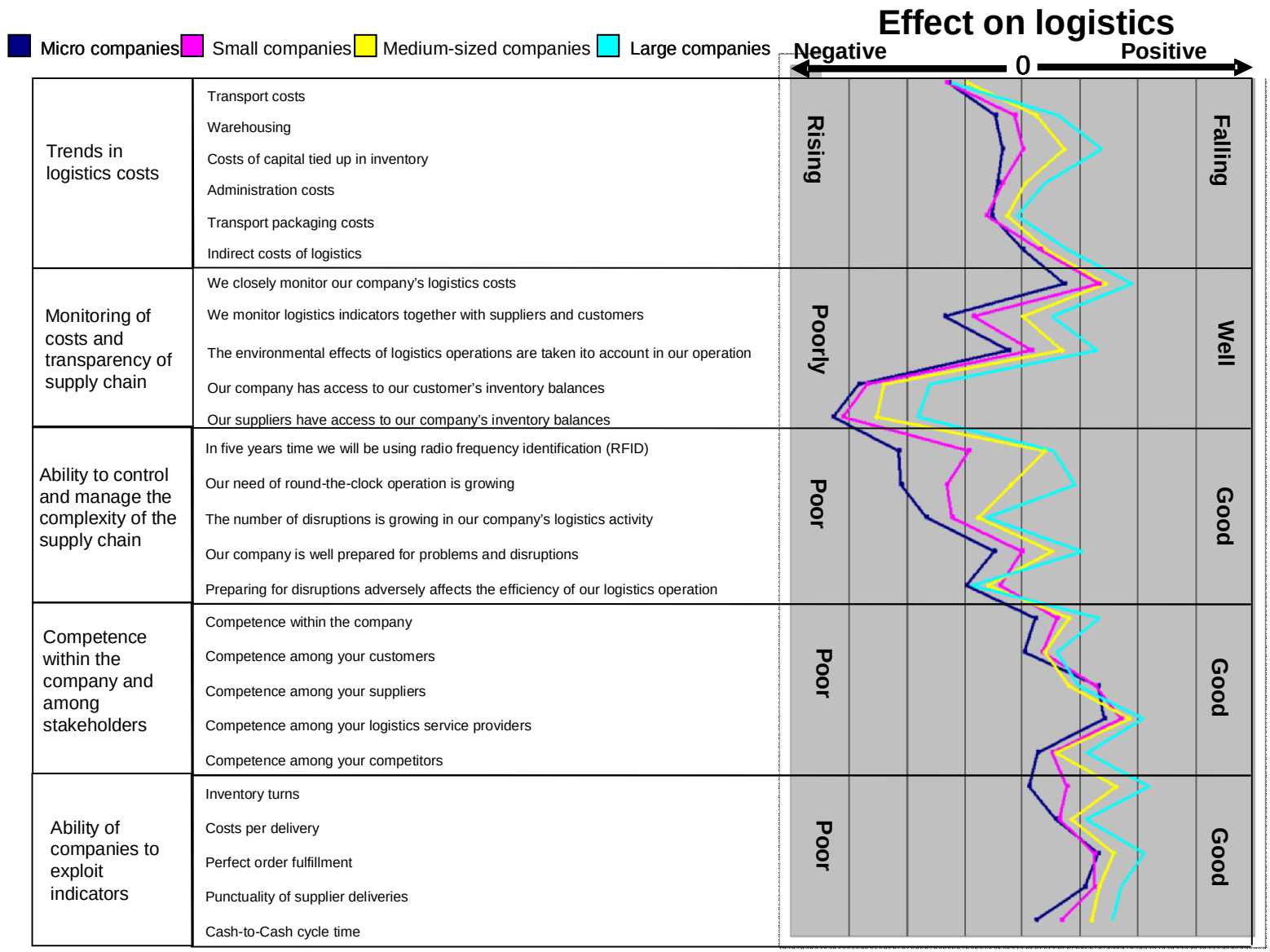


Figure 53 Logistics profiles of respondents in the survey by company size: micro n=1,066 ,small n=309, medium-sized n=170, large n=169.

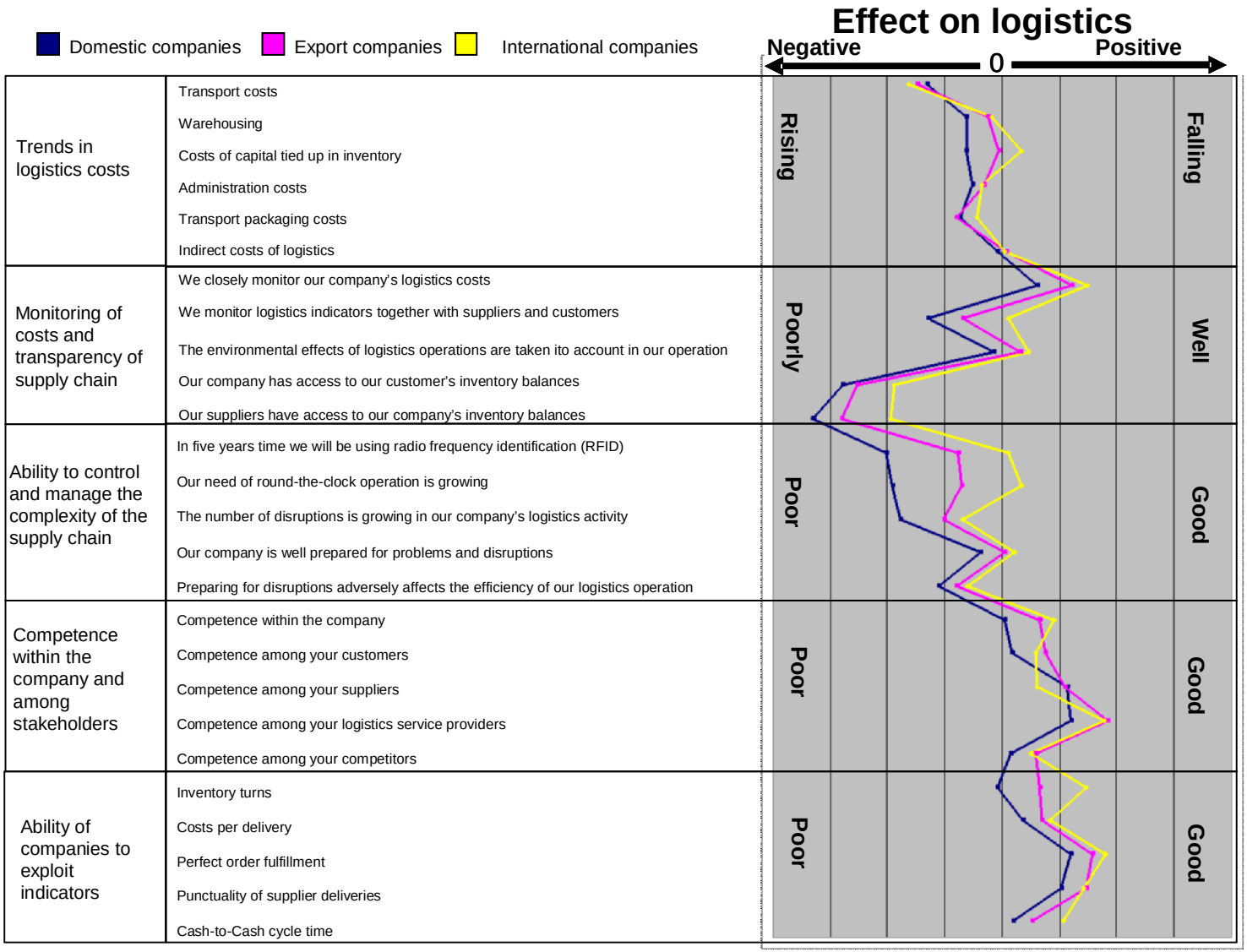


Figure 54 Logistics profiles of respondents in the survey by degree of internationalisation: international companies n=171, export companies n=206, companies operating in the domestic market n=604

However, medium-sized and large industrial companies are at a good level internationally, going by available comparative data. There are a number of companies in Finland among the most progressive in the world for their sector. Thus, competence is to be found where the need for it is greatest.

In postal and courier services the use of IT systems was the most advanced, as was to be expected. The largest group of respondents was from the road haulage industry, where the use of IT systems was, on average, at a very low level. Among logistics companies, intranet/extranet systems were used the most, thanks to the Portnet system used in waterway transport. The continued use of this system, unique in the global context, needs to be ensured, both with regard to software development and the administrative structure.

The main area for development in large and internationalised industrial companies is better transparency, whilst for small companies it is improved staff competence. Logistics companies see the strengthening of the partnership network and better standards of customer service as the most important issues.

With regard to logistic indicators, Finnish companies fare averagely well in the global context. This applies especially to companies under pressure from international competition. Figure 53 and Figure 54 show the key observations in condensed form based on replies from industry, in which such areas as the trend in costs, transparency of deliveries, the use of indicators and the management of various disruptive situations were assessed. The groups of questions were chosen so that for most of them there are equivalents in the comparative global data.

With regard to virtually all indicators, large companies fare better than SMEs and micro companies and international companies better than export companies and companies operating in the domestic market. The basic problems are still, and this has been the case in previous logistics surveys and in research literature on the subject, poor transparency of the supply chain and the ability to manage order-supply processes which are becoming more complex.

In spite of this, the levels of competence in logistics among companies in industry as well as their reliability and warehouse replacement rates are relatively good on average, whilst at the same time the period of time for which cash is tied up is short. Large companies in particular rated their ability to control disruption in the supply chain very highly. To control the supply chain, there are available very advanced technologies, and the role of information systems for effective and efficient management of logistic activity is more obvious than ever. The barrier to development of logistic operations and functions in companies, supply chains and networks of companies is not a lack of technology but the inability to operate in a business environment that is increasingly globalised and challenging.

Finnish business has been able to keep fairly well abreast of the ‘moving goal posts’. Companies’ practical and flexible solutions will mean they will have a keen competitive advantage in the future, particularly when operating from Finland. If they are to maintain that competitive edge they will have to have good levels of business competence and better logistics skills. This the respondents had understood well, as the need for logistic competence in its various forms was emphasised very clearly in this survey.

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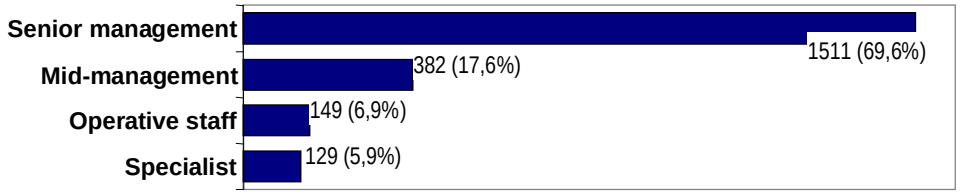
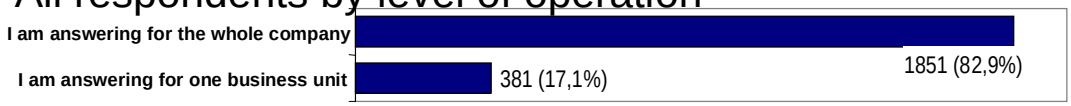
Attachment 1 Background information on respondents and their companies (1)

All respondents by main sector

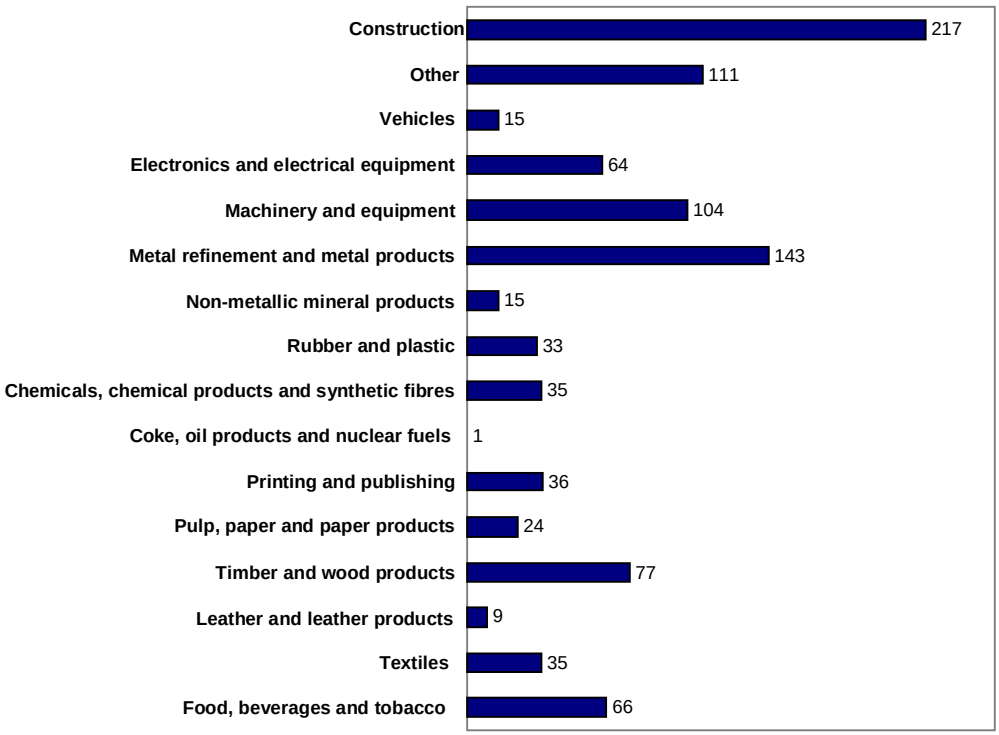
All respodents by personnel group



All respondents by level of operation

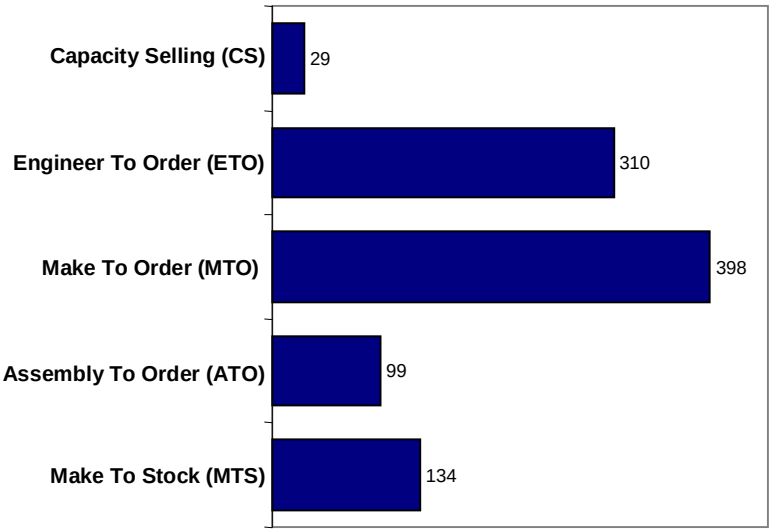


Companies in maufacturing and construction by sector



Attachment 2 Background information on respondent companies in manufacturing

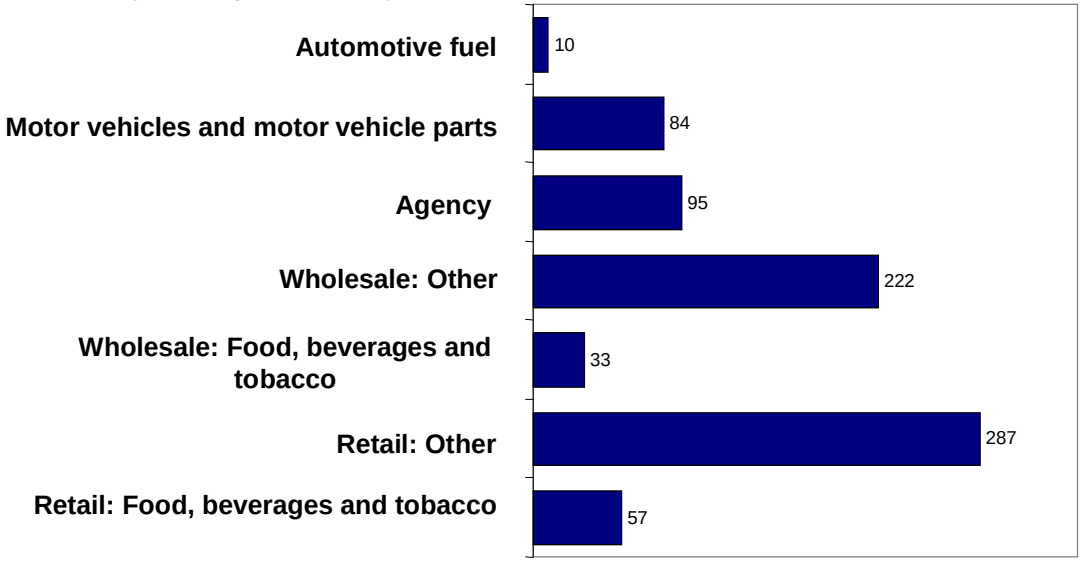
Manufacturing and construction companies by type of production



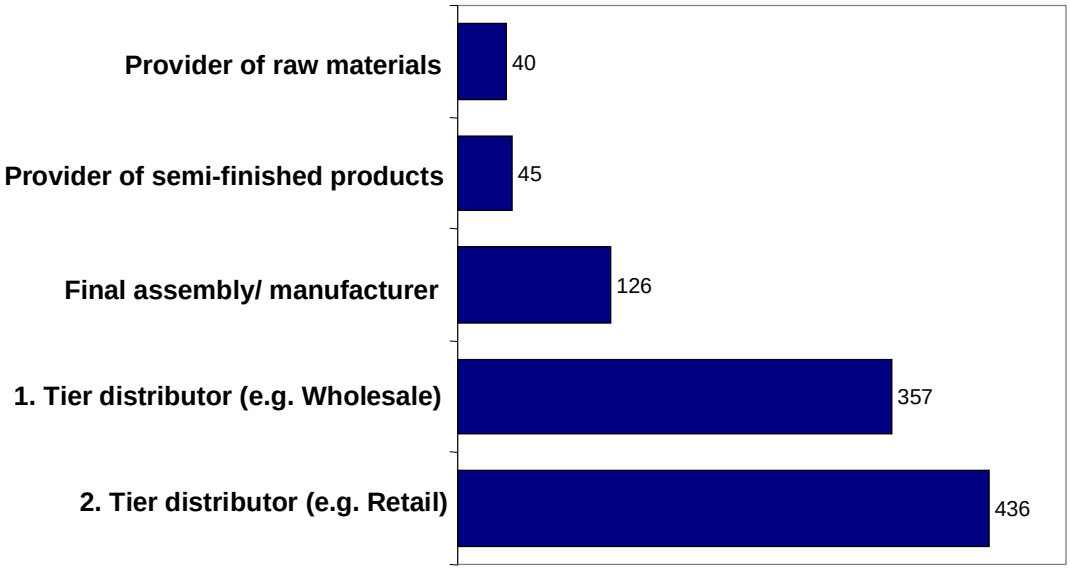
Manufacturing and construction companies by position in the Supply Chain

Attachment 3 Background information on respondent companies in trade

Trading companies by sector

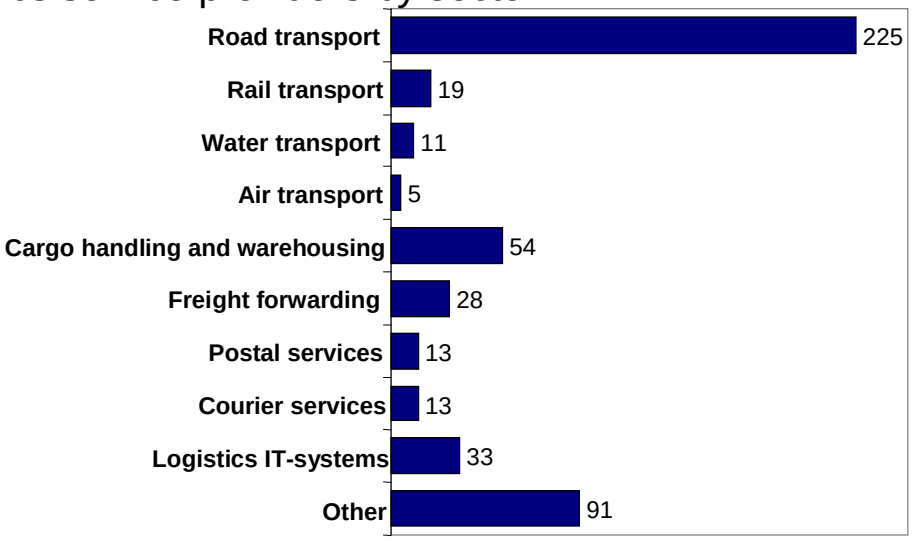


Trading companies by position in the Supply Chain

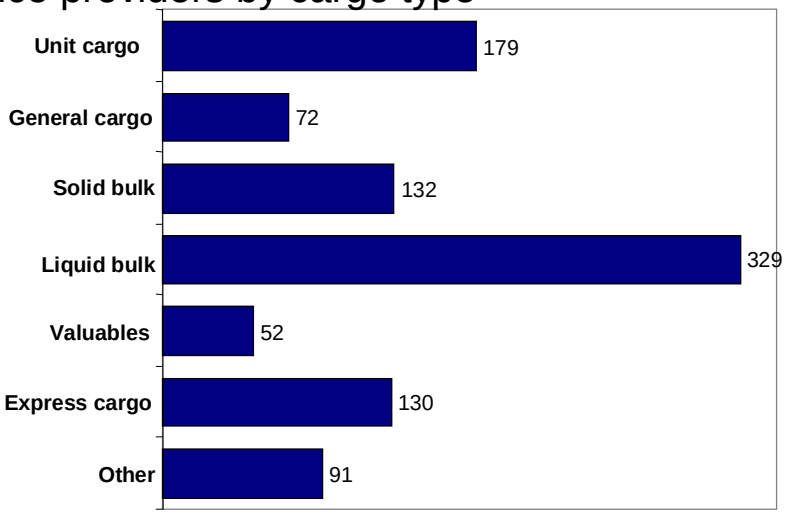


Attachment 4 Background information on respondent logistics service providers

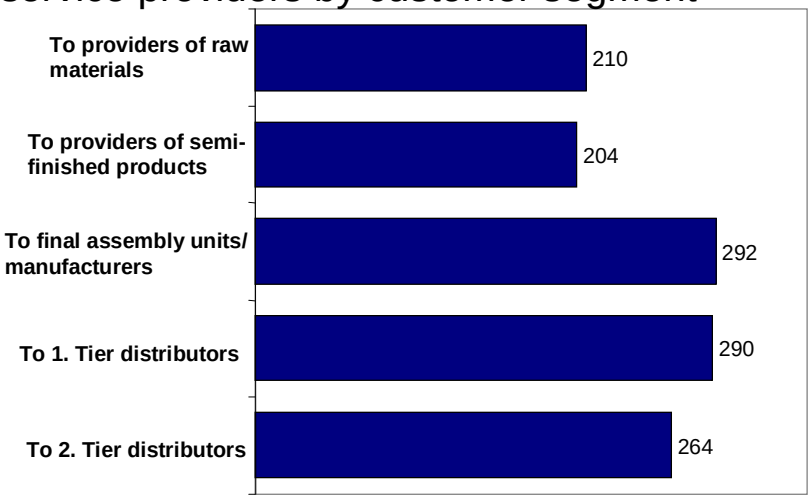
Logistics service providers by sector



Logistics service providers by cargo type



Logistics service providers by customer segment



Attachment 5 Key indicators in the road haulage and forwarding

Number of road haulage companies and staff, and turnover and turnover per company at fixed prices (1995=100). Source: Statistics Finland

Year	Number of companies	Number of staff	Turnover (€ billions, 1995=100)	Turnover per company (1,000 euros, 1995=100)
1995	11,111	27,501	2,321	209
1996	11,858	30,748	2,708	228
1997	11, 985	34,322	2,978	249
1998	12,001	35,510	3,226	269
1999	11,829	36,335	3,389	286
2000	11,672	37,812	3,435	294
2001	11,439	36,870	3,533	309
2002	11,319	37,250	3,659	323
2003	11,162	38,003	3,879	348
2004	11,092	38,220	4,004	361

Number of forwarding and freight companies and staff, and turnover and turnover per company at fixed prices (1995=100). Source: Statistics Finland

Year	Number of companies	Number of staff	Turnover (€ billions, 1995=100)	Turnover per company (1,000 euros, 1995=100)
1995	237	4,417	1,454	6,133
1996	263	4,687	1,570	5,968
1997	299	5,062	1,883	6,298
1998	323	5,017	1,730	5,356
1999	317	4,881	1,656	5,225
2000	319	4,750	1,682	5,273
2001	313	4,789	1,636	5,227
2002	327	5,658	1,743	5,330
2003	345	6,073	1,937	5,614
2004	395	6,344	2,123	5,376

Lorry traffic indicators. Source: Statistics Finland

Year	Operating margin %	Net profit %	Quick ratio	Equity ratio %	Debts / turn-over %	Value added in production (€billions, 1999=100)
1999	16.5	4.0	0.9	24.7	46.3	1,545
2000	15.2	3.3	0.9	27.1	43.6	1,503
2001	14.5	3.0	0.9	27.2	40.3	1,558
2002	14.4	3.6	0.9	29.3	39.2	1,708
2003	13.7	3.7	0.9	30.7	37.0	1,773
2004	13.1	3.1	0.9	29.4	39.2	1,746

Forwarding and freight sector indicators. Source: Statistics Finland

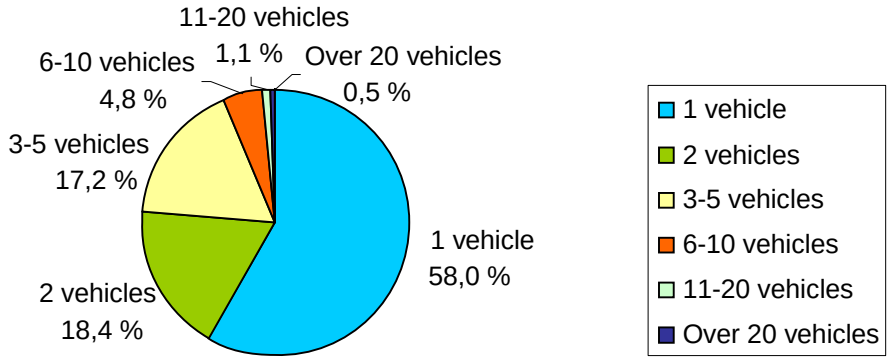
Year	Operating margin %	Net profit %	Quick ratio	Equity ratio %	Debts / turn-over %	Value added in production (€billions, 1999=100)
1999	3.1	0.9	1.2	31.2	25.7	225
2000	3.8	1.4	1.2	32.3	25.4	218
2001	4.5	2.5	1.2	32.9	26.0	248
2002	4.4	2.3	1.3	36.4	24.4	270
2003	4.2	2.1	1.3	36.8	22.4	280
2004	4.6	2.5	1.2	32.2	25.5	302

Company sizes in 2003 in the lorry transport and forwarding sectors. Source: Statistics Finland: Profit and balance sheets in business 2003

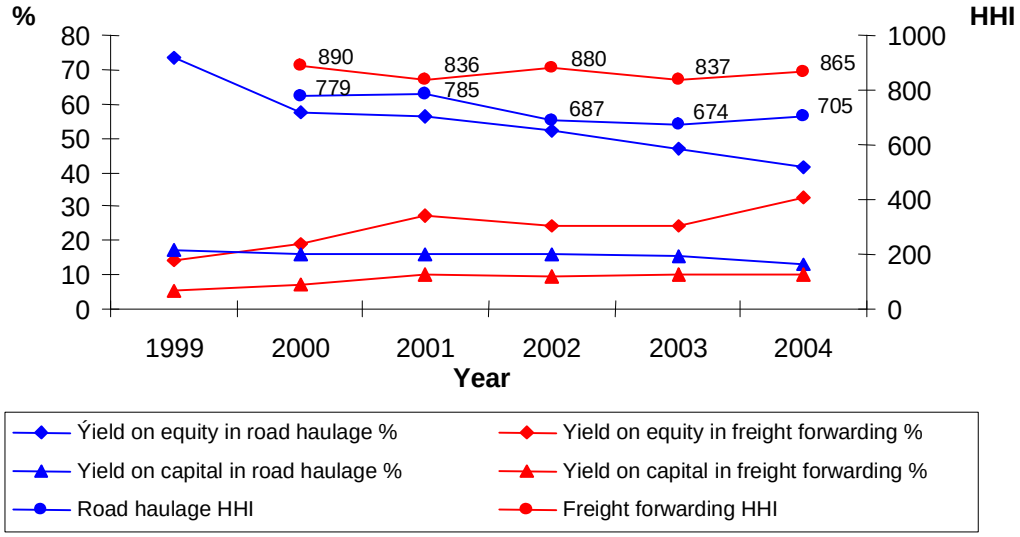
Lorry transport	Number of companies	Total business yield (1 000 €)	% of total business yield
Micro*	10 519	2 192 316	49,8
Small **	548	970 253	22,1
Medium-sized***	37	441 175	10,0
Large ****	24	794 666	18,1

Freight forwarding	Number of companies	Total business yield (1 000 €)	% of total business yield
Micro*	255	221 924	11,5
Small **	44	300 319	15,6
Medium-sized***	17	616 985	32,0
Large ****	34	786 469	40,8

* Micro companies, under 10 employees
** Small companies, 10–49 employees
*** Medium-sized companies, 50–249 employees
**** Large companies, over 250 employees



Company size in licensed freight traffic 2004 (Source: SKAL)

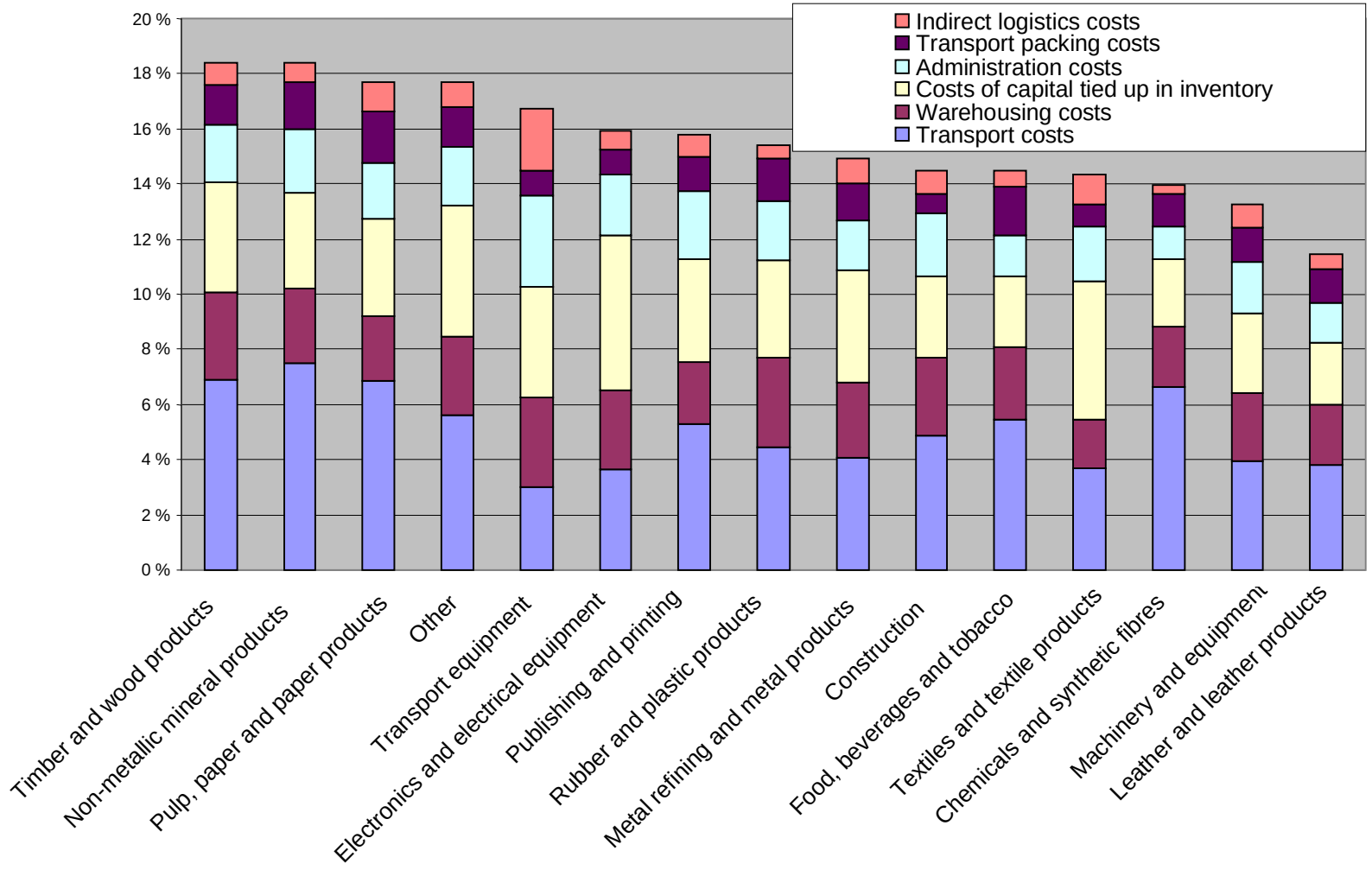


Trends in the concentration and degree of yield/earnings in road haulage and forwarding

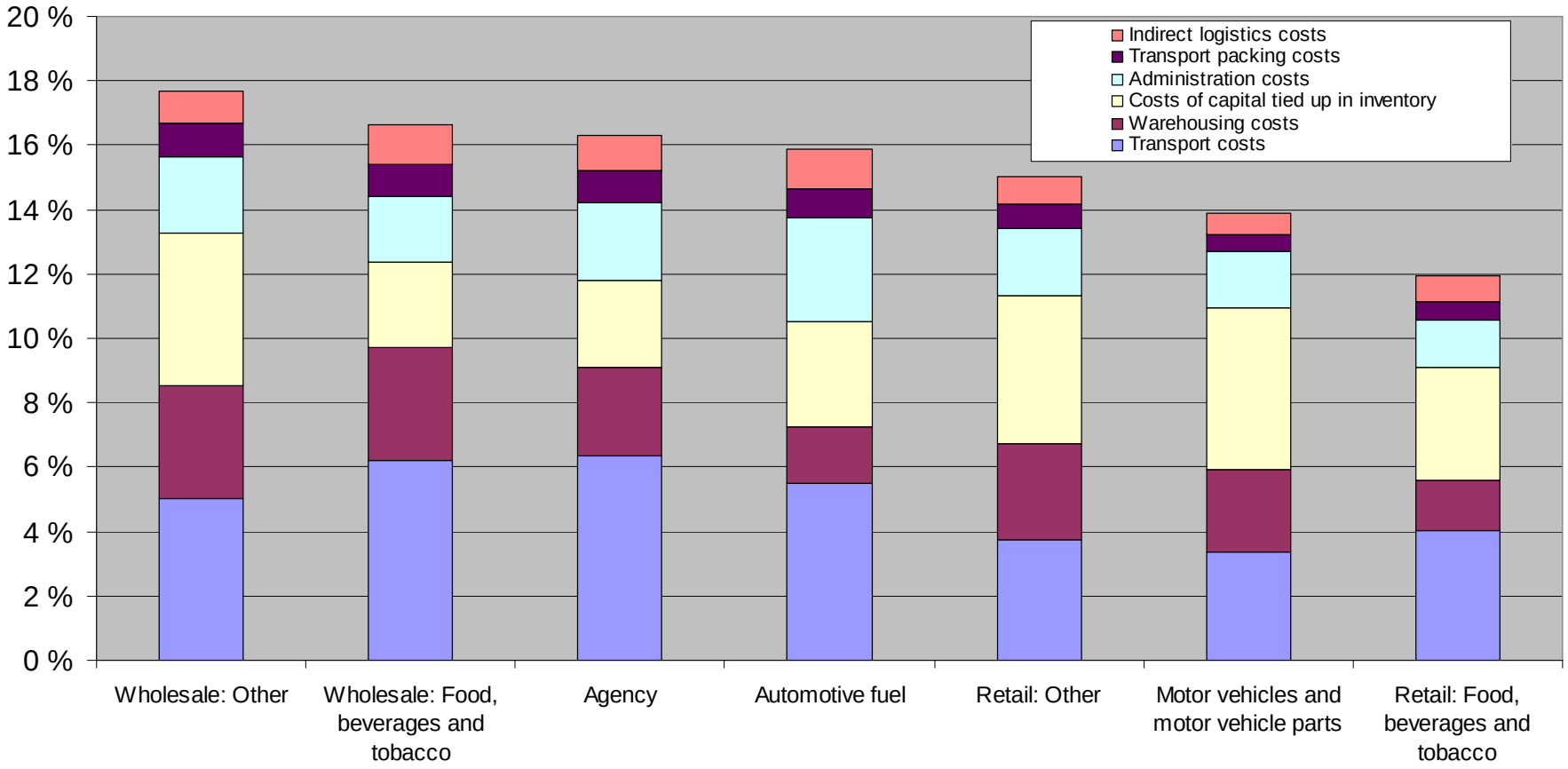
Three biggest players in road haulage and other transport agency services: share of combined turnover of 20 biggest firms in the market. Source of data for turnover: (Finnish) Profit database

Market share %	**2000**	**2001**	**2002**	**2003**	**2004**
Schenker	16.9	21.9	22.7	22.0	23.1
DHL (Danzas)	10.2	15.1	14.3	14.0	14.0
Pohjolan Liikenne (Pohjola Transport)	9.3	8.2	6.9	6.7	6.6
Total for three biggest	36.3	45.2	43.8	42.7	43.7

Attachment 6 Average logistics costs in manufacturing by cost component (N=814)

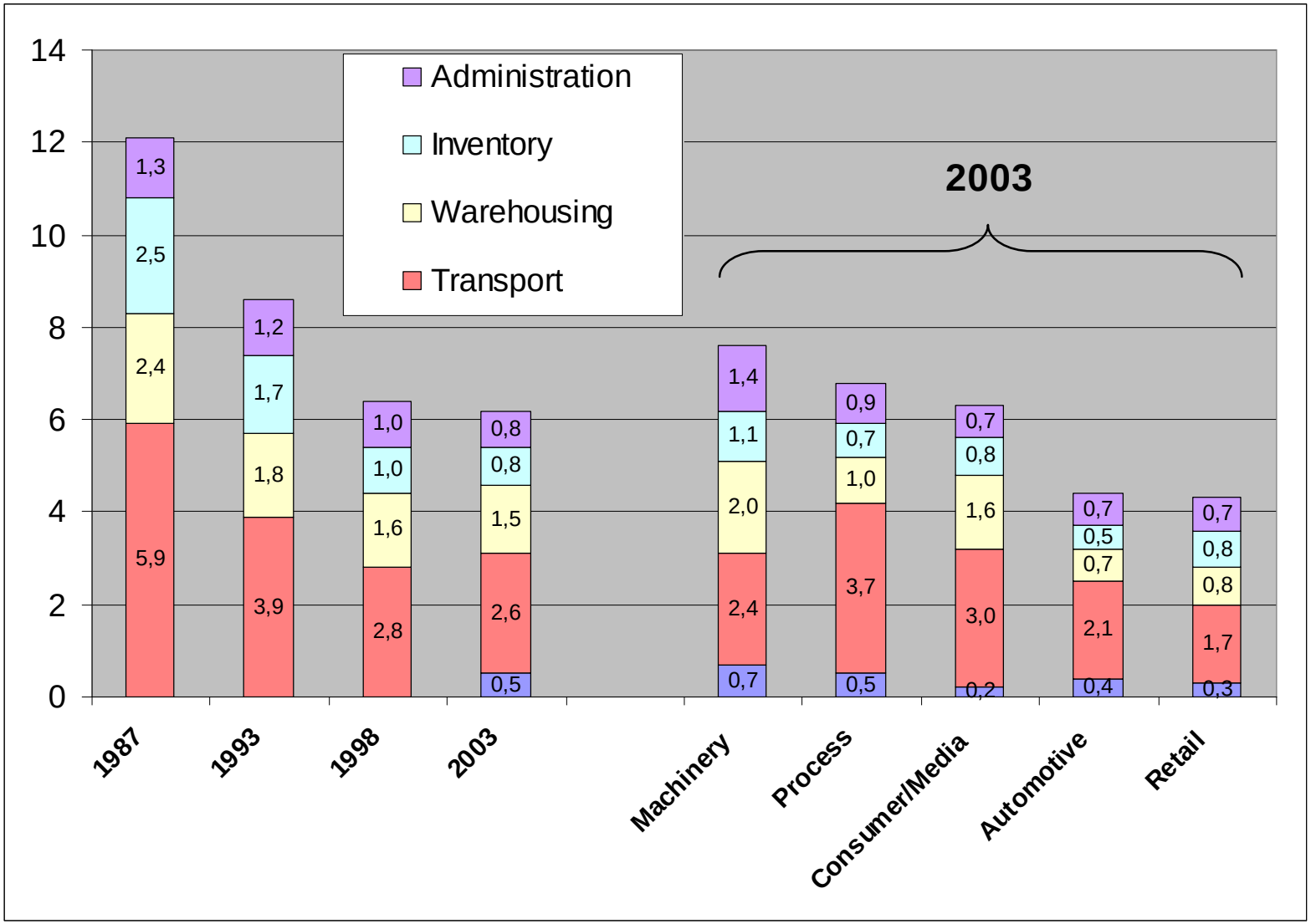


Attachment 7 Average logistics costs in trade by cost component (N= 618)



Attachment 8 Companies' logistics costs 1987 – 2003 in the survey by the European Logistics Association (ELA) and AT Kearney (2004): Differentiation for Performance

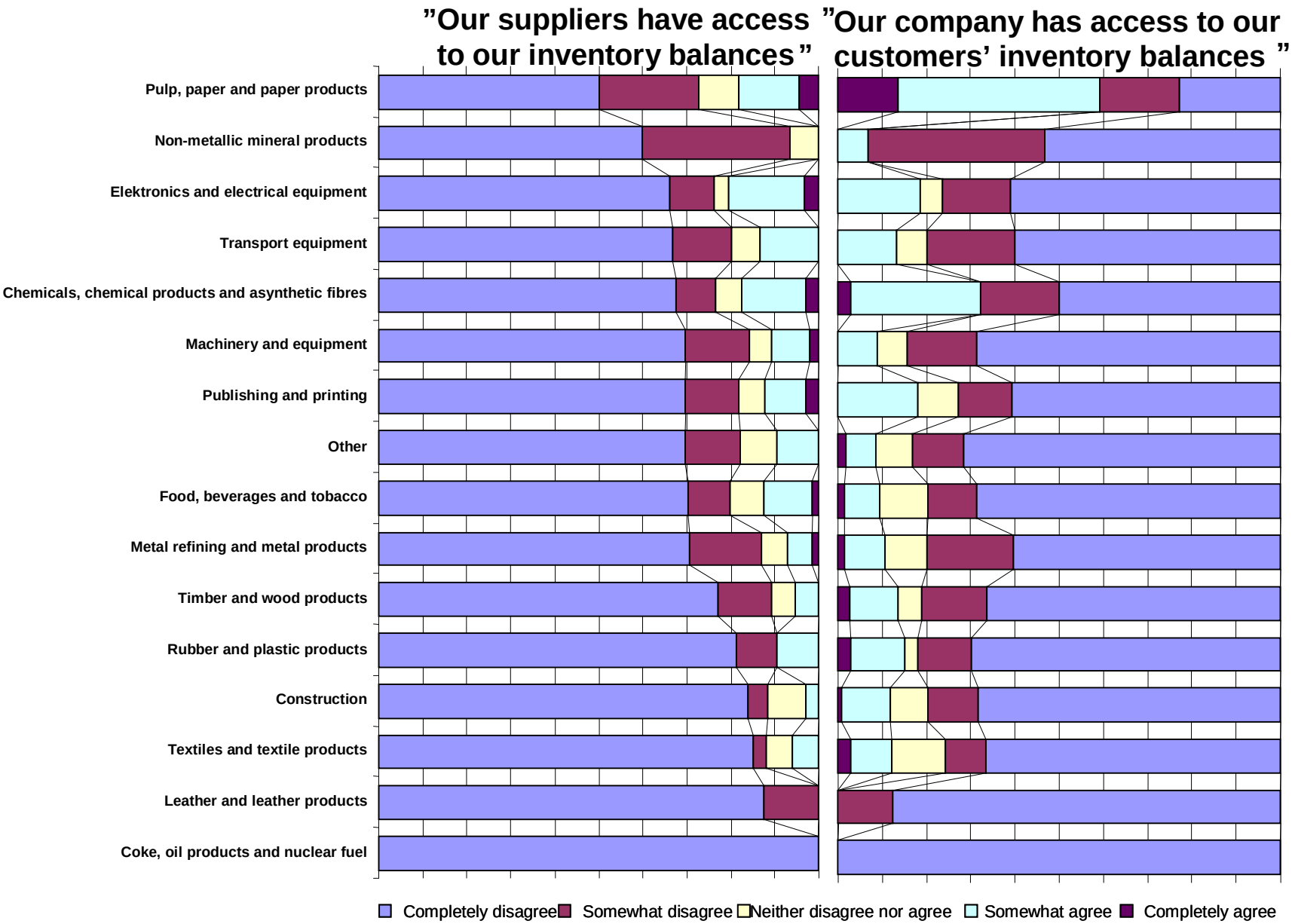
Excellence in Logistics 2004.



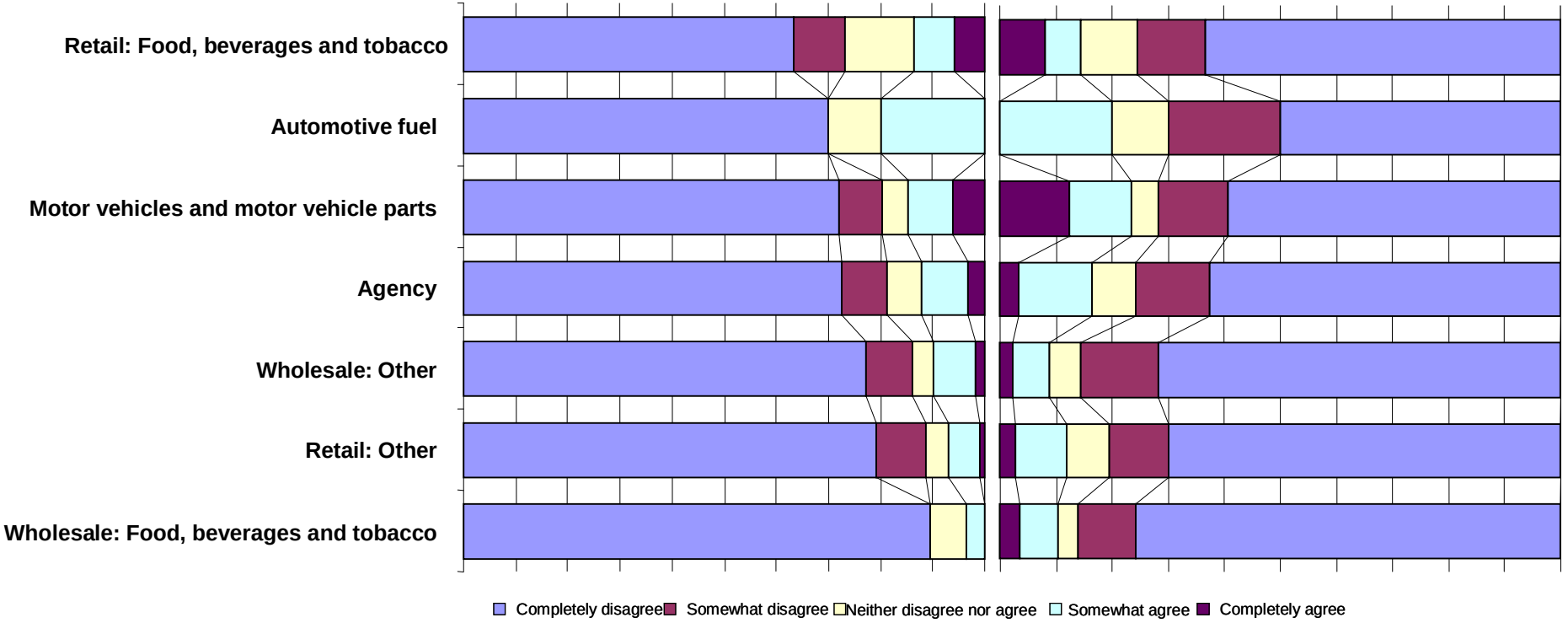
Attachment 9 Country scores and ranking orders according to Logistics Survey 2003. Source: Naula and Ojala 2005.

Ranking by country	1. Transport time	Avg.	2. Punctuality	Avg.	3. International freight costs	Avg.	4. Domestic Freight costs	Avg.	5. Customs	Avg.	6. Forwarding competence	Avg.	7. Logistics environment generally	Avg.
1	Belgium	6.33	Netherlands	6.43	Netherlands	6.20	Netherlands	5.83	Norway	6.75	Austria	6.88	Belgium	6.83
2	Poland	6.33	Germany	6.43	Denmark	5.86	Denmark	5.43	Sweden	6.60	Sweden	6.70	Switzerland	6.67
3	Switzerland	5.83	Switzerland	6.33	Portugal	5.71	Czech Republic	5.33	Austria	6.50	Hong Kong	6.67	Hong Kong	6.67
4	Hungary	5.67	Denmark	6.33	United Kingdom	5.60	Singapore	5.25	Netherlands	6.43	New Zealand	6.67	Austria	6.63
5	Denmark	5.57	United Kingdom	6.29	Ireland	5.57	Spain	5.20	United Kingdom	6.17	Poland	6.67	New Zealand	6.50
6	Netherlands	5.57	Belgium	6.17	Switzerland	5.50	New Zealand	5.17	Belgium	6.17	Hungary	6.67	Norway	6.38
7	Czech Republic	5.50	Hong Kong	6.00	Hong Kong	5.50	Hungary	5.17	Denmark	6.14	Australia	6.57	Denmark	6.33
8	**Finland**	**5.50**	Portugal	5.86	Israel	5.50	South Korea	5.17	Ireland	6.14	Switzerland	6.50	Italy	6.29
9	Portugal	5.43	**Finland**	**5.79**	Germany	5.40	Switzerland	5.00	Greece	6.13	Belgium	6.50	Sweden	6.20
10	United Kingdom	5.43	Japan	5.75	Turkey	5.33	United Kingdom	5.00	Germany	5.86	Japan	6.50	Spain	6.17
11	Japan	5.33	Singapore	5.75	Lithuania	5.28	Hong Kong	5.00	Switzerland	5.83	Norway	6.43	Netherlands	6.14
12	Turkey	5.33	Ireland	5.71	Singapore	5.25	**Finland**	**5.00**	Hong Kong	5.83	Singapore	6.38	United Kingdom	6.14
13	Germany	5.29	Sweden	5.67	Sweden	5.22	Ireland	5.00	New Zealand	5.67	**Finland**	**6.36**	Australia	6.14
14	SerbiaMontenegro	5.29	New Zealand	5.67	Poland	5.17	Norway	5.00	Australia	5.67	Czech Republic	6.33	Germany	6.00
15	Sweden	5.22	Norway	5.63	Hungary	5.17	France	5.00	Singapore	5.63	Italy	6.29	Portugal	6.00
16	France	5.14	France	5.57	Italy	5.14	South Africa	4.88	Portugal	5.57	South Africa	6.25	Japan	6.00
17	Australia	5.13	Austria	5.57	Malaysia	5.14	Croatia	4.86	Italy	5.57	Canada	6.20	Poland	6.00
18	USA	5.08	Poland	5.50	USA	5.08	Belgium	4.83	Taiwan	5.43	Denmark	6.14	Ireland	5.86
19	Austria	5.00	Taiwan	5.50	Belgium	5.00	Poland	4.83	France	5.29	Greece	6.14	France	5.86
20	Hong Kong	5.00	Turkey	5.33	New Zealand	5.00	Lithuania	4.78	Estonia	5.17	Latvia	6.05	Taiwan	5.63
21	Ireland	5.00	Italy	5.29	Czech Republic	5.00	Canada	4.76	USA	5.15	France	6.00	Greece	5.63
22	New Zealand	5.00	Canada	5.25	Slovak Republic	5.00	Taiwan	4.75	**Finland**	**5.00**	Taiwan	6.00	South Korea	5.60
23	Brazil	4.83	Hungary	5.17	Indonesia	5.00	Greece	4.75	Hungary	5.00	Estonia	6.00	Canada	5.57
24	Lithuania	4.80	Czech Republic	5.17	Romania	5.00	Portugal	4.71	Slovak Republic	5.00	Spain	6.00	Vietnam	5.57
25	South Korea	4.80	South Korea	5.17	Vietnam	5.00	Sweden	4.70	Spain	5.00	Slovenia	5.88	Estonia	5.54
26	Canada	4.73	USA	5.15	Russia	5.00	Latvia	4.60	Czech Republic	4.83	Egypt	5.86	USA	5.54
27	Italy	4.57	Greece	5.13	Greece	4.88	Malaysia	4.57	Canada	4.76	Netherlands	5.83	Slovak Republic	5.43
28	Singapore	4.50	Malaysia	5.00	South Africa	4.88	Romania	4.57	Poland	4.67	Indonesia	5.71	Singapore	5.38
29	Thailand	4.50	Lithuania	4.95	SerbiaMontenegro	4.86	Germany	4.50	South Korea	4.67	Croatia	5.71	Hungary	5.33
30	Ukraine	4.50	Estonia	4.86	Morocco	4.86	Israel	4.50	Vietnam	4.29	United Kingdom	5.67	**Finland**	**5.21**
31	Estonia	4.43	South Africa	4.75	Belarus	4.80	Estonia	4.46	Japan	4.25	Brazil	5.67	Czech Republic	5.17
32	Vietnam	4.43	SerbiaMontenegro	4.71	**Finland**	**4.79**	USA	4.38	Slovenia	4.25	Argentina	5.64	Romania	5.14
33	Philippines	4.29	Australia	4.71	Japan	4.75	Slovenia	4.38	Indonesia	4.13	Kazakhstan	5.63	Lithuania	5.05
34	Latvia	4.25	Latvia	4.70	Canada	4.75	Colombia	4.38	Lithuania	4.11	South Korea	5.60	Latvia	4.90
35	Norway	4.25	Brazil	4.67	Mexico	4.71	Argentina	4.31	South Africa	4.00	Romania	5.57	South Africa	4.88

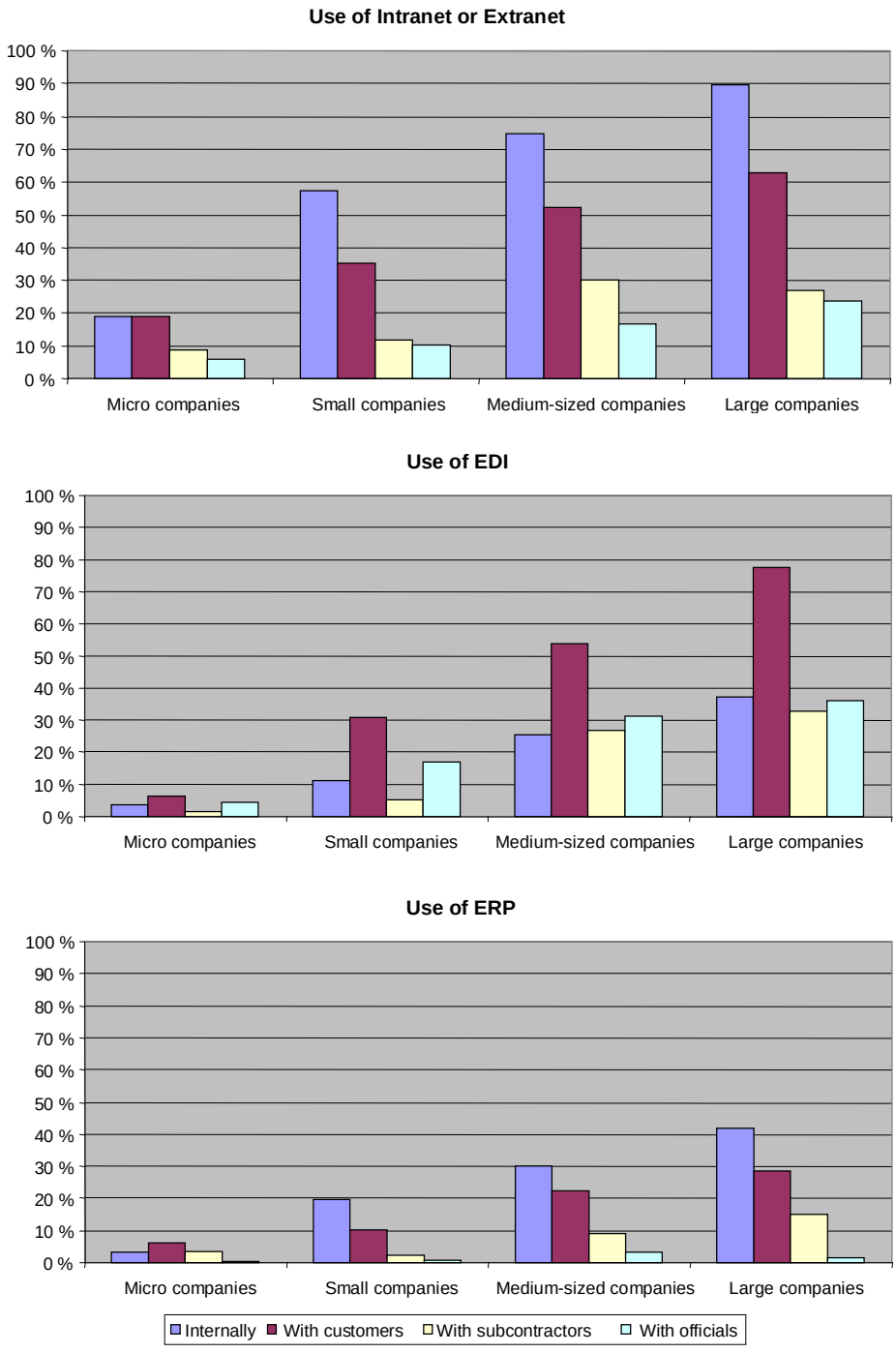
Attachment 10 Transparency of the supply chains inmanufacturing



Attachment 11 Transparency of the supply chain in trade



Attachment 12 Frequency of use of electronic information systems among logistics service providers internally and in dealing with subcontractors, customers and the authorities



TURUN KAUPPAKORKEAKOULU
Turku School of Economics and Business Administration

LOG4

Dear Respondent,

Dear Respondent,

Thank you for participating the Logistics Survey 2006!

The unique feature of our Survey is that the **respondents are provided free of charge with a report which relates the key survey findings with the respondent firm data**. The report will be delivered in an electronic form in June 2006 to those respondents, who have completed the questionnaire. Responding will take approximately 30 minutes of your time. You may suspend your session any time and continue answering when convenient using the same web link. Answers that you have already submitted will remain. Thank you very much!

Sincerely Yours,
(contacts)

1 Background information

Company name/name of the business unit:

Postal code: *

E-mail address (provide only if you wish to receive the customized survey report free of charge):

Respondent's position in the firm:

(Select)

2 Choose whether you respond on behalf of a business unit or the whole company/group of companies.

Attention: Both options are hereon referred as "Firm".

- I respond on behalf of the firm/group of companies.
- I respond on behalf of the business unit.

3 Choose the number of employees in your firm at the end of 2005: *

4 Select your firm's turnover in 2005: *

5 Choose the main branch of your firm. *

- Manufacturing and construction
- Trading
- Logistics Services

6/28 Choose the industry that best fits your firm's field of business. *

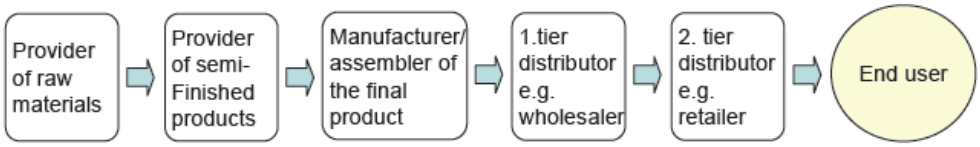
7/28 In how many localities does your firm have production or construction activities?

a) Domestic: b) Outside domestic:

8/28 Choose the option that best describes the production in your firm:

- Products are made to stock (MTS).
- Products are assembled to order (ATO).
- Products are made to order (MTO).
- Customer specific products are engineered to order (ETO – including project driven business).
- The business bases on selling other firms' manufacturing capacity (capacity selling CS).

9/28 According to the figure below, which of the following options describes your firm's position in the production chain?



- Provider of raw materials
- Provider of semi-finished products
- Manufacturer / assembler of the final product
- 1. tier distributor (e.g. wholesaler)
- 2. tier distributor (e.g. retailer)

10/28 Estimate how many percent of your firm's SALES in 2005 were generated in each of the following geographical areas:

Answer sections a, b, c, d, e and f:

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(Select)	(Select)	(Select)	(Select)	(Select)	(Select)

11/28 Estimate how many percent of your firm's PURCHASES in 2005 originated from each of the following geographical areas:

Answer sections a, b, c, d, e and f:

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(Select)	(Select)	(Select)	(Select)	(Select)	(Select)

12/28 Estimate how many percent of your firm's PRODUCTION CAPACITY in 2005 was located in each of the following geographical areas:

Answer sections a, b, c, d, e and f:

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(Select)	(Select)	(Select)	(Select)	(Select)	(Select)

13/28 Estimate the percentage share of each type of logistics cost from your firm's turnover in 2005:
Answer sections a,b,c,d,e and f.

Instructions: If your firm does not actively keep track of these types of logistics costs, estimate each cost based on your business experience

a) Transportation and cargo handling	b) Warehousing (cost of running own warehouse or buying the service)	c) Cost of capital tied in inventory	d) Administration (costs from functions indirectly related to logistics e.g. IT)	e) Cost of packing needed in transport	f) Other indirect logistics costs (e.g. cost of lost sales)
% of turnover: (select)	% of turnover: (select)	% of turnover: (select)	% of turnover: (select)	% of turnover: (select)	% of turnover: (select)

In section a), did you respond :

- Concerning all the transportation in your firm
- Concerning inbound transportation
- Concerning outbound transportation

14/28 Estimate and forecast how the share of each type of logistics cost from your firm's turnover will change by 2010:
Answer sections a,b,c,d,e and f

a) Transportation and cargo handling	b) Warehousing (cost of running own warehouse or buying the service)	c) Cost of capital tied in inventory	d) Administration (costs from functions indirectly related to logistics e.g. IT)	e) Cost of packing needed in transport	f) Other indirect logistics costs (e.g. cost of lost sales)
share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:
increase significantly	increase significantly	increase significantly	increase significantly	increase significantly	increase significantly
increase some	increase some	increase some	increase some	increase some	increase some
remain the same	remain the same	remain the same	remain the same	remain the same	remain the same
decrease some	decrease some	decrease some	decrease some	decrease some	decrease some
decrease significantly	decrease significantly	decrease significantly	decrease significantly	decrease significantly	decrease significantly

"Third party logistics" is in question if the co-operation with the service provider:

. is long-spanned with duraton of one year minimum (and)
. comprises at least one package of services, such as all outbound transportation (and)
. involves both sides in developing the co-operation

15/28 Is your firm a user of third party logistics (3PL) services?

- Yes.
- No.

16/28 How many percent of the following logistics functions are managed by an external service provider in your company now and year 2010?

	a) Now:					b) In year 2010:				
	0%	less than 25%	25%-50%	50-75%	over 75%	0%	less than 25%	25%-50%	50-75%	over 75%
Transportation										
Reverse logistics										
Freight forwarding										
Sales order handling										
Invoicing										
Warehousing										
Inventory management										
Product customisation / finalisation										
Logistics IT systems										

17/28 Check off an option if you consider it a significant MOTIVATOR to use external logistics providers.

Check off the needed amount of options:

- € Our firm is expanding geographically
- € Quality of logistics is improved by outsourcing
- € Logistics costs are lowered
- € Our firm needs flexible service capacity
- € Our firm needs external expertise in logistics
- € Our firm policy is to focus on our core competency
- € Outsourcing logistics facilitates Supply Chain Management
- € Our customers expect us to use external service providers
- € Our suppliers expect us to use external service providers

18/28 Check off an option if you consider it a significant DEMOTIVATOR to use external logistics providers

Check off the needed amount of options:

- € Outsourcing logistics means losing control
- € Logistics is a core business area
- € Logistics costs can not be lowered by outsourcing
- € Our firm has more logistics expertise than available externally
- € Outsourcing will not significantly improve service levels
- € Our firm does not know how to buy logistics services
- € Outsourcing logistics has hidden costs
- € Our dependency on service providers grows when logistics is outsourced
- € Service level is hard to evaluate and monitor

19/28 Which of the following methods are in use in your company for controlling orders and deliveries on a weekly basis?

Answer sections a, b, c and d:

	a) Internally	b)When dealing with customers	c)When dealing with suppliers	d)When dealing with logistics providers
Letter / telephone / fax	€	€	€	€
E-mail	€	€	€	€
Web-based portal, e.g. Internet marketplace	€	€	€	€
Intranet/Extranet	€	€	€	€
Electronic Data Interchange (EDI) or similar	€	€	€	€
Enterprise Resource Planning system (ERP) or similar	€	€	€	€
RFID-Radio Frequency Identification technology	€	€	€	€

20/28 How many different computer applications are in use in your company for controlling orders and deliveries?

a) Internally:

(select)

b) With external interest groups:

(select)

21/28 How well is your firm able to take advantage of the following logistics indicators in managing your operations?

Answer sections a,b,c,d and e.

	not at all	some	well	very well
a)Inventory turnover	}	}	}	}
b)Cost of unit transported	}	}	}	}
c)Perfect order fulfillment	}	}	}	}
d)Suppliers' delivery accuracy	}	}	}	}
e)Cash-to-cash cycle time	}	}	}	}

22/28 Estimate the following key figures in your company's current operations

Instructions: If your firm does not actively keep track of these figures, estimate each section based on your business experience.

Answer sections a, b, c, d, e, f and g:

a) How many order lines a day does your firm handle on average?

b) How many % of your customer orders are delivered complete in the right place and time (Perfect order fulfillment%)?

c) How many days is your customer order fulfillment cycle time (order-delivery)?

d) What is the average number of your firm's inventory days of supply?

e) What is the average number of your firm's days of sales outstanding?

f) What is the average number of your firm's days of payables outstanding?

g) How many tons of materials does your company handle in a year?

23/28 How high is the level of logistics competence

Answer sections a, b, c, d and e :

	Very low	Somewhat low	Not high nor low	Somewhat high	Very high
a.In your company					
b.Of your customers					
c.Of your providers					
d.Of your logistics_providers					
e.Of your competitors					

24/28 Choose the area of logistics competence whose development would benefit your company the most for each of the following personnel groups.
Answer sections a,b and c.

a) Operational management and employee level: (select)

b) Middle management: (select)

c) Strategic management level of the firm: (select)

25/28 Please answer according to whether you agree or disagree with the following statements

Answer sections a, b, c, d and e:

	I completely disagree	I somewhat disagree	I do not agree nor disagree	I somewhat agree	I completely agree
a)We carefully keep track of our firm's logistics costs					
b)Our firm follows logistic performance indicators together with our suppliers and customers					
c)Environmental effects of logistics operations have been taken into account in our activities					
d)Our firm has access to our customers' inventory level information					
e)Our suppliers have access to our inventory level information					

26/28 Please answer according to whether you agree or disagree with the following statements

Answer sections a, b, c, d and e:

	I completely disagree	I somewhat disagree	I do not agree nor disagree	I somewhat agree	I completely agree
a.Our company will be utilizing RFID Radio Frequency Identification technology in five years	○	○	○	○	○
b.Need for round-the-clock operations will increase	○	○	○	○	○
c.Different disturbances and irregularities will increse in the logistics of our company	○	○	○	○	○
d.Our company is well prepared for disturbances and irregularities in logistics	○	○	○	○	○
e.Preparing for disturbances and irregularities decreases the efficiency of logistics in our company significantly	○	○	○	○	○

27/28 Select three most important development needs in the logistics of your company during the next five years

Answer sections a, b and c.

a) Most important development need: (select)

b) Second development need: (select)

c) Third development need: (select)

28/28 Rate the operational preconditions of your firm locality/localities in your country...

Answer sections a, b, c, d and e:

	Very poor	Poor	Not high nor poor	High	Very high
a.In general business perspective	○	○	○	○	○
b.From the perspective of logistics efficiency	○	○	○	○	○
c.From the perspective of production location	○	○	○	○	○
d.From the perspective of traffic infrastructure	○	○	○	○	○
e.Compared to competitors' locations	○	○	○	○	○

6/26 Choose the industry that best fits your firm's field of business *

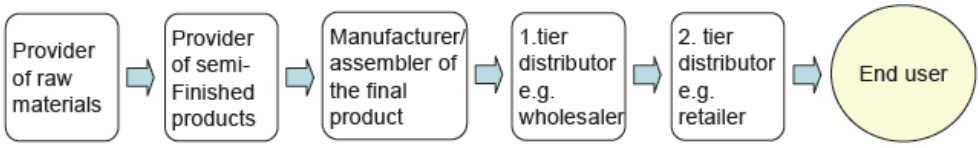
(select)

7/26 In how many localities does your firm have businesses with logistics operations?

a) Domestic: (select)

b) Outside domestic: (select)

8/26 According to the figure below, which of the following options describes your firm's position in the production chain?



○ Provider of raw materials	○ Provider of semi-finished products	○ Manufacturer / assembler of the final product	○ 1. tier distributor (e.g. wholesaler)	○ 2. tier distributor (e.g. retailer)

9/26 Estimate how many percent of your firm's SALES in 2005 were generated in each of the following geographical areas:

Answer sections a, b, c, d, e and f:

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(select)	(select)	(select)	(select)	(select)	(select)

10/26 Estimate how many percent of your firm's PURCHASES in 2005 originated from each of the following geographical areas:

Answer sections a, b, c, d, e and f:

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(select)	(select)	(select)	(select)	(select)	(select)

11/26 Estimate the percentage share of each type of logistics cost from your firm's turnover in 2005:
Answer sections a,b,c,d,e and f.

Instructions: If your firm does not actively keep track of these types of logistics costs, estimate each cost based on your business experience.

a) Transportation and cargo handling	b) Warehousing (cost of running own warehouse or buying the service)	c) Cost of capital tied in inventory	d) Administration (costs from functions indirectly related to logistics e.g. IT)	e) Cost of packing needed in transport	f) Other indirect logistics costs (e.g. cost of lost sales)
% of turnover: (select)	% of turnover: (Select)	% of turnover: (select)	% of turnover: (select)	% of turnover: (select)	% of turnover: (select)

In section a), did you respond :

- Concerning all the transportation in your firm
- Concerning inbound transportation
- Concerning outbound transportation

12/26 Estimate and forecast how the share of each type of logistics cost from your firm's turnover will change by 2010:
Answer sections a,b,c,d,e and f.

a) Transportation and cargo handling	b) Warehousing (cost of running own warehouse or buying the service)	c) Cost of capital tied in inventory	d) Administration (costs from functions indirectly related to logistics e.g. IT)	e) Cost of packing needed in transport	f) Other indirect logistics costs (e.g. cost of lost sales)
share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:	share of turnover will:
increase significantly	increase significantly	increase significantly	increase significantly	increase significantly	increase significantly
increase some	increase some	increase some	increase some	increase some	increase some
remain the same	remain the same	remain the same	remain the same	remain the same	remain the same
decrease some	decrease some	decrease some	decrease some	decrease some	decrease some
decrease significantly	decrease significantly	decrease significantly	decrease significantly	decrease significantly	decrease significantly

"Third party logistics" is in question if the co-operation with the service provider:

. is long-spanned with duraton of one year minimum (and)
. comprises at least one package of services, such as all outbound transportation (and)
. involves both sides in developing the co-operation

13/26 Is your firm a user of third party logistics (3PL) services?

Yes. No.

14/26 How many percent of the following logistics functions are managed by an external service provider in your company now and year 2010?

	a) Tällä hetkellä: 0%	less than 25%	25%-50%	50-75%	over 75%	b) In year 2010: 0%	less than 25%	25%-50%	50-75%	over 75%
Transportation										
Reverse logistics										
Freight forwarding										
Sales order handling										
Invoicing										
Warehousing										
Inventory management										
Product customisation / finalisation										
Logistics IT systems										

15/26 Check off an option if you consider it a significant MOTIVATOR to use external logistics providers.

Check off the needed amount of options:

- Our firm is expanding geographically
- Quality of logistics is improved by outsourcing
- Logistics costs are lowered
- Our firm needs flexible service capacity
- Our firm needs external expertise in logistics
- Our firm policy is to focus on our core competency
- Outsourcing logistics facilitates Supply Chain Management
- Our customers expect us to use external service providers
- Our suppliers expect us to use external service providers

16/26 Check off an option if you consider it a significant DEMOTIVATOR to use external logistics providers

Check off the needed amount of options:

- Outsourcing logistics means losing control
- Logistics is a core business area
- Logistics costs can not be lowered by outsourcing
- Our firm has more logistics expertise than available externally
- Outsourcing will not significantly improve service levels
- Our firm does not know how to buy logistics services
- Outsourcing logistics has hidden costs
- Our dependency on service providers grows when logistics is outsourced
- Service level is hard to evaluate and monitor

17/26 Which of the following methods are in use in your company for controlling orders and deliveries on a weekly basis?

Answer sections a, b, c and d:

	a) Internally	b)When dealing with customers	c)When dealing with suppliers	d)When dealing with logistics providers
Letter / telephone / fax	¢	¢	¢	¢
E-mail	¢	¢	¢	¢
Web-based portal, e.g. Internet marketplace	¢	¢	¢	¢
Intranet/Extranet	¢	¢	¢	¢
Electronic Data Interchange (EDI) or similar	¢	¢	¢	¢
Enterprise Resource Planning system (ERP) or similar	¢	¢	¢	¢
RFID-Radio Frequency Identification technology	¢	¢	¢	¢

18/26 How many different computer applications are in use in your company for controlling orders and deliveries?

a) Internally: (select)

b) With external interest groups: (select)

19/26 How well is your firm able to take advantage of the following logistics indicators in managing your operations?

Answer sections a,b,c,d and e.

	not at all	some	well	very well
a)Inventory turnover	¡	¡	¡	¡
b)Cost of unit transported	¡	¡	¡	¡
c)Perfect order fulfillment	¡	¡	¡	¡
d)Suppliers' delivery accuracy	¡	¡	¡	¡
e)Cash-to-cash cycle time	¡	¡	¡	¡

20/26 Estimate the following key figures in your company's current operations:

Instructions: If your firm does not actively keep track of these figures, estimate each section based on your business experience.

Answer sections a, b, c, d, e, f and g:

a) How many order lines a day does your firm handle on average?

b) How many % of your customer orders are delivered complete in the right place and time (Perfect order fulfillment%)?

c) How many days is your customer order fulfillment cycle time (order-delivery)?

d) What is the average number of your firm's inventory days of supply?

e) What is the average number of your firm's days of sales outstanding?

f) What is the average number of your firm's days of payables outstanding?

g) How many tons of materials does your company handle in a year?

21/26 How high is the level of logistics competence

Answer sections a, b, c, d and e :

	Very low	Somewhat low	Not high nor low	Somewhat high	Very high
a.In your company					
b.Of your customers					
c.Of your providers					
d.Of your logistics_providers					
e.Of your competitors					

22/26 Choose the area of logistics competence whose development would benefit your company the most for each of the following personnel groups.
Answer sections a,b and c.

a) Operational management and employee level: (select)

b) Middle management: (select)

c) Strategic management level of the firm: (select)

23/26 Please answer according to whether you agree or disagree with the following statements

Answer sections a,b,c,d and e:

	I completely disagree	I somewhat disagree	I do not agree nor disagree	I somewhat agree	I completely agree
a)We carefully keep track of our firm's logistics costs					
b)Our firm follows logistic performance indicators together with our suppliers and customers					
c)Environmental effects of logistics have been taken into account in our activities					
d)Our firm has access to our customers' inventory level information					
e)Our suppliers have access to our inventory level information					

24/26 Please answer according to whether you agree or disagree with the following statements

Answer sections a,b,c,d and e:

	I completely disagree	I somewhat disagree	I do not agree nor disagree	I somewhat agree	I completely agree
a.Our company will be utilizing RFID radio frequency identification technology in five years					
b.Need for round-the-clock operations will increase					
c.Different disturbances and irregularities will increase in the logistics of our company					
d.Our company is well prepared for disturbances and irregularities in logistics					
e.Preparing for disturbances and irregularities decreases the efficiency of logistics in our company significantly					

25/26 Select the three most important development needs in the logistics of your company during the next five years

Answer sections a, b and c.

a) the most important development need: (select)

b) 2nd most important development need: (select)

c) 3rd most important development need: (select)

26/26 Rate the operational preconditions of your firm locality/localities in your country...

Vastatkaa kohtiin a, b, c, d ja e:

	Very poor	Poor	Not high nor poor	High	Very high
a.In general business perspective	○	○	○	○	○
b.From the perspective of logistics efficiency	○	○	○	○	○
c.From the perspective of trading location	○	○	○	○	○
d.From the perspective of traffic infrastructure	○	○	○	○	○
e.Compared to competitors' locations	○	○	○	○	○

6/25 Choose the industry that best fits your firm's field of business. *

(Select)

7/25 In how many localities does your firm have logistics service operations?

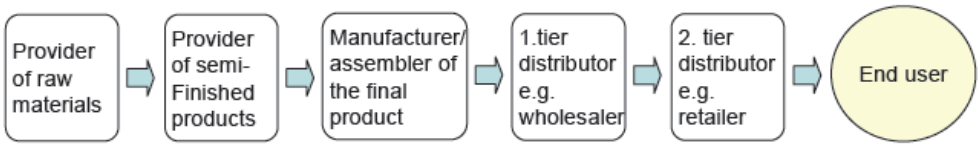
a) Domestic? (Select)

b) Outside domestic? (Select)

8/25 Select the cargo types your firm deals with:

- ○ Solid bulk
- ○ Liquid bulk
- ○ Unitized cargo
- ○ Break bulk
- ○ Valuables
- ○ Express cargo
- ○ Other, what?

9/25 Which parts of the production chain (see figure below) are your firm's services targetted to? You may select more than one option.



○ Providers of raw materials	○ Providers of semi-finished products	○ Manufacturers / assemblers of the final product	○ 1. tier distributors (e.g. wholesalers)	○ 2. tier distributors (e.g. retailers)

10/25 Estimate how many percent of your firm's services are provided in each of the following geographical areas?

Answer sections a, b, c, d, e and f.

(In case your firm deals with export or import please include these in sections b,c,d,e or f.)

a) Domestic	b) Outside Domestic in the EU	c) Outside the EU in Europe	d) North America and South America	e) Asia	f) Australia and Africa
(Select)	(Select)	(Select)	(Select)	(Select)	(Select)

11/25 Estimate how many percent of your firm's sales in 2005 were contributed by...

When applicable, answer the sections a, b, c and d.

a) the biggest customer	b) 5 biggest customers combined	c) 10 biggest customers combined	d) 20 biggest customers combined
(Select)	(Select)	(Select)	(Select)

12/25 Forecast how many percent of your firm's sales in 2010 will be contributed by...

When applicable, answer the sections a, b, c and d.

a) the biggest customer	b) 5 biggest customers combined	c) 10 biggest customers combined	d) 20 biggest customers combined
(Select)	(Select)	(Select)	(Select)

13/25 Estimate how many percent of your firm's sales in 2005 were generated by...

When applicable, answer the sections a, b, c and d.

a) Transport services only	b) Warehousing services only	c) Standard and recurrent service packages	d) Customer-tailored service packages
(Select)	(Select)	(Select)	(Select)

14/25 Forecast how many percent of your firm's sales in 2010 will be generated by...

When applicable, answer the sections a, b, c and d.

a) Transport services only	b) Warehousing services only	c) Standard and recurrent service packages	d) Customer-tailored service packages
(Select)	(Select)	(Select)	(Select)

15/25 Over the next five years, which of the following do you consider the most serious threats in the business environment? Answer the sections a, b and c.

a) the most serious threat:	b) the 2nd most serious threat:	c) the 3rd most serious threat:
(Select)	(Select)	(Select)

16/25 Forecast how the demand of different logistics services will develop over the next five years:

Vastatkaa kohtiin a...k:

	Strong decrease	Slight decrease	Remain the same	Slight increase	Strong increase
a.Domestic transportation	☐	☐	☐	☐	☐
b.International transportation	☐	☐	☐	☐	☐
c.Reverse logistics	☐	☐	☐	☐	☐
d.Freight forwarding	☐	☐	☐	☐	☐
e.Receiving orders on behalf of customer	☐	☐	☐	☐	☐
f.Invoicing on behalf of customer	☐	☐	☐	☐	☐
g.Warehousing services	☐	☐	☐	☐	☐
h.Inventory management	☐	☐	☐	☐	☐
i.Finalizing product on behalf of customer	☐	☐	☐	☐	☐
j.Managing_logistics_information_on_behalf_of_customer	☐	☐	☐	☐	☐
k.3PL/4PL services	☐	☐	☐	☐	☐

17/25 Check off an option if you consider it a significant MOTIVATOR FOR YOUR CUSTOMERS to use external logistics providers.

Check off the needed number of options.

- ☐ Our customers are expanding geographically.
- ☐ Quality of our customers' logistics is improved by outsourcing.
- ☐ Our customers' logistics costs are lowered.
- ☐ Our customers need flexible service capacity.
- ☐ Our customers need external expertise in logistics.
- ☐ Our customers' policy is to focus on core competencies.
- ☐ Outsourcing logistics facilitates our customers' Supply Chain Management.
- ☐ Our customers' customers' expect use of external service providers.
- ☐ Our customers' suppliers expect use of external service providers.

18/25 Check off an option if you consider it a significant DEMOTIVATOR FOR YOUR CUSTOMERS to use external logistics providers.

Check off the needed number of options.

- ☐ Outsourcing logistics means losing control for our customers.
- ☐ Logistics is a core business area for our customers.
- ☐ Our customers cannot cut logistics costs by outsourcing.
- ☐ Our customer has more logistics expertise than available externally.
- ☐ Outsourcing will not significantly improve service levels received by our customer.
- ☐ Our customer does not know how to buy logistics services.
- ☐ Outsourcing logistics is related with hidden costs.
- ☐ Our customers' dependency on service providers grows when logistics is outsourced.
- ☐ Logistics service level is hard to evaluate and monitor.

19/25 Which of the following are used at least weekly in your firm for service provision?

Answer sections a, b, c and d:

	a) Internally	b)When dealing with customers	c)When dealing with subcontractors	d)When dealing with authorities
Letter / telephone / fax	¢	¢	¢	¢
E-mail	¢	¢	¢	¢
WWW portal	¢	¢	¢	¢
Intranet/Extranet	¢	¢	¢	¢
EDI or similar	¢	¢	¢	¢
ERP or similar	¢	¢	¢	¢
Radio Frequency Identification technology	¢	¢	¢	¢

20/25 How many different computer applications are there in use for service provision?

a) Internally:

(Select)

b) With external interest groups:

(Select)

21/25 How high is the level of logistics competence... ...

Answer sections a, b, c and d:

	Very low	Somewhat low	Not high nor low	Somewhat high	Very high
a.In your company	j	j	j	j	j
b.Of your customers	j	j	j	j	j
c.Of your subcontractors	j	j	j	j	j
d.Of your competitors	j	j	j	j	j

22/25 For each personnel group choose an area of logistics competence that your firm would most benefit developing.

a) Supervisors and operational staff:

(Select)

b) Middle management:

(Select)

c) Top management:

(Select)

23/25 Please answer according to whether you agree or disagree with the following statements.

Answer sections a,b,c,d,e,f,g and h:

	Fully disagree	Somewhat disagree	Not agree nor disagree	Somewhat agree	Fully agree
a.Environmental effects have been taken into account in our activities.	j	j	j	j	j
b.Regulation of dangerous good transports has tightened lately.	j	j	j	j	j
c.Need for round-the-clock operations will increase.	j	j	j	j	j
d.Different disturbances and irregularities will increase in the logistics of our customers.	j	j	j	j	j
e.Our company is well prepared for disturbances and irregularities in logistics.	j	j	j	j	j
f.Preparing_for_disturbances_and_irregularities_decreases_the_efficiency_of_logistics_significantly.	j	j	j	j	j
g.For us it is important to be a member of a Pan European network	j	j	j	j	j
h.In five years we will use RFID technology.	j	j	j	j	j

24/25 Select three most important logistics development needs in your company over the next five years.

Answer sections a, b and c.

a) the most important development need:

(Select)

b) 2nd most important development need:

(Select)

c) 3rd most important development need:

(Select)

25/25 Rate the operational preconditions of the locality/localities of your firm in your country.....

Answer sections a, b, c, d and e.

	Very low rating	Somewhat low rating	Not high now low rating	Somewhat high rating	Very high rating
a.In terms of business generally					
b.In terms of logistics efficiency					
c.In_terms_of_logistics_service_provision					
d.In terms of transport infrastructure					
e.Compared to competitors' locations					

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