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DEVELOPING REGIONS THROUGH SPATIAL PLANNING, LOGISTICS & ICT COMPETENCE - FINAL REPORT

Wolfgang Kersten,
Mareike Böger,
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UDC Logistics, Competence, ICT, Regional Development, Baltic Sea Region

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LIST OF ABBREVIATIONS

ARGE	Arbeitsgemeinschaft Arbeit und Grundsicherung
BAFA	Federal Office of Economics and Export Control
BCCA	Baltic Sea Chamber of Commerce Association
BDF	Baltic Development Forum
BFAI	German Office for Foreign Trade
BIBB	Federal Institute for Vocational Education and Training
BMBF	Federal Ministry of Education and Research
BMWI	Federal Ministry of Economics and Technology
BN	Billion
BSR	Baltic Sea Region
BSSSC	Baltic Sea States Sub-regional Co-operation
CBSS	Council of the Baltic Sea States
DEMIA	Development Measure Impact Analysis
DSL	Digital Subscriber Line
EDI	Electronic Data Interchange
EFFORTS	Effective Operations in Ports
ERDF	European Regional Development Fund
EU	European Union
FGL	Forschungsgemeinschaft Logistik
FP7	Seventh Research Framework Programme
FZH	Fortbildungszentrum Hafen Hamburg
GDP	Gross Domestic Product
GPRS	General Packet Radio Service
GVA	German gross value added
HSBA	Hamburg School of Business Administration
HSL	Hamburg School of Logistics
HST	Hamburg School of Shipping & Transportation
HWF	Hamburger Wirtschaftsförderung
ICT	Information and Communications Technology
IMF	International Monetary Fund
IT	Information Technology
LIH	Logistics Initiative Hamburg
NUTS	Nomenclature of Territorial Units for Statistics
R&D	Research and Development
SME	Small and medium-sized enterprises
TEN-T	Trans-European Network – Transport
TSE	Turku School of Economics
UBC	Union of the Baltic Cities

PART I: FACTS ABOUT THE BALTIC SEA REGION

1 INTRODUCTION

This study is part of the LogOn Baltic project, which ran from December 2005 until December 2007. The LogOn Baltic project was approved within the Baltic Sea Region (BSR) INTERREG III B Neighbourhood Programme, which is sponsored by the European Regional Development Fund (ERDF), as part of its structural funds, and co-financed by the national project partners. In the following, the project and its regional partners will be described. In addition, the objectives and structure of this report are presented.

1.1 Project introduction - LogOn Baltic

The purpose of LogOn Baltic is to present solutions that improve the interplay between logistics and ICT competence and spatial planning and strengthen small and medium-sized enterprises' (SMEs) competitiveness in the BSR. This is primarily done through the production and dissemination of information for regional development agencies on how to support enterprises in the participating regions in the field of information and communications technology (ICT) and logistics. The following regions participated in the project:

- Denmark
- Estonia
- Latvia
- Lithuania
- Pomerania (Poland)
- Östergötland (Sweden)
- Saint Petersburg (Russia)
- Southern Metropolitan Region of Hamburg (Germany)
- Southwest Finland
- Mecklenburg-Vorpommern (Germany)

LogOn Baltic provides an overview of logistics efficiency and logistics information systems in order to improve the interaction between SMEs and other public and private actors. On the one hand,

the empirical activities of LogOn Baltic compare existing logistics services and infrastructure with logistics needs in the participating regions, making it possible to develop perspectives and action plans for strengthening logistics competence in the regions. On the other hand, it describes the existing ICT infrastructure and services and reveals the extent to which they meet with companies' needs for further development. In this way, LogOn Baltic focuses on:

a. identifying development agencies and evaluating their performance in each region
b. evaluating the level of logistics and ICT efficiency
c. suggesting concrete action for regional and local public sector bodies.

Previously, no comparative data on logistics and ICT in the regions had been available. Data were gathered from each participating region using four tools, a logistics survey, an ICT survey, a DEMIA (development measure impact analysis) and expert interviews. Each of these is presented in a separate report. These results together with secondary data are summarized in this aggregated regional report that describes the current state of affairs, with regard to the economy and logistics, in the participating regions and makes recommendations on what and how the region needs to develop. All reports and working papers resulting from this project are available at the project's homepage, http://www.logonbaltic.info.

1.2 Regional partner introduction

The project has brought together experts from the whole BSR. More than 30 partners from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden collaborated on setting up a joint database on regional competences in logistics and information and communication technologies. The partners consist of 3 groups: The first group includes ministries of economy and labour as well as public authorities and regional development agencies. Moreover, logistics and transport associations such as the Association of Danish Transport Centres or the Polish Logistics Association, who promote and conduct practical project work, were integrated into the LogOn Baltic project. This group has efficiently disseminated the project results and supported a contemporary realisation of the

recommendations made by the project. The third group consists of a number of research institutions such as the Kühne School of Logistics and Management (formerly HSL Hamburg School of Logistics) representing the Southern Metropolitan Region of Hamburg, Linköping University in Sweden as well as Turku School of Economics (TSE) from Finland.

The management team of the LogOn Baltic project consists of Turku School of Economics, Linköping University, the University of Wismar and the Kühne School of Logistics and Management.

The following list will give an overview of the participating project partners, arranged in the alphabetical order of the BSR's project partner areas.

Denmark

- FDT Association of Danish Transport Centres

Estonia

- Estonian Logistics Union
- Tallinn City Government
- Tartu Science Park

Latvia

- Logistics and Customs Brokers Association
- Riga City Council, City Development Department
- Transport and Telecommunication Institute

Lithuania

- Vilnius Gediminas Technical University

Pomerania (Poland)

- City of Pruszcz Gdański
- Polish Logistics Association

Östergötland (Sweden)

- Linköping University, Linköping School of Management, Logistics Management
- Östsam Regional Development Council
- Transportcentrum AB

Saint Petersburg (Russia)

- Non profit training and research centre for adult education "Protey"
- North Western Russia Logistics Development and Information Center ILOT
- Saint Petersburg Government Committee for Transport-Transit Policy

Southern Metropolitan Region of Hamburg (Germany)

- Kühne School of Logistics and Management GmbH
- (formerly HSL Hamburg School of Logistics gGmbH)
- Growth Initiative Süderelbe AG (subcontracted partner)

Southwest Finland

- Turku School of Economics (lead partner)
- Development Centre of the Salo Region
- ICT Turku Ltd
- Loimaa Regional Development Centre
- Pilot Turku Ltd
- Regional Council of Southwest Finland
- TEDIM Telematics, Education, Development and Information Management
- Turku Region Development Centre
- University of Turku, Department of Geography

West-Mecklenburg (Germany)

- Business Association of Wismar
- Federal Association of SMEs (Section for Northern Germany)
- Ministry for Transport, Building and Regional Development Mecklenburg-Vorpommern
- Wismar University

1.3 Final Report introduction

The objective of this final report is to summarise and highlight the various results developed during the two years of the project. The individual results from each region and each research step have been published in separate reports. Figure 1 shows the structure of the reports.

The five types of regional reports have provided the basis for the final report. Four of them summarise the results from the empirical studies: Logistics survey, ICT survey, Expert Interviews and Development Measure Impact Analysis.

The Regional Logistics & ICT Profile (Regional Profile) is to be considered as the main tool for secondary data collection because it provides a comprehensive overview of the current situation and development in the logistics and ICT industry. It integrates the empirical analyses and additional secondary information from different areas of interest (i.e. the economy, human resources, logistics infrastructure, ICT infrastructure, public sector, etc). All of the regions involved in the LogOn Baltic project have followed the same content structure n order to help keep uniformity among the different regional profiles.

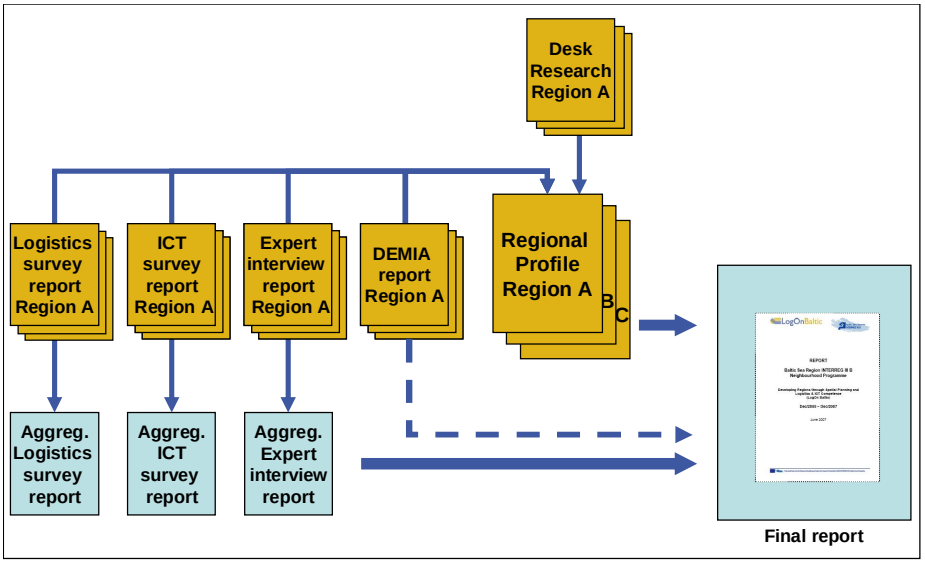

Figure 1 Procedure of the LogOn Baltic Reports. Source: Own illustration

On the aggregate level, the reports for the individual empirical activities highlight the main results from each of these activities by making a cross-regional comparison. In the final step, the aggregated reports and regional profiles, as well as the DEMIA reports were combined into the Final Report, thus turning it into a reference document for the whole project.

This report is structured as follows: In the first part, after this introduction, facts about the BSR are presented. This includes general information about the BSR as a whole and the regions participating in

the project (chapter 2), about the economy and educational issues (chapter 3). In addition, more specific details about the logistics (chapter 4) and ICT (chapter 5) sectors in the regions are given in order to provide a detailed background for the second part.

In this part, the empirical results obtained during the project are described and interpreted. It is divided into three chapters according to the data collection methods: results from the logistics survey (chapter 6), from the ICT survey (chapter 7) and from the expert interviews covering both logistics and ICT aspects (chapter 8).

In the third and final part, the results and facts about the region are brought together and integrated into a SWOT analysis. In addition, successful regional development projects in the BSR are described. Together, these two sections form the basis for deriving development needs and suggestions for the BSR (chapter 9). Chapter 10 presents an initiative which was brought up within the framework of the project and the impact the project has already made since its inception. The report finishes with a conclusion.

2 GENERAL INFORMATION ABOUT THE BALTIC SEA REGION

In the following, the BSR and its main location factors, general climate conditions and governmental and regional administrative divisions in the regions will be described. Furthermore, the available public sector support for enterprises as well as the BSR's historical background and co-operation will be explained.

2.1 The Baltic Sea Region and its main location factors

The **BSR** is one of Europe's most dynamic economic regions, representing an attractive market with a high purchasing power. It consists of regions in ten countries with around 75 million inhabitants and a commercial trade volume of about one third of Europe's total exports (Senat Hamburg 2007). The project comprises Denmark, Sweden (Östergötland region), Southwest Finland, Russia (St. Petersburg region), Estonia, Latvia, Lithuania, Pomerania in Poland and Germany (Southern Metropolitan Region of Hamburg and Mecklenburg-Vorpommern) (see figure 2).

Figure 2 Map of the BSR. Source: LogOn Baltic 2007

The **Southern Metropolitan Region of Hamburg** – in the following referred to as “Hamburg” is located in the north of Germany on the Elbe River between the North Sea and the Baltic Sea. It covers a surface area of about 4,588 km^2, has a population of 2,357,370 and comprises the federal state of Hamburg, the second largest city in Germany, as well as the three administrative districts of the southern adjacent state of Lower Saxony – Stade, Harburg and Lüneburg.

The city of Hamburg is not only considered to be the most important centre for commercial export and logistics in Germany but is also thought of as the hub of the BSR and Central Europe (Senat Hamburg 2007). In terms of location Hamburg’s advantage is its harbour. Measured by container handling, the port of Hamburg is the second largest in Europe and ninth in the world, handling almost 135 million tons of cargo per year (Hafen Hamburg 2007). Almost 25% of this trade is done with the BSR. Furthermore, Hamburg is connected by several motorways and is linked with major international and regional economic centres. Both the main and regional Deutsche Bahn railway lines intersect in Hamburg so that important European economic centres can also be reached by train. While a very large and modern station for multi-modal transport is located in Hamburg-Billwerder, the largest European marshalling yard can be found in Maschen. Hamburg is known for being one of the most productive regions in Germany, as well as in Europe. Not only is the port growing, but also logistics and other industries in general are too (Kersten et al. 2007h).

The German state of **Mecklenburg-Vorpommern** is situated in the Northeast of Germany and has 400 km of Baltic Sea coastline to the north. It covers an area of 23,182 km^2 and has almost 1.7 million inhabitants (Innenministerium des Landes Mecklenburg-Vorpommern 2007). The landscape is dominated by broad, open plains. However, some areas are hilly and lakes prevail. Forests account for approximately 20% of the land.

Mecklenburg-Vorpommern is located between the two largest German metropolitan areas, i.e. Hamburg and Berlin. Therefore, there are a large number of potential consumers with high purchasing power nearby. Efficient transportation links exist to the German and European hinterland as well as numerous ferry links with Scandinavia. Prices for real estate and office rent are relatively low while labour costs can be considered moderate. Companies benefit from the modern telecommunications network and from economic incentives that cover up to 50% of a company's investment costs (Kron et al. 2007b).

The Polish province of **Pomerania** is located in the North of Poland and has more than 300 km of Baltic Sea coastline. Approximately 2.2 million people inhabit the area of 18,293 km^2. The Pomeranian landscape is dominated by the highest elevation in the central European Lowlands as well as many forests and lakes.

Pomerania's location is favourable as it has a crossroads of important transportation corridors from going from north to south as well as east to west; nevertheless it is remote from the main Polish consumer markets. The coast however offers recreation and residential areas and its main metropolitan city areas are being developed. In particular, the large seaports in Gdańsk and Gdynia are multimode transport operators with specialist port services for chemicals and metallurgical industries (Trzuskawska 2007).

Lithuania, the southernmost and biggest of the three Baltic States, has a surface area of 65,300 km^2 and a population of 3.4 million. It has a Baltic Sea coastline of 99 km. The country's landscape is also flat and rich with lakes and rivers. Approximately a third of Lithuania is covered by forests (European Communities 2007a).

Due to Lithuania's location, freight shipments between east and west are of great importance for the transit industry. The Port of Klaipeda is ice-free all-year round and represents the country's major seaport. The port is linked by a four lane motorway to Vilnius and by rail to the east and onto Moscow (The World Bank 2007).

The Republic of **Latvia** in the northeast of Europe has 2.37 million inhabitants, of which almost a third live in the capital Riga. The country

covers 64,589 km^2 and its western border has a 531 km Baltic Sea coastline. Around 40% of its land is covered by forests.

Latvia is situated on the crossroads of important routes between Russia and Western Europe. The three large seaports in Riga, Ventspils and Liepaja operate throughout all the seasons and are well-linked by road to the landlocked regions in the neighbouring countries (Telematics and Logistics Institute Ltd. 2007).

The Republic of **Estonia** with its surface area of 45,226 km^2 and a population of 1.324 million is the most northern country of the Baltic States. Its landscape is characterised by many lakes, bogs and rivers. Almost half of the country is covered by forest.

Estonia is favourably positioned, close to Scandinavia and the EU consumer market and also to Russia. The well-equipped ports enable trade, especially with Baltic Sea countries, but Estonia is also a transit centre, which is supported by its well-developed road network (Kiisler 2007).

Saint Petersburg is situated in the northwest of Russia on the eastern shore of the Baltic Sea (The Gulf of Finland) in the delta of the Neva River on numerous islands. It covers a surface area of 1,400 km^2 and has 4,750,000 inhabitants making it the most northern city in the world with a population of more than 1 million. Not only is there water on its surface area it is also found underneath the city as it was built on swampland (Saint-Petersburg.com 2007).

Saint Petersburg is an important transport hub. Importantly it links maritime shipping and the railway system. The port is the biggest one in Russia and offers ferry connections to other ports in the Baltic Sea. Furthermore, the city is linked to other towns in Russia via the Neva River. The same applies to the railway. A circular road east of Saint Petersburg makes transport more efficient nowadays. However, a ring road west of the city is being planned (Wikipedia 2007).

Southwest Finland is situated on the southwest coast of Finland and comprises an area of 18,188 km^2 including an archipelago and various lakes. The region has 457,789 inhabitants of which two thirds live in the sub-region of Turku, Finland's former capital.

It has long been a traditional meeting place for trade and communication between the Nordic Countries and Russia, as well as other European countries and continues to be so (Malmsten 2007).

Östergötland in the East of Sweden has 415,000 inhabitants and covers a surface area of approximately 10,000 km^2. It includes the cities of Linköping and Norrköping and is the fourth largest urban area in Sweden. The landscape is characterised by a Baltic Sea coastline

that includes hilly fault valleys and a rocky outer archipelago, while the interior comprises forests and cultivated land.

The region is well-connected to Copenhagen and Stockholm and includes Sweden's important harbour of Norrköping. Östergötland has two airports, a motorway connection to Stockholm and the south of Sweden as well as the main railway from the capital to continental Europe. Not only do a large amount of Swedish consumers live nearby, but other parts of Northern Europe and the BSR are also easily accessible and hence can be served (Aronsson et al. 2007).

The Kingdom of **Denmark** comprises a surface area of 43,098 km^2 excluding the Faroe Islands and Greenland. Denmark is located between the North Sea and the Baltic Sea and apart from Jutland, the country consists of 406 islands. It has a coastline of 7,314 km and therefore none of its 5,447,084 inhabitants live more than 50 km from the sea.

Traditionally, ferries have taken on an important role in transport. Nowadays, the Fehmarn link enables cars and trucks to cross the sea and the great belt link additionally enables trains to save time (Ministry of Foreign Affairs of Denmark 2007).

2.2 General climate conditions

The southern part of the Baltic Sea is located in the temperate zone and has a strong maritime influence near Denmark in the west but has a rather continental climate in the east. The northern part of the Baltic Sea is not as strongly affected by the Gulf Stream and its salinity is rather low and thus the continental climate is intensified. The Baltic Sea normally ices up every winter and some seaports even experience five months in which ice breakers are needed. However, the three most recent winters have been exceptionally mild. Normally though only a few islands have a very mild climate (Ostsee.info, 2007).

In the following, the climate of two selected partner regions (Hamburg and Estonia) is described in more detail. Since the whole German state is located in the temperate zone, neither temperatures nor precipitation levels are extremely high or low. Due to maritime influences, **Hamburg**'s climate is milder and less volatile than further inland. It is not as cold in winter and not as hot in summer as in other places in Germany. In July and August, which are the warmest months in Hamburg, the temperature averages around 17.2 to 17.4 degrees Celsius. The coldest month is January with an average temperature of

1.3 degrees Celsius. In the course of a year, precipitation amounts to about 750 mm. It is higher in the second half of the year and varies from about 42 mm in February to approximately 78 mm in July and August (Kersten et al. 2007h).

Estonia is situated within a transition zone from the maritime to continental climate. The main factor influencing the differences in air temperatures between regions in Estonia is the Baltic Sea. In winter, it keeps the coastal areas much warmer than further inland. The average air temperature in January is -6°C to -7°C in Central and East Estonia and -2°C to -4°C in the Estonian Archipelago. In spring, the inland area heats up faster than the sea. As a result, coastal areas remain cooler than the rest of the country. Differences between the average temperatures in the regions exceed 3.5°C in May. In summer, these differences disappear and the average temperature varies between 16°C and 17.4°C in July. In autumn, the inland area cools faster than the coastal areas and those contrasts are seen in winter. Estonia's annual average precipitation is between 550 and 800 mm with about 160 to 180 rainy days. The coastal zone usually receives less rainfall than the inland areas (Kiisler 2007).

The following table (table 1) summarises the key facts about the climate in the two described regions:

Table 1 Climate in Hamburg and Estonia. Source: Own illustration

Region	**Hamburg**	**Estonia**
Climate	Temperate zone	Temperate zone
Average air temperature in summer	17.2°C to 17.4°C	16°C to 17.4°C
Average air temperature in winter	1.3°C	-6°C to -7°C (Central and East Estonia) -2°C to -4°C (West Estonia)
Annual average precipitation	750 mm	550 to 800 mm

2.3 Governmental and regional administration in the regions

The Nomenclature of Territorial Units for Statistics (NUTS) will be used in the following in order to compare the regions' governmental and

regional administrative divisions. The NUTS was established by Eurostat more than 25 years ago ”to provide a single uniform breakdown of territorial units for the production of regional statistics for the European Union” (Europäische Kommission 2007c). It was developed according to three principles:

1. Due to practical reasons associated with data availability and the implementation of regional policies, the NUTS *favours institutional breakdowns*.
2. The NUTS favours *regional units of a general character* and therefore does not include specific territorial units in certain fields of activity nor local units.
3. The NUTS is a *hierarchical classification* which subdivides each member state into a number of NUTS 1 regions, each of which is in turn subdivided into a number of NUTS 2 regions and then into a number of NUTS 3 regions.

   The grouping together of comparable units at each NUTS level may lead to the establishment of an additional regional level for each state, which may correspond to a less important or even non-existent administrative structure.

   There are minimum and maximum thresholds for the average size of the NUTS regions, namely 3 million to 7million inhabitants for NUTS 1; 800,000 to 3 million for NUTS 2 and 150,000 to 800,000 for NUTS 3 (Europäische Kommission 2007c and Europäische Kommission 2007d).

Table 2 shows the NUTS level of each of the EU partner regions, the countries, their administrative arrangements and the countries’ forms of government. Subsequently, the St. Petersburg region will be regarded separately.

Table 2 Administrative divisions of the regions. Source: Bibliographisches Institut & F.A. Brockhaus AG 2007, Europäische Kommission 2007a, Europäische Kommission 2007b

EU Partner Region	NUTS level	Country	Administrative arrangement of country	Form of government
Hamburg	1, 2	Germany	16 federal states	Federal Republic
Mecklenburg-Vorpommern	1, 2	Germany	16 federal states	Federal Republic
Pomerania	2	Poland	16 voivodeships	Republic
Lithuania	1, 2	Lithuania	10 districts	Republic
Latvia	1, 2	Latvia	26 administrative and 7 urban districts	Republic
Estonia	1, 2	Estonia	15 counties	Republic
South West Finland	3	Finland	6 provinces	Republic
Östergötland	3	Sweden	21 states	Constitutional Monarchy
Denmark	1, 2	Denmark	14 administrative and 2 urban districts	Constitutional Monarchy

The Russian Federation consists of 21 republics, 7 regions, 48 oblasts, 1 autonomous area, 9 autonomous districts and 2 cities with a federal position, one being Saint Petersburg (Bibliographisches Institut & F.A. Brockhaus AG 2007).

2.4 Public sector support for enterprises

There are several political layers which provide support for enterprises in the different countries. The top level is the support given by the European Union, while the second layer is the support given by the state governments. Depending on a country's structure, a third layer may be support from regional government institutions and the last level may be formed by local institutions.

The **European Union (EU)** offers support through several initiatives and funds. One of the aims of the EU is economic and social cohesion

between the European countries, mainly through the correction of imbalances between the regions. Different kinds of funds represent instruments for achieving this goal and the most important are the so-called structural funds. The concrete objectives of these funds are

- Convergence,
- Regional Competitiveness and Employment and
- European Territorial Co-operation.

One of the main funds is the European Regional Development Fund (ERDF). The areas related to infrastructure, transport and ICT are explicitly targeted by this fund (European Communities 2007b).

The support lent by the **state governments** is shaped differently. For example, in Germany, the central contact in the field of public authorities and administrations is the BMWi – Bundesministerium für Wirtschaft und Technologie (Federal Ministry of Economics and Technology). It offers a number of different support possibilities for SMEs. The major goal of the BMWi is to give support to start-ups as well as to established companies. In the logistics and ICT sector, their efforts can be roughly divided into five categories: support for business start-ups, support for investments, securities, research and innovation, and training, consulting and qualification services. Other ministries and authorities offering support are the Federal Office of Economics and Export Control (BAFA), the Federal Ministry of Education and Research (BMBF), the German Office for Foreign Trade (BFAI) and the Federal Institute for Vocational Education and Training (BIBB).

On the **regional and also on the local level**, the organisations may be separated by the area they cover. Furthermore, **interregional organisations** may operate in specific geographic regions (Kersten et al. 2007h).

The types of **support** can be divided into four groups: Financial support often concentrates on newly started businesses in order to help them before they become profitable. This support can take the form of subsidies and grants, loans, securities and tax benefits. Research foundations may provide research support for new product development or production technology development. Knowledge support is given by universities and other organisations and is often associated with SMEs in helping them e.g. develop business plans. An example of infrastructural support is assistance in finding suitable land areas for a company's activities (Kersten et. al 2007h and Aronsson et al. 2007).

On each of the described levels, a wide range of **initiatives and projects** has been started. In the following, initiatives from the EU and one project which started in the city of Hamburg are described.

The European Union (EU) offers support through several initiatives. The Seventh Research Framework Programme (FP7) of the European Union (which is valid from 2007 to 2013), assists research activities through four sub-programs. “Co-operation”, “Ideas”, “People”, and “Capacities” are the topics of these programs.

In the following, one large initiative that supports multinational projects shall also be showcased.

The EUREKA initiative is a research and development network that “supports the competitiveness of European companies through international collaboration, in creating links and networks of innovation”. It was established in 1985 and consists of 38 member countries. As of 2006, there are more than 700 projects being supported. The total budget for these projects is more than 1.7 billion €. More than 2760 organisations are involved; more than 1200 of these are SMEs. The goal of EUREKA is to provide member companies and project partners with fast access to knowledge, skills and expertise. In addition, it facilitates access to national public and private funding. The EUREKA label adds credibility to a project (Eureka 2007).

There are also several EU programs specifically aimed at improving logistic factors in the BSR, for example:

ADOPT This European Commission Project was primarily aimed at helping ship captains make better decisions by providing a Decision Support Tool. The main premise was the possibility to promote optimal decision-making possibilities by combining data from several scientific data sources into one powerful tool (Adopt 2007).

EFFORTS The acronym stands for Effective Operations in Ports. The project, however, also focuses on other issues affecting port operation such as navigational, environmental, and infrastructure challenges (Efforts 2007).

On the regional level, one important project related to logistics and ICT is the “Logistics Initiative Hamburg” (LIH). This project’s overall goal is to enhance Hamburg’s position as the leading centre for logistics in northern Europe. It is aimed at building a network of business, academic and research partners. The initiative is organised around a central cluster management, which has the goal of affecting the Hamburg logistics location by making sustained, ground-level improvements. In addition, it has the task of safeguarding labour potential for the logistics industry. In order to do this it targets national

and international logistics companies as well as companies from related industries. The LIH offers a wide range of support. It organises workshops, research groups and conventions. Companies are offered help in administrative and permit related matters. They can apply for comprehensive consulting services, including communication with authorities. In addition, the LIH carries out promotional campaigns to enhance the profile of the Hamburg location, nationally and abroad (HWF Hamburgische Gesellschaft für Wirtschaftsförderung mbH 2007).

2.5 Historical background and co-operation in the BSR

All of the regions involved in the project have their own long and extensive history which is certainly linked to that of the other regions. However, working out historical details would go beyond the scope of this report. Instead, relevant examples that reflect historical ties, namely the Hanseatic League, the European Amber Road and the Old Salt Road will be described in the following. Afterwards, examples of current co-operation in the BSR will be given.

The **Hanseatic League** was an organisation of merchants centred on Northern Germany, which consisted of around 200 towns in its heyday. These towns were located in an area that is nowadays spread over seven European countries from the Netherlands in the west to Estonia in the east, and from Sweden in the north to a line going from Cologne to Erfurt to Breslau to Krakow in the South. From their base, the Hanseatic traders economically influenced an area in the 16th century that covers 20 European countries today, extending from Portugal to Russia, and from Scandinavia to Italy. At times, the Hanseatic League was so powerful that it was able to impose economic blockades against kingdoms and principalities. From the 13th century to the mid-15th century, it dominated most of the international trade in Northern Europe.

Hanseatic trade was primarily focused on maritime trade. In particular, the merchants traded the following goods, furs and wax from Russia and Eastern Europe, corn (cereal crops) from Eastern Europe and Poland, fish from Scandinavia, salt from France and Lüneburg (in Germany – see the “Old Salt Road” in the following) as well as wine from the Rhineland and France.

Although the Hanseatic towns tried to establish a more permanent alliance organisation for support from the second half of the 14th century onwards, they were unable to stop ongoing developments in

the long run. The influence of the Hanseatic League gradually declined, despite the enormous growth in trade in the 16th and early 17th centuries, because the rise of national and territorial economies negatively affected cross-border trading communities like the Hanseatic merchants and their towns. Furthermore, goods as well as money transactions as offered by the Fuggers e.g., proved to be more profitable. Consequently, the last Hansa Convention of the historic Hanseatic League was held in Lübeck, Germany, in 1669. However, the “old” Hanseatic League was revived in Zwolle, The Netherlands, in 1980, to provide an active network for the towns that once belonged to the league (SUSAS 2007 and Die Hanse 2007).

The Amber Road is an example of ancient trading in the BSR. Amber is found in some places in the world; however its main sources are concentrated along the coasts of the Baltic Sea. The resource was used as a means of payment as well as barter object and was later also worked so that it could be used in hilts and in jewellery.

Figure 3 The European Amber Road. Source: Resch 2007

Amber has been traded along several routes and had its peak during the Roman Empire. The most significant route, **the European Amber Road**, is shown in Figure 3, linking the BSR with towns in Russia, Estonia, Latvia, Lithuania, Poland, The Czech Republic, Austria, The Slovak Republic, Hungary, Slovenia and finally Aqulieia on the Mediterranean in Italy (Verein – Die österreichische Bernsteinstraße 2007).

Similar to the European Amber Road, **the Old Salt Road** represents a long-established trade route. It is also known as the "Via Regia", or the King's Highway, and is about 130 km long, stretching from Lüneburg to Lübeck on the Baltic Sea. The Old Salt Road reached its greatest importance in Hanseatic Times, i.e. from the 12th century to the 16th century (German National Tourist Board 2007).

The "white gold" as salt was also called – was not only used as a condiment in these times, but perishable goods like fish and meat were preserved in salt in order to be transported over large distances. This was especially of great importance in the summer months. Nevertheless, there was always a high demand for salt in the BSR due to its extensive fisheries.

Figure 4 The Old Salt Road. Source: Die Radreisen-Datenbank 2002

In mediaeval times, salt was significant for Lüneburg and provided the basis for the town's wealth. The salt dome located under the town almost reached the surface area and was permanently washed by ground water (Sell 2007).

The wealth of not only Lüneburg but also of Lübeck and the towns of Lauenburg, Moelln and Ratzeburg on the route (see Figure 4), was founded on salt trading and transporting it, extracting it, buying and selling it or taxing the traders who travelled this route. The towns

boosted their income by passing laws which forbade traders and carriage-drivers bypassing them. Anyone disobeying these laws risked their goods being confiscated. That ensured not only the collection of taxes but also business for the inns, taverns and local traders. Nowadays, well-preserved and splendid half-timbered buildings and churches still give evidence of the towns' wealth experienced in former times (German National Tourist Board 2007).

The following examples show current co-operation in the BSR:

The **Hanseatic Parliament**, settled in Hamburg, is a modern association of small and medium-sized enterprises that promotes their sustainability, competitiveness, and market positioning in the BSR. It was founded in St. Petersburg in 2004 and has members of Chambers of Commerce and Industry, Chambers of Skilled Crafts and other institutions. The Hanseatic Parliament has several goals. One is to develop knowledge management capabilities and opportunities and then to leverage these in and through a network of cities and clusters. Other projects include joint marketing campaigns such as trade fairs. On a more international level, the association attempts to help formerly disadvantaged Eastern European countries. These states can benefit from and contribute to the economic advantages of the BSR. The Parliament's main objective is to create a macro-economic environment in the region that will be conducive to SME development, sustainability, and success (Hanse-Parlament 2007).

The **Baltic Co-operation Forum** has developed from the Hanseatic Parliament and is primarily focused on helping SMEs to integrate themselves into mutually beneficial relationships. Internet-based, the platform allows companies to create profiles and use search functions to find partners. But the platform also allows users to access SME relevant information regarding events, for instance trade fairs. In addition, information is displayed about significant developments in the region that are of interest to smaller companies. The Baltic Co-operation Forum is a free program that is partly funded by the EU and seeks to provide an easily accessible internet platform to facilitate the sharing and synergy of relevant knowledge and resources (Baltic Co-operation 2007).

The **Baltic Sea Chamber of Commerce Association (BCCA)** is an organization of altogether 50 Chambers of Commerce in Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden. It was established on June 4, 1992 in Rostock-Warnemünde, Germany, to give the business community of the region a common voice for common concerns. Hamburg's chamber of

commerce is also a member of the BCCA. The BCCA represents more than 450,000 companies which belong to all sectors of the northern and north-eastern European market. The threefold task of the BCCA is to protect and uphold the interests of private entrepreneurship by advising politicians about business related affairs, offering services to the business community and providing facilities for contacts, debates and meetings in the region (Baltic Sea Chambers of Commerce Association 2007).

The **Baltic Development Forum (BDF)** is an independent non-profit network organisation. Major cities, research and media institutes as well as members of large companies, institutional investors and business associations are registered members. The mission of the BDF is to "promote the BSR as an integrated prosperous and internationally competitive growth region" (Baltic Development Forum 2007).

The **Council of the Baltic Sea States (CBSS)** (Ostseerat) is a political forum for regional intergovernmental co-operation. The forum deals with issues concerning the BSR. Topics discussed include, the economy, civil society development, human rights as well as nuclear safety and environmental protection. From the German point of view Hamburg is also represented, but this was only done after consulting Mecklenburg-Western Pomerania and Schleswig-Holstein (Council of the Baltic Sea States 2007).

The **Baltic Sea Forum e.V. - Pro Baltica** is a non-profit organisation situated in Hamburg. It deals with promotion and assistance in the coalescence of the BSR and supports economic, political and cultural co-operation in the BSR (Baltic Sea Forum e.V. 2007).

The **Baltic Sea States Sub-regional Co-operation (BSSSC)** is a political network of decentralised authorities, located in the BSR (Baltic Sea States Sub regional co-operation 2007).

The **Union of the Baltic Cities (UBC)** was founded in 1991 in order to develop co-operation and exchange between its member cities. The goal of the UBC is to actively contribute to the democratic, social, economic and environmentally friendly development of the BSR. Currently, the UBC has 103 member cities in ten countries surrounding the Baltic Sea (Trzuskawska 2007 and Union of the Baltic Cities 2007).

Baltic 21 as an Agenda 21 for the BSR was adopted by the signatures of all the foreign ministers of the Baltic Sea States and aims at pursuing sustainable development by enlisting the co-operation of multiple stakeholders. Thus, Baltic 21 provides a regional network in order to realise the globally agreed Agenda 21 and World Summit on

Sustainable Development activities by focusing on the regional context of sustainable development. Members include the CBSS member states, the European Commission, international financial institutions such as the European Financial Investment Bank and non-governmental organisations such as the UBC (Baltic 21 2007 and Umweltbundesamt Berlin 2007).

VASAB 2010 is an intergovernmental multilateral co-operation between eleven countries of the BSR on spatial planning and development. It is guided by the conference of ministers responsible for spatial planning and development (Trzuskawska 2007).

Table 3 EU member states and their year of entry. Source: Europäische Kommission 2007a

Country	**Year of EU entry**
Germany	Founder member
Poland	2004
Lithuania	2004
Latvia	2004
Estonia	2004
Finland	1995
Sweden	1995
Denmark	1973

Apart from the above-mentioned initiatives, **town twinning**, **partnerships, university and cultural co-operation** links are also being created by participating in **EU programs and projects** such as LogOn Baltic (see chapter 2.4). Table 3 lists the EU member states and their year of entry.

3 ECONOMY

In the following part of the report, the economic importance of the single Baltic States will be described in chapter 3.1. In chapter 3.2., the trade relations of the participating regions within and outside the BSR are summarized. The most important export and import countries for the regions are listed.

The information is partly taken from the regional profiles written for the LogOn Baltic projects that have been available since November 2007. Therefore, not all regions have been considered in this chapter.

3.1 Economic importance and the key financial figures of the Baltic Sea Region

When comparing the different regions in the BSR, it can be seen that they have not been developing under the same conditions recently. Large differences in country size, in population density, the availability of natural resources and industries, as well as big discrepancies in the development of infrastructure are only some of the reasons for the differences in the economic structures. The history of an individual region and its previous and current political situation can be said to determine its current economic development and that of the near future.

Considering the Gross Domestic Product (GDP) of the Baltic States, it becomes clear why the BSR is regarded as one of the most dynamic regions in the European Union. On the one hand, Table 4 illustrates its GDP's rapid development, but on the other hand, the economic data indicate huge discrepancies between the countries. It can be seen that the average growth of GDP from 2004 to 2006 is the highest in Latvia (10.4), followed by Estonia (9.9), Lithuania (7.5), Russia (6.8) and Poland (5.0). Taking into account that the three first-mentioned states together possess only five percent of the Russian population, this development becomes even more admirable.

The slowest growing economies were Germany (1.6) and Denmark (2.9), followed by Sweden (3.7) and Finland (3.9). While it is evident that some countries still lag behind, it is also an indication that they

have great potential for further GDP growth. In 2007, Poland, for example, even expected a rise in GDP to 6.6%. (International Monetary Fund, World Economic Outlook Database 2007).

Table 4 GDP (constant prices) of the Baltic States 2004 to 2008. Source: International Monetary Fund (IMF), World Economic Outlook Database (2007)

Country	Units	Scale	2004	2005	2006	2007	2008
Denmark	National currency	Billions	1,342.167	1,383.239	1,431.943	1,458.650	1,480.199
Denmark	Annual percent change		2,1	3,1	3,5	1,9	1,5
Estonia	National currency	Billions	128.922	142.013	157.901	170.586	180.757
Estonia	Annual percent change		8,3	10,2	11,2	8,0	6,0
Finland	National currency	Billions	145.672	149.923	157.428	164.206	169.161
Finland	Annual percent change		3,7	2,9	5,0	4,3	3,0
Germany	National currency	Billions	2,104.692	2,120.747	2,181.873	2,235.094	2,279.180
Germany	Annual percent change		1,1	0,8	2,9	2,4	2,0
Latvia	National currency	Billions	6.367	7.041	7.881	8.708	9.244
Latvia	Annual percent change		8,7	10,6	11,9	10,5	6,2
Lithuania	National currency	Billions	61.656	66.315	71.293	76.996	82.001
Lithuania	Annual percent change		7,3	7,6	7,5	8,0	6,5
Poland	National currency	Billions	836.192	866.438	919.551	980.238	1,032.096
Poland	Annual percent change		5,3	3,6	6,1	6,6	5,3
Russia	National currency	Billions	20,319.643	21,620.100	23,068.647	24,683.452	26,287.876
Russia	Annual percent change		7,2	6,4	6,7	7,0	6,5
Sweden	National currency	Billions	2,420.347	2,490.615	2,594.878	2,688.294	2,763.566
Sweden	Annual percent change		4,1	2,9	4,2	3,6	2,8

The development of GDP is closely linked with the different types of industrial sectors that dominant the different parts of the BSR. The individual regions can be clustered into separate core industries. While Finland, Sweden and Lithuania are strong in natural products e.g. from forestry, Germany and Poland belong to the strong metal industry countries. However, Russia dominates when it comes to reserves of natural resources of oil and gas.

The following will give an overview about the most important industries in the participating regions, based on the reports of the individual regional profiles that are part of the LogOn Baltic publication series. The descriptions will start with the Hamburg region and will continue anti-clockwise to the northern regions.

The economy of the **Hamburg** region is dominated by the service sector. More than three quarters of the work force is employed in services, especially in the media industry, telecommunications, software providers and consulting firms. Around 100,000 companies and businessmen are currently registered with the Hamburg Chamber of Commerce. About 300,000 people from outlying districts commute to Hamburg each working day. More than 70 of Germany's top 500 companies are from Hamburg. The economy is hence characterised by

internationally renowned company names such as Airbus, Beiersdorf, Hapag-Lloyd, Olympus, OTTO, Panasonic, Tchibo and others. Despite the dominance of services, Hamburg is also a leading location for highly-specialised industries. The city ranks third after Seattle and Toulouse as the most important location for the civil aerospace industry worldwide. The maritime industry embraces shipbuilding, the steel industry and metal construction amongst others. Furthermore, several well-known bio-technology and medical technology research institutes and companies operate from Hamburg.

Eventually, the IT and media sector as well as some music companies and internet businesses will provide numerous jobs for Hamburg. Banking and insurance are another important factor in Hamburg's economy (Kersten et al. 2007h, pp. 30-31).

In contrast to Hamburg, where a high number of large companies are located, the economic structure of **Mecklenburg-Vorpommern** is characterised by a high number of small and medium-sized companies. The settled companies tend to operate more in traditional branches, i.e. the food industry, machinery manufacturing, telecommunications, but also modern shipyards and their suppliers, port-related, maritime industry, agriculture and the fishing industry. Although the service sector has grown significantly in importance in Mecklenburg-Vorpommern, it still has not obtained the acceptance it has in the Hamburg region. The boom in tourism in the eastern part of Germany in connection with the renewed importance of the port economy has meant that trade, hotels and catering as well as transport have contributed to a bigger gross wealth creation. Finance, leasing and letting, as well as business services, which mainly depend on the region's structurally weak industrial sector, are less developed. During recent years, numerous new branches of economic activity have developed, such as bio-technology. However, among these future branches the health industry, the timber industry and information technology can also be found (Kron et al. 2007b, pp. 6-8).

Due to its geographical closeness to the Baltic Sea, the region of **Pomerania** is mainly characterised by traditional sea, river and harbour industries, such as shipbuilding, fisheries and seaports, but also has refining and the paper industry. The strongest industries, including shipbuilding, refining and paper, are represented by one single, large company. In Pomerania, there is high economic activity, however, most businesses are located in and around the region's main cities, such as Gdańsk, Gdynia and Sopot. That is also a reason why economic growth rates differ largely within the region. More than 100 companies

per 10,000 inhabitants are registered in Pomerania. As in Mecklenburg-Vorpommern, the majority of companies belong to small and medium-sized enterprises. The service sector is also well-developed, especially in tourism, finance and insurance. Alongside the above-mentioned traditional industries, the high-tech industry with its fast growing ICT and IT sectors is well-represented in Pomerania. Its rapid and positive development has been additionally furthered by the establishment of universities and regional research centres. Also, the pharmaceutical and cosmetics industries have to be mentioned, since they are booming and deliver an added value for the region (Trzuskawska 2007, pp. 21-26).

In **Lithuania**, retail and wholesale trade are clearly the dominant types of economic activities with their total number of economic entities amounting to 15.3%. Retail trade tops the list of economic activities with a share of 8.8% and is followed by wholesale trade. Transport, storage and communication as a group are in third place. SMEs accounted for 99.4% of the total number of enterprises in Lithuania. These enterprises employed 69.7% of the total number of employed people and 68.2% of the gross value added was created by these enterprises. The structure of the operating SMEs according to various types of economic activity at the end of the period from 2001 to 2004 was also dominated by trading companies (Adomaviciute et al. 2006).

The structure of the **Latvian** economy has been dominated by the service sector in recent years. The share of the service sector in value added terms has increased from 71.8% in 2000 to 73.8% in 2005. Construction, trade services, transport and communications have grown faster than other sectors of the economy in value added terms and in the number of employees. The reasons behind the rapid economic growth of recent years are; increased domestic demand and more export opportunities. The increase in domestic demand has also had a direct impact on the rapid growth of several service sectors, while the increased volumes of industrial production have mainly been based on rising exports. During recent years, increasing wholesale and retail trade has contributed to almost one-third of that growth. The contribution of manufacturing currently lags behind the contribution of the transport and communications sector. That discrepancy has probably occurred because the majority of the total demand in the transport and communications sector has been determined by stable domestic demand, which has increased faster than external demand in recent years (Telematics and Logistics Institute Ltd. 2007, pp. 21-26).

The **Estonian** economy is mainly dominated by the forest industry, the oil industry and the service sector. Due to plenty of available natural resources, the Estonian economy largely relies on the branches related to forestry. The Estonian energy sector also benefits by having oil shale, which is a resource that is quite rare elsewhere in the world. In recent years, real estate and the renting of property have generated the largest share of the GDP, indicating (together with construction) the increasing importance of inner consumption in Estonian GDP generation. The manufacturing sector (18% of GDP) is also strongly represented in the Estonian economy, followed by wholesale and retail trade (15% of GDP). The transport, storage and communication sector has become less important in recent years and has a share of about 18% of the GDP (Kiisler 2007, pp. 32-37).

In **Southwest Finland**, more than 60% of the population works in services. Approximately, a further 29% is employed in industry and construction. Southwest Finland forms one of the most important economic zones and concentrations of industrial activity in the whole of Finland. Manufacturing is grounded most of all in the shipbuilding, electronics and metalworking industries, but other key branches are well-represented too, such as the manufacturing of transport equipment, chemicals etc. Southwest Finland is also one of Finland's key agricultural and industrial production areas, with a multifaceted industrial base. Lumber and papermaking are less important because they have a lower share of the industrial base. Very strong growth can also be seen in high-tech industries. As in Pomerania, the regional economic structure differs in each sub-region. The Turku region e.g. is specialised in research, industry and services, while the Salo sub-region has grown to become the centre for Finland's electronics manufacturing industry (Malmsten 2007, pp. 24-30).

The industry in **Östergötland** (Sweden) is dominated by the manufacturing industry. As in Mecklenburg-Vorpommern, the region has a strong tradition in farming and has a higher number of employees in that sector than Sweden has on average. Furthermore. in the central and western parts of Östergötland many companies related to the food industry are found. Furthermore, the region has a high level of research and development. One example that has boosted the economy of Östergötland is the so called Mjärdevi Science Park. This Park consists of about 220 companies and has more than 5000 employees. They have world-class competence in telecommunications, software and systems development, electronics, media technology,

and automotive safety (Aronsson et al. 2007, pp. 24-30). Accordingly, the logistics industry has become well developed in Östergötland.

In **Denmark**, the majority of employees work in the service sector. The importation of raw materials and foreign goods characterises its industrialised market economy. Importantly, the production of oil, natural gas as well as wind and bio-energy has made the energy sector very comfortable.

The description of the individual Baltic Sea Regions shows that there is a shift in the dominant types of industries depending on a region's geographical location. Hamburg, as well as Pomerania and Latvia, but also Estonia, Finland and Denmark are dominated by the service sector. Hamburg's economy is characterised by both large, small and medium-sized companies. In contrast, the majority of Polish; Latvian and Finnish companies are SMEs. Hamburg with its huge port is strong in the maritime industry but also in IT and the media. However, in Mecklenburg-Vorpommern the service sector is still underdeveloped. Due to the large amount of areas being used for agriculture and their closeness to the Baltic Sea, the food industry and maritime industry are better developed in this region.

Pomerania, Estonia and Östergötland are also strong in the forestry (paper) and agricultural industries while the IT branch stretches across Hamburg and Pomerania up to Finland.

3.2 The Baltic Sea Region's internal and external trade

The BSR is of special interest regarding business relations for companies in the **Hamburg** region. About one tenth of Hamburg's entire foreign trade can be traced back to the BSR. Many companies use Hamburg as a hub for exports to Western markets. However, the city is also a purchasing centre for various products, such as pharmaceuticals, medical equipment, spare parts and infrastructure components. The largest trade partners in terms of the value of the import goods are France (10.6 billion € in 2006), the United States of America (4.7 billion €) and the Peoples' Republic of China (4.6 billion €). For export goods, the most important trading nations are France, the Peoples' Republic of China and the United Kingdom (each about 2.2 billion €). The total trade volume in 2006 was 56.1 billion € for import goods and 28.1 billion € for export goods (Statistikamt Nord 2007c). In 2006, the value of foreign trade between Hamburg and the countries in the BSR (without Norway) amounted to nearly 7 billion €.

The main trading partners for Hamburg in the BSR are Russia, Poland, Sweden and Denmark (Kersten et al. 2007h, pp. 32-33).

During recent years, international trade has become more significant for **Mecklenburg-Vorpommern**. The value of its export goods more than doubled in the period from 1995 to 2005. The export volume in 2005 amounted to about 2.8 billion euros. While in 2005 the export rate of the manufacturing industry amounted to only 20 percent. In addition, branches like mechanical engineering, electrical engineering and electronics, communications engineering, medicine, measuring, and control technology registered considerable foreign trade increases (around 40%). Fertilizers, plastic goods, engines, engine parts and vehicle accessories were among the dominant export goods in 2005. The volume of imported goods grew less than the volume of exported goods in the past decade, amounting to 2.6 billion euros in 2005. Petroleum products, wood products and furniture parts were among the most imported goods. Russia, Denmark and the Netherlands were the main suppliers of these goods (Kron et al. 2007b, p. 9).

The **Pomeranian** Region belongs to the Polish regions that have strong exports and their exports are steadily increasing. The most important export markets for Pomeranian exporters are not only traditional trade partners like Germany (28.2%), France (6.2%), Italy (6.1%), the United Kingdom (5.6%) or the Czech Republic (4.6%), but also Russia, whose significance is growing. The main export products of this region are: ships, electronic products, petroleum, synthetic and paper products, as well as food and timber products. Its imports are increasing year upon year (e.g. the difference between 2003 and 2005 was 17.8%) and its value was 7.5 billion PLN (2 billion €). The main types of import (about 67%) consisted of raw materials, as well as of materials and components for production. Sub-assemblies and assemblies for further manufacturing operations are the second biggest group with regard to import value (approximately 27%) (Trzuskawska 2007, pp. 26-27).

The main trading partners for **Lithuania** are Russia, Germany, Latvia, Switzerland, the United Kingdom, and Poland. A recent tendency has been the decline of trade with eastern countries and a growth in trade with the western European countries. Germany is ranked as the third main export country with a 9.9% share of all exports. According to the data on imports, Germany ranks second and accounts for 16% of all imports. Major traded commodities (imported as well as exported) include mineral products, textile and textile articles, machinery and other equipment, vehicles and related transport

equipment. The share of SME's exports and imports relative to the total amount of foreign trade of the country is of growing importance. However, being considerably smaller, the comparative share of SME exports compared to imports indicates that SMEs are not yet capable of competing with large enterprises with regard to export possibilities (Adomaviciute et al. 2006).

The European Union is the main trading partner of **Latvia**. Most of its foreign trade turnover, in 2005, consisted of trade with Lithuania (12.7% of the total amount), Germany (12.6%), Estonia (9%), Russia (8.3%), Sweden (6.1%) and Poland (5.9%). After accession to the EU, Latvia's trade volume and relations with Lithuania and Estonia as well as with other new EU member states strengthened rapidly. In the last two years, Latvian trade has increased to be more than twice what it was in the period before accession to the EU. The exported commodities, which had increased considerably in the previous year, were metal-working products, which accounted for almost 30% of the total growth of exports, and mineral products. Only the export of wood products slightly decreased (Telematics and Logistics Institute Ltd. 2007, pp. 35-45).

After **Estonia's** entry to the EU in 2004, its foreign trade has been characterised by a rapid rate of development. The increase in goods imports has been faster than that of exports resulting in a rising negative balance. Only timber and timber products, furniture and other industrial goods show a surplus. This reflects Estonia's rapid economic expansion, an increase in investments and especially private consumption. The main driving force behind this export growth in 2006 was the (re)export of mineral products, which was 2.6 times higher than in the previous year. In 2006, 91% of exports comprised motor fuel (80% was imported for processing from Russia and Belarus and then re-exported to the USA and the UK. Its main timber and paper export articles are wooden sleepers, construction components, firewood, wooden furniture and prefabricated wooden buildings (Kiisler, 2007, pp. 38-49).

The countries of the EU as a whole are the most important trade partners for **Finland**. More than 59% of all imports arrive from the EU region and about 57% are directed to EU countries. Nevertheless, Russia (5.7 billion €) was the most important export country for Finland in 2005, followed by Sweden (5.6 billion €), Germany (5.5 billion €) and the United Kingdom (3.5 billion €). In forthcoming years it is expected that Russia will assume the position of Finland's most active trade partner as its significance to the Finnish economy is increasing.

However, Germany (7.0 billion €) ahead of Russia (6.5 billion €), Sweden (4.9 billion €) and China (2.8 billion €) was the most important country for imports (Malmsten 2007, pp. 30-34).

One of the main barriers to the **Östergötland** region becoming an important international actor is the region's small size compared to the other Baltic Sea Regions. Therefore, the possibilities for developing competitiveness are limited as the local market is too small compared to other regions. But the region has a well-developed infrastructure and connections with other regions within Sweden and the BSR. It has a good position in the context of importing material and components for further refining and end products. The region's international competitiveness is reflected by the high percentage of foreign and semi-foreign owned companies located there. All larger companies and smaller companies in the region have a high proportion, often the majority, of their business, on the international market. Heavier export industries include the paper industries, telecommunications, medicine and biotechnology and defence related industries. Several international research and development projects within the areas of polymer electronics, silicon carbide manufacturing, digital image treatments and unmanned space rockets etc. are underway in the region (Aronsson et al. 2007, pp. 21-22).

This short summary of import and export trade in selected Baltic Sea Regions shows that the BSR itself is an important market for the countries that are located geographically close to it. The significance of exports and imports varies from country to country. However, the market is not only lucrative for countries neighbouring the BSR, for smaller and medium-sized regions, like Estonia, Latvia and Lithuania the BSR represents the most important market. Primarily, the BSR strengthens intraregional trade, because trade with partners who are close to the region does not have as many obstacles and differing conditions as does trade with more distant countries. Therefore, it is important to focus on and strengthen the possibilities that exist within regional trade.

3.3 The BSR's Logistics and ICT knowledge base

In today's dynamic business environment, requirements for employees are changing and increasing. Employees face several new tasks and are taking on more responsibility in day-to-day business. This is true for blue collar employees but even more so for white collar employees and

managers. Most employees in the logistics sector have a practical background and several years of work experience. The constant addition of new requirements in the logistics sector, however, makes it necessary to maintain, adjust and broaden one's professional skills and one's knowledge with continuous education. The keywords for Hamburg are higher-level education and advanced training.

According to recent studies, many companies still lack sufficiently qualified employees, although there are a relatively high number of courses regarding logistics education, especially in Hamburg (Kersten et al. 2007i, p. 31 and Trzuskawska 2007, p. 64).

In the **Baltic States**, the business environment has significantly changed since EU membership. There is a new market for logistics service providers, and companies continue to have new opportunities to enhance their logistics operations. Consequently, there is a demand for logistics education and training. However, the providers have to recognise the companies' needs. Furthermore, peoples' awareness has to be raised as jobs in the logistics sector, especially in the transport area, require training and research (Telematics and Logistics Institute Ltd. 2007, p. 121).

Logistics comprises expertise in many fields, not only the control and integration of transport, but also logistics services, the networking and use of education and research and the management of the whole logistics process. Furthermore, the development of control and product systems, telematics and positioning technologies, the impact of e-commerce on distribution systems, compatible transport systems, traffic efficiency as well as increasing environmental and safety requirements are of interest for logisticians (Malmsten 2007, pp. 77-78).

Regarding **the field of ICT**, the fast changing business environment has also meant new requirements for companies and their customers. New markets, increased competition, cost efficiency, customer orientation and continuous renewal are all well-known keywords. While business and soft skills are essential nowadays, technical skills can even provide the basis for competitiveness (Malmsten 2007, p. 77).

There is much education at university level as well as at basic educational levels, i.e. apprenticeships and training on the job. They are all important for the development of a region and hence for the competitiveness of a region (Aronsson et al. 2007, p.5).

In the following, jobs that require training in the field of logistics and ICT are illustrated by the example of Hamburg. There is a wide range of education opportunities in these two fields. More than 20

apprenticeship programs are offered in the logistics area only. The jobs are grouped into different categories: harbour and navigation, storage and delivery, air traffic, road and rail, as well as ICT. There are, of course, also several general apprenticeship programmes that enable apprentices to work in different industries, including the logistics and ICT industry, one example being the Office Management Assistant (Kaufmann für Bürokommunikation). Furthermore, there are several jobs in logistics that do not require a formal apprenticeship, but training on the job. These are not listed here.

a) Logistics

Apprenticeships within various logistics field are listed below:

Harbour and navigation

INLAND BOATMAN (Binnenschiffer)
Inland boatmen play an important role in the transportation of goods and the conveyance of people on European waterways and lakes. They work on watercrafts such as dry ships, tankers, ferries, cabin ships, cruisers, etc. They are part of a crew and work in all areas of a ship to guarantee its secure and smooth progress. For instance, they participate in ship control (support docking manoeuvres), implement servicing and maintenance, control shipments and unload ships.

HARBOUR BOATMAN (Hafenschiffer)
Harbour boatmen support a ship's captain in the areas of goods and passenger transportation, cargo handling. In detail, their job includes the handling and supervision of tug boat equipment, the supervision of tug operations, the appropriate handling and maintenance of the drive line as well as all equipment and devices on board.

TRAINED ASSISTANT FOR HARBOUR LOGISTICS (Fachkraft für Hafenlogistik)
Trained assistants for harbour logistics work in terminals and deal with cargo handling and warehousing with regard to bulk and general cargo at sea and in inland harbours. Their responsibilities include, e.g. the acceptance of export and import goods and the control of accompanying documents, the quantity of goods, quality, etc.

SHIPPING AGENT (Schifffahrtskaufmann)
Shipping agents organise the transportation of all kinds of goods by sea. They work in line trade, tramp navigation or shipping agency companies. These merchants are in contact with customers, suppliers and ships' crews all over the world and communicate with service providers in the maritime traffic and harbour economy.

MARITIME GOODS CONTROLLER (Seegüterkontrolleur)
Maritime goods controllers are responsible for the fast and smooth movement of incoming and outgoing goods in a harbour. Their tasks include weighing, sampling and marking goods, etc. The controllers repair defective packages, write reports and prepare goods for shipping and customs clearance.

Storage and delivery

TRAINED ASSISTANT FOR COURIER, EXPRESS AND POST SERVICES (Fachkraft für Kurier-, Express- und Postdienstleistungen)
These service employees work in companies that plan, organise, supervise and conduct the transport of small-sized and time-critical consignments as well as other logistical services. They mainly work in functions such as order acceptance, cargo handling and delivery.

MANAGEMENT ASSISTANT FOR COURIER, EXPRESS AND POST SERVICES (Kaufmann für Kurier-, Express- und Postdienstleistungen)
These service employees work in companies that plan, organise, supervise and conduct the transport of small-sized and time-critical consignments as well as other logistical services. They mainly work in the fields of managing and controlling goods and services, order processing and sales as well as human resources.

TRAINED ASSISTANT FOR WAREHOUSE LOGISTICS (Fachkraft für Lagerlogistik)
Trained assistants for warehouse logistics work in industrial and trading firms as well as in forwarding agencies. They also work for other logistics service providers. Their tasks include all operations in warehouse logistics.

PROFESSIONAL WAREHOUSEMAN (Fachlagerist)
Professional warehousemen work for industrial and trading firms, as well as for forwarding agencies and other logistics service providers. Their responsibilities lie in the fields of cargo handling and storage.

Air traffic

MANAGEMENT ASSISTANT FOR AIR TRANSPORT SERVICES (Servicekaufmann im Luftverkehr)
Air transport service management assistants work in air transport companies, mostly in areas that are close to the customer such as air traffic, airport and handling companies and are thus important representatives of their companies. They can work in all operating functions and consult and care for passengers both on the ground and in the air.

Road and rail

FREIGHT FORWARDING MANAGEMENT ASSISTANT (Kaufleute für Spedition und Logistikdienstleistung)
Freight forwarding management assistants work in the area of national as well as international transport, usually in companies which organise, manage, control and handle transport and other logistics services. They mainly have responsibilities in the fields of service provision, order processing and sales. They often work independently on the basis of the instructions of their company and relevant laws and regulations. In addition, they coordinate logistics with their business partners. They are deployed not only in the area of roads and railways, but also in any kind of company that deals with logistics.

PROFESSIONAL DRIVER (Berufskraftfahrer)
Professional drivers accomplish their tasks independently on the basis of technical documents and orders. They plan and coordinate their tasks individually or together with clients and members of the supply chain. Furthermore, they take measures to improve quality, security and health protection as well as environmental protection. In addition, they document their activities and draw up accounts.

RAILWAYMAN (Eisenbahner im Betriebsdienst)
Railwaymen either work for railway companies (passenger and/or cargo transportation) or for infrastructure companies. As locomotive

drivers or movement inspectors, they are responsible for the smooth and safe transportation of goods.

TRAFFIC SERVICE MANAGEMENT ASSISTANTS (Kaufmann für Verkehrsservice)
There are two fields of specialisation for traffic service management assistants. One has a focus on sales and services in local service and sales agencies (e.g. service points and travel centres) or they attend to travellers during their travel (e.g. as a train guard). Management assistants with a focus on security and safety and service mainly work at traffic facilities (e.g. train stations) and on means of transportation.

SERVICE DRIVER (Service Fahrer)
Service drivers work in companies which offer services to customers such as the maintenance of devices, the restocking of inventory, the replacement of products and goods. They also have tasks in collecting and delivering to various industries such as hygiene, catering, technology, etc as well as courier, express and post services (Handelskammer Hamburg 2007a).

b) ICT

The following section describes studies available in the ICT field. As shown by the number of selected descriptions, the different kinds of professions are more limited than in the logistics sector.

IT SPECIALIST (Fachinformatiker)
IT specialists are trained in the field of application development or system integration. They implement subject-specific requirements in hardware and software systems. Their responsibilities also include: analysis, planning, the realisation of technical information and telecommunication systems, the implementation of new and modified systems of information and telecommunication techniques, and user support and training.

MANAGEMENT ASSISTANT FOR INFORMATICS (Informatikkaufmann)
Management assistants for informatics work in commercial functions in their industry, for example in the manufacturing industry, trading industry, in banks, insurance or hospitals. Their responsibilities include the planning, adjustment and implementation of information and

telecommunication systems, the training and support of employees regarding the use of ICT systems to fulfil their specific tasks and system administration. Thus, they are intermediaries between the requirements set by the operating departments and by the implementation of ICT systems.

INFORMATION ELECTRONIC TECHNICIAN (IT-System-Elektroniker)
This new occupational image replaces radio and television engineering as well as office information electronics. The functions include the setup of radio and television components and software, equipment and cross linked systems for information and communication techniques, the support of these systems and components, the adjustment of hardware and software to the specific requirements of companies, training and support for the system user, maintenance, control and the supervision of technical equipment.

IT SYSTEMS MANAGEMENT ASSISTANTS (IT-Systemkaufmann)
IT systems management assistants mainly work in companies that develop and offer information and communication systems. Their task is to provide information and communication solutions for customers. They are responsible for projects regarding the implementation and the upgrading of an information and communication infrastructure with respect to commercial, technical and organisational aspects. They mainly work in the areas of sales or consulting and their responsibilities include acting as a contact person for customers and providing services to them, monitoring the market for ICT systems and performing marketing activities (Handelskammer Hamburg 2007b and Kersten et al. 2007h).

Higher education is mostly available in the centres of the regions (Trzuskawska 2007, p. 64). The relevant **universities** in the partner regions and a selection of their relevant **study programs** are specified in the following.

There are four major universities in the Region of **Hamburg**, three in Hamburg and one in Lüneburg. Two universities of art, one university of applied sciences for full-time students, several smaller universities, schools, academies and institutions for co-operative education are also located in Hamburg. All of these institutions offer a wide range of different programs. While the universities are public, other institutions can be either public, private or public-private partnerships such as the Kühne School of Logistics and Management. An overview of these

institutions in the field of logistics can be found on the education web portal of the Logistics Initiative Hamburg and the Chamber of Commerce Hamburg (Handelskammer Hamburg 2007c).

There are specialised study programs for logistics and ICT as well as more general programs, e.g. in the business or engineering field, which enable students to choose logistics or ICT as an elective subject. The following specialised logistics programmes are offered in the Hamburg region: logistics management at HSBA Hamburg School of Business Administration, an MBA in Logistics (full-time and part-time) at Kühne School of Logistics and Management and international business and logistics, as well as logistics in technical business studies at Hamburg University of Applied Sciences (HAW). A large number of different ICT programs are provided by Hamburg University of Technology, HAW Hamburg University of Applied Sciences, University of Hamburg, Leuphana University Lüneburg and FOM Study Centre University of Applied Sciences Econometrics and Management (Kersten et al. 2007h, pp.83-86).

In **Mecklenburg-Vorpommern**, there are universities in Greifswald and Rostock and universities of applied sciences are located in Wismar, Stralsund and Neubrandenburg (Kron et al. 2007b, p.53).

There are three large, public universities situated in **Pomerania**: University of Gdánsk, Gdánsk University of Technology and Gdynia Maritime University. Apart from them, there are other higher education institutions e.g. economic universities and colleges in the region (Trzuskawska 2007, pp.65-66).

In **Latvia**, the Transport and Telecommunication Institute offers study programmes, amongst others, directly related to logistics, namely transport and business logistics as well as telematics and logistics. Riga Technical University, Banking College of Higher Education, Rezekne Higher School, Ventspils College and Riga International School of Economics and Business Administration are providers of economics and management and information technology programmes. Further education is also provided by the Telematics and Logistics Institute, Komin, Logistikas Partneri as well as by the Transport and Logistics Training and Consulting Centre (Telematics and Logistics Institute Ltd. 2007, pp.122-124).

In **Estonia**, the main providers of logistics education are Tallinn University of Technology (as an academic education provider) and Tallinn College of Engineering (as a professional higher education provider). They offer study programmes in logistics and in transport and logistics. Other institutions provide courses in (business)

management with a specialisation in logistics, military management with a specialisation in logistics or port management and the managing of marine transport. Tallinn University of Technology and the University of Tartu as public universities and the Estonian Information Technology College as a private institution are providers of academic higher education and professional higher education in the fields of ICT. Professional higher education is also offered by other private institutions of higher education, the largest ones being the College of Computer Science and Mainor Business School (Kiisler 2007, pp. 126-128).

In **Southwest Finland**, teaching in logistics is part of the programme of Turku School of Economics as well as of Turku Polytechnic. In addition, The Polytechnic of Southwest Finland has a school for sea captains and maritime law can be studied at Åbo Akademi. Turku School of Economics also offers courses in maritime economics and the Centre for Maritime Studies has a wide range of services and educational programmes. The Turku Centre for Computer Science coordinates four IT master's programmes (Malmsten 2007, p. 80-81).

In **Östergötland**, Linköping University offers study programs in communication and transport systems, industrial management, business administration and technical logistics (Aronsson et al. 2007, pp.51-52).

Apart from providing study programs, it is very important that the universities and other educational institutions co-operate with companies in order to respond to the fast developing competence needs of the future. Skills and competence can not only be transmitted but can also be developed through joint projects (Malmsten 2007, p. 77). Moreover, not only is the co-operation of educational institutions with companies necessary but also co-operation with universities and educational institutions in different regions and countries is needed. The exchange of scientists or students as well as the carrying out of projects together (like LogOn Baltic) has lead to deeper knowledge of foreign languages and cultures, i.e. cross-cultural competence, and greater technical skills for the individual. Through such kinds of co-operation regions can learn from each other and therefore support the BSR's regional development.

4 LOGISTICS IN THE REGION

In the following, the structure of the logistics industry and the importance of the logistics sector in the BSR is described (section 4.1). In section 4.2, the transport infrastructure and connections between the countries in the BSR are highlighted. The chapter concludes by looking at likely future trends for logistics in the BSR.

4.1 Logistics industry characteristics

In this chapter, the logistics sector in the BSR is introduced. The BSR is a heterogeneous group of countries and regions, not only with respect to geographical, economic, and educational aspects, but also regarding the development and status quo of logistics. While some developments can be seen in nearly every country, such as a drop in the freight volumes transported by railway, the specific characteristics and history of each region have lead to differences concerning their transport infrastructure and transport modes.

Until recently, mainly national or even regional thinking has dominated the transport policy. Today the challenge is to integrate a European element into the planning system. The new EU countries and Russia are becoming part of the European transport network; trade volumes within the BSR have increased and so has the demand for logistics services.

In recent years, the importance of the logistics industry for the economy in Europe in general and more specifically in the BSR has grown with the increased intra and inter-European transport volumes. However, it is still difficult to measure logistics statistics or analyse logistics information. There are several reasons for this (Klaus/Kille 2006, p. 16-17): Firstly, there is a lack of consistent, systematically gathered data; the logistics industry is dominated by small and medium-sized enterprises which are not subject to publication requirements; a large amount of logistics services are recorded as in-house logistics services that are not published in annual reports; and finally, there is a variety of definitions for logistics and the logistics industry. For the BSR, an additional difficulty is that statistics and

analytical tools for economics and transport in some Eastern and Middle European countries are less developed than for example in Germany or Scandinavia (BMT Transport Solutions GmbH 2006).

One approach to measuring the importance of logistics according to the EU is to study figures for value added products and services and study employment rates. With reference to value added for the year 2004, in the majority of the BSR countries, the transport sector was more important than in the EU-25 on average, while Sweden, Germany and Poland were below the average[1] (European Communities 2007c, p.52). The average of the value added weight for transportation services was about 7.5 percent. Lithuania was the country with the highest weight of transportation in the EU-25, i.e. its transport services generated nearly 11.5% of the value added of the non-financial business economy. Latvia, Denmark and Estonia followed behind with about 10.5 to 11 percent. In Finland, which is also still above the EU-25 average, transport services account for about 8% of the value added. In the remaining countries, transportation services have a weight of only about 7% in Sweden, slightly more than 6% in Germany and slightly less than 6% in Poland.

With respect to employment in the transport sector, it can be said that its value added weight was lower than the value added weight in Lithuania, Denmark, Estonia, and Germany, pointing to relatively high labour productivity in these countries. Latvia was the country with the highest weight for transport services (11%).

When looking at the industry structure in the EU-25 the largest share of people working in the transport sector were employed in the field of road freight (32%), followed by cargo handling and storage (23%), other road and land transport (21%), and railway transport (11%) (European Communities 2007c, p. 57).

Of the European top 10 companies ranked by turnover in 2006, four companies are located in countries bordering the Baltic Sea:

[1] Value added of transport services (NACE 60-63) as percentage of total value added of the non-financial business economy (NACE C-K excl. J). For Russia, no comparative data were available as only EU countries were considered.

Table 5 Top 10 logistics companies in Europe ranked by turnover in 2006. Source: Klaus/Kille 2007, p.199

Company	Turnover in 2006 (mio. €)
1. Deutsche Post (Germany)	**39,934**
2. Maersk (Denmark)	**18,529**
3. Deutsche Bahn (Germany)	**17,034**
4. Kühne + Nagel (Switzerland)	11,551
5. MSC (Switzerland)	8,500
…	…
8. Hapag-Lloyd (Germany)	**6,064**

4.2 Transport, connections and infrastructure

Transport connections have been recognised by the EU as one of the most important factors for economic growth. In order to achieve more efficient and sustainable transport networks, a number of measures have been placed on the political agenda, such as regulated competition, linking up the modes of transport, and eliminating bottlenecks (European Communities 2001). For this purpose, the Trans-European Network – Transport (TEN-T) has defined 30 priority axes and projects for development in the next years, including all transport modes except pipelines. At least six of these strongly affect the BSR: The Nordic Triangle road and rail axis, the Fehmarn belt railway axis, the sea routes, the railway axis Gdansk to Warsaw to Brno to Bratislava to Vienna, the motorway axis Gdansk to Brno to Bratislava to Vienna, and the “Rail Baltica” axis Warsaw to Kaunas to Riga to Tallinn to Helsinki (European Communities 2007c, p. 25).

The status quo of the infrastructure in the regions is quite different, quantitatively as well as qualitatively. One large difference can be seen in the importance of different modes of transports, as shown in the modal split. While in Germany, road transport accounts for about 70% of the transport volume in tonnes per kilometre, in Lithuania this percentage is only slightly more than 50%. In Russia, the importance of road transport is not even 10%; here, the railway system is of great relevance. However, the importance of road transport is constantly increasing in the whole of the BSR.

In the following, the specific logistics characteristics of the regions involved in the project are introduced. The information is partly taken

from the regional profiles written for the LogOn Baltic projects and thus reflects the perspectives of the respective regions to a large extent.

Germany

Germany has Europe's largest national logistics market. Besides the size of the country and its economy in general, the reasons for this lie in the geographical position of Germany in the middle of Europe and the structure of the country's economy, which is still based on industry and trade. The logistics market volume is 7.5% of the GDP and thus higher than the EU average. In the top 10 of the logistics service providers one mainly finds international German-based companies can. The list is led by Deutsche Bahn and its subsidiaries Railion and Schenker, Deutsche Post with the logistics subsidiary DHL, Kühne + Nagel, and Dachser (Klaus/Kille 2007, pp. 156-157).

Hamburg (Germany)

The region of Hamburg is superbly connected to the motorway network via the A1 and the A7, which run directly through the city. The A7 is the longest German motorway and runs on a north-south axis through the whole of Germany. The A1 runs from the Southwest to the Northeast through Hamburg. In addition, two smaller motorways connect Hamburg to other parts of Germany. The A24 connects Hamburg to the capital city, Berlin. In addition, Hamburg offers five smaller interstates, which run in and around Hamburg. In addition to motorways, a large part of the traffic runs along federal highways. In order to handle the increasing traffic and to avoid bottlenecks, however, an expansion of the road infrastructure in and around Hamburg is crucial to the further development of the logistics sector. Further development examples include a connecting motorway from the A1 to the A7 through the harbour, or the use of more modern traffic management systems.

Hamburg has four large long-distance railway stations used for passenger transportation. Additionally, the region offers four goods stations. The biggest marshalling yard in Europe is situated in the region of Hamburg-Harburg. The "Hamburger Hafenbahn", a harbour railway, is also of special importance. The railway service is maintained by the port of Hamburg connecting the whole port area with the German and European railway network. Approximately, 30% of the total goods at the harbour and 70% of the containers are handled by the Hafenbahn (Hamburg Port Authority 2007).

Hamburg has one major airport which lies about 8.5 kilometres north-west of the city centre. Hamburg airport is mainly used for passenger travel. It is the fourth largest passenger airport in Germany with a capacity of 16 million passengers per year. In 2006 nearly 12 million passengers were served on about 170,000 flights (Flughafen Hamburg GmbH 2007a). Regarding goods transport and handling Hamburg airport only plays a minor role. In 2006 around 77,000 tonnes of air goods were handled at the airport (Flughafen Hamburg GmbH 2007b).

Hamburg is well-connected to all main waterways in Germany. It is the central hub for sea-based trade and the shipping of goods. Managed by the Hamburg Port Authority (HPA), Hamburg Port (also called “Hamburg’s gate to the world”) is Germany’s biggest harbour and the second biggest in Europe after Rotterdam. The Elbe River is the main water connection and links the harbour through Cuxhaven to the North Sea and the North Baltic Sea Canal to the Baltic Sea. The port of Hamburg lies around 110 km from the mouth of the Elbe River on the North Sea. The main issue in the future is that the Elbe River is not deep enough for the new generation of container ships. Thus there are plans for the deepening of the river (Kersten et al. 2007h).

Mecklenburg-Vorpommern (Germany)

The economy in Mecklenburg-Vorpommern is dominated by micro and small companies, which is also true for the logistics market.

The road network in Mecklenburg is well-developed and a number of investments have been made concerning the renewal and expansion of the network, e.g. the Baltic Sea motorway A20. However, further investments (e.g. the completion of the A241) are necessary to integrate the region better with other economic centres. Due to its thin population density the density of the road network is approximately one third smaller than the German average.

The region has a modern railway network allowing for efficient transportation links to the German and European hinterland. Connections to bigger cities are possible via first or secondary lines. Measures for improvement are the increase of the average speed, the establishment of attractive direct connections, the modernisation of stations and better coordination with other means of transport.

The ports in the region have experienced strong growth recently. The basis of this growth was fundamental restructuring. The main seaports of the region are located in Wismar, Rostock, Stralsund, Sassnitz, Greifswald, Wolgast, Ueckermünde.

Compared to other transport means, air transport plays only a minor role. There are five airports, but all of them are only of regional importance. The closest large airports are in Berlin or Hamburg (Kron et al. 2007b).

Pomerania

Poland is a fast growing logistics market with a relatively wide range of service providers and a well-developed infrastructure, although it is not up to the same standard as in Western Europe the railway system, in particular, has been modernised. However, with respect to the motorways there is a lack of a north-south and east-west axis. Furthermore, the Baltic ports are not linked to the important customer areas such as Warsaw.

The logistics market in Poland is dominated by railway companies. The state railway and the private railway companies are very important and are in the top 10 logistics service providers. The largest carrier in Poland, Trade Trans, headquartered in Austria, also has strong connections to the railway. The Western European companies, DHL, Schenker and Raben are among the top 10 logistics service providers (Klaus/Kille 2007, pp. 173-174).

In the region of Pomerania itself, the transport system is relatively poorly developed. Poor access and communication with regional centres has clearly been a disadvantage for investors. The road network is in bad condition and does not even fulfil basic safety standards. The ports in Gdansk and Gdynia, as in the whole of the region, are not well-connected to the road network, especially not the motorways. Also passenger transport in different parts of the region is not integrated. However, the quality of the infrastructure is increasing.

Investments in the railway system, which traditionally plays a major role in Poland, have not been carried out in an efficient manner. Regional rail services are closed, making the railway less competitive compared to other transport modes.

There is one airport in Gdansk, which is one of the main Polish international airports and it served 1.2 m. passengers in 2006.

Regarding ports, the sea cargo network is well-developed with ports in Gdansk and Gdynia. The most important investments have been made in container terminals and in a logistics centre. With the privatisation of the terminals investments are expected to continue in the future (Truzskawska 2007, pp. 36-59).

The Baltic States

In all three Baltic States, transportation plays an important role in the national economy as described in section 5.2. All three countries currently invest in infrastructure as they are important gateways between Russia and Europe. The logistics markets are, to a large extent, affected by their borders with Russia and its large natural resources as the Baltic States often serve as transit countries for the transport of these resources to central Europe.

A transport issue for all three states are the railway gauges which are not consistent with the ones in Central Europe. Thus, there is no direct railway connection to these states.

Lithuania

Lithuania has a special status as a transit country as it has a border with Poland. In addition, the city of Klaipeda is the biggest harbour in the Baltic States with respect to tonnage. One of the most important development needs in Lithuania is its road system, as there is no motorway going from the south to the north of the country.

The biggest logistics service provider in Lithuania is the state-owned railway operator, followed by a national diversified logistics company and an Icelandic shipping line. Among the top 10 logistics service providers there is only one Western European company: DSV. (Klaus/Kille2007, pp. 127-129)

Latvia

The top 10 logistics service providers in Latvia are led by Latvian Railways and the Latvian Shipping Company. Similarly to Lithuania there are only a very few Western European companies in the top 10: DSV and Alpha Management (Klaus/Kille 2007, pp. 127-128).

Latvia’s border with Russia is also the North-Eastern European border with Russia, which is a geographically advantageous position for the country.

The Latvian Railway is dominated by the government owned Latvian Railways, while in recent years, parts of the passenger traffic business (since 2002) and freight transport business (since 2003) have been taken over by private companies.

The four airports of the country are located in Riga, Liepaja, Ventspils and Daugavpils and all of them have high growth rates. The number of passengers carried increased from about 234,000 in 1995 to about 1,150,000 in 2005. International traffic currently goes through Riga and Liepaja.

In relation to maritime logistics, Latvia operates 3 large and 7 small ports, which have profited and have gained in importance in recent decades with the transition to a market economy. Transit goods represent the largest share of the cargo. The performance of the ports significantly influences 15 industries in the Latvian economy, the development speed of the port being notably faster than overall economic growth.

The establishment of freight terminals and warehouses were identified as one of the most important development needs. However, the main bottlenecks in Latvia result from

a) the Latvian-Russian border (congestion due to inefficient customs controls and frequently changed control requirements by Russia)
b) the motorways, particularly around the Riga region, and
c) railway capacity (under-investment in the last 50 years).

Thus, infrastructure investment will be one of the main challenges for the future of Latvian logistics development (Telematics and Logistics Institute Ltd. 2007, pp. 61-112).

Estonia

The Estonian logistics market is not as dominated by national companies as the markets of Latvia and Lithuania. The biggest service providers are the shipping line NT Marine, Estonian Railway, and Pakterminal. The German companies DHL and Schenker (owned by Deutsche Bahn) are ranked in fourth and fifth place. Due to the location of Estonia, the main focus in the markets is now on sea freight, transit traffic and raw materials (Klaus/Kille 2007, pp. 127-128).

The infrastructure is quite well-established; and due to tough competition with other European companies, local service providers have reached a high level of standards and service quality. However, large investments in infrastructure are also necessary in Estonia. One example is the highway system where the density of the road network system has increased by 11% since 1991 but the number of passenger cars has increased by 112% in the same period. Motorways are not developed in terms of the European context.

Regarding the railway, the privatisation of the infrastructure, as well as the national freight carrier Estonian Railways early this century has proved to be disadvantageous and was revoked in 2007. Similar to Latvia, one of Estonia's focuses is to build up facilities at the border to Russia.

Estonia holds five airports that are open for international traffic: Tallinn, Tartu, Kuressaare, Kärdla, and Pärnu. Growth rates are similar to those of Latvian airports. As for ports, the most important cities are Tallinn, Kunda, Sillamäe, Pärnu and Paldiski Pohjasadam (Kiisler 2007, pp. 65-105).

Saint Petersburg

The logistics sector is an important economic factor for Russia. The industry is subject to ongoing drastic changes which are mainly demand driven. The logistics market is characterised by a relatively small number of companies, which have little competition. Large logistics companies are the National Logistics Company (NLK), tablogix, and ATL. As of 2005, international companies with a subsidiary in Russia are FM Logistic, Wincanton Logistics, Kühne + Nagel, Schenker, Panalpina, and Rewico (Doborjginidze/Abelmann 2005, p. 57). Also the German-based company DHL has recently expanded their business in Russia. About 63% of all companies are situated in the central area around the City of Moscow. A major problem for local service providers is the out-dated freight transport fleet, which results in a disadvantage in competitiveness. Thus, only about one third of all freight transport services are conducted by national service providers.

The road network in Russia is characterised by large quantitative and qualitative differences in the individual regions. The area around Moscow has a well-developed infrastructure system as does St. Petersburg due to the economic strengths of the city (Doborjginidze/Abelmann 2005, pp. 13-25). The main problems of the road infrastructure include a small percentage of motorways, a lack of multimodal transport hubs, and a lack of network effects. In addition, the maintenance and modernisation of the roads lags behind the EU.

The rail network, however, plays a much more important role than in other countries of the BSR. The country is more rail dependent than other large countries with Moscow being the focal point of the network. Important lines are Moscow to St. Petersburg and on to Finland, Kaliningrad to Lithuania and the lines into Poland. The longest railway line is the Trans-Siberian Railway with more than 10,000 km. Thus, the system is relatively well-developed, but suffers from worn-out tracks, out-dated signalling devices and old rolling stock.

With respect to its maritime infrastructure, Russia has several ports on the Baltic Sea: Vysotsk, Vyborg, Primorsk, Kronstad, Ust-Luga, Kaliningrad, and St. Petersburg, with the latter being most important. In

addition, Russia has the largest system of navigable inland waterways totalling more than 70,000 km.

The country has about 70 international airports. In the north-western part of Russia, the Pulkovo airport in St. Petersburg is of relevance for this study (BMT Transport Solution GmbH 2007, pp. 57-68).

Southwest Finland

Finland has a very small population density, which influences the density of the infrastructure. The best developed network has been established in the regions around Helsinki and Turku. Shipping plays a major role in the Finnish logistics market, and the inland waterway system is well-developed. The biggest logistics companies in Finland are the railroad system VR Cargo and the Itella Corporation (the Finnish Post Office). Strong foreign companies in Finland include Schenker, DHL from Germany and DSV from Denmark (Klaus/Kille 2007, pp. 150-151).

Turku is an important centre in a national context, and at the European level, Southwest Finland has a good position relative to the main transport corridors of Northern Europe. The region's international connections operate in an east-west direction, linking the EU with Russia, and in a north-south direction mainly linking Finnish markets with Central Europe.

The road connections between Turku and the regional centres of Southern Finland are quite good. A series of main roads radiates outwards from Turku to other parts of the country and the region. The principal connection is with Helsinki, and the E18 highway linking the two major cities of Southern Finland is regarded as likely to become the most important future thoroughfare of the country. The Turku area is thus highly accessible by road from all major centres of Southern Finland. No serious congestion arises, even on the main roads, which would compare well with that of Central Europe.

About a quarter of Finland’s goods traffic is conveyed by railways. The Turku area also enjoys excellent accessibility by rail from other parts of Finland, and the connections also extend eastwards into Russia, linking the area with central parts of Russia and the Far East. The Finnish railways are of the same gauge as those in Russia and all the other parts of the former Soviet Union. Turku is also the centre of the rail network in its region, which is composed of lines from Turku via Salo to Helsinki, via Loimaa to Tampere and also to Uusikaupunki.

Air transport has been of considerable importance for the Finnish economy and for the country’s international connections and will

remain very important in the future. In 2003, a total of over 13 million air travellers used Finland's airports. The logistic significance of airports has greatly increased in recent years. The main passenger services provided by Turku Airport (the only international airport in Southwest Finland) are connections with the three nearest major international nodes, Helsinki – Vantaa, Stockholm and Copenhagen.

Finnish ports play an important role in Finnish business. Almost 90% of Finland's foreign trade passes through the ports. In Southwest Finland, the ports of Turku, Naantali and Uusikaupunki are the most important as far as overseas traffic is concerned, although there is also some traffic to and from Parainen, Kemiö, Dalsbruk and Förby as well. The region's main concentration of logistics functions has nevertheless formed around Turku and Naantali (Malmsten 2007, pp. 44-56).

Östergötland (Sweden)

Sweden is the largest economy in Northern Europe. All major cities and coastal regions in Poland, Germany, the Baltic States and Russia can be reached within one day. The highly concentrated and sophisticated logistics sector is dominated by foreign players, above all Schenker and DHL based in Germany. These are followed by the Swedish Post (Posten AB) and the Danish company DSV. Other important companies include the shipping lines Broström and Stena Line as well as the rail freight company Green Cargo (Klaus/Kille 2007, pp. 185-186).

The foundation of Östergötland's infrastructure is good. The most important national road and railway systems pass diagonally through the most populated parts of the region. This link has one of the highest traffic volumes within the Nordic Triangle (between Oslo, Helsinki, and Copenhagen). The airports and ports of the region also lie within this corridor. The Swedish institutes of transportation (Swedish Rail Administration, Swedish Road Administration, Swedish Aviation Administration and Swedish Maritime Administration) have recognised Norrköping as one of Sweden's four most meaningful inter-modal transportation nodes within the Nordic Triangle. Problems in the future may arise from the increasing demand for capacity.

Most of the region's main roads belong to the national net of roads. They are well-expanded from the north-east to the south-west, due to the most important national road, the E4. The connections from east to west are not as good and numerous routes need to be improved.

The southern region's most important railway passes diagonally through Östergötland connecting Stockholm and Northern Sweden with

the Southern Sweden and Denmark. The railway to Bergslagen is a strategic national thoroughfare. The planned railroad for high speed trains from Stockholm to Linköping will reduce the journey times between the two regions dramatically which is considered to be one of the most important goals of the region.

There are two airports in the region, one in Linköping and one in Norrköping. Both are relatively small city airports but an increase in capacity is possible if necessary. Linköping City Airport is a subsidiary of Saab AB. The airfield is also used for test flights for both military and civilian aircrafts as part of Saab's development.

The port in Norrköping is one of the more important harbours of Sweden and handles about 4 million tonnes per year, mainly petroleum products and forest related products. The strategic position of the harbour has led the national government to suggest that Norrköping will become one of four inter-modal nodes (Aronsson et al. 2007, pp. 33-44).

Denmark

Denmark plays an important role in transport as it connects the Northern Scandinavian countries with Western and Central Europe. Compared to Sweden and Finland, it has a dense road network. In recent years, the demand for logistics services has increased so that there are capacity problems and a shortage of trucks and personnel.

The logistics market leader in Denmark is the Denmark-based company DSV. The Maersk Group and DHL rank second and third (Klaus/Kille 2007, pp. 147-148).

As Denmark is relatively densely populated compared to the other Northern European countries, the road network is dense and well-developed In particular, in the region around Copenhagen and on the Danish motorway network, large amounts of traffic can be found which may lead to congestion. An important infrastructure component is the new Great Belt Bridge which has improved road and rail traffic to a large extent.

The rail network plays a minor role compared to the road network but as in Sweden and Germany, Denmark also invests heavily in the network.

With regard to the maritime infrastructure, large ports exist in Copenhagen, Fredericia and Aarhus, each handling more than 10 million. tonnes per year.

The most important airport in Denmark is Kastrup Airport located in Copenhagen. There are five other international airports in all parts of

Denmark, namely Billund, Alborg, Aarhus, Odense and Rönne (BMT Transport Solution GmbH 2007, pp. 57-68).

4.3 Future trends in the logistics industry

Klaus/Kille (2007, pp. 18-31) identified several so-called mega-trends in the global economy which are the drivers of changes in logistics. These include not only the globalisation of production and commerce, the acceleration of economic activities, but also a growing environmental awareness. One of the reactions of the logistics industry facing these trends in the BSR was to change the management of transport resources. More concretely, the trends have led to

- An increase in the average transport distance
- A concentration of flows on links and nodes
- The optimisation of transport resources, and
- A strong overall growth in transport activity (BMT Transport Solution GmbH 2007, pp. 93-95).

All regions have realised that the provision of a pure transport infrastructure is one way to cope with this growth. However, other measures have had to be taken as well. For example, investments in new logistics and distribution centres have been made. Ports have specialised in certain products due to the fostered competition (BMT Transport Solution GmbH 2007, p. 95). New concepts for the education of qualified staff have been developed and new forms of regional or international co-operation have been established.

In the future, the challenge of the logistics industry will be to cope with these market conditions on the one hand, while on the other hand taking these environmental and social issues more into account. This is true for regions with a well-developed logistics industry but also and especially so for regions in which the logistics sector has just started to develop.

5 ICT IN THE REGION

In the following part of the report, the general ICT infrastructure of the BSR and the characteristics of the ICT industry as well as the ICT sector's development and outlook will be described.

5.1 General ICT infrastructure in the region

The different regions of the BSR have not been developing under the same conditions and this has led to differences in the speed of economic development between them. The differences in the use of and competence in information and communication technologies (ICT) has played a major role in this issue (Kersten et al. 2007f, pp. 143-144).

Economic development and ICT are closely linked in today's era of globalization. ICT can contribute significantly to the economic development of a region by providing adequate information rapidly and at low cost, thereby enhancing productivity in different sectors of an economy. It offers great value added potential and is an important driving force towards more innovation, growth and employment in the BSR

The use of ICT is connected with new challenges for enterprises. Thus the requirements and needs of customers have to be identified and satisfied. Companies now have to react instantly to and handle the increasing complexity of supply chains. Here, the use of ICT plays a crucial role.

Although for example mobile phones, computers and the internet have become important in all regions, the fields and their intensity of use differs a lot among the individual regions. Companies and authorities increasingly use the internet, and it is becoming all the more decisive in matters of efficiency and profitability, but there are still considerable regional differences in the diffusion of internet access. In the following section, the most progressive countries with regard to ICT use are described.

Finland is one of the pioneers in the development of the information society. The country belongs to the group of leading producers and users of information and communication technologies (Finfacts 2001). Its strengths include a high level of education, regional and social equality, a good administration culture, national databases and registers, the public nature of information, and the citizens' strong trust in electronic services. The region has become an export-driven location for leading international ICT sector companies. Overall, Finnish exports increased by 28.4% from 2001 to 2006. Finnish imports recorded an increase of about 53% for this period (Statistics Finland 2007). Finland is also seen as an important research centre for new technology. Technological innovations have always been quickly adopted by the Finnish consumers and companies. The R&D input of about 5.5 billion euros, around 3.5% of the Finnish GDP (Gross Domestic Product) in 2005, belongs in the world's highest (Tekes 2007). The Finnish ICT sector has been characterised by a rapid growth in employment. Job creation has, to a large extent, been due to the growth of the ICT services. Nearly one tenth of the people employed in the private sector work in the fields of ICT production and services. In 2003 this amounted to about 109,000 people. The density of mobile telephones in Finland is also the world's highest. The use of the internet is equally widespread; its penetration rate currently stood at about 62.3%, ranking 21st in the world (Internet World Stats 2007). Nevertheless, there are still great difficulties, e.g. in geographic coverage. There has been a sharp increase in the usage of broadband in Finland. This expansion of broadband facilities in Finland has been one third faster than any other country in Europe reflecting the awareness of companies to implement new ICT (Läikkö et al. 2007).

In **Estonia**, the existence and development of ICT is also of great importance. The ICT sector is dominated by telecommunication network services, which had a market share of 58% in 2003 (€426 million). The market is characterised by a few large companies. Altogether they have achieved a shift away from low-cost assembly and are now offering higher value added ICT products and services. More than 31% of Estonia's households have internet access; about 45% of individuals regularly use the internet. Today, the internet penetration rate in Estonia currently stands at about 51.8%, ranking 33rd in the world. The internet is mainly used from workplaces, followed by school and home (Internet World Stats 2007). The level of users is relatively high and investments in internet stores are extensive and the turnover of electronic commerce is significant.

Banking and telecommunication are the driving forces of the Estonian IT industry. It is widely seen as one of the most advanced countries in terms of e-government development and is ranked first in Central Europe. Efficient and coherent strategies, precise action plans and clear and centralised responsibility for its implementation and operation have been developed over the last years. This has included the adoption of an intelligent framework, the building of a national infrastructure as well as the modernisation of back office systems. For example, the Estonian government has been the first to introduce paperless meetings. The strengths of the Estonian market are the well-developed ICT infrastructure, including mobile phones, GPRS solutions, as well as modern ICT solutions. In addition, the willingness and the positive attitude of both the public and the private sector towards the use of innovative ICT solutions has promoted the increasing use of ICT. Another advantage is the abundance of ICT service providers and the fact that employees are professional and well-educated. However, the small size of the potential market represents a primary weakness and insufficient ICT backup systems have had a negative impact on ICT. In most cases, ICT and EDI expectations and needs are higher than local market capabilities and resources. Finally, a shortage of IT specialists in Estonia is causing problems (Eilmann et al. 2007).

The ICT industry is not only one of the biggest but also the most dynamic industrial sectors in **Germany**. It is the only one which has been showing a continuous increase in its part of the German gross value added (GVA) since the 1980s. Moreover, the ICT industry represents the most dynamic employment trend in the German economy. Although the total number of employees in Germany has been decreasing for years, the German ICT industry created approximately 113,000 new jobs between 1998 and 2004. Nowadays, 4% of all jobs in Germany are in the ICT industry while 5% of all employees work in related sectors. It has been responsible for 40% of German economic growth in recent years (Kersten et al. 2007e).

The technology level has been primarily assessed by internet penetration rates. The internet penetration rate in Germany currently stands at about 61.3%, ranking 22nd in the world. Internet use in Germany increased between 1997 and 2003 from 4.1 million users to 34.4 million. This is far above the world's average but below many industrialised nations. In terms of broadband penetration, Germany ranks fifth worldwide with just below 6 million users. In the first quarter

of 2004, 95% of all enterprises in Germany with 10 or more employees had internet access.

More than 7,280 IT companies were located in Hamburg in 2006. In Mecklenburg-Vorpommern information and communication technology has developed positively. Currently, there are about 600 ICT companies with approximately 14,000 employees located in this area (Kron et al. 2007b).

The use of ICT is also increasing as a modern support for the management of public issues in Germany. Hamburg has intensively developed through e-government and electronic governance and administration. E-government can be said to be a main project for Hamburg and is crucial in the context of working with countries seeking its co-operation while also contributing to a modern public administration. Furthermore, it is both economically meaningful and recommendable from a political point of view as e-government will bring new possibilities to the region of Hamburg (City of Hamburg 2007). This is due to the fact that the German population makes greater use of e-government sites on the internet than their European neighbours: In fact 31% of the German population searched the websites of public agencies for information in the first quarter of 2004, while the European average was only 25%.

As in Germany, the IT industry in **Latvia** belongs to one of the fastest growing economic sectors. The software industry is especially well-developed and well-organized. The number of successful outsourcing activities of IT giants, e.g. Microsoft and IBM, has progressed because of the country's asset of a highly educated well-qualified workforce. In contrast to other EU countries, the Latvian government does not promote open-source software via Microsoft. Therefore, experts foresee an increase in new software sales because the government and private companies have to upgrade and adapt their own during the next three years (Riga City Council et al. 2007).

Sweden can reflect upon a fast growing expansion of its ICT infrastructure during the 1990s as well. In 2001, there were more than 892,000 companies registered in Sweden and about two percent of these were working in the ICT sector. In 2001, the government decided that it was time to support the expansion of broadband availability in certain areas. For that reason, an ICT infrastructure project (2001-2006) was started which was partly financed by the national government (Kumar et al. 2007, pp. 39-40).

When comparing **Poland** with the other EU regions it has to be mentioned that the country has a low development level with respect to

ICT. However, the Polish policy has become aware of these poor conditions and started intensely supporting ICT infrastructure development by running different ICT projects financed by the EU (Trzuskawska et al. 2007, pp. 60-61). The current level of ICT usage and needs in the BSR are described and summarised below.

5.2 ICT sector development and outlook

Information and communication technology (ICT) forms the backbone of many business activities. Its use has gained in importance because the implementation of ICT has sped up business processes and facilitated them. In modern management environments a high quality ICT system is a “sine qua non“ for any kind of business success. The use of the internet e.g. has made a range of information available at very low cost and at high speed. Customers can use it to compare prices and to make selections whereas business people can find new partners, customers or other areas of opportunity. Paperless and therefore very fast and safe communication is possible by sending e-mails not only internally but also to customers or suppliers. Hence transaction costs can be kept much lower.

ICT use has developed from simple storage and retrieval functions to interactive, global tools that allow businesses to save money and time when they use these tools correctly. Nowadays, finance, accountancy, marketing and sales are the main business areas which use ICT systems. In business areas like production, production planning and logistics, ICT systems are often applied as well and their usage is increasing (Kersten et al. 2007e).

Although there are big discrepancies in IT infrastructures and in the use of ICT, there is a trend towards the rising use of information and communication technologies in the BSR. All regions show an increasing demand for and supply of electronic handling. Furthermore, ICT is not only common in private households as reflected by the increased penetration rate of the internet and the increase in internet users, but also in public institutions. E-government has become more and more integrated into services and is therefore a strategic orientation of public authorities and companies. In brief, the use of ICT has become ubiquitous.

Logistics companies are thus forced to join in this trend as its use becomes even more important and serves as a precondition for remaining competitive. Many logistics companies have realised that the

implementation of efficient ICT systems has sped up business processes (Kersten et al. 2007c, pp. 143-144).

In order for information technologies to be utilised, the users must have confidence in the information and the technical information processing systems that are involved. Therefore, regional development organisations are focused on organising different kinds of projects that support the ICT development of country-specific regions. Simultaneously, through these projects, the awareness of logistics companies is being broadened and it is being implemented as a supportive management instrument. Logistics companies consequently see that the implementation of new technologies in their daily business can add value to their business.

The task of public institutions is to broaden and to reinforce the awareness of ICT as a supportive and efficient management instrument. Regional development projects aim at supporting logistics companies by implementing new IT systems and by creating platforms. Furthermore, by offering workshops and congresses experiences can be exchanged and networking can be reinforced.

Unfortunately, these strategies for implementing ICT into a daily routine have not been implemented in all the BSR yet. Thus, this ought to be a task for regional development agencies and a regional policy as well as a challenge for companies and should be looked upon as a problem that needs to be solved in order to raise the BSR's overall competitiveness (Kersten et al. 2007f).

PART II: EMPIRICAL RESULTS OF THE PROJECT

6 RESULTS FROM THE LOGISTICS SURVEY

The logistics survey was one of four tools used for primary data collection and it reflects the current status and needs of logistics in the business community in the region. Three versions of the survey have been used to focus on the following three types of companies:

a. Manufacturing - including construction companies
b. Trading companies
c. Logistics service providers

In the following, the aim of the survey, its structure, the target group and sample are presented (section 6.1 and 6.2). The results from manufacturing, trading and from the logistics service providers are discussed in sections 6.3 and 6.4 respectively.

6.1 Introduction to the logistics survey

The logistics survey consisted of two parts: The first part contained general questions (being the same for the three types of companies). The second part contained specific questions pertaining to the type of companies concerned. The same questionnaire was used in all regions, but each region had the opportunity to add one or two questions focusing on specific regional issues.

The aim of this explorative study was to evaluate the internal situation of companies, especially of SMEs, with respect to logistics, but also the views of the companies on their regional business environment and future trends.

Thus, the main **themes** of the survey were:

- Current logistics costs and their development
- The need for further competence development
- Outsourcing – the current situation and the expected development within the firms

- Operating environment – an assessment of regional advantages and disadvantages
- A self-assessment of the companies' logistics activities and the extent to which they are coordinated.

The survey was mainly conducted as a web-based survey. E-mails that contained a link leading to a website were sent to companies where the participants could directly answer the questions. Mail, telephone and face to face interviews were used as complementary measures in some regions. This is by far the largest survey conducted in the BSR in the field of logistics. The survey was carried out, in most regions, from January to March 2007. After sending the first e-mail, two reminders were sent out at two week intervals in order to increase the response rate (Kersten et al. 2007b).

6.2 Target group and sample

The respondent companies were generally categorised according to sector and the company size and classified as micro, small or medium-sized companies depending on their turnover as defined by the European Commission as follows (European Commission 2003):

- Micro companies: €0 to 2 million
- Small companies: €2 to 10 million
- Medium-sized companies: €10 to 50 million

Large companies are therefore characterised by a turnover of more than €50 million. Micro, small and medium-sized companies are referred to as SMEs (small and medium enterprises). The company size and sector were generally used as background parameters. In total, more than 1,200 companies participated in the study. The number of respondents varied from about 80 in Pomerania, Poland to about 330 in Southwest Finland (figure 5).

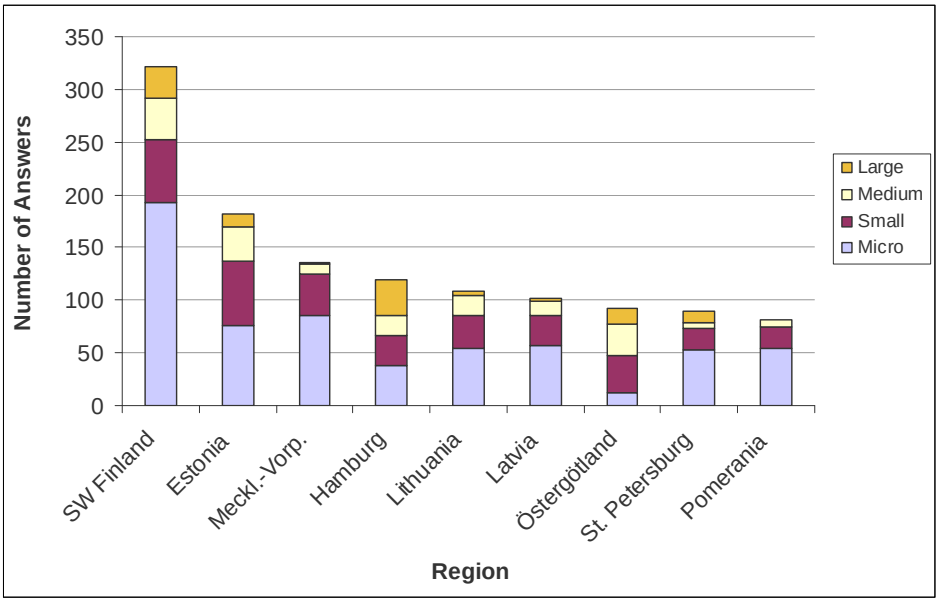

Figure 5 Number of respondents per region. Source: Own illustration

More than 90% of the companies can be classified as **SMEs**. The distribution of participants supports the objective of the LogOn Baltic project in evaluating the need for strengthening the competitiveness of SMEs in particular.

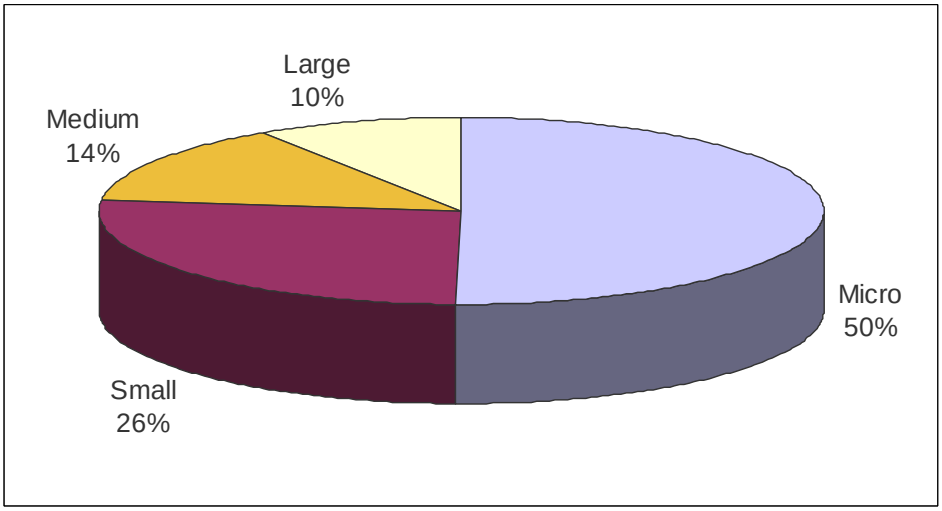

Figure 6 Number of respondents according to company size. Source: Own illustration

In addition to their size (see figure 6), companies were also classified according to their **industrial sectors** (see figure 7). The percentage of respondents is approximately evenly split into the three different sectors: 38% represent the manufacturing industry, 33% belong to the trading industry and 29% are logistics service providers. Thus, a broad and evenly spread assessment of the issues as seen by logistics users as well as by providers of logistics services should be guaranteed.

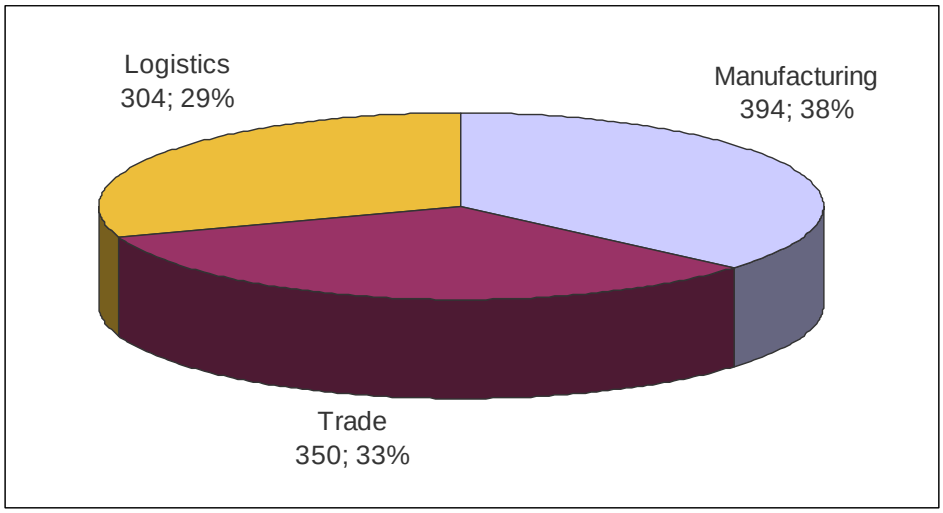

Figure 7 Number of respondents according to industry. Source: Own illustration

6.3 Results from manufacturing and trade

In the following, the main results from the manufacturing and trading industries are presented.

The **overall logistics costs** in the investigated regions varied from 8% to 14% of the turnover of the participating companies (figure 8). Only Mecklenburg-Vorpommern deviated from this distribution and had logistics costs slightly above 20%. An important reason for that is the structure of the companies in this region which are dominated by micro and small companies. In addition, the structure of the products is mainly composed of relatively low-value goods. Another surprising result is that the logistics costs of the Southwest Finland region are among the third best of all regions. Former studies often came to the conclusion that due to the large distances between cities and the small

population density logistics costs in Finland were significantly higher than in other countries (Klaus/Kille 2007, p. 150). At least for Southwest Finland, this does not seem to hold true. The region around the city of Turku is one of the most densely populated regions in Finland with a well-developed infrastructure.

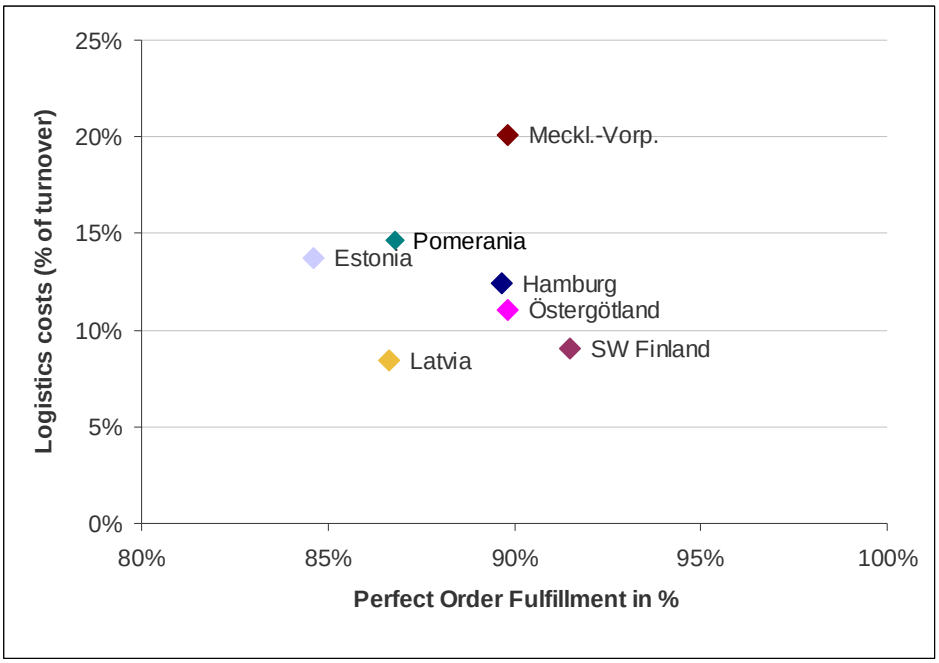

Figure 8 Costs versus perfect order fulfilment. Source: Own illustration

Regarding the **composition of logistics costs**, no significant differences between the regions can be observed. In all regions, transport costs accounted for the largest part of logistics costs, followed by inventory costs. However, in terms of the logistics performance of the regions analysed, measured by the percentage of **perfect order fulfilment**, the advantage of the western EU countries can be recognised. In addition to the expense of costs, companies were also asked about their expectations regarding the **future development of costs**. Here, the evidence seems to be clear: In all regions except St. Petersburg, more than 50% of the companies from the manufacturing sector believe that their logistics costs will rise in the next few years, particularly transport costs. The reasons for this are increases in the price of oil, as well as increasing bottlenecks due to a higher demand for logistics services.

A second important focus of the survey was the **outsourcing** of logistics services. In brief, national and international transport services show the highest share of outsourcing. For the service “national transports”, the most logistically developed regions ranked the highest. The vast majority of respondents from manufacturing and trade indicated that they outsource more than 75% of all inland transport services to external service providers. The Baltic States are in the middle of this range, while St. Petersburg and Mecklenburg-Vorpommern are at the lower end of the ranking. In the latter region, only 20% of the companies indicated that they outsource inland transport to a rate above 75 percent. A completely different result, however, is shown when it comes to the outsourcing of logistics IT services. These services are conducted to a much greater extent by the companies themselves. In addition, the ranking of the regions is altered. Estonia leads with respect to IT services where 17% of the companies said they outsource more than 75% of their IT services. This is not surprising when considering the high acceptance of information and communication technologies in Estonia in general.

Interesting findings were also seen in the answers to the question of whether companies in the manufacturing sector see **logistics as a key source of competitive advantage** (see figure 9). In the region of Hamburg, three-fourths of the respondents were of this opinion. Also in the other western European regions of the BSR, in Östergötland and Mecklenburg-Vorpommern, the majority, over 60%, agreed with this viewpoint. In the Baltic States, this topic is regarded more conservatively e.g. in Latvia and Lithuania only about 40% are of the opinion that logistics is a main factor in providing competitive advantage, while in Estonia the figure is only 18%. In these countries, a comprehensive understanding of logistics, which goes beyond the function of transport is only partially developed and is one of the reasons for those results.

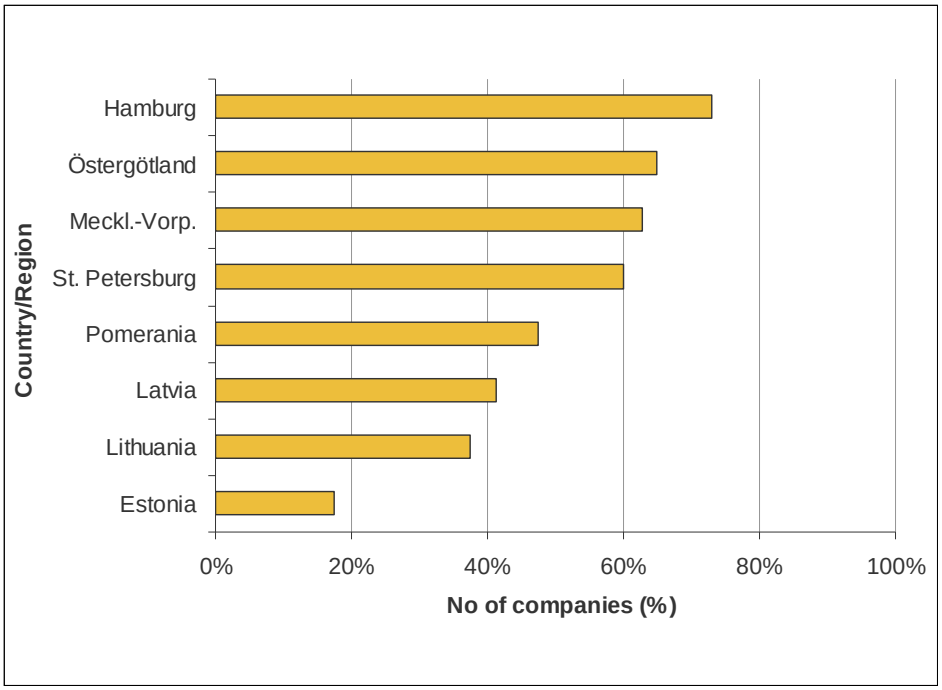

Figure 9 Logistics as a key source of competitive advantage for a firm. Source: Own illustration

Developments and tendencies in the logistics sector were also an important part of the survey. In all regions, the reduction of costs was mentioned as one of the three development needs for the respondent companies, in eastern as well as in western European regions. In addition to this, the improvement of customer service, the development of information systems and the selection of logistics service providers were named as main development needs. In Hamburg an increase in the transparency of the supply chain, an inter-organisational aspect, was ranked below the top 3. The following table (table 6) shows the main development needs for Hamburg, St. Petersburg and Estonia.

Table 6 Future development needs. Source: Own illustration

	Hamburg	St. Petersburg	Estonia
Priority 1	improvement of customer services	development of information systems	decrease of logistics costs
Priority 2	decrease of logistics costs	improvement of customer services	selection of logistics service providers
Priority 3	selection of logistics service providers/ increase of supply chain transparency	decrease of logistics costs	development of information systems

A key factor for successfully coping with those challenges is the training and education of employees. Therefore, the companies were asked: In which areas do they see the largest need for the **competence development** of their personnel? In the following figure (figure 10), the findings are again shown for the three regions of Hamburg, St. Petersburg and Estonia.

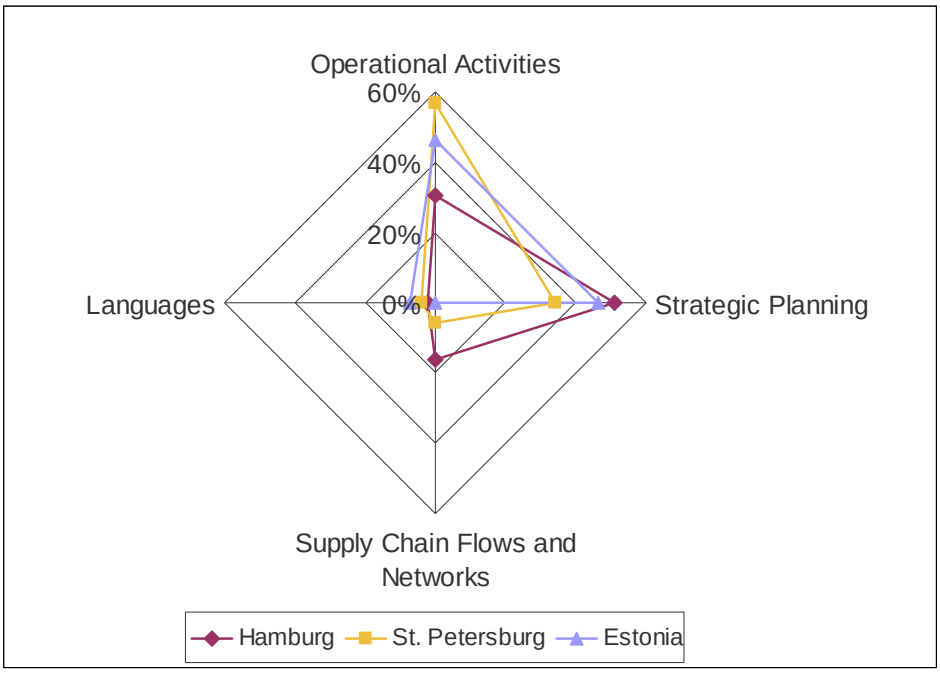

Figure 10 Development needs for personnel competence. Source: Own illustration

As a result, the requirements for competence development vary to a surprisingly large extent. In St. Petersburg, the need for competence in basic operational activities is quite high (about 60%), while strategic (about 35%) or even inter-organisational activities (about 5%) are regarded as less important. In Hamburg, the priorities were the opposite of St. Petersburg. Estonia fell between those two regions in its competence needs. The development of language skills, however, was considered to be of less importance in all three regions.

6.4 Results from the logistics industry

In order to obtain a broad picture of the status quo and trends in the logistics sector, companies from different sectors were asked to take part in the logistics survey. After presenting the results from the manufacturing and trading sectors, the findings from the logistics industry itself are discussed in this sub-chapter.

Firstly, logistics companies were asked to state, or estimate, the **distribution of their turnover** for different types of services for the year 2006 and also asked to estimate it for 2010. In all regions, pure transportation services accounted for the largest part of the four service categories in 2006, although this share varied from region to region. However, a clear trend could be observed in all regions except for Östergötland: The share of customised, individual logistics services was expected to increase by 2010. This means that the share of pure transportation services was expected to shrink at the same time. In contrast to that, changes in the amount of pure warehousing services and standardised logistics service packages were not expected. This corresponds to two trends presented next.

On the one hand, there is a general tendency towards providing more individualised products and services, which are demanded by end customers and reflected in the demand for more individualised logistics services. On the other hand, the trend for outsourcing more and more different services to logistics service providers is seen as leading to a relative decrease in the importance of transport services as a traditional service offered by logistics companies. In the following figure (figure 11), the change in the distribution of turnover is shown for the regions that expect the biggest changes.

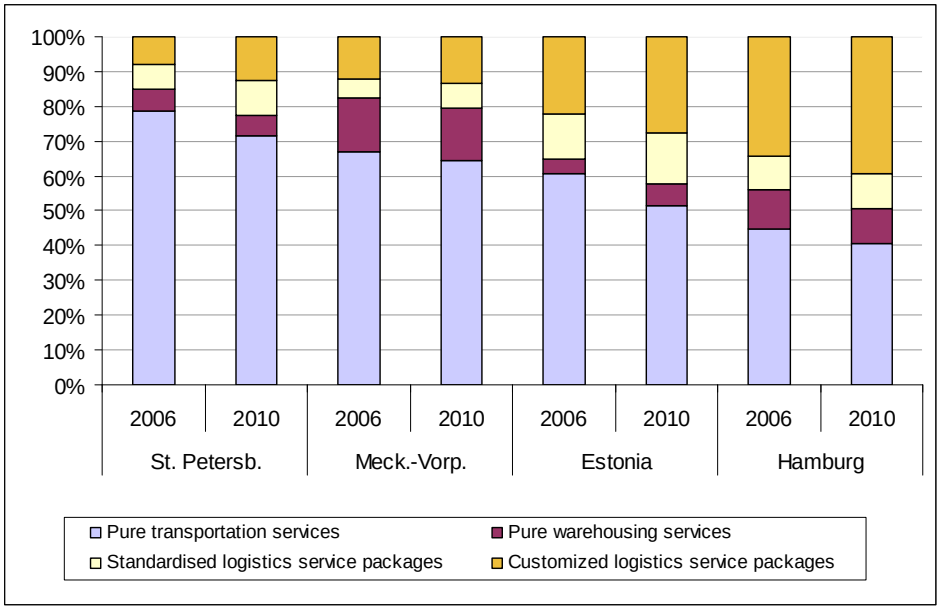

Figure 11 Change in the distribution of turnover. Source: Own illustration

In addition to the development of turnover, logistics service providers were also asked in which areas they see the biggest **threats** to their business in the future (see figure 12). To draw a direct comparison with the findings from the previous section, the results are again shown for Hamburg, St. Petersburg and Estonia. The aspect that all three regions regarded as the biggest threat was the increasing costs of service provision. This corresponds to the answers of the manufacturing companies that see the reduction of costs as one of the main development needs of their company in the future. As costs are an important criterion for choosing a service provider, logistics companies have to take this particular need into account.

In Hamburg and St. Petersburg, the decrease in the demand for services was ranked as the second largest threat. In the growing logistics market of Estonia, this was not seen as a big problem.

Tightening competition was also considered an important threat in all three regions, which can be seen as a direct consequence of less demand on the one hand and cost pressure on the other hand. Another issue might be the fear of new competitors coming into the market as a consequence of the EU enlargement and globalisation. Tightening competition, in general, makes it harder to pass costs on to customers.

Companies also noted that the availability of skilled personnel could be a problem, particularly in Estonia and also in Hamburg. This is an issue already obvious in today's business.

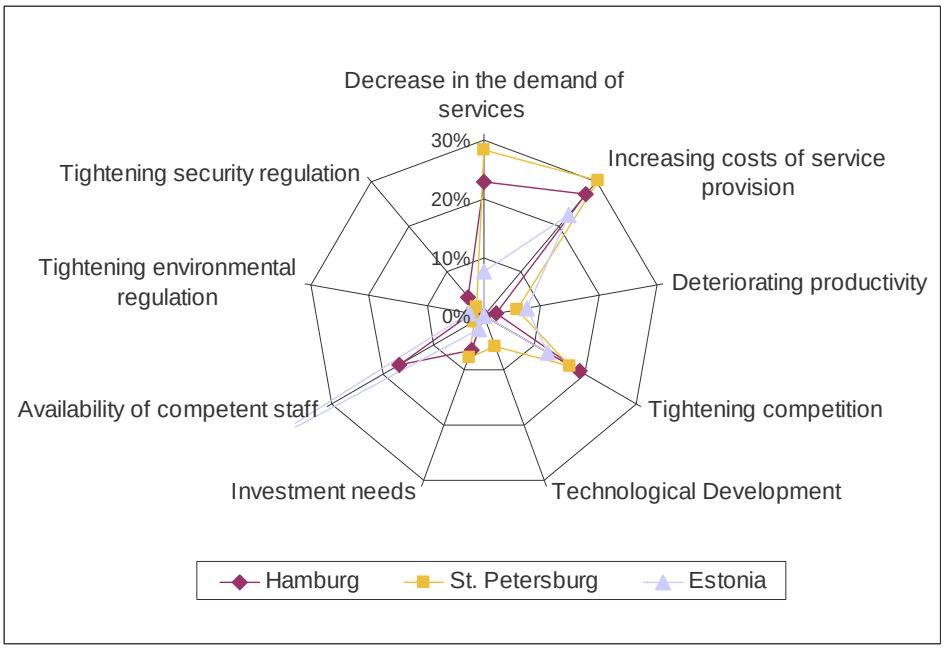

Figure 12 Areas where companies see the biggest threats to their business in the future. Source: Own illustration

Another part of the survey was the evaluation of the **business environment** of the respondents. Figure 13 shows how logistics service providers evaluate their environment compared to that of their main competitors. Other questions in this part of the survey were more specific and included an assessment of the transport infrastructure, the efficiency of logistics or the availability of production and business facilities.

Surprisingly, a large percentage of the logistics service providers believe that they are neither in an advantageous nor in a disadvantageous position compared to their competitors. The blue section of the bars represents the share of companies that are of the opinion that their business environment is better or much better than that of their competitors. With about 85%, this share is largest in Östergötland. About 50% of the companies in Pomerania considered their environment better, although about 10% evaluated it worse. Additionally, in two West European regions Hamburg and Southwest Finland, the share of companies evaluating their business environment as positive was more than 40%.

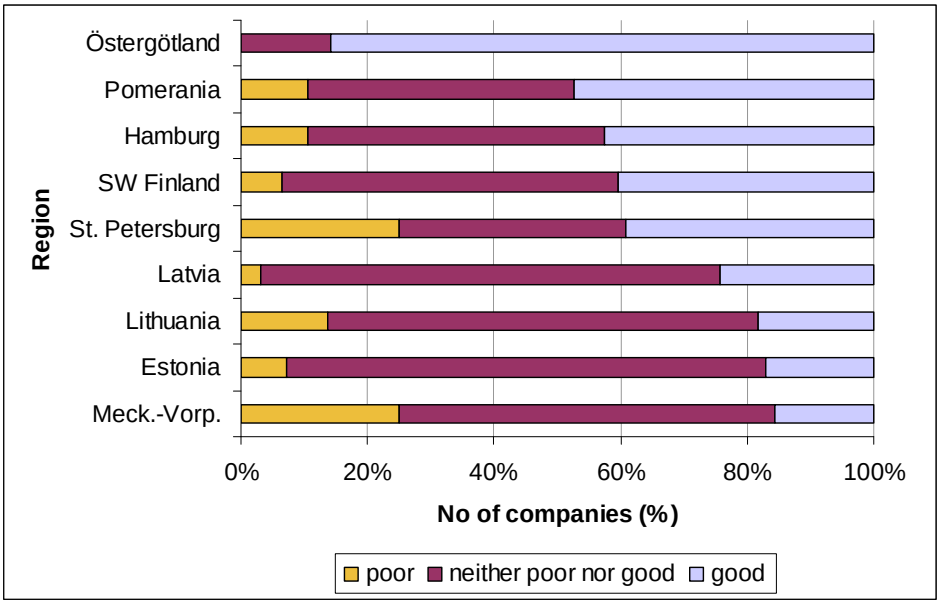

Figure 13 How logistics service providers evaluate their environment compared to that of their main competitors. Source: Own illustration

In St. Petersburg, nearly 40% are of this opinion, but there is also a share of about 25% of companies who evaluate it as worse. At the end lower of the ranking are the Baltic States and Mecklenburg-Vorpommern.

7 RESULTS FROM THE ICT SURVEY

In the following chapter, some empirical key findings of the ICT survey will be presented. The structure of this chapter follows the structure of the interview guideline of the ICT survey. Therefore, the following subchapters refer to the four parts of the guideline listing and the analysis of the findings regarding the use of ICT systems, the internet, e-commerce and e-business, as well as a general assessment of ICT usage.

7.1 Introduction to the ICT survey

Like the logistics survey, this survey was a tool for primary data collection. It aimed at reflecting the use of ICT as an interface between the private and public sector. It was also intended to describe the existing ICT infrastructure and services in the participating regions, revealing up to what extent they meet the companies' needs for further development. A summary of the key findings of the individual participating Baltic regions can be found in the regional ICT survey reports. The cross-regional analysis is presented in a separate report, available on the project homepage, http://www.logonbaltic.info.

The questionnaire consisted of five modules and was available in English as well as in the different languages of the participating regions. The same questionnaire has been used in all regions.

The main themes of the survey were:

- General contact and background information about the companies
- Use of ICT in companies within the regions
- Use of the internet in companies within the regions
- E-commerce and E-business
- General assessment of the use of ICT in the regions
- Region-specific issues [optional module]

The survey was mainly conducted as a web-based survey, but mail surveys, phone surveys and interviews have also been used to

complement the survey in some regions. All LogOn Baltic partner regions sent e-mails to the employees of these company groups in January 2007 and asked them to take part in the survey. The e-mails contained a link leading to a website where the participants could directly answer the questions. This was by far the largest survey conducted in the BSR in the field of ICT. Altogether, over 1,200 responses were gathered throughout the BSR. The data was used to make a cross-regional analysis, focusing on differences and similarities between the regions.

7.2 Target group and sample

The target group of the survey were companies from several industrial sectors: manufacturing industry, trading companies and logistics service providers, In particular, the survey focused on SMEs. More than 1,200 respondents represented micro, small and medium-sized companies as well as large companies.

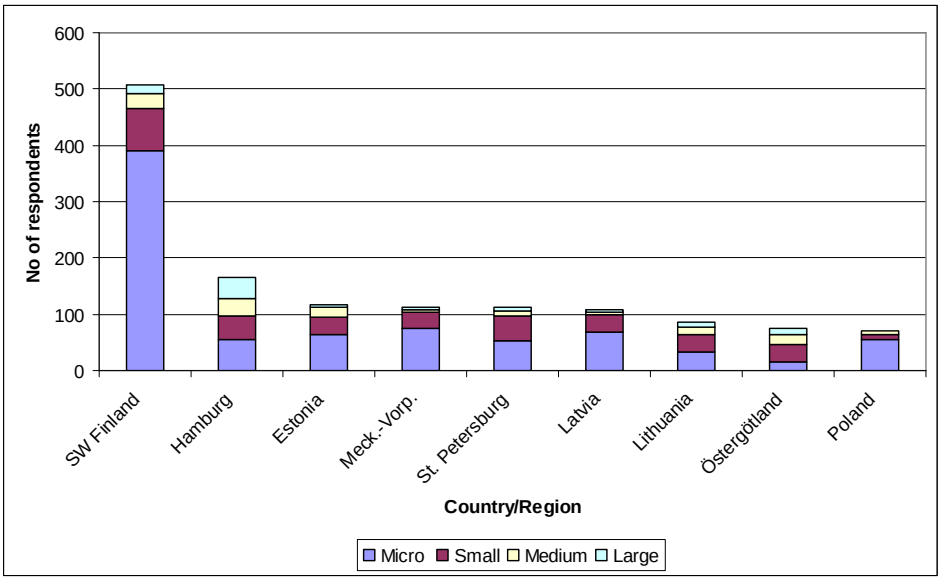

Figure 14 Distribution of the companies according to their size. Source: Own illustration

However, as the majority of respondent companies represented SMEs, the distribution of participants supported the objective of the LogOn Baltic project in evaluating the needs and strengthens of the

competitiveness of SMEs in particular. However, it can be seen that in some regions, that are economically more important, a higher proportion of large companies took part in the survey. It should be mentioned that there are more large companies in the databases in some regions e.g. in Hamburg and in St. Petersburg. On the other hand, in some regions (e.g. Southwest Finland, Latvia, Pomerania and Mecklenburg-Vorpommern) the business structure is dominated by micro companies. The distribution in each region is illustrated in Figure 14.

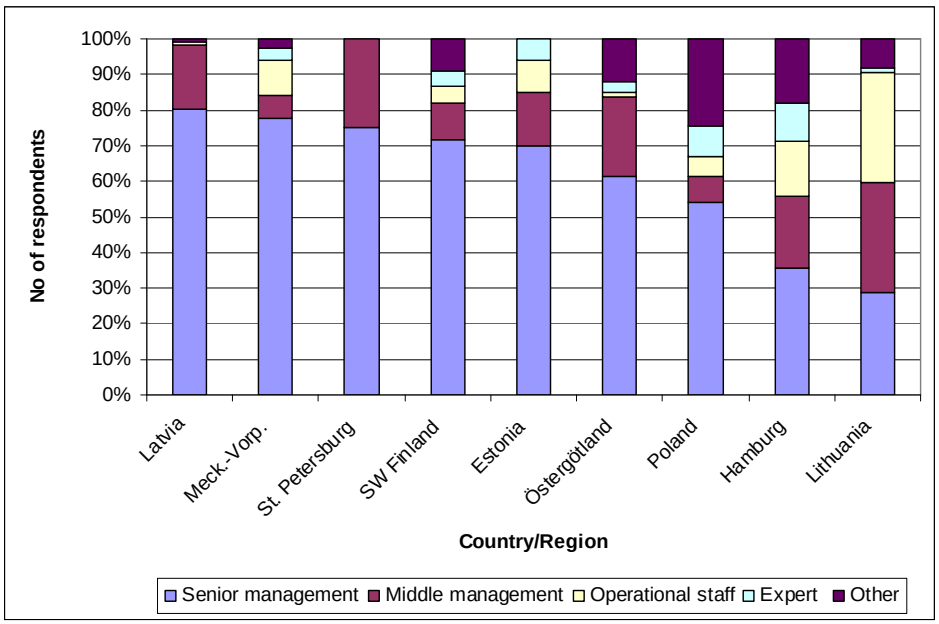

Figure 15 Respondents' positions in their company. Source: Own illustration

Moreover, the respondents were also categorised according to their positions in the companies (Figure 15). In nearly all regions, more than 80% of the respondents either belonged to senior or middle management. More than two thirds of the respondents were senior and middle managers, which gives more credibility to the answers received by the survey.

That is due to the fact that management can be expected to have a broad overview of their current situation with respect to ICT and also to have a strategic view on future developments and trends. In SMEs, management is often involved in operational issues as well and thus

has a good knowledge of daily problems and challenges (Kron et al. 2007a, p. 16).

7.3 Results from the survey

The following chapter will summarise the key results of the main themes asked in the ICT survey. It will start with the distribution of e-mail and internet access, followed by the use of ICT and continue with an overview of ICT expenses and the development of e-commerce.

First, the respondents were asked if employees have e-mail and/or internet access as e-mail and the internet have a great impact on the competitiveness and performance of a company by increasing information flow. The internet makes a range of information available at very low cost and at high speed. Paperless and therefore very fast and safe communication is possible by sending e-mails not only internally but also externally. Hence, transaction costs can be kept very low. The closer a company gets to the manufacturing industry, the less internet and e-mail are normally used by employees. For service providers, however, internet and e-mail have become more and more important in ensuring seamless and smooth communication with customers (Kersten et al. 2007e, p. 25f.).

E-mail/Internet Access

Both e-mail and the internet are widely used in the surveyed companies, as Figure 16 shows. However, when it comes to the analysis of the amount of employees that have a company e-mail account and/or internet access many differences appear among the regions.

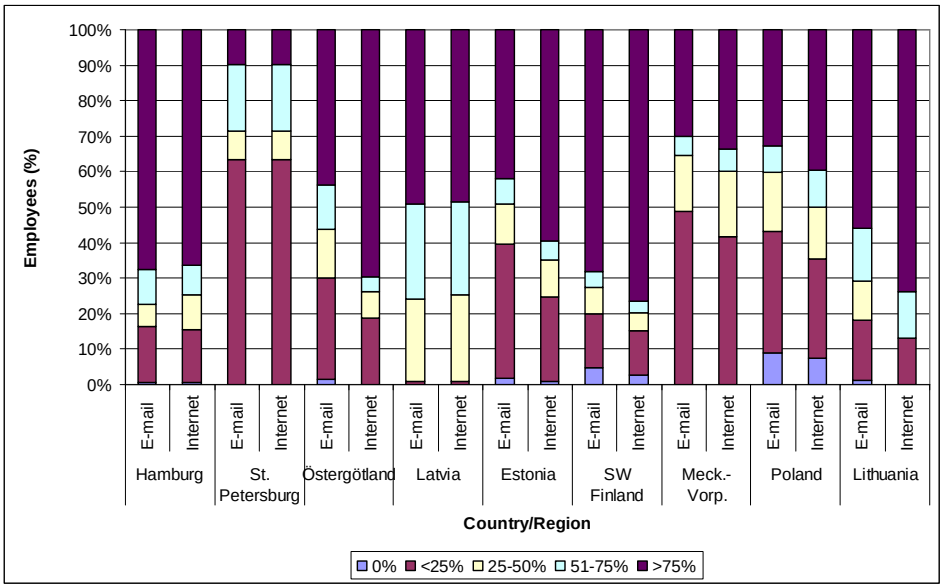

Figure 16 Percentage of employees having access to e-mail and the internet. Source: Own illustration

In Hamburg, one of the most important logistics hubs in Germany, around two thirds of the companies stated that over 75% of their employees have internet access and even more companies stated that their staff also had a company e-mail account. Businesses often have to be transparent in their activities and therefore all of the business activities need to be thoroughly administered and documented. Consequently, every employee keeping track of these business activities needs the necessary equipment such as e-mail and internet access etc.

Similar results can be found in Southwest Finland. Here, many of the SMEs can be characterised as service providers, where a major part of the work is done using a computer.

Latvia, for example, has a very important financial sector, therefore it is not surprising to find a more even distribution of the access rates. Thus, there are only few companies where less than 25% of the employees have access to e-mail and internet at the same time.

The relatively low access rates in Mecklenburg-Vorpommern, Poland and Estonia can be explained by the amount of manufacturing and trading companies that took part in this survey as well as by the size of the companies. The distribution of these companies within their regions according to size shows that most of them belong to the micro and

small companies i.e. mainly shops, stores, consulting firms etc. In these cases one computer is more than enough to manage the business activity and there is no need for every employee to have e-mail and internet access.

All the results described above are very different to those of St. Petersburg. Here, only 10% of the companies state that over 75% of their employees have e-mail and internet access and up to 60 % mentioned that less than 25% of their employees have these possibilities. Those companies that are connected to the internet have e-mail access. The larger the number of personnel involved in production operation and manual work is, the smaller the number of those with connection to the internet is. The larger the number of white-collar workers in the company is, the larger the number of the personnel connected to the internet is (Ardatov 2007, p. 15).

Use of ICT

Another survey question looks at the use of ICT in different business areas, e.g. accountancy, marketing, finance, human resources, production and production planning, logistics and keeping inventories and sourcing.

Finance, accountancy, marketing and sales are the main business areas for using ICT systems, although ICT systems are also widely used in other fields. For finance and accountancy, different software tools are applied enabling quick and easy access to the information that is required without any delay or disruption. In business areas like production, production planning and logistics, ICT systems are often applied as well and their usage is still increasing. Customers, suppliers, product data, as well as formulas, batches, orders and deliveries can be entered into one central system and can be managed from there on.

This way, all available data is always up-to-date and consistent, can be better monitored and the flows of information can be better managed. Furthermore, inventory levels, as well as any movements of goods can be optimised. Authorised users both inside and outside of companies can access the necessary information quickly and easily. At any time of the day and the supply of raw materials, semi-finished products and finished products can be controlled.

In conclusion, companies seem to have realised that today's information technology very often leads to greater accuracy, more economic benefits, higher speed and visibility, immediate availability, higher productivity and a greater focus on customers (Kersten et al. 2007e, pp. 26-27).

The following figure reflects the usage of ICT in production planning within companies of the BSR.

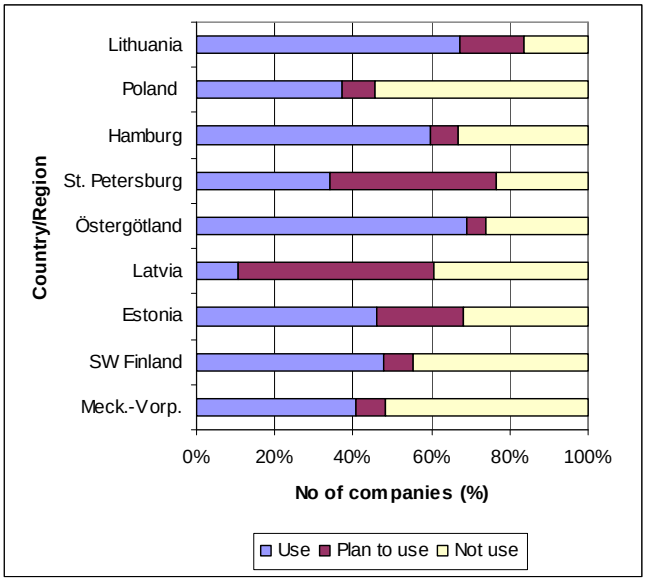

Figure 17 Use of ICT in production planning. Source: Own illustration

Regions like Östergötland and Estonia that have a high proportion of manufacturing companies participating in this survey, show a higher proportion of companies using or planning to use ICT in the business area of production planning.

On the other hand, regions like Latvia show a low rate of ICT usage in the field of production planning, due to the low proportion of companies in the manufacturing and production industries.

ICT Expenses

For the next question, companies were asked to state or estimate their ICT expenses for 2005 as a percentage of their turnover with regard to; IT personnel, software and hardware. In total, the cost structure for the three main aspects hardware, software and IT personnel is very similar. The results show that companies spend quite different proportions of their turnover on IT.

The majority of companies did not have high costs for hardware during 2005. They only invested abut 0 to 2.5% of their annual turnover in hardware. A reason for this could be that hardware can often be updated every four to six years, because many basic functions do not really change. Also, hardware is able to work more efficiently at higher

speeds and with a higher memory capacity and most software systems are also compatible with older hardware. Therefore high expenses in hardware are not always necessary. Another reason for this low investment could be that hardware with the same performance has become much cheaper during recent years. The general trend of the increasing use of IT and telecommunications and the high speed of hardware developments has also brought down prices. Some of the companies even mentioned that they did not have any hardware expenses at all during 2005.

Figure 18 shows the estimated software expenses as a percentage of the companies' turnover.

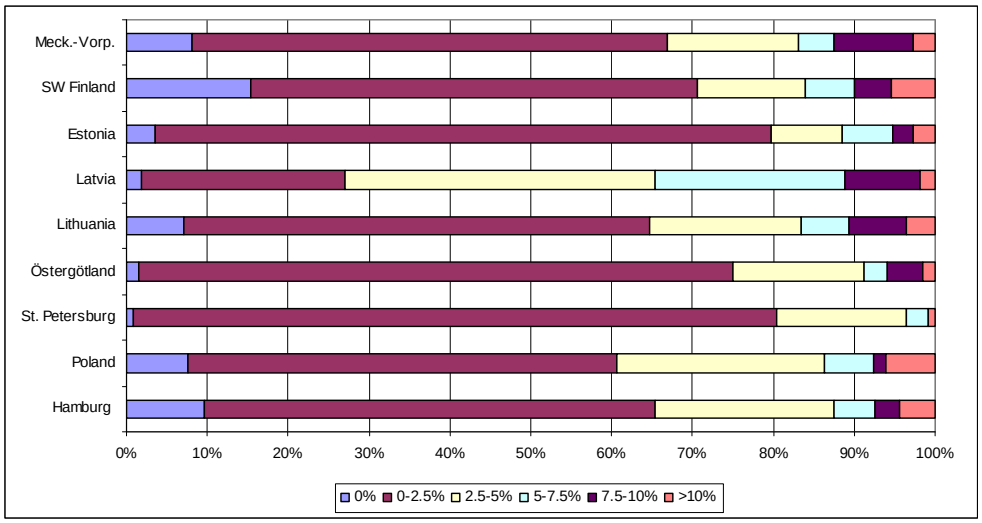

Figure 18 Software expenses as a percentage of the companies' turnover. Source: Own illustration

At an average of 6%, the companies did not have any costs for software in 2005. As mentioned before, the responses of this survey are dominated by SMEs where IT systems do not have to be changed very often. In general, the business structure of micro, small and medium-sized companies is rather simple. This means that they do not need sophisticated software. In most cases, the standard software packages that are often included in the installed operating systems (i.e. Microsoft Windows) are enough to run the business. If companies have implemented a software tool, they can often use it for several years with rather low maintenance costs. Consequently, the majority of the companies used only 0 to 2.5% of their annual turnover for software

expenses. An average of 4% also stated that they used more than 10% of their turnover on IT systems. This number seems surprisingly high.

In Estonia, for example, software, expenses are quite low. SMEs rarely upgrade their software, and usually buy new software with new hardware in extreme cases when old machinery is unusable. The higher level of expenses could originate from investments in software that SMEs have made. Thus, from their total turnover, the sum paid for it is proportionally high (Kron et al. 2007a, p. 28).

Concerning the level of investment in qualified IT personnel, the majority of companies have expenses of about 0 to 2.5% of their turnover. However, the average IT personnel expenses are lower than hardware and software expenses.

Some companies have a certain demand for IT specialists, because IT belongs in their core business, or because the company's structure requires its own IT department. The results from the regions Mecklenburg-Vorpommern and Hamburg show higher levels of IT expenditures compared to the rest of the BSR.

In the case of Mecklenburg-Vorpommern, IT is among the branches of economic activity that have strongly developed. As a consequence, many technology-oriented SMEs have been established. In Hamburg there is a bigger proportion of medium and large companies who need their own IT department, due to their structure. As mentioned before, the relative proportion of these expenses compared to the company's size and turnover also explains the high level of expenses. Other companies, mainly SMEs not belonging to the IT industry, have a rather sporadic demand for IT specialists. These companies usually find innovative solutions to meet their needs. One of these solutions is to hire an employee with sufficient IT knowledge, capable of solving simple IT issues. Younger generations who grew up with modern technology, and probably had some type of IT lectures or courses during their studies, are skilful enough to solve these simple IT issues. Another way to overcome the sporadic need for IT knowledge is to hire services from an IT service provider or from a consulting firm (Kron et al. 2007a, pp. 28-29).

In addition to estimates about the amount of ICT expenses in 2005, respondents were asked how they expect ICT costs to develop up to 2010 and again differentiate between hardware, software and IT personnel.

Figure 19 shows that the majority of companies expect software costs to remain the same in the near future.

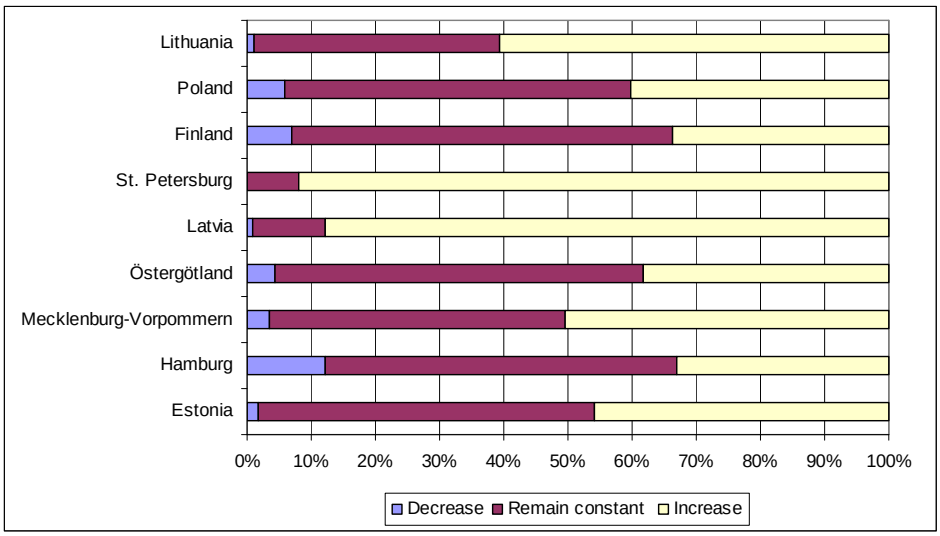

Figure 19 Expected development of software expenses up to 2010. Source: Own illustration

Regarding the expected development of software expenses up to 2010 only a few companies believe that ICT costs for software will decrease while the majority expect costs to remain constant or to even increase. One reason for this could be that an increasing number of business processes will be handled electronically in the next period. Order tracking and service status, payment possibilities etc. will increasingly be available online in the future, thus requiring new software and hardware.

With an increasing number of people using e-mail and the internet for everyday business or for private matters such as banking, the need for higher security with respect to certain information has increased enormously. Information and network security are increasingly recognised as vital elements for ensuring participation in the information society. Among the different measures used to protect data, the most implemented ones are password access control, virus protection applications, and computer firewall applications (see figure 20). Regions such as Mecklenburg-Vorpommern and Southwest Finland lag behind others in the BSR regarding the issue of employee education on data security.

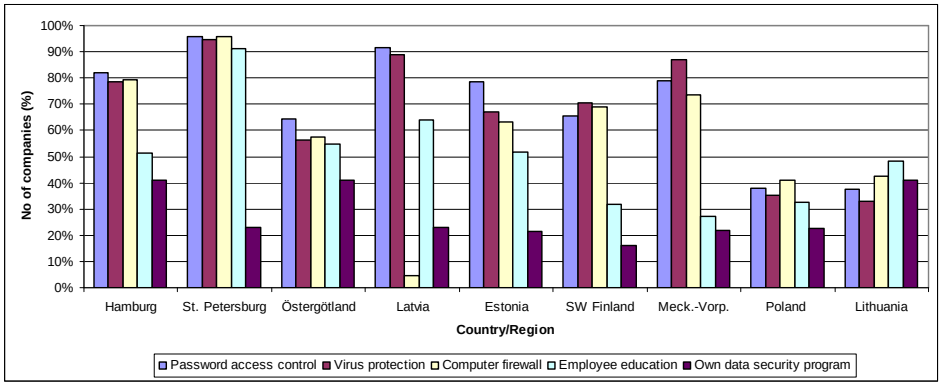

Figure 20 Availability of different data security measures. Source: Own illustration

Monitoring IT expenses and performance can lead to remarkable savings in costs and can make the company function more efficiently through enhanced solutions. Many of the surveyed companies in all of the regions regularly monitor and evaluate ICT expenses and performance internally (Kron, E. et al. 2007a, pp. 32-33).

E-commerce and E-business

Electronic commerce or e-commerce is the ability to perform major commercial transactions electronically. There is no generally accepted definition for the term. In the following, electronic business, or e-business is defined as a collection of business models and processes motivated by internet technology and focused on the improvement of extended enterprise performance. With the help of e-business, companies are able to link their internal and external data processing systems more efficiently and more flexibly. Thus they can work more closely with suppliers and partners, and can better satisfy the needs and expectations of their customers. In comparison to e-commerce, e-business refers to a more strategic focus, it emphasises the functions that use electronic capabilities. E-commerce is a subset of an overall e-business strategy (Kersten et al. 2007e, p. 36).

In another question, the respondents were asked to estimate the share of e-commerce conducted with their customers for the year 2006 (figure 21).

None of the surveyed companies handled more than 60 percent of their business electronically. Hamburg and Estonia are the regions that show a higher acceptance of e-commerce. In contrast to these regions, St. Petersburg and Latvia show a considerably lower acceptance of e-

commerce. Among the reasons for this low acceptance could be the perception of low benefits for the company. Therefore, the companies are not willing to invest in developing internet shops or other means for e-trading.

Companies in Östergötland, Southwest Finland and Mecklenburg-Vorpommern are slowly but increasingly accepting trading over the internet (Kron et al. 2007b, p. 39).

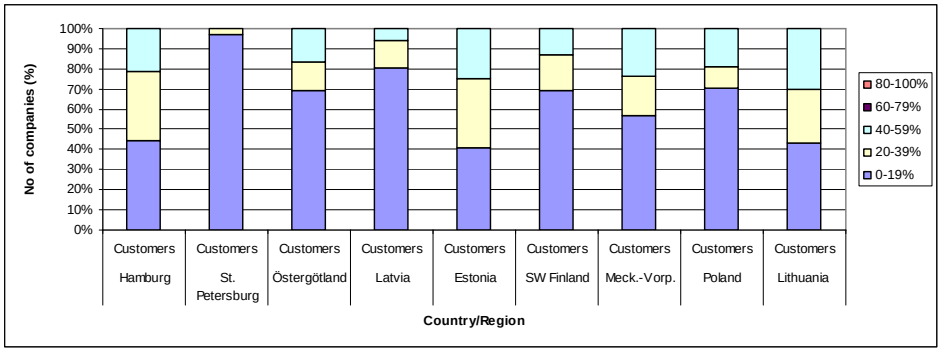

Figure 21 Estimated share of e-commerce business with customers. Source: Own illustration

The results of the survey indicate that the increased application of modern information and communication technologies is finding its way into SMEs. The growing importance of e-commerce and e-business is being realised and will be increasingly incorporated into business strategies in the future.

8 RESULTS FROM THE EXPERT INTERVIEWS

In the following, an introduction will be given to the expert interviews conducted in the participating regions. The target group and sample will be described and trends in logistics and ICT as well as regional development activities will be explained. The respondents' answers regarding education, competence and required qualifications in the regions and also companies' expectations will conclude the chapter.

8.1 Introduction to the expert interviews

While the logistics survey and the ICT survey mainly focused on the current status and needs of the logistics community and allowed for a quantitative analysis, the expert interviews mainly followed a qualitative approach. The aim was to investigate regional strengths and weaknesses with respect to logistics and ICT. Nevertheless, expectations and future visions about and of different kinds of institutions and companies were also examined.

A willingness to answer questions in greater depth and in an open discussion can only be achieved by personal and individual conversations with selected interview partners. Furthermore, the aim was not only the aim to analyse the current situation but also to uncover the background and causes leading to current situations and make recommendations and determine future trends in regional development. Thus, the complexity and multifarious nature of the research questions required personal interviews and a qualitative approach. With ten to fifteen interviews in each region, it was possible to cover the major views on regional development regarding logistics and ICT.

The interviews were conducted according to a semi-structured interview guideline. Most questions were open questions. A quantitative scale was used in addition to the qualitative answers as it seemed useful for making later comparisons between the interviews.

The interview guideline comprised five major parts. The first part covered general trends regarding logistics and ICT, while the second

part dealt with current and planned business contacts in the BSR. Furthermore, the barriers and problems of doing business in the BSR were discussed. Part three analysed regional development measures. This began by looking at key issues and evaluating regional development activities. It then discussed the strengths and weaknesses of the region, competence levels with respect to logistics and ICT and finally proposals for improvements were examined. Part four addressed the issue of qualification levels in the logistics and ICT businesses as well as future needs for education. The interview guideline finished by discussing expectations and wishes and asking the interview partners to make concrete recommendations for improvements in the logistics industry (Kersten et al. 2007g, pp.17-18, 21).

8.2 Target group and sample

The objective was to choose a heterogeneous target group in order to guarantee an analysis based on many perspectives. In each region, ten to fifteen interview partners were selected, representing seven different institutions or company groups: Local authorities, logistics consultants, logistics service providers, research institutions, support initiatives and companies from the manufacturing as well as the retail industry. Another aspect in selecting the companies or institutions was the possibility to contact potential interview partners at a higher management level in order to ensure that the interview partners had the willingness to answer the questions and possessed a good overview of the development of the industry in the region.

The private sector is represented by four different company groups: The manufacturing industry, the retail industry, logistics service providers and logistics consultants. The latter two were chosen because their employees are usually experienced and have numerous clients and/or projects.

The public sector is mainly represented by local authorities, which are responsible for regional development. Support initiatives may either belong to the private or the public sector or are public-private partnerships. Both institutional groups have experience in initiating, financing and executing regional development activities. Lastly, representatives from research institutions complete the target group by presenting their independent and research-oriented perspective. Figure

22 shows the target groups separated into the public and the private sector (Kersten et al. 2007g, pp.19-20).

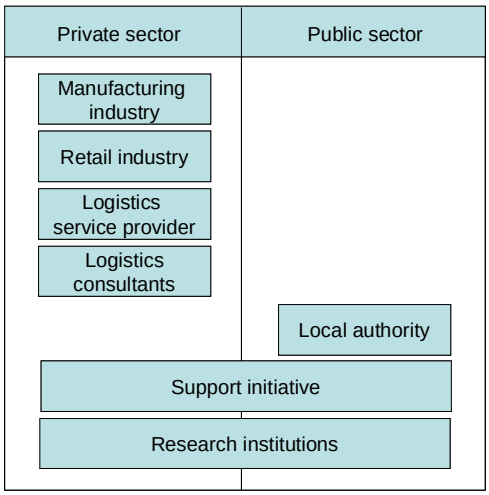

Figure 22 Target groups of the expert interviews by public and private sector. Source: Kersten et al. 2007g, p.20

The "Aggregated Expert Interview Report" written by Matti Takalokastari resulted within the scope of the LogOn Baltic project and provides the basis for the following results.

8.3 Trends in Logistics and ICT

The trends that were mentioned in the expert interviews were partly specific to the regions, being driven by changes in their operating conditions or economic environment. Other trends could be identified which were prevalent in several regions. Since the respondents very often did not distinguish between trends affecting their own company or the region, they will not be differentiated between in the following.

Trends in Logistics and ICT

Globalisation and internationalisation are issues that were often mentioned by the experts. The result is not surprising as the two issues have been widely discussed in recent years in various contexts. The respondents' comments about globalisation can be divided into two different categories: European Union enlargement and trade with the Far East.

European Union enlargement in May 2004 has affected logistics operating conditions in the regions in different ways. It was mentioned that as border crossing has become easier, it has had positive effects on the speed, precision and predictability of international deliveries from the EU to the region and vice versa. In some regions, certain industries were moved to Eastern Europe in search of lower costs. Trade with the Far East was also often mentioned as an issue affecting logistics. The amount of Asian suppliers continues to increase and has set its own requirements for supply chains. This was also regarded as an opportunity in the regions that could benefit from their possible position as a gateway from the Far East into Europe.

Outsourcing was mentioned by the experts in most of the regions. An increase in the outsourcing of logistics activities can be observed especially in transportation services, but also in other logistics services. Third party logistics providers are increasingly often expected to provide comprehensive integrated logistics solutions combining transportation, warehousing, freight forwarding, value added services and other services.

Regardless of differences in existing infrastructure levels in the BSR the **transport infrastructure** was expected to experience bottlenecks that reduce the effectiveness of logistics in most of the regions involved. Infrastructure investments were seen as requiring comprehensive strategic planning in order to be effective, and more coordination was often hoped for.

Increasing volumes of goods transported around the BSR are expected to require future investments in seaports. The importance of seaports in the region will remain high. Some of the interviewed experts voiced their concern over the limited space available for port development. In the countries that have a border with Russia, crossing into Russia was considered increasingly problematic. Truck queues have kept building up on the Russian border in several of the BSR countries.

Inter-modality was seen as a growing trend, and container cargo transports in particular are expected to grow significantly. This development will place its own requirements on container handling terminals. One of the factors facilitating the growth of inter-modal transport is the growing concern over environmental issues in society.

The **centralisation of inventories** is an apparent development especially in the northern BSR and is often regarded as a result of increasing internationalisation. The ease of transportation over borders

is enabling companies to create “Nordic” or “Pan-Baltic” distribution centres.

Other trends that were mentioned comprise the following: The growth of the logistics sector in many of the regions is expected to cause a shortage of qualified labour. The respondents expected this to either force companies to find more effective logistics solutions, or to require the regions to educate and attract more logistics professionals to the region.

Trends in ICT

The demand for easy and fast access to information was considered a major ICT trend affecting all sectors of economic activity. Not only is the speed of information flow rising, but the volume of information to be handled is also growing. Both require that companies develop their ICT systems accordingly. Well-developed ICT systems and ICT competence is becoming more important. An example of this development is the increasing use of tracking and tracing systems, which often allow the monitoring and controlling cargo shipments in real time on the internet.

The **growth of electronic trade and internet trade** is expected to continue. This trend applies to retail as well as to wholesale trade. The scope and volume of retail trade via the internet is expected to increase. Some experts considered electronic purchasing to be significantly more efficient in comparison with other options and expect the electronic wholesale business to keep growing.

Furthermore, not only is the trade in goods increasing, but also the amount of electronic services that are being offered is growing. In addition, the use of e-service applications offered by state and local governments is expected to increase. Experts also saw significant growth potential in the amount of electronic governmental services on offer in several regions. One obvious drawback though would be that electronic trade and services will require a greater focus on ICT security issues (Takalokastari 2007, pp.15-18).

8.4 Regional Development Activities

The estimates of the percentage of **successful regional development projects** varied significantly by region. Based on the interviews it appears that the success or failure of regional development projects depends mostly on the actors that are involved, not so much on other

factors. It proved to be difficult for the respondents to estimate the success of already implemented regional development projects because regional development projects or sometimes even the concept of a regional development project was poorly known. This lack of control or strategic vision was seen as a common reason for failure concerning the projects. According to the respondents the implementation of projects is most often successful when there is a concrete need to fulfil an aim and that aim is clearly defined.

Most of the experts from the interviewed companies or institutions were **participating in either logistics support agencies, networks or initiatives** for the sake of networking. Furthermore, the participants were gaining the possibility to support local development and obtain information about regional developments.

The experts were asked to assess their **level of satisfaction concerning local authority support and policy on logistics and ICT issues** and to make suggestions for improvement. Some of the suggestions were common to several of the regions: Firstly, the companies wished for a more holistic approach regarding regional development. Secondly, they stated that communication between authorities and companies should be improved, and co-operation increased. Thirdly, infrastructure development issues often arose in the interviews in relation to proposals for improvement that should be carried out by local authorities.

Local authorities' support and policies concerning logistics issues mostly received neutral ratings. Several experts stated that they did not know about local authorities' support and policy, or that they did not even expect to get support from the authorities. Overall it would seem that there is room for improvement on support and policy issues, but that the level was not generally considered poor.

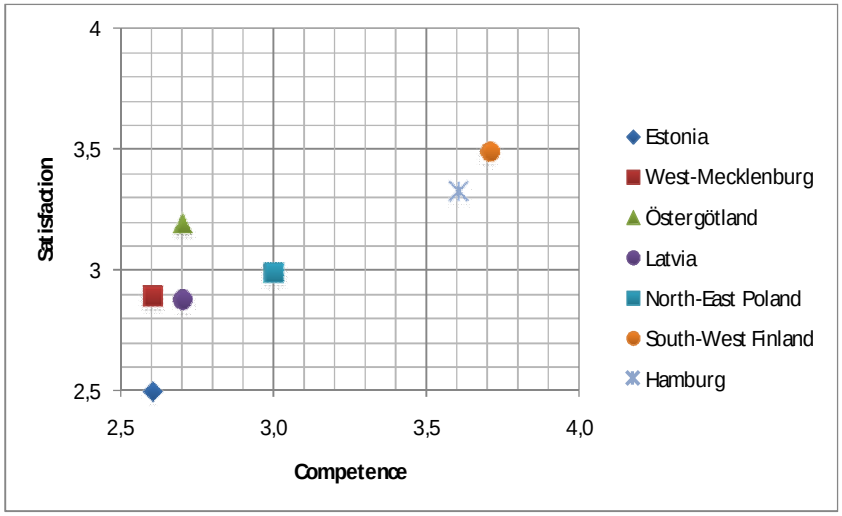

Figure 23 Satisfaction related to authorities' average logistics competence and policy. Source: Takalokastari 2007, p. 22

The rating of local authorities' support and policy concerning logistics appears to rise with the logistics competence level (see figure 23). In regions where local authorities' logistics competence was estimated as being high on average, satisfaction with local authorities' support and policy was also regarded as high. The main sources of dissatisfaction were insufficient activity by authorities in relation to infrastructure development, weaknesses in strategic planning and the unsuccessful implementation of planned activities. In addition, delays in infrastructure development projects often negatively affected the experts' dissatisfaction.

Evaluating **local authorities' ICT support and policy** proved to be difficult for the interviewed experts. Local authority support and policy concerning ICT matters was often unknown to the respondents. However, when it was known ICT support and policy received slightly better ratings than logistics support and policy and was mostly considered sufficient. The development of an ICT infrastructure is usually faster as it is not as expensive and is more commonly carried out by the private sector, which is often not the case with the development of a logistics infrastructure. The most common proposal for improvement concerned services electronically offered by the authorities. It was thought that more public services and documents should be made available on the internet. Commonly the respondents were neither dissatisfied nor satisfied with the ICT support and policy of their local authorities (Takalokastari 2007, pp. 19-22).

The experts' statements concerning the question of **who should carry out regional development measures** were very similar. The most common response was that the development of regional logistics projects should ideally come from companies because they generally ensure the demand for projects. The companies developing the projects not only know the needs and the market, but are also able to estimate the consequences of projects. The advantage for companies is their independence, which allows them to change a business direction in a relatively short period of time. Projects carried out by the public sector always depend on their current political situation, which often means that particular projects that may be good for companies and the economy are not pursued because of differing political interests. However, if companies are not able to start and develop a project. it is assumed that they will contact regional associations for help.

The majority of the interviewed experts are of the opinion that projects concerning the infrastructure, e.g. port infrastructure and road works, should be begun by the state after mutual consent has been reached between associations and companies. If the state does not have the financial resources available, a public-private partnership was usually suggested as being an alternative solution for these kinds of infrastructure projects. A public-private partnership is any partnership with federal agencies, state agencies or individuals or any combination of federal agencies, state agencies or individuals that includes corporations and private persons or organisations. By sharing costs and risks, the state is able to realise more projects. Figure 24 illustrates the interplay between the companies, the associations and the state. It shows that projects can only be developed successfully if there is a good communication flow between companies and associations as well as between associations and state or public-private partnerships. In preparation for future projects it was thought that these channels of communication should be strengthened (Kersten et al. 2007g, pp. 41-42).

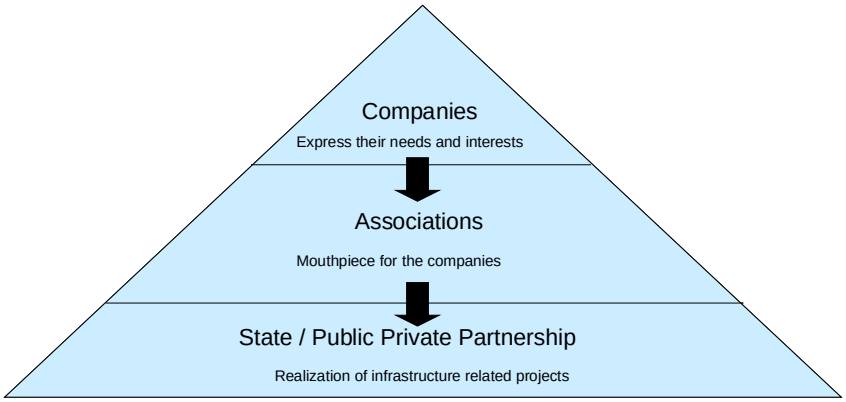

Figure 24 Interplay between companies, associations and the state. Source: Kersten et al. 2007g, p. 42

8.5 Education, competence and qualifications in the regions

The interviewees were asked to estimate the qualification level of employees in logistics in their company and in their region. To get a more detailed picture, employees were classified into three groups: blue-collar workers, white-collar workers and managers. Some experts were not able to fully rate the level of qualification in their company, because they did not employ every type of employee (Kersten et al. 2007g, pp. 42-43).

The overall **logistics and ICT qualification level of employees** in the respondents' companies was considered acceptable or high. The qualification level of blue-collar workers was considered lowest, that of management highest and white collar workers were seen as being in between the two. Some experts found the rating of employee groups' competence levels difficult due to differences within the groups. In general, the qualification level of employees seems to increase with seniority. Many of the interviewed experts mentioned that their organisation offers training for their employees. This may be one factor behind the relatively high qualification level estimates. The regional differences in estimates of employees' qualification levels were small. Regarding the qualification level of employees in their region, the estimates were slightly lower than the qualification level in their own organisation. However, they still remained acceptable or above average.

The rating of management ICT qualifications had considerable variation in many regions for two reasons: Management often consists of more experienced employees whose ICT skills were estimated as being lower by some interviewees than those of their company's younger employees. Younger employees were seen as often bringing new ICT skills and knowledge from schools to the companies. It was also stated by some of the respondents that ICT qualification depends on the amount of ICT related work required in different branches and tasks. Despite the factors mentioned above, management ICT qualification was still considered to be slightly higher than that of white-collar workers. The largest differences between the average ratings in the regions were found in the qualifications of blue-collar employees. On this issue, Poland and the Baltic States received slightly lower ratings on average. The differences became smaller when the respondents were estimating white-collar workers' or management's qualification levels (Takalokastari 2007, pp. 25-31).

Expectations for future educational training in logistics and ICT regarded a constant improvement in employees' professional qualifications as essential because the operating environment was undergoing constant change in most branches. Hence, it is vital for workers to constantly learn new skills and working methods. Organisations often offered regular further education and in-house professional training to their own employees. Secondly, general ICT knowledge is important on all employee levels. The use of ICT tools is common in all kinds of tasks and consequently proficiency in using common ICT-based tools is therefore increasingly important. Thirdly, against the background of internationalisation, language proficiency is expected to be critical in the future as is knowledge of other cultures and the ability to co-operate (Takalokastari 2007, pp. 31-32).

The respondents were asked to evaluate the **logistics competence level** of four different groups of actors in their respective regions. The scale that was used was from 1 (very low) to 5 (very high). The competence of the respondents' own organisation was usually estimated the highest, namely high or very high in all of the regions. In contrast, the overall logistics competence in comparison to other regions in the BSR was estimated to be slightly lower, and so were the support agencies. In particular, local authorities' logistics competences were seen as being the most lacking. While there were significant differences in the level of logistics competence in the regions, the relationship of the logistics competences of different actors within a region followed the same pattern in almost all of the BSR.

The logistics competence of the regions was mostly considered to be high or in some regions acceptable (see figure 25). Experts in Hamburg had a positive attitude. Their region was viewed as a well-established hub area for logistics with mostly good conditions regarding logistics issues. Excellent transport connections and several successful players in the logistics business were mentioned. Similar motivations for stating high regional logistics competence were also given in the Finnish interviews. Latvia received the lowest average grade of the involved regions. Nevertheless, the regional competence level was rated acceptable by all but one respondent. In Northeast Poland the experts viewed their regions' logistics competence as lower than in Germany and Scandinavia, but on the same or at a higher level than in other regions of the BSR.

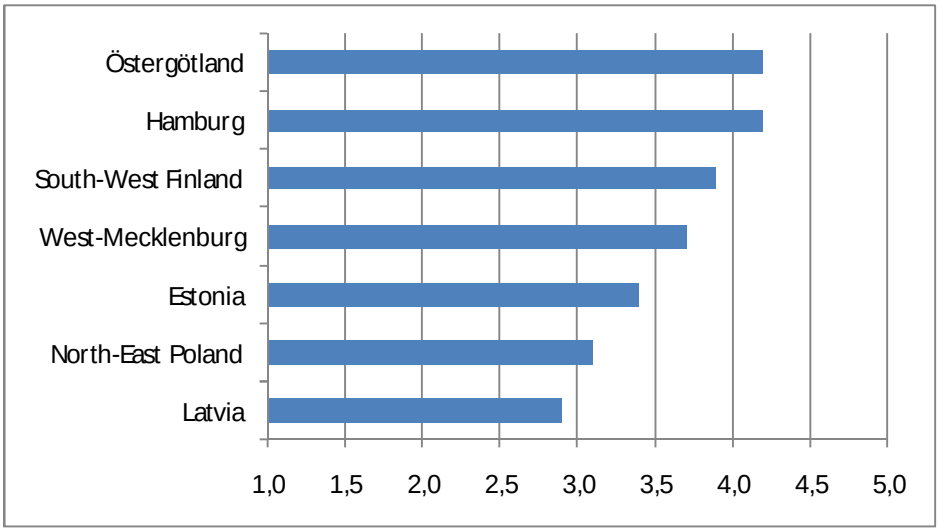

Figure 25 Logistics competence level of the regions in the BSR. Source: Takalokastari 2007, p. 34

The logistics competence level of local authorities was generally considered lower than of other actors. It was often regarded as difficult to estimate since there are different divisions within local authorities, each with their own focus and different competence levels. The answers concerning local authorities were also the most varied. Only in Southwest Finland and Hamburg was their competence regarded as high. Despite their high rating in Southwest Finland, it was pointed out that their focus on logistics issues is not always sufficient. Room for improvement in the logistics competence of regional authorities can be found in all regions, e.g. due to a lack of planning for logistics and the

lack of awareness of the developments in the private sector. In Estonia a point was made that there is no separate Ministry of Transport, which there is in most other countries.

The competence of support agencies was generally viewed as acceptable or high. As with local authorities, the opinion of the competence of support agencies was highly dependent on the support agencies the respondents had been in contact with. Several of the respondents were unable to estimate the competence of support agencies as they had not been in sufficient, or in any contact, with such agencies in order to make an estimate. The respondents that had been in contact with support agencies were however quite often satisfied with their work. It can be deduced from the results that the quality of the support agencies' work and their logistics competence is often seen as satisfactory. Problematically, an awareness of regional development projects is low and marketing measures should be reinforced for them.

While there is still room for improvement especially in the competences of local authorities, it can be concluded from the results that overall the level of logistics competence in the participating regions is high (Takalokastari 2007, pp. 32-36).

8.6 Companies' expectations

The following two expectations and wishes were common to several regions. Projects to improve the **transportation infrastructure** remain a central issue in the development discussion. They were very often specific statements with regard to building new highways or improving railroad connections. Several of the regions participating in the project thought that they are able to benefit from their geographical position, but a well-constructed infrastructure would be a precondition for them. Infrastructure development was seen as a slow and expensive process with effects reaching far into the future. Such long time scales caused uncertainty in the planning process. Strategic planning was seen as vital for ensuring a sufficient and well-functioning infrastructure in the future. It was often thought that involving the private sector early in this type of planning process would therefore enable such development to serve the needs of business life better.

Several of the experts wished for **more co-operation between the private and the public sector** in logistics development projects in general. It was also argued that the public sector should have a deeper understanding of the importance of logistics for economic activity and

also the requirements which have to be fulfilled to achieve effective logistics operations. Hence, when making such decisions the consensus was it might be beneficial to involve the private sector early on in the process in order to achieve effective solutions as changes in the logistical environment are often slow processes or long-term projects. Furthermore, to be able to better serve the needs of a region, it was stated that public sector actors should perform long-term strategic planning for logistics for which a concrete action plan is produced. That then has to be followed in order to achieve better operating conditions in a region and it was commonly believed that this strategic planning process should involve the private sector.

The use of public-private partnerships in regional development in general, and also in infrastructure development projects in particular is expected to increase in the future. In the interviews, public-private partnerships were commonly seen as an effective way of implementing development projects and achieving the significant additional benefit of the more effective utilisation of local know-how (Takalokastari 2007, pp. 37-38).

PART III: INTEGRATION OF THE DATA

9 INTEGRATION OF THE RESULTS

This chapter integrates results from the different data gathered during the project and described in the previous parts of this report. The current situation and future development needs regarding logistics and ICT will be discussed. In the following section, the strengths and weaknesses of the regions with respect to logistics and ICT will be presented. Based on this, the key success factors for regional development will be analysed in chapter 9.2.

9.1 Analysis of the BSR's strengths and weaknesses

In this section, the strengths and weaknesses of the region are presented. They integrate the data collected from the two surveys during desk research and, most importantly, from the expert interviews. The experts were asked in which areas they see strengths and weaknesses with respect to logistics and ICT. Some experts also came up with more general issues. Of course, all the results have to be interpreted against the background of the overall situation of a region as they mostly reflect the perspective of local companies and institutions within their country. Thus, the aspects mentioned here are not necessarily strengths and weaknesses compared with the other regions participating in the project but strengths and weaknesses compared with other competing regions in the same country (Kersten et al. 2007a).

The results are brought together and categorized in the following table:

Table 7 Analysis of strengths and weaknesses. Source: Own illustration

Region	Strengths of the region	Weaknesses of the region
Estonia	**General location factors** • Favourable geographical location in relation to main suppliers and clients **ICT** • Modern IT solutions • Willingness to use ICT is high (high internet access rate) • Public sector support for ICT is high **Education & Workforce** • Labour skills and abilities in operating under difficult conditions	**General location factors** • Lack of economies of scale due to a small market **Logistics** • Poor quality of road infrastructure • Competence level of local authorities with respect to logistics rather poor **ICT** • No clear vision from the public sector on how to develop the ICT sector **Education & Workforce** • Low level of vocational training in logistics and ICT, shortage of IT specialists **Regional development** • Little attention to long term planning • Difficult relations with Russia • Tallinn centeredness
Hamburg	**General location factors** • Geographical position: The harbour is the most important North European harbour for Baltic Sea traffic • Strong economic power (large catchment area and population) • Attractiveness of the city for managers	**Logistics** • Planning and extension of infrastructure projects are often very slow • Allocation of logistics space problematic • Interest in logistics still very low from policy makers • Focus is often too much on the harbour • High costs (labour, property, taxes)

Region	Strengths of the region	Weaknesses of the region
	Logistics • A high number of logistics hubs (waterways, roads, railway) • Clusters in logistics and related industries (e.g. the maritime cluster) • Logistics properties (particularly in the surrounding region) **ICT** • Competence networks in the field of ICT (e.g. Dakosy, Hamburg@work) **Education & Workforce** • High competence of employees due to concentrated know-how, several universities with a wide variety of offers	**ICT** • A lot of IT systems exist in parallel • Very few ICT providers which are specialised in logistics **Education & Workforce** • Very few employees have a specialised apprenticeship or academic background in logistics à problems to get sufficient qualified staff **Regional development** • No bundling of activities • Lack of service orientation of the local authorities towards interested companies
Latvia	**General location factors** • Location on the Russian-EU border and the Trans-Siberian transport axis • Relatively inexpensive workforce **Logistics** • Good railway network (same track gauge as Russia) and existence of ports • Emergence of private investors and the emergence of cargo transport companies focusing on the local market **ICT** • IT infrastructure with respect to communication networks • IT education • IT workforce costs • Relatively large number of good IT companies	**General location factors** • Remote location from the rest of the EU, the Baltic Sea being a natural barrier • Small market **Logistics** • Inadequate quality of road infrastructure, lack of warehouses and distribution centres • Lack of a comprehensive development strategy for the logistics sector and a lack of state support, also due to only small financial resources **ICT** • Public sector support in the field of ICT • Underdeveloped throughput capacity of IT infrastructure • Under-utilisation of new technologies

Region	Strengths of the region	Weaknesses of the region
	Regional development • Good tax policy	**Education & Workforce** • Shortage of workforce, especially on low and medium-skilled levels • Low level of education in logistics related disciplines **Regional development** • Contradictions of EU and Russian (customs) policy • Lack of coordination among the different actors on regional development
Mecklenburg-Vorpommern	**General location factors** • Geographical position (vicinity to markets and customers, good connections to Northern Europe, Eastern Europe/Asia), especially for the maritime sector • Relatively low labour costs compared to other regions in Germany • Company and competence cluster for wood, timber, food and shipbuilding **Logistics** • Multi-modal transport chains via the port, well-developed road and rail connections (hub of wood and timber in Europe) • Good opportunities for specialised products in the area of logistics • Physical space for locating a company **ICT** • Existing ICT infrastructure	**General location factors** • Relatively far from densely populated areas like Berlin or Hamburg • Low industrial density and poor diversification • High taxes, energy and labour costs **Logistics** • Capacity problems and infrastructure extension • No adequate hinterland connection • Lack of overall logistics strategy **ICT** • Missing integration of ICT networks and extensive DSL connections **Education & Workforce** • Shortage of qualified workforce because many people leave the region and seek better jobs in Western Germany • Logistics not given its necessary importance in the region's universities

Region	Strengths of the region	Weaknesses of the region
		Regional development • Bureaucratic procedures and over-regulation
Östergötland	**General location factors** • The region often serves as a distribution centre for the Nordic market **Logistics** • All transport modes present • All major logistics providers are established • Strong position as a logistics centre **ICT** • Strong ICT cluster in developing and commercialising new products **Education & Workforce** • High availability of specialists due to the university	**General location factors** • Small region which is not well-known and thus is not seen as a strategically important region by the national government and needs more marketing than other regions **Logistics** • Road infrastructure • Need to upgrade inter-modal terminal **Regional development** • A local focus by regional policy makers, no regional thinking • Local authorities lack competence, no strong regional organisation that promotes the region
Pomerania	**General location factors** • Economic potential of the Tri-Cities agglomeration with sea ports and airport **Logistics** • Located on crossroads of the main transportation corridors north-south and east-west **ICT** • Strong job market for software developers • Investments in software companies	**General location factors** • Far from main population centres **Logistics** • Poor transportation infrastructure and lack of modern warehousing and logistics centres **ICT** • Relatively high IT costs and low usage of ICT in businesses **Regional development** • Long-term planning for the implementation of infrastructure projects • Low logistics and ICT awareness and related projects

Region	Strengths of the region	Weaknesses of the region
Southwest Finland	**General location factors** • SW Finland is Finland's closest location to Central Europe • Geographical position (good traffic connections to Scandinavian countries and the whole of the BSR) **Logistics** • Overall good transport infrastructure **ICT** • Modern ICT infrastructure • Successful programmes for SMEs in order to support ICT **Education & Workforce** • Availability of skilled workforce (three universities)	**General location factors** • Distance to continental Europe and other parts of the country • High logistics costs **Logistics** • Railroad infrastructure • Condition of road infrastructure, especially compared to bigger cities such as Helsinki • High pilotage dues in ports **Education & Workforce** • In particular, SMEs often lack ICT-skilled people • Amount of education at different levels is not balanced: it is hard to find a lower-skilled workforce (e.g. truck drivers) **Regional development** • Many actors in the development area, but reality of the companies not always met
St. Petersburg	**General location factors** • Geographically and politically advantageous position • Rapid economic development • Proximity to markets and customers of the BSR and EU • Low level of labour costs **Logistics** • The port and its connection to all transportation means • Large number of science organisations • Large number of educational organisations	**Logistics** • Low effect of state budget investments into logistics infrastructure in the region, concentration mostly on transport infrastructure • Road infrastructure is not sufficient for volume of cargo • Limitation in port facility areas, e.g. terminals • No consistency in policy for airports and ports tariffs • Lack of complex solutions in the development of different logistics chains due to both market failures and administrative aspects

Region	Strengths of the region	Weaknesses of the region
		ICT • Private transport companies often do not have experience in using electronic information exchange methods • Level of information systems of state organisations partly insufficient **Education & Workforce** • Problems in getting sufficiently qualified staff, universities are just starting to teach logistics **Regional development** • Federal and regional structure of government weakly supports horizontal links

As can be seen from the table, the strengths and weaknesses identified in the regions can be grouped into five categories: General location factors, logistics, ICT, education and the workforce, and regional development.

General location factors

All strengths and weaknesses that are related to the BSR's geographical position and economic key factors are summarised under the general location factors. Nearly all of the regions named geographical position as one of their most important strengths. One reason for this is the location of all regions directly on the shores of the Baltic Sea, thus all regions have ports and direct connections to customers in Northern, Eastern, Central, and Western Europe. In addition, all are located at the border of important transport corridors. For the Baltic States and Finland, the borders with Russia lead to a competitive advantage, as most of the goods transported to the EU pass through these countries. On the other hand, the location can be a disadvantage at the same time, e.g. Finland and Latvia pointed out their location is remote from Continental and Western Europe. Another problem is the difficulty caused by differing customs policies for goods transfer between the EU and Russia.

Other general factors are the size of the market and the overall economic power of the region, which are strengths in the case of Hamburg, but weaknesses in regions such as Mecklenburg-Vorpommern or the Baltic States, which generally lack economies of scale due to their small market size. Lastly, the level of costs plays an important role either as a strength or as a weakness. The Eastern European regions, Pomerania, St. Petersburg and partly Mecklenburg-Vorpommern see their low cost level as an advantage, unlike Hamburg which suffers from relatively high labour costs, taxes etc. However, the logistics survey has also shown that logistics costs vary from region to region relative to the turnover of companies, but that there is not a large difference between Western European regions and Eastern European regions.

Logistics

The transport infrastructure is closely linked to geographic position.

Hamburg combines junctions of waterways, railways and the road network in a logistics hub of great significance for Northern Europe and is the dominant infrastructure point in Hamburg. In most of the other regions, all transport infrastructure modes are present but vary in their quality and quantity to a large extent. While regions such as Latvia, Pomerania and Estonia criticise the quality standards of their road network or inadequate connections, other regions in the BSR have the differing problem of how to cope with growing traffic volumes with their existing, mostly well-developed infrastructure. In particular, Hamburg faces this problem. Thus, in Hamburg the infrastructure is not only seen as a strength, but also as a weakness. While the basic infrastructure conditions in regions like Hamburg are good, new infrastructure projects or the extension of existing infrastructure are often realised very slowly and the planning horizon is very long. The consequences can already be seen: Traffic jams, lower capacities, the problems of transporting containers via waterways to the hinterland etc. Therefore, reducing bottlenecks in the road or railway network, the development of logistics and distribution centres, container terminals, and the establishment of inter-modal hubs are of great relevance especially, in the Baltic States and Pomerania. Consequently, suggestions for the improvement of infrastructure were made in all regions.

Another topic of importance to logistics is the existence of clusters. This aspect is an important strength for the Hamburg region. The logistics cluster not only comprises a high number of logistics

companies, but also related industries such as the maritime cluster (shipbuilding companies, ship financing companies etc.). An advantage of competence clusters like this is that Hamburg serves as a meeting place for companies, especially for those that do not necessarily have their own business there. Ideas such as the so-called “Logistics Initiative”, which tries to bundle interests and activities in the logistics sector in a bid to further strengthen a cluster can and do serve as a role model for other regions. For example, in Mecklenburg-Vorpommern, a logistics initiative is currently being founded.

Another criticism in some of the regions was too narrow focus by the national and/or local authorities either on a specific region or on a specific mode of transport: In Hamburg, the focus is mainly on the port, in Östergötland policy makers are said to focus too much on the municipalities and do not take a regional view, in Finland the authorities are accused of paying too much attention to big city centres but neglect smaller regions.

Overall, the most mentioned weaknesses in all regions were

- Qualitative or quantitative issues regarding the transport infrastructure,
- A lack of strategic, consistent and long-term planning (e.g. in Estonia or St. Petersburg),
- The problem of infrastructure planning times being too long (in Hamburg and Mecklenburg-Vorpommern),
- Too narrow a focus on certain regional areas by local and national policy makers, and
- A lack of co-operation and coordination between the private and the public sector.

ICT

With respect to ICT, several regions mentioned their good ICT infrastructure as one of their region’s strengths, e.g. Southwest Finland or Östergötland. Especially in the Baltic States there is a willingness to use modern ICT systems and accordingly IT systems are available and widespread. For example, Estonia has the highest rate of internet users in Europe. Support from the public sector for ICT is also high, although there is often a lack of a clear vision or a long-term strategy for developing the ICT sector (e.g. in Estonia). Furthermore, the integration of ICT networks and the availability of high speed DSL connections could be improved. (Digital Subscriber Line (DSL) is a

family of technologies that provide digital data transmission over the wires of a local telephone network.

In some regions, such as Östergötland and Southwest Finland, there seem to be successful strategies on how to develop and commercialise ICT products. Southwest Finland mentioned the implementation of programmes for SMEs that have supported them in strengthening the usage of ICT. In other regions, such as St. Petersburg or Pomerania, the low diffusion of ICT usage was seen as a weakness. In Hamburg, another category of problems has arisen: ICT systems are widespread, the availability of the infrastructure is good, and there are existing networks; however, a number of experts were critical that a lot of ICT systems exist in parallel and very few providers of ICT solutions specialise in the logistics field. This was therefore evaluated as a weakness for the region.

Education & Workforce

In the field of education and the availability of competent staff two sides of the same coin were seen in nearly every region. Several regions stated that they have several universities and research organisations with a wide variety of courses which is a good precondition at least for the competence of white-collar workers and management. Nevertheless, there is a shortage of sufficiently qualified staff in all regions at different education levels. SMEs, in particular, noted a lack of skilled people. For example, Estonian experts criticised the low level of vocational training in logistics and ICT, while Latvia complained about workforce shortages, especially in the low and medium-skilled sector. In St. Petersburg, there are problems regarding the availability of sufficiently qualified staff at different levels. On the management level, universities have just begun to teach logistics-related subjects. In Western European regions experts are also dissatisfied with the situation. In Southwest Finland, experts stated that education at different levels was not balanced. So, although there are three universities in Turku, which guarantees the high availability of a skilled workforce, there was a shortage of truck drivers, making it more expensive to find adequate staff. In Hamburg, very few employees have a background in logistics and the majority of employees have studied something else and learned logistics “on the job”. Good starting points for developing skilled personnel can be seen in most regions, such as in Hamburg with the initiative “Logistik Lernen” (learning logistics) or in other regions that have new study programmes for logistics.

Regional development

Some of the strengths and weaknesses of regional development have already been explained in the logistics and ICT section respectively. So, in this section, some general findings about regional development are concentrated on.

One of the main results of the expert interviews but also of other data collection methods was that there is generally a very low awareness among companies from the private sector regarding available development measures. This fact was observed in all regions. Thus, a lot of experts were not able to evaluate local or national development activities. A second finding is that aspects grouped into the category “regional development” only appear on the “weakness side” of the table, and that the points of critique are very similar in all regions. It is certainly a matter of fact that successful development activities are not sufficiently promoted.

The most mentioned issue was the lack of a service-oriented organisation of high competence capable of bundling and coordinating different ICT and logistics activities. The concrete impacts of this lack of organisation are diverse: a lack of service-orientation in general (Hamburg), little attention being paid to long-term planning (Estonia), a lack of coordination among different actors (Latvia, Hamburg), long, bureaucratic planning procedures (Mecklenburg-Vorpommern, Hamburg), a lack of a regional perspective and marketing (Östergötland), or the fact that the reality of the companies’ daily business is not always met (Southwest Finland). In addition, because logistics and ICT has just started to be placed on the political agenda there is in some cases still a low awareness among policy makers of the economic importance of these sectors.

9.2 Success factors for regional development

In today’s global economy there are a number of trends that affect the whole of the BSR. In addition to local developments or infrastructure projects, trends that were mentioned in several regions and have cross-regional impacts on logistics and/or ICT include the following:

- General globalisation of the economy and thus growing trade volumes
- The tendency of Western European companies to relocate parts of their production

- The enlargement of the European Union
- The growing tendency to outsource services
- The intensification of co-operative projects and process integration
- Building of competence clusters
- Development of logistics costs
- Automation and system integration
- Demographic changes
- A growing attention to social and environmental issues

These provide opportunities, but also threats to the regions participating in the project. All regions believe that they will benefit from new and bigger markets, harmonised standards and regulations, co-operation with other regions and countries and learn from each other. Foreign investments are facilitated and, especially in the Eastern European countries, seen as an opportunity. Logistics and ICT service providers can benefit from higher demand for their services and more complex solutions. Of course, there is also the other side of the coin. Regions worry that jobs are being relocated to other countries (e.g. Hamburg). Companies fear that new competitors will enter their markets and that competition might be distorted due to differences in taxes, regulations, etc. Another worry is that large volumes of transport cargo may also lead to severe gridlock bottlenecks, particularly in densely populated areas such as Hamburg.

An even greater threat is seen in the demographic and social changes. For example, St. Petersburg is expecting a rapidly growing share of pensioners in its population, which is a fact that was not explicitly mentioned by other regions but is also a severe problem e.g. in Germany. Experts in Pomerania also fear that young, well-educated people will leave the country to seek better job opportunities elsewhere, which is a problem in Mecklenburg-Vorpommern. In Latvia, increasing international crime was also mentioned as a threat. One reason for this is a concern about the unequal development of different regions.

In order to cope with these trends and use strengths to overcome the weaknesses of the regions the following **key factors** for **success** were identified by the regions:

- For regional development institutions: Have a clear vision and long-term strategy and provide a continuous policy on which companies can rely (especially for regions with high economic

growth and a dynamic business environment, like Eastern Europe and St. Petersburg).
- Harmonise regulations in the EU countries and customs regulations with Russia.
- Shorten administrative processes.
- Provide a regional development organisation which is service-oriented, integrates the views of the private as well as the public sector and also markets successful regional development activities.
- Support more co-operation between development agencies, research communities and the business communities in establishing a competence network. An example is the logistics initiative which was recently founded in Hamburg.
- Speak with one regional voice and market the region as such nationally and also internationally (“think big”).
- Develop a qualitatively and quantitatively adequate transport infrastructure (multi-modal logistics centres) in order to balance different modes of transport.
- Develop a comprehensive understanding of logistics and do not simply focus on the transport function.
- Support the usage of ICT with appropriate laws, financial and administrative measures and projects. This also includes adequate data and privacy protection laws. A successful example can be found in Southwest Finland where SMEs are supported effectively regarding their ICT infrastructure.

Successful examples already exist for most of these strategies and measures that have been proposed by the companies and experts interviewed for this project. Two of these are presented in the next section.

9.3 Development and Outlook

The successful regional logistics and ICT-related projects that have been summarised and described in each participating BSR within the development measures impact analysis (DEMIA) are now being analysed by development agencies in other regions. In the near future the participants will discover if those successful concepts can be transferred to their own regions and adapted to their regional work.

The consequences of the LogOn Baltic project will only be obvious one or two years from now (2008).

Within this EU project, the differences between the individual regions have been clearly illustrated. By describing several regional development approaches and by giving a summary and analysis of successfully realised regional projects, as part of the DEMIA, different regions have had the possibility to learn from each other and to profit from the experiences of others. The only way to find joint solutions to common problems such as the improvement of infrastructure and education as well as the improvement of the competitiveness of logistics companies and regions is to transfer know-how and interchange best practice examples within the BSR. All participating regions have to meet these challenges in order to continue further regional development. The task of public institutions is to broaden and reinforce the awareness of regional development measures within the BSR.

LogOn Baltic is only one example for supporting innovative regional development for logistics and ICT. The cross-regional contacts that have been made during the project and the experts who have been connected in this new Baltic network will need some time before they can accomplish goals. Furthermore, it is expected that common projects and approaches will need several months before they are implemented.

10 CONCLUSION

This report is the main document of the LogOn Baltic publication series. The LogOn Baltic project ran from December 2005 until December 2007. The purpose of LogOn Baltic was to present solutions that improve the interplay between logistics and ICT competence and spatial planning, while strengthening small and medium-sized enterprises' (SMEs) competitiveness in the BSR.

The project has brought together experts from the whole of the BSR. More than 30 partners from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden have participated in the project. Data were gathered from each participating region by using four tools, a logistics survey, an ICT survey, a DEMIA (development measure impact analysis) and expert interviews.

The aim of this report was to give a comprehensive overview of the current situation and development of the logistics and ICT industry within the BSR. Thus, the selected results of the empirical data were analysed in combination with the secondary data collected for the LogOn Baltic project. Based on that, the strengths and weaknesses of the regions were identified and key success factors for regional development deduced. It is the first time that this kind of comparable data from surveys and expert interviews in the BSR has been gathered and analysed.

In the **first part** of the report (chapters 1-5), facts about the BSR are presented. The BSR is one of Europe's most dynamic regions. With 75 million inhabitants it represents an attractive market with high purchasing power. The co-operation of cities in the BSR is ancient, yet the regions and countries adjacent to the Baltic Sea represent a quite heterogeneous group with respect to economy and history and also with regard to the organisation of the public sector. This diversity provides the basis for the differences in their current state of economic and social development and the development of their logistics and ICT sectors.

The **second part** (chapters 6-8) discusses the empirical results obtained within the project, the logistics survey, the ICT survey, and the expert interviews.

More than 1,200 manufacturing as well as trading companies and logistics service providers participated in the study in 2007. Similarities as well as differences were highlighted. Similarities include observations regarding the evaluation of the development needs of manufacturing companies, the development of the structure of turnover and the assessment of business threats for logistics service providers. In addition, a trend towards more individualised products and services and costs was identified as playing a major role. Significant differences were also noted in the evaluation of logistics as a source of competitive advantage, especially with reference to the need for the competence of personnel and the evaluation of the business environment. In the Western European regions analysed in this project, more than 60% of the companies considered logistics to be a key source of competitive advantage. At the same time, companies in these regions regarded strategic and inter-organisational activities as the major development needs, while not surprisingly, other regions were still more concerned with operational issues. One main result is that a reduction in logistics costs was considered to be one of the main challenges for logistics service providers and users of these services.

Different topics were covered by the ICT survey, ranging from the usage of ICT systems, ICT administration and costs, to barriers to usage and the future development of ICT. More than 1,200 Baltic respondents took part in the survey, the majority representing SMEs. This supports the main objective of the LogOn Baltic project, which was to evaluate the needs and to strengthen the competitiveness of SMEs.

The results of the survey show that in the majority of companies, more than 75% of the employees have access to internet and e-mail, which shows that they are widely used. Finance, accounting, marketing, sales and sourcing are functions where ICT systems are used most often. Nevertheless, there are still discrepancies within the companies of the BSR when it comes to the usage of ICT in production planning.

In most cases, the estimated costs for personnel, software and hardware account for 0 to 2.5% of the turnover in each category. In the next three years, however, an increase in these costs is expected.

The results of the survey indicate that the increased application of modern information and communication technologies will also find its way into SMEs. The growing importance of e-commerce and e-business has to be realised and will be increasingly incorporated into business strategies in the future.

For the expert interviews, 10 to 15 experts from each region were chosen. They represented the private as well as the public sector and a wide range of organisations. Globalisation, internationalisation, outsourcing, infrastructure development, inter-modal transport and the centralisation of inventories were identified as logistics trends. Trends in ICT were comprised of the demand for easy and fast access to information and the growth of electronic and internet trade.

Concerning regional development activities, the success rate of regional development projects varied from region to region. The most common reason for the failure of projects was considered to be a lack of strategic vision and coordination; while a concrete goal was often seen as a critical success factor for projects.

The competence level of all employee groups was considered either acceptable or high. Regional differences in estimates were small. Continuous professional training in logistics as well as in ICT was regarded as necessary to keep the competence of employees up-to-date. Language proficiency was seen as becoming important in the course of internationalisation.

Finally, the experts specified their wishes and expectations for policy makers. The latter were concerned with infrastructure development and increasing co-operation between the public and the private sector.

The **third part** of the report (Chapters 9+10) integrated the results and gave examples of successful projects in the BSR. The strengths and weaknesses of the regions were also analysed and found to encompass factors from general location and regional development to very concrete issues regarding ICT and logistics. Also, education and the workforce was a topic in all regions. Two of the key success factors that were identified as important for the regions were; better support for ICT especially in SMEs and working together with research institutions, development organisations and private companies in order to take action that balances and improves education.

The basics for better co-operation between the regions were established during this project. It is now the task of policy makers and regional development agencies in conjunction with the business community and research institutions to make the best of these conditions.

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