1999

Cargo traffic prospects for the new deep sea port in Klaipeda, Lithuania

Robertas Valantiejus
World Maritime University

WORLD MARITIME UNIVERSITY
Malmö, Sweden

CARGO TRAFFIC PROSPECTS FOR THE NEW DEEP SEA PORT IN KLAIPEDA, LITHUANIA

By

ROBERTAS VALANTIEJUS
Lithuania

A dissertation submitted to the World Maritime University in partial fulfilment of the requirements for the award of the degree of

MASTER OF SCIENCE

in

PORT MANAGEMENT

1999

Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views and are not necessarily endorsed by the University.

..... (Signature)

..... (Date)

Supervisor: Ma Shuo

Office: Course Professor, Port- and Shipping Management
World Maritime University

Assessor: Bernard Francou

Office: Associate Professor, Port Management
World Maritime University

Co-assessor: Hans Ludwig Beth

Office: Chief Executive Officer
Marketing and Public Relations Association
Port of Hamburg
Visiting Professor, World Maritime University

Abstract

Title of Dissertation: **Cargo Traffic Prospects for the New Deep Sea Port in Klaipeda, Lithuania**

Degree: **MSc**

The dissertation is aimed at forecasting cargo traffic development in the port of Klaipeda until the year 2015.

A number of factors that influence cargo flows via the port are identified and evaluated in this paper. Political factors discussed in chapter 2 include policies of Lithuania, hinterland countries, and the European Union. In chapter 3, technical advantages and limitations of Klaipeda port are analysed as far as port facilities, nautical access and hinterland connections are concerned. Economic factors are discussed in chapter 4 and include the economies of Lithuania and the hinterland countries.

Two scenarios of cargo traffic development are presented in chapter 5, following the regression analysis of macroeconomic indicators and cargo flows. Lithuanian seaborne trade, as well as transit traffic, are forecasted, the latter being segmented by commodity.

A number of recommendations are made to improve the forecasting procedure in Klaipeda port, including the use of scenario planning.

Keywords: Forecasting, Scenario Planning, Klaipeda port, Lithuania.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AISI	American Iron and Steel Institute
BIMCO	Baltic and International Maritime Council
BTL	Bilspedition Transport & Logistics
CEFTA	Central European Free Trade Agreement
CIS	Commonwealth of the Independent States
Cosco	China Ocean Shipping Company
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EIA	United States Energy Information Administration
EIB	European Investment Bank
EIU	Economist Intelligence Unit
EU	European Union
FDI	Foreign Direct Investment
FEZ	Free Economic Zone
FSU	Former Soviet Union
GDP	Gross Domestic Product
GNP	Gross National Product
GRL	Government of the Republic of Lithuania
GSP	Generalised System of Preferences
IFA	International Fertiliser Industry Association
IFC	International Finance Corporation
IISI	International Iron and Steel Institute
IMF	International Monetary Fund
IPC	International Potash Company
ISL	Institute of Shipping Economics and Logistics
ISPA	Instrument for Structural Policies for Pre-Accession
Klasco	Klaipeda Stevedoring Company
KSSA	Klaipeda State Seaport Authority

LR	Lietuvos rytas
MIS	Marketing Information System
MOE	Ministry of Economy of the Republic of Lithuania
MOT	Ministry of Transport and Communications of the Republic of Lithuania
NATO	North Atlantic Treaty Organisation
NIS	New Independent States
NYK	Nippon Yusen Kaisha
OECD	Organisation for Economic Co-operation and Development
PCAs	Partnership and Co-operation Agreements
PDI	Port Development International
Phare	Programme of assistance to the future member-countries of the EU
RMPM	Rotterdam Municipal Port Management
SL	Statistics Lithuania
SPK	Services of Port Klaipeda
SPM	Single Point Mooring
Tacis	Technical Assistance to the CIS
TENs	Trans-European Transport Networks
TINA	Transport Infrastructure Needs Assessment
UAN	nitric solutions
UNCTAD	United Nations Conference on Trade and Development
US	United States of America
WB	World Bank
WTO	World Trade Organisation

1. Introduction

The main feature of the world today is change. The recent turmoil in Asia has shown that even countries with long lasting economic dynamism are not safeguarded from uncertainties in their development. Some two years ago developing countries in Asia were called the “tiger economies” due to their rapid development. Today they have been pushed a long way back by the crisis. Similarly, the East European countries are following the recent trend in the world economy, and their growth is slowing.

Moreover, this trend is getting even worse in the Baltic States. They are still dependent on the Russian economy, which is in deep recession at the moment. As shipping relies on international trade, certain parts of it have also been badly affected by the recent crisis. Cargo traffic patterns have changed significantly: Russian imports have slumped while exports continue to grow. This change has left its marks at ports on the eastern coast of the Baltic.

However, the ports in the region are not shelving their development projects. Ventspils in Latvia plans to increase capacity by 60% by 2005 and to remain a regional leader in terms of total throughput. Finnish ports are developing container terminals to retain their share in transit traffic to Russia when it recovers. In addition, Russia itself has intentions to build new ports in the Gulf of Finland. All these projects are based on the long-term outlook, and everybody believes that serving the Russian market with some 200 million people offers great opportunities in the future.

To keep pace with the competitors, Klaipeda port is also looking forward and has ambitious plans. Klaipeda State Seaport Authority (KSSA) is implementing the programme for construction and reconstruction of infrastructure works, which is budgeted at 200 million US dollars. It includes deepening the harbour to 14 metres, rehabilitation of the port entrance, constructing and reconstructing quays, and improving the port-railway-road interface. Among the projects already implemented,

there are the reconstruction of quays at Klaipeda Stevedoring Company (Klasco) and jetties at the oil terminal Klaipedos Nafta. The reconstruction of the ro-ro terminal has been completed as well, and the new container terminal was delivered in 1999. After implementation of the programme, the port will be able to handle 25-30 million tons a year.

As far as a long-term development is concerned, the need for the substantial expansion of the port is anticipated. The options in this case are limited, because the port area is narrow and restricted from being widened by the adjacent city. Therefore, only developments in a northern or southern direction are possible. In 1998, the northern option was chosen as more attractive after preliminary studies. The project foresees the expansion of the port into the open sea and towards the north from the port entrance.

In June 1998, the feasibility study of this project was ordered by KSSA, the company Pramprojektas being the main contractor. The first task was to analyse potential throughput of the existing port. Next, future cargo flows in Klaipeda port had to be forecast and the required capacity of the deep-sea port estimated. Other activities included preliminary design, cost estimates, regulatory regime, and environmental and social impact studies.

In this paper, which is an alternative to some findings of the above mentioned study, the methodology of cargo traffic forecasting is proposed. Political, economic and technical factors, which influence port throughput, are analysed and prioritised. Following this analysis, future cargo flows are forecast using scenario planning.

2. Political factors

Cargoes shipped via the port are the part of international trade. As any international activity, seaborne trade carried out through Klaipeda is influenced by the policies of different countries. The major players are Lithuania, the hinterland countries, and the European Union (EU).

2.1. Lithuania

One of the strategic goals outlined in the Programme of the Government of the Republic of Lithuania is to promote the economic well-being of Lithuanian citizens through integration into the European common market of goods, services and capital (GRL, 1999). At present, Lithuania is an associate member of the EU, and progress in the country is monitored by the Association Council and Association Committee. There are hopes that the country will be invited to negotiations on full membership at the end of this year. EU membership will provide full access to the European market and, as a result, trade with other EU countries will intensify and the quantity of transported goods will increase considerably. These developments would mean that additional cargo traffic could be directed through Klaipeda port. Until now, Lithuanian exports and imports to/from the EU contribute 31% to the turnover of the port (KSSA, 1999).

As far as the policy of international trade is concerned, Lithuania seeks to become a member of the World Trade Organisation (WTO) and the Central European Free Trade Agreement (CEFTA). The membership requires the further removal of trade barriers, which are tariff as well as non-tariff measures including complex customs regulations and border crossing procedures. Regarding Lithuania's trade with the EU, the European Commission (EC) has stated that there are no major trade problems (EC, 1999a). This statement proves that the tariff policy of Lithuania is satisfactory. Therefore, trade growth mostly depends on the withdrawal of non-tariff barriers.

This action is imperative not only for import and export, but also for transit, which amounted to 64% of the traffic via Klaipeda port in 1998 (KSSA, 1999). As a transit country, Lithuania should be interested in simplifying border-crossing procedures. For example, the port could be granted Free Port Status and excluded from the customs zone of Lithuania. Then, customs clearance would take place when the cargo leaves or enters the port to/from the hinterland. In this way, the unnecessary delays of ships due to documentary procedures would be reduced. Provided these obstacles are removed, transit traffic will grow. On the contrary, if total cargo checking and voluminous documentation are introduced, this traffic is going to be lost to neighbouring countries, because cargo flows take routes of the least resistance. This is especially true for containers (in Klaipeda, 90% are transit cargoes) and road transport.

Transit could also be influenced by inter-governmental agreements on the use of the infrastructure of coastal countries by landlocked ones. Lithuania has such documents signed with Kazakhstan and Belarus. However, Latvia, which has similar agreements, is taking more benefits from them. For instance, in 1997, there were some 300,000 tons of the Uzbek cargo handled in Riga, while only some 40,000 tons were shipped via Klaipeda (KSSA, 1998).

2.2. Hinterland countries

All eastern Baltic ports consider the entire Commonwealth of the Independent States (CIS) as their hinterland. The CIS is a very loose partnership created mostly through nostalgia to the Soviet Union rather than by real economic or political interests. Attempts to build a common military and economic policy failed. Therefore, member-countries are looking for other forms of co-operation.

In the case of the partnership between Russia and Belarus, this is about to be transformed into a union. On December 25, 1998, their presidents announced plans for

a common policy on economic, foreign and military matters. According to "The Economist" (1999), this deal seems to be more successful than previous attempts because of three reasons. First, the Prime Minister and the parliament, which has set up a parliamentary union with Belarus, backs the union. Next, it would be a counter-move for the expansion of the North Atlantic Treaty Organisation (NATO). Finally, the recent crisis brought the states of two economies closer. If the Russian-Belarussian Union comes into existence, it could be beneficial for Lithuania as a transit country for the Russian cargoes, which would then avoid double border crossings (assuming there would be no border control within the Union). Klaipeda, as a transit port, would also benefit, mostly in container and ro-ro traffic.

The Russian policy on international trade is oriented towards protectionism, and this affects transit cargo flows via Klaipeda port. For example, imports of grain and sugar are handled exclusively in Russian ports. As a result, these cargoes have almost disappeared from the port of Klaipeda (KSSA, 1998). Another example is encouraging exports via Kaliningrad by rebates on railway tariffs (according to forwarders, up to 80%). For the time being, re-routing is limited by the insufficient capacity of the ports of Saint Petersburg and Kaliningrad. However, the reconstruction and expansion of these ports is planned.

Furthermore, construction of new Russian ports is planned in the Gulf of Finland (table 2.1). These new ports, together with existing ones, will attract some 43 million tons of cargo in the year 2005, and transit traffic via the ports of the Baltic countries will contract 1.5 times, according to Russian transport specialists (Artamakina, Kuznetsova, 1998). The Vice-Minister of Transport argues that it is possible to reduce Russian cargoes transported via Belarus to Lithuania and Latvia from 15.2 million tons in 1997 to 3.7 million tons in 2010 (Kovaliov, 1998). These forecasts are realistic bearing in mind the firm position of the Russian government to re-route cargoes to their national ports.

Port	Terminals	Annual capacity, million t
Batareinaya	Oil and oil products	15.0
Lomonosov	Multipurpose	0.9
	Metal	1.2
Primorsk	Oil	45.0
Ust Luga	Coal	8.0
	Metal	5.0
	Fertilisers	7.0
Vistino	Multipurpose	5.0
Vysotsk	Multipurpose	5.8

Table 2.1. Planned Russian ports in the Gulf of Finland (KSSA, 1999).

However, the construction of new ports is delayed due to financial difficulties. There are no foreign investors nor stevedoring, construction and transport companies involved in the financing, and ports under construction are lacking funds. For instance, the company-coordinator of the Ust-Luga port project failed to pay 319 million US dollars for the design work to the Lenmorniiprojekt Institute from Saint Petersburg. The Institute has filed a bankruptcy application against it (PDI, 1999). The other projects still remain on the drawing boards. Taking into account the present problems in the Russian economy, there are no possibilities to implement these in the short term.

Besides protectionism, there are other ways in which politics are influencing the economics. During the times of economical crisis, politicians are eager to raise the question of human rights for the Russian minority in the neighbouring countries. As regards Lithuania, there have been no major problems with economic consequences. However, the other two Baltic countries have experienced political pressure followed by economic sanctions. For example, after the dispersion of the Russian pensioners' demonstration in Riga, a 10% rebate on railway tariffs was abolished on the Russian goods destined for the ports of Estonia and Latvia. Such politically driven sanctions would be even more likely if nationalists gain more power and the economic crisis

continues. Similarly, such actions may be employed if Lithuania becomes a member of NATO.

2.3. The European Union

Differently from the uncertainty in the East, the political situation in the West is stable and easier to predict. The major player there is the EU. As mentioned before, Lithuania seeks full membership in the Union. Moreover, it has the full support from the EU, which has adopted specific Accession Partnerships. These documents set up the priorities of preparatory work and assistance, transport being one of the main areas for improvement. The Union's policy is to connect the Trans-European Transport Networks (TENs) to the networks of the applicant countries. The Transport Infrastructure Needs Assessment (TINA) under the Phare Programme (the programme of assistance to the future member-countries of the EU) is carried out to identify necessary projects of common interest (EC, 1999b). Klaipeda port, being the nodal point of the multimodal transport corridor No IXB (Klaipeda - Vilnius - Minsk - Kiev), is among the priorities. As a result of upgraded infrastructure, cargo flows via the port are likely to increase.

Another important aspect of the EU's policy is the promotion of Short Sea Shipping. This is aimed at shifting cargo "from road to sea", ie maximising the sea leg and minimising the land leg of transport chains. Klaipeda port could benefit from the additional cargoes, if the Short Sea Shipping policy is successful.

Cargo flows via Klaipeda port are indirectly affected by the European policy towards the New Independent States (NIS, the former Soviet republics, except the three Baltic countries). According to the communication of the EC "Towards integration with the NIS" (EC, 1999c), the main areas of co-operation are trade, investment, and assistance.

Bilateral trade with the NIS follows the 1989 Agreement on Trade and Commercial Economic Co-operation with the Soviet Union, which was then granted the Most Favoured Nation status. This is to be confirmed by the new generation of bilateral Partnership and Co-operation Agreements (PCAs) with the NIS. Furthermore, granting access to the Generalised System of Preferences (GSP) facilitates trade. The GSP offers tariff reductions to some 10 per cent of imports from the NIS, which results in the weighted average tariff on imports from Russia of less than 1 per cent. As far as anti-dumping measures are concerned, they affect only less than 1 per cent of the total trade both with Russia and the Ukraine.

The above-mentioned PCAs are aimed at facilitating not only trade, but also direct investments. Several other efforts were made to promote this activity in the NIS. In 1996, the Joint Venture Programme was extended to these countries. It contributes to the market economy building by promoting inter-state, inter-regional and cross-border co-operation. In addition, there are programmes set up by individual member states.

The EU encourages a combination of private investment and funds raised through the programmes like Technical Assistance to the CIS (Tacis). The latter contributed almost 40 per cent to the total technical assistance provided to the NIS by the international community during 1990-95. However, the possibilities for investment promotion by the international community are limited. According to the above mentioned communication of the EC, '... the crucial role for encouraging FDI [Foreign Direct Investment] must be played by the recipient governments themselves. (...) It is in the interest of the NIS governments to remove trade and investment obstacles and push for a more rapid integration into the world economy. The European Union supports these endeavours in every respect to foster sustainable development in this region.'

2.4. Summary

To sum up, there are a number of political factors, which influence cargo flows via Klaipeda port. The highly uncertain situation in the CIS, particularly in Russia, is of major concern. On the other hand, the European policy towards these countries is directed to help in transition difficulties and is a stabilising factor. Finally, Lithuanian accession to the EU is of great importance, being an accelerator of trade and development. These considerations will be used for scenario building later on in this paper.

3. Technical factors

Another group of factors, which affects cargo traffic via Klaipeda port, comprises those related to the technology used in transportation. The port is a hub where interaction among different modes of transport takes place. Cargo flows depend on efficiency of this process as well as of the sea and land legs of the transport chain.

3.1. Port facilities

Klaipeda port has cargo handling equipment for all types of cargo (table 3.1, KSSA, 1999). This was not the case several years ago. For instance, there was no equipment for dry bulk loading. As soon as conveyors for fertilisers had been installed, the traffic of this type of cargo started to increase dramatically. During the period from 1994 to 1998, the average annual growth was 16%.

Type of cargo	Klasco	Klaipedos Nafta	Bega	Klaipedos Smelte	Klaipedos Terminalas	Peat terminal
Liquid bulk		2,234	571			
Dry bulk	940		992	684		68
Break bulk	5,162		438	52	162	22
Containerised	96				178	
Ro-ro	1,722				380	
Refrigerated	197			188		
Other general	100			94	23	

Table 3.1. Types of cargo handled by Klaipeda port operators in 1998, ‘000 t (KSSA, 1999).

Dry bulk cargo flows depend very much on the type of delivery/receipt operations as well. Until recently, there has been no storage facilities and this cargo (mainly fertilisers) was loaded from railway wagons directly to ships. The service time was significantly prolonged due to the manoeuvring of the wagons and the slow process of self-unloading. Therefore, one of the port operators, Bega, built a warehouse for fertilisers in 1998. Productivity of loading is expected to increase from 5,000 to

14,000 tons per day. This significant technological change should result in additional fertiliser traffic.

Another example is liquid fertiliser traffic. In 1996, the same company, Bega, built tanks and pipelines for a liquid bulk terminal, while KSSA financed the construction of a pier. These new facilities resulted in increased productivity from 8,000 to 24,000 tons per day. Thus, liquid bulk throughput almost doubled at this terminal: from 120,000 tons in 1996 to 233,000 tons in 1997. By 1998, the amount of this cargo had reached 571,000 tons. (Kaunas, 1997; Petrauskas, 1999; KSSA, 1999))

A port information system is another prerequisite for turnover growth. Associated only with containerisation and liner shipping in the past, information technology has become a feature also of bulk shipping nowadays. The reason for this development, according to the China Ocean Shipping Company (Cosco) president Captain Wei Jiafu, is that

> the customer requirements have expanded from the area of maritime transport service to a whole range of services including the “chain of supply”, the “chain of management” and “integration of the chain of supply”. (Lloyd’s List, 1999a)

Therefore, the port must become a place for efficient handling of information as well as goods. Provided the port information system is an integral part in the data interchange, bigger volumes of cargoes could be expected.

3.2. Nautical access

Besides new facilities for cargo handling and storage, seaside access is of great importance in attracting additional cargo. For example, after the reconstruction of the oil terminal Klaipedos Nafta, its annual capacity increased to 7 million tons. However, oil products turnover kept decreasing, one of the reasons being a deficient

water depth for Aframax tankers, which were only partially loaded in Klaipeda and filled up in Tallinn-Muuga. This resulted in additional port costs, and the transportation became too expensive during the collapse of the oil price. When the oil price was at the record low level (less than 11 US dollars per barrel at the end of 1998, compared with some 20 in 1996), Russian fuel oil was mainly shipped via Tallinn-Muuga. Consequently, liquid bulk volumes increased by 37% to 11.1 million tons (Tallinn, 1999), while fuel oil slumped almost 58% to 1.3 million tons in Klaipeda (KSSA, 1999). In this situation, the decisive factor for choosing the port was the maximum draft, which is 16 metres in Muuga, while only 10.5 metres in Klaipeda.

	Draft, m	Length, m	Breadth, m
Klaipeda	10.6	200	
Liepaja	8.5	200	35
Ventspils: oil	17.3*	252	43
other	15.5*	225	32
Riga: inner roads	12.5	225	35
alongside	10.5	200	35
Gdansk	15.0	300	
Muuga	16.0	280	40
St. Petersburg	11.0	260	40
Kotka: bulk	15.3	300	
oil	13.5	300	
Porvoo	17.6*	340	
Helsinki	11.0		
Pori	15.3		

* water depth

Table 3.2. Restrictions for vessels in the eastern Baltic ports
(Fairplay (1998), ports' handbooks).

Similarly, water depth in ports is of major importance for dry bulk cargo routing. Bearing this in mind, Ventspils with a draft restriction of 14.2 metres at a fertiliser terminal is not surprisingly chosen as the main loading port for Russian and Belarussian fertilisers. This traffic was record-breaking at 4.5 million tons in 1997,

and a capacity of 7.5 million tons is said to have been reached after the reconstruction last year (Bashtovoj, 1998). At the same time, Klaipeda port handled 1.5 million tons of fertilisers in bulk. In 1998, healthy growth continued at 30%, mostly due to the new possibility to accommodate ships with 10.6 metres draft (previously - 8 metres) (KSSA, 1999). However, this trend will persist only in case sufficient water depth for bigger ships is provided.

It follows from the given examples that water depth in ports can substantially influence bulk cargo flows. This is especially true when the ports are competing over the same cargo and are close to each other. Fortunately, competition concerning deeper harbours is restricted by the 19m depth of the entrance to the Baltic Sea (BIMCO, 1996). Thus, Klaipeda port will be able to catch up with its rivals by deepening the harbour, while some competitors have almost reached the maximum of the possible depth (table3.2).

Along with bulk shipping, bigger vessels are being used for break bulk and container transportation. This was a reason for the reconstruction of the quays at Klasco, where Panamax ships now can be fully loaded with metals. As regards containers, the berths of the new terminal have 10m depth. However, this can be insufficient, if containerisation more than triples to the year 2010, as Ocean Shipping Consultants forecast (Lloyd's List, 1999b). Then, feeders would carry some 1500 TEUs (this is already the case in other parts of the world), calling at fewer ports with the deepest harbours. Therefore, harbour deepening would be necessary to attract and retain containerised cargoes as well.

3.3. Hinterland connections

Cargo flows depend on the condition of the links from the port to inland destinations. Railway and road are major modes of transport to/from Klaipeda port, while inland waterways and pipelines are little used.

The Lithuanian railway network comprises some 2,000 kilometres of tracks (Labutis, 1999). As a part of the former Soviet railway system with the same gauge (1,520 mm), it provides excellent connections with the hinterland countries. Consequently, 87% of all transit goods were carried to/from the port by railway in 1997, while for Lithuanian cargoes this figure was 81% (KSSA, 1998).

Being so important for transit and foreign trade, the railways are kept in proper condition, particularly those included in the international corridor IXB. The main lines are being upgraded by means of new rails, concrete sleepers, elastic fastenings, as well as new control and signalling systems. The loans from the European Bank for the Reconstruction and Development (EBRD) and the Japanese Exim Bank totalling 62 million Euros as well as the grant of 5.3 million Euros from Phare are being used for this purpose together with national financing (Maciulis, 1998). The reconstruction is aimed to increase the speed of trains to 160 kilometres per hour without diminishing safety, thus decreasing transit time.

In addition, the port-railway interface is being improved. Despite there are two railway stations serving the port, the major constraints for the smooth traffic are approaches to the terminals, where additional lines are needed. Investments required are 1,405 thousand US dollars in 1999, 1,875 in year 2000, and 1,430 in 2001 (Tallat-Kelpsaite, 1999). Better railway access will minimise manoeuvring and waiting time, making the port more attractive to the customers and resulting in additional cargo.

The road network is the second most important link to the hinterland for Klaipeda port. At the beginning of 1998, it comprised 21,121 km of motorways of state significance (MOT, 1999). The motorway E271 (Klaipeda-Kaunas-Vilnius-Minsk-Gomel) is of major importance for transit and is a part of the international corridor IXB. Thanks to the developed road network, the number of trucks and trailers handled at the ro-ro terminal increased at an average annual rate of 30% between 1994 and 1997 (KSSA,

1998). In addition, more than 90% of containers are carried by road. The increasing traffic of heavy vehicles requires an adequate infrastructure. Therefore, strengthening of the pavement on the main highways is being carried out. Well-maintained roads provide reliable connections between the port and the rest of Lithuania, as well as the CIS.

Similarly with railways, the bottleneck for port bound road transport is access to the port, especially to the northern part. To overcome this shortage, an additional overpass is being constructed above a railway line. In the southern part of the port, where ro-ro terminals are situated, a connection to the main motorway is being widened. Consequently, trucks will reach the port more easily, by-passing the city. The improved motorway-port interface will contribute to the smooth cargo flow.

The inland waterways provide the connection between the Klaipeda port and the smaller ports of Kursiu Marios (Curronian Lagoon) and Nemunas River. The most distant reachable location is Kaunas, the second largest city of Lithuania, where the river is blocked by a hydropower dam. In 1998, Klaipeda port handled 102,000 tons of inland waterways cargo, mostly building materials (KSSA, 1999). Low volumes transported by this mode are limited by the deficient draft of the waterways and big distances between industrial sites and river ports. Some 60 million Euros are needed to improve this mode of transport, including 29.2 million for waterway management, 16.43 million for river ports, and 11.8 million for fleet development (TecnEcon, 1997). Despite present low utilisation, the inland waterway network is still an alternative link to the nearest hinterland.

The last alternative hinterland connection, pipelines, is not used for cargo transfer to Klaipeda port. The reason is that the oil terminal was initially built for the export of fuel oil, which requires heating and is not transported via pipelines over long distances. However, after reconstruction, the terminal is handling other oil products as well. For instance, there were 865,000 tons of diesel oil loaded in 1998, four times

more than the year before (KSSA, 1999). If the oil refinery Mazeikiu Nafta is oriented to the European market, these volumes will grow in the future. Provided traffic substantially increases, construction of the pipeline could become feasible.

3.4. Klaipeda port in the TINA programme

The balanced development of the port as well as the hinterland connections is required to facilitate the growth of cargo volumes. Such a development is planned under the TINA programme. The scope of investments to the year 2015 includes 588 million Euros into port infrastructure, 948 into the railways, and 607 into the road network. In addition to national funds and loans, the EU will provide support for transport infrastructure projects by means of the Phare Programme and the new Instrument for Structural Policies for Pre-Accession (ISPA). The EC has proposed that ISPA should contribute 1 billion Euros annually as from 2000 to transport infrastructure and environmental projects in all the candidate countries (EC, 1999). The contribution shall take place alongside lending from the international financing institutions like the European Investment Bank (EIB). Being an integral part of this investment programme, Klaipeda port will improve its facilities and will be better linked to the hinterland. These developments will make the port more attractive for shipowners as well as shippers and contribute to the turnover increase.

4. Economic factors

Some main economic factors are analysed in this chapter. For this purpose, Klaipeda port turnover is segmented into domestic traffic (imports/exports) and transit traffic (table 4.1). These two cargo flows follow different tracks. The domestic cargoes, which can be called the Lithuanian seaborne trade, have been steadily increasing since 1993, while transit traffic has been developing unevenly (figure 4.1). One of the reasons for this difference is a contrast between the economy of Lithuania and those of hinterland countries. National economies are characterised by macroeconomic indicators as well as by ones of particular industries. The relationships between these indicators (annexes 1, 2) and corresponding cargo flows in Klaipeda port, are of great importance for traffic forecasting.

	1993	1994	1995	1996	1997	1998
Domestic	2,600	3,404	4,435	4,358	5,199	5,512
Transit	13,318	11,105	8,274	10,471	10,919	9,588
Total	15,918	14,509	12,709	14,829	16,118	15,100

Table 4.1. Cargo traffic via Klaipeda port, ‘000 t (KSSA, 1999).

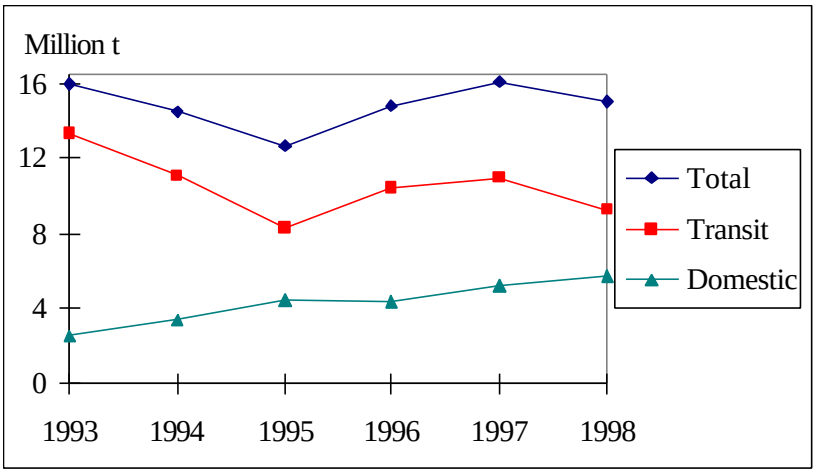

Figure 4.1. Cargo traffic via Klaipeda port, ‘000 t (KSSA, 1999).

4.1. The Lithuanian economy

The first macroeconomic indicator to consider is the Gross National Product (GNP). According to M. Stopford (1997), the coefficient of correlation (R^2) between GNP and seaborne imports is 0.69. This means that 69% of the variation in these imports can be explained by changes in GNP. In the case of Lithuania, its GNP is close to the Gross Domestic Product (GDP), because only a few companies have their subsidiaries abroad. Therefore, GDP is used in a regression model (figure 4.2).

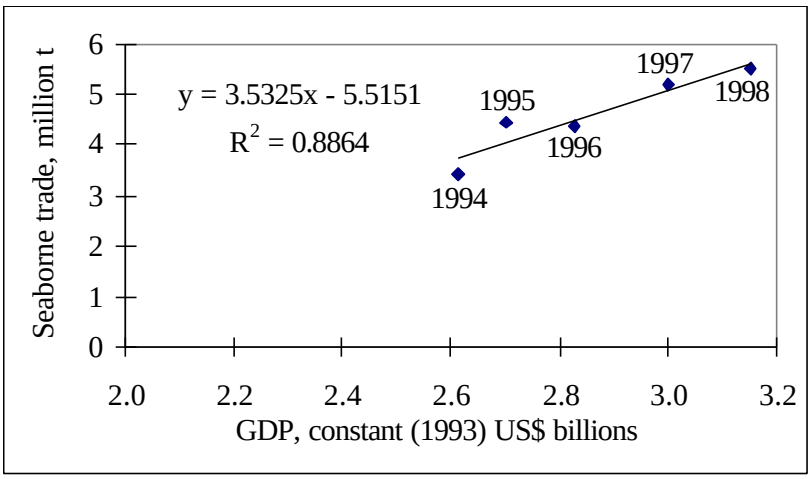

Figure 4.2. Correlation between Lithuanian GDP and seaborne trade.

The model starts with data from 1994, because then the Lithuanian economy bottomed out from the post-Soviet recession. Of course, the period of five years is not sufficient to draw far-reaching conclusions. However, the results show the clear relationship between seaborne trade and GDP. Not all developments of national seaborn traffic are explained by this model. The data point for 1994 is below the trendline, because at that time the economy was still declining. Another major deviation occurred in 1995 due to the exceptionally high trade in timber and scrap metal. Despite these discrepancies, the correlation coefficient R^2=0.8864 is higher than expected. Therefore, GDP trends can be used to some extent in port traffic forecasting.

Lithuanian foreign trade is another important macroeconomic indicator, because shipping is derived from trade. Only a smaller part of it is carried out via Klaipeda port. One of the reasons is that Russia is among the biggest trading partners and accounted for 16.7% of Lithuanian exports and 21.1% of imports in 1998 (MOE, 1999). Most raw materials are imported using railway and pipelines, while finished goods are exported using rail and road. Therefore, trade with Russia has no direct impact on traffic via Klaipeda port.

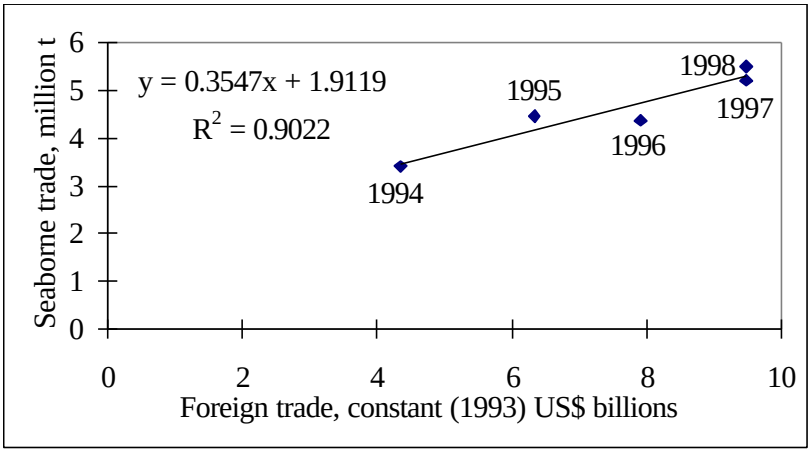

Figure 4.3. Correlation between Lithuanian foreign and seaborne trade.

On the other hand, Lithuanian foreign trade is re-orienting from the eastern markets to the west. For instance, the trade with the EU grew by 9.9% from 1997 to 1998 and constituted 43.4% of the total in 1998, while that with CIS slumped by 19.2% to 30% in the same year (MOE, 1999). This trend continued in 1999, when during the first two months the EU accounted for 51% of the total foreign trade, while CIS accounted for 20.9% (SL, 1999). In terms of tonnage, some 80% of goods between Lithuania and the EU are transported by sea (EC, 1999; KSSA, 1999). While the Lithuanian-EU trade is growing, EU-related throughput of the port is increasing accordingly. The analysis of data from 1994-1998 shows that seaborne trade grows in line with foreign trade, and the correlation is even higher than in the case of GDP (figure 4.3).

Finally, industrial production is a relevant indicator for seaborne trade volumes. According to the classification of the EU, which has applied in Lithuania since 1997, industry is composed of three main parts: mining and quarrying, manufacturing, and electricity, gas and water supply. Indices of mining, quarrying and manufacturing, hereinafter-industrial production, are used for regression analysis (figure 4.4).

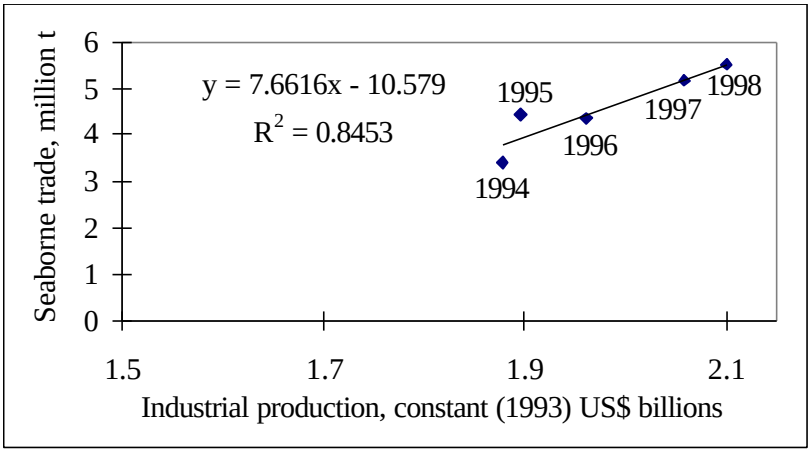

Figure 4.4. Correlation between Lithuanian industrial production and seaborne trade.

Industrial production accounted for 19.9% of the Gross Added Value in 1998 (MOE, 1999). This share has been decreasing during recent years due to structural changes in the economy, and services have become dominant. However, sales of industrial production have been constantly growing since 1994, although not as fast as in the service sector. In some industries, growth was considerably faster than the average. For example, the latter was 7% in 1998, while the major contributors were the manufacture of refined petroleum products (growth of 23.9%), wood and wood products (12.4%), electrical equipment and apparatus (60.5%). Moreover, there are changes for the better in the competitiveness of the Lithuanian industry, and they are reflected in growing exports. These accounted for 42.5% of the total sales in 1995, while this share increased to 54.6% in 1998. (MOE, 1999)

Industry	Share in total, %	Exports, %
Total industrial production	100.0	54.6
Manufacture of refined petroleum products	20.2	64.5
Manufacture of wearing apparel, dressing and dyeing of fur	7.2	89.9
Manufacture of chemicals and chemical products	7.1	79.2
Manufacture of textiles	7.0	77.4
Manufacture of wood and wood products	3.0	65.8

Table 4.2. The main Lithuanian industries in 1998 (MOE, 1999).

The industries that are the most important for foreign trade are listed in table 4.2. These industries are the main cargo generators for Klaipeda port. However, here the volume of production becomes more important than the value. From the structure of the Lithuanian cargoes handled in the port (table 4.3), it is obvious that the chemical and oil industries are the most substantial for the port.

Cargo	Share, %	Total, '000 t	Export, '000 t	Import, '000 t
Fertilisers	26.1	1,507	1,490	17
Oil products	11.3	651	625	26
Timber	8.4	484	484	0
Scrap metal	6.1	353	343	10
Cement	5.3	303	303	0
Containerised cargo	2.6	148	62	86

Table 4.3. The main Lithuanian cargoes in Klaipeda port in 1998 (KSSA, 1999).

The manufacture of fertilisers is the main cargo generator. The share of this commodity in Lithuanian seaborne trade increased from 20% in 1996 to 26% in 1998 (KSSA, 1999). There are two producers of fertilisers in Lithuania: Achema and Lifosa. The former has the following annual capacity ('000 t): ammonium nitrate - 450, urea - 270, nitric solutions (UAN) - 560 (Achema, 1999). The latter, which recently has sold 15% of its shares to the American company Cargill, produces some 0.5 million tons of phosphate fertilisers per annum. Production must be doubled to

achieve economies of scale and improve competitiveness (Dastikas, 1999). Prospects for fertiliser production, as well as their traffic via Klaipeda port, are healthy with an annual growth of 10% to be retained.

The second most important industry in terms of seaborne trade is oil refining. The only refinery in Lithuania is a part of the consortium Mazeikiu Nafta, the other parts being Naftotiekis (pipeline system) and Butinges Nafta (oil export/import terminal with the Single Point Mooring (SPM) buoy system). The refinery processed 6.8 million tons of oil in 1998, an increase of 1.1 million on the previous year (LR, 1999). This improvement was reflected in bigger volumes of domestic oil products exported via Klaipedos Nafta: 625 thousand tons in 1998, compared with 184 thousand in 1997. The consortium is undergoing the process of privatisation, and the American company Williams International has been chosen as a strategic investor. The inflow of foreign investment is expected to increase production, especially that of petrol and diesel oil. Consequently, the traffic of oil products via the port is going to grow.

The situation in timber cutting and trade is less optimistic. Some 4.9 million cubic metres of logs were cut in 1998, compared with 5.1 million in 1997 and 5.5 million in 1996 (MOE, 1999). Seaborne trade of timber fell from 618 thousand tons in 1997 down to 484 thousand tons in 1998. However, there was an increase on the previous year of 117 thousand tons in 1997, despite the drop in cutting. Therefore, the parallels between cutting and seaborne trade are difficult to draw.

The cement industry of Lithuania comprises the plant Akmenes Cementas. It remains the only plant in the central and eastern Europe, which is relatively independent from the Scandinavian and German producers, with Selvaag Gruppen of Norway holding a 34% stake (Tamulionis, 1999). The Lithuanian plant is one of the main competitors to such a giant as Scancem. Akmenes Cementas sells some 40% of its annual production of around 800 thousand tons to the west, and there are plans to double the capacity in

the future. A specialised terminal is under construction in the company Bega to cope with the anticipated traffic of 1 million tons.

Other industries are not very significant to the port at present, but they have to be watched closely as well. The Lithuanian economy is still undergoing major structural changes, which are directed by domestic policy makers and increasingly by international investors. The most active of the latter is the EBRD, which gives priority to the food industry. Another institutional investor, the International Finance Corporation (IFC), is present in Lithuania with two projects worth almost 29 million US dollars. The presence of the IFC is usually considered as the beginning of big investments, which can help new significant industries to emerge with the need for shipping.

Such industries are most likely to be placed in proximity to the port. Klaipeda Free Economic Zone (FEZ) is a suitable choice because of its location and fiscal incentives. This place is attractive for domestic as well as foreign manufacturers. For example, the American steel maker Penninox is going to invest some 50 million US dollars in a new mill to be built there. Besides manufacturing being a potential cargo generator to the port, this is a superb location for storage and distribution, which the port lacks area for. Therefore, Klaipeda FEZ can facilitate seaborne trade.

To sum up, Lithuanian seaborne trade is largely dependent on the status of the national economy. There is a clear correlation between domestic cargo throughput and the general macroeconomic indicators. Similarly, developments in the domestic industries are reflected in different commodity trades, which are carried out via Klaipeda port. Therefore, macroeconomic analysis and industrial information are essential for port traffic forecasting.

4.2. The economies of hinterland countries

An economic analysis for transit traffic forecasting may follow a similar pattern. First, the macroeconomic indicators of the hinterland countries are to be analysed. Then, the flows of various commodities in the port have to be related to the corresponding industries. This approach is applicable only to a certain extent, because the data on transit traffic distribution according to the countries of origin is inadequate (table 4.4). Another reason is that the foreign hinterland market is not a captive one; therefore, transit flows are distributed among the ports of the eastern Baltic coast and depend on competition. Thus, the relationship between transit traffic and the economies of hinterland countries should be investigated taking into account the mentioned limitations.

	1996		1997		1998	
	Loaded	Discharged	Loaded	Discharged	Loaded	Discharged
Russia	7,396	1,262	7,948	963	6,495	1,047
Belarus	1,011	400	796	854	986	258
Ukraine	163	82	181	56	164	52
Other CIS	46	111	22	99	103	122
Total	8,616	1,855	8,947	1,972	7,748	1,479

Table 4.4. Transit in Klaipeda port by hinterland countries, ‘000 t
(KSSA, 1999, estimations based on a forwarders survey).

First, dependency of transit on the macroeconomic indicators of the countries in question should be investigated. In most economic analyses, the CIS is regarded as one economic space, where development in separate countries follows a similar pattern. In addition, three countries, namely Russia, Belarus and Ukraine, have even more in common. Therefore, combined macroeconomic indicators of these countries (annex 2) could be related to the transit traffic, because they account for more than 98% of it.

As follows from figure 4.5, the correlation is weaker than in the case of national traffic. The data point of 1995 is the most inconsistent with the model, because at that time volumes of oil products decreased almost twice in Klaipeda due to the opening of a new oil terminal in Muuga (Estonia).

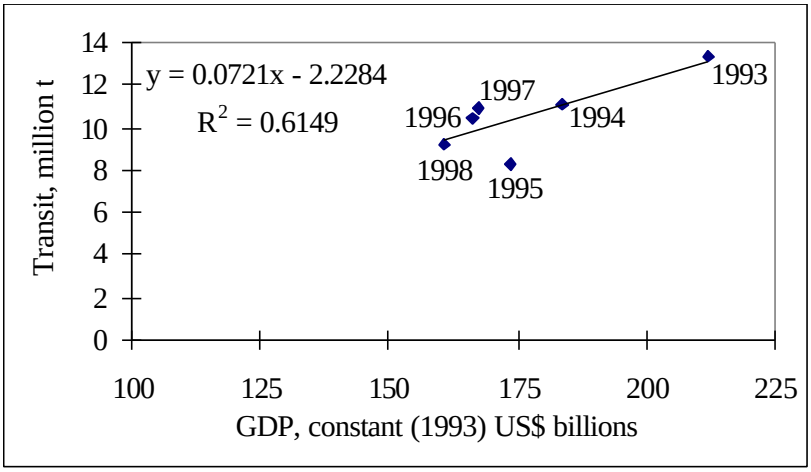

Figure 4.5. Correlation between combined GDP and transit traffic.

Because of weak correlation between GDP and transit traffic, further segmentation of the latter into eastbound (or discharged in the port) and westbound (or loaded) cargo flows is suggested. Regression analysis of GDP and eastbound transit shows stronger

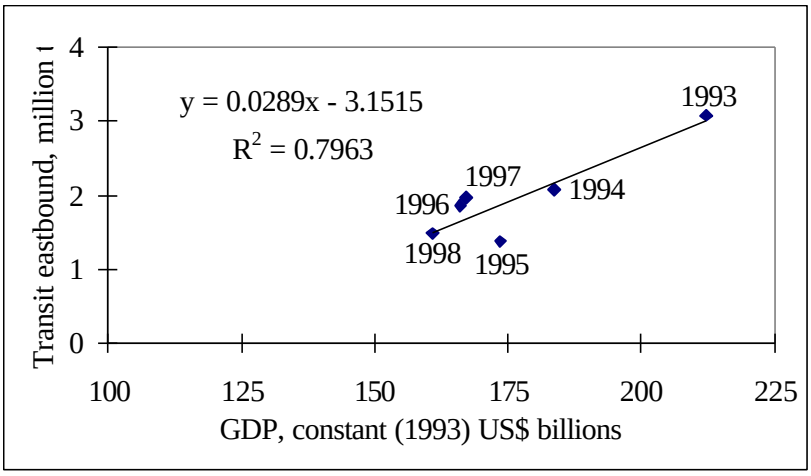

Figure 4.6. Correlation between combined GDP and eastbound transit traffic.

correlation between the two (figure 4.6). This traffic, which consists of imports to the CIS, is largely dependent on the state of the hinterland economies. However, some 20% of changes in eastbound transit need an additional explanation. Similarly to the previous regression analysis (figure 4.5), the major deviation from the model occurred in 1995. In that year, the number of wagons handled at the railway ferry terminal dropped by 40%, because withdrawal of the Russian army from Germany had been completed. Bearing in mind the need to take such factors into account, the relationship between the GDP of the hinterland countries and eastbound transit traffic is useful in forecasting.

As far as westbound transit is concerned, this comprises exports generated by different industries of the hinterland. First of all, more detailed segmentation of this traffic by various commodities is required. Next, these should be ranked according to their share in westbound transit flow. Then, the shippers that are the most important for the port can be identified. As shown in table 4.5, the main cargo generators for the port are the Russian steel and oil industries and the Belarussian fertilisers. Therefore, these industries are to be examined in terms of production capacity as well as their place in world commodity trades.

Commodity	1996	1997	1998
Oil products	3,867	3,301	1,389
Metals	3,460	4,268	5,086
Fertilisers	779	858	335
Sugar	371	388	329
Cereals	265	344	248
Reefer products	319	365	326
Containerised	253	133	132

Table 4.5. Transit in Klaipeda port by commodities, ‘000 t (KSSA, 1999).

Russia ranked fifth in the world league of the major steel producing countries in 1998, while Ukraine was tenth (IISI, 1999). The steel industry of the CIS experienced a dramatic drop in production, which halved from 161.4 million tons in 1988 to 78.2 million in 1994 (Kaunas, 1997). As follows from table 4.6, steel production in the CIS continues to fall.

Country	1992	1993	1994	1995	1996	1997	1998
Russia	67,0	58,3	48,8	51,6	49,3	48,4	42,5
Ukraine	41,8	32,6	24,1	22,3	22,3	25,6	23,5

Table 4.6. Crude steel production, million t (IISI, 1999).

On the other hand, transit of metals in Klaipeda port is growing. This traffic depends on factors other than steel output. One such factor is the world steel trade. Here Russia and Ukraine are active participants, because their output exceeds demand in the Former Soviet Union (FSU) more than twice. In addition, export of steel is a reliable source of foreign exchange for the producers, while the domestic market is unattractive because of delayed payments and currency devaluation. Figure 4.7 proves that export is oriented mostly to the countries outside the FSU.

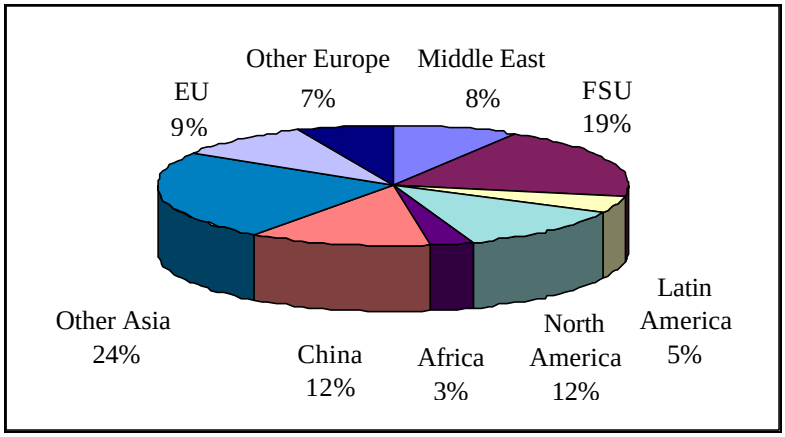

Figure 4.7. Exports of steel from the countries of the FSU by area in 1997 (IISI, 1999).

American and European markets are the most important from the transit via Klaipeda point of view, because the port is in an advantageous location for this trade. However, anti-dumping measures, which have been recently imposed by the USA for cheap steel from Russia and Ukraine, have reduced transit traffic of this commodity during 1999. After five years of considerable growth, this declined by 79% in the first quarter of 1999 as compared to the same period one year ago (AISI, 1999), causing a slump of volumes in the port by some 45% (SPK, 1999). Despite these developments, the American market remains the main destination for transit steel.

Steel products transported to Asia contribute significantly as well. For example, Asian traffic of metals stood at 45% of the total transit of this commodity in 1996. As demand for steel there had decreased due to the economic crisis, this share dropped to 29% in 1997 and further to 12% in 1998. This is a good example of integration of the port into the world economy, leading to interdependencies between the port throughput and the economic situation world-wide.

The oil industry of Russia, which usually was the biggest shipper in Klaipeda port, has recently become the second one. Oil refining rather than oil extraction is important for the port, because Klaipedos Nafta is a specialised terminal for oil products, such as fuel oil and diesel oil. Moreover, exports have to be really looked at, not production itself. Refined products constituted one-third of Russia's oil exports in 1997. They were mostly exported to countries outside the CIS, the main destination being western Europe. Reduction in railway tariffs and the elimination of export tariffs for product shipment were among the factors that encouraged this trade. (EIA, 1999)

The oil price is amongst the major factors, which influence transit of oil products via the port. In the early 1990s, this was not a case, because the traffic of oil products was mostly determined by the transportation patterns of previous years. However, exports have become more market-driven since 1995. Regression analysis of data from 1995-1998 shows a high correlation between the oil price and oil products

transit (figure 4.8). This statistical model should be applied with care, because the time series are not long enough and the oil price is difficult to predict.

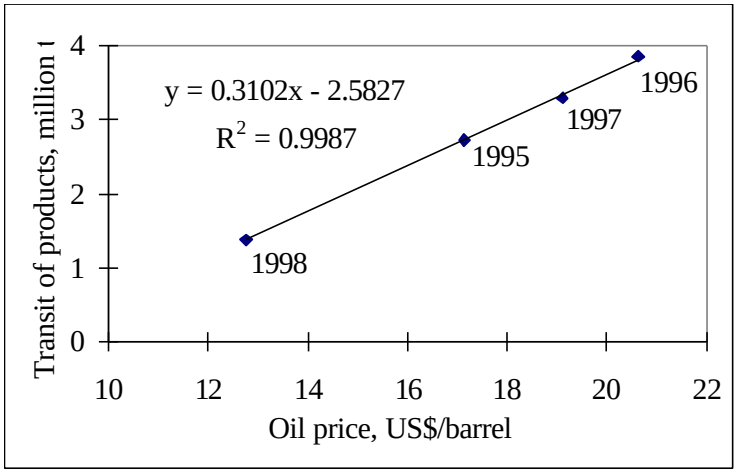

Figure 4.8. Correlation between the oil price and transit of oil products in Klaipeda port.

Here is an example of the interrelationship among the world oil market, Russian exports of oil products, and their transit via Klaipeda port. Oversupply in the world caused the fall of the oil price to a record-low level in 1998. Hence, the major oil producing countries, including Russia, agreed to cut oil production. In addition, the Russian government imposed export duties on crude oil to finance construction of new terminals in the Gulf of Finland. These factors forced exports of crude oil to decline. However, oil products were exempted from limitations and duties, and their exports were growing. Consequently, transit volumes of oil products in Klaipeda port substantially increased in 1999. For instance, almost 1 million tons were handled in the first four months, 2 times more than in the same period in 1998. This example shows that the Russian oil industry should be examined in the context of the world oil market.

The fertiliser industry of the CIS is the third most important for Klaipeda port in terms of generated transit cargo. Russia and Belarus have reserves of potassium salts, which

should last at least 150 years at the present rate of exploitation. The major producers are Belaruskali (Belarus) with an annual capacity of 9.2 million tons, Uralkali (Russia) - 5.8, and Silvinit (Russia) - 4.2, all together representing about one third of the world total capacity. (IPC, 1999)

As is the case with those industries discussed earlier, trade rather than production is an important factor for port traffic. Bearing in mind production capacity of some 19 million tons, it is worth mentioning that consumption of potash fertilisers in the FSU decreased seven times during the last decade. Thus, surplus production and increasing demand world-wide has led to increasing exports from Russia and Belarus, which produced 22% of the world total in 1996. (IFA, 1999)

Most of these exports have been shipped via a specialised terminal in Ventspils, which is the biggest one in the world. Klaipeda port has handled the Europe-bound traffic, mostly in shipments of 2,000 to 6,000 tons (KSSA, 1999). An important detail of potash fertiliser export is that the International Potash Company (IPC), which has been jointly set up by the producers of the CIS, controls all their exports. Thus, the importance of the relations between the port and the shipper is apparent in this trade.

Besides potash fertilisers, nitrogen and phosphate are worth considering as well. Russia has the biggest in the world reserves of natural gas, which is used for nitrogen fertiliser production. CIS exports of nitrogen fertilisers accounted for 29% of the world total (in terms of pure nitrogen) in 1996, while those of phosphate fertiliser for 15% of corresponding world exports (in terms of pure phosphate) (IFA, 1999). However, until now these commodities have transited via Klaipeda in very small quantities.

4.3. Importance of the economic factors

The analysis of the economic factors is crucial for traffic forecasting due to several reasons. First, these factors, differently from those discussed in the previous chapters, are easier to quantify. This allows the use of quantitative techniques and, provided that funding and technology is available, the building of econometric models. Second, there are forecasts available for the economic indicators, which make predictions of future traffic easier, although not more certain. Finally, all the other factors have to be translated into the economic ones, such as cost of transportation and its place in the value chain of shippers.

5. Scenarios

The purpose of a scenario is to describe the whole of the future traffic. The basic assumption is made, as recommended by the United Nations Conference on Trade and Development (UNCTAD, 1984), that the port encourages traffic by providing reasonable facilities and does not prevent it from coming. On the one hand, the port of Klaipeda has to utilise its major strengths, which are proximity to the entrance of the Baltic Sea and good hinterland connections. On the other hand, it must overcome the weaknesses, such as insufficient water depth. The scenarios also take into account the factors discussed in the previous chapters.

First, Lithuanian seaborne trade is forecasted according to the possible developments in the national economy. GDP trends are used, because it is the only macroeconomic indicator, forecasts for which are available. The outlooks that are provided by different institutions vary greatly even in the short-term. For example, the Ministry of Economy (MOE) estimates GDP growth of 3.7% for the current year (LR, 1999), the International Monetary Fund 2.5% (IMF, 1999), and the Economist Intelligence Unit 0.5% (EIU, 1999). Bearing this uncertainty in mind, the long-term outlook is even gloomier. However, forecasts for the long-term were produced by the World Bank (WB, 1999) for Lithuania and logistics firm BTL for Eastern Europe (Nordh, 1999). Therefore, currently available short-term forecasts were combined with long-term ones and two of them chosen as a basis for further calculations (table 5.1).

	1999	2000	2001	2002	2003 - 2010	2009 - 2015
High	3.7	5.2	5.7	5.7	5.0	5.0
MOE	3.7	5.2	5.7	5.7		
WB (1999)	4.0	5.0				
BTL	2.0 - 4.0					
Low	0.5	2.0				

Table 5.1. Forecasts of annual growth rates of GDP (%).

Seaborne trade was initially forecast according to the linear relationship determined in figure 4.2. Rough calculations showed that an optimistic scenario, which was based on a high GDP forecast, had come to a very high figure of more than 21 million tons in 2015. Thus, the logarithmic relationship (figure 5.1) is used for seaborne trade forecast instead of the linear one. The reasoning behind this choice is that, as the economy develops, trade grows more in value than in volume, especially in an economy with scarce resources of raw materials.

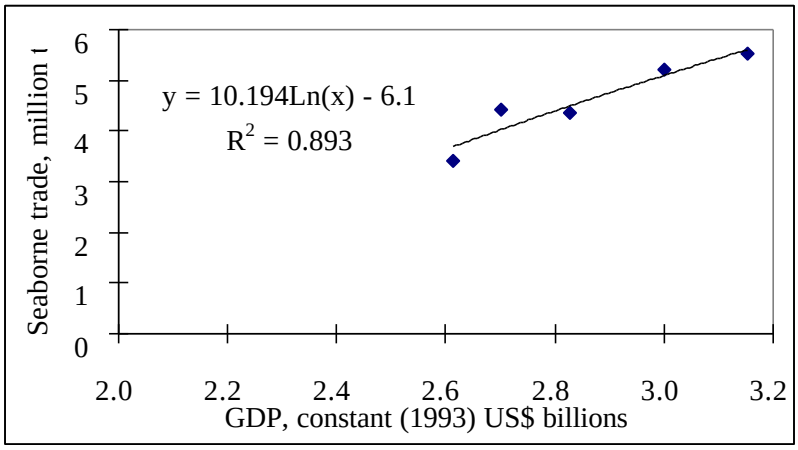

Figure 5.1. Logarithmic correlation between Lithuanian GDP and seaborne trade.

A mean deviation, which is found from the statistical analysis of the above regression model (table 5.2), is used for the scenarios of the seaborne trade development. Forecasted traffic is increased by an additional 4.94% in the case of the optimistic scenario and decreased by the same amount in the pessimistic case.

	1994	1995	1996	1997	1998	Mean
Seaborne trade, million t	3.404	4.435	4.358	5.199	5.512	
Mean (trend)	3.693	4.024	4.493	5.096	5.603	
Square deviation	0.084	0.169	0.018	0.011	0.008	0.058
Deviation	0.289	0.411	0.135	0.103	0.091	0.206
Deviation	7.8%	10.2%	3.0%	2.0%	1.6%	4.94%

Table 5.2. Statistical analysis of the logarithmic regression model (figure 5.1).

5.1. The development of Lithuanian seaborne trade

The optimistic and pessimistic scenarios of the Lithuanian seaborne trade development are presented in figure 5.2. In the first case, GDP grows at 5% per year, and Lithuanian traffic via Klaipeda port almost reaches 15 million tons in 2015. In the second case, it develops to just below 8.5 million tons, while an estimated GDP growth rate is 2% per year.

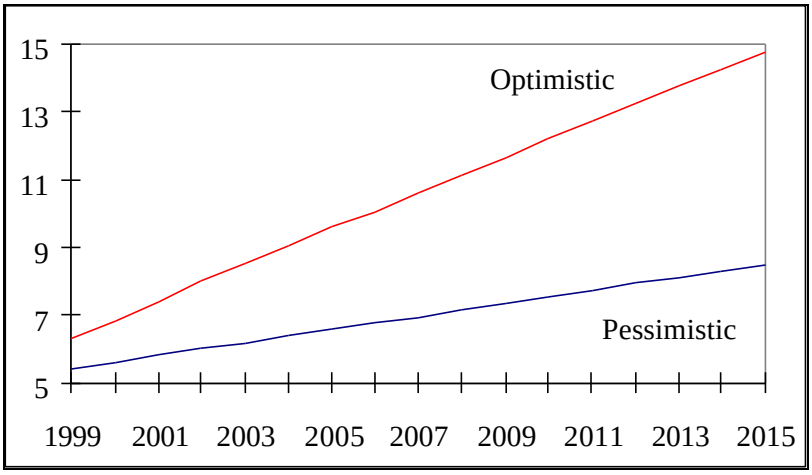

Figure 5.2. Scenarios of Lithuanian seaborne trade development (million t).

After making quantitative projections, qualitative ones have to be made as well. The latter part of scenario building usually requires a great deal of effort, and it is not an individual task. This process involves institutions at a national level as well as consultants. For instance, Rotterdam Municipal Port Management based its 'Projections 2020' (RMPM, 1999) on socio-economic scenarios for future developments provided by the Central Planning Bureau, the national economic forecasting and research institute. In the case of the present forecasting exercise, assistance on such a level is not available. Therefore, the 'Projections' are used as a model for the scenarios that follow.

Optimistic scenario of the development of Lithuanian seaborne trade
(based on strong GDP growth by 5% per year)

1. Political developments

- Lithuania joins the EU in 2005, following the fast track
- Short sea shipping policy becomes a success
- Lithuania becomes a member of the WTO in 2000
- Klaipeda port is granted Free Port Status

2. Technological developments

- Sufficient cargo handling and storage facilities are provided
- Deepening of the harbour to 14m is completed in 2002
- Port-railway-road interface is improved
- Information technology is extensively used in port operations

3. Economic developments

- Strong private consumption growth
- Foreign investment is encouraged, which allows for modernisation of the industry
- Highly dynamic production structure, greater emphasis on medium- and high-value activities, which lead to increasing volumes of containerised cargo
- FEZ is successfully developed

Pessimistic scenario of the development of Lithuanian seaborne trade
(based on weak GDP growth by 2% per year)

1. Political developments

- Lithuania joins the EU after 2010
- Short sea shipping policy fails
- Lithuania imposes protectionist measures on foreign trade
- Customs procedures remain as barriers for smooth cargo flow

2. Technological developments

- Cargo handling and storage facilities do not meet customer requirements
- Deepening of the harbour to 14m is completed after 2002
- Port-railway-road interface is still a bottleneck
- Information technology is rarely used in port operations

3. Economic developments

- Sluggish private consumption growth
- Foreign investment remains low
- Relatively few changes to production structure compared to current situation

5.2. The development of transit traffic via Klaipeda port

Scenarios for transit traffic are built using the discussed methodology. However, there are differences between the models for transit and national cargo flows. The most important distinction between the two is the subdivision of transit traffic into eastbound and westbound components, while Lithuanian seaborne trade is analysed as a whole. Eastbound transit consists mainly of high value goods imported by the hinterland countries, and its patterns are not going to change significantly in the future. Therefore, a linear model is used to forecast this component of transit traffic.

	1993	1994	1995	1996	1997	1998	Mean
Transit eastbound, million tons	3.086	2.081	1.372	1.855	1.973	1.479	
Mean (trend)	2.984	2.154	1.862	1.652	1.683	1.491	
Square deviation	0.010	0.005	0.240	0.041	0.084	0.076	0.089
Deviation	0.102	0.073	0.490	0.203	0.289	0.231	0.257
Deviation	3.4%	3.4%	26.3%	12.3%	17.2%	12.5%	14.3%

Table 5.2. Statistical analysis of the eastbound transit regression model (figure 4.6).

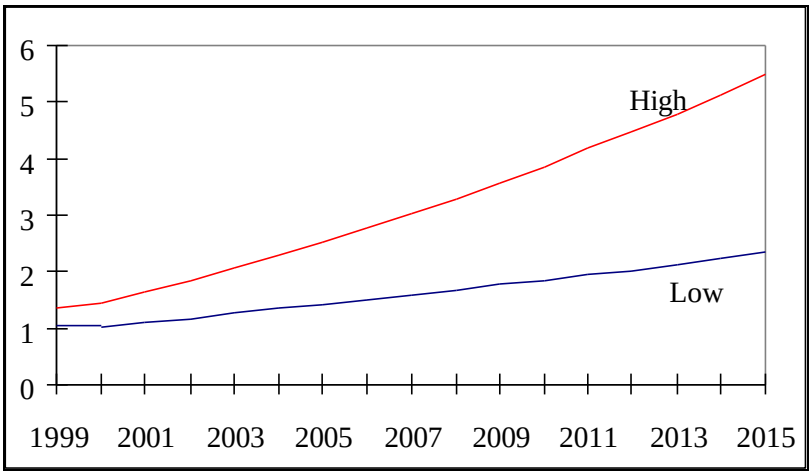

Figure 5.3. Scenarios of the eastbound transit development (million t).

The scenarios are based on predictions of GDP annual growth ranging from 2% to 4% (Nordh, 1999). In addition, traffic figures are adjusted by the mean deviation of 14.3% (table 5.2).

Scenarios for westbound transit are more complicated than those previously presented. This traffic is a mixture of commodities, each of whose are traded differently. Thus, thorough analysis of trends in these trades is required. The most important commodities are steel, oil products, and ferilisers.

Steel products traffic, which is mostly Russian – US trade, depends on a number of factors. First comes the American anti-dumping action, which is likely to continue followed by other countries. Second, pricing of Russian exports has been uneconomic due to orientation towards production rather than profit (OECD, 1999). Consequently, growth in exported volumes is not sustainable in the longer term. In addition, domestic consumption of steel increases as the economy recovers. According to Holschuh, steel consumption of the CIS will grow from 29.6 million tons in 1998 to 32 in 2005 (IISI, 1999). Finally, the Institute of Shipping Economics and Logistics (ISL) and Nippon Yusen Kaisha Research Group (NYK) forecast growth of world seaborne trade in minor bulks at 1-2.5%. All these factors lead to the conclusion that the volumes of steel products handled in the port will grow moderately.

	1996-1997	2000	2005	2010	2015
Minor bulks total (ISL)	772.5	840	970	1080	1200
Steel products	106.2	117	135	151	168
Fertiliser	169.0	169	183	204	226
Minor bulks total (NYK)		785	805	820	838
Steel products		110	113	115	117
Fertiliser		172	176	180	183

Table 5.3. Forecast minor bulk shipments world-wide (million t)
(Baltic, 1999, author's estimate).

Steel products are assumed to retain their share of 14% in total minor bulk shipments and to grow at the same rate as the latter. A yearly growth rate of 1-2.5% may be applied to the transit traffic of steel via Klaipeda port as well (figure 5.4).

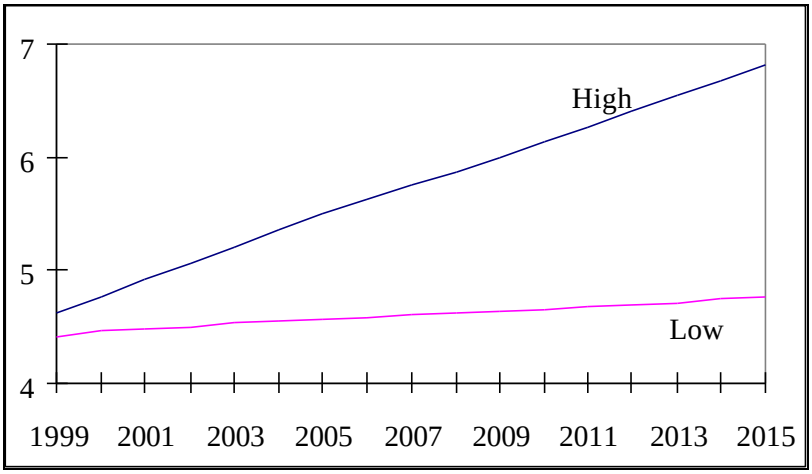

Figure 5.4. Scenarios of the steel products transit development (million t).

Scenarios for fertiliser transit are derived from table 5.3. On the one hand, this traffic is forecasted more precisely, because worldwide fertiliser shipments in 2005 are estimated by ISL. On the other hand, low and high scenarios differ greatly in their starting points (figure 5.4).

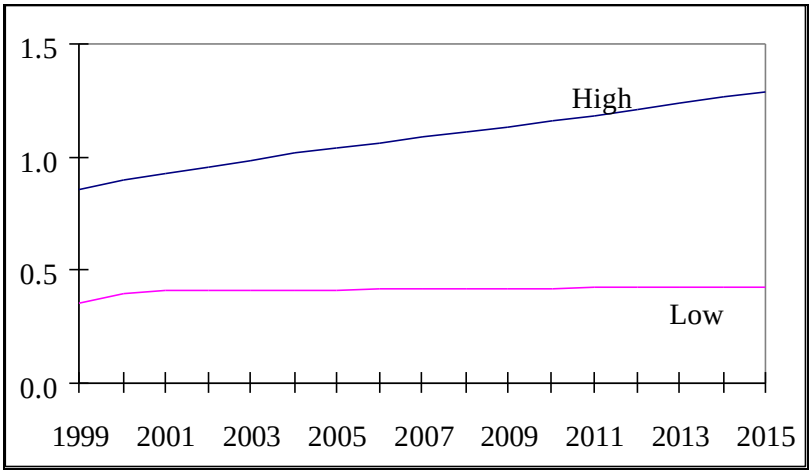

Figure 5.5. Scenarios of the fertiliser transit development (million t).

The explanation can be found in table 4.5, which shows the potential of this cargo flow (858 thousand tons in 1997) and the recent slump to 335 thousand tons due to increased traffic of Lithuanian fertilisers and capacity constraints in 1998.

Forecasting of oil products transit is based on projections drawn up in the International Energy Outlook 1999 (EIA, 1999). According to this study, the FSU will export some 7.9 million barrels of oil per day in 2020, compared to 2.87 in 1997. However, this growth is to be achieved by the starting up of Caspian Basin projects after 2005, but their effect on transit via Klaipeda will be marginal. The most important factor, the oil price, is forecasted to stay at just over 14 US dollars per barrel in the low case or, in the high case, to exceed 29 US dollars in 2020. Scenarios of oil product transit (figure 5.6) are built according to these projections using the regression model presented in figure 4.7.

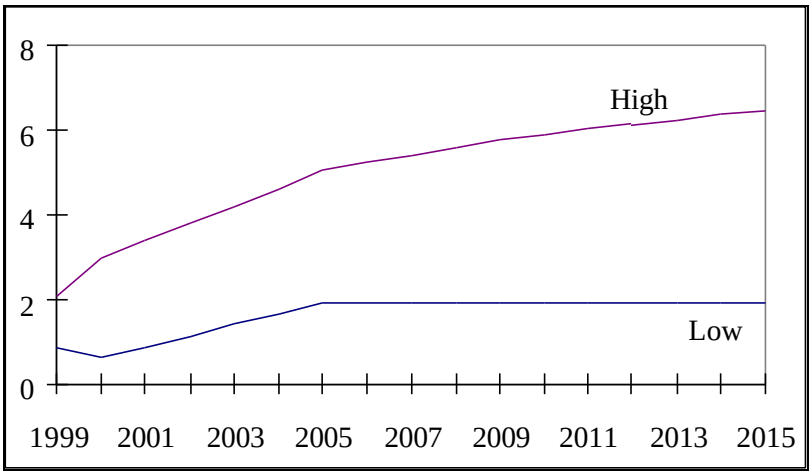

Figure 5.6. Scenarios of the oil products transit development (million t).

By adding together corresponding eastbound, steel products, fertiliser and oil products flows, the overall transit development scenarios are built (figure 5.7). Volumes of other commodities are insignificant at present (3% of westbound transit) and not taken into account in the scenarios.

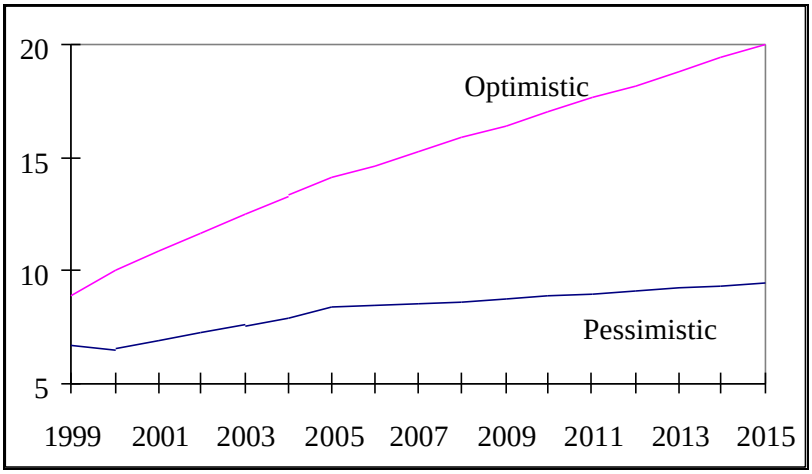

Figure 5.7. Scenarios of total transit traffic development (million t).

Having the quantitative projections in place, qualitative descriptions of scenarios are necessary. They are provided on the next two pages using the same model as in the case of Lithuanian seaborne trade.

Optimistic scenario of the development of transit traffic

1. Political developments

- More reformists in governments
- The CIS becomes a common economic space with free market dominance
- Good relations between Russia and the West
- Countries of the CIS become members of the WTO and are recognised as free market economies, leading to the abolishment of trade restrictions

2. Technological developments

- Sufficient cargo handling and storage facilities are provided
- Deepening of the harbour to 14m is completed in 2002
- Railway services and links to hinterland are upgraded to be sufficient for general cargo and container traffic
- Information technology is extensively used along the whole transport chain

3. Economic developments

- Strong GDP growth by 4% per year
- Strong private consumption growth
- More foreign investment
- Westbound transit structure changes from raw materials to finished and semi-finished goods
- CIS exports and imports are routed according to economic, not political, considerations

Pessimistic scenario of the development of transit traffic

1. Political developments

- More communists and nationalists in government
- Further disintegration of the CIS
- Relations between Russia and the West erode
- Countries of the CIS are not recognised as free market economies, leading to further trade restrictions
- Cargo flows are routed according to political considerations

2. Technological developments

- Cargo handling and storage facilities do not meet customer requirements
- Deepening of the harbour to 14m is completed after 2002
- Railway transport remains inefficient
- Information technology is rarely used in transportation

3. Economic developments

- Weak GDP growth by 2% per year
- Sluggish private consumption growth
- Foreign investment remains fragmented
- Relatively few changes in the CIS export structure compared to current situation

5.3. Integrated scenarios

By integrating projections of developments in the Lithuanian seaborne trade and transit (figure 5.8), scenarios for total cargo traffic via Klaipeda port are built. The big difference between the pessimistic and optimistic scenarios occurs due to several reasons. First, the economic and political situation in the hinterland is highly uncertain. Next, the transit of steel and oil is contingent on volatile commodity markets, the behaviour of which is difficult to predict. Finally, Klaipeda port shares transit traffic to/from the CIS with other ports of the eastern Baltic, and its market share in the future depends on the competitiveness among the rivals.

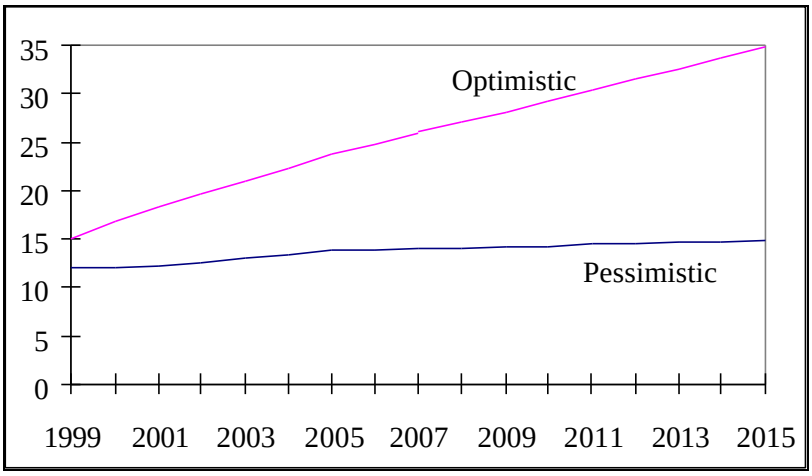

Figure 5.8. Scenarios of the total cargo traffic development (million t).

6. Conclusion

The forecasting methodology presented in this paper included four stages. First, political factors influencing throughput of Klaipeda port were analysed. This analysis showed the great importance of the uncertain political situation in Russia as well as the stabilising impact of the EU. During the second stage, construction of specialised terminals, sufficient water depth, and improved railway connections were identified as the key technical factors. The third stage of the forecasting was devoted to the analysis of economic factors. At this stage, the quantitative dependencies between macroeconomic indicators and cargo traffic were established. These were later employed in scenario building, which was the final stage of the forecasting process. Using this methodology, two scenarios of cargo traffic development were produced.

The purpose of having these two scenarios is to identify the range of possible circumstances in the future. The pessimistic scenario shows what can happen at worst. Port development projects should be carried out taking into account this possibility. Such an attitude may avoid big losses in the case of unfavourable traffic development. The optimistic scenario shows what can happen at best. Bearing in mind this prospect, the port must be developed with the possibility of further expansion.

As far as construction of the new deep-sea harbour is concerned, the two scenarios lead to different decisions. The pessimistic scenario shows a stagnant port throughput at the present level. In this case, the existing facilities will be sufficient to satisfy future demands. In view of the reconstruction programme, which is under implementation and is aimed to increase port capacity to at least 25 million tons, further development of the port could be questioned.

The optimistic scenario is clearly more challenging for the port. Its capacity after reconstruction is estimated to be a maximum of 30 million tons. In the case of favourable traffic development, this throughput will be reached around 2010.

Therefore, expansion of the port will be necessary to cope with increasing cargo flows. The biggest challenges will be to provide sufficient water depth for bigger ships and storage for bulk cargoes. The latter scenario should become a starting point in making plans for the future. It is believed that overestimates of traffic usually result in less costly mistakes than underestimates do.

To minimise such mistakes, the database used in forecasting must be improved. First, domestic as well as transit cargo flows should be subdivided into liquid bulk, dry bulk and general cargo. At present, subdivision by cargo type is available only for the whole traffic. Second, transit should be subdivided by hinterland country more precisely. Until now, it has only been possible to find out exactly which country cargo is transported by ship to or from, while hinterland origins and destinations are determined from the incomplete surveys of forwarders. In addition, there is a need to split the traffic of each hinterland country by commodity. This would allow particular markets to be focused upon. These improvements will lead to more detailed scenarios.

Furthermore, scenarios should be kept up-to-date. To do this, the factors and their impact on Klaipeda port must be systematically revised. In addition, the potential factors have to be identified. This requires the proper functioning of a Marketing Information System (MIS), the main activities of which are market research, analysis, and intelligence. The Marketing Department of KSSA has been focusing on the first two, while the latter remains undeveloped. Market intelligence implies regular consultations within the port community as well as external sources, such as diplomatic services, other governmental institutions, and port users. The MIS will ensure that real demand for port services is known.

A changing environment requires a proactive response to the increasing demands of customers in Lithuania and abroad. To meet these requirements, active co-operation is needed among Klaipeda State Seaport Authority, port operators, and providers of

other services. Port users already co-ordinate their activities through the Lithuanian Association of Ship Brokers and Agents and Lithuanian Shipowners' Association. Port operators have recently founded the Association of Lithuanian Stevedoring Companies. The task of KSSA is to foster relations with these associations as well as with individual companies. Only joint efforts of the whole port community will lead to the balanced development of Klaipeda port and ensure its competitive position among the ports of the eastern Baltic.

Bibliography

Chapter 2

Artamakina, N and Kuznetsova, G (1998). 'Russian cargo transportation by rail to sea ports'. *Morskiye porty (Seaports)* (in Russian), No 4, pp 43-44.

EC (1999a). *Regular Report from the Commission on Progress towards Accession: Lithuania.* Brussels: European Commission. *http://europa.eu.int/comm/dg1a/enlarge/report_11_98_en/lithuania/index.htm,* 29 03 1999.

EC (1999b). *The Phare Multi-Country Transport Programme. Project Information Sheet 97-0150. Transport Infrastructure Needs Assessment in Central and Eastern Europe (TINA).* Brussels: European Commission. *http://europa.eu.int/comm/dg1a/phare/programme_types/multi_country/mctp/projects/970150.htm,* 29 03 1999.

EC (1999c). *Towards greater economic integration. The European Union's financial assistance, trade policy and investments for the New Independent States.* Brussels: European Commission. *http://europa.eu.int/comm/dg1a/nis/econ/toward_eco_integration.htm,* 29 03 1999.

GRL (1999). *Action programme of the Government of the Republic of Lithuania for 1997 – 2000.* Vilnius: the Government of the Republic of Lithuania. *http://www.lrvk.lt/anglu/a-programa/a-programa.html,* 29 03 1999.

Kovaliov, V (1998). 'Russia needs a strategy to increased international cargo transportation'. *Morskiye porty (Seaports),* No 4, pp 8-13 (in Russian).

KSSA (1998). *Annual Report 1997.* Klaipeda: Klaipeda State Seaport Authority, Marketing department.

KSSA (1999). *Annual Report 1998.* Klaipeda: Klaipeda State Seaport Authority, Marketing department.

The Economist (1999). 'Russia and Belarus. Hallo Minsk, farewell Kazan?'. *The Economist,* 09 01 1999.

Chapter 3

Bashtovoj, N (1998). 'Clear skies at the potash terminal'. *Delovyje liudi (Business People, in Russian),* No 94, October 1998, p 36.

BIMCO (1996). 'Route T'. *BIMCO Bulletin,* December 1996, p 46.

EC (1999). *The Phare Multi-Country Transport Programme. Project Information Sheet 97-0150. Transport Infrastructure Needs Assessment in Central and Eastern Europe (TINA).* Brussels: European Commission. *http://europa.eu.int/comm/dg1a/phare/programme_types/multi_country/mctp/projects/970150.htm,* 29 03 1999.

Fairplay (1998). *Fairplay Ports Guide*. London: Fairplay.

Kaunas, V (1997). *An analysis of new cargo traffic patterns and the general development of the port of Klaipeda.* Msc dissertation. Malmö: World Maritime University.

KSSA (1998). *Annual Report 1997.* Klaipeda: Klaipeda State Seaport Authority, Marketing department.

KSSA (1999). *Annual Report 1998.* Klaipeda: Klaipeda State Seaport Authority, Marketing department.

Labutis, S (1999). 'Electronics hastens into railway sphere'. *Business and Exhibitions,* September - October 1999.

Lloyd's List (1999a). 'Bulk carriers need to learn logistics lesson'. *Lloyd's List,* 22 04 1999, p 3.

Lloyd's List (1999b). 'Central Europe lifts regional box trades'. *Lloyd's List,* 07 01 1999, p 3.

Maciulis, A (1998). 'Development of a multimodal transit business'. *Lithuanian Transport,* 1998, No 3.

MOT (1999). Ministry of Transport and Communications of the Republic of Lithuania home page. *http://www.transp.lt/~keliai.htm,* 21 04 1999.

PDI (1999). 'Ust-Luga has problems'. *Port Development International,* March 1999, p 8.

Petrauskas, E (1999). 'Bega constantly increases its cargo turnover'. *Jura (The Sea, Lithuanian maritime weekly),* 1999, No 10.

Tallat-Kelpsaite, Z (1999). 'The perspective of the port development depends on the Port Development Council'. *Jura (The Sea, Lithuanian maritime weekly),* 1999, No 16. *http://www.spk.lt/jura/15/e6-15.htm,* 21 04 1999.

Tallinn (1999). The port of Tallinn home page.
http://www.ts.ee/business_info/port_statistics.htm, 20 04 1999.

TecnEcon (1997). *Inland Waterways Development Plan and Feasibility Study.* (Phare contract reference 96-0325.00). Vilnius: TecnEcon.

Chapter 4

Achema (1999). *http://www.achema.com/eng_gamyba.htm,* 24 05 1999.

AISI (1999). *AISI press release,* 22 April. American Iron and Steel Institute homepage. *http://www.steel.org/news/pr/1999/pr990422.htm,* 22 06 1999.

Dastikas, J (1999). 'Technical progress in Lifosa: restructuring and prospects' (in Lithuanian). *The Lithuanian Science and Industry: Facing Technologies of the 21st Century* (2 February, 1999: Kaunas, Lithuania). Kaunas University of Technology.
http://www.ktu.lt/lt/mokslas/konferencijos99/konf_5/pranesimai/14/1.html,
24 05 1999.

EC (1999). 'External trade EU15 – CEC'. *Tranport in Figures*. Directorate General VII at the European Commission homepage.
http://europa.eu.int/en/comm/dg07/tif/8_central_and_eastern_europe/ch8_cec_external_trade.htm, 20 02 1999.

EIA (1999). United States Energy Information Administration homepage.
http://www.eia.doe.gov/emeu/cabs/russia.html, 30 05 1999.

IISI (1999). International Iron and Steel Institute homepage.
http://www.worldsteel.org/trends_indicators/contents.html, 31 05 1999.

IFA (1999). International Fertiliser Industry Association homepage.
http://www.fertilizer.org/stats.htm, 31 05 1999.

IPC (1999). International Potash Company homepage.
http://www.ipcmos.com/R&B_potash_ind_eng.htm, 31 05 1999.

Kaunas, V (1997). *An analysis of new cargo traffic patterns and the general development of the port of Klaipeda.* MSc dissertation. Malmö: World Maritime University.

KSSA (1999). *Annual Report 1998.* Klaipeda: Klaipeda State Seaport Authority, Marketing department.

LR (1999). 'Stoppage of Mazeikiu Nafta will not damage the Lithuanian economy' (in Lithuanian). *Lietuvos rytas* (Lithuanian daily), 03 02 1999, p 12.

MOE (1999). *Review of the Economic and Social Situation of the Lithuanian Economy in 1998* (in Lithuanian). Vilnius: Ministry of Economy. *http://www.ekm.lt/muitai/ekmin/ap98_m.htm*, 24 05 1999.

SL (1999). *Economic and Social Development in Lithuania. January - March 1999.* Vilnius: Statistics Lithuania.

SPK (1999). Services of Port Klaipeda. Hidrosfera Ltd homepage. *http://www.spk.lt/port/new_stat.htm*, 22 06 1999.

Stopford, M (1997). *Maritime Economics.* London: Routledge.

Tamulionis, P (1999). 'In Akmenes cementas - the conflicts of interests' (in Lithuanian). *Lietuvos rytas* (Lithuanian daily), 22 04 1999, p 13.

Chapter 5

Baltic (1999). 'Minor bulks set for 2.5% growth'. *The Baltic*, February 1999, p 78.

EIA (1999). 'World oil market'. *International Energy Outlook 1999*. The Energy Information Administration homepage. *http://www.eia.doe.gov/oiaf/ieo99/oil.html*, *http://www.eia.doe.gov/oiaf/ieo99/tbld6-10.html*, 23 06 1999.

EIU (1999). '18 Jun 1999 - Lithuanian economy: business outlook'. Economist Intelligence Unit webpage "Viewswire". *http://www.viewswire.com*, 20 06 1999.

IISI (1999). International Iron and Steel Institute homepage. *http://www.worldsteel.org/trends_indicators/contents.html*, 22 06 1999.

IMF (1999). 'Real Gross Domestic Product (annual percent change): developing and transition countries'. *The World Economic Outlook Database,* April 1999. *http://www.imf.org/external/pubs/ft/weo/1999/01/data/growth_c.csv*, 20 06 1999.

LR (1999). 'The Ministry of Economy downgrades figures of growth' (in Lithuanian). *Lietuvos rytas* (Lithuanian daily), 20 03 1999, p 13.

Nordh, J (1999). 'Developments in Freight Forwarding'. *Shipping Industry Today*, Handout. World Maritime University, Malmo, Sweden.

OECD (1999). 'Co-operation between OECD and Russia and Ukraine in the Steel Sector'. Organisation for Economic Co-operation and Development homepage. *http://www.oecd.org/news_and_events/release/nw98-126a.htm,* 23 06 1999.

RMPM (1999). 'Projections 2020'. Rotterdam Municipal Port Management homepage. *http://www.port.rotterdam.nl/2020/english/inleiding/inleiding2.htm,* 20 06 1999.

UNCTAD (1984). 'Port traffic forecasting'. *Port Development. A Handbook for Planners in Developing Countries.* Geneva: UNCTAD.

WB (1999). 'The World Bank group countries: Lithuania'. The World Bank homepage. *http://www.worldbank.org/html/extdr/offrep/eca/lt2.htm,* 20 06 1999.

Appendices

IMF (1999). 'Real Gross Domestic Product (annual percent change): developing and transition countries'. *The World Economic Outlook Database,* April 1999. *http://www.imf.org/external/pubs/ft/weo/1999/01/data/growth_c.csv*, 20 06 1999.

SL (1999). 'Main indicators of economic development of Lithuania in 1993 – 1998'. Statistics Lithuania homepage. *http://www.std.lt/informacija/rodikliai/pagrindiniai_rodikliai_apie_sali.htm,* 20 04 1999.

UN (1997). *World Statistical Yearbook 1995*. New York: United Nations.

Appendix 1. The Main Macroeconomic Indicators of Lithuania

	1993	**1994**	**1995**	**1996**	**1997**	**1998**
GDP						
Actual prices, million Lt	11,590	16,904	24,103	31,569	38,340	42,768
Constant (1993) prices, million Lt	11,590	10,454	10,799	11,307	11,996	12,608
Constant (1993) US$ millions	**2,958**	**2,614**	**2,700**	**2,827**	**2,999**	**3,152**
Foreign trade						
Exports, million Lt	8,707	8,077	10,820	13,420	15,436	14,849
Imports, million Lt	9,798	9,355	14,594	18,235	22,577	23,186
Total, million Lt	18,505	17,432	25,414	31,655	38,013	38,036
Total, US$ millions	**4,626**	**4,358**	**6,354**	**7,914**	**9,503**	**9,509**
Industrial production						
Actual prices, million Lt		10,746	14,072	17,182	19,184	
Constant (1993) prices, million Lt	10,700	7,511	7,579	7,844	8,236	
Constant (1993) US$ millions	**2,675**	**1,878**	**1,895**	**1,961**	**2,059**	**2,101**

(SL, 1999)

Appendix 2. Gross Domestic Product of the Main Hinterland Countries

US$ million

	1993	**1994**	**1995**	**1996**	**1997**	**1998**
Belarus						
At constant (1993) prices	6,667	5,828	5,245	5,392	6,007	6,506
Growth rate, %	-10.6	-12.6	-10.0	2.8	11.4	8.3
Russia						
At constant (1993) prices	172,893	151,109	144,762	139,695	140,813	134,026
Growth rate, %	-8.7	-12.6	-4.2	-3.5	0.8	-4.8
Ukraine						
At constant (1993) prices	32,731	26,648	23,462	21,116	20,476	20,118
Growth rate, %	-14.4	-18.6	-12.0	-10	-3.0	-1.8
Combined						
At constant (1993) prices	**212,291**	**183,585**	**173,469**	**166,203**	**167,296**	**160,649**
Growth rate, %		**-13.5**	**-5.5**	**-4.2**	**0.7**	**-4.0**

(Compiled from UN (1997) and IMF (1999))