



SWEDISH MARITIME
ADMINISTRATION



THE COMPETITIVENESS OF
THE SWEDISH SHIPPING INDUSTRY
– ANNUAL REPORT, 2000

The competitiveness of the Swedish shipping industry – annual report, 2000

Introduction

This year's report on the competitive situation of the Swedish shipping industry adopts a far broader approach than in previous years. The background to this is that a new shipping policy needs to be approved by the Swedish Parliament during the year ahead since the current five-year shipping policy resolution expires at year-end 2001.

In order to produce the requisite basis for the extensive preparatory process required prior to such a resolution, the Swedish Maritime Administration has since spring 2000 conducted the project entitled 'The Competitiveness of Swedish Shipping, 2000' (CSS 2000), which is now being presented.

The structure of the CSS 2000 project

In May 2000, the Swedish Maritime Administration appointed a special project group to draw up the data and analyses required to serve as the basis for the year's more ambitious and broad-ranging annual report. The project group was made up of the Institute of Shipping Analysis (SAI) and a number of independent experts from the Gothenburg School of Economics, and the Bergen School of Economics in Norway and others.

A reference group consisting of some 30 people was linked up to the project group. This reference group comprised representatives from the industry, the seamen's trade unions, universities, authorities and others.

Work took the form of a network process, with the project secretariat and project group acting as the co-ordinating links.

According to the Swedish Maritime Administration's directive, efforts were to focus on the continual production of a number of factual and analytical reports as the basis for a summary report to be presented during autumn 2000.

Government working group on shipping policy

In close conjunction with the commencement of the CSS 2000 project by the Swedish Maritime Administration, a special inter-departmental working group was appointed by the Government to appraise the shipping policy pursued to date and to prepare a new parliamentary resolution to take effect as of 1 January 2002. The working group consisted of representatives of the Ministries of Finance, Health and Social Affairs, and Industry, Employment and Communications under the supervision of the Director General of the Swedish Institute of Mediation, Anders Lindström. Lars Vieweg of the Swedish Maritime Administration acted as the working group's secretary.

As a result of the close link between the Swedish Maritime Administration's CSS

2000 project and the inter-departmental working group, various work reports have been continually submitted to and dealt with by the working group.

Main results of the CSS 2000 project

In line with directives, work within the framework of CSS 2000 was directed at highlighting a number of key areas for Swedish shipping policy and the Swedish shipping industry by producing and compiling data and analyses.

The areas dealt with may be summarised under the following themes.

- The situation of the Swedish shipping industry.
- Shipping markets and competitiveness
- The financial situation of Swedish shipping companies
- The regional policy significance of shipping
- EU shipping policy

A total of eleven sub-reports were drawn up within the project, including the report on the Swedish ferry sector, which the Swedish Maritime Administration presented to the Government in June 2000.

The following reports were included under the theme 'Shipping markets and competitiveness':

- Shipping markets – trends and tendencies.
- The Swedish merchant fleet – a factual compilation.
- TAP-agreements – a factual compilation.
- Comparison of labour costs among various registers – an analysis.
- Exports of sawn-timber products – from Gävle to Japan in containers.
- Know-how in the shipping industry – a question of training and research

The theme 'The financial situation of Swedish shipping companies' was presented in a sub-report with the same name.

The scope and significance of the shipping industry, or to use another term, the shipping cluster, as well as its regional policy significance was previously highlighted during the year by a study conducted by the Jönköping School of International Economics. Consequently, within this project, the Swedish Maritime Administration has supplemented the study with two sub-reports that attempt to illustrate the regional/local significance of the shipping cluster.

- Swedish municipalities with the relatively largest involvement in the shipping industry – a selective report.
- Shipping and Tjörn island – a cluster study

Finally, a sub-report was drawn up as part of the theme of shipping policy in the EU.

- EU shipping policy – a comparison.

The final report on the competitiveness of Swedish shipping is based on the sub-reports and, in the form of a strategic analysis, attempts to summarily provide a broad and forward-looking picture of the Swedish shipping industry's potential and significance as a business sector as well as a strategically important area of know-how and skills for Swedish society as a whole.

The latter part emphasises the importance of maintaining Swedish shipping know-how for central Swedish policy areas such as maritime safety and environmental questions related to shipping and Sweden's potential to continue to be a driving force in international efforts in these areas.

Sweden's geographical location and our strong dependence on shipping for foreign trade leads also to the conclusion that sufficient shipping expertise is of major

The Swedish shipping industry and competitiveness

importance for the positive development of the Swedish transport sector as a whole and for efforts aimed at inter-modal transport solutions with shipping as a significant link in the transport chain.

What is referred to within the EU as Short Sea Shipping – which for Sweden's part means European shipping/Local shipping – is a priority area in the Union's transport policy. With the maintenance and development of its shipping expertise, Sweden has the potential to make a positive contribution to progress in this area. This is important, not least from an eastern European perspective, when our new neighbours emerge as increasingly important trading partners and the EU prepares for the enlargement of its membership to include countries with major geographical and cultural proximity to Sweden.

This is perhaps the most important message in the final report as opposed to the narrower competition appraisals of previous years, which focused on the cost situation for Swedish shipping companies. Cost competitiveness is, of course, important and is a prerequisite for the survival of the industry. However, there are other forward-looking perspectives on Swedish shipping.

As regards competition from the cost viewpoint, the final report concludes that the development of shipping policy – which in recent years has led to Sweden approaching what has become a form of EU standard and which was codified in the European Commission's state aid rules for shipping from 1997 – should now be followed through.

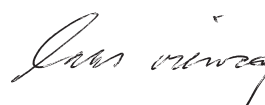
The Swedish Maritime Administration has noted that the Government in this year's budget bill stated that it was important to safeguard Swedish shipping and that this, against the background of the latest shipping developments in our local region, also applies to the ferry sector. The inter-departmental working group that is now studying the complex problem of shipping policy in its entirety has thus been given the task of drawing up proposals for a new shipping aid policy, which will primarily be based on what is known as the net model and will encompass the ferry sector. As far as the Swedish Maritime Administration can ascertain, this means that Swedish shipping gains the same conditions – in respect of those aspects that state policy can influence – as other competing countries in the EU already have or are about to introduce.

This paves the way for the progressive development of shipping and the transport area in Europe and in the Baltic Sea region, as indicated by the Swedish Maritime Administration above, and where Swedish shipping may play an important roll as an industry and as a driving force in the areas of maritime safety, environmental questions and other central policy areas.

The Swedish Maritime Administration herewith presents this year's report on the competitiveness of the Swedish shipping industry in the form of the final report entitled 'The Swedish Shipping Industry and Competitiveness' along with ten sub-reports from the CSS 2000 project.



Jan-Olof Selén



Lars Vieweg

An illustration of a white cruise ship deck against a clear blue sky. The ship's white hull is the dominant feature, with a yellow funnel visible in the upper center. A white railing runs along the edge of the deck, where a group of diverse, colorful figures representing passengers are standing. The ship's side is marked with a series of small, light-colored oval portholes. The overall style is clean and modern, with a focus on geometric shapes and a vibrant color palette.

THE SWEDISH SHIPPING INDUSTRY
AND THE COMPETITIVENESS
– A STRATEGIC ANALYSIS

Foreword

As part of current Swedish shipping policy, it is the task of the Swedish Maritime Administration to analyse and report to the Government on the trend in the competitiveness of the shipping industry. In order to compile a factual basis for such reporting, the Administration decided to draw up a number of sub-reports covering the following areas:

- Shipping markets and competitiveness
- Follow-up of the ferry market
- The financial situation of Swedish shipping companies
- Local importance of shipping – a cluster analysis
- Appraisal of EU shipping policy, with the focus on Northern Europe.

A total of twelve sub-reports on these areas have been drawn up within the framework of the project.

To complete the studies, experts from the Gothenburg School of Economics, the Norwegian School of Economics and other institutions, as well as independent players have been used. The Swedish Maritime Administration, in co-operation with the Institute of Shipping Analysis (SAI), which also prepared certain sub-reports, was responsible for project management and co-ordination. In addition to drawing up certain sub-reports, SAI was responsible for the graphic design and co-ordination of the reports.

Using the sub-reports and other sources, a special group of experts, comprising Prof. Tor Wergeland, Prof. Claes-Göran Alvstam, Prof. Thomas Polesie as well as Kaj Rehnström and Jennie Thalenius from SAI, prepared this final report.

The authors and SAI are responsible for all comments and analyses in the report. We would like to take this opportunity to thank all of those who assisted in the CSS2000 project.

Gothenburg, 26 November 2000

Kaj Rehnström
Jennie Thalenius
Claes G Alvstam
Thomas Polesie
Tor Wergeland

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Summary and conclusions

Thanks to the agreements covering temporary employees (TAP-agreements) along with current state aid, costs for vessels flying the Swedish flag have been reduced and the registration of ships to other flags has ceased. However, costs remain about 20% higher compared with the Dutch, Norwegian and Danish registers. Consequently, given current Swedish rules, registration of ships to other flags is likely to gain renewed momentum, notably in the ferry sector, since ferries may now also utilise the Danish International Shipregister (DIS).

However, focusing on the costs of Swedish-flagged vessels as the determinant of the competitiveness of the Swedish shipping industry is an excessively narrow approach.

Historically, the main policy motives for supporting the shipping industry in Sweden and other countries have been as follows:

- National industrial interests – lower transport costs.
- Employment and regional policy.
- Macroeconomic aspects - impact on the balance of payments.
- Contingency factors and security of supplies.

The primary motives underlying support for shipping have been of a protectionist nature. Meanwhile, other factors have gradually assumed greater significance.

A strategic analysis of the competitive-

ness of the Swedish shipping industry in a broader perspective suggests that developments in the following areas will determine the competitiveness of the shipping industry over the next few decades:

- The policy framework.
- Globalisation of economic activity and growing free trade.
- Developments in Information and Communications Technology (ICT).
- Volume growth in trade and transport, combined with increasingly customised logistics, an inter-modal approach and higher quality requirements in the transport area.
- Internationalisation of the shipping labour market.
- Formulation and implementation of new political objectives for longer-term, sustainable economic development based on greater social, environmental and cultural considerations (sustainable development) The concept of sustainable development made its breakthrough in the Brundtland Commission's report 'Our Common Future' (1987).*

The 'new' policy objectives are no longer directed towards protectionism but focus instead on long-term survival.

Since the market does not fully price 'sustainability' in relation to the environment, safety, social factors and transport, pricing will be shaped through political processes. Consequently, political influence on the transport industry and its competitive conditions will be even greater in the future.

Volume growth in world trade and transport continues to offer potential for considerable economies of scale in the transport industry, and particularly so in shipping. Meanwhile, new ICT applica-

* NTN – Nordic Transport Policy Network, Interreg IIC, Subproject 5.



tions will continue to offer greater efficiency in transport systems. As a result, transport costs will become increasingly marginal in relation to the value of goods transported. This may periodically lead to poor profitability in the transport business and, longer term, may present a threat to the ability of the industry to achieve the requisite skills development, adaptation and efficiency-enhancement in the transport system.

As a result of new requirements in terms of the environment and safety, along with increasingly refined customised logistics solutions, transport calculations will include 'new' cost items that cannot be offset through rationalisation. Consequently, one scenario that cannot be dismissed is that unit transport costs may reach a turning point, leading to rising unit costs over the next few decades. In the case of countries such as Sweden, with its considerable transport distances to the major markets and a substantial dependence on commerce and transport, higher transport costs would, of course, have an adverse economic impact.

The international economy has undergone several crises as a result of efficiency problems and inferior resource utilisation, leading to major adverse effects on economic development over shorter or longer periods. These crises have also created the conditions for new innovations and more efficient resource utilisation. This development will certainly repeat itself. Economic history shows that the long-term trend in unit transport costs is falling in real terms.

The European Commission's new guidelines (May 1997) covering state aid for the shipping industry should be

viewed against the above background.

The guidelines permit considerably greater possibilities for aid compared with earlier policy. Also, more forms of aid are allowed and they offer greater flexibility. Among other implications, these permit full compensation for tax and social security charges for onboard employees.

Development in the EU is increasingly heading towards a more uniform formulation of national and regional objectives in the context of shipping policy. These goals are designed to contribute to long-term economic sustainability.

The current policy objectives relating to shipping within the EU may be summarised as follows:

- Primary objective: Long-term, sustainable economic development – including environmental, social and cultural sustainability.
- Sub-objective 1: To achieve an environmentally-friendly and safe transport system that includes inter-modal solutions.
- Sub-objective 2: To strengthen competitiveness in Short Sea Shipping. *

These give rise to the following questions:

Is there a conflict of objectives?

What strategies are required to attain the objectives?

Can the sub-objectives themselves serve as a means of achieving the primary objective?

Shipping is primarily an international activity. This implies that a strategy for implementation must be pursued in international forums if the objectives are to be attained. Consequently, any conflict among the objectives is related to the degree to which objectives and means are accepted in the major shipping countries.

* Examples of this are the establishment of Short Sea Shipping Promoting Bureaus and the system based on national Focal Points.

The components of a future strategy are:

- Greater harmonisation among the various regulatory systems.
- Greater transparency in the transport and shipping markets.
- Greater standardisation.
- Greater competitive neutrality throughout the entire transport sector.

The conditions for launching a joint multinational strategy vary considerably among various regions. As a result, the implementation of strategy must be adapted to the prevailing policy, institutional and geographic circumstances in global shipping.

The analyses presented in the report 'Baltic Maritime Outlook 2000', which cover the ten coastal states around the Baltic Sea, and also Norway, show that the region is a significant and diversified shipping market. At the same time, the region is linked to the competitive situation in international shipping. These circumstances mean that application of the strategy in the Baltic Sea Region could lead to a decrease in total transport and logistics costs per unit and a quality improvement in the region's transport system (sustainable mobility).

This would strengthen Short Sea Shipping and inter-modal transport solutions based on an expansion of the feeder system, Ro/Ro and ferry traffic.

The region could serve as an example of best practice for efforts within the EU to develop the shipping industry's competitiveness, at the same time as policy objectives are satisfied.

Sweden plays a prominent role in the Baltic Sea region. Consequently, the policy motives and objectives, as well as the endeavour to offer Swedish shipping competitive terms and conditions, are good reasons for focusing on aggressive policy action in the transport and shipping context. Such a focus must take place in co-operation with other players in the industry – a cluster strategy, in other words. This would result in a Baltic Sea

region that comprised an open, competitive and unrestricted market.

An important effect for transport and shipping in the Baltic Sea region – especially for the transport of low-value goods – would be the greater incentive to improve technology, environmental and safety standards. This offers companies in the region a competitive advantage, both regionally and, later, globally.

Regional implementation of the strategy within the Baltic Sea region does not conflict with efforts within the EU, and globally within the framework of the IMO, on the contrary, it must be based on the same values. However, the time horizon for global programmes is more long term.

For the reasons outlined above, Swedish shipping requires the development of know-how. This cannot be achieved without a national shipping industry with a critically minimum-sized Swedish-flagged fleet. In the meantime, this requires satisfactory industry conditions, competitive cost levels for vessels on the Swedish register and skills-enhancing research and training programmes that encompass the entire Swedish shipping cluster. These efforts must be made in co-operation with the Swedish cluster and, in the future, within a Nordic shipping cluster. Consequently, this requires a national strategy if Swedish shipping and Swedish policy interests are to play an active future role in the Nordic region, the EU and globally, which is a prerequisite for long-term competitiveness.

Stability and transparency in the general policy framework underlying transport and industry are key factors in the development of an efficient and competitive transport cluster.

The task of the group of experts has not been to define tactical and operational proposals as to how the strategy might be implemented. Examples of such proposals are available in SOU 1998:179 'The Swedish shipping industry – threats and possibilities'.



The Swedish tanker 'Okarina' at sea.

Introduction

1.1 Assignment

Current Swedish shipping policy expires at year-end 2001 and the Swedish Maritime Administration commenced the project entitled "The Swedish Shipping Industry's Competitiveness, 2000" (SSK2000) during the spring as part of the Administration's assignment to monitor annually the competitive situation of the shipping industry on a broad front.

This presentation represents a final summary report in the form of a strategic analysis of the competitive situation of the Swedish shipping industry. Extensive factual information has been drawn up to serve as underlying material and has been presented continually in separate reports.

1.2 Purpose

The purpose of the SSK2000 project has been to illustrate the trend in the Swedish shipping industry's competitiveness in relation to the pursued shipping policy. Project work has been conducted in the form of separate analyses, each of which highlight significant individual structures and development features.

This summary analysis by the group of experts is thus based on the various sub-reports and is aimed at identifying anticipated long-term structural changes in the transport and shipping markets.

In addition, other purposes are to:

- Highlight the competitive situation of the Swedish shipping industry against the background of the structural changes and prevailing policy objectives in Sweden and in the EU for the transport sector and shipping.
- Formulate a strategic approach in an

effort to strengthen the competitiveness of the Swedish shipping industry.

1.3 Implementation

A project group under the supervision of the Swedish Maritime Administration and SAI was established for the assignment. A group of experts was linked up to the project group, with the former including a reference group with representatives from the shipping industry, trade union organisations, authorities and universities.

Within the framework of the project, the project group has been responsible for drawing up the following sub-reports:

- Shipping markets – trends and tendencies.
- Swedish ferry market – impact assessment analysis after tax-free. *
- The Swedish merchant fleet – a factual compilation.
- TAP-agreements – a factual compilation.
- Comparison of labour costs among various registers – an analysis.
- EU shipping policy – a comparative study.
- Know-how in the shipping industry – a question of training and research.
- Exports of sawn-timber products – from Gävle to Japan in containers.
- The financial situation of Swedish shipping companies – a presentation.
- Swedish municipalities with the relatively largest involvement in the shipping industry – a selective report.

* Reported separately in June 2000.

A cluster-study of Shipping on Tjörn – one of several reports.

- Shipping and Tjörn island – a cluster study.

Previously completed analyses of the competitiveness of shipping have been used as the basis for the reports. This reference material includes the following sources:

- Swedish shipping – an industry for the future (SOU 1995:112).
- The competitiveness of the Swedish-flagged merchant fleet (SOU 1997:171).
- Implications of the removal of tax-free sales within the EU (SOU 1998:49).
- The Swedish shipping industry – threats and possibilities (SOU 1998:129).
- The European Commission's guidelines on state aid for the shipping industry, 1997.
- The European Commission's communication on Short Sea Shipping, 1999.
- Action Programme for Shipping in the Baltic Region, Swedish Maritime Administration, August 1999.
- Baltic Maritime Outlook 2000, Swedish Maritime Administration, December 1999.
- The Role of the Swedish shipping industry in the Swedish economy, the Swedish Shipowners' Association, May 2000.

In addition to the above material, use has also been made of studies conducted in Norway ('I samma båt', 'Framtidig utvikling i skipsfarten og skipsfartens markeder'), Denmark ('Det blå Danmark') and Holland ('The Dutch maritime cluster') and others.



Industry and policy

Development in brief

2.1 Sweden

The prospects for the Swedish shipping industry were bright when it moved into the 1950s. This was an era of strong volume growth and rapid technical progress, which completely revolutionised shipping across the board, from coastal to transoceanic transport. This period witnessed a steady increase in the share of foreign production factors and skills.

Problems were accentuated in connection with sharply rising prices for energy, raw materials, labour and capital during the period 1974–1986, when world shipping experienced two serious crises.

The first crisis was caused by the surge in volume growth in the consumption of industrial raw materials, which led to an international supply crisis in 1973, resulting in steeply rising prices for input goods. In Sweden, the textile and shipbuilding industries, for example, were no longer able to offset higher Swedish labour costs through rationalisation.

The second crisis emerged in the beginning of the 1980s and led to a reduction in demand, primarily in the energy area, which in turn con-

tributed to a sharp fall in capacity utilisation in shipping.

During 1979–1980 and 1985, major sections of the Swedish shipping company sector capitalised on the buoyant market for bulk and special tankers. Meanwhile, it proved impossible to use rationalisation and new technology to counteract rising onboard labour costs, instead deregistration to other flags emerged increasingly as a necessary measure.

However, the struggle against relentless deregistration, crew reductions and the introduction of new technology was not solely negative – it was simultaneously a driving factor in development. It contributed to making a number of Swedish shipping companies market leaders in their niches world-wide.

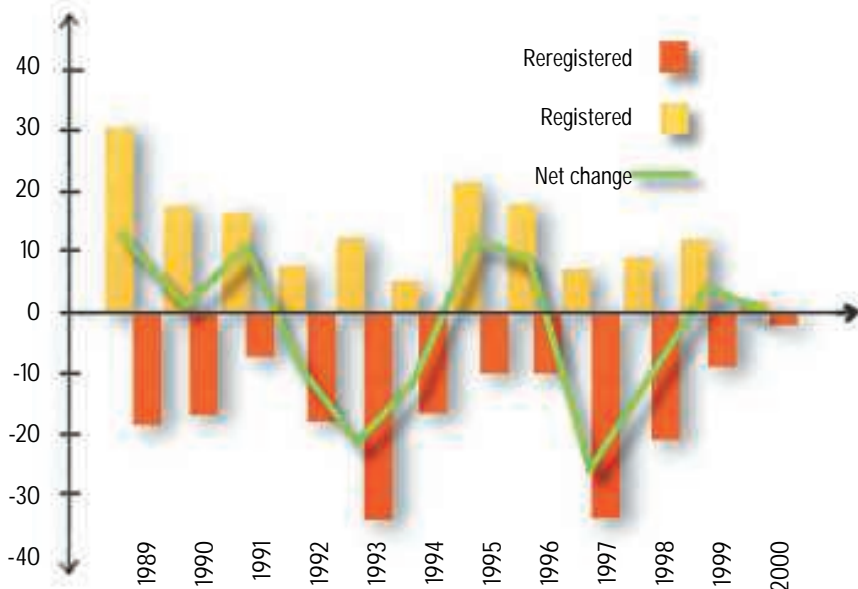
The equipment industry contributed in the form of new propulsion, navigational and cargo-handling systems. Also, goods owners and Swedish shipyards played a key role in the development and upgrading of Ro/Ro, Sto/Ro, offshore, ice-breaking and catamaran technologies.

Swedish military requirements also contributed to developments in the marine technology area. Examples of these include the use of plastics and aluminium in ships' hulls, and the development of the Stirling engine and radar technology. In addition, world-leading projects were developed in the marine services sector.

Active development in the shipping sector is continuing, with a strong degree of co-operation between shipping companies, export companies and ports/terminals in the development of efficient logistics solutions throughout the transport chain. Without the devel-



Figure 1: Number of registered and deregistered Swedish-flagged vessels, 1989–2000



Source: Institute of Shipping Analysis

opment of advanced techniques in management, ship design and cargo-handling systems in the Swedish marine industry, Swedish shipping and export industry would have a less favourable competitive situation than is currently the case.

Thanks to the adjustment to business conditions in the shipping market and continuing rationalisation, a large share of Swedish shipping companies and their sub-suppliers were able to survive the 1973–1978 and 1980–1984 crises. But it was increasingly obvious that the industry would not survive without aid to shipping companies as the Swedish-flagged merchant fleet risked disappearing completely.

Consequently, several shipping policy studies have been conducted in recent years. (Table 1)

The number of Swedish-flagged vessels has steadily declined, although the process was halted periodically as a result of shipping policy measures.

In conjunction with the latest shipping policy study, market parties agreed to introduce what is referred to as the TAP agreements, which permit the

employment of citizens domiciled outside the EES on vessels in the Swedish register, subject to certain conditions.

Industry players believe that the TAP agreements, along with the measures passed by Parliament, have contributed to halting deregistration in recent years. When reregistration ceased, the number of vessels exceeding 300 DWT stabilised at approximately 230 in the Swedish register. (Figure 1)

At the end of July 2000, there were TAP agreements covering about 400 positions, and the number of agreements had risen by some 50% within just about a year. Slightly more than 120 of the 400 positions involved masters. The number of TAP-based masters has remained rather stable at about 120 since April 2000.

We estimate that slightly more than 1,000 Swedes have been able to retain their jobs in the shipping industry than if the previous pace of deregistration had continued at a linear rate. Also, currently (August 2000), about 480 Filipinos and Poles are employed on Swedish-flagged vessels. (Figure 2)

The total potential for TAP-related employment, assuming the continuing size of the current Swedish-flagged fleet, is estimated by the Swedish Shipowners' Association to amount to slightly more than 600 positions.

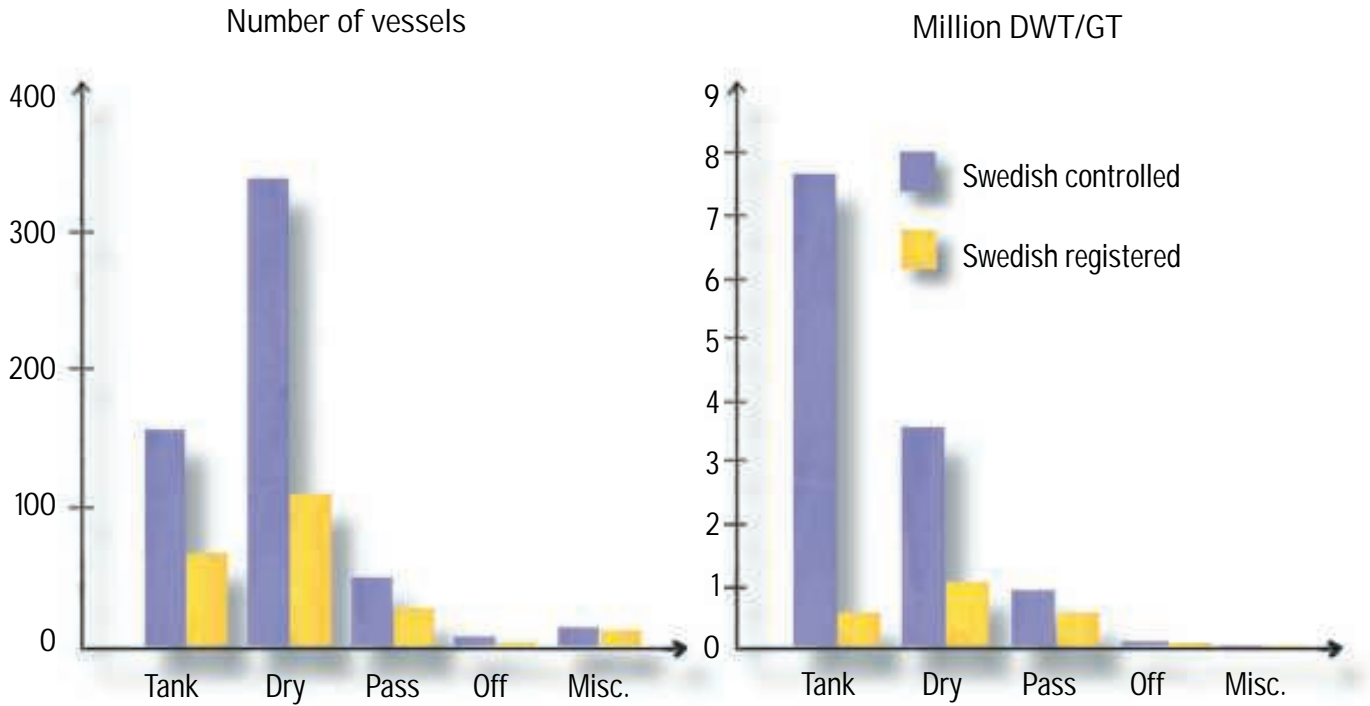
Major changes have occurred in the Swedish-controlled, foreign-registered fleet during the past two years. During this period, the fleet has been reduced by almost 50% in conjunction with the sale of Swedish tanker companies to foreign ownership interests.

In May 2000, the Swedish-controlled fleet comprised 574 vessels over 300 gross tonnes, of which 229 were included in the Swedish ship register and 345 vessels were listed on other registers. In terms of dead-weight tonnes, the controlled fleet amounted to 11.6 million, of which the Swedish registered portion

Table 1: Shipping policy studies conducted recently in Sweden

SOU 1995:112 Swedish Shipping – an industry for the future
SOU 1997:171 The competitiveness of the Swedish-flagged merchant fleet
SOU 1998:49 Implications of the removal of tax-free sales within the EU
SOU 1998:129 The Swedish shipping industry – threats and possibilities

Figure 3: The Swedish-controlled fleet, 2000



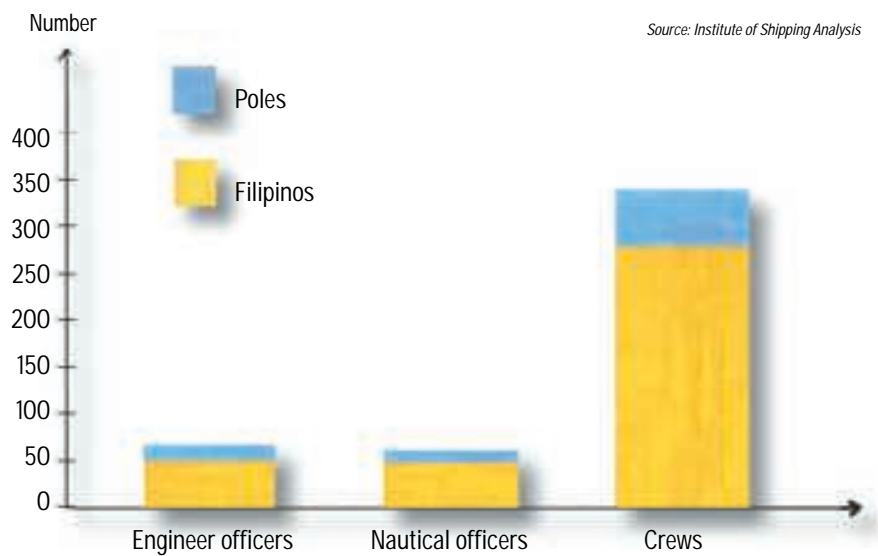
Source: Institute of Shipping Analysis

was 1.8 million. These vessels are only partly owned by Swedish shipping companies, since about 200 vessels, totalling 490,000 DWT, are leased. 140 of these leased vessels fly foreign flags. (Figure 3)

The TAP agreements have permitted a cost reduction for vessels under the Swedish flag and deregistration has ceased. Nevertheless, costs for Swedish-flagged vessels remain about 20 % higher than those on the registers of the Netherlands, Norway and Denmark..

Consequently, given current Swedish rules, it is likely that deregistration will gain renewed momentum, especially in the ferry sector due to the fact that ferries may now also utilise the Danish international register.

Figure 2: TAP-agreements by occupational category



Source: Institute of Shipping Analysis



2.2 EU

The global economy has experienced higher growth and political integration in recent years, resulting in the expansion of world trade. This trend has also led to a situation in which international shipping is now increasingly operating in conditions of low or zero national taxes and social security charges.

In turn, this has meant that high-cost countries, with shipping governed by national labour market conditions, have seen a considerable reduction in the nationally registered fleet.

The large labour cost differential, combined with the internationalisation and deregulation of shipping, means that it is only a matter of time before shipping companies that continue to operate under unfavourable national labour costs move operations to another register.

International comparisons of competitiveness and labour costs for seamen

will increasingly be a question of the individual shipping company's costs compared with those of other shipping companies rather than with the cost of domestic factors of production.

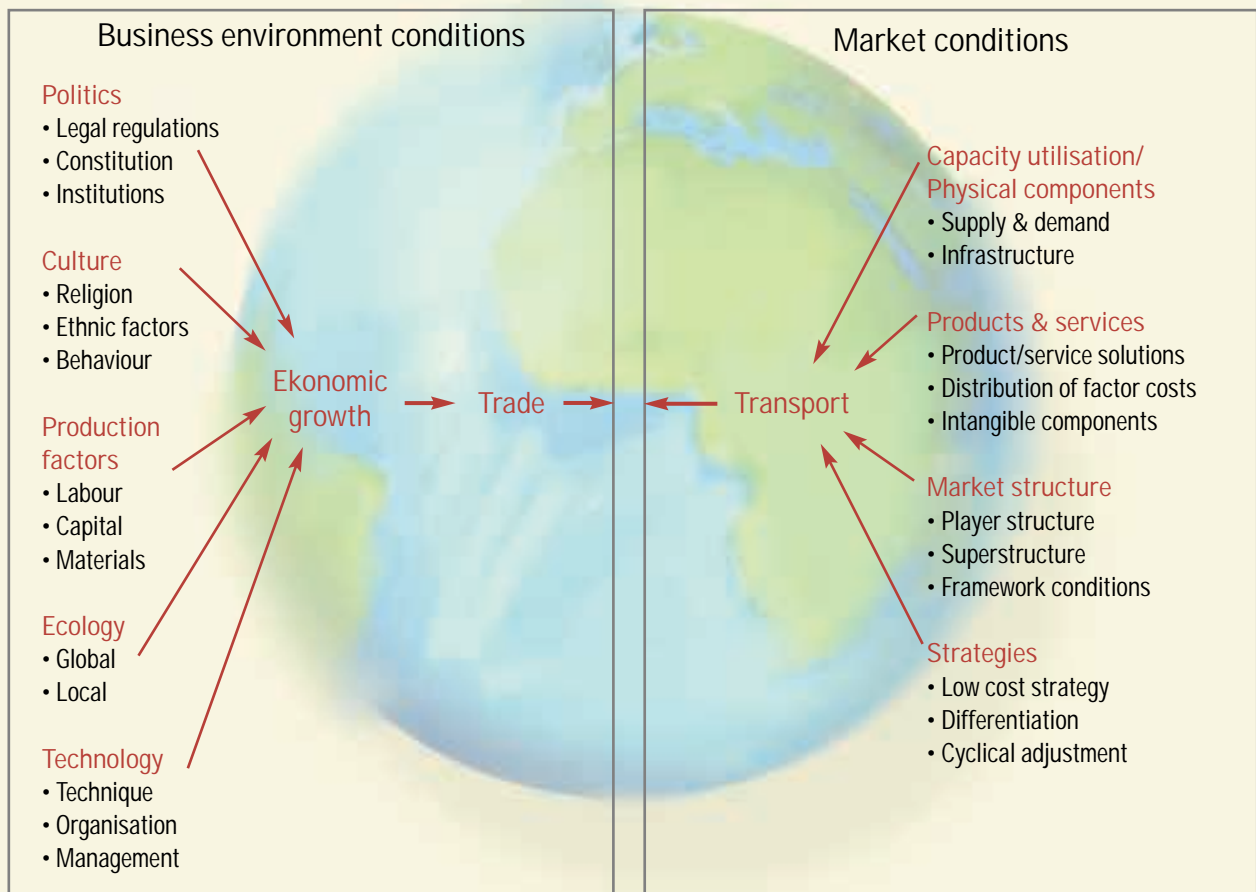
Meanwhile, there has been a significant shift in policy motives underlying involvement in developments in the transport and shipping industry.

Against the above background, the European Commission in May 1997 established new guidelines for state aid to the shipping industry that offer considerably greater potential for support compared with the previous situation. Also, the forms of aid on offer are more numerous and more flexible.

Although the effect of the various rules and subsidies is small in relation to turnover as a whole, the result can be of key significance for the marginal competitiveness and profitability of individual shipping companies.

Figure 4: The transport market – controlling factors

Factors controlling the development of transport



Economic growth, trade and maritime transport

Business conditions in shipping are highly cyclical in the short and medium term. Long term, the economic trend is affected by several factors, both regionally and globally. (Figure 4)

3.1 Global trends over the next 20 years

During the past 40 years, 75% of maritime transport operations have involved the transport of the five major bulk goods – oil, oil products, coal, iron ore and grain. Bulk goods

with the closest linkage with global environmental problems, namely, oil, oil products and coal, have accounted for almost 60% of maritime transport operations.

During the past 20 years, the heavy bulk segment has seen a relative decline in significance. High-value finished goods and semi-finished products are gaining an increasingly major role in international trade and transport. For shipping, this means that a growing share of goods is transported by container, Ro/Ro and general cargo vessels, as well as by ferries.

Major differences in economic growth world-wide will affect the structure of world trade during the decades ahead. Since 1970, aggregate GDP world-wide has risen ten fold, while maritime transport operations have increased only twofold. This is because the value of goods is rising more than the volume of goods, in line with the increasing proportion of processed goods involved in foreign trade. Even though economic growth is generally higher outside the traditional markets of North America, Western Europe and Japan, these areas will continue to account for the larger share of the world economy.

It is currently estimated that some 78% of total world GDP* is generated in NAFTA*, Western Europe and Japan. This group of countries accounts for about 16% of global population. With a continuation of current trends, this group's GDP share should fall to about 75% and the population share to 14% by 2010. However, the growth of foreign trade is expected to be distributed more unevenly and a considerably larger share of world trade in industrial products – notably intermediate goods – is expected to be conducted across long distances via intercontinental maritime transport links than is currently the case.

International enterprise has expanded rapidly in recent decades, not least as a

result of improved accessibility to global communications, continuing liberalisation of international trade and currency deregulation. The proportion of foreign trade consisting of transactions within the same company continues to grow. Consequently, the strategies of transnational companies in terms of the location of physical production within the framework of the globally organised production system represent an increasingly important factor in understanding the geographic patterns of future maritime international trade.

These companies attempt to win cost advantages by locating production where components or entire systems can be most cheaply produced, while simultaneously adapting the products to meet local requirements.

This probably means that world trade in international components will increase faster than trade in finished products.

Consequently, as regards finished products, trade and transport are expected to increase more in intra-regional trade than between regions.

None of shipping's traditional products show the same combination of key strategic factors as finished goods – namely, small geographic linkage, combined with high requirements in terms of local adaptation and cost-effectiveness.

An important question in the longer term is whether East-Asian growth will continue at the high level of the 1990s, at about 7% annually (even taking into account the financial crisis in 1997–99), and whether the Third World in general can hope to gain growth rates exceeding those of the industrial world.

Population growth in all countries is declining rapidly and it is assumed that, estimated as a ten-year average, it can fall to 10 per thousand annually during the period 2000–2010 compared with current world-wide rate of some 15

* IMF World Economic Outlook Oct. 2000.

* NAFTA (North American Free Trade Agreement).

per thousand. However, population growth in sub-Saharan Africa and in North Africa/Middle East and South Asia will be in the interval of 15–20 per thousand annually.

Also, another key question is whether the economic transition of the former Soviet Union and its former allies in Eastern and Central Europe will be successful.

Even with current rather positive growth trends, it will take two to three decades for today's EU candidate countries to approach the GDP average for Western Europe. On the basis of recent growth rates, Russia and the Ukraine cannot expect to attain the 1989 GDP level ahead of 2015 and 2025, respectively.

The basic demand situation for shipping is expected to remain positive during the initial decades of the new millennium. Thus, there is reason to expect a continuing positive development in maritime transport operations, albeit a slower rate than in the past.

This is because an increasing share of world trade will consist of finished products. The share represented by bulk goods will fall, not least because of more stringent environmental requirements in the energy area.

3.2 Business conditions, 1997–2002

Boom growth in East and Southeast Asia created a sharp increase in employment in shipping up to 1997, when the currency crisis and negative growth led to falling trade in this region. Transoceanic shipping was immediately hit, with repercussions also for regional shipping.

High growth in the US and a strengthening dollar prompted imports of finished goods from Asia to resume momentum during 1998, as was also the case for imports to Europe. In this case, shipping was also favoured by differences in economic growth among the EU countries, where exports from,

for example, the UK, Ireland, Finland and Sweden contributed to double digit growth rates for maritime transport in 1999.

Increased oil exports from Russia, along with rising prices, fuelled the Russian economy during 1999–2000, leading in turn to an increase in Russian imports of consumer and investment goods.

Trade among the Mediterranean countries has also increased sharply and, combined with the effects of the Balkan crisis, the conditions for shipping in the eastern Mediterranean have been significantly affected. On top of this, there is strong growth in container transit traffic via the Mediterranean region.

European dry cargo traffic, especially using Ro/Ro vessels, was favoured by stronger economic conditions in the UK and Scandinavia. Among other developments, the transport of forest-products has increased.

In other special segments, market conditions have been quite varying. Growing global trade in automotive products increased the utilisation of the car transport fleet, while another special segment – reefers – was hit by production disruptions and a fall in demand for fruit, leading to a reduction in transport volumes and stiff competition.

Despite the positive demand trend in 1999, the net growth in tonnage, which resulted from positive expectations ahead of the Asian crisis, contributed to downward pressure on freight prices. In addition, bunker oil prices doubled during 1999. Low capacity utilisation, reduced freight prices and poor profitability led many tanker lines to operate at a loss.

The continuing high consumption of oil, with the restoration of oil stocks to normal levels in industry, plus the easing of oil output in OPEC countries, contributed to a sharp increase in demand for tanker tonnage during

2000. This has improved freight prices, of course. Demand for modern product tanker tonnage has risen significantly, leading to higher freight prices. Higher demand for modern tonnage resulted partly from the effect of the Erika catastrophe.

Low profitability in 1998 and 1999 encouraged greater co-operation between shipping companies in the form of pooling, strategic alliances and take-overs. New pooling co-operation commenced in the giant tanker sector, for example. This trend is also very evident in container traffic – as well as in Ro/Ro operations.

Shipping companies have conducted extensive programmes to expand and restructure capacity and to adapt to trends in trade and transport. Major investments have been made in new tonnage in an effort to gain economies of scale and simultaneously improve the level of service through frequent and faster trips.

This has occurred in both trans-oceanic and regional traffic. Co-operation and mergers have bolstered corporate earnings, as reflected in stock prices. This trend is also being buoyed by positive expectations of developments in global shipping markets.

Generally speaking, shipping is in a favourable phase of the business cycle, which is expected to cover the period 2000–2003.

3.3 Swedish economy, trade and maritime transport

Sweden's geographical location makes the country highly dependent on maritime transport for foreign trade, both regionally and globally. 76% of Swedish foreign trade in 1999 derived from European countries. As regards Swedish exports, Europe accounted for a slightly smaller share, namely 72%.*

Of the seaborne volumes from, to and

within Sweden of almost 135 million tonnes, 70% is carried by cargo vessels in foreign traffic, 20% by ferries in foreign traffic and 10% in domestic goods traffic. Petroleum products are the largest product group, accounting for slightly more than 40% of the total volume of goods in foreign cargo traffic.

Goods volumes on trailers and trucks carried by ferries are rising rapidly and amount to 22 million tonnes. The share of rail cargo via ferries remains fairly static at a little more than 7 million tonnes. Other goods transported by cargo vessels total some 100 million tonnes, of which container goods amount to 8–9 million tonnes.

Maritime traffic is undertaken to and from more than 50 ports in Sweden, with a relatively short distance from port to the end customer, but with a strong concentration to the 10–12 major ports, which account for 75% of total volume.

Goods not carried in containers are of a highly varying nature and vessels are more or less adapted for one or a few products. As a result, ports are faced with high demands in terms of the provision of technology, skills, infrastructure and cost-effectiveness.

Germany, the UK, and the Netherlands account for 35% of total Swedish imports. Denmark, Norway and Finland also account for a substantial share, which has increased in absolute terms over the years.

In general, the products imported to Sweden are equally highly processed as those exported. A large share of exports is attributable to the diversification characteristics of Europe. In particular, trade with EU countries has risen and the largest markets for Swedish exports within the EES area are Germany, Norway, Netherlands, UK, Denmark and Finland.

As regards the Baltic Sea region, Sweden plays a significant role in the area and is involved in almost 20% of

* IMF, Direction of Trade Statistics Quarterly, September 2000.



total trade in the region. The other Nordic countries, as well as Poland and Russia, account for 5–10% each. Finally, the three Baltic States have a share of about 1–2% each.

Looking at foreign trade with the ten eastern European candidate countries and Russia, Swedish imports accounted for 11.5 million tonnes and exports for 3.2 million tonnes. Accordingly, in tonnage terms, Sweden imported considerably more goods than it exported, a relationship that derives from the composition of goods. Overall, trade in 1997 with these countries amounted to almost 15 million tonnes, which may be compared with Sweden's total foreign trade of some 150 million tonnes.

The most important export goods from Sweden are machine goods, equipment and transport goods, which comprised a combined total of between

30% and 50% of Swedish exports to countries in Eastern Europe and the former Soviet Union in 1997. Imports to Sweden consist mainly of bulk goods.

Several studies suggest that Swedish trade with Eastern Europe and the former Soviet Union will increase at about 8% annually up to 2015. In terms of tonnage, forecasts for Swedish exports to the region indicate an increase of about 120–130%, with imports rising 40–60%, although from very low levels for both imports and exports.

Thus, in terms of demand, the trend in Short Sea Shipping (SSS) in the Swedish hinterland is expected to develop positively. However, a warning is warranted in this respect, since there is a definite risk of an excessively large corporate presence. The reason for this risk is that the deployment of each new line/vessel in the market represents con-

Göteborg – a hub for the Swedish foreign trade.

General trends in the transport and shipping markets*

* NTN, 'Flaskhalsar i ett transportsammanhang' (Bottlenecks in a transport context) Lumsden, Thalenius. 'Färjemarknaden' (The ferry market) and the series of reports by SAI.

A higher level of processing, increasingly streamlined logistics and increased cost-effectiveness in transport represent a continual process. The driving force underlying development is the endeavour to exploit economies of scale simultaneously in production, costs and revenue.

The export industry is characterised by a limited number of very large exporters, with a substantial share of export volume and a growing number of small and mid-sized export and import companies.

The production process from raw material to final product is becoming increasingly diverse in geographic terms. Regional flows must also be linked up to inter-regional and global systems. As a result, the selection of transport medium and supplier of transport services cannot be derived from simple decision-making criteria, such as the shortest distance and the lowest transport cost.

This entails continually rising demands for effective flow channels that link up a single region with its hinterland. Swedish industry has an explicit demand for the same transport services and at a cost comparable with that paid by companies in other parts of the world. One aspect of efficiency-enhancement is that the supply of transport services is adapted to the specific requirements and logistics situation of transport-purchasing companies.

The quality requirements imposed on transport rise in line with the level of processing. The choice of transport solution, transport channel and transport company is determined by various criteria. These criteria are characterised by the fact that they vary in terms of significance and value for different car-

go owners. Thus, the appraisal of bottlenecks and how they are best rectified also show major differences among various players.

Among other implications, this development has meant that the share of goods transported by truck is rising very rapidly as a result of the small-scale nature and flexibility of this type of transport. Maritime – and to a certain extent rail – transport requires larger volumes in order to be cost-effective.

The concentration of flows towards fewer and larger terminals and ports (hubs) makes it possible to combine cost-effectiveness in transport through larger economies of scale and higher frequency.

A number of key questions arise in this context:

- What are the conditions for creating an even stronger concentration of flows?
- What critical factors can be identified from a regional perspective?
- Can greater concentration occur without new, critical bottlenecks arising?
- What effects does such concentration have on the rest of the transport system, society and the environment?

The concentration of flows towards larger and fewer hubs also entails an ever-increasing burden on infrastructure and thus on the resources of society. Large volume goods owners can capitalise on economies of scale in line with investments made in heavy goods corridors in the form of highways and railways. These goods owners also view this development very positively.

The same applies to goods owners utilising standard cargo carriers and who are centrally located in relation to heavy goods corridors. Companies that

are not centrally located or have goods that cannot easily be unitised and transported using road transport regard developments with increasing unease, since they may result in deteriorating service, accessibility and rising costs.

Transport systems have been structured to serve various geographical market areas and transport markets are more or less specialised in respect of goods. Among other factors, this may be explained by the fact that the need for resources and their composition differ considerably among the different categories of goods and transport relationships. Transport companies develop and adapt their resources to be best able to meet needs in a certain market. Variations in demand over time impose major demands on such adaptation.

Development is characterised by the growing structural complexity of the transport network. There are numerous reasons for this. The transport system becomes increasingly large scale and capital intensive in an effort to offer additional economies of scale. Logistics services develop in parallel. The transport system is expected to handle variations in volume, smaller shipment sizes and the simultaneous rise in frequency requirements.

As a result, productivity problems are closely linked to the type of transport markets and networks studied and the time horizon. Regional transport systems encompass everything from global line networks to transport networks that serve their own region. One way for a transport company to solve this problem is to add to frequency, which in itself attracts additional flows. Frequency can also be increased

through concentration and groupage of different consignments within the networks or via various networks that linked up to form larger, common hubs. This in turn is a precondition for gaining additional economies of scale.

The container transport market has undergone radical restructuring, which has been permitted through far-reaching co-operation between transport companies and their route networks, through joint hubs and integration with land-based networks.

As a result of efficiency gains in transport networks, transport costs have declined in real terms over the longer term, notwithstanding the achievement of better services and customer value. However, undertakings by transport purchasers have not been more extensive or long-term, instead goods owners have greater flexibility and more options within open transport networks.

The average cost for conveying a truck by ferry from Sweden represents about 0.5% of the average goods value loaded on the truck. The cost of shipping a 40-foot container to Japan with sawn timber corresponds to about 14% of the goods value. We believe the cost share accounted for by maritime freight is to be found within this range, with the variation depending on distance and type of goods/transport solution.

Over the long term, the transport sector, including shipping, has been able to meet growing transport requirements via considerable rationalisation, primarily by using economies of scale. This has also contributed to the transport industry being more or less continually subjected to supply pressure, resulting periodically in low profitability.

Shipping markets – future competitiveness

The shipping market consists of a number of global and regional sub-markets, with varying revenues, cost structures and strategic conditions.

Vessels are sold essentially on an international market, and thus vessel prices are correlated world-wide. Factor costs for operating a vessel are also similar world-wide, except in respect of labour. Otherwise, differences between the costs of vessels differ only depending on the type and size of the vessel, technology, speed, size of crew and crew composition.

Differences can be substantial but price formation for freight and vessels functions essentially in the same manner in all sub-markets. Any extreme variations are due to such factors as market structures – meaning the degree of oligopoly, regulations and differentiation potential and so forth.

Movements in freight and vessel prices are thus a function of global capacity utilisation in any given situation, at the same time as they reflect the long-term cost trend in the industry. The ability to monitor these conditions and the internal adaptability to price fluctuations are absolutely essential for the long-term competitiveness of each individual company.

In addition to the general conditions affecting competition, three dominant driving forces will affect the competitive conditions for shipping over the next 20 to 30 years:*

- Developments in the Information and Communications Technology area (ICT).
- Globalisation of economic activity and greater free trade.

- Conditions underlying political frameworks and environmental and social considerations.

These driving forces will lead to considerable changes, which the industry must be prepared to meet.

A primary conclusion is that, irrespective of the driving forces to which one attaches the greatest weight, the relevant skills and know-how will increasingly become the key competition parameters of the future.

Combined, these factors will have a major influence on how companies configure their logistics solutions, which in turn affects shipping in several respects.

5.1 Developments in ICT

Development in the Information and Communications Technology (ICT) area will change internal work processes in companies, as well as communication among companies. Consequently, ICT also creates the conditions for strategic changes.

Globalisation of operations will continue in line with improvements in communications, which means that major players will become larger and will impose new requirements on their distribution systems.

ICT will play a steadily greater role in economic development world-wide. It will have profound effects in various ways:

- As technology platforms for information and communication.
- As 'catalysts' in enhancing the efficiency in work processes and business communications.
- As an industry.

* SNF, Fremtidig utvikling i skipsfarten og skipsfartens markeder" [Future development in shipping and shipping markets] Atle Minsaas, Peter C. Omtvedt, Sigbjørn Södal and Tor Wergeland.

The first two points will have a direct impact on shipping. The development of ICT impacts on commercial transactions between producers and consumers, as well as on co-operation among companies through the full or partial integration of internal information.

It is easy to imagine a scenario in which information on goods and transport is available without delay for the players involved, which in turn will affect their working methods in relation to other parts of the transport chain. Opportunities also emerge for new players, such as network operators, who understand the technical potential of ICT, although they do not necessarily know much about maritime transport.

It is not easy to gain an overview of Internet trading, but the success of this requires the development of highly effective distribution systems and other innovations. Intermediaries who can offer improved service through a combination of groupage cargo and flexibility will be winners.

Internet trading will simultaneously contribute to fragmenting international trading flows. In the area of international transport, this entails a paradigm shift, with the emergence of totally new market opportunities. Meanwhile, a new type of expertise will be required.

ICT will undoubtedly lead to new ways of thinking and thus also to new working methods. New skills and strategies to facilitate adaptation to the market will therefore be a key challenge for shipping. In purely technical terms, ICT represents major potential for communication between vessels and onshore organisations. This permits progress towards the generation and processing of more information at a highly centralised level, at the same time as other central functions can be remote-controlled from land.

5.2 Globalisation of economic activity and greater free trade

Direct foreign investment is growing two to three times faster than international trade, which in turn is expanding 1.5–2 times faster than global GDP. Moreover, a substantial and increasing share of global exports and imports consists of internal shipments within multinational companies.

There is a definite tendency towards consolidation in a number of markets through take-overs and alliances between companies. In shipping, this means that shipping companies are seeking a scale of operation that permits them to be cost effective and market leaders in a global market. Recent years have witnessed a greater degree of consolidation in international container traffic, for example, as well as in chemical and gas transport operations.

Higher quality requirements and product development opportunities mean that foreign direct investments tend to move towards areas with already appropriate industrial environments. Silicon Valley exemplifies this type of self-reinforcing business clusters.

The maritime business cluster in the Netherlands has attracted considerable attention in recent years. There are many indications that several countries will in the future focus on acting as hosts for similar clusters, leading to stiffer tax competition and other effects. The trend towards the creation of the most favourable conditions for business clusters is set to continue.

It seems evident that Asia will continue to attract a large share of international investment capital, quite simply because Asia is the foremost growth area world-wide and has a surplus of low-cost labour. India and China are expected to attract a considerable portion of international capital over the next 20 years.



Environment concerns may be a threat but also a possibility for the transport sector.

5.3 The policy framework

The transport market is affected by political policy in a number of ways, for example, as a result of policies that affect the world economy and world trade, as well as international policies that more directly regulate markets and working conditions. In addition, policy decisions at the national level influence the business framework of the transport industry.

The international economy is undergoing increasing economic and political integration, leading to growing global trade. Shipping is ahead of other industries in this process of change and the emergence of an internationally mobile labour market for seamen has resulted in changes in competitive terms for players in the shipping industry.

At the international level, environmental policies, as well as financial, security and trade policies, have major potential implications.

Trade policy

Trade policy affects transport through:

- Regional policy agreements.
- Multilateral removal of trade barriers.

The creation of regional trade areas results normally in increased trade among countries in the particular

region and a certain decline in trade with the rest of the world. However, the trade-generating effects exceed the distortional effects, leading to an overall growth in trade flows. Future development will not be dramatically different than during the past 10–20 years.

Trade policy questions are of key significance for international transport and the continuing liberalisation of world trade. A breakthrough by WTO (World Trade Organisation) in respect of the liberalisation of the agricultural sector would have considerable implications – both positive and negative- for the dry cargo trade.

Environment

Growing concern about the global environment will entail considerable uncertainty in assessments of the long-term trend for shipping.

The key driving force will be changes in attitude among shipping customers, who are giving greater priority to environmentally compatible and safe transport. These changes in attitude represent considerable challenges as well as major opportunities for shipping.

Environmental regulations may entail a substantial burden for the transport market – but they also present opportunities, and notably so if the industry improves the conditions for inter-modal transport systems with a more distinct environmental profile. In the long term we can expect a gradual shift in international environmental policy to the effect that fossil fuel will be substantially more costly as a result of environment taxes.

This may have several consequences:

- First and foremost, there will be a transition from coal to gas and other energy forms. There is currently a keen interest in hydrogen-based fuel cells, which may eventually lead to a reduction in the use of coal and oil.
- Energy taxes will hit the steel indus-

try, which will increasingly shift production from ore to scrap-based production, and lead to a significant reduction in demand for coal and iron ore.

- Energy taxes will also lead to a technical development towards a more energy-efficient society. This will have a positive impact on world output and trade but will, of course, continually reduce the need for oil and coal.

Longer term, a combination of these effects may reduce the need for coal and oil by 20–30%. This will have considerably adverse effects on transport and thus the need for tanker and dry cargo tonnage.

Safety

Deregulation of world shipping and the inferior standard that characterises the ship registers of many flag states, combined with a number of accidents in recent years, have led to a focus on safety issues. The reasons for this are the environmental and social consequences of accidents involving freight and passenger vessels.

The tighter regulations being considered by the IMO will contribute to a significant reduction in the supply of transport capacity in a number of markets, resulting in rising freight prices over the next decade.

Regional policy – transport infrastructure

Infrastructure has become a feature of regional policy in Europe. In turn, this has created problems of priorities when costly investments in, for example, road infrastructure in a certain region are weighed up against the needs of other regions.

At the same time, transport and infrastructure must be viewed in a broader international perspective, in which the development of just a few links is given major importance – TEN (Trans European Network) and the

Nordic Triangle are examples of this. A good infrastructure is a precondition for the development of future transport systems and, ultimately, for the competitiveness of the Swedish export industry.

Transport policy

Transport policy decisions affect the transport market directly and indirectly when measures are not competitively neutral. Accordingly, an extremely important factor is the approach used in transport policy and decisions at the national and EU levels. In this context, an important question for the future involves the principles governing infrastructure charges as noted in the White Book (Kom 1998:466).

The principle underlying responsibility for the cost of transport, namely, that the user pays, may be regarded as correct but is also extremely difficult to implement in practice. This involves the application of the marginal cost principle but application requires competitive neutrality in respect of member countries and type of transport. One can hardly say that the marginal cost principle is in force today since there are numerous exemptions to it, with sharply varying methods and principles applied among member countries. Implementation entails that everyone is treated equally and that nobody is discriminated.

A greater use of rail and maritime transport may be viewed as an urgent need but this should be achieved by stimulating the development of inter-modal transport solutions. A major step would be to really implement the deregulation of rail traffic. Railways cannot be sheltered from competition through higher charges and taxes on road transport. The White Book deals very little with shipping and aviation, perhaps because these transport modes account for relatively low infrastructure

costs and charges are determined by international agreements.

Shipping policy

It was against the background of globalisation and its effects and modified policy objectives that the EU Commission in May 1997 set new guidelines for state aid for the shipping industry. Compared with the previous framework, the new guidelines entailed much greater potential for aid, with additional forms of aid and greater flexibility.

The main rule is that state aid may be provided only for vessels on the register of a member country. However, in special cases, state aid may be made available for vessels listed in other special registers, provided that such a register contributes directly to the objectives stated for the Community's shipping policy. In addition, flag-neutral support measures may be approved in special cases when it is clear that these are of benefit to the Community.

As regards the ceiling for aid, the guidelines indicate a reduction to zero in the case of taxes and social security charges for seamen and corporation tax. Each form of state aid is to be submitted by member states and will be examined by the Commission on the basis that the total aid may not exceed that which would have been paid in taxes and social security charges by seamen and shipping companies. Within the framework for the total limit for state aid, seamen may be compensated for home travel expenses.

Major restrictions apply to investment aid in connection with the procurement of vessels, in line with the EU's directive on aid for shipyards. However, to a certain extent, such aid is approved if it contributes to improving onboard equipment and stimulates the use of safe and environmentally-friendly vessels through upgrading beyond the mandatory safety and environmen-

tal requirements set by international conventions.

Support for training and research in the maritime area may be approved under certain conditions.

Support for Public Service Organisations (PSOs) may be allowed in order to cover the shipping company's losses arising as a result of the service requirements set by governments. Public tendering is a prerequisite for the approval of this type of aid.

There are essentially two systems governing the taxation of shipping companies in the particular countries. Either the shipping company pays normal corporation tax or the country applies a system using tonnage tax.

In turn, the tonnage tax may be designed as a selective tax or as a system in which profit is estimated according to a standard method and is then taxed at the normal corporate tax rate. The latter is the most common form.

The replacement of corporation tax with tonnage tax has attracted considerable attention in recent years. This tax is levied as a fixed tax based on vessel size and thus attributes a fictitious profit to the vessel-related side of the shipping company's operations, irrespective of whether or not it reports a profit. Compared with corporation tax, the tonnage tax entails considerably lower tax when the company reports a large profit. Greece has used this form of tax since 1957. Holland, Norway, Germany and the UK have recently introduced tonnage tax.

According to the prevailing State Aid Guidelines, there are various approaches used in Europe for treating taxes and social security charges for onboard employees. The result for onboard employees should in principle be the same whether or not they receive gross or net wages. However, the treatment of shipping companies can provide different results.

The general conclusion is that development is a slow process, in which individual countries more or less gradually 'copy' each other's system, as in the case of Norway emulating Holland. In the longer term, this will eliminate cost differentials among various EU flags.

In line with this development, skills and owner control as well as safety and environmental issues will be more important competitive factors in shipping.

The trend is evident when we look at changes in the German, Italian, Dutch, Irish and French regulations.

Combined, the changes mean that the shipping policies of the various countries are tending to converge. Examples include exemption from tax and social security charges for onboard employees and the tonnage tax system. The Danish decision to also allow ferries to be completely covered by the system may also be viewed as another stage in this process.

5.4 Cost situation

A international comparison of the cost situation for the Swedish shipping industry may be divided into two parts:

- Costs of the onshore organisation, and
- Costs of vessels.

The costs relating to onshore employees make up only a minor share of a shipping company's aggregate costs over a year and reflect the national cost situation of Swedish industry as a whole. As regards this portion of costs, the Swedish shipping industry has a definite advantage compared with the major seafaring nations such as Japan, Norway, Netherlands and others.

For all vessel-related costs, travel costs and daily costs, only the onboard labour costs are dependent on Swedish domestic conditions, provided the vessel sails under the Swedish flag.

Table 2 shows the trend in relative

Table 2: Cost comparison for seamen

Year	SRTAP	NIS	NR	DIS
Year 2000 index F	100%	83%	74%	78%
År 1999 index	100%	76%	70%	76%
År 1998 index	100%	77%	73%	78%

F = Forecast Source

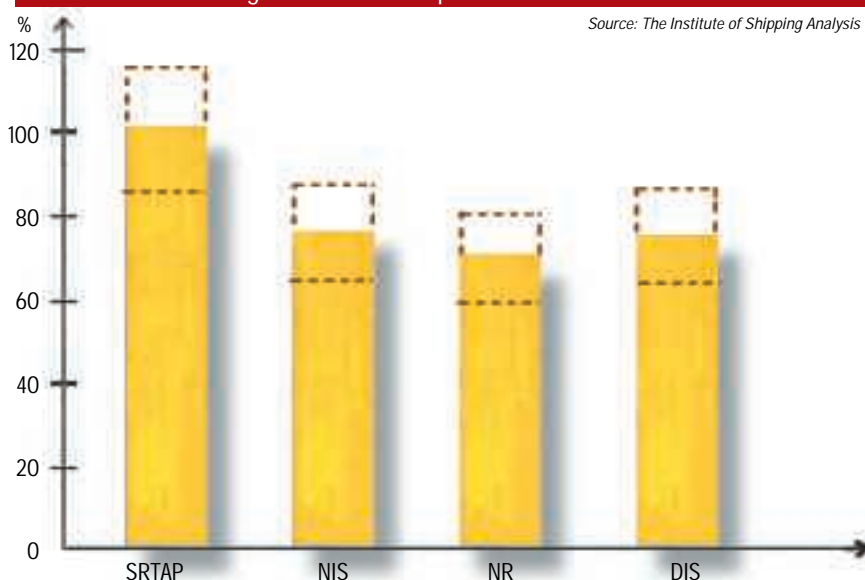
Source: The Institute of Shipping Analysis

labour costs for three different types of vessels – a 7,000 DWT product tanker, a 5,000 DWT bulk cargo vessel and a 14,000 DWT Ro/Ro, sailing under the Swedish flag and subject to TAP (SRTAP), the Netherlands flag (NR), Norwegian International Register (NIS) and Danish International Register (DIS). (Table 2)

A typical crew for SRTAP, NIS and DIS, with supplements for a trainee in NIS, is 50% made up of national citizens with the remainder made up of EU nationals. The corresponding situation for a Dutch crew is 25/75.

The relative labour cost situation in 1999 for a merchant vessel flying the Swedish flag, and covered by TAP agreements, weakened between 1998 and 1999. However, the trend during the current year appears to be towards an improvement in the order of 12% vis-à-vis the Norwegian International Register (NIS), 3% vis-à-vis the Netherlands Register (NR) and 2% vis-à-vis the Danish International Register.

Figure 5: Cost comparison for seamen



* NTN report, 'Nordisk transport i framtiden' (Nordic transport in the future) Carsten Jahn Hansen, Karl G. Høyer and Emin Tengström.

* Swedish Ministry of Finance, DS 1999:47, 'Att reda sig själv- An ESO-report', Lars Hultkrantz.

For an individual vessel in 1999, SRTAP corresponded to an aid level of 62–68% of total tax and social security charges. Differences among individual vessels are due to the variations in over-time levels.

The achievement of the same cost level under the Swedish flag in 2000 as in the case of NR would require the same conditions in the Swedish register (SR100) as in the Netherlands register, that is, full compensation for tax and social security charges in line with the EU's guidelines.

We may conclude that adjustment to EU guidelines has taken place gradually, which has resulted in disruptions and shifts in the competitiveness of European shipping. These occurred despite the fact that in the longer term the result will be the same, namely, that pay differentials among countries subject to EU guidelines will be levelled out for equivalent occupational positions.

In the case of ferries, a general comparison of labour costs, subject to various agreements and flags, indicates that:

- If the cost index under the Swedish and Finnish flags is 100 and 115 respectively, the
- German flag and DIS and NIS have an index of 60–70, and
- Russia, Estonia and Poland have an index of 20–40.

Extending the same aid that applies to cargo vessels under SRTAP to the entire crew under the Swedish flag, the cost level would be on a par with that under the Danish flag, for example.

5.5 Modified policy motives

The traditional primary motives for supporting shipping can be summarised as:

- Swedish export industry – lower transport costs
- Employment and regional policy

- Macroeconomic – balance of payment effects
- Contingency reasons – security of supplies

There is an aspect of protectionism underlying these motives. Viewed from traditional macroeconomic and trade theory perspectives, serious misgivings arise about this type of economic policy*. In the longer term, it leads to sub-optimisation and lower growth.

A growing world population, environmental problems and special conditions in developing countries have gradually attracted greater attention. The concept of sustainability gained a political breakthrough in conjunction with the Brundtland Commission's report 'Our Common Future' (1987), which spoke of achieving what it referred to as sustainable development*.

Following this breakthrough, new policy initiatives emerged in a number of areas, including the transport sector. The concept and vision underlying sustainability has influenced the formulation of current transport and industrial policy objectives in several countries, including the EU.

Current transport and shipping policy is governed by the following motives:

- Environmental effects (sustainable environmentally friendly development).
- Safety issues (safe transport system).
- Competitive situation (fair competition).
- The importance and role of transport for longer-term sustainable economic development (sustainable transport and mobility).

The policy motives underlying the industry and transport policy emerging in the Nordic region, the EU and globally has turned from a purely protectionist direction towards long-term sustainability, which is encompassed by the concept of long-term sustainable economic development.

Competitiveness in a broader sense

Over the past 20 years, the competitiveness of Swedish shipping has been associated with trends in the Swedish-flagged fleet and labour costs in comparison with other ship registers. The cost disadvantage of the Swedish flag was met by registration to other flags and a greater use of what are referred to as open registers. Thus, the problem of vessel operating costs and the related inferior competitiveness seems to have been solved.

Meanwhile, other problems have gradually gained significance. These include:

- Globalisation of the production of goods and services.
- Internationalisation of the shipping labour market.
- Growth in trade and transport volumes, combined with increasingly streamlined logistics, an inter-modal approach and transport quality requirements.
- Development and deployment of policy objectives for a more sustainable, long-term economic development, along with the long-term social, environmental and cultural sustainability (sustainable development).

6.1 Know-how and adaptability

The competitiveness of transport and shipping will increasingly be a question of know-how, adaptability, greater customer-focus, service and cross-border co-operation among companies.

The process started in transoceanic shipping but has become increasingly evident in what is referred to as Short Sea Shipping, where both efficient

logistics and inter-modal co-ordination are of crucial significance.

Adaptation has progressed in stages and by country, leading to considerable disruptions in competitive conditions among individual countries. Developments in Northern Europe are a good example of this process. Countries such as the Netherlands and Norway have been driving forces in these changes and have thus created competitive advantages, which business and industry in those countries have been able to utilise.

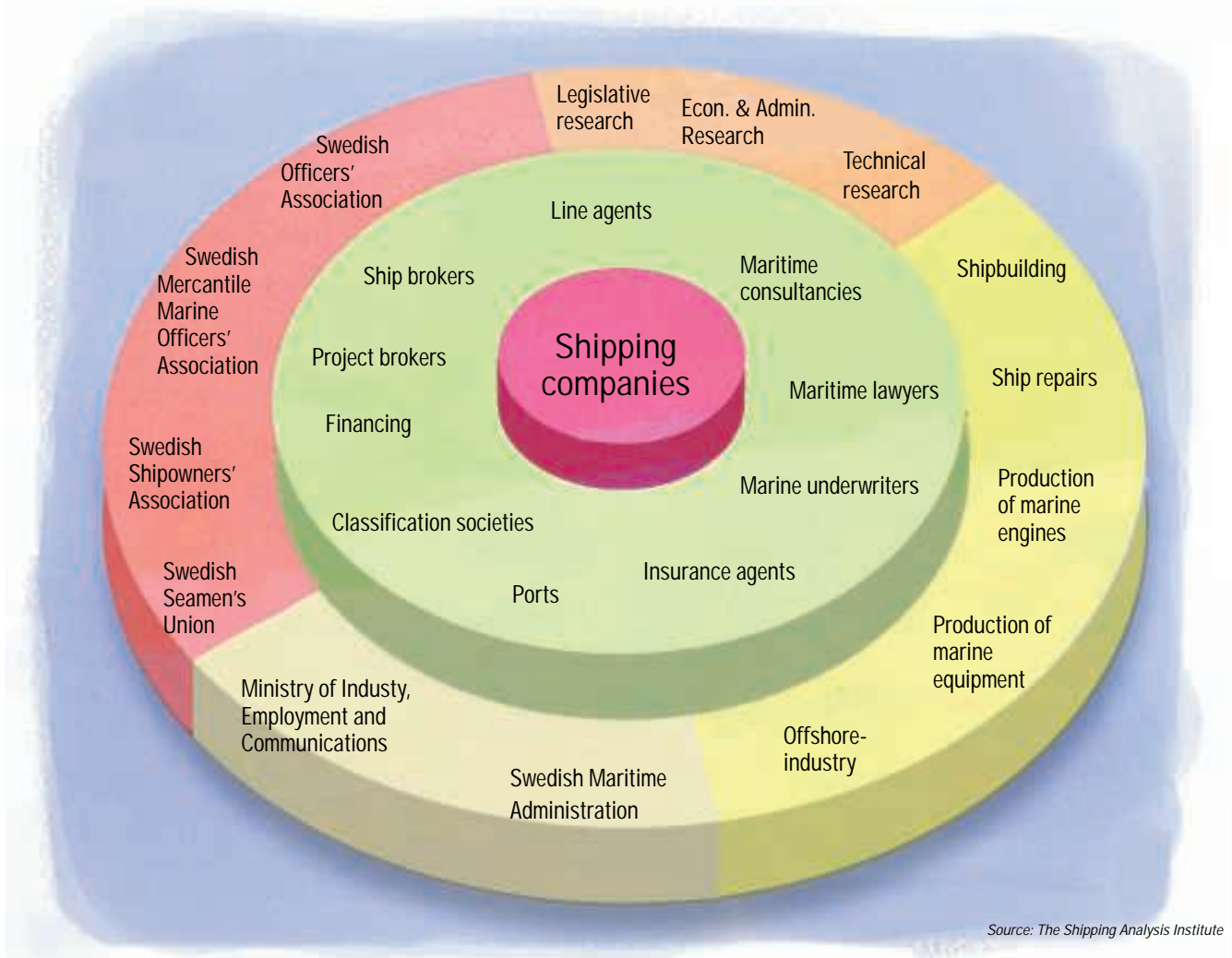
For these reasons, Swedish shipping needs to ensure the development of know-how via training and R&D programmes, which cannot be attained without nationally-based shipping operations that encompass a critically minimum fleet under the Swedish flag. At the same time, this requires favourable industry conditions and competitive costs for vessels in the Swedish register.

Without this, Swedish transport and shipping know-how cannot be developed, although this is necessary in order to ensure the competitiveness of Swedish business and industry on the one hand, and to ensure the influence of Swedish transport and the shipping policy on the other. This in turn is important for the achievement of the new policy objectives.

In order to achieve these objectives, strategy must also be based on a view of the transport industry in which the commercially competitive situation of individual companies can be combined or balanced with the ability of the public sector to achieve long-term sustainable economic development.

Consequently, in a broader sense, Swedish competitiveness is a question of both commercial and policy capacity. Our policy 'competitiveness' can, for example, be reflected by how well Sweden succeeds in pursuing specific issues within the EU.

Figure 6: The shipping industry as a network



Source: The Shipping Analysis Institute

From the national viewpoint, this involves achieving a balance and co-operation between the commercial competitiveness of Swedish shipping and Swedish policy competitiveness nationally, regionally and globally.

The key question is whether policy competitiveness can be developed that simultaneously strengthens national commercial competitiveness and vice versa.

This viewpoint is found in cluster theories.* Modern management literature frequently uses the 'cluster' concept to describe networks that shape nationally important industries. The concept is a new one but the actual process is

old and has historically played an important role in the development of the Swedish metallurgical, engineering, food-processing and shipping industries, for example.

6.2 The shipping industry from a cluster perspective

Swedish shipping is the term used to describe that part of Swedish business and administration that is active in shipping or in the shipping industry's supply lines (equipment, supplies, port services, pilotage, salvage, insurance, training and so forth).

The Swedish shipping industry may

* Appendix 1: 'Klusteranalys som metod' (Cluster analysis as a method). Memorandum by Claes-Göran Alvstam.

be defined on the basis of various criteria, such as the size of the merchant fleet and ownership situation, but also on the basis of business links and relationships. As the basis of the description of the industry, we proceed from the players who are traditionally regarded as comprising the core of the business, that is the shipping companies/agents, ports, shipyards and the sub-suppliers linked to these players.

A review of the approximately 600 vessels shows that slightly more than 500 shipping companies, agents, ports, shipyards and sub-supplier companies may be considered to comprise the industry. These companies have a turnover of SEK 45–50 billion and directly employ about 27,000 people. Including indirect employment, the number of people involved amounts to about 150,000*.

Relationships within an industry are not solely of a commercial nature. They also encompass the transfer of know-how via supplier/customer links, and the exchange of labour or joint R&D. (Figure 6)

Without this interplay, which has given Sweden a technical and commercial lead in several market segments, the potential for continuing positive development deteriorates, not just for shipping company activities but also for the industry as a whole. In the Northern European context, major resources are being invested in developing the shipping industry and Sweden can benefit from these investments if we ourselves contribute actively with our own know-how and skills. This view of the shipping industry as an integrated network can be further developed by including the industry's ability to compete at both the corporate level and as a cluster. This approach rests on a definition of competitiveness outlined in the chart below.

A self-reinforcing cluster survives and

strengthens itself over time, primarily because there are co-operative benefits to be gained from the interplay with other players in the cluster through R&D programmes, for example. A lack of stability weakens the cluster and at a certain point it becomes excessively small and thus degenerates.

6.3 A dynamic transport market and methodology/measurement problems

We have pointed at the need for and value of regional studies of flows and transport channels, as well as the need for the development of know-how in order to be able to define and evaluate the efficiency and strength of the transport system today and in the future.

Regional analyses permit the identification of structural similarities and differences, problems and requirements as well as development potential within a specific geographic region. At the same time, the regional analysis must reflect the background conditions and driving forces in individual countries that may entail substantial differences in terms of history and traditions, economy, production conditions, living conditions and political situation, etc.

However, the transport market in a region must not be viewed as closed but is instead integrated with its hinterland. Consequently, a region must be

* Einarsson et al, Jönköping School of International Economics, 2000.

Figure 7: Competitiveness – a question of implementing strategies



Figure 8: The shipping cluster and competitiveness



viewed from a holistic perspective, which means that the region's commercial and social requirements and the underlying view of function and benefits – in comparison with those of other regions – can be identified and related within the framework of a common descriptive model. This in turn represents a necessary basis prior to further work on the national and international levels with target-oriented measures for greater harmonisation, liberalisation, maritime safety, environmental compatibility, efficient transport, lower resource utilisation and so forth, all of which are encompassed by more sustainable development.

Reliable data, systematic methods and analysis as well as uniformity in monitoring over time are prerequisites

for being able to analyse the dynamics of the transport market, that is, showing how the transport system's structure, function, characteristics and relationships change over time.

There is a major need to capture significant development trends and evaluate the impact on society and commercial life, at the same time as complexity has increased considerably with the globalisation of the production of goods and services.

This also implies a greater need for a dynamic approach and aids in order to analyse the transport system and its environment. Without such aids, we encounter difficulty in illustrating change over time in the transport system's characteristics and/or relationships and function.

A strategy for increased competitiveness

This section represents an attempt to formulate a strategy for increased competitiveness, in terms of both policy and industry. A strategy that takes into consideration the shipping industry's business environment and the market conditions, as well as changes in policy objectives.

Development in the EU is moving increasingly towards uniform national and regional target formulations in the political context. The currently prevailing policy objectives* relating to shipping can be briefly formulated as follows:

- Primary objective: Long-term sustainable economic development – encompassing environmental, social and cultural sustainability.
- Sub-objective 1: To achieve an environmentally-friendly and safe transport system that includes inter-modal solutions.
- Sub-objective 2: To strengthen competitiveness in Short Sea Shipping.*

The following questions then arise:

- Is there a conflict of objectives?
- What are the strategies required for attaining the objectives?
- Or – can the sub-objectives themselves serve as a means of achieving the primary objective?

Any conflict of objectives is related to the degree to which the objectives and means are accepted in the most important shipping countries.

The strategies under discussion can be summarised as follows:

- Greater harmonisation among the various regulatory systems.

- Greater transparency in the transport and shipping markets.
- Greater standardisation.
- Greater competitive neutrality throughout the entire transport sector.

The international transport market has been largely deregulated and liberalised, but harmonised only to a limited extent. This applies essentially to all forms of transport. Harmonisation encompasses a number of areas, not just the tax area but also the technology, infrastructure, social, environmental and safety areas. The objective does not necessarily mean that creation of exactly the same conditions or charges in all countries, but only that the differences among them are reasonable. The wide spectrum of charges and charging systems contributes to inefficiency and uncertainty for operators and their customers. Progress in harmonisation within the EU is slow and occasionally one gets the impression that the number of special cases is actually increasing.

Consequently, conflicts arise if the strategies are pursued by just one or a few nations within a region. This results in extra costs for the shipping industry and its customers in these countries, at the same time as goal fulfilment remains low. If on the other hand, more stringent environmental and safety standards are introduced throughout the region, there is no conflict of interests. Harmonisation issues must be pursued in international forums, for both national and international traffic. However, the conditions for pursuing a multinational strategy vary in different regions.

The analyses in the report entitled 'Baltic Maritime Outlook 2000', which cover the 10 coastal states in the NBSR* including Norway, highlighted a number of fundamental features of the region's transport market, some of which are as follows:

- Volume turnover for ports in the

* Baltic Maritime Outlook 2000, Swedish Maritime Administration.

* Examples of this are the establishment of the Short Sea Shipping Promoting Bureaus, and national 'Focal Points' etc.

* NBSR – Nordic Baltic Sea Range.

A strategy for increased competitiveness

region amounts to 700 million shipments,

- More than 5,500 vessels are employed annually,
- Countries in the region control more than 10,000 vessels, 50% of which are not on the national register,
- Approximately 40 % of the tonnage is more than 20 years old,
- 80% of port calls are generated within the region,
- 60% of cargoes arrive in or depart the region,
- Sweden is the major player in terms of port calls and cargo turnover in the region.

Accordingly, the region is a considerably large shipping market with diversified markets. At the same time, the region is linked to the competitive situation in international shipping.

These circumstances contribute to the fact that an application of the strategies, although isolated exclusively to the NBSR region, could lead to a decline in total transport and logistics costs per unit in the region and a simultaneous quality improvement in the region's transport system (sustainable mobility). This would strengthen Short Sea Shipping and inter-modal transport solutions based on the expansion of

feeder systems, Ro/Ro and ferry traffic.

A definite advantage in the region is the potential co-ordination among the countries and their roles as coastal and flag states. The region can function as an example of best practice for efforts within the EU aimed at enhancing the competitiveness of shipping, at the same time as policy objectives are satisfied.

Adapting the actions of coastal and flag states for the regional implementation of the strategies in the NBSR creates no conflict with the strategies pursued globally within the framework of the IMO's work – on the contrary. The plan is to highlight the NBSR as a pioneer and driving force in ensuring that shipping can make its contribution to long-term sustainable economic development, both regionally and globally. The result would be an NBSR region which in the future would encompass an open and competitive free market.

An important effect of this co-operation for the transport and shipping industries in the region, particularly in the transport of low-value goods, would be the greater incentive to improve technical, environmental and safety standards. This would offer companies in the region a competitive advantage at the regional and, eventually, global level.

Sweden's prominent role in the region, the policy motives and objectives and the endeavour to offer Swedish shipping equal competitive conditions are good reasons for focusing on aggressive action in the transport and shipping policy context and extending interaction with the industry's other players – a cluster strategy, in other words.

A Swedish strategy is required to ensure that the Swedish shipping industry can be part of a future Nordic shipping cluster. This in turn is a prerequisite for ensuring that the competitive conditions of the Swedish shipping industry can develop favourably in the longer term.



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Cluster analysis as a method*

* Extract from 'Agglomerationer och kluster i ett teoretiskt sammanhang' (Agglomerations and clusters in a theoretical context), working paper for CSS2000 by Claes G. Alvstam, Department of Cultural Geography, Gothenburg University, 2000-09-24.

* See, for example, Marshall, 1890; Schumpeter, 1911; Dahmén, 1950; Perroux, 1950; Porter, 1990; Krugman, 1994.

Economists and geographers have long noted and described how a geographic concentration of companies and industries can create positive external effects through the support of each other's internal activities as a result of the proximity of the particular players to each other - in other words, by utilising their advantages of common location - even though they do not necessarily co-operate formally and may actually be competitors.*

These external economies of scale - or positive externalities - are regarded as being conditioned by the cumulative and self-reinforcing local traditions that emerge as a result of several closely located companies developing their expertise and experience in a particular production sector. This know-how is then disseminated by the movement of people among these companies, by their being influenced by new ideas and thereby creating internal networks and an interactive and innovative environment. In turn, this environment contributes to the emergence of new innovations, efficiency enhancement, quality improvements and other forms of interplay, subject to low transaction costs. Moreover, companies related in this manner also support each other by specialising in various niches in a production system, thus also serving as each other's sub-suppliers and customers. In his classic work, 'Principles of Economics', Alfred Marshall formulated this situation thus:

"(When) an industry has thus chosen a locality for itself, (the) mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously".*

These positive effects were regarded as being readily created in an environment marked by a small-scale corporate structure, featuring a high level of flexibility, adaptability to new external conditions and a true entrepreneurial spirit marked by a sound balance between risk-taking and commercial security.

It is far from obvious that only a small-scale corporate environment offers this type of specialised production the greatest advantage. Many of today's large companies have at some stage or other expanded as a result of being extremely successful vis-à-vis their local and regional competitors. Not infrequently, this expansion has been generated though the internalisation of related and supporting companies within the company's own production and through the acquisition of competitors. However, one striking feature is that there are so many good examples among a wide range of industries - and in totally different parts of the world - in very successful and geographically highly curtailed production agglomerations, specialising in very narrow niches.

Today, there are even examples of such small corporate groups in single city or a local industrial district that dominate the entire global market in its speciality product (such as the production of sherry in the Spanish town of Jerez de la Frontera, Scottish whiskey distilling, or the manufacture of pencils in Nürnberg, but the most common case is that locally concentrated and specialised production in certain product groups and industries primarily play a local, regional or even a nation-wide role. A sizeable share of the production agglomerations cited in the literature on this subject are located in peripheral areas, usually with no strong links to their external business environment (such as Jæren in south-western Norway, the crystal district of Gnosjö Anderstorp in the Swedish province of Småland, the furniture companies in

* Marshall, 1890 (1916), page 271.

Tibro, and brush manufacturers in Bankeryd, in Sweden – ‘the Third Italy’ – the leather conglomerate in Ubrique in Andalusia, and machine tools manufacturers in Elgoibar in the Basque country.)

There is probably no relationship between successful production agglomerations and peripheral locations; instead this over-representation in the literature is because agglomerations in peripheral rural areas are easier to identify and describe than their counterparts in major cities, such as the Kista telecommunications zone in north-west Stockholm or the specialist textile conglomerate in Milan.

The shared learning process has been an important component in the study of industrial agglomerations and has attracted a number of researchers*. The general argument is that a local industrial structure with many companies in related industries or several jointly localised competitors tend to trigger processes that create dynamism and flexibility as well as learning and innovation*. A local culture with specific norms, values and informal game rules develops and this environment also provides ‘tacit knowledge’ that can be transferred from one player to another.*

Naturally, the distinct success of local and regional production agglomerations in generating employment and growth has prompted players involved in government and municipal industrial policy to create such environments through the establishment of special research villages or science parks around universities, technology institutes or research institutes (such as Tsukuba in Japan, Cambridge in England, French Sophia Antipolis in France, and others). Since they share the same functional characteristics, there is no reason to distinguish between these artificially created agglomerations and those that have grown generically over a protracted period.

However, it is important to remember that the absence of a lengthy and deeply ‘embedded’ production tradition in recently established science parks can contribute to their demise during temporary recessions. Generic agglomerations frequently have greater sustainability and long-term capacity to survive.

There is no unambiguous definition of production agglomerations, instead research tends to select different concepts for similar phenomena, depending on the approach used. Perroux (1950) refers to growth poles, Dahmén (1958) speaks of development blocs, Porter (1990) calls them value chains, and Saxenian (1994) refers to industrial systems and so forth.

In their studies of national competitiveness, Michael Porter and his student Michael Enright broadened the classical Marshallian agglomeration concept by relating individual companies and industries to larger industrial clusters*. A cluster in this sense is an industrial network that remains together through the interdependence of the various components. Consequently, companies in the same cluster need not belong to the same industry. All that is required is that there is an internal dependence in the form of a customer or sub-supplier relationship, or alternatively a common production base. This dependence can also be indirect through the two companies in same cluster representing external end-points in a long production chain. For example, this may involve an engine-block casting company in relation to the unit in the automotive company where final assembly takes place. Two companies can also belong to the same cluster by being related to a common customer, although not otherwise having internal relations. This, for example, may involve a manufacturer of welding electrodes for use in shipbuilding in relation to the company that supplies tex-

* See, for example, Asheim, 1996; Malmberg et al, 1996; Maskell et al, 1998; Maskell-Malmberg, 1999).

* Porter, 1990; Enright 1998.

* Malmberg, 1998.

* Malmberg, *ibid.*

tile interior fittings for the same vessel.

Consequently, the external demarcation of an industrial cluster is frequently rather arbitrary. As a result, one usually uses a more narrow definition comprising, for example, vertical links within a value chain (iron ore – steel – rolled products) or horizontal links, consisting of companies that complement each other technologically and in terms of markets (such as the electronics-based companies in Silicon Valley). Thus, a demarcated cluster should normally have a common production base, frequently a natural advantage – a natural resource or an advantageous geographical location – but it may also be a joint research base, microelectronics, or biotechnology, etc. Moreover, the industrial cluster frequently has an individual prime mover – or central figure – who at some stage initiated the whole process, such as the brush pioneer Harry Isaksson in Bankeryd* or William Hewlett and David Packard in Silicon Valley*.

The relatively limited geographical space has traditionally been regarded as a key criterion in referring to local production agglomerations or industrial clusters. However, this feature is gradually losing its significance. Porter defined industrial competitiveness in the emergence of national clusters by claiming that a nation – as a result of specific factor supply and demand conditions – could encompass groups of particularly strong and internationally competitive groups. By his use of such large geographical units in his case studies, such as the US, Germany, Japan, Italy, and the UK, it is doubtful whether one can speak of production agglomerations in the classical sense. Instead, these involve national production clusters, although he takes most of his pedagogical examples from local and region clusters. Consequently, it appears that Porter's analysis is more

suitable to smaller industrial countries, which in certain cases were incorporated into the original study (Sweden, South Korea, Denmark, Switzerland, Singapore). Subsequent follow-ups using Porter's methodology have frequently functioned better in small rather than large countries.*

Consequently, economic geographers have therefore preferred to concentrate on local/regional clusters, frequently geographically connected in industrial districts, and rather sharply demarcated territorially.* A frequently applied rule of thumb is that what should be involved is a local labour market, that is, that the various workplaces in the regional cluster should normally be within commuting distance of, say, a 100-kilometre radius*, while the local cluster is seldom regarded as encompassing more than a single urban area or a municipality/city. However, this proximity concept is vague in many ways and must be related to the type of industry and functional form of the labour market in the particular region.*

It is important to distinguish between the cluster itself, on the one hand, and its direct and indirect links, on the other. In addition, we can identify a number of operations that indirectly support the production base, such as the medical care sector, elementary schools, infrastructure and so on. These are not usually included in the actual cluster since they are not unique to this type of production. On the other hand, they are often included in studies of local and regional multiplier effects of production and investment.

In recent years, these limitations have tended to lose their significance with the emergence of information and communications technology that permits close contact between and within companies across limitless distances. For example, a biotechnology cluster can encompass a group of researchers

* Sölvell et al, 1991; Reve et al, 1992; Hernesniemi et al, 1996.

* See, for example, Isaksen, 1996; Jonsson, 1992; Jonsson et al, 1996; Lundquist, 1996.

* See, for example, Larsson, 1998.

* Malmberg, 1998.

* Saxenian, 1994.

* Jonsson et al, 1998.

working in widely different parts of the world, but who are nevertheless in daily contact with each other via the Internet.

One question that has troubled research efforts is that it is rather easy to point to several good examples of successful production agglomerates and industrial clusters, but it is difficult to verify that there is a general relationship between success and common location. The various more ambitious attempts to draw up more extensive empirical studies have not provided definitive results. Occasionally, it has even proved difficult to identify social structures or joint utilisation of local institutional arrangements in such regions that are very frequently cited in the literature as 'typical' of successful industrial districts, such as Baden-Württemberg*. Nonetheless, the phenomenon exists in so many different environments in various parts of the world and in widely different industries that it cannot be denied. Perhaps the key factors are to be found outside the quantifiable limit.

* Staber, 1996.

Tjörn – associated with a certain activity – shipping.







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