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# CONCENTRATION IN LINER SHIPPING

ITS CAUSES AND IMPACTS FOR  
PORTS AND SHIPPING SERVICES  
IN DEVELOPING REGIONS

## **ABSTRACT**

Concentration in liner shipping means that relatively larger shipping companies are increasing their market share at the expense of the remaining smaller players. Although this process is not new, it has gained strength and is particularly affecting ports and shipping services in developing regions.

Because trade is growing as a proportion of world GDP, governments and international organizations attach an increasing priority to improving ports and shipping services. This leads to deregulation, which, together with technological advances, increases the incentives for shipping companies to form alliances and to merge. Another cause of the process of concentration is technological change, which has led to an increase of fixed costs as a proportion of total average costs. This leads to larger optimum unit sizes of vessels, ports, and companies, which in turn reduces the number of participants in the long-term market equilibrium.

To analyse the impacts of these trends, the document examines the following issues: the extent to which economies of scale are being realized; possible declines in liner shipping companies' profits; the danger of overcapacity; fluctuations in freight-rates; the strength of alliances; the expansion of east-west carriers into north-south markets; the increasing proportion of trans-shipped containers; ports as trans-shipment centres; options for small liner operators; benefits for importers, exporters and consumers; and the implications for regulatory bodies.

The document presents a generally positive picture. The word concentration might initially raise the issues of abuse of market power and monopoly rents, but importers, exporters, consumers, ports, and major east-west carriers are all likely to gain from the described process. The ones that are most likely to lose are traditional north-south liner shipping companies. It would, however, be a costly misconception of competition if the public sector tried to protect smaller players from its consequences.



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# EXECUTIVE SUMMARY

## Concentration in ports and shipping

Concentration in the field of maritime transport means that relatively larger ports, shipping companies and their alliances are increasing their market share at the expense of the remaining smaller players. Although this process is not new, it has gained strength in recent years. The following figures describe this trend:

- The size of the largest container ships has almost tripled within the last two decades.
- Recent mergers and acquisitions have resulted in some very large liner shipping companies. The top 20 carriers now control more than half of the world's container slot capacity.
- Since the beginning of the 1990s, liner companies have begun to form global alliances. The largest ten groupings now control about two thirds of the world's container slot capacity.
- Containers are increasingly trans-shipped. Ports that provide trans-shipment services have experienced particularly high growth rates.
- In practically all other maritime industries, such as shipbuilding, open registries, seafaring personnel and container leasing, the market share of the largest suppliers has also increased.

## Causes

Maritime transport is not the only industry undergoing a process of concentration. The two main motives for companies to merge and to form alliances are the desire to reduce unit costs (i.e., to achieve economies of scale) and to increase income (i.e., to gain greater market power). This is only possible up to a certain limit, and this limit has shifted toward fewer but larger commercial units. This document examines the possible causes for this shift from the following three perspectives:

- Economic background. Trade is growing faster than world GDP, and in spite of a reduction of transport costs per ton, the share of transport costs within the total costs of merchandise goods has gone up. Increasing demand and containerization have led to high growth rates for liner shipping. In itself, this is not a cause for mergers and alliances. However, this economic background has encouraged the development and use of new technologies, and it has caused many governments and regional organizations to change their attitude toward deregulation.
- Government regulation. Governments and regional organizations are attaching a greater priority to the promotion of trade through improved, less expensive transport services. They are also increasingly hesitant to protect national maritime industries. The attitude of governments and

their national cartel offices toward mergers and acquisitions has become less adverse because national players have to compete globally.

- Technologies. Under given factor prices, such as wages and interest rates, new technologies lead to a changing cost function. In ports and shipping, these changes include an increased proportion of fixed costs as compared to variable costs. This shift of the relation fixed costs/variable costs leads to increased scale economies. This, in turn, implies larger optimum company sizes and thus leads to a reduction of the number of players in the long-term market equilibrium.

## Impacts

Concentration in ports and shipping largely results from the desire to achieve scale economies. Although this leads to fewer global players, competition on individual routes is actually increasing. Together, scale economies and increased competition have the following main impacts:

- Unit costs. Individual ports and shipping companies are able to reduce unit costs through economies of scale. However, this is achieved at the expense of overall lower freight-rates.
- Profits. In absolute terms, liner shipping companies' profits are increasing because of the growing market. In relative terms (i.e., return on investment), profits have been declining. Competition obliges carriers to pass on cost reductions to the shipper. If compared to the historically low interest rates, the return on investment is not as bad as some representatives of liner companies may think.
- Overcapacity. High fixed costs and weaker liner shipping conferences have led to a strong perception of overcapacity among many liner executives. Globally, such overcapacity does not exist. It may occur in the future if liner shipping companies continue to expand their capacity to reduce unit costs. The introduction of larger container carriers on the main east-west routes creates particular pressure in secondary markets because of the redeployment of medium-sized vessels.
- Freight-rate fluctuations. High fixed costs and the desire to gain and hold market shares leads to increased marginal pricing. In the short term, only the marginal costs need to be covered by the freight-rate. As marginal costs have decreased, freight-rates are likely to fluctuate more.
- Alliances. The recently established global alliances have been less stable than was initially foreseen by their members. Although alliances will probably continue to exist for some time, in the long run they may be superseded by outright mergers.
- North-south and regional markets. The need to fill the larger ships and the cascade effect of redeploying medium-sized ships into secondary



markets has leads to an expansion of the major east-west carriers into north-south and regional markets.

- Trans-shipment. Larger ships and more trans-shipment are cause and effect of the same trend. Ports will gain from this tendency, whereas traditional north-south carriers are most likely to lose market share.
- Trans-shipment centres. Apart from the need to provide high-quality services at low prices, the main determinant for a port to become a trans-shipment centre is its location.
- Options for small liner operators. In responding to the challenges that are posed by the process of concentration in ports and shipping, north-south and regional carriers can join global alliances, form regional alliances, merge and grow on their own, be sold or focus on a particular niche.
- Global trade. Shippers have benefited from the cost reductions that shipping lines have achieved due to scale economies. Also, increased competition and the use of trans-shipment services have increased the number of transport options and frequencies.
- Policy implications. Governments that hope to generate income and employment for a national maritime industry must focus on the few areas where their countries have a comparative advantage and the possibility of achieving scale economies. To promote trade, international competition in the provision of port and shipping services should be encouraged.

## Outlook

This document presents a generally positive picture. The word concentration may initially raise the issues of abuse of market power and monopoly rents. After analysing the causes and impacts of the process of concentration in ports and shipping, however, no abuse of market power was detected. Importers, exporters, consumers, ports and major east-west carriers are all likely to gain from the described process. Traditional north-south liner shipping companies are most likely to lose, but they, too, may identify options for benefiting from the overall growing market.

Governments and regional and international organizations such as the European Union and the World Trade Organization must follow and watch the process of concentration very closely. Should, for example, a vertical integration between shipping lines, port operators and freight forwarders occur, some regulatory intervention might become necessary. So far, however, the largest liner shipping company only controls 6% of the world's slot capacity and the biggest port operator around 10% of container port moves. Shippers themselves have formed associations that should be capable of countering possible abuses of market power by the port and shipping sector. It would be a misconception of competition if the public sector tried to protect smaller players from its consequences, even if this results in smaller number of larger market players.

Based on these conclusions, the following recommendations are being made:

- Smaller liner shipping companies. To wait and see is a policy which could lead to bankruptcy and should be avoided; the process of concentration is going to continue. Carriers can cooperate with each other or try to grow, thus forming part of the process of concentration. Alternatively, they can focus on a particular niche. If a niche can be identified and maintained, the return on investment is likely to be higher than the average earned by east-west carriers. Specialization should thus be the preferred option. If this alternative seems unreachable, the option to sell should not be excluded.
- Ports. Ports should have no illusions concerning the viability of establishing new trans-shipment centres. Some very specific characteristics have to be met. Furthermore, it is not inherently bad to be feeder port. To benefit from the process of concentration in liner shipping, ports need to foster containerization by investing in gantry cranes, and ports that lie on the same route need to cooperate to create common conditions for the carriers and thus avoid bottlenecks. By increasing their productivity, ports indirectly foster the process of concentration because they promote trade, encourage more trans-shipment and the use of larger ships.
- Regulatory bodies. The concepts of globalization and privatization have not always been accepted by all sectors of the society, especially in developing countries. The protection of national industries, the interests of labour unions and strategic considerations have led to delays in the acceptance of these concepts. This should be avoided with concentration, which has been a reality since the onset of the industrial revolution and which is going to continue in the foreseeable future. Regulatory bodies, including governments and international organizations, need to accept and understand this reality to ensure that their countries benefit from the process of concentration in liner shipping.

## INTRODUCTION

Concentration in the field of maritime transport means that relatively larger ports, shipping companies, company alliances and suppliers of other maritime services are increasing their market share at the expense of the remaining smaller players. This process of concentration in ports and shipping is not new, as it is part of a process that originates in the industrial revolution, yet it has gained force in recent years. In particular, in light of trade liberalization and economic growth in developing countries, ports and liner shipping companies in their countries are now starting to feel a particularly strong impact of this process of concentration.

Ship sizes have grown since man first used a tree-trunk to cross a river. Thanks to technological advances and specialization, such as the steam engine and containerization, a single container ship now carries more cargo than several thousand trucks. In order to fill these ships, liner shipping companies are expanding their activities into the increasingly attractive markets of the Southern Hemisphere.

Many existing liner shipping companies are already the result of previous mergers. They have cooperated for many years in the form of conferences and have now started to form even closer alliances. Carriers in developing countries, which are no longer protected by their governments through mechanisms such as cargo reservation need to decide how to respond to the challenges resulting from these alliances.

Individual ports already began to die in the Mediterranean four centuries ago, once ships were able to skip port calls every evening due to the advent of accurate navigation systems. Nowadays, in Europe, most extra-regional trade passes through just five major ports in the Le Havre-Hamburg range thanks to fast and reliable inland transport connections. Worldwide, hub ports increasingly concentrate cargo for trans-shipment, thus creating global networks of links for the maritime transport of containerized cargo; networks, which increasingly also include the ports of developing countries.

This document describes and analyses this process. It is mainly written for liner shipping companies and ports who serve developing countries. This includes regional and north-south liner shipping companies, private and public general cargo ports, as well as present and potential trans-shipment centres. The document is also intended for the public sector, such as transport ministries, ministries of public works, and port and maritime authorities, which regulates the maritime industry. Governments should try to generate benefits for their economies from the trends that are here described and analysed. It is not a practical possibility to stop the process of concentration – nor would it be desirable.

The document has three main parts. First, it describes the present situation and recent trends of concentration in the maritime industries. Second, the document discusses the causes that lie behind this process of concentration. It deals with the economic background and regulatory parameters. Above all, it argues that a main cause for the process of concentration is the increased proportion of fixed costs among the total average costs. Third, the impacts of the previously described trends are discussed with regard to shipping companies, ports and regulatory bodies.

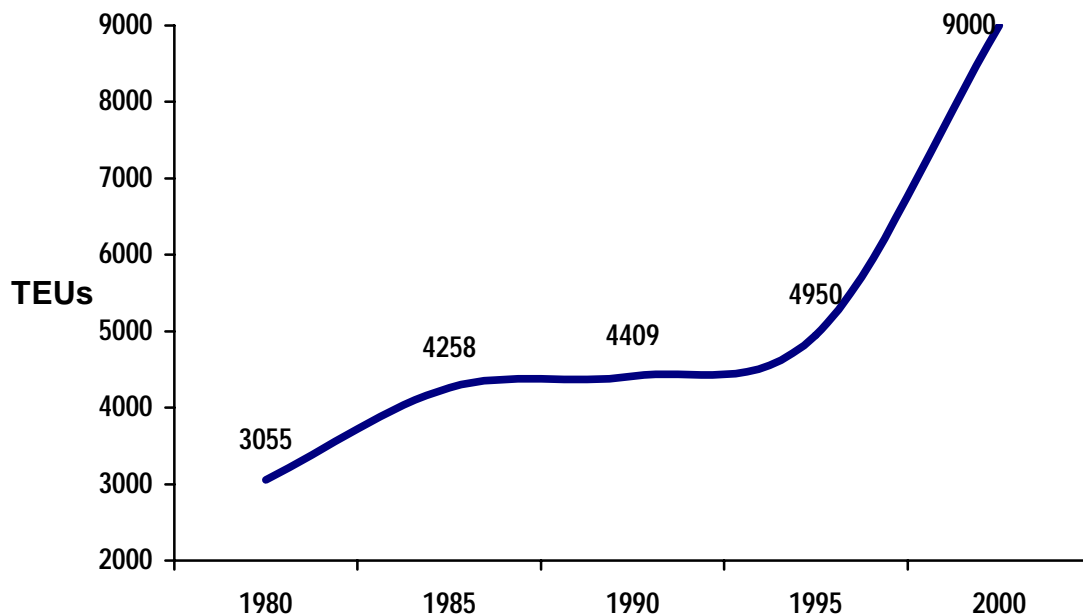
# I. CONCENTRATION IN MARITIME TRANSPORT

## A. VESSEL SIZES

### 1. The Panamax barrier

Since 1980, the capacity of the largest container ship has almost tripled, and the average container ship size has increased by two thirds from 955 TEUs in 1980 to more than 1,600 in 1996 (Drewry Shipping Consultants, 1996b, p. 49).<sup>1</sup>

Figure 1  
Largest container ships, in twenty-foot equivalent units (TEUs)



Source: Data for 1980 – 1995: Drewry Shipping Consultants, *Post-Panamax Containerships*, London, 1996, p. 49. Data for 2000: ECLAC forecast.

Note: At the beginning of 1998, the largest container ship had a carrying capacity of around 8,700 TEUs, including empty containers.

One of the factors contributing to this trend is the introduction of the so-called post-Panamax container ships. Panamax vessel is a ship that has the maximum dimensions to pass through the Panama canal. Such a vessel has a maximum beam of 32.3 m and lengths of up to 290 m. The largest Panamax container vessels carry up to 4,442 TEUs with approximately 60,000 dead-weight tons (dwt).

The first post-Panamax container ship was built in 1988, yet only in 1995, did the worldwide container-carrying capacity of post-Panamax vessels start to increase sig-

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<sup>1</sup> One TEU is 20x8x8 feet, the size of a standard container. A forty-foot container is equivalent to one forty-foot equivalent unit (FEU) or two TEUs.

nificantly. In 1997, almost 60% of the orders for container slots at world shipyards were for post-Panamax ships. At the end of that year, more than 50 post-Panamax vessels were in operation and about 40 additional ships were on order. The largest post-Panamax ship now carries more than 6,600 full TEUs, and with existing technology, ships with a capacity of up to 7,500 full TEUs are feasible (Drewry Shipping Consultants, 1996b).

So far, post-Panamax vessels are only employed on two major routes: (1) trans-Pacific (i.e., between the United States West Coast and Asia) and (2) between Europe and the Far-East. The latter is sometimes part of a pendulum service which reaches the United States East Coast. No liner operator is currently calling at South American ports or going around Cape Horn or the Cape of Good Hope with post-Panamax vessels.

## **2. How much bigger?**

Several major carriers have not yet started to construct vessels with a capacity of 6,000+ TEUs, and it may thus seem unlikely that others will start construction of the next generation of ships. It is also possible, however, that a company like Evergreen, which so far has not constructed 6,000+ TEU-vessels, will skip one step and go directly to the 8,000-TEU barrier – or even bigger. Technological and natural limits and dis-economies of scale in ports may not permit vessels to become much bigger than 8,000 TEUs.<sup>2</sup> The limiting factors are the water depths of ports, the outreach of cranes and the quantity of containers that have to be moved through the port in a very short time.

Other analysts envisage ships of 12,000 to even 15,000 TEUs.<sup>3</sup> The main obstacle would be the necessary time spent in ports. This could be reduced by fine-tuning present ship and crane designs and by introducing new technologies such as cranes that move more than just one forty-foot container at a time, systems that move containers within the ship's hull or loading and unloading the ship from both sides.

An alternative to existing container ships might be the Jumbo Barge Carrier (JBC). It is supposed to offer “still greater capacity and more flexibility for different cargoes” (*World Cargo News*, July 1997). The JBC carries six 2,000-TEU barges at once, reaching a total capacity of 12,000 TEUs. The barges can be loaded at different berths and thus require less time in the port. Also, the necessary investment in ports would be reduced because each barge would require smaller cranes and less draft than the existing post-Panamax ships. The barges are not ocean-going vessels however, so the system would not reduce the need for trans-shipment services. A major disadvantage is the high initial capital expenditure, possibly with various sets of barges for each mother vessel.

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<sup>2</sup> At the Terminal Operation Conference (TOC) 96, “the majority were of the opinion that it would be scarcely possible to achieve any economies of scale with ships of over 8,000 TEUs.” See *International Transport Journal*, 18/96, p. 46.

<sup>3</sup> Rogan McLellan, P&O Containers, paper presented at TOC 96 in Hamburg, April 1996, quoted in *International Transport Journal*, 18/96. See also Gustaaf de Monie, quoted in *Cargo Systems*, August 1997.

**Box 1**  
**THE "GROWTH" OF THE SOVEREIGN MAERSK**

The recent trend of growing ship sizes took many industry observers by surprise. As the following news items show, throughout the planning, construction, and servicing of Maersk's post-Panamax ships, the actual size of these vessels was the subject of intense discussions.

November 1996: "Confirming current rumours, Thomson, the President of Maersk Inc., added that Maersk's next generation of container ships, now being built in Europe, will emerge with a capacity of 5,500 TEUs, making them the largest built to date." (*Shipping Times* via <http://web3.asia1.com.sg/timesnet/data/cna/docs>, 14 November 1996).

January 1997: "Danish shipping giant AP Moller is believed to be planning to extend its building run of 12 giant container vessels to 15 amid denials from the company and the shipyard. Informed industry sources have told *Fairplay* that the company has definite plans for a further three vessels to be constructed in 1999, but this has been refuted by the Odense Lindo shipyard's V.P. Frank Gad. Despite this denial, the story is likely to cause concern to rival container operators, which were caught out by the surprise unveiling of the first 6,000+ TEU vessel early last year. Maersk has an enviable reputation in shipping, not least for its tight control of information about the company's operations." (<http://www.fairplay-publications.co.uk>, 15 January 1997)

July 1997: The technical specification of the K-Type Regina Maersk include a total dead-weight of 82,135. Total capacity 6250 TEUs. Loa 318.2 m, beam 42.80, draft 14 m. (*World Cargo News*, 7/97)

November 1997: "Maersk's 'mega' ships are now rated (officially) at 6,600 TEUs ... Originally, these vessels had been capable of loading 6,000 TEUs, but according to Maersk the insertion of two 40ft holds midship has expanded their carrying capacity by 10%" (*Containerisation International*, November 1997).



December 1997: "The Sovereign Maersk just keeps growing. When the giant ship entered service in September, Maersk insisted she had a capacity of 6,600 TEUs, although ports handling the vessel said the true size was above 7,000 TEUs. The ship quickly became regarded in liner-industry circles as the world's first 8,000-TEU ship. But now, it seems, the vessel may be even larger than that. Some experts say the Sovereign Maersk has enough space to load 8,700 TEUs. Admittedly, the ship could not carry that many full containers because of dead-weight restrictions, but competitors are convinced the Sovereign Maersk is very much larger than Maersk will admit to." (*Lloyd's List* via <http://pnp.individual.com>, 22 December 1997). Some sources now even mention the figure of 8,736 TEUs (e.g., Richard Butcher of IMS Ltd, Cambridge, UK, during the Caribbean Shipping Association's Annual General Meeting in October 1997, quoting *Lloyd's List* of September 1997).

Although it is not clear if and when 15,000-TEU vessels will be built or new systems such as the JBC deployed, the recent surge in vessel size will not halt at the present maximum of around 8,000 TEUs. The proportion of post-Panamax vessels within the total fleet is bound to increase, as is the average vessel size.

## B. CARRIERS

### 1. Mergers and acquisitions

Independent of the exact measure of concentration in liner shipping, there clearly exists a tendency toward more consolidation. According to *Containerisation International*, by the end of 1996, the world's largest 20 container service operators controlled a combined carrying capacity of 2.6 million TEUs, which is 48% of the world's total capacity. By the year 2000 this is expected to be "well in excess of 50%" (*Containerisation International*, November 1997, p. 57). *Shipping Times*, on the other hand, states that "at present 18 companies control about 71 per cent of the world's container slot capacity, with 11 of these companies based in Asia".<sup>4</sup> Similarly, a report by *Lloyd's Shipping Economist* states "that the 10 largest carriers represented 48% of slot capacity in January 1997, while the top 20 accounted for more than 70%" and "the world's top five container shipping lines accounted for almost 30% of total capacity". (*Lloyd's Shipping Economist* only counts container ships with a capacity of more than 1,000 TEUs, whereas *Containerisation International* takes all vessels with container carrying capacity into account.) Another indicator of concentration is the number of containers that are operated by the top 20 carriers. This percentage has increased from 32% in 1981 to 64% in 1997.<sup>5</sup>

Recent mergers, take-overs and shareholding agreements include the acquisition of APL by NOL, the merger between P&O and Nedlloyd, the purchase of CGM by CMA, the acquisition of Lykes and Ivaran Lines by CP Ships, the purchase of Blue Star by P&O Nedlloyd, and the majority shareholding of Hanjin in DSR Senator Line. Hanjin Shipping Co. itself is the result of a merger between Hanjin and the Korea Shipping Corporation. Liner company spokesmen often reject the idea of future mergers for their own company. "Cooperation yes – merger no" and at the same time "In ten years we will be among the largest" are typical statements – in this case of a Hanjin spokesman (*International Transport Journal*, 52/1996).

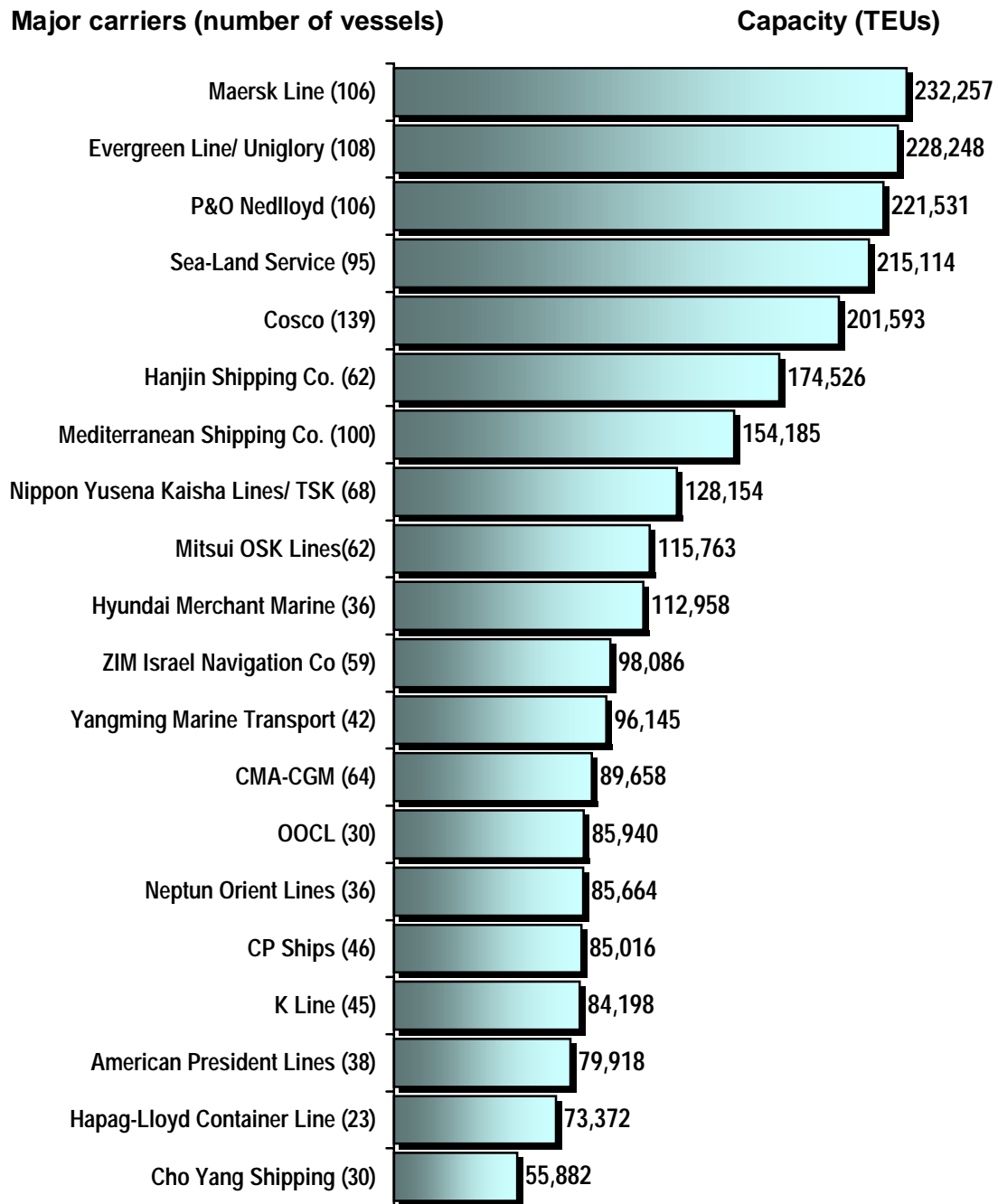
Compared to other industries, shipping is still a rather fragmented industry. No single line controls more than 6% of the world's total slot capacity. Around 30 companies hold a share of about 1% each. The development in shipping is similar in this respect to other service industries such as telecommunication and air transport. Some other industries are dominated by far fewer suppliers, the aeroplane industry by Boeing and Airbus, chip production by Intel, the diamond trade by de Bear and software by Microsoft.

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<sup>4</sup> *Shipping Times* via <http://web.3.asia1.com.sg/timesnet/data/cna/docs>, 13 November

<sup>5</sup> *Lloyd's List* via <http://pnp.individual.com>, 1 December 1997

Figure 2  
Top 20 container carriers, September 1996



Source: *Containerisation International*, November 1997.

Notes: Data is for September 1996 (i.e., before some of the recent mergers such as American President Lines (APL) and Neptun Orient Lines (NOL), which still appear separately in the list).  
TEU: Twenty-foot equivalent unit.



In shipping, most industry observers expect more consolidation in future. The result may be a total of ten or eleven major carriers, “plus in each area a number of niche operators” (*International Transport Journal*, 27/1996). According to Leif Loddesol of Wilhelmsen “the number of global lines would diminish as vessel sizes increased”. He also “estimated that in the trunk (east-west) lines only five to ten Far Eastern companies would survive along with two to four European and one or two US operations.”<sup>6</sup>

**Box 2**  
**ASIAN CARRIERS RULE THE WAVES**

Eleven of the twenty largest carriers are based in Asia. These are NYK-Line, Mitsui OSK-Line and K-Line of Japan, Hanjin Shipping, Hyundai Merchant Marine and Cho Yang Shipping of Korea, OOCL of Hong Kong, Evergreen and Yangming of Taiwan, NOL of Singapore and COSCO of China.

These carriers are now offering service levels similar to companies from Europe and North America. Their growth has been based on trade growth in Asia and also on government subsidies. These subsidies are expected to continue, especially as the shipping industry is not yet governed by WTO rules which prohibit subsidies to promote exports.

Asian lines carry around 70% of Asia-Europe trade, more than 80% of the containerized United States-Asia trade, and 90% of the intra-Asia trade. Given the global trend toward more consolidation mergers will occur probably also particularly in the Asian region.

Sources: S.C. Chan, “Asian carriers rule the waves”, *Shipping Times*, 17 November 1997. Marcus Hand, “Liner shipping industry set to see more mergers”, *Shipping Times*, 13 November 1997. Felix Chan, “More mergers expected between shipping firms”, *Shipping Times*, 6 October 1997.

## **2. Fewer companies, yet more competition**

Mergers and acquisitions result in fewer companies, which might suggest that competition diminishes, yet, mergers and acquisitions themselves are the result of competitive pressures. Smaller liner operators often complain that fewer, larger operators may lead to oligopolies, which use their market power to reduce competition, yet large lines tend to expand into new markets, which increases competition on many individual trade routes.

On a global scale, there are now fewer operators than in the past, but on most individual trade routes the number of lines competing for cargo has actually increased. For example, Asian lines have entered the North Atlantic trade, east-west lines are entering north-south markets and the feeder services of large lines are competing with traditional regional lines.

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<sup>6</sup> *Lloyd's List* via <http://pnp.individual.com>, 2 December 1997.

## C. ALLIANCES

### 1. Alliances, consortia, and other forms of cooperation

Cooperation between liner operators has undergone dramatic changes during the last few years. In particular, 1997 saw many changes in the composition of the major alliances. Alliances offer liner shipping companies an opportunity to aggregate cargo volumes, increase service frequencies, improve asset utilization through the sharing of vessels, terminals, equipment and containers and employ their collective financial strength for long-term asset procurement and replacement. Alliances should not be confused with earlier forms of cooperation such as slot chartering and consortia, nor with the fusion of two or more lines through a consolidation or merger. Slot chartering allows a liner operator to utilize part of the transport capacity of a competitor while remaining totally independent, and a consortium is limited to a particular route.

In the mid 1980s, a study carried out by Hapag-Lloyd suggested that the utilization of vessel capacity on the North Atlantic would rise from 68% to 85% if services were coordinated and that this would lead to a cost savings of over 20%. As a result of this study, Hapag-Lloyd reached an agreement with ACL to rationalize their services on two routes between Europe and North America. This enabled the lines to eliminate four vessels while maintaining the same level of service and to share equipment, port facilities and inland transport equipment (ECLAC, 1987, p. 62).

Many consortia became unworkable in the late 1980's because of the divergent ambitions and commitments of the participants, differing performances by the participants and commercial pressures from powerful independent carriers when partner's permission had to be sought for matters as trivial as minor route and schedule adjustments. The delay caused by the need to consult members of a consortium might seem unwieldy in a fast-paced commercial world, but many state-owned shipping lines face even greater delays when governments have to harmonize commercial and socio-political objectives. For example, various share offerings have reduced the share of the government of Taiwan (Province of China) in the Yangming Marine Transport Company from 56.5% to 48%. This should permit the line to operate more efficiently because it will no longer have to wait up to 14 months for ministerial and even parliamentary approval in decisions for the acquisition of new ships.<sup>7</sup> Yangming attributes its fiscal 1995-96 earnings, which reached US\$ 84.2 million or a 35.3% increase over the prior period, to cost reductions from its slot-charter agreement with K-Line and to its greater flexibility as a private line.<sup>8</sup>

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<sup>7</sup> *Containerisation International*, August 1996, p. 21; *International Transport Journal*, 33/1996, p. 37; 12/1996, p. 51; and 24/1995, p. 69.

<sup>8</sup> *International Transport Journal*, 34/1996, p. 37; and 33/1996, p. 37.

**BOX 3:  
THE PACIFIC ALLIANCE SERVICE**

Alliances that do not imply the cooperation among various shipping lines on a global scale are usually considered to be consortia. Consortia do not necessarily provide worldwide services. An example of a small alliance (i.e., consortia) is the Pacific Alliance Service.

In February 1996, APL executed a ten-year agreement with Matson Navigation Company to provide a joint Pacific Alliance service between Guam, Hawaii and the United States West Coast. This service combines the strengths of each company. APL faces a heavy demand for services eastbound from Asia to the United States West Coast and Matson faces its greatest demand westbound from the United States West Coast to Hawaii and Guam. By sharing transport capacity, both lines can enjoy greater load factors on east- and west-bound hauls.

In addition, Matson operates a shuttle service between the ports of Los Angeles (California, United States), Seattle (Washington, United States) and Vancouver (British Columbia, Canada). This service taps several market niches, such as the reserved coastal trade of the United States, the low-cost repositioning of empty containers for lines in transpacific trades and the elimination of multiple calls by major operators at ports on the United States West Coast. This service has permitted Blue Star Line and Columbus Line, for instance, to eliminate their direct calls at the ports of Seattle and Vancouver, using the shuttle to serve them via Los Angeles. It is much more than a connecting carrier agreement, as the above mentioned companies have linked their on-time performance to Matson's shuttle, which moves their containers between the Pacific Northwest and Los Angeles in competition with rail and truck carriers.

Sources: *Containerisation International*, September 1996, p. 14; *International Transport Journal*, 40/1996, pp. 89 and 91; William DiBenedetto, "Matson Navigation considers sailing into the Alaskan market", *The Journal of Commerce*, 21 August 1996, p. 1B; and Bill Mongelluzzo, "Matson shuttle makes its mark", *The Journal of Commerce*, 8 August 1996, pp. 1B and 2B.

## **2. Increasing market share**

The market share of alliances has increased; their growth forms part of the process of concentration in shipping. By mid-1997, the largest ten groupings, including some companies which were not part of any alliance, together accounted for 63% of the world's container slots. By the end of 1997, the largest three groupings with 100 or more vessels each were the Grand Alliance with 541,000 TEUs, the Maersk/Sea-Land Alliance with 476,000 TEUs, and the Global Alliances (now the New World Alliance) with 408,000 TEUs (Rogliano Salles, 1998, p. 20).

Alliances increasingly control the world's container-carrying capacity. In the long term, however, it is likely that alliances will be superseded by mergers. In particular, mergers between lines that belong to different alliances have recently led to costly realignments among the major alliances. For example, the old Global Alliance has ceased to exist, and most of its members have formed the New World Alliance. The services of major alliances are presented in the annex, and chapter III discusses the symmetries and asymmetries of alliance membership.

## D. PORTS

### 1. Larger vessels require fewer port calls

Because alliances use large vessels of 5,000 to 6,000+ TEUs the number of ports served must be minimized. If a vessel of 6,000+ TEUs calls at six European ports to load and discharge containers and is in port three days at each, the elimination of three ports would generate voyage savings of around US\$ 200,000 to US\$ 250,000, less any on-carriage costs for cargoes (*Fairplay*, 6 February 1997, pp. 22-23). For example, Mediterranean Shipping Company (MSC) uses the Port of Felixstowe (UK) as its European export hub and the Port of Antwerp (Belgium) as its hub for European imports. It avoids additional ports of call through the employment of integrated land and ocean transport services (*Fairplay*, 6 February 1997, pp. 26-27).

The number of port calls by the post-Panamax vessels will be reduced as long as the additional costs for feeder and intermodal connections are lower than the savings from fewer port calls. This tendency directly leads to further concentration of port traffic in fewer and larger ports. On the United States East Coast, for example, the ten largest ports have experienced a growth rate of 12% in 1997, versus an average growth rate of just 6% for the remaining smaller ports.<sup>9</sup>

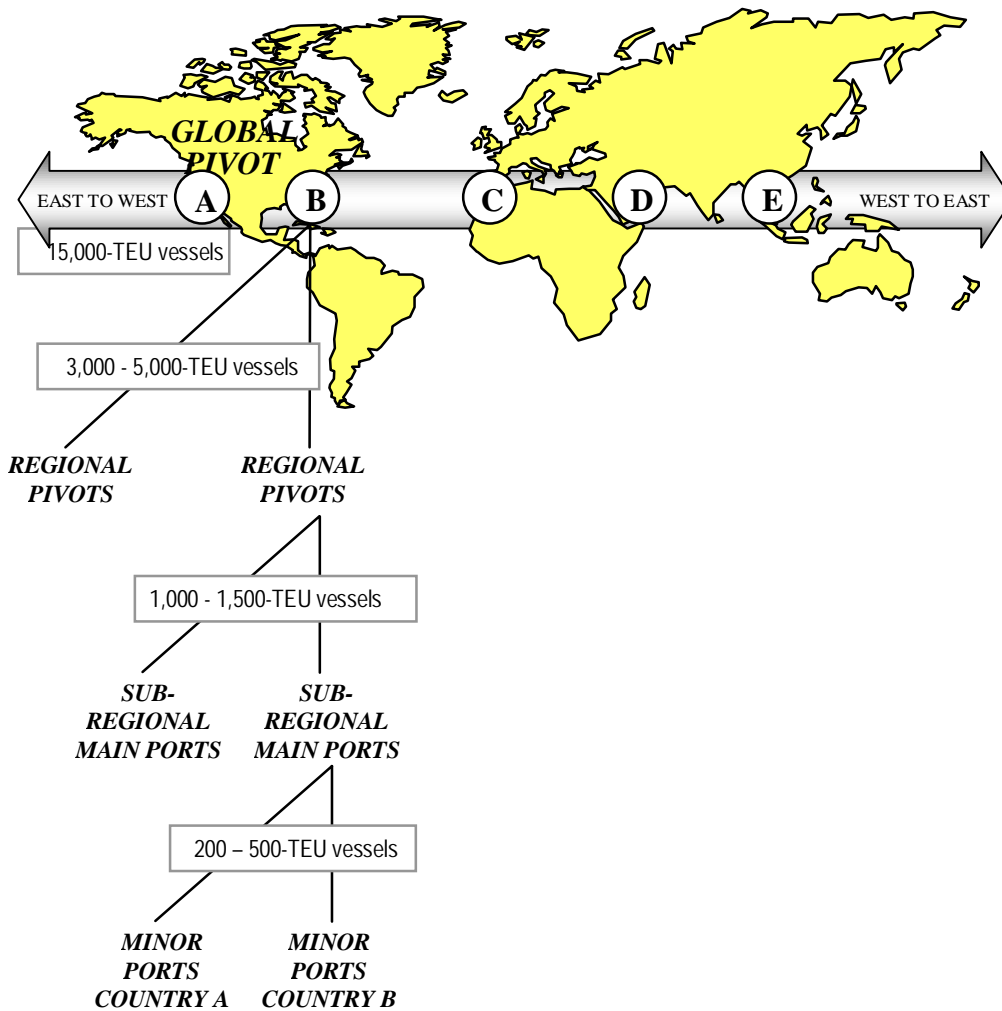
### 2. Fewer port calls require more trans-shipment

In one of the more futuristic scenarios, Gustaaf de Monie of Policy Research Corporation N.V., (Antwerp, Belgium) envisages the use of up to 15,000-TEU vessels making use of just four or five megahubs worldwide. “The most likely locations for the four (or possibly five) ‘megahubs’ in the world are South-East Asia, the western exit of the Mediterranean, the Caribbean, and the west coast of Central America. A fifth ‘megahub’, if selected, could well be a port relatively close to the Arabian Gulf. On further reflection it becomes obvious that such ‘megahub’ facilities could well be ‘off-shore’, as they may well exclusively cater for trans-shipment” (*Cargo Systems*, August 1997). The establishment of such a “necklace” of off-shore megahub container ports could take 20 years. Although it is impossible to know whether and when this scenario might actually materialize, it serves as an illustration for the present trend of increasing trans-shipment and related shipping services.

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<sup>9</sup> Rex Sherman, American Association of Port Authorities (AAPA), Washington, D.C..

**Figure 3**  
Possible future scenario of multi-layered port calls



Source: Policy Research Corporation N.V., Antwerp, Belgium, as reported in ECLAC, *FAL Bulletin*, No. 142, April 1998.

The process of concentration in shipping – larger ships, mergers, more trans-shipment, alliances – has profound effects on port development. Analysts often suggest that the ports will be negatively affected by this development. For example, an article in *Shipping Times* stated that a participant at a conference “complained” that there will be only three major ports left in Europe and North America, and that “everything else will be an outport.” Also, the “president of Maersk Inc. gave port authorities more bad news when he predicted that ships are going to continue getting bigger and deeper.”<sup>10</sup>

Larger ships and more trans-shipment require additional investments in ports, but ports will also be selling more services. The use of larger ships and more trans-

<sup>10</sup> *Shipping Times* via <http://web.3.asia1.com.sg/timesnet/data/can/docs>, 14 November 1996.

shipment directly leads to more port container movements and fewer ship miles. It is largely due to trans-shipment that the number of port container moves has grown faster than the number of trade moves.

#### Box 4

##### ALLIANCES AND THEIR PORTS OF CALL

In the context of ports and hub ports, alliances pool the demand of various carriers for port services and trans-shipment. This implies risks and opportunities for potential hub ports. With major alliances now controlling 80% of Asia-United States West Coast eastbound market and 78% of the westbound market and with major carriers purchasing 6,000+ TEU ships, only those ports that can adjust to new market requirements will achieve hub status.

Terminal sharing among alliance members is more complicated than vessel sharing. The container volumes at stake are several times higher than those with individual lines; carriers often have long-term leases for terminals which can be costly and difficult to break; relocating carriers and their cranes within and between ports is costly and can affect charges; and a common terminal for an alliance creates an impediment to the flexibility of individual members. With around 15% of liner shipping costs directly related to port charges, the Global Alliance (now the New World Alliance) declared that it seeks to use its larger commercial presence in negotiations with port managers to reduce port costs by 10-15% and increase productivity. Thus, the focus on ocean-freight-rate reductions is unbalanced, as they are only 25-30% of the total transit costs from origin to destination.

For example, members of the Global Alliance have agreed to share the costs associated with ending individual terminal leases, and they temporarily suspended services to the Port of Jeddah because of low productivity. The four terminals that the alliance members use at the Port of Seattle (Washington, United States) could be reduced to only one and a decision could be made to use the new 230-acre APL terminal facilities at the Port of Los Angeles (California, United States). In contrast, the Port of Singapore has developed the Virtual Terminal Program which guarantees berth availability, price stability and cost effectiveness to liner carriers, and the Global Alliance was the first group to sign a 10-year contract.

At present, the British ports of Felixstowe, Tilbury, Thamesport and Southampton are vying for national cargoes and regional hub port status as well as with the Continental ports of Le Havre (France), Antwerp (Belgium), Rotterdam (the Netherlands), and Bremerhaven and Hamburg (Germany). The latter ports are all trying to resolve the increasing congestion of road transport networks and expand the use of railways and waterways. French port authorities believe that a direct rail service between Lyon (France) and Rotterdam could take traffic away from them. Mediterranean ports, such as Algeciras (Spain), Malta Freeport, Gioia Tauro (Italy) and Cyprus also compete to provide trans-shipment hub services to alliances. For example, Malta Freeport recaptured the Grand Alliance after losing it to Gioia Tauro. Representatives at the Port of Felixstowe (United Kingdom) believe that Southampton Container Terminal lowered its rates to an unremunerative level to capture the Grand and Global alliance traffic. The traffic of those alliances contributed to a 25% growth in throughput at Southampton during the first six months of 1996, but Felixstowe decided not to reduce its rate due to the possible initiation of a domino effect by its other customers seeking to obtain such low rates. Thus, a container terminal might be located in a major port and not be selected by an alliance as a hub centre.

Another example of concentration of port traffic as a result of alliances between carriers is the recent decision of OOCL to join the partners of the reformed Grand Alliance in moving its

container handling business in Hong Kong to Modern Terminals Limited at the expense of Hong Kong International Terminals. Similarly, the Global Alliance decided to use the British Port of Southampton, even though Nedlloyd Lines, MISC and OOCL had used Felixstowe for many years. In a separate matter, Nedlloyd Lines accepted the decision of alliance members to use Manzanillo (Panama) instead of Curaçao or Jamaica as a regional hub port for the Caribbean, Central America and the north coast of South America.

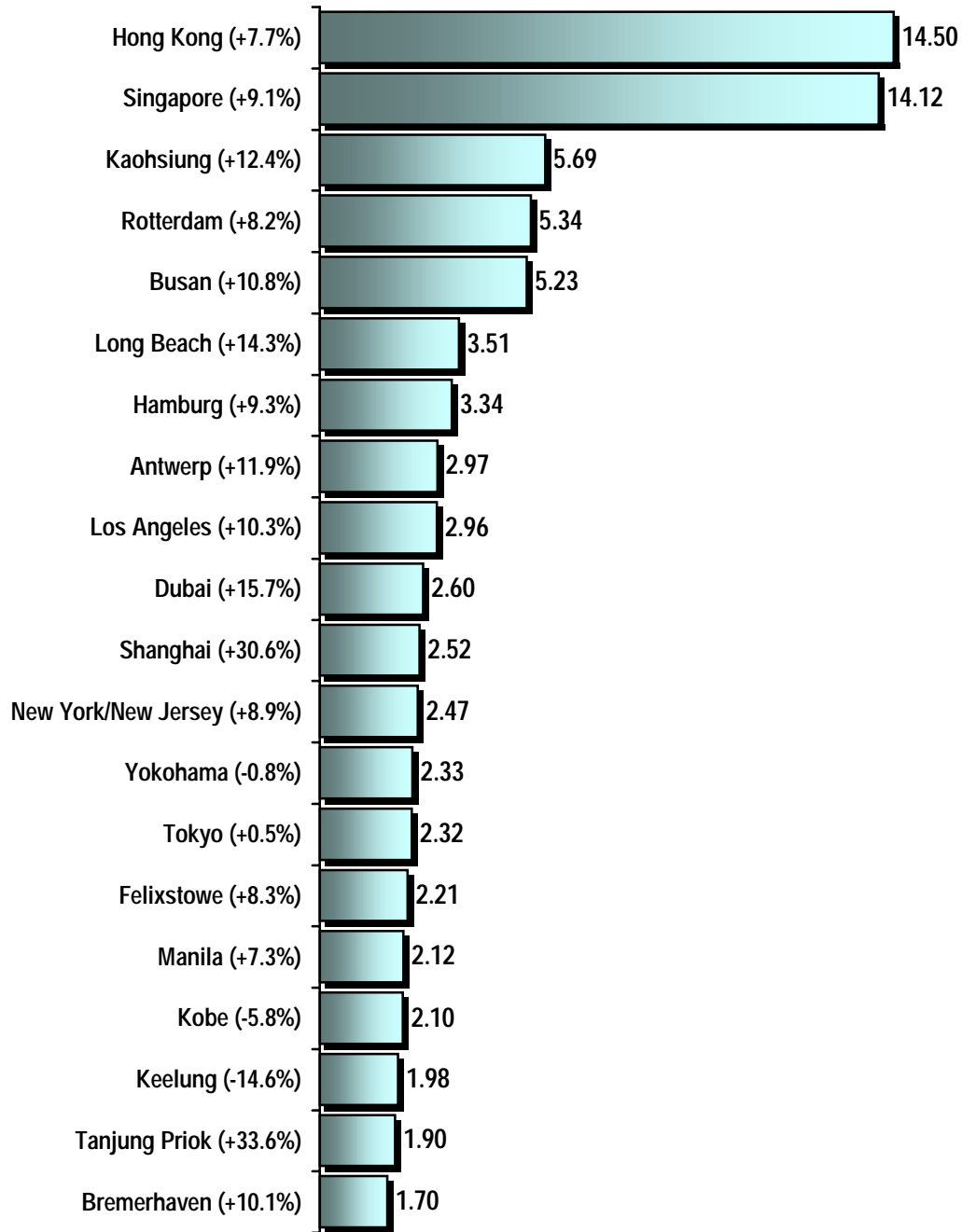
Sources: *The Journal of Commerce*, 20 August 1996, p. 2B; *Port Development International*, July/August 1996, pp. T13, T15 and T17; *Fairplay*, 8 February 1996, p. 21; *Fairplay*, 8 February 1996, p. 48; *International Transport Journal*, 12/1996, p. 53; *Containerisation International*, May 1995; *Container Management*, October 1996, p. 15; *The Journal of Commerce*, 18 October 1996, pp. 1B and 2B; *The Journal of Commerce*, 26 December 1995, p. 6B; *Lloyd's List*, 19 August 1996, p. 3; *International Transport Journal*, 1/1996, pp. 30-31; *The Journal of Commerce*, 12 March 1996, p. 3B; *International Transport Journal*, 40/1996, p. 53; *The Journal of Commerce*, 12 September 1996, p. 4B; and *Container Management*, April 1996, pp. 25, 27-28.

Another important aspect is the appearance of large international port operators, such as Hutchison Port Holdings of Hong Kong, Stevedoring Services of America (SSA), International Container Terminal Services (ICTS) of the Philippines and P&O Ports of Australia. These companies benefit from the recent surge in privatizations. The ports that are being operated by Hutchison, for example, together account for around 10% of world container throughput.

According to a recent study by Drewry Shipping consultants, the major international terminal operators have, on average, an operating cost advantage of US\$ 12 per TEU because of their economies of scale (Drewry Shipping Consultants, 1998).

Figure 4  
Top 20 container ports, 1997

Major ports in 1997 (growth over 1996) Container moves, millions of TEUs



Source: *Containerisation International*, March 1998

Note: TEU: Twenty-foot equivalent unit.



**Table 1**  
**Proportion of trans-shipments to total throughput in major ports**

Port	Trans-shipment as percentage of total throughput, 1996
Malta	92
Algeciras	90
Damietta	90
Singapore	78
Kingston	75
Colombo	72
Gioia Tauro	65
Dubai	48
Kaohsiung	43
Rotterdam	40
Antwerp	35
Hamburg	35
Pusan	30
Felixstowe	28
Bremerhaven	25
Hong Kong	20
Kobe	15

Source: Drewry Shipping Consultants, quoted in Harmut Menzel, "Options for fiche operators", paper presented at the Terminal Operations Conference (TOC) in Antwerp, May 1998.

**Table 2**  
**Total trans-shipped containers by region, in twenty-foot equivalent units (TEU)**

Region	Millions of TEUs (1998 forecast)
South-East Asia	12.96
Far East	9.52
North Europe	6.26
South Europe	4.91
Middle East	2.98
Caribbean and Central America	1.78
North America	1.71
Africa	1.38
South Asia	1.02
South America	0.21
Oceania	0.10

Source: Drewry Shipping Consultants, quoted in Harmut Menzel, "Options for fiche operators", paper presentation at the Terminal Operations Conference (TOC) in Antwerp, May 1998.

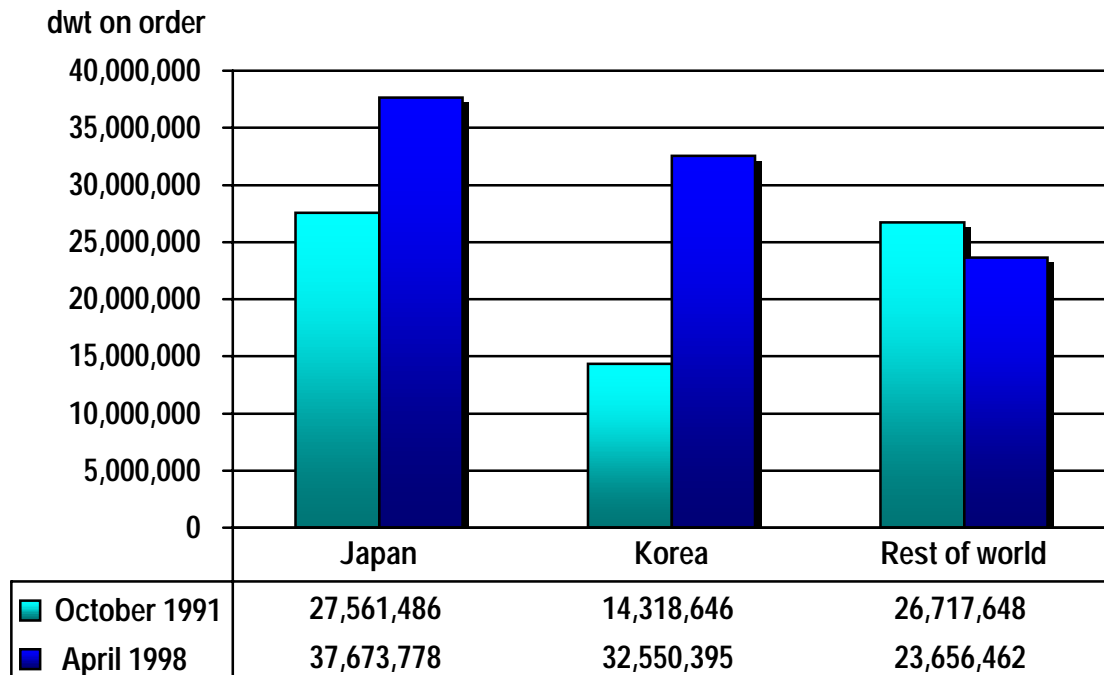
## E. OTHER MARITIME INDUSTRIES

### 1. Shipbuilding

As with ports and shipping, other maritime industries and services are characterized by ever-fewer suppliers accounting for an increasing share of the world total.

In the case of shipyards, newbuildings on order in April 1998 were concentrated in just two countries: Japan accounted for 37.7 million dead-weight tons (dwt), Korea for 32.6 million dwt and all remaining countries of the world together for just 23.6 million dwt. Korea and Japan thus produce 75% of the world's tonnage. In 1991, the combined share of Japan and South Korea was 61% (calculated from *Fairplay*, 31 October 1991 and *Fairplay Solutions*, April 1998).

Figure 5  
Major shipbuilding countries



Source: *Fairplay*, 31 October 1991 and *Fairplay Solutions*, April 1998.

During 1997, South Korea actually received more new contracts (21.5 million dwt) than Japan (19.5 million dwt). The major shipyards in Korea are now fully booked until 2000. The largest growth of shipbuilding in recent years has taken place in China, which is now the third-largest shipbuilding nation (*Shipping Times*, 14 April, 1998).

## 2. Registries

Four open registries (Panama, Liberia, Cyprus and the Bahamas) have 40% of the world fleet (dwt) under their flag. Fifteen years ago, these same open registries accounted just for 28% of the world fleet (UNCTAD, *Review of Maritime Transport*, various issues).

Although open registries are often criticized and called flags of convenience (FOCs) because they are supposedly less stringent with respect to maritime safety and the protection of the marine environment, their market share has been increasing for many years. One of the main reasons for their use is the reduction of labour costs: They permit the employment of foreign seafarers on ships whose owners are likely to have their offices in North America, Europe, Japan or Taiwan.

Several countries have tried to generate income through the establishment of their own open registries, often in vain. Scale economies make it easier for larger flags to provide the required services at a lower cost per vessel (e.g., consular services, certification in cooperation with classification societies, information), whereas a newly established registry has to incur high up-front costs to get its business started. Further more, a registry that has established a certain capacity and reputation, such as Secnaves in Panama, it attracts new clients much more easily than the newcomers.

Given the increased relevance of port state control and private-sector mechanisms such as variable insurance premiums, open registries are no longer the main culprits of low maritime safety standards. The composition of the crew, the choice of classification society, the areas in which the ship trades, its age and many other criteria are more relevant than the choice of the flag. In fact, a recent study has shown that Panama, for example, has a better safety record than most other Latin American fleets, which are supposedly are not FOCs (Hoffmann, 1996). Consequently, the market share of the major open registries should continue to grow in the foreseeable future, especially given the continuing pressure to reduce costs.

## 3. Seafarers

Four nationalities predominate among seafarers: Filipinos, Indonesians, Chinese, and Turks together made up 39% of the world's ratings and officers in 1995. This share is expected to increase to 48% by 2005.<sup>11</sup>

Here, too, exist economies of scale. It is advantageous for a shipping company or crewing agent to be able to draw upon a broad base of potential employees. Setting up additional training institutions and crewing agencies is only worthwhile for a minimum number of seafarers. For a government, the ratification and implementation of the conventions of the International Maritime Organization (IMO), such as the Standards of Training, Certification and Watchkeeping (STCW) convention, is an investment in the

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<sup>11</sup> BIMCO/ ISF, *1995 Manpower Update*, with the University of Warwick, December 1995. The forecast may be overly optimistic for the developing countries. Since the International Maritime Organization (IMO) revised the Standards of Training, Certification and Watchkeeping STCW in 1996, the relative share of European and North American seafarers will probably increase again.

export of the country's seafarers. Finally, it is safer for an individual ship not to employ too many different nationalities so as to avoid misunderstandings during emergencies.

#### **4. Container leasing**

Two leasing companies dominate the market. Genstar with 1,350,000 TEUs and Trans-american with 1,004,150 TEUs together own almost as many containers as all other leasing companies put together.

By mid 1996, the world fleet of containers exceeded 10 million TEUs. The fleet continues to be dominated by ISO boxes built to an International Organization for standardization (ISO) eight-foot width, which account for more than 97% of the world container fleet. The exact figure of 10.27 million TEUs represents a growth of 11% over 1995. Ocean carriers generated around 65% of this growth; and leasing companies purchased around 35%. Ocean carriers now account for more than half of the existing stock. About 87% of the fleet were standard dry twenty-foot and forty-foot units, and 5.6% were special dry units. Reefer containers accounted for 6.3% and tank containers for less than 1%. The total market price of this container inventory was US\$ 30 billion (*Containerisation International*, March 1997, p. 19).

#### **5. Vertical integration**

The vertical integration of different maritime industries occurs, for example, when a shipping line buys a container leasing company, when a freight forwarder purchases a shipping company, when an international port operator merges with a shipping line or when that an international investor purchases a shipyard and a shipping line.

So far, the maritime field offers relatively few examples of such vertical integration. A.P. Moller of Denmark owns a shipyard and also the Maersk shipping line. Some liner companies have started to operate their own ports, such as Evergreen in Panama, or to be assigned dedicated terminals within larger ports, such as Maersk in Rotterdam. Sea-Land is already considered one of the world's largest port operators. Hapag-Lloyd has been bought by Preussag, which also owns a freight forwarding agency, and ACL was purchased by the freight forwarder Bilspedition AB.

The desire not to compel clients probably explains why so little vertical integration has taken place. A shipping company may not wish to purchase a ship with a shipyard belonging to a competitor. A non vessel operating common carrier (NVOCC) would not want to purchase container slots with a shipping company that also acts as an NVOCC itself.

The hypothetical news headline "Panalpina (freight forwarder) purchases Sea-Land (carrier) and SSA (port operator)" will remain unlikely for many years, because shippers and other carriers would be very hesitant to cooperate with such a group. Still, the influence of freight forwarders should not be underestimated. They already obtain non-contractual payments from shipping lines with the threat that otherwise they would deliver the cargo to another line willing to make this additional payment. Concentration in ports and shipping may one day reach new dimensions should conglomerates of freight forwarders, carriers, and port operators become reality.

**Box 5**  
**MERGERS BOOM IN THE UNITED STATES**

Not since a wave of industrial takeovers created the great oil, steel and auto companies at the beginning of the century has corporate America been reshaped by a sweep of merger activity as broad as the one taking place today. Last year alone, a record US\$ 1 trillion in mergers took place involving businesses in the United States. This is equivalent to 12% of GDP; it is up from US\$ 138 billion (2% of GDP) in 1991 and well above the previous peak of US\$ 352 billion (7% of GDP) in 1988. By 13 April, US\$ 441 billion worth of mergers had already been announced for 1998, which indicates that the previous record is going to be broken again.

Practically every industry in the United States has been affected, from telecommunications to banking and from aerospace to accounting. The strength of this trend is shown by the fact that the total dollar value of mergers in 1997 was about 50% higher than those in 1996, itself a record year. Companies are combining to create new entities on a scale larger than ever before, reflecting a growing belief among government regulators and many business executives, that big business is not necessarily bad.

Sources: *New York Times*, 21 January 1998; *The Economist* 17 April 1998.

## F. OUTLOOK

The process of concentration in shipping can be expected to continue in the foreseeable future. It will probably include the following characteristics.

- Although the maximum vessel size may not surpass the 8,700-TEU limit (including empties) for several years, the average vessel size on most trade routes is bound to increase. At some point during the next century, vessels with a capacity of up to 15,000 TEUs may become feasible.
- Mergers and acquisitions will increase. However, concentration is unlikely to reach the levels it has in other industries, such as computer software, chip production, the diamond trade or aeroplane construction. In the foreseeable future, there will still be room for more than ten global players plus a large number of specialized operators.
- The recent upheavals among the different alliances will probably lead to deeper cooperation among alliance members. This should cover marketing, operations and logistics, purchasing, port operations and inland operations. The growth of alliances will mainly continue at the expense of traditional conferences. Alliances could be superseded by more mergers of shipping companies.
- The proportion of containers that are trans-shipped at least once during their transportation will continue to increase. This implies more relay ports and feeder shipping services. International port operators will gain market share in the context of port privatizations.

Chapter II examines the underlying causes and motivations of concentration in shipping to establish a basis for analysing the impact of these trends (chapter III).

## II. CAUSES

### A. MOTIVES

Three principle objectives motivate most alliances, mergers and other forms of concentration in shipping:

- To reduce unit costs through productivity improvements and scale economies. These are mainly related to staff reductions, but they also include savings from container and vessel operations.
- To achieve greater market domination so as to increase earnings. This includes more frequent and broader transport services and the possibility of reducing individual trade imbalances.
- To reduce the exposure to risk. Being active in more trade routes with different vessels and ports also implies a more diversified portfolio of assets. As a consequence, freight-rate reductions in one market can be offset by freight-rate increases in another market.

A company can increase profits by reducing costs or increasing income. Mergers, alliances and the use of larger ships can help to achieve both scale economies and greater market power so as to increase income. The increased profit may fluctuate less if diversification leads to less exposure to risk.

In the case of P&O Nedlloyd, for example, the merger was motivated by the expectation of achieving US\$ 200 million in cost savings. US\$ 130 million of the total savings were due to staff reductions from 9,400 employees to 8,000. Further savings resulted from a decrease in the 540,000 containers used, rationalization of the agency network, a decline in the volume of empty container movements, better ship utilization, integrated computer systems and volume purchases of everything from bunkers to containers.<sup>12</sup> Thanks to the merger, P&O Nedlloyd is now the world's third largest liner shipping company. Similarly, when NOL acquired APL, the company hoped to achieve cost savings of US\$ 130 million. It also hoped to gain easier access to the United States market.

These motivations are not new. The current process of concentration is stronger than in previous decades, however. Companies are increasingly merging, forming alliances and using other methods to concentrate cargo and generate scale economies. The main reasons, which are to be discussed in this Chapter, are the economic background, the regulatory framework and technologies, which are leading to an increase in fixed as a proportion of the total costs of most operations.

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<sup>12</sup> *American Shipper*, "P&O Nedlloyd creates two operating units", March 1997, p. 16; Sean Moloney, "P&O and Nedlloyd face consortia call", in *Lloyd's List*, 11 September 1996, p. 1.

## B. ECONOMIC BACKGROUND

### 1. The global trade environment

#### (a) *The mutually beneficial relation between trade and transport*

Transport is one of the four cornerstones of globalization. Together with telecommunications, trade liberalization and computer technology, the increased efficiency of port and shipping services has made it ever easier to buy and sell merchandise goods, raw materials and components almost anywhere in the world. Information technology is the basis for the post-industrial service economy. Trade liberalization allows the efficient allocation of resources on a global scale. Finally, telecommunication and transportation are the necessary tools to move information and goods on a global scale. As a recent article in *The Journal of Commerce* rightly emphasizes, “Despite all the headlines and political bluster surrounding the World Trade Organization, NAFTA and other trade pacts, the real driving force behind globalization is something far less visible: the declining costs of international transport” (*The Journal of Commerce*, 15 April 1997).

As a percentage of the value of imports, the total expenditure on transport has decreased from 6.64% in 1980 to 5.27% in 1995, which is a decline of 21% (UNCTAD, 1997, p. 64). This decline, however, does not reflect the true efficiency gains: because of lower transport costs many goods were internationally traded in 1995 which in 1980 could not bear the (then) prohibitive costs of international transport. On the other hand, the relative costs of transport have decreased not only because of increased efficiency, but also because the value of traded goods has gone up faster than its volume.

At first sight it might seem a contradiction to say that in the global economy transport matters more than it did before and, at the same time, that the costs of transport matter ever less. Yet both statements are true: Trade and the necessary shipping services are growing faster than the world’s GDP. The same applies to the world total paid for transport services, though not quite as much: in 1995 world output grew by 3.7%, the value of trade increased by 15.4% and total freights rose by 12.8% (UNCTAD, 1997, p. 64). In 1997, world output grew by 3% and the volume of trade by 9.5%.<sup>13</sup>

Similarly, while “in theory, a reduction in shipping costs should have resulted in significantly lower physical distribution costs,” that has not happened, because the average value of the goods carried is increasing. Although the costs of transporting these goods may decline, the inventory costs (e.g., depreciation, foregone interest) are rising. In the United States between 1970 and 1994, the relative cost of carrying inventories, measured as a percentage of total physical distribution expenses, rose by 88.2%, maintaining warehouses rose by 17.6% and transportation costs fell by 20.7%.<sup>14</sup>

The costs of transporting a final product, such as a car, from one country to another have decreased, yet the proportion of transport costs within the price of the final

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<sup>13</sup> WTO, Press Release, Press/98, 19 March 1998.

<sup>14</sup> Ted Scherck, “Inventory costs on the rise”, *Shipping Times* via <http://web3.asia1.com.sg/timesnet/data/can/docs/cna3253.html>, 12 February 1998.

product has gone up. Today, the consumer not only pays for the transport of his new car “made in Germany” from Bremen to New Jersey, but also for the transport of the different parts of this car, which may be made in Mexico and Hong Kong and then transported to Germany to be incorporated into the final product.

Trade and transport thus mutually benefit each other. Some liner operators actually believe that their low freight-rates have not only encouraged but subsidized the increase in global trade (World Bank, 1996). Since 1950, the volume of world trade has grown three times as fast as the world GDP (*The Economist*, 7 November 1997). In the ten years from 1985 to 1994, the pace of global economic integration as measured by the ratio of world trade to world GDP rose three times faster than during the previous decade (*The Economist*, 14 November 1997). This is partly due to the reduced costs of transport: if one assumes a price elasticity of the demand for imports of +1.1 (*Comercio*, 7 July 1997, p. 3) the reduction of transport costs by 10% directly leads to additional global trade of approximately US\$ 30 billion.<sup>15</sup> Indirectly, through its impact on global income, this reduction it leads to additional trade and further demand for transport services. Finally, apart from becoming cheaper, maritime transport has also become faster, more frequent and more reliable, which further promotes merchandise trade.

#### **(b) Competition in a globalized economy**

Economic activities increasingly generate a demand for transport, and more efficient transport promotes commercial exchanges and economic growth. The advent of a global economy has transformed the parameters of international trade and created new operational requirements. For manufacturers, traders and carriers to compete in a global economy, which must be carried out in increasingly unprotected domestic markets, they must acquire advanced technologies, avoid competition-distorting subsidies and protection and continuously upgrade their goods and services.

Trade globalization refers to the commercial interdependence among factors of production in different countries, which results from collective efforts to produce raw materials and components, as well as to provide assembly and distribution services for goods that will be sold throughout the world. Trade has always been international, in the sense of one country’s goods being sold in other countries, but the globalization of trade alters this historical framework by establishing a basis for enterprises and governments to take advantage of complementarities between factors of production in different countries. The capacity to compare, purchase and employ raw material, labour and service inputs worldwide has rendered meaningless the debate that “only a nation’s exports stimulate economic growth and imports do not” versus “the benefits of trade arise from the commodity received and not the commodity given”.<sup>16</sup>

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<sup>15</sup> Total Trade in 1996 was US\$ 5,200 billion multiplied by the world-wide average costs of transport of 5.27% equals US\$ 274 billion. Cost savings of 10% of US\$ 274 billion is US\$ 27.4 billion, which multiplied by 1.1 gives US\$ 30.1 billion.

<sup>16</sup> The opinion that exports are positive whereas imports are negative is traditionally held by many politicians and public opinion. The alternative view that only imports contribute to a nation’s welfare was, for example, expressed by James Mill in 1821. See *The Economist*, “Schools Brief”, 7 November 1997.



**Box 6**  
**GLOBALIZATION AND THE HYPOTHETICAL EXAMPLE OF KENYAN PINEAPPLES**

An example of how the global trade environment functions is the recent decision by the government of Kenya to execute a port management agreement with the Port of Felixstowe (United Kingdom) so as to improve efficiency at the Port of Mombassa. This could lead to a reduction in the demand for Central American pineapples and increased unemployment in Puerto Limón (Costa Rica).

The new working arrangements at the Port of Mombassa could allow the import of fertilizers to be handled at a lesser cost than those into Central America. This reduces the production costs of East African pineapples. Consequently, fruit brokers in the United States, for instance, would request Kenyan growers to provide them with greater volumes. The fruit brokers would continue buying pineapples from Central America, but only to the extent that the volumes from Kenya were insufficient to satisfy market demand. A relative decrease in the competitiveness of Central American pineapples would lead to a decline in the demand for farm workers, for fruit packing services, for land transport services, for ocean transport services and for cargo-handling services at ports in Central America.

On a worldwide scale, the increased efficiency of the Port of Mombassa would lead to an improvement of global welfare because consumers could save money when buying Kenyan pineapples. These savings could, for example, translate into the purchase of home computers with "Intel" microchips produced in Costa Rica. This, in turn, could result in a shift of investment from pineapple to computer production.

Central American pineapple growers would have to reduce the cost of their exports if they wish to remain competitive in the United States market. Put another way, the buying decisions of the fruit brokers transmit a market signal to Central American pineapple growers, providing an unprocessed, unanalysed indication that their costs are too high in comparison with those of major competitors. The market signal does not indicate that the reduction in costs at the Port of Mombassa is the result of improved management techniques, greater labour productivity or the acquisition of new cargo-handling equipment. The market would merely indicate that Kenyan pineapples are less expensive in the United States than those from Central America.

In order to determine why Kenyan pineapples are less expensive, it is necessary to go behind the market-price signal and evaluate each input in their entire production and distribution network, and compare it with the corresponding factors in Central America. Thereafter, Central American exporters, importers, carriers, governments and labour could make efforts to meet the cost, productivity and infrastructure parameters established by Kenya. Thus, market mechanisms provide signals of the need for cost savings, but they do not identify the areas in which costs should be reduced or productivity increased, nor the options to achieve those ends.

Returning from the hypothetical example to the real world, Costa Rican pineapple growers will be glad to learn that political problems and labour disputes led to a termination of the management contract between the government of Kenya and the Port of Felixstowe as of January 1998.

The division of markets into domestic and international has lost much of its relevance. The term market was used to denote an economic coherence for a product or group of products within a state, but the era of semi-autonomous national economies has ended as enterprises and governments search worldwide for technical capacities, least-

cost inputs and market-access advantages. Decisions about labour, sources of raw materials, plant locations, transport systems, delivery times and distribution channels are being made on a worldwide, instead of a local, basis.

Many industrial products are no longer produced in a single country and shipped to another. Instead, manufacturers obtain least-cost inputs from all over the world and then produce and assemble goods in multiple locations which offer the greatest commercial advantages. If ocean transport costs are excessive for any one of these inputs, this could result in the loss of that market, even though production costs might be inferior.

Thus, competition within the global economy is altering industry structures and moving them toward new market, service and technical equilibria. As a result, liner operators face two broad categories of competition. First, as always, a shipping company competes directly with other carriers to transport the goods offered by shippers. Second, liner shipping is a service industry and the demand for transport services is derived from the demand for the goods being carried. The technologies, routes, frequencies and prices offered by liner operators strengthen or weaken the competitiveness of the goods carried and, hence, the demand for carrier services.

## **2. The demand for liner shipping services**

### ***(a) Output, trade, and liner shipping***

For 1997, the United Nations Conference on Trade and Development (UNCTAD) projected international seaborne trade of almost 5 billion tons. Of this total, 44% was tanker cargo and 23% corresponded to the main dry bulk commodities, which are not usually transported in containers. That leaves roughly one-third of world seaborne trade as general cargo (UNCTAD, 1997, p. 5). At present, the containerization rate of general cargo is 50%. It is expected to grow to 65-75% by the second decade of the next century (Drewry Shipping Consultants, 1996a).

Maritime transport, though, is only one way to carry merchandise trade. Because it is cheaper and slower than air transport and most other alternatives, it is mostly used for relatively low-value, high-volume trades. Therefore, its share of the volume of world trade is bigger than its share of the value of world trade. The total volume of world merchandise trade has grown by an average of almost 6.5% during the last 5 years.<sup>17</sup> The volume of all seaborne trade has grown by only 2.9% annually during the same period, which indicates that other forms of transport have gained relative importance.

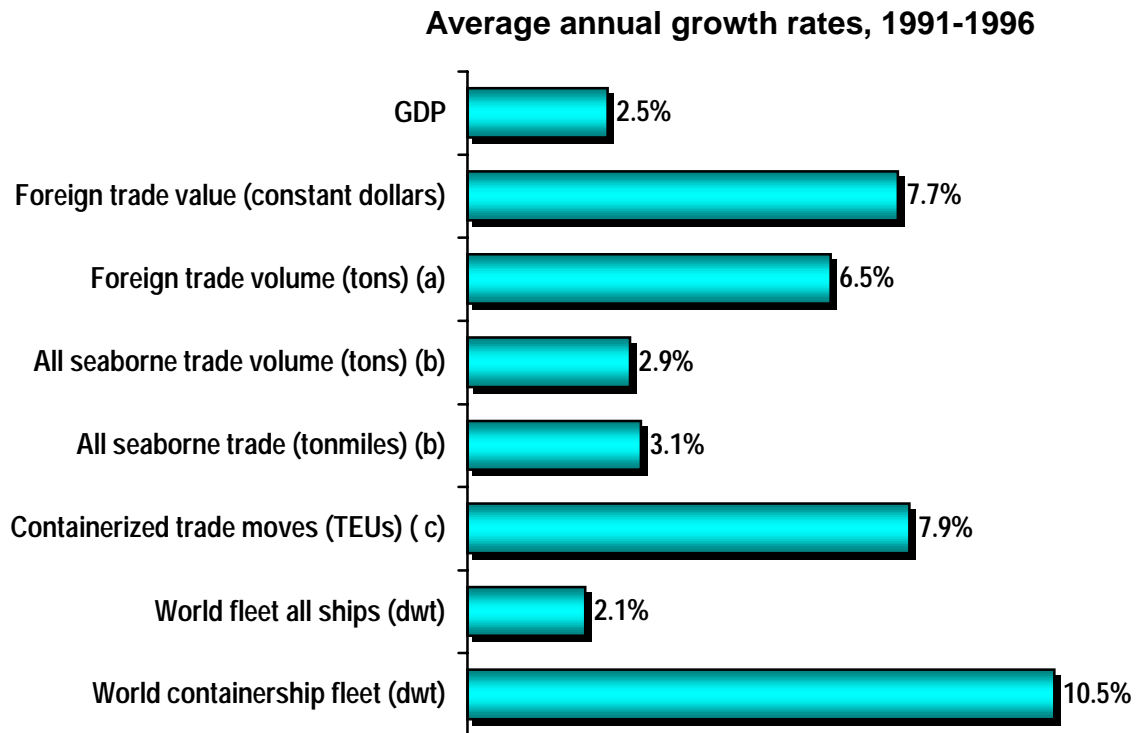
A representative of P&O Containers recently maintained that containerized goods could withstand a 25% increase in rates without any decrease in trade volumes (*Lloyd's List*, 9 August 1996, p. 3). Such statements are almost certainly not true, at least not in the long run. As explained above, there exists a mutually beneficial relation between trade and the costs of transport: lower transport costs promote additional trade. In addition, maritime transport is competing with other forms of transport for at least part of the cargo.

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<sup>17</sup> ECLAC, based on UNCTAD, *Review of Maritime Transport*, various editions.

Figure 6 illustrates that containerized and other seaborne trade, the volume and value of overall international trade, ton-miles and the world's output have grown at different rates during the last five years. The relations between output and trade, interregional and intraregional trade, trade and transport, volume and value, ton-miles and tons, miles and time spent in ports and the different modes of transport all have to be taken into account when determining the total demand for liner shipping services.

**Figure 6**  
Growth of trade and cargo volumes

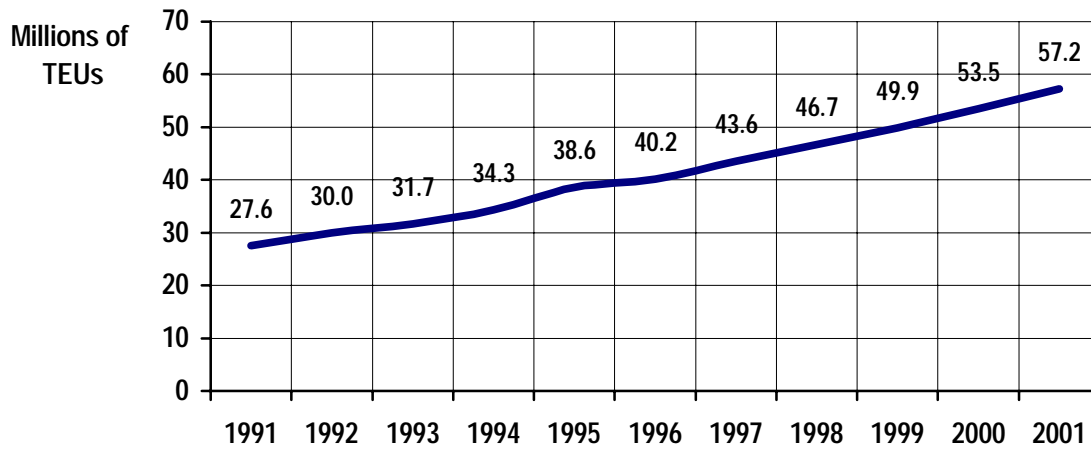


Sources: ECLAC, based on: UNCTAD, *Review of Maritime Transport*, various issues; DRI/McGraw-Hill and Mercer Management Consultants, *World Sea Trade Service Review*, Third Quarter 1997; *The Economist*, 14 November 1997

Notes: TEU: Twenty-foot equivalent unit; dwt: dead-weight ton.  
Some growth rates are approximations based on (a) data for 1990–1997, (b) data for 1990–1996, (c) data for 1991– 997.

In 1991, the world total containerized trade moves were 27.6 million TEUs. This is forecasted to more than double by the year 2001, to 57.2 million TEUs. At a forecasted annual growth rate of 7.1%, containerized trade moves will increase by three and a half million TEUs per year for the foreseeable future (see figure 7).

**Figure 7**  
World containerised trade moves



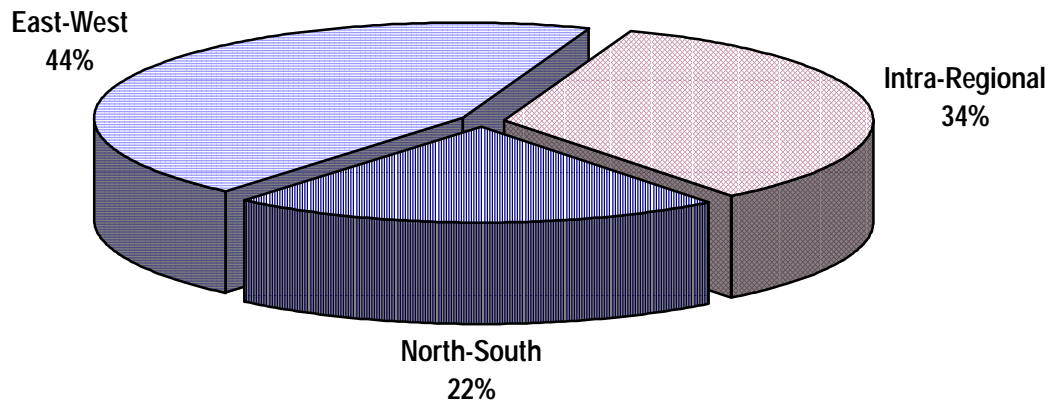
Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Third Quarter 1997.

Note: TEU: Twenty-foot equivalent unit.

**(b) Trade Directions**

Trade between the major northern industrialised regions of Europe, North America and East Asia (i.e., the so-called east-west trade) accounts for around 45% of the world's container traffic. North-south trade makes up almost 22%, and intraregional trade encompasses almost 34%. The latter has experienced the fastest growth of the three major trades, which is mainly due to increasing intra-Asian trade.

**Figure 8**  
Major container trades, 1994

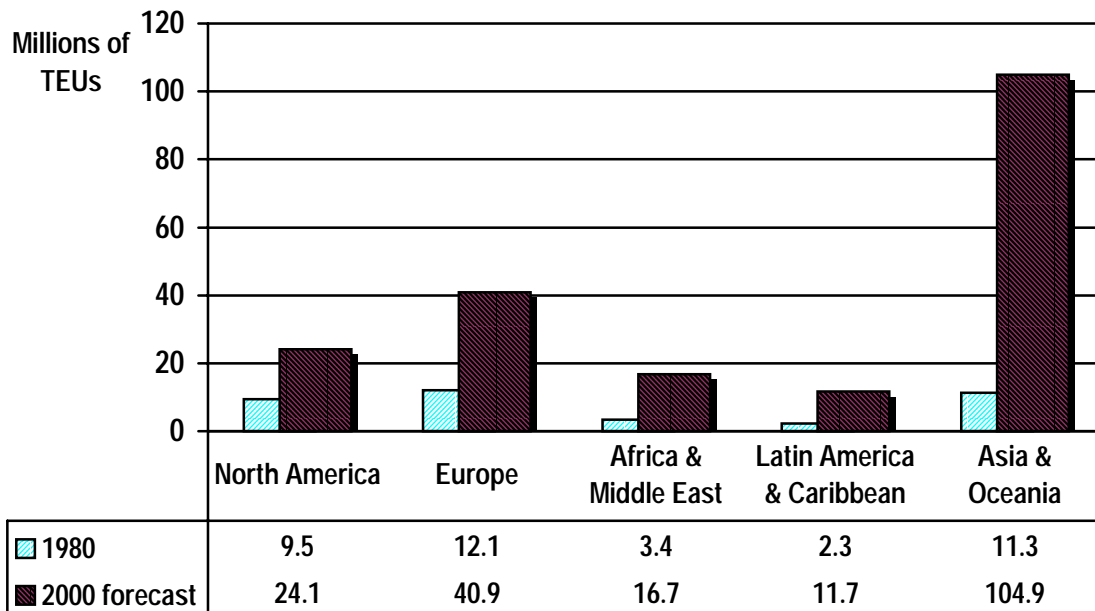


Source: Drewry Shipping Consultants, *Global Container Markets*, London, 1996.

The distinction between north-south and east-west trades is somewhat blurred because, due to trans-shipment, part of the north-south trade is carried by east-west carriers for part of the journey.

With regard to port traffic, by 2000 more than half of all port container movements will take place in Asia and the Pacific. The number of port container moves is about three and a half times as large as the number of containerized trade moves. This is because each trade move implies at least two port movements. In addition, port movements include empty containers and trans-shipment. The latter already accounts for one out of every four port container movements.

**Figure 9**  
**Port container traffic by region**



Source: Drewry Shipping Consultants, *Global Container Markets*, London, 1996.

Note: TEU: Twenty-foot equivalent unit.

Within 15 years, worldwide port container throughput grew by 100 million TEUs, from about 39 million TEUs in 1980 to about 140 million TEUs in 1995. The most rapid growth was in Asia, which now accounts for an estimated 43% of world container port throughput, up from 25% in 1980.<sup>18</sup> By 2000, Asian throughput is projected to be

<sup>18</sup> Ocean Shipping Consultant, *Market prospects for Asian containerisation: Container port, shipping, trade and investment trends and prospects to 2008*, 1996, as reviewed by David Osler, "Asian container ports set for volume surge", *Lloyd's List*, 7 August 1996, p. 12.

72% higher than in 1995, with 105 million TEUs. The Port of Hong Kong alone handled more than 14 million TEUs in 1997, that figure is projected to grow to 36 million by 2011 (*Containerisation International*, May 1996, p. 33). In contrast, the volume of containers passing through all European ports is expected to rise from 30 million TEUs in 1995 to about 43 million by the end of the century (*The Journal of Commerce*, 14 July 1995, p. 8B).

In March 1998, Ocean Shipping Consultants predicted “that ports in Asia will continue to see growth in cargo handling in the medium and long-terms, despite the short-term effects of the financial crisis” (*The Journal of Commerce*, 26 March 1998, p. 11A).

### **3. The supply of transport services**

#### ***(a) Responding to demand***

Containers have transformed liner shipping into a neo-bulk industry because the vessel operator is unconcerned with their contents unless they contain dangerous or refrigerated goods. The actual cargo handling has become almost irrelevant. Instead, the shipper expects a fast, frequent and reliable transport of his container, no matter its content.

Shippers expect higher quality services, including guaranteed delivery times, door-to-door services, zero damages, the use of electronic communications, and systems which have received an ISO 9000 certification. Most of these services are given to all clients because containerization and scale economies have made it difficult to sell different services to different clients.

The traditional price differentiation for different types of cargo is increasingly giving way to FAK (freight all kinds) freight-rates. The tendency toward treating “a box as a box as a box” also reflects the declining monopoly power of liner companies and their conferences. Although a client may be willing to pay a higher price for the transport of more valuable product, competition among liner operators based on price rather than quality makes it ever more difficult to respond to these different price elasticities of demand with different prices.

Ocean Shipping Consultants forecasts that containerized trade between Europe and Asia will total of 7.1 million TEUs by the end of the decade, up from 4.4 million in 1995. The available transport capacity in the Asia-Europe trade is expected to increase from 6.3 million TEUs in 1995 to almost 9 million TEUs by 2000. A major carrier in this trade estimated that the gap between supply and demand in terms of transport capacity increased by 35% in the first six months of 1996 (*Containerisation International*, October 1996, p. 22). On the North Atlantic, trade volumes are expected to increase from 3.2 million TEUs in 1995 to 4.3 million TEUs by the end of the century. The transport capacity for the North Atlantic is projected to increase from 3.7 million TEUs to 4.4 million in the five year period to 2000. In the Pacific, trade volumes are projected to rise from 7.4 million TEUs in 1995 to 9.3 million by the end of the century, while container transport capacity should increase from 11.9 million TEUs to 15.8 million over the same period (*The Journal of Commerce*, 7 November 1995, p. 1B).

Such figures can only serve as rough indicators of available capacity. Seasonal fluctuations, trade imbalances, differences between parts of the overall routes (e.g., India-

Europe as part of East Asia-Europe) and the use of twenty-foot containers in one direction versus the use of forty foot containers in the other all need to be taken into account when determining the capacity of a particular trade at a particular point in time.

**(b) Reducing costs**

The initiative to bring down the unit cost of liner transport by constructing larger vessels is not new, but such cost reductions are valid only when cargo volumes are sufficient to fill them. Scale economies are much more prominent in what is referred to as bulk shipping. As exporters and importers of manufactured goods seek to establish partnerships with liner shipping companies in order to control costs, however, they will begin to look at greater scale economies as a means of reaching that objective.

There may exist a trade-off between scale economies and just-in-time delivery. The frequency of liner shipping services for a growing number of exporters and importers is more important than the savings which result from the use of larger vessels. These clients are better able to control their logistics from supplier to consumer with just-in-time delivery systems, and they achieve important savings by reducing their investments in inventory. On the other hand, larger vessels also facilitate trans-shipment, which may increase the number of service options and thus facilitate just-in-time delivery.

These considerations are important from an operational viewpoint, but they ignore the major factor which led to the acceptance of containerization itself: the increase in the speed of loading and discharging operations permits faster vessel turn-around and more intensive utilization. For almost a century any attempt by operators of general cargo vessels to reflect the characteristics of trade demand and reach new levels of scale economy was restricted by slow loading and discharge rates. Most general cargo vessels spent about three days in port per call, or about 50% of the time required for an entire round-trip voyage. Containers did not eliminate this requirement, but they raised cargo-handling rates enough to permit the size of ocean-liner vessels to be increased considerably. Container ships have an average port stay of less than one day, which is 25% of a round-trip voyage. The cargo carrying capacity of liner vessels should continue to increase until port stays begin to raise the cost of transport services (*The Journal of Commerce*, 12 September 1996, p. 3B). Thus, the cost advantages of scale-economy vessels are so important that they should encourage the development of more rapid container-handling systems.

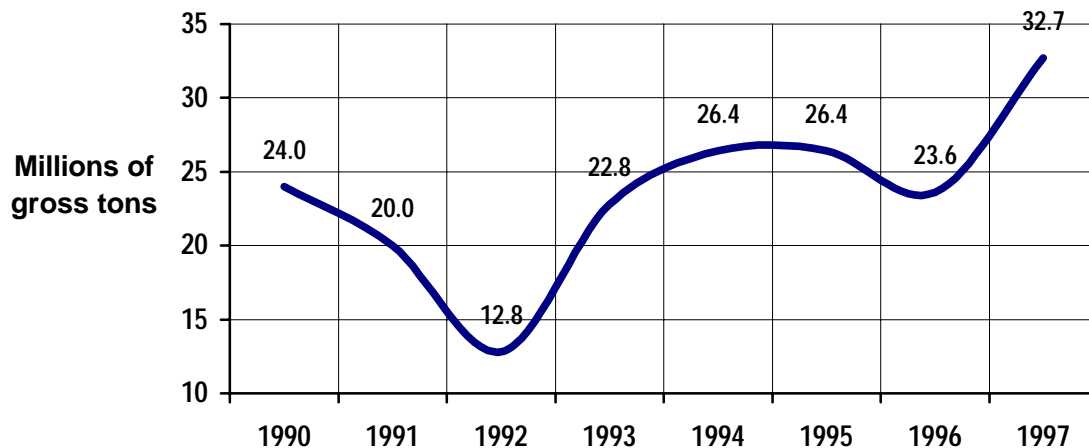
Ship operators see larger vessels, staff reductions, negotiations with governments and cargo owners, slot-chartering arrangements, consortia and alliances as a means of altering cost structures to improve their returns on capital. The relation between the number of container vessels used and shipping company's employment opportunities and revenues is apparently perverse. In 1970, for example, Hapag-Lloyd operated 106 general cargo vessels; by 1995 it was using only 18 container ships, a decrease of 83%. At the beginning of that period it transported 6.8 million freight tons and by the end of that period the volume had increased to an estimated 24 million freight tons, a growth of 253%. In 1970, it had 8,450 employees and by 1995 that number had been reduced by 60% to 3,400. Finally, the revenue per freight-revenue ton (FRT) decreased by 50% between 1970 and 1995.

According to Drewry Shipping Consultants, the per-TEU expenses of a 6,000-TEU vessel, compared with a 4,000-TEU ship, should result in a 30% savings in crew costs, a 20% savings in fuel costs, a 15% savings in port and canal duties and a 10% savings in insurance costs. Thus, scale economies would permit transpacific freight-rates to fall about US\$ 27 per TEU per voyage.<sup>19</sup> Carriers in major trade lanes who reject, or who are unable to justify investment in the new generation of giant vessels, may experience a major unit cost disadvantage.

**(c) Supplying transport capacity**

By the end of 1996, the world merchant fleet reached a total of 758.2 million dwt, which represents a 3.2% increase over the 734.9 million dwt of the previous year. By vessel type, oil tankers represent 35.8% of the total, dry bulk carriers 36%, general cargo vessels 13.8% and container ships 6.4%, with combination and specialized ships accounting for the remaining 8%. The supply of maritime transport capacity is also facilitated by subsidies to shipbuilding and a forecasted shipyard overcapacity. According to Nomura Research of Japan, the annual output capacity of the shipbuilding industry will total 33 million gross tons (gt) in 2000, whereas the demand for new buildings is likely to range from 20 to 25 million gt per year over the next five years.<sup>20</sup>

**Figure 10**  
New orders for shipbuilding, all types of vessels



Source: *Lloyds Register of Shipping*, as reported in Barry Rogliano Salles, *Shipping and Shipbuilding Markets 1998*, p. 3.

<sup>19</sup> *The Journal of Commerce*, 10 December 1996, p. 4C; Drewry Shipping Consultants, *Post-Panamax Container ships: 6,000 TEU and Beyond*, London, 1996; *International Container Review*, Autumn/Winter 1996, pp. 108-110; *Lloyd's List*, 3 September 1996, p. 5; and Seok-Min Lim, "Round-the-world service: The rise of Evergreen and the fall of U.S. Lines", *Maritime Policy Management*, Vol. 23, No. 2, April-June 1996, pp. 119-144.

<sup>20</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 22 January 1998.



With regard to liner transport capacity, in 1997 the world fleet reached a figure of over 5 million TEUs, with a total of 6,200 ships including all types of vessels. Container capacity on order, as a percentage of the existing fleet, fell from 35% in spring 1997 to below 25% in November 1997. Almost half of the remaining orders are for carriers of 3,000 TEUs and over, including 40 post-Panamax ships which are to be delivered before the end of 1999. Of the total order book, almost 60% of the slot capacity is for post-Panamax container ships (Rogliano Salles, 1998, p. 21).

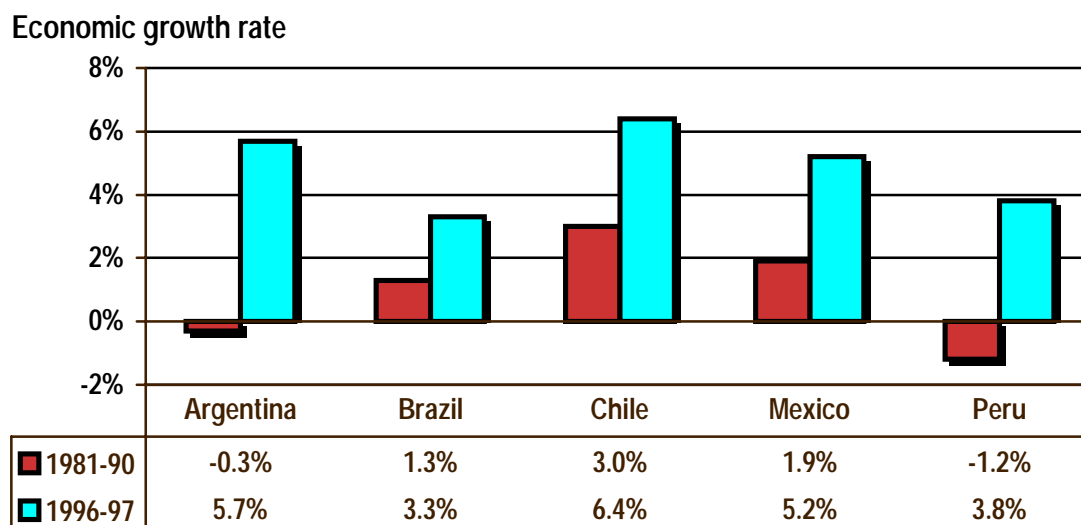
By 2000, post-Panamax ships will account for more than 500,000 TEU slots, or 9% of the total capacity, compared with just 3.8% (185,000 TEUs) in 1996. Of particular interest is the creation of new reefer capacity on the post-Panamax vessels. Some of these ships can carry 600 FEUs of refrigerated cargo, which is more than most specialized reefer ships. In order to fill these slots, leading carriers are increasingly competing with traditional specialized reefer lines.

#### 4. Focus: Latin America and the Caribbean

##### (a) Economic growth

Latin America and the Caribbean have experienced very positive economic growth rates in the last decade (see figure 11). Annual fluctuations and the differences among the various countries have been reduced. Low inflation rates, high foreign direct investment, political stability, privatization, and liberal open-market economic policies all indicate that high economic growth rates should continue in the foreseeable future.

Figure 11  
Economic growth rates in selected Latin American countries



Source: ECLAC, on the basis of official figures. Data for 1997 are forecasts made in September 1997.

**(b) Merchandise trade**

The positive economic indicators in Latin America and the Caribbean have led to a surge in imports and exports. Although the Asian financial crisis is likely to slow this growth in the short term because Central Banks increased interest rates to defend their currencies, the medium- to long-term perspectives for foreign trade are still very positive. Figures 12 and 13 illustrate the impressive growth of foreign trade in recent years.

Latin America and Caribbean exports and imports totalled 1,463 million tons in 1994. Around 95%, or an estimated 1,300 million tons, was shipped via ocean transport. Of that seaborne trade, approximately 35-40%, or roughly 500 million tons, was carried on liner services.

In 1995, Latin America and the Caribbean exceeded Europe for the first time as the second most important market after Asia for containerized United States exports with about 1.5 million TEUs (*The Journal of Commerce*, 8 July 1996, pp. 1C and 12C). The region is expected to account for 19% of United States container trade by 2005, compared with 13% currently, while Europe is expected to decrease from 23% to 18%.<sup>21</sup> With regard to values, Chile exported US\$ 5.59 billion of goods to Asia in 1995, or 34% of its total exports. This surpassed its combined exports of US\$ 5.57 billion to North, Central and South America (*The Nikkei Weekly*, 1 July 1996, p. 19).

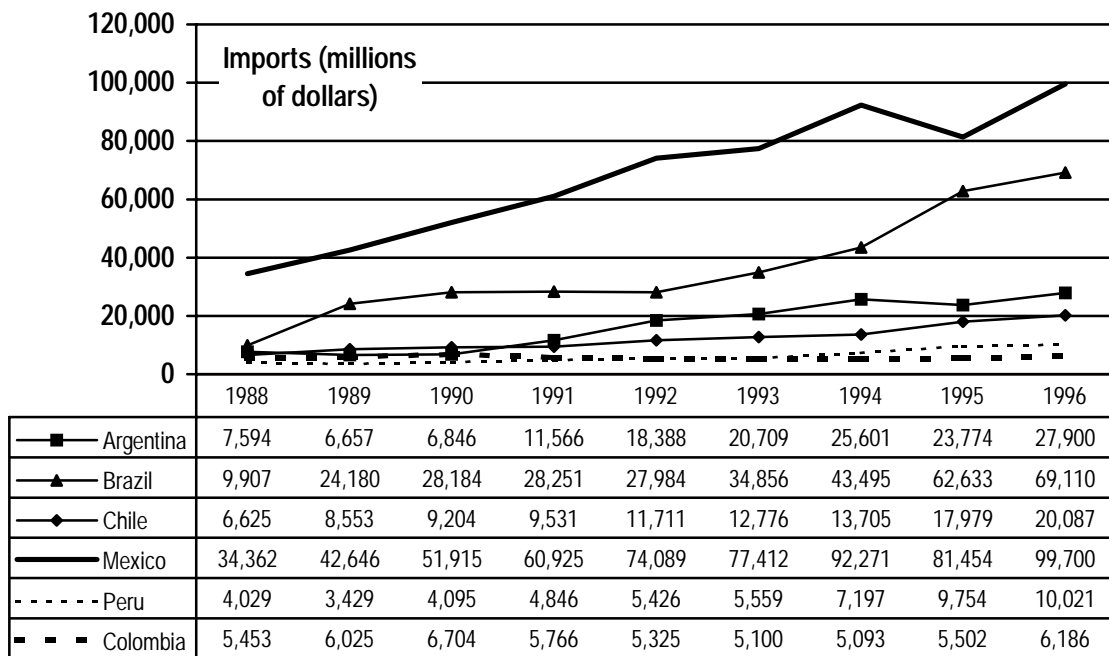
The east coast of South America is the second largest north-south market in the world (after Australasia), moving an estimated 2.1 million TEUs in 1995. Of that total, Brazil accounts for two-thirds. By 2004 the volume for the entire east coast should expand to 7.7 million TEUs (*Lloyd's List*, 19 July 1996, p. 7). Thus, with growing and stable trade volumes, Central and South American markets have become quite attractive to major liner companies.

The growth of Latin American trade volume is also reflected by the increasing use of the Panama Canal. Total Canal cargo movements reached almost 190 million long tons of cargo in 1997, which was a slight decline over the historical record of 198 million long tons in 1996. The three principal commodity and merchandise groups are grains, petroleum and petroleum products, and containerized cargo. Table 3 highlights movements of containerized and general cargo through the Canal.

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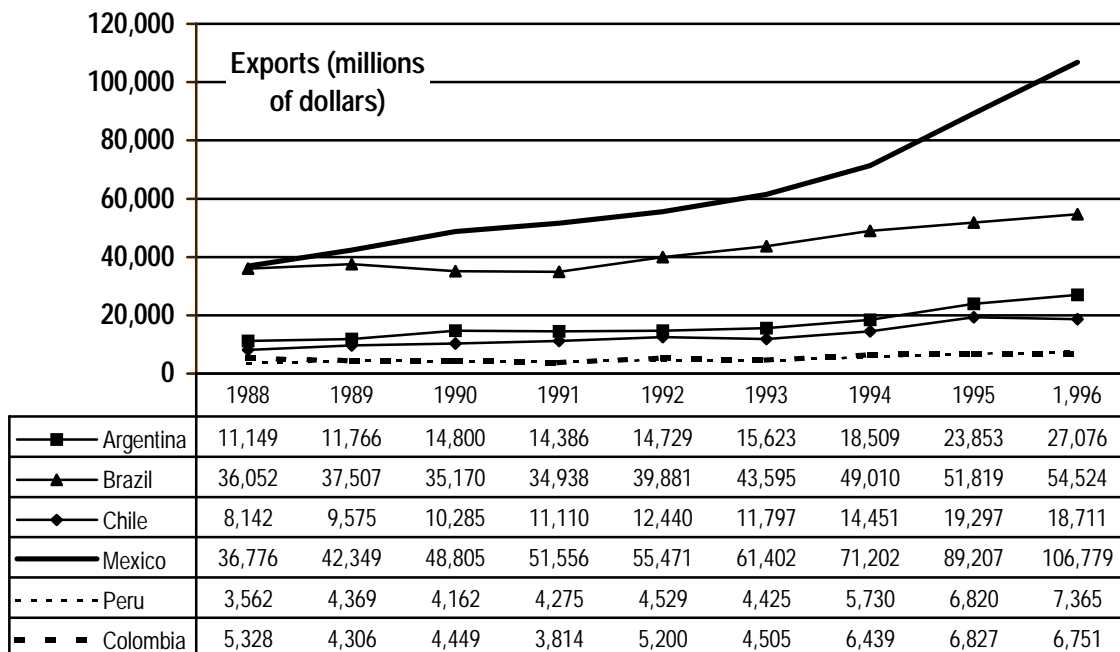
<sup>21</sup> *Fairplay*, 27 February 1997, p. 15; and *The Journal of Commerce*, 26 April 1996, p. 4B.

**Figure 12**  
Value of imports of selected Latin American countries



Source: ECLAC, *Estudio Económico de América Latina y el Caribe*, 1996-1997.

**Figure 13**  
Value of exports of selected Latin American countries



Source: ECLAC, *Estudio Económico de América Latina y el Caribe*, 1996-1997.

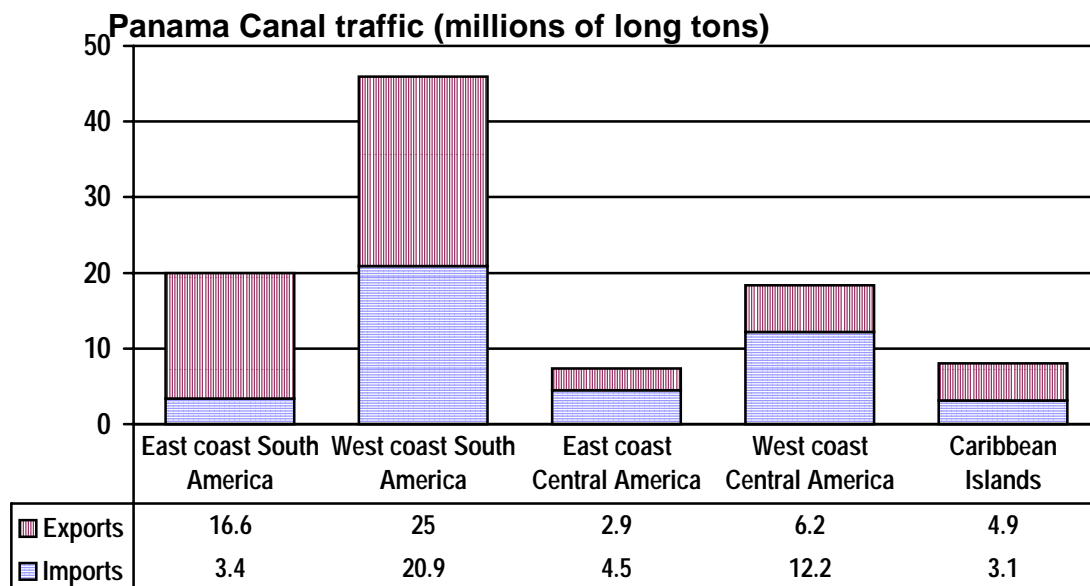
**Table 3**  
**Container and general cargo movements through the Panama Canal, 1997**

Thousands of long tons	Atlantic to Pacific	Pacific to Atlantic
Container / Breakbulk ships	4,030	3,568
Full container ships	13,572	11,104
General cargo ships	4,335	3,707

Source: Panama Canal Commission.

Trade between the Far East and the United States East and Gulf coasts is the most important source of container traffic through the Canal. The second most important source is trade between the United States East and Gulf coasts and the west coast of South America. The grain trade includes United States shipments to Asia and to the west coast of South America. Petroleum and petroleum products encompass shipments between North and South America, as well as via intermediate Caribbean ports. As for the different sub-regions of South America and the Wider Caribbean, Figure 14 illustrates the cargo movements in both directions of the Panama Canal.

**Figure 14**  
**The origin and destination of Panama Canal traffic for Latin American and Caribbean**



Source: Panama Canal Commission.

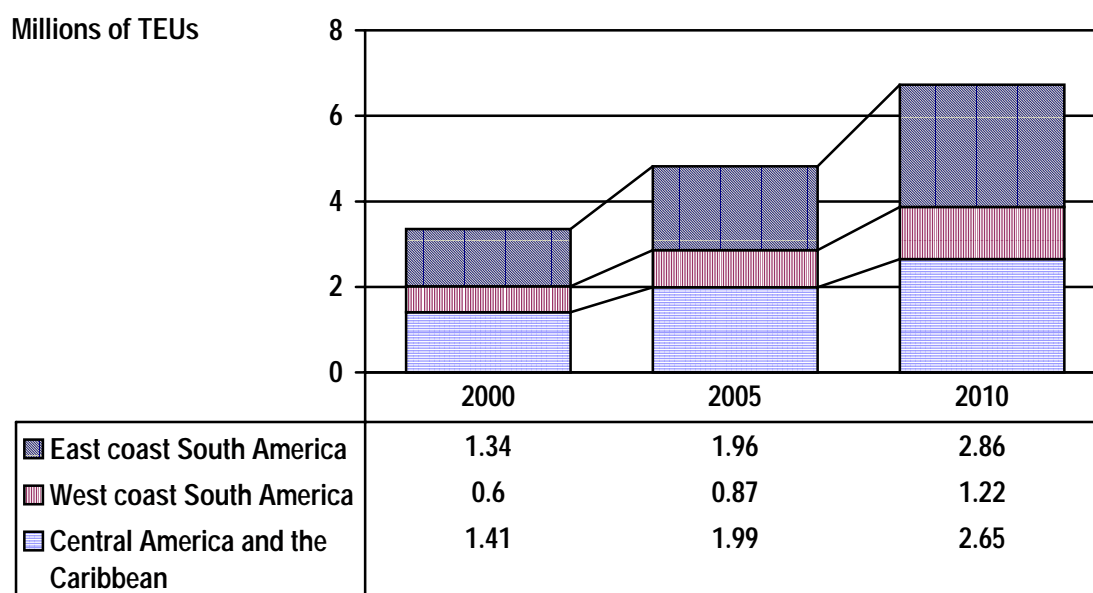
Note: "Exports" implies that cargo moves from the Atlantic to the Pacific in the cases of east coast South America, east coast Central America (including Mexico), and the Caribbean Islands. It implies that cargo moves from the Pacific to the Atlantic in the cases of west coast South America and west coast Central America. "Imports" accordingly implies that cargo moves in the opposite direction.

(c) **Containerized trade<sup>22</sup>**

In 1980, Latin America and the Caribbean accounted for 1.34 million TEUs of port container throughput, or 3.7% of the world total. In 1996, this total grew to 10.04 million TEUs, or 6.4% of the world total. Because of a higher containerization rate and trans-shipment, Central America and the Caribbean make up 63% of the region's total, versus 37% for South America. Between 1991 and 1996, South American port throughput grew by 122%. In Central America and the Caribbean, accumulated growth was 61%, which is roughly parallel to the growth of world port throughput.<sup>23</sup> For the period 1997-2000, Ocean Shipping Consultants Ltd forecasts port throughput to grow by 53% in South America and by 45% in Central America and the Caribbean (*International Container Review*, Autumn/Winter 1996, pp. 128-142)

Trade-movement forecasts of the World Sea Trade Service (WSTS)<sup>24</sup> indicate that the Latin American and Caribbean economies will generate significant additional containerized traffic in the future, as illustrated by figures 15 and 16.

**Figure 15**  
**Inbound container traffic forecasts for Latin America and the Caribbean**



Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Fourth Quarter 1997.

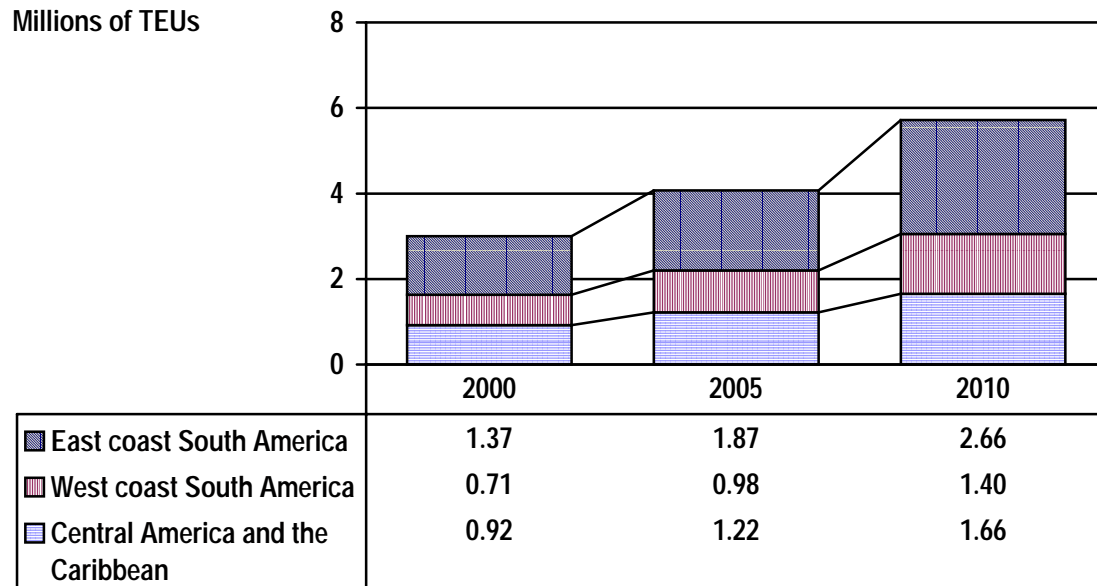
Notes: Deep-sea trade only, excluding intraregional trade. TEU: Twenty-foot equivalent unit. "Central America" includes Mexico.

<sup>22</sup> This section draws heavily on Bruce Lambert, "Trans-shipment in Latin America", *World Sea Trade Service Review*, DRI/ McGraw-Hill and Mercer Management Consulting, Fourth Quarter 1997.

<sup>23</sup> Ocean Shipping Consultants Ltd., quoted in *AAPA Advisory*, July 28, 1997.

<sup>24</sup> The WSTS does not report total trade movements for Latin America directly. Maritime information is developed from the reverse-flow trade data reported by the various countries in the WSTS forecast.

**Figure 16**  
**Outbound container traffic forecasts for Latin America and the Caribbean**



Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Fourth Quarter 1997.

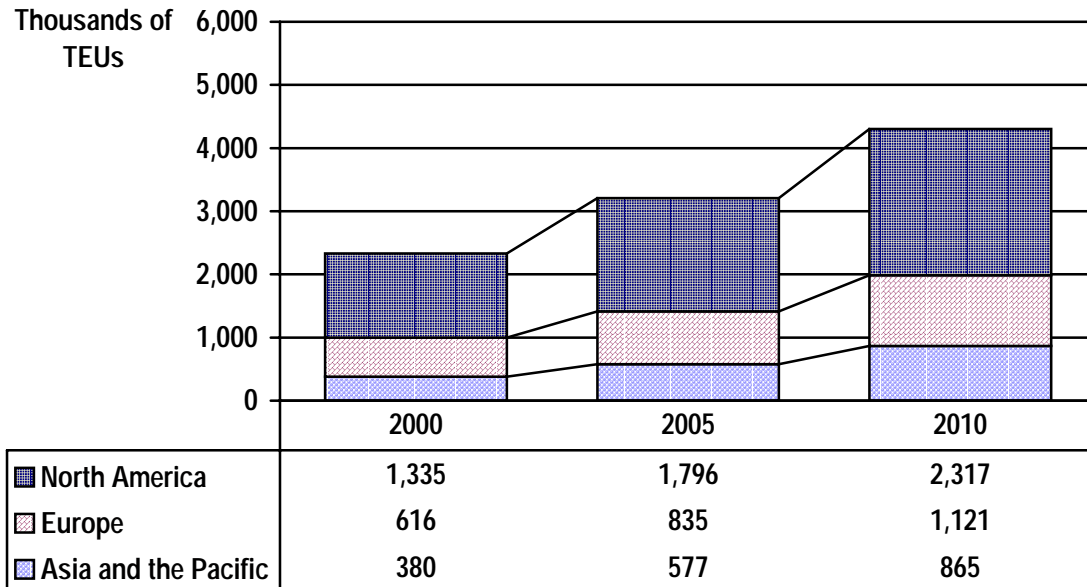
Notes: Deep-sea trade only, excluding intraregional trade. TEU: Twenty-foot equivalent unit. "Central America" includes Mexico.

Despite a drop in 1996 (mostly involving shipments from Europe), WSTS expects Latin American trade to regain momentum over the next few years. Between 1997 and 2010, WSTS projects total containerized trade movements in Latin America to increase by 7.0% per year. Exports from the region should climb 6.2% annually in the short term, but this pace should increase slightly after 2000. Inbound shipments will also remain strong, with annual growth rates of 8.4% in the short term. Over the longer term, the gains in inbound traffic will ease, but they are projected to remain strong.

In 1997, the United States and Canada together accounted for 46% of the containerized traffic of Latin America and the Caribbean as reported by WSTS countries. Europe and Asia and the Pacific captured 31% and 23%, respectively.

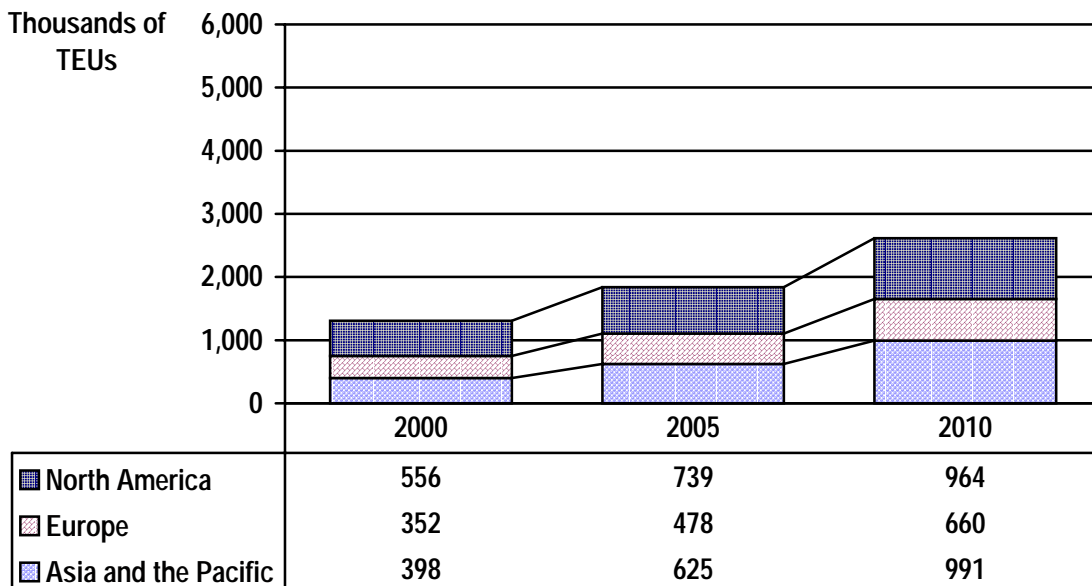
Trade with all countries that report to the WSTS is expected to grow over the next 10 years. Trade between Latin America and Asia should experience the highest growth rates. The United States will remain Latin America's largest single market, but its share of total trade should decline to less than 37% of all deep-sea shipments. Similarly, shipments to and from Europe should continue to grow, although Europe's share of the Latin American market will probably fall to about 28%. The projected loss in market share by both these regions can be attributed to growth in Asian and Pacific trade. By that year, Asia and the Pacific is thus expected to have overtaken Europe as Latin America's second most important trading partner. The relative importance of the trading partners of the three major Latin American subregions is illustrated in figures 17, 18, and 19.

**Figure 17**  
**Container traffic forecasts for Central America, by trading partner**



Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Fourth Quarter 1997.

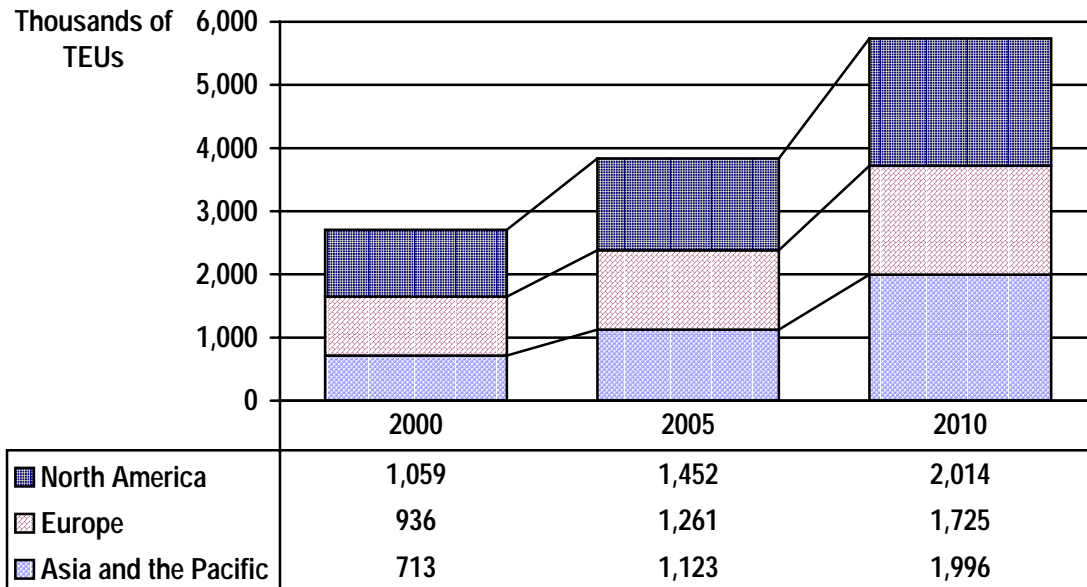
**Figure 18**  
**Container traffic forecasts for the west coast of South America, by trading partner**



Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Fourth Quarter 1997.

Note: TEU: Twenty-foot equivalent unit.

**Figure 19**  
**Container traffic forecasts for the east coast of South America, by trading partner**



Source: DRI/McGraw-Hill and Mercer Management Consulting, *World Sea Trade Service Review*, Fourth Quarter 1997.

Note: TEU: Twenty-foot equivalent unit.

**(d) Implications for shipping**

In Latin America and the Caribbean, many shipping lines anticipated or at least responded quickly to the region's economic reforms and the resulting high economic growth rates. Traditional lines added capacity, and many new lines entered the market. While in 1985 only six of the top 20 container lines were serving South America, this number had doubled to twelve by 1994 (Drewry Shipping Consultants, 1995, p. 69). At present, a total of about 30 lines are offering services to and from the east coast of South America, which is the highest number of companies competing per TEU on any major trade route.<sup>25</sup>

The Wider Caribbean and the South American east coast dominate over the South American west coast in terms of port traffic. The growth potential of the west coast is limited by the Andes mountains. The potential for scale economies on the east coast and the fact that the Caribbean lies at the crossroads of various trade routes give ports in these two sub-regions strong competitive advantages over ports on the west coast when competing for trans-shipment cargo.

<sup>25</sup> Mark Kadar of Mercer Management Consulting during the Terminal Operations Conference (TOC), June 1997, Barcelona.



**Box 7**  
**VESSEL DEPLOYMENT IN LATIN AMERICA**

Carriers examining routes in Latin America can use World Sea Trade Service (WSTS) forecasts of traffic flows to determine the demand for vessel utilization and to gain insight into whether trans-shipment services are needed.

WSTS assumes that a representative ship engaged in a Latin American service is a 1,500-TEU vessel operating at 80% capacity, based on the geographical disparity of the region, coupled with the size constraints of the Panama Canal and the size of the vessels currently engaged in the trade. Using this ship as the standard, Latin America needed 43 weekly vessel services during 1997 to all regions. If the average vessel size does not increase by the year 2000, Latin American trade would support a minimum of 107 services.

Using other vessel sizes changes WSTS's analysis. If the representative vessel size increases to 2,500 TEUs, again operating at 80% capacity, then only 64 sailings are needed by the year 2010. If 4,000 TEU vessels are used (at 80% capacity), Latin America would only support 40 sailings in 2010. With this growth in vessel size, the importance of trans-shipment becomes greater: generally, as ships get larger, the number of port calls is reduced. Additional trans-shipment facilities to pool container traffic would be needed, especially if they can provide areas for container depot functions. Also, the movement of empty containers will become more important in the future, especially in Central America and along the west coast of South America.

Source: Bruce Lambert, "Trans-shipment in Latin America", *World Sea Trade Service Review*, DRI/McGraw-Hill and Mercer Management Consulting, Fourth Quarter, 1997.

A particularly high growth potential of coastal and international shipping has been forecasted for the east coast of South America. Table 4 presents a forecast of general cargo flows for Brazil, assuming that port privatizations and modernizations, as well as liberalizations within the Southern Common Market (Mercosur), are carried out.

**Table 4**  
**Forecast for Brazilian general cargo flows**

	1995	2000	2005
	(millions of tons)		
<b>Highway</b>	272	331	426
<b>Railway</b>	25	50	100
<b>International shipping</b>	39	56	84
<b>Coastal shipping, including feeder and Mercosur trade</b>	0.5	11	27
<b>Inland waterways</b>	1	2	4
<b>TOTAL</b>	338	450	641

Source: GEIPOT, quoted in *International Transport Journal*, 52/1997.

The relative share of maritime transport (international, coastal, and waterway) within all types of transport is forecasted to grow by 50%, from 40 million tons in 1995 to 115 million tons in 2005. In absolute terms, maritime transport in Brazil is thus expected to grow by 180% within 10 years. These forecasts may be overly optimistic, however, because they were made before the recent financial crises in Asia, which also affected the South American economies. Brazil, in particular, had to raise interest rates substantially to protect its currency. Also, as stated above, these forecasts depend on optimistic assumptions concerning port privatization and modernization, the improvement of Customs procedures, and liberalization of maritime transport within Mercosur.

## **5. Causes of concentration in shipping**

Both, globally and in Latin America and the Caribbean, several trends are developing within the economic conditions described above.

- Transport is becoming more relevant. Although transport costs are declining relative to the value of the goods that are being transported they are assuming an increasing share of the total costs within the production process.
- Traded volumes are increasing. The total volume of trade and its transport is growing faster than the world's output. The increasing integration of developing regions, such as Latin America and the Caribbean, into the global economy leads to a particularly fast rise of the containerized maritime transport of their foreign trade.
- The share of containerized transport is growing. The increasing unit value of transported goods and the globalization of the economy, which requires more just-in-time deliveries lead to an increased containerization of general cargo.

Consequently, the market for liner shipping services is growing. This on its own, however, does not necessarily lead to a process of concentration. On the contrary: if nothing else changes, there should be more room for different players.

Nevertheless, the above described economic trends have encouraged governments and international organizations to liberalize maritime transport, which in turn avoids protectionism and encourages certain forms of concentration (see part C of this chapter). Also, the increasing volumes are encouraging the development and use of new technologies, which seem to permit the achievement of scale economies. These scale economies, in turn, facilitate the process of concentration (see part D of this chapter).

## C. GOVERNMENT REGULATION

### 1. Synergies and conflicts of interest

#### (a) *The goals of government regulation*

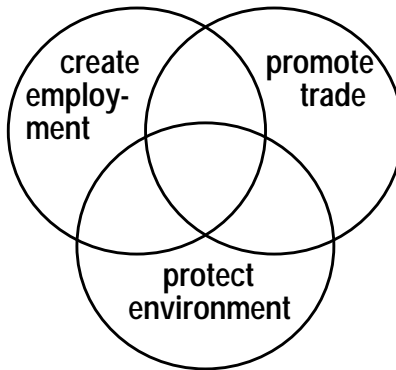
National or regional regulation of maritime transport, as part of a more general maritime policy, can focus on three main goals:

- The promotion of trade through fast, reliable and inexpensive maritime transport.
- The creation of employment and taxable income in maritime industries. Regulation may try to promote or protect employment by national seafarers or shipbuilding in national shipyards.
- The protection of the marine environment and the protection of human life at sea. The ratification of international conventions and their inclusion into national regulation usually aims to reduce the environmental and social costs of maritime transport.

The goals may be conflicting or synergistic. For example, the recent discussion of the one-man watch on ocean-going vessels would have helped to reduce the costs of maritime transport, thus promoting trade, but it would also have reduced employment and, possibly, increased the risk of accidents. Similarly, Brazil has reached several bilateral agreements requiring the use of national ships for the transport of bilateral trade. This directly creates employment for Brazilian shipping companies and their seafarers, but it also increases the transportation costs of bilateral trade. In the United States, the Jones Act limits shipping within the United States to ships that are flagged, manned and built in the United States, which directly increases the costs of transport between, for instance, Puerto Rico and the United States mainland as compared to transport between neighbouring Dominican Republic and the United States. Finally, the Standards of Training, Certification, and Watchkeeping (STCW) convention, targets low safety standards, but it has also had the effect that the demand for British seafarers has increased because seafarers from some developing countries are less likely to be able to prove that they have been adequately trained.

These synergies and conflicts of interest can be illustrated by a graph with three overlapping circles (see figure 20). Each circle represents the achievement of one of the three goals.

**Figure 20**  
**The goals of regulation of maritime transport**



Source: ECLAC.

The priorities vary from country to country and from region to region, and what may be a conflict of interest in one region may become a synergy in another. For example, a country with strong comparative advantage to supply a variety of maritime services, such as Panama, can easily claim that its efforts to export these services promote Panamanian merchandise trade at the same time. The European Union exercises more stringent port state control aimed at improving ship safety and environment protection; such policies benefit European shipping companies, which often have better safety standards than shipping companies from developing countries.

**(b) *The promotion of trade***

Governments and international organizations, such as the European Union, the Organization for Economic Cooperation and Development (OECD), and the World Trade Organization (WTO), are confronted with another conflict of interest when considering policies for trade promotion.

- On the one hand, liner shipping companies need to achieve scale economies to reduce costs. This can partly be achieved by cooperation in the form of cartel-like mechanisms such as liner conferences, discussion agreements and alliances, and also through straight-out mergers.
- On the other hand, the best mechanism for reducing costs and avoiding oligopolies is competition. This implies the application of anti-monopoly laws and the restriction of exemptions for liner shipping conferences. It may also imply the prohibition of mergers by national or regional (e.g., European Union) cartel offices.

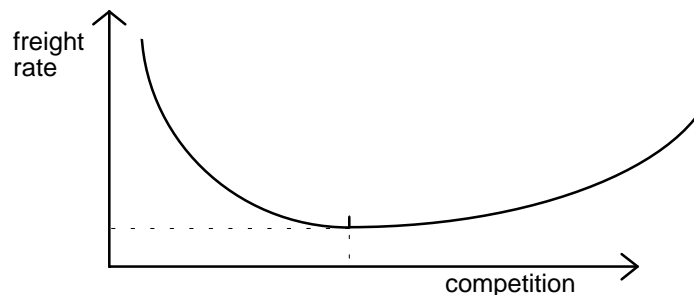
This conflict of interest is evident in the discussion within the European Commission as to whether to allow liner shipping conferences to offer origin-to-destination inland tariffs. The United States is debating whether carriers should be permitted to enter into individual contracts with shippers without publishing the tariffs. The German cartel office recently had to decide whether to allow the purchase of the shipping company Ha-

pag-Lloyd by the conglomerate Preussag, which also owns a freight forwarder. The European cartel office was also involved in this matter.

In view of these recent approvals, the United States Federal Marine Commission (FMC) has said that further mergers in the container shipping sector would need continued governmental scrutiny to ensure fair competition. FMC Chairman Harold Creel recently stated, “Whether it be new types of alliances, company mergers, or other forms of joint ventures, carriers will continue to deem it necessary to combine forces in order to effectively compete in a deregulated environment. While this creates efficiencies and economies of scale, close government scrutiny will be necessary to ensure that the shipping public is not left with too few service options” (*Fairplay*, 12 March 1998, p. 11).

The graph in figure 21 illustrates the trade-off between scale economies and competition. The presence of too few shipping lines increases the probability of their abusing their monopoly position, which could lead to high freight-rates. Too many lines, on the other hand, make it impossible to achieve scale economies and may even lead to over-competition and duplication of efforts, where no single line has sufficient cargo to justify the use of large vessels or gantry cranes in its own terminal. This could lead to unnecessarily high unit costs, which in turn cause higher freight-rates.

**Figure 21**  
**The trade-off between economies of scale and the risk of anti-competitive behaviour**



Source: ECLAC.

Liner shipping companies argue, for example, that when the European Commission prohibited capacity management and conference tariffs for inland transport, it became impossible to achieve full operational efficiency; long-term freight-rates would be lower if less competition were forced upon them. According to this view, the present situation is to the right of the freight-rate minimum on the graph. The European Commission, on the other hand, argues that capacity management and the like lead to unnecessarily high freight-rates, pushing the situation to the left of the freight-rate minimum on the graph.

Several articles in the *International Transport Journal* (e.g., “Viewpoint”, 27 December 1996, and 17 September 1997) have argued in favour of allowing capacity management by conferences. This is even compared to the European Union’s Common Agricultural Policy (CAP), which includes setting aside 5% of arable land. Given the enormous sums wasted by CAP, it seems questionable whether this policy should guide liner shipping regulation.

## **2. Recent trends**

### **(a) *Liberalization versus protectionism***

Most countries are increasingly shifting their focus from the creation of employment to the promotion of trade and the protection of the environment. In Latin America, in particular, abolishing cargo reservation in most countries, together with port modernization and some other trends, has led to a noticeable decline of freight-rates.

To create long-lasting employment in all sectors of the economy, it is necessary to participate in the global economy. To achieve this, a country needs to be able to count on efficient ports and shipping services. The use of capital-intensive technologies may imply less employment in a port, but in the long term this is more than compensated by additional employment in industries that depend on foreign trade.

In spite of recent trends toward liberalization, some protectionist mechanisms still prevail. These include Brazil's reluctance to allow bonded warehouses to be run by foreign operators. The ability to combine conventional maritime affairs with bonded warehouses can be considered a major efficiency enhancer for operators, and allowing only Brazilians to run them should be seen as an anti-competitive practice. Another concern is the Brazilian tax provision favouring vessels that use the newly established second registry. Also, Mercosur might limit competition for coastal intra-Mercosur shipping to its own shipping companies. China, too is being criticized for not permitting competition in intermodal services. In the United States, the "Jones Act" restricts the business of carrying cargo between American ports to American-registered ships. Congress passed a bill in 1996 awarding subsidies of around US\$ 2.5 million per ship to any local shipping company that keeps its vessel registered in America. The cost of this "maritime security program" is estimated to be around US\$ 1 billion over ten years (*The Economist*, 2 November 1996). Foreign shipping companies are now establishing United States subsidiaries to benefit from these subsidies.

### **(b) *Competition versus cooperation***

The main purpose of a liner conference is to be a "rate setting mechanism". Cooperation is thus used to increase income, and only to a lesser extent is it used to reduce costs. Capacity management is mainly a tool for stabilizing rates. Regulators are increasingly hesitant to grant exceptions from anti-monopoly laws that have so far been granted to these liner conferences.

For example, the European Shippers' Councils (ESC) are lobbying the European Commission to abolish the anti-monopoly immunity of freight conferences. The ESC argue that regulation 4056/86, which gives liner conference agreements a block exemption from the Treaty of Rome rules of competition, has become outdated because conferences no longer provide rate and service stability in liner trades, but rather contribute to instability by attracting excess capacity to freight-rates that are higher than market determined rates. Another example is the Transpacific Stabilization Agreement's decision to drop its plan to collectively withhold capacity in the trade lanes between the United States and Asia at the beginning of 1997 because the United States FMC had expressed

Asia at the beginning of 1997 because the United States FMC had expressed concerns that the plan would be anti-competitive.<sup>26</sup>

Unlike ocean transport, intermodal traffic is not exempted from the Treaty of Rome competition requirements by Directive 4056/86. The European Union's General Directorate VII (DG VII), which deals with transport matters, has prohibited members of various conferences from agreeing on prices for inland transport services within the European Union because, in its opinion, they provide no benefits to shippers. The ESC has welcomed the prohibition of price fixing for intermodal transport, and it rejects shipowner's claims that price fixing was needed. Instead, the ESC supports shippers' claims that transport users obtain no benefit from inland price fixing by liner conferences.

In April 1998, the United States Senate approved Ocean Shipping Reform Act of 1998 (S 414), which allows confidential service contracting and the elimination of tariff filing for shipping lines. The legislation has been endorsed by most United States ports, as well as by ocean carriers and shippers. Under the bill, the major provisions of shipping line service contracts, including rates, service commitments and liquidated damages, can be kept confidential. In addition, tariff filing with a government agency has been eliminated, along with the requirement that carriers match service contract terms for similarly situated shippers. The bill also adds exemptions from tariff and service contract requirements for commodities such as new assembled motor vehicles. Mandatory tariff filing previously represented 95% of the activities of the FMC.<sup>27</sup>

In Asia, the newly established Shanghai Shipping Exchange will create a rate index, based on rates that will have to be filed by shipping lines. Chinese authorities compare it to the obligatory tariff filing in the United States. Foreign carriers fear that the information they provide might be leaked to Chinese carriers. It is also feared that the index might be used to influence the freight-rates themselves.

### **3. International coordination**

As the above discussion indicates, different regulations apply in Europe, North America and Asia. The shipping newspaper *Lloyds' List* writes accordingly, "For lines to be answering to two masters is a misfortune; to answer to three could be a disaster. Against this background, the ideal world of a single regulatory body for international liner shipping seems little more than a dream."<sup>28</sup>

This has given rise to suggestions that an international organization, such as the WTO in Geneva, coordinates these regulations. So far, liner shipping is not governed by WTO rules, although the OECD's Maritime Transport Committee has formulated a set of common principles designed to promote compatibility of competition policies. So far, liner shipping is not governed by WTO rules.

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<sup>26</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 29 January 1998.

<sup>27</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 22 April 1998.

<sup>28</sup> *Lloyd's List* via <http://pnp.individual.com>, 30 January 1997.

#### **4. Causes of concentration in shipping**

There is a tendency toward less protection of national carriers. This allows new participants to enter the market, and it is thus possible that more carriers are competing on individual routes. To avoid “over-competition”, lines are increasingly seeking to form alliances or even to merge.

The focus of cartel offices is no longer limited to the national level. Whereas on a national level certain mergers might have been considered anti-competitive, sufficient competition still exists on a regional or international level. Hence, mergers and alliances meet fewer objections.

If carriers do not have to file tariffs with the United States FMC, carriers will compete for the cargoes of large volume shippers. Most of the remaining shippers have much less bargaining power, and they end up paying freight-rates that are higher than those with greater volumes. However, the 1984 shipping act allows smaller shippers to join forces to combine their negotiating power.

Regulatory bodies are increasingly intolerant of traditional liner conferences. This encourages liners to look for alternative forms of cooperation, including alliances and mergers. Although the regulatory bodies in the United States and Europe are taking different measures, the general tendency in both cases is to allow cooperation if this can lead to cost reductions. Cooperation to increase prices is supposed to be avoided. Deregulation benefits large carriers and shippers more than smaller ones because it permits individual confidential arrangements. Above all, “the big shippers who have been pushing [the deregulation bill in the United States] see its provisions undermining ship conferences as its biggest benefit” (*The Journal of Commerce*, 17 March 1998, p. 1).

### **D. TECHNOLOGICAL CHANGES**

#### **1. Technologies and services**

Technologies determine what services can be provided at what cost, under a given economic and regulatory framework. Factor prices (e.g., wages and interest rates) are generally exogenous. Assuming rational behaviour (i.e., the company uses its resources efficiently), a company’s costs are thus determined by the services it provides.

Obviously, total costs will always rise if services (e.g., TEU-miles) are increased. The interesting question is, what happens to unit prices. Scale economies imply that unit prices decrease if output increases. This decrease will occur up to a certain limit, and this limit seems to have moved up.



## Box 8

### ADVANTAGES AND DISADVANTAGES OF POST-PANAMAX SHIPS

The introduction of post-Panamax ships was facilitated by the development of large capacity double-stack railway systems in the United States (for the transpacific trades) and by greater confidence in the political stability of the Middle East and the resulting security of the Suez Canal (for Europe Far-East trades). The availability of higher-powered marine diesel engines to allow for single screw propulsion helped to overcome a major technical obstacle for post-Panamax vessels.

post-Panamax container ships make it possible to reduce unit costs through economies of scale on the major east-west routes. With similar total operating costs, a post-Panamax ship carries 40% to 50% more TEUs than a Panamax vessel. Another advantage is the fact that post-Panamax ships are wider, which reduces the necessity to take the weight of individual containers into account when loading cargo; even if the heaviest containers are loaded on top, the ship moves less in heavy seas than ships with a narrower beam. Post-Panamax ships are generally faster than traditional vessels, although, this is not a real “advantage” but rather a necessity to compensate for longer stays in ports.

Post-Panamax ships also have disadvantages. With building costs of around US\$ 15,000 per slot, they are not cheaper than traditional vessels. Total costs for one vessel can reach up to US\$ 100 million. Greater cargo volumes and larger ship sizes imply longer handling times and additional costs in ports. To avoid crushing the lower containers, particular care has to be taken with the stack weight if containers are to be stacked higher than the total of nine full boxes according to ISO TC 104.

Taking into account operative costs and fixed costs and other transport system costs, the advantages and disadvantages of post-Panamax vessels are estimated to translate into a 6.3% cost savings for transpacific container traffic.

Obviously, these cost saving can only be achieved if the vessel’s capacity is fully used. Maintaining a certain frequency on a trade route, e.g., weekly, still requires the same number of ships. This implies that the use of post-Panamax vessels necessarily requires more cargo to realize the desired economies of scale.

Source: ECLAC, based on Drewry Shipping Consultants, *Post-Panamax Containerships*, London, 1996.

## 2. New cost function

### (a) *Increasing proportion of fixed costs*

More and larger gantry cranes in ports, bigger and more expensive ships, increased investments in computers, more expensive but fuel-efficient ship engines, electronic communications and many other technological innovations have resulted in a change in the relation between fixed and variable costs. Booking one container requires almost as much work as booking 20; increasing shipment sizes thus also lead to lower variable costs. Assuming a 10% interest rate over 20 years, for an initial investment of US\$ 100 million the daily capital costs would be more than US\$ 30,000. With direct operating expenses of about US\$ 15,000 per day, depending on flag of registry and crew nationalities, the daily fixed costs of such a vessel can reach US\$ 45,000. Fuel costs, on the other hand, which are a major component of variable costs, have reached historically low levels.

In sum, fixed costs have increased as a proportion of total costs. According to one estimate, “the ratio between fixed and variable costs is shifting from the traditional 50:50 to more like 90:10 in the container industry”.<sup>29</sup> This is independent of the question whether fixed costs and variable costs have gone up or down. As will be shown below, whether total average costs increase or decrease is not relevant to the process of concentration in shipping. What matters is the coefficient fixed/variable costs. Neither is the exact definition of long and short term fixed costs relevant or the exact ratio of fixed to total costs. What matters is the direction: an increasing proportion of fixed costs among total costs leads to relatively lower marginal costs and to a smaller number of operators in a given market.

**(b) A numeric example**

This change has a tremendous impact on the development of the entire industry. Even if total costs and demand remained the same, the reduction of variable costs versus increased fixed costs directly leads to concentration in the shipping industry. This can best be illustrated by a numeric example.

The cost function of an individual shipping company can be written as

$$(1) \quad c = \alpha + \beta x^\gamma,$$

where  $c$  is the cost and  $x$  the number of TEU per week.  $\alpha$  reflects the monthly fixed costs in millions of \$ (any monetary unit), and  $\beta$  and  $\gamma$  describe the variable costs. The trend in the cost function can be described by increasing the fixed costs  $\alpha$  (e.g., higher monthly capital costs related to bigger ships and computer equipment) and reducing  $\beta$  or  $\gamma$  (e.g., the variable costs of fuel per TEU).

Assuming now  $\alpha = \$ 100$  million,  $\beta = 1$ , and  $\gamma = 2$  in the original cost function we obtain

$$(2) \quad c = 100 + x^2.$$

Given a fixed demand of 100,000 TEU per month on the trade route, the least-cost market solution will be a total of 10 companies, each with a market share of 10%, transporting 10,000 TEU each per month, at an average cost of \$ 20 million per thousand TEU. The total costs incurred will be \$ 2 billion. A company that is offered to transport 1,000 additional containers will be confronted with additional costs of \$ 21 million.

If the fixed costs are now increased to  $\alpha = \$ 200$  million, and the parameter  $\beta$  is reduced to 0.5, the cost function becomes

$$(3) \quad c = 200 + 0.5 x^2.$$

In this example, average costs per TEU and the total costs of the industry do not change at all. Yet, to maintain these minimum costs, the number of suppliers has to be reduced. The average cost per thousand TEU in the least-cost market solution will still be \$ 20 million and the total costs incurred by the industry will still be 2 billion. However,

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<sup>29</sup> Leif Loddessol, CEO of Wilhelmsen, quoted in *Lloyd's List* via <http://pnp.individual.com>, 2 December 1997.

the number of companies in the least-cost market solution will be reduced to five from the previous ten. Also, the costs of transporting one additional container will be reduced.

**(c) Changing the coefficient fixed costs/variable costs**

The conclusions of the numeric example are valid for any cost function of type (1) as long as  $\alpha$  and  $\beta > 0$  and  $\gamma > 1$ .

To reach the optimum condition of minimum unit costs, marginal costs have to be equal to average costs, i.e.,

$$(4) \quad \gamma \beta x^{(\gamma-1)} = (\alpha / x) + \beta x^{(\gamma-1)}$$

which can be solved to

$$(5) \quad \alpha / \beta = (\gamma - 1) x^\gamma .$$

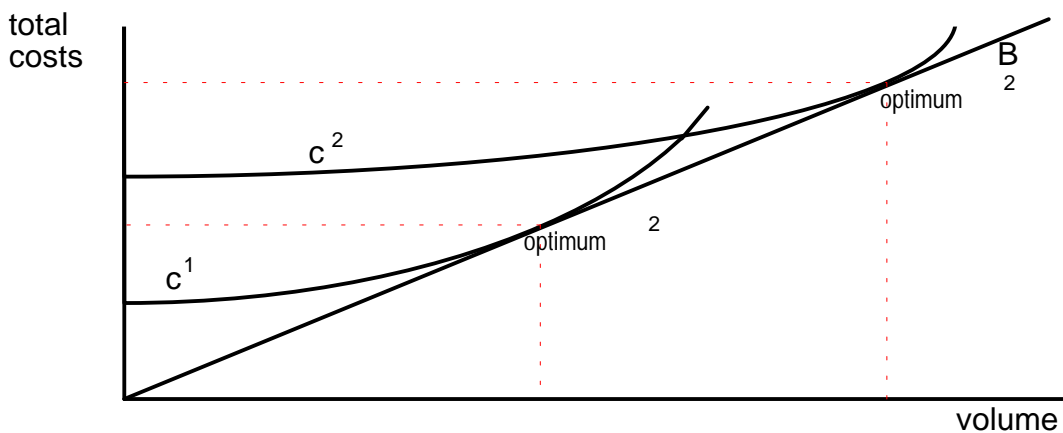
The term  $\alpha/\beta$  reflects the relation between fixed costs and variable costs. If it is increased,  $x$ , which is the volume per company, will also increase. Under a given total demand for the services of all companies, this directly implies that there will be room for fewer companies.

Although other cost functions might be possible, the chosen example has realistic characteristics as it implies positive fixed costs, declining average unit costs for low values of  $x$  and increasing marginal costs for the part where the minimum cost solution is to be found.

**(d) A graphical illustration**

The graph presented in figure 22 shows that even if average unit costs are held constant, a changing relation between fixed and variable costs implies a higher optimum volume per company and thus fewer companies in the market.

**Figure 22**  
**A shipping company's cost curve and the minimum-cost solution**



Source: ECLAC.

The curve  $c^1$  describes a company's total costs as a function of the volume carried. The inclination of line B reflects the average unit costs, which have to be equal to the marginal costs if average costs are to be minimized. Thus, optimum<sup>1</sup> can be determined.

The curve  $c^2$  implies higher fixed costs (i.e., the distance along the "total costs" line) and lower variable costs. It has been drawn in a way that optimum<sup>2</sup> is reached at the same average unit costs (inclination of line B) as was the case for cost curve  $c^1$ . Optimum<sup>2</sup> requires a higher volume per company than optimum<sup>1</sup>. In the long term, at a given total demand a higher optimum volume per company will lead to fewer participants in the market.

*(e) Lower marginal costs*

To show the impact of changing just the relation between fixed and variable costs, the average unit costs were held constant in the above paragraphs. In reality, however, average costs have been reduced.

To minimize unit costs, an enterprise will have to assure that average unit costs are equal to the marginal costs. Lower average unit costs thus also imply lower marginal costs, which, in turn, implies that in the long-term market solution, the coefficient average fixed costs/marginal costs will rise just as the coefficient fixed costs/average unit costs rises.

### **3. Causes of concentration in shipping**

Independent of the exact cost function, an increase in the relation fixed costs/variable costs in the cost function will lead to lower marginal costs and more consolidation (i.e., fewer companies). As the relation between fixed and variable costs has increased – and continues to do so – this trend can be considered to be one of the main causes of the process of concentration in ports and shipping.

### III. IMPACTS

#### A. ARE ECONOMIES OF SCALE ACTUALLY BEING REALIZED?

##### 1. Size improves financial results

Not everybody agrees that larger ships, mergers and alliances actually lead to lower unit costs. Ships need to be full to achieve their scale economies. Alliances need to be stable to obtain the desired efficiency gains. The initial costs of a merger or the formation of an alliance need to be lower than the resulting long-term cost savings.

In the case of ports, Drewry Shipping Consultants calculated that the major international port operators have, on average, an operating cost advantage of US\$ 12 per TEU because of their economies of scale (Drewry Shipping Consultants, 1998).

To obtain quantitative indicators on the effects of size on the financial results of shipping companies, data for 16 major east-west container carriers was compared (see tables 5 and 6).

**Table 5**  
**Indicators of size and financial results of liner carriers**

Company	Total capacity (TEU)	Number of vessels (Units)	Average vessel size (TEU)	Net profit margin	Return on investment
Maersk	232,257	106	2,191	4.6%	4.6%
Evergreen	228,248	108	2,113	10.3%	7.4%
P&O Nedlloyd	221,531	106	2,090	1.8%	4.0%
Sea-Land	215,114	95	2,264	2.1%	11.0%
Hanjin	174,526	62	2,815	0.4%	5.6%
Mitsui OSK	115,763	62	1,867	0.8%	3.2%
NYK	128,154	68	1,885	1.3%	1.3%
Hyundai MM	112,958	36	3,138	0.9%	6.5%
Zim Israel	98,086	59	1,662	1.1%	1.4%
Yangming	96,145	42	2,289	5.6%	7.8%
CMA CGM	89,658	64	1,401	0.7%	0.8%
OOCL	85,970	30	2,866	5.8%	5.8%
NOL	85,664	36	2,380	1.0%	1.6%
K-Line	84,198	45	1,871	1.3%	1.6%
APL	79,918	38	2,103	2.5%	7.5%
Hapag-Lloyd	73,372	23	3,190	1.2%	13.1%

Source: *Containerisation International*, September and November 1997. Data is for 1996.

Note: TEU: Twenty-foot equivalent unit.

**Table 6**  
Correlation coefficients between indicators of size and financial success.

	Return on Investment	Net profit margin
Total capacity (TEU)	+ 0.17	+ 0.37
Average ship size (TEU)	+ 0.63	+ 0.05
Number of ships (units)	- 0.06	+ 0.33

Source: ECLAC, on the basis of data from *Containerisation International*, September and November 1997. Data is for 1996.

Note: TEU: Twenty-foot equivalent unit.

Nobody would expect a perfect correlation (i.e., a coefficient of 1.0) between indicators of size and the financial success of any sample of companies. However, taking into account the diverse individual circumstances of different carriers from different countries in different markets, the relatively high correlation between vessel size and return on investment is striking.

**Table 7**  
Regression results on financial success and indicators of size

	Return on investment	Net profit margin
Sample size	16	16
Multiple corr. Coefficient	0.67	0.40
R <sup>2</sup>	0.45	0.16
Adjusted R <sup>2</sup>	0.32	-0.05
<i>Explanatory variables (t-value in parenthesis):</i>		
Total capacity	- 0.00000047 (- 0.43)	- 0.00000023 (- 0.24)
Average ship size	+ 0.00007390 (+ 1.42)	+ 0.00002210 (+ 0.47)
Number of ships	+ 0.00137700 (+ 0.55)	+ 0.00092500 (+ 0.42)

Source: ECLAC, on the basis of data from *Containerisation International*, September and November 1997. Data is for 1996.

Table 7 presents the results of two simple linear regressions using the data in table 5. R<sup>2</sup> describes the proportion of the endogenous variable's variance that can be statistically explained by the regression. In other words, 45% of the sample's return on investment and 16% of its net profit margin can be explained by three simple indicators of size. This value for return on investment is probably higher than most readers would expect because the financial success of a shipping company depends on a large variety of different factors. Ship and fleet sizes can only achieve economies of scale if these ships and fleets can actually be filled.

A t-value greater than 1 indicates that the standard deviation of the parameter's estimator is larger than the estimated parameter value itself. In other words, only in the case average ship size is the estimated impact on return on investment larger than its standard deviation. The regression results are not very significant in this respect.

All in all, the signs of the partial correlation coefficients and the regression parameters go mostly in expected direction. Larger ships and larger fleets seem to have a positive impact on the return on investment.

It is important to note that the above data includes only mainstream east-west carriers. Data on the financial success of some niche operators, indicates that they, too, can achieve a high return on investment.

Mergers have thus far occurred primarily between companies with previously unsatisfactory financial results. The merger costs must be lower than the resulting cost savings if the merger is to succeed. Newly merged P&O Nedlloyd, for example, "celebrated its first year of operations by unveiling 1997 pre-tax earnings of US\$ 73 million. This was a US\$ 54 million improvement on the combined profit of US\$ 19 million P&O Containers and Nedlloyd Lines had achieved separately in 1996 before they joined forces" (*The Journal of Commerce*, 19 March 1998). The merger between Gran-Colombiana and Transportación Marítima Mexicana (TMM) resulted in a consolidated net income last year of US\$ 914 million, 37% higher than in 1996. The increase was due to the operations of Transportación Marítima Gran-Colombiana and Compañía Transatlántica Española and higher cargo volume in South America.

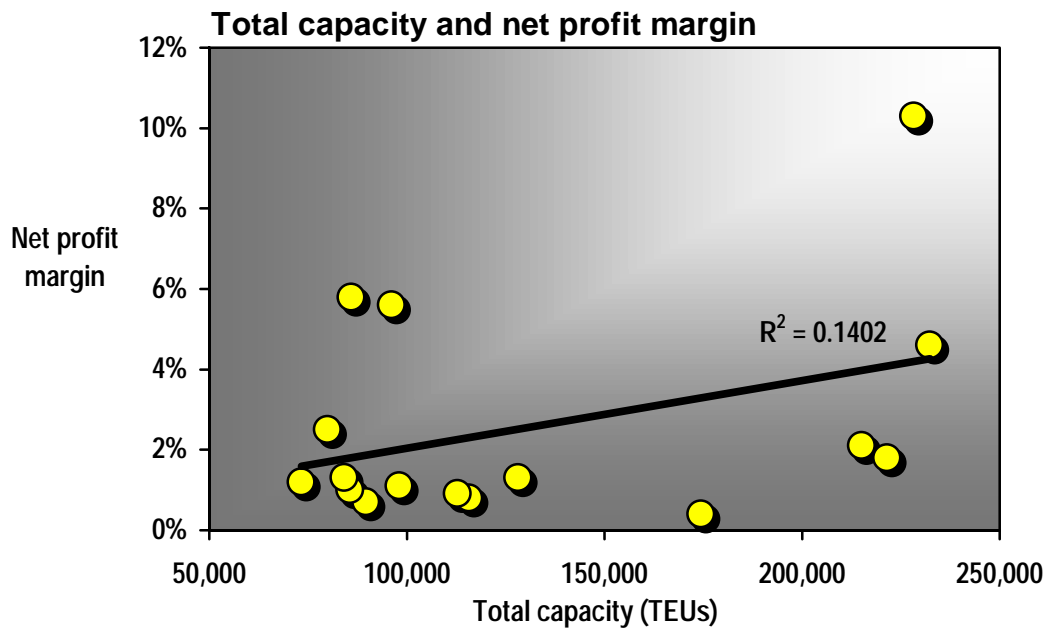
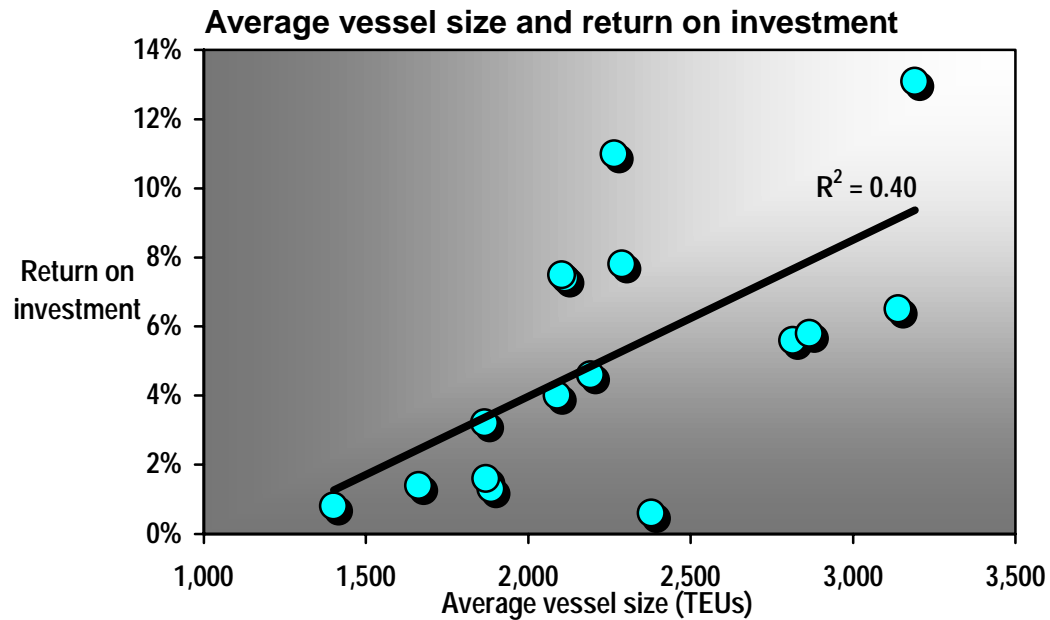
The positive relation between size and financial success may also be the opposite of that suggested above: companies with a better return on investment are more likely to have the courage and the cash flow to expand services and invest in larger ships. The statistical correlation coefficients presented above do not provide any information about the actual causality. It may thus be that financial success causes growth (i.e., mergers, larger ships, acceptance into an alliance) rather than the other way round.

## **2. Lower costs and lower freight-rates**

The positive relation between financial success and size only holds for individual companies. Given one base freight-rate for a specific route, cargo and type of service, this market freight-rate is generally valid for all participating carriers. Companies that have achieved scale economies earn better returns because they reduced costs and not because they increased sales. The return on investment is mainly an indicator of cost effectiveness and has less to do with the freight-rates of individual carriers.

Industry-wide, the relation between size and financial success is possibly even negative rather than positive: Sooner or later, lower costs and an increased total capacity lead to lower overall freight-rates. The increased volume of individual carriers "is intended to serve as a basis for cost-saving rationalization, but is rarely sufficient to make good the losses that result from the rate wars by which it is achieved" (*International Transport Journal*, 40/97). In spite of the success of individual carriers in reducing costs, the industry's average rate of return will always tend to suffer from the capacity increases which lead to the cost reductions in the first place.

Figure 23  
Relation between financial success and indicators of size



Source: ECLAC, on the basis of *Containerisation International*, September and November 1997. Data is for 1996.

Notes: TEU: Twenty-foot equivalent unit.  
The reported  $R^2$  is the square of the partial correlation coefficient.



## B. ARE LINER SHIPPING COMPANIES' PROFITS DECLINING?

### 1. Not as bad as it seems

An overcapacity in liner shipping should be reflected in the financial success of carriers. The industry is still generating positive profits, however, and companies continue to find financing for capacity expansions.

#### Box 9

##### HAMBURG SÜD: LOWER FREIGHT-RATES, YET HIGHER PROFITS

Hamburg Süd achieved a small operation profit in 1997, after making a loss in 1996. The turnover rose by 21%, if measured in German Marks. This was fuelled by increased transport volumes and the rising dollar. The rising dollar had a positive impact on profits because revenue is mainly generated in United States currency whereas a large proportion of the costs has to be incurred in German Marks.

Of the total turnover, two-thirds come from liner shipping and the remainder from reefer and tramp shipping. In total, Hamburg Süd carried around 330,000 TEUs in 1997.

The volume increase was mainly due to the growth of Brazilian imports. Total volume is expected to grow by a further 11% in 1998.

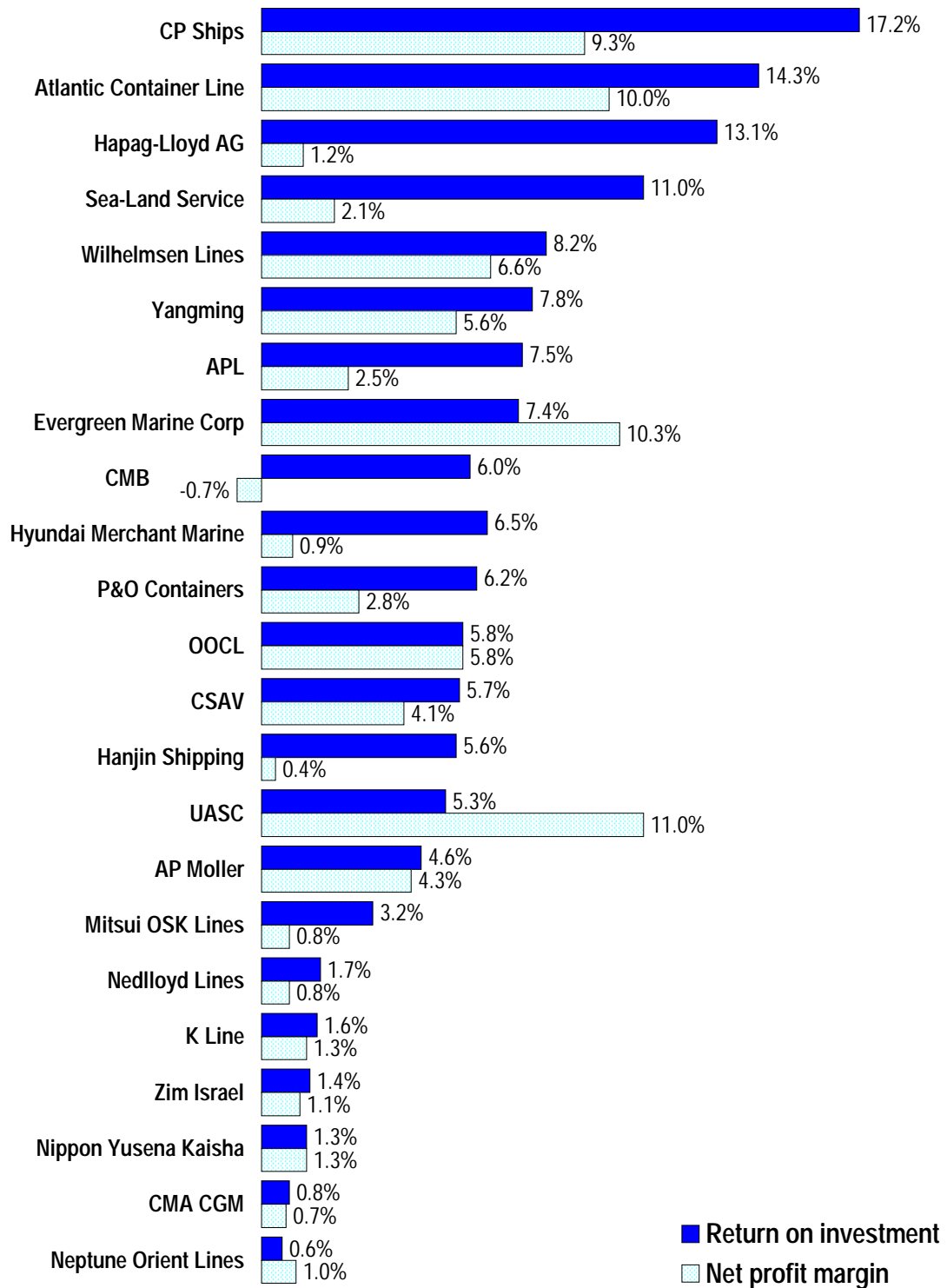
Cost savings could be achieved by replacing German seafarers with foreign crew and by cutting Hamburg back-office jobs by 20% to 400.

Source: *Lloyds List* via <http://pnp.individual.com>, 9 March 1998.

The vigorous demand for liner shipping services has led to increasing total operating profits. Compared to increased turnover and invested capital, however, the average financial results of carriers have not improved. In September 1997, *Containerisation International* published the net profit margins (i.e., net profit divided by total revenue) and return on investment (operating profit divided by total assets) of over 20 major liner shipping companies.

- Of these, 56% reported worse financial results in 1996 than in 1995 versus 44% who reported improved net profit margins and returns on investment.
- The average net profit margin was 3.66%, which is a slight decrease over 1995.
- The average return on investment was 6.21%, which is a slight improvement over 1995.

**Figure 24**  
**Financial results of major carriers, 1996**



Source: *Containerisation International*, September 1997, p. 45.

Of the carriers included in figure 24, three of the five most profitable lines are niche carriers. These are CP Ships, Atlantic Container Line, whose trading areas are largely confined to transatlantic trades, and Wilhelmsen Lines, which focuses on ro-ro and multipurpose shipping.

Unfortunately, the sources used for the analysis of the impact of size on profitability (see chapter II) did not include most of the above mentioned niche operators. Future research should include a wider spectrum of lines; econometric regressions could then incorporate dummy variables for “niche operator”. Such research may find that in order to generate a satisfactory return on investment, a shipping line must be either big or a niche operator.

## **2. The reasons for lower freight-rates**

In real terms, and even in nominal terms, freight-rates have tended to decrease for many years. Some operators claim that this is due to overcapacity. Given the continuously high growth rates of demand for liner shipping services, however, the main reasons for the decreasing freight-rates are different. Apart from short-term fluctuations, the long-term decrease has three main causes:

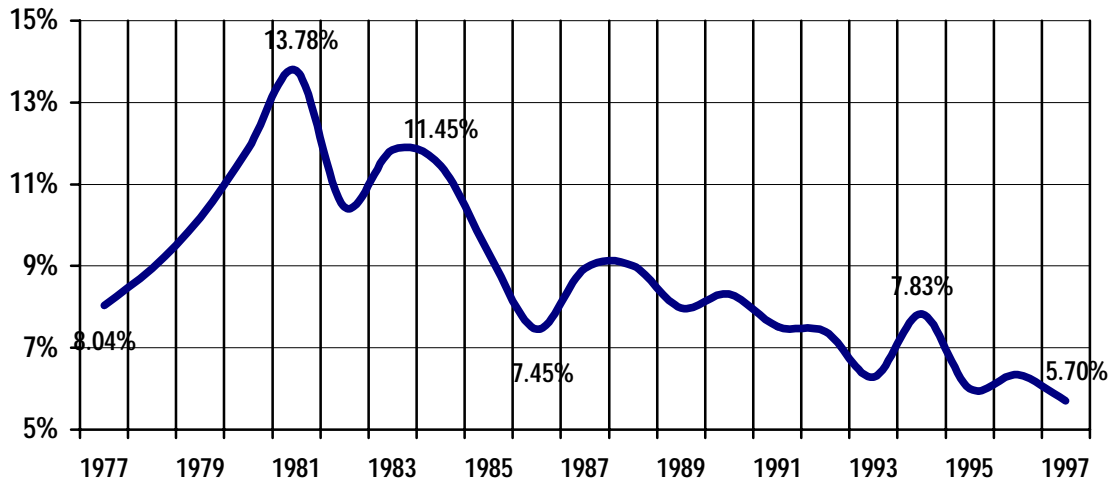
- Technological progress,
- Economies of scale, and
- Competition.

Carriers intend to use the cost reductions which are achieved through technological progress and scale economies to increase their market share. Combined with the forces of the free market, especially the free entry of new suppliers of transport services on most routes, such cost reductions are bound to lead to lower freight-rates.

Other industries commonly associated with the globalization of the economy have experienced far stronger price reductions. The cost of a three-minute telephone call between New York and London has fallen from US\$ 300 (in 1996 dollars) in 1930 to US\$ 1 today. The cost of computer processing has fallen by an average of 30% per year in real terms over the past two decades (*The Economist*, 18 October 1997, p. 79).

Shipping companies' turnover is increasing with the growing demand. Although financial indicators such as the return on investment and the net profit margin are not impressively high, they should not be compared only to the possibly higher rates of previous years. Instead, they need to be compared to the cost of capital, and world interest rates have reached historically low levels. United States government Bonds yielded only 5.7% at the end of 1997 and 6.635% at the end of 1996, which is the lowest level in 25 years (see figure 25).

**Figure 25**  
**United States government Bond yields**



Source: Global Financial Data via <http://www.globalfindata.com/tbusbond.htm>.

A similar tendency can be observed in the price of oil. At the beginning of 1998 it reached the lowest level in two decades. Bunkering is one of the major components of a company's variable costs, which have thus been further reduced by the lower price of oil. In March 1998, oil prices reached just US\$ 13 per barrel and "some predict oil even could drop as low as US\$ 10 a barrel" (*Washington Post*, 20 March 1998).

#### Box 10

##### SEA-LAND: HIGHER VOLUMES AND LOWER COSTS, YET LOWER PROFITS

During the last quarter of 1997, "US container shipping firm Sea-Land failed to overcome the adverse impact of lower rates in all major trade lanes and saw its fourth-quarter operating income plunge to US\$ 75 million, off a sizeable 17% on the year-earlier period's record US\$ 90 million."

"Sea-Land also suffered from a 6% reduction, to US\$ 2,121 from 2,245 in average revenue per container" compared to the fourth quarter of 1996. For the full year of 1997, average per-container revenue was reduced by 8% from US\$ 2,319 to US\$ 2,145.

Comparing 1996 and 1997 results, operating expenses were reduced by 1% and traffic volume grew by 2%. Because of lower rates, however, overall revenue of US\$ 4 billion was 1% lower than the previous year.

Had Sea-Land's owners invested in United States Government Bonds, their income would have been reduced by 14% because yields decreased from 6.635% to 5.7%. Hence, the 17% reduction of operating income is not that bad after all. In any case, the 1996 income of US\$ 90 million was already a record. In 1996 Sea-Land reported a return on investment of 11%, which is far above the 6.6% Sea-Land's investors would have earned had they invested in government bonds.

Source: *Lloyd's List* via <http://pnp.individual.com>, 23 January, 1998.

## C. IS THERE AN OVERCAPACITY IN LINER SHIPPING?

### 1. Different perceptions

In spite of the rather positive analysis presented above, the possibility of an overtonnage in the foreseeable future cannot be excluded. A recent study by London shipbroker Howard Houlder estimates that in 1998, 277 ships totalling more than 500,000 TEUs will be delivered.<sup>30</sup> This is equivalent to about 16% of the existing fleet. Because the average age of the container ship fleet is still comparatively low, these vessels will practically be a net addition to total capacity. This would imply that capacity is expanding at twice the growth rate of expected demand. Liner trade is predicted to continue to increase at high rates, but numerous commentators believe that liner shipping companies are making the same mistake that tanker owners did in the 1970s, when they ordered so many ships that the carrying capacity of the tanker fleet doubled between 1970 and 1975, which then led to a slump in tanker freight-rates.<sup>31</sup>

On the other hand, UNCTAD estimates that the world's unitized fleet, which mainly includes container carrying vessels, is currently the only major group of ships with no surplus capacity. Whereas UNCTAD calculated an overcapacity of 1 to 2% in the period 1989-1995, in 1996 it estimated a zero surplus. In contrast, UNCTAD calculated a surplus of 2.2% for the conventional general cargo fleet, 6.7% for the dry bulk fleet and 10.1% for the tanker fleet (UNCTAD, 1997). Others, too, expect demand to stay ahead of capacity in 1998. P&O Nedlloyd assumes "that the world fleet capacity growth is not likely to outstrip the growth in world trade next year. P&O Nedlloyd now expects an 8% increase in world trade for 1998, compared to a fleet capacity increase of no more than 7%".<sup>32</sup> In the words of the President of Maersk Inc, "With world trade growth the way it is, I honestly think there will be no problem".<sup>33</sup> According to OOCL, the load factor based on dwt in the largest of all routes (the Europe-Asia trade) will actually improve over the next few years. It was 86% in 1996 for both east bound and west bound trade, and it is expected to grow to 89% for east bound trade and 92% for west bound trade.

A recent comprehensive study by Mercer Management Consulting on behalf of the European Commission's transport directorate (DG VII) concluded that the supply-and-demand dynamic operates healthily. Apart from temporary imbalances in individual trades, in the long run the worldwide process of adaptation has operated in such a way that it cannot be regarded as one of the main causes of the carriers' relatively poor returns (*International Transport Journal*, 40/97). The slot capacity on order at world shipyards has in recent months declined from one-third to about one-quarter of the existing capac-

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<sup>30</sup> *Shipping Times* via <http://www.asia1.com.sg/shippingtimes>, 26 January 1998.

<sup>31</sup> DRI/McGraw-Hill and Mercer Management Consulting *World Sea Trade Service Review*, Third Quarter 1996, p.III1.

<sup>32</sup> Michael Seymour, P&O Nedlloyd Director of Far East, Asia and Middle East Trades, as quoted in *Fairplay* via <http://www.fairplay-publications.co.uk>, 27 November 1997.

<sup>33</sup> Tommy Thomson, President of Maersk, Inc., quoted in *Shipping Times* via <http://web3.asia1.com.sg/timesnet>, 14 November 1996.

ity, which also indicates that the market is responding rationally to the previously feared oversupply (Rogliano Salles, 1998, p. 21).

The worldwide available space for transporting containers will always be less than 100% filled. This is due to trade imbalances, short term fluctuations on different routes and the carriers' need to respond flexibly to demand shifts. Yet, at present, practically all market players are perceiving a particularly high overcapacity. The main reasons seem to be:

- the weakening of the conferences;
- the fact that services are increasingly homogenous (i.e., under a given route and frequency, customers focus more on price differences than on the "quality" of cargo handling); and
- high fixed costs versus reduced variable costs, which make unused capacity particularly expensive.
- Finally, the creation of more and larger vessels so as to achieve economies of scale obviously results in a real capacity increase.

## **2. Weaker rate-setting mechanisms**

The weakening or demise of many conferences, discussion agreements and other rate-setting mechanisms does not create additional capacity or overcapacity because it does not create new space in the face of unchanged demand. It only makes previously disguised overcapacity visible and increases competition. The difficulty controlling the supply of shipping services has also reduced the possibilities of establishing common rates. From a carrier's perspective, it thus "creates" overcapacity because it becomes more difficult to sell existing space for the same price. Its effect on freight-rates has been significant.

For example, *Traffic World* reports that "the cost of shipping cargo between Central America and the New Orleans region has plummeted as much as 30 percent since [the] demise of the rate-setting consortium that controlled the bulk of trade between Central America, the Gulf Coast and South Florida".<sup>34</sup>

From the liners' perspective, strong competition might be considered unsophisticated pricing. For example, at the end of 1997, in the Europe-Asia trades ships were running at full capacity and still incurring losses, whereas in the transatlantic trades, ship utilization rates were averaging around 80% and the participating lines still managed to generate a profit.<sup>35</sup> Both, the spare capacity and the generated profit, are probably the result of better pricing coordination among lines on the transatlantic route. This rate setting

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<sup>34</sup> *Traffic World* via <http://pnp.individual.com>, 5 November 1996.

<sup>35</sup> Jim Poon, Chairman of OOCL (Europe), quoted in *Lloyd's List* via <http://pnp.individual.com>, 7 November 1997. The article also states that "In the past, price-restoration initiatives by the FEFC (Far East Freight Conference) have been undermined by independent rate-cutting, whereas the Trans-Atlantic Conference Agreement has been able to instill much greater pricing discipline among members."

is going to become more difficult, however, since the New World Alliance has begun offering its own new service on this trade.

### **3. Competition on price, not on quality**

While rate-setting mechanisms become weaker, shippers and, above all, freight forwarders become stronger. Liner operators compete increasingly for this clientele by focusing on cost savings and price reductions rather than product differentiation. By just focusing on price, it is even easier for shippers to benefit from the competition because it is easier to compare different offers. All carriers use the same technology (i.e., containers) and are ever less involved in the actual handling and storage of cargo.

The containerization of cargo has reduced the possibility for carriers to compete on quality. Often, it is no longer the shipping company but rather the exporter or forwarder that handles the actual cargo. In the United States and Great Britain, for example, one-third of all cargo is handled by trade forwarders; in Germany it is more than three-quarters. Even if the carrier does fill the container, the actual ocean transport of containers has become a homogeneous service. There is now more competition to sell just the transport of containers, whereas in carriers used to compete on the quality and reliability of cargo handling as well. Carriers are thus confronted with more competing capacity than in the past, when they still had some kind of “monopoly” on their particular service.

Although this trend is not new, it intensifies competition and the perception of overcapacity. It is easier for lines to enter new markets, using gearless vessels and without experience transporting a particular type of cargo, because in most ports the same containers are handled by the same type of ship and gantry crane.

### **4. Marginal pricing**

Higher fixed costs and relatively lower variable costs lead to an increasing opportunity cost of not using existing capacity. Independent of the question whether or not overcapacity has actually increased, it now hurts more not to use available container slots.

For example, the latest Maersk vessels with a capacity of 6,000+ TEUs imply an initial investment of almost US\$ 100 million, yet they only carry a crew of fifteen. This is equivalent to US\$ 1.7 million per seafarer. A 1,000 dwt general cargo vessel in contrast, may represent a capital expenditure of just US\$ 200,000.- per seafarer. Other examples of high fixed costs include the necessary investment in information and communication technologies, as well as expenditures to comply with international regulations related to maritime safety and environmental protection, such as the International Safety Management (ISM) code and the revised STCW convention.

It is often stated that provided that large vessels are full, they facilitate scale economies. It is also true, however, that if they are not full, the opportunity costs are particularly high and consequently intensify the subjective impression of overcapacity.

### **5. Capacity expansion to achieve economies of scale**

The genuine creation of additional capacity by many shipping lines is happening because these lines anticipate continued growth and because in response to lower freight-rates they are attempting to reduce costs by achieving economies of scale. Thus, the choice of

many individual companies to expand their own capacity by adding container slots or by using existing slots more efficiently contributes to a vicious cycle (from the liner's perspective) in which increasing capacity leads to lower freight-rates which leads to increasing capacity in order to reduce unit costs in response to the lower freight-rates.

Expanding capacity is a long-term decision which anticipates an increase in demand. It is thus only logical that at the beginning some overcapacity is created, which will diminish as demand increases over time.

Whether all of the above will actually lead to an overall excess supply of transport capacity is uncertain. In recent months, the container slots on order have declined from around one-third of existing slots to about one-quarter. It is almost certain, however, that the newer, larger vessels will replace older, smaller vessels, which will then have to find employment in regional and feeder routes. Carriers in these trades will be the most affected.

## **D. WILL FREIGHT-RATES FLUCTUATE MORE?**

### **1. New supply function**

In the long term, shipping companies will only survive if their freight-rates cover their total average unit costs. In the short term, however, they may choose to supply shipping services even if their average unit costs are not covered by the freight-rate, as long as the short-term marginal costs are covered.

As the increasing ratio of fixed costs to variable costs leads to lower marginal costs, a new supply function will emerge. In the case of oversupply of transport capacity, lines will be encouraged to reduce their freight-rates further so as to earn at least some income, as long as the marginal costs are covered. This behaviour is called marginal pricing. Once the oversupply is reduced, companies will have to increase their freight-rates above the long-term equilibrium level to recover previous losses.

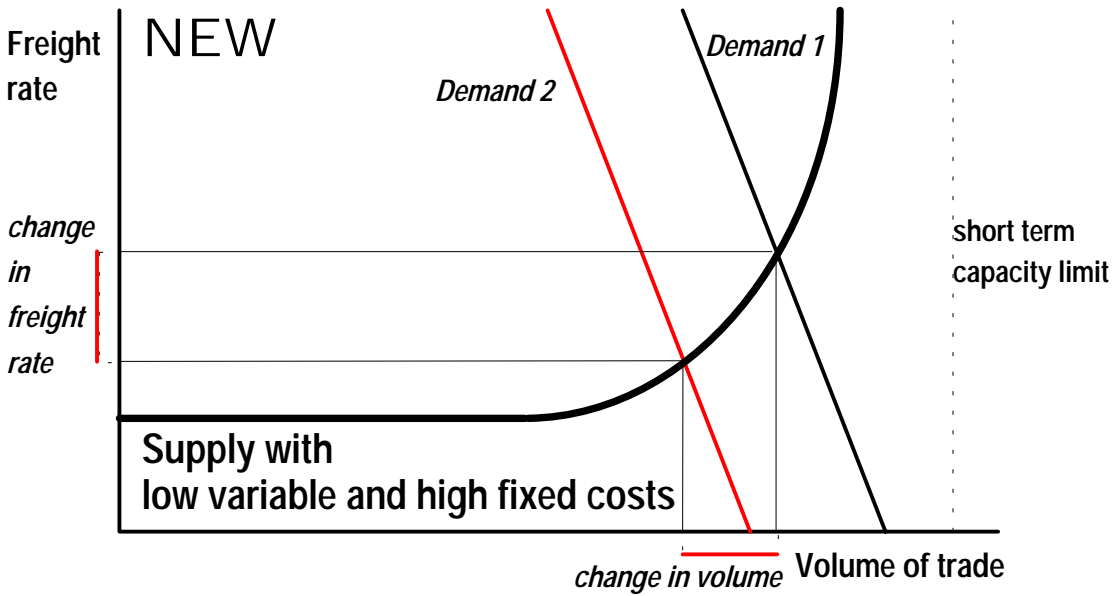
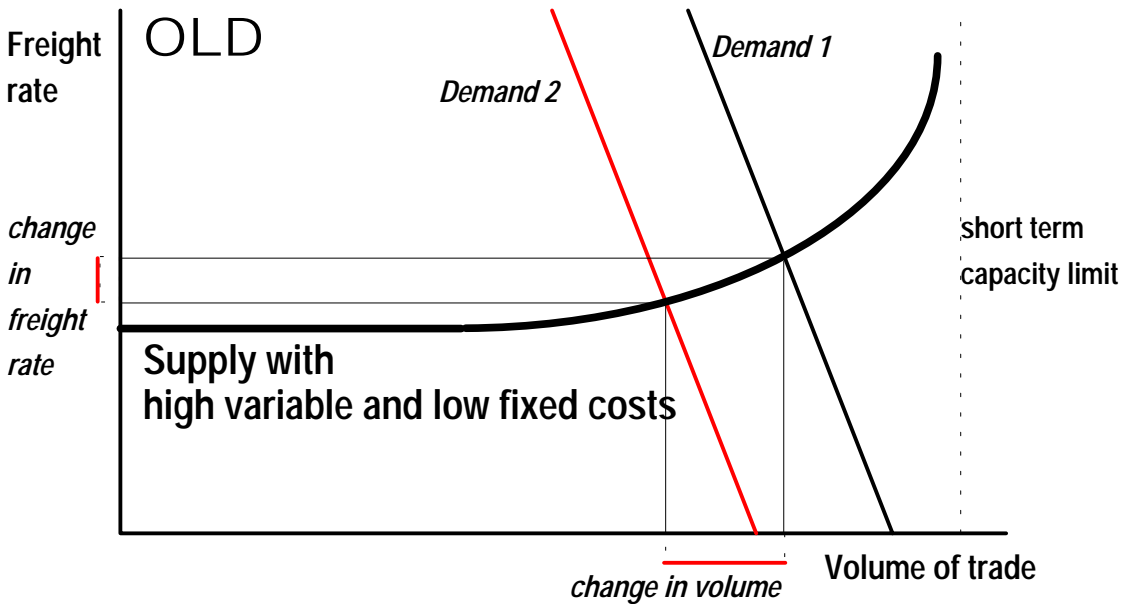
### **2. Stronger responses to demand shifts**

The graphs in figure 26 demonstrate that the same demand shift – say, after a financial crisis in Asia – leads to different responses by the shipping industry depending on its supply function.

Lower marginal costs and increased fixed costs lead to the supply function which is presented in the chart labeled New. A shift of the demand curve in this scenario leads to a higher fluctuation of the freight-rate and a less intense response of overall equilibrium volume between demand and supply than does a similar shift of the demand curve in the old scenario, in which fixed costs were lower and variable costs higher.



Figure 26  
Freight-rate changes with short-term supply function



Source: ECLAC.

## **E. WILL ALLIANCES LAST?**

### **1. Symmetry and asymmetry of interests**

Technological advances in transport, telecommunications and computers have made it easier for liner operators to integrate functions, but they still do not wish to eliminate their individual corporate identities. They will keep their individual administrative and marketing functions separate, but they will merge activities such as transactions with insurers and associated legal services, the management, utilization and repair of vessels and containers, contracting with inland transport and ocean feeder services and investment in and operation of port terminals.

Alliance members maintain their corporate identities to ensure that their relationship is reversible, if necessary. This desire to keep an Alliance relationship reversible contrasts with the objective that the relationship be of long duration and provide associates with the opportunity not only to utilize each other's assets but also to formulate joint commercial goals. Alliance partners often find, however, that the initiation of liner services by shipping companies spread around the world, with different languages, corporate cultures, commercial strategies and long-term plans, is far more difficult than previously imagined. Without genuine cooperation and teamwork among members, internal conflicts could shift the focus from serving cargo owners, providing greater asset utilization and improving cost control to the resolution of disagreements.

The compatibility of interests among alliance members need not be complete. The experiences of industrial alliances outside the ocean transport suggests that the most successful liner-shipping alliances should be those in which partners have counteracting or offsetting – not similar or equivalent – routes, capabilities, vessels and equipment.<sup>36</sup> A significant overlap in those factors can easily eliminate the basis for teamwork and create competing goals among members, with each trying to dominate. For example, before its merger with P&O, Nedlloyd Lines was the world's largest north-south liner operator and a member of the Global Alliance, while other alliance participants were major east-west carriers.

Everything in an alliance is magnified, whether maximizing potential cost savings by effectively integrating operational networks, obtaining large volumes of cargoes to fill scale-economy vessels, consolidating port terminals, responding to shippers' consultation and notice needs or in harmonizing corporate cultures. Sea-Land Services, for instance, found it a very complex process to increase the number of twenty-foot containers needed each week from 1,400 to 5,000 in order to fill vessels dedicated to four different Europe-Asia services (*The Journal of Commerce*, 23 May 1996, p. 3B).

### **2. Mergers supersede alliances**

Numerous complications can arise in an alliance despite the symmetry and asymmetry of services among members. In October 1995, for instance, APL, a member of the Global Alliance, reduced rates on disassembled automobiles, automobile parts and electrical

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<sup>36</sup> Mark Kadar, "The future of global strategic alliances", *Containerisation International*, April 1996, pp. 81 and 83-85.

goods moving from Japan to the United States in 40-foot containers, thereby reducing the spread between conference and independent rates from US\$ 500 to nearly US\$ 100. MOL, a member of the same alliance, considered these rates so low as to be unremunerative. In July 1996, APL lowered its rate on the movement of wastepaper to Asia and the Far East, which accounts for 25% of total westbound traffic, by an average of US\$ 10 per ton, but later modified this to US\$ 2 in response to pressures from other carriers.<sup>37</sup>

The fact that Nedlloyd was a member of the Global Alliance and P&O a member of the Grand Alliance raised many questions when these two companies decided to merge. Their merger was followed by NOL's take-over of APL, which also belonged to different alliances.

Uncertainty over the membership of specific alliances has frustrated efforts to integrate inland transport services. Carriers are reluctant to start reorganizing road, rail, barge and other land services with lines whose alliance commitments are unclear. As a result, the area with the most potential for further efficiencies has not yet been exploited. Inland costs account for around 40% to 75% of most shipping lines' costs.<sup>38</sup>

These conditions create a vicious cycle. Alliances are not stable and participants are therefore hesitant to make long-term commitments. The lack of long-term commitments precludes alliances from realizing the full potential of synergies and cost savings. This weakens their stability and promotes mergers to achieve the desired stability.

## **F. WILL MAJOR CARRIERS CONTINUE TO EXPAND INTO NORTH-SOUTH MARKETS?**

### **1. The need to fill large ships**

It is unlikely that post-Panamax ships will call on South American, African or Australian ports in the near future, but their effect could still be felt in these regions' ports and shipping companies.

To fully utilize their new post-Panamax ships, large carriers will have to generate extra traffic by adding feeder routes from areas outside the core Europe-North America-Far East cargo areas. This will become increasingly commonplace to ships in the east-west trades, and many of the new large ships are fitted with a considerable number of outlets for the carriage of refrigerated cargo (Drewry Shipping Consultants, 1996b, p. 76). The encroachment of larger liner shipping companies into regional markets has to be seen as a complement to worldwide services. To illustrate this connection, figures 27 and 28 show one east-west service and one north-south Service each for two major carriers.

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<sup>37</sup> *The Journal of Commerce*, 21 October 1996, p. 3B; *Containerisation International*, September 1996, p. 25.

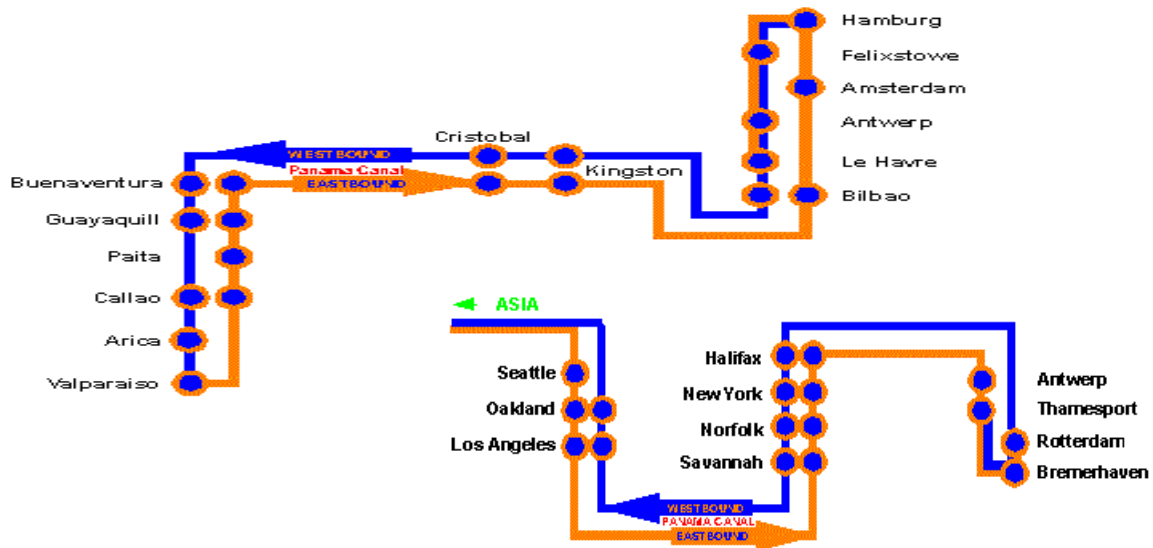
<sup>38</sup> *Lloyd's List* via <http://pnp.individual.com>, 2 December 1997; and Ray Miles, CP Ships, in *American Shipper*, February 1997.

Figure 27  
An example of Maersk's north-south and east-west services



Source: Maersk via <http://www.maerskline.com>.

Figure 28  
An example of Hapag-Lloyd north-south and east-west services



Source: Hapag-Lloyd via <http://www.hlcl.de>.

Note: Hapag-Lloyd recently added a call in Panama to its east-west route, which thus links the two services.

## 2. The cascade effect

Due to the reluctance of liner shipping companies to scrap smaller vessels, the replacement of ships with a capacity of 1,000 to 4,000 TEUs by those of 5,000 and 6,000+ TEUs

in major east-west trades leads to a cascade effect, involving the utilization of larger ships in secondary trades.

The ships that are being phased out of the east-west trades are larger than most ships presently employed in the north-south routes. Most of them do not have their own gear, which puts pressure on ports in the Southern Hemisphere to provide container gantry cranes.

Large carriers clearly have a high incentive to expand into regional markets. Traditional intraregional traffic as well as north-south traffic is increasingly linked to the major east-west routes. What was once part of a complete north-south journey is thus being converted into a feeder for the major carrier.

### 3. Regional developments

#### (a) Africa

Table 8 lists the world's "top 20" container lines which were active in the African north-south market. These grew from seven in 1980 to 11 in 1994.

**Table 8**  
**The encroachment of mega-carriers into African north-south container trades**

1980	1985	1990	1994
K-Line	Cosco	APL	Cosco
Maersk	DSR	Cosco	DSR
MSC	Hapag-Lloyd	DSR	Evergreen
Nedlloyd	K-Line	K-Line	K-Line
NYK	Maersk	Maersk	Maersk
OCL	MOL	MOL	MOL
P&O	MSC	MSC	MSC
	Nedlloyd	Nedlloyd	Nedlloyd
	NYK	NYK	NYK
	OCL	P&OCL	P&OCL
		Zim	Zim

Source: Drewry Shipping Consultants, *North South Container Trades*, London, 1995, p. 71.

The following are samples of recent news items detailing the activities of major carriers in Africa.

9-10-97: Maersk targets West/Central Africa growth. The Danish shipping giant has begun a weekly service to the Ivory Coast's second port of San Pedro as part of plans to expand its presence in West Africa.<sup>39</sup>

14-11-97: P&O Nedlloyd and Mitsui OSK have announced a significant upgrading of their liner service between East Africa, the Indian Ocean Islands and South East Asia.<sup>40</sup>

<sup>39</sup> Reuters, infoseek via internet, 9 October 1997.

(b) *Oceania*

Table 9 lists the world's "top 20" container lines which were active in the Australasian north-south market. These grew from ten in 1980 to 15 in 1994.

**Table 9**  
**The encroachment of mega-carriers into Australasian north-south container trades**

1980	1985	1990	1994
Cosco	APL	APL	APL
K-Line	Cosco	Cosco	Cosco
Hapag-Lloyd	Hyundai	Hapag-Lloyd	Hanjin
MOL	Hapag-Lloyd	K-Line	Hapag-Lloyd
Nedlloyd	K-Line	MOL	K-Line
NOL	MOL	MSC	Maersk
NYK	Nedlloyd	Nedlloyd	MOL
OCL	NOL	NOL	MSC
OOCL	NYK	NYK	Nedlloyd
ZIM	OCL	OOCL	NOL
	OOCL	P&OCL	NYK
	Yangming	Sea-Land	OOCL
	Zim	Yangming	P&OCL
		Zim	Yangming
			Zim

Source: Drewry Shipping Consultants, *North South Container Trades*, London, 1995, p. 76.

The following are samples of recent news items detailing the activities of major carriers in Oceania.

10-01-97: An increasing number of carriers have begun to use Singapore as a hub port for Australia and New Zealand because the size of main-line vessels is greater than the volumes of cargo on offer and the cost of direct services are more than those of a trans-shipment operation (*International Transport Journal*, 2/98, p. 33).

04-03-97: Sea freight costs between Australia and New Zealand are 20% lower following the liberalization of the shipping route.<sup>41</sup>

01-01-98: Europe-Australasia direct carriers are being "tormented" by a mass of relay services using an almost inexhaustible supply of spare slots. But while shippers prefer going direct, the relay route dictates the market rate (*Containerisation International*, January 1998, p. 45).

01-02-98: P&O Nedlloyd with express service to Auckland. With its Europe-Far East services to Singapore and South-East Asia services from Singapore to Auckland, the shipping line now offers its customers weekly fixed-day departures. Accord-

<sup>40</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 14 November 1997.

<sup>41</sup> Associated Press via <http://pnp.individual.com>, 4 March 1997.

ing to P&O Nedlloyd, this is the fastest weekly service in this trade (*International Transport Journal*, 12/98, p. 41).

01-04-98: The trans-Tasman trade is becoming merely an intermediate leg for the deep-sea carriers crossing between Australia and New Zealand. As a trade in its own right, it will soon be extinct. Average revenue per TEU has been reduced by 65% in eight years (*Containerisation International*, April 1998, p. 65).

**(c) South America**

Table 10 lists the world's "top 20" container lines which were active in the South American north-south market. These grew from none in 1980 to 12 in 1994.

**Table 10**  
The encroachment of mega-carriers into South American north-south container trades

1980	1985	1990	1994
-	Hapag-Lloyd K-Line MOL Nedlloyd NYK Zim	Cosco DSR Hapag-Lloyd K-Line MOL MSC Nedlloyd NYK Zim	Cosco DSR Evergreen Hapag-Lloyd K-Line Maersk MOL MSC Nedlloyd NYK Sea-Land Zim

Source: Drewry Shipping Consultants, *North South Container Trades*, London, 1995, p. 69.

The following are samples of recent news items detailing the activities of major carriers in South America.

01-07-97: Vessels of over 2000 TEUs are being introduced into South American trades. This could have very great bearing on compact ships of 1,500 to 1,700 TEUs which until now have dominated this market (*Containerisation International*, July 1997, p. 18).

04-08-97: Maersk and Sea-Land in South America agreement. The lines are to work together on services linking the east coast of South America with North America and Europe.<sup>42</sup>

21-08-97: Five major lines are to form a new service partnership on the Europe-South American east coast trade. The lines – Blue Star, Contship, DSR-Senator, Mon-

<sup>42</sup> Fairplay via <http://www.fairplay-publications.co.uk>, 21 August 1997.

temar and P&O Nedlloyd – have entered a long-term commitment to offer weekly service capacity deploying ships of 2,400 TEUs.<sup>43</sup>

03-09-97: Argentine shippers assess bulk in boxes. Rock bottom liner rates have helped to encourage the development of containerized bulk cargo on the River Plate in Argentina.<sup>44</sup>

15-09-97: APL adds United States-Brazil/Argentina service. APL is entering the fast-growing trade between North and South America with two weekly services.<sup>45</sup>

09-10-97: Lauritzen changes its strategies. Lauritzen designated its new partner OOCL as principal carrier for refrigerated cargo between America and Asia. Refrigerated cargo from South America will pass to the Far East via Los Angeles.<sup>46</sup>

14-10-97: According to Christopher Rankin of P&O Nedlloyd North America, there were 8,200 TEUs per week of cargo from the East Coast of the United States to the South American east coast. With an additional 10% to include cargoes for other destinations on the same route, there are around 9,000s TEU to be moved per week. Assuming a utilization rate of 90%, the approximate figure of 10,000 TEUs per week is obtained. This is roughly sufficient cargo for three to four alliances or consortia using vessels with a capacity of 2,500-3,000 TEUs. Assuming three members per group, this gives sufficient cargo for around nine to 12 carriers. At present there are 30.<sup>47</sup>

01-01-98: P&O Nedlloyd has created a new seasonal service to move containerized coffee from the ports of Acajutla and Corinto on the west coast of Central America to Cartagena in Colombia. The service, called expresso service, relays the containers to the New Caribbean Service for final carriage to Europe (*Containerisation International*, January 1998, p. 19).

01-01-98: Evergreen Caribbean feeds “mushroom”. Since the opening of its Colon Container Hub in Panama in late 1997, Evergreen has enlarged its intra-Caribbean feeder system to lock the new terminal in its deep-sea and local line systems. It now has three weekly loops, each with two ships of between 510 and 846 TEUs (*Containerisation International*, January 1998, p. 10).

25-02-98: Lines add box ships in east South America trade. Crowley American Transport will add larger, faster vessels to its existing seven-ship rotation (*The Journal of Commerce*, 26 February 1998, p. 12A).

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<sup>43</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 21 August 1997.

<sup>44</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 3 September 1997.

<sup>45</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 25 September 1997.

<sup>46</sup> Comtex via <http://pnp.individual.com>, 9 October 1997.

<sup>47</sup> Seminar of the Maritime League, Chile. 14 October 1997.



14-04-98: Cosco set to enter north-south trades. Cosco could team up with Brazil's Transroll on its South America services.<sup>48</sup>

22-05-98: APL to set up joint operations firm with Mexico's TMM. It hopes to boost services on Asia-Mexico container trade.<sup>49</sup>

23-04-98: Evergreen launches a Northern Europe –South American east coast Service with a 4,211-TEU vessel scheduled to sail from Rotterdam. Other European ports of call are Hamburg, Thamesport, Zeebrugge and Le Havre. Containers for South America will be trans-shipped at Evergreen's Colon Terminal in Panama to vessels on its new weekly, seven-ship United States East Coast-South American east coast service. Ships on that service will call at Puerto Cabello in Venezuela, Rio de Janeiro, Santos, Rio Grande and San Francisco do Sul in Brazil and Buenos Aires in Argentina. Northbound vessels sail directly from Rio de Janeiro to New York where Northern European cargo will be trans-shipped.<sup>50</sup>

**(d) South Asia**

Table 11 lists the world's "top 20" container lines which were active in the South Asian north-south market. These grew from three in 1980 to 15 in 1994.

**Table 11**  
**The encroachment of mega-carriers into South Asian north-south container trades**

1980	1985	1990	1994
APL P&O Sea-Land	APL CMA DSR Hapag-Lloyd Maersk MOL Nedlloyd NOL OCL Sea-Land	APL CMA COSCO DSR Evergreen K-Line Maersk MOL Nedlloyd NOL OOCL P&OCL Sea-Land Yangming Zim	APL CMA COSCO DSR/Senator Evergreen K-Line Maersk MOL Nedlloyd NOL OOCL P&OCL Sea-Land Yangming Zim

Source: Drewry Shipping Consultants, *North South Container Trades*, London, 1995, p. 73.

The following are samples of recent news items detailing the activities of major carriers in South Asia.

<sup>48</sup> *Shipping Times* via <http://web3.asia1.com.sg/timesnet/data/can/docs/cna3269.html>, February 1998.

<sup>49</sup> *Shipping Times* via <http://web3.asia1.com.sg/timesnet>, 22 May 1997.

<sup>50</sup> *Fairplay* via <http://www.fairplay-publications.co.uk>, 23 April 1998.

29-01-98: APL moves into India. The new service connects at Singapore with APL's line haul services to and from the United States and Asia, and at Colombo with the company's Europe service.<sup>51</sup>

14-04-98: Uniglory feeder to Indian subcontinent. The company has announced its intention to start operating in the Indian subcontinent using feeder services through Singapore, Colombo and the United Arab Emirates.<sup>52</sup>

**(e) Outlook**

Africa is still a comparatively small market for liner shipping companies. In 1997, Maersk added new services to the region, but overall the expansion of major east-west carriers in the African trades seems to have levelled off. Fewer east-west carriers are active in Africa than in any other major north-south trade. The non-existence of container cranes in most ports and the complicated economic and legal situation in many African countries may protect the remaining specialized smaller carriers for some time from further encroachment of the major 20 liner shipping companies. The trans-shipment centres that are competing with direct north-south services are mainly located in the south of Spain and the gulfs of Oman and Aden.

Australia and New Zealand have been served by the major liner shipping companies for many years. Direct services are competing fiercely with indirect services via the world's largest trans-shipment centre, Singapore. This strong competition, long distances to European and North American markets and the long experience with active east-west carriers make Australia and New Zealand an exemplary case for the difficulties traditional north-south carriers are facing. The geographic and economic situation of New Zealand, for example, is comparable to the Chilean position with regard to distances, types of cargo and geographical isolation are concerned.

South America was the last region to be included in the network of global carriers because until the 1980s its governments protected regional liner shipping companies by way of cargo reservation systems and because containerization has only recently been accepted by port labour unions. The region is now one of the fastest growing markets in the world, and the pressure of new entrants is particularly strong. Trans-shipment services in the Caribbean, Panama, and Los Angeles/Long Beach are competing with direct north-south services. Volumes and distances may justify a regional hub on the east coast in the Rio-Santos-Buenos Aires range. From the east coast, there already exists direct regular services to Asia, via South Africa. On the west coast, on the other hand, a major trans-shipment centre does not seem viable in the foreseeable future.

The Indian subcontinent lies directly at the centre of the most important east-west route (i.e., Europe-East Asia), and it is host to a major trans-shipment centre in Colombo in Sri Lanka. East-west carriers are trying to balance the Europe-East Asia trade with Indian cargo to and from these regions. As for containerization, India still lags behind most other regions because of labour objections, which directly benefited Colombo

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<sup>51</sup> *Shipping Times* via <http://web3.asia1.com.sg/timesnet/data/can/docs/cna3180.html>, January 1998.

<sup>52</sup> *Shipping Times* via <http://web3.asia1.com.sg/timesnet/data/can/docs/cna3225.html>, April 1998.

as a trans-shipment centre. If trade liberalization, port privatizations and containerization advance, India should become fully integrated into the global network of the east-west carriers.

## **G. WILL THE PROPORTION OF TRANS-SHIPMENT CONTINUE TO INCREASE?**

### **1. More port traffic, fewer ship miles**

The consolidation process in shipping – larger ships, mergers, more trans-shipment, alliances – has profound effects on port development. These effects are often described in a way that makes the ports appear to be negatively affected by this development. The opposite is true. The use of larger ships and more trans-shipment directly leads to more port container movements and fewer ship miles.

This can be illustrated by a hypothetical numerical example. Table 12 lists the distances between several sample ports. Assuming that there are 1,000 TEUs per week of cargo from each one of the ports of Valparaíso (Chile), Quetzal (Guatemala), Maracaibo (Venezuela) and Panama to each of the destinations Hamburg (Germany), New York (United States), Los Angeles (United States) and Yokohama (Japan), two scenarios are possible.

**Table 12**  
**Distances between sample ports**

	Panama	Hamburg	New York	Los Angeles	Yokohama
Valparaíso	2658	7713	4638	4806	9280
Quetzal	938	5993	2908	2047	6807
Maracaibo	600	4675	1902	3556	8325
Panama	0	5005	1972	2956	7725

Source: ECLAC, based on *Fairplay Ports Guide*.

Without trans-shipment (Alternative I), four times four direct services would be required. That is, individual services would be required between each of the ports of Valparaíso, Quetzal, Maracaibo and Panama, to each of the ports of Hamburg, New York, Los Angeles and Yokohama.

With trans-shipment in Panama (Alternative II), three times four services would carry cargo from Latin American ports to Panama in vessels with a capacity of 1,000+ TEUs. There would then potentially be two services per destination per week in ships of 2000+ TEUs. Alternatively, four weekly services in 1,000+ TEU ships or one weekly service per destination in a 4000+ TEU ship could deliver the cargo the destination ports.

### **2. Winners and losers**

Table 13 summarizes the results of these two alternatives, assuming the use of 2000+ TEU ships for Alternative II.

**Table 13**  
**Comparison of direct services with services using trans-shipment**

	<b>Alternative I: direct services</b>	<b>Alternative II: with trans-shipment</b>	<b>Change, %</b>
Trade movements	16,000	16,000	-
TEU miles	80,308,000	87,416,000	+ 9%
Ship miles	80,308	21,854	- 73%
Port calls	32	56	+ 75%
Port container moves, TEU	32,000	56,000	+ 75%
Services per week per destination	1	2	+ 100%
Services per week per origin	1	4	+ 400%
Vessel size for major part of the journey, TEU	1000 +	2000 +	+ 100%

Source: ECLAC.

Note: TEU: Twenty-foot equivalent unit.

The winners and losers after the introduction of trans-shipment are as follows:

- The trans-shipment port wins. The port generates income with cargo from other countries.
- The exporters and importers near the trans-shipment port win. They have far more options to transport their trade.
- Port operators win. The number of port calls and port container moves increases.
- East-west carriers win. There is a larger demand for large vessels on the east-west routes.
- Shippers in Latin America win. They have more services per week per destination. Increased competition for the service from and to Panama may even lead to lower freight-rates. The use of larger ships for the major part of the journey is likely to offset the additional costs of trans-shipment.
- North-South carriers lose. Demand for ship miles falls considerably, and a large percentage of the total will go to east-west carriers.

The trend toward more trans-shipment can be expected to continue, because the difference between the unit costs per TEU of the largest ships compared to the costs per TEU of smaller ships has increased. Therefore, it is increasingly worthwhile to trans-ship from smaller ships onto these larger vessels.

In addition, a virtuous cycle develops in which more trans-shipment leads to more routing options, which in turn lead to more trans-shipment. Once a trans-shipment service is established, additional shippers will use that option. The process of concentra-

tion in shipping leads to relatively stronger east-west carriers who have a strong incentive to fill their main-haul east-west ships by trans-shipping cargo from the north-south trades.

## H. WHICH PORTS WILL BECOME TRANS-SHIPMENT CENTRES?

### 1. Requirements for a trans-shipment centre

For a port to be selected as a hub, it should have a strategic location vis-à-vis multiple trade routes and desired markets, charge market determined dues and tariffs; be surrounded by a dynamic local economy which provides a balanced cargo baseload (except in the case of off-shore mega hubs), offer modern infrastructures encompassing berths of 900-1,100 or more feet, at least three or four gantry cranes, 40-50 acres per berth of container storage space and on-dock or contiguous railway connections; have 14-15m of water depth; require minimal transit time from sea to dock, be served by competitive ocean feeder and inland transport services, and be known for harmonious labour relations and productive workers.

Many container ships of 4,000 TEUs have a laden draft of 12.8 metres. For every 30 centimetres of draft that is lost to such vessels, 91 containers cannot be carried (*Lloyd's List*, 14 June 1996, p. 3). The existing depth at the Port of Hamburg (Germany) limits the capacity of the new Maersk 6,000+ TEU vessels by one-third, and a decision has been made to dredge the entrance to the port on the River Elbe to 15 meters. Maersk has also indicated that it will invest heavily in Brazilian ports so that its larger vessels can make direct calls (*International Transport Journal*, 48/96, p. 73).

International terminal operators could contribute to the selection of a port as a hub because such operators can attract business through their customers at other ports and handle the container traffic for carriers at both ends of a trade route.

The outreach of many gantry cranes is seventeen rows of containers, which sets an informal limit on post-Panamax capacity. This informal limit has now been surpassed. For example, COSCO has ordered cranes capable of covering 20 rows to be installed at the Port of Long Beach. Bremer Lagerhaus-Gesellschaft (BLG) at the Port of Bremerhaven (Germany) has ordered three cranes capable of serving ships with up to 18 rows of containers. The Port of Freeport (Grand Bahama) is developing a container terminal with four cranes with a similar outreach.<sup>53</sup> Considering future size increases, inquiries are now based on 20-row (10,000-TEU) or 22-row (15,000-TEU) ships (*Containerisation International*, April 1998, p. 41).

The cost of purchasing multiple container cranes with an extended outreach of 18 to 20 or even 22 containers, dredging entrance channels and harbours, establishing efficient intermodal links, constructing extra docks to avoid vessel delays, training a skilled workforce and offering other auxiliary services should limit the number of contenders for hub port status.

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<sup>53</sup> *International Transport Journal*, 49/1996, p. 37; and *The Journal of Commerce*, 6 November 1996.

## 2. Trans-shipment without local cargo

Traditionally, ports chosen as a trans-shipment centre also had high volumes of local cargo. Increasingly, cargoes are being trans-shipped at ports with little or no local cargo. In the case of Panama, for example, after successful privatizations, several ports are now vying for trans-shipment cargo. In Jamaica, as early as 1987, Zim Israel took the decision to use Kingston as a trans-shipment port. “Based on operations research techniques,” it was concluded that “a hub, located at an intermediate point along a pendulum-type route, would be twice as efficient as a port at either end. ... Zim’s Caribbean feeders were effectively serving two trades, one to the United States East Coast/Mediterranean and another to California and the Far East. A ship turning back from the Caribbean could only offer one of these, so Zim’s feeders could either go twice the distance or be twice the size, enjoying lower unit costs”.<sup>54</sup>

### Box 11 THE "FALMOUTH ARGUMENT"

The idea of calling intensively, with large deep-sea vessels, at a port for which a line has no local cargo is still relatively new. Carriers still remember that about 15 years ago the idea of building a European super-hub port at Falmouth, in England’s rural West County, was firmly squashed.

At that time, the hopeful developers were told that although container ships called directly at fewer ports than did conventional ships, they would always call at ports with greater volumes of local cargo. This minimized the amount of cargo which then had to be moved to smaller ports.

“The cost of distributing 100% of a ship’s European cargo from Falmouth, however much main-haul ship time it saved, would always be greater than for a load centre like Rotterdam, where only a portion of its cargo would need to be onward cross-subsidised”.

According to *Lloyd’s List*, new hubs such as Malta or Freeport “refute the ‘Falmouth argument’ by relaying nearly 100% of its cargo.” However, this comparison is only partly correct. Whereas Falmouth lies at the end of a major trade lane and near larger competing ports with the same hinterland, Malta and Freeport are located at the crossroads of several trade lanes.

Source: *Lloyd’s List* via <http://pnp.individual.com>, 18 April 1997.

Panama and Jamaica have limited local cargo. Some of the new trans-shipment centres have practically no local cargo at all. Examples include Freeport (Bahamas), Algeciras (Spain), Marsaxlokk (Malta), and Gioia Tauro (Italy). The Freeport trans-shipment centre was a necessary condition for a new Maersk-Sea-Land service from South Florida to Colombia and Venezuela.

This new trend toward trans-shipment centres without local cargo has created expectations in many ports to generate additional business by attracting the cargo of other

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<sup>54</sup> *Lloyd’s List* via <http://pnp.individual.com>, 18 April 1997.

ports. However, before taking far-reaching investment decisions, the following points need to be taken into account:

- Competition for trans-shipment cargo is fierce, and no port is able to charge the same tariffs for trans-shipped cargo as it may for local containers. The trans-shipment business is much more volatile than the handling of local cargo which at least partly comes from a captive hinterland. Carriers may switch their trans-shipment port without warning, which makes it crucial for the port to achieve maximum productivity at the lowest costs.
- To justify the trans-shipment of a container, the trans-shipment port needs to lie at the crossroads of at least two trade routes. Alternatively, a trans-shipment port can handle feeder services for a trade route which passes through the region. The latter is the case in the Mediterranean ports of Gioia Tauro and Malta.
- Many of the recently established trans-shipment centres that lack local cargoes are located near other ports, which do count on local cargo but have had difficulties expanding their own capacity. These include Miami and various Mediterranean ports.
- Finally, many of the trans-shipment centres that lack local cargoes have some specific advantages or characteristics which cannot be transferred to other places. For example, the United States Jones Act limits coastal shipping within the United States to ships constructed in the United States, owned by United States citizens, and manned by United States crews. By trans-shipping in the Bahamas, a shipping line can avoid these restrictions. Panama counts on synergies with its Canal. Trans-shipment ports in Aruba, Sri Lanka, Hong Kong and Singapore benefited from inefficiencies in ports in neighbouring countries.

### **3. Trans-shipment in developing regions**

Although cargo volumes are smaller and trans-shipment will not imply the use of the post-Panamax vessels, containers are increasingly being trans-shipped in practically every region of the world.

In Western Africa, for example, the World Bank is currently studying the ports of Lagos (Nigeria) and Abidjan (Ivory Coast) to determine which has the greatest likelihood of being chosen as a ship and cargo processing centre for West and Central Africa.

In Latin America and the Caribbean, the opinions vary concerning a possible future scenario<sup>55</sup>. A mega-hub for the entire Western Hemisphere may develop on the West Coast of the United States in Long Beach/Los Angeles, or possibly also in Manzanillo (Mexico). On the East Coast, a possible candidate is Freeport (Bahamas), which is oper-

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<sup>55</sup> *Fairplay*, 18 September 1997, p. 13. Also *Port Development International*, July/ August 1997 trans-shipment supplement, p.T5; ECLAC, *Fal Bulletin*, Nr. 142, April 1998; also Alan Harding, speaking at the conference Latin Ports in Miami, December 1997.

ated by Hutchison Port Holdings. A likely regional hub for the Latin American west coast could be Panama. On the east coast, Santos is a likely candidate, and Sepetiba might also be a strong contender if Santos' productivity and labour relations do not improve. Obviously, different lines will not necessarily always trans-ship at the same ports.

## I. WHAT ARE THE OPTIONS FOR SMALL LINER OPERATORS?

Every carrier's is different, and it is therefore impossible to make general recommendations of how to respond to the process of concentration in shipping. Nevertheless, small liner operators, such as north-south lines and carriers that specialize in a route or product niche, have five basic options, which are not necessarily exclusive.

(1) Small liner operators can join larger alliances and cooperate with major east-west carriers. For example, Lauritzen and OOCL are cooperating in the Reefer trades between the South American west coast and Asia. The containerized cargo is being trans-shipped in Los Angeles. A different form of cooperation has been chosen by APL and Crowley, who share a joint Houston Service and a weekly feeder service in the Caribbean.

(2) Smaller carriers may also form regional alliances. This can be done either to better compete with major carriers or to cooperate jointly with them. The latter was suggested by a representative of Tropical Shipping during a recent conference in the Caribbean: "Regional alliances can work together with international alliances to provide a global services infrastructure unlike any in existence today."<sup>56</sup> In a separate matter, five smaller lines recently sought to reduce costs by forming a joint agency to coordinate North American sales.<sup>57</sup> In Africa, four independent lines have entered a vessel sharing agreement to better compete with Maersk.

(3) Carriers are increasingly trying to merge and grow so as to achieve scale economies similar to those of as the major east-west lines. This strategy was pursued by CSAV of Chile when it unsuccessfully sought to purchase Alianca of Brazil in 1997. A similar strategy is being pursued by Global Carriers, a Malaysian company, whose chairman says, "we want to grow big and we want to operate globally" (*Containerisation International*, October 1997, p. 47). SCL, too, "is convinced that for a shipping line to be profitable, it is essential for it to have a certain size" (*International Transport Journal*, 44/97, p. 38). The same applies to Grupo Libra, which is "impatient to expand".<sup>58</sup>

(4) If the price is right, no owner will exclude the possibility of selling the shipping company. A potential buyer who can generate a larger profit with the purchased company than was possible before the sale should also be willing to pay a price that

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<sup>56</sup> Richard Spohn, "Worldwide Alliances – Impact on the Caribbean", 27<sup>th</sup> Annual General Meeting of the Caribbean Shipping Association, October 1997.

<sup>57</sup> The lines are Italia, d'Amico, Amazon Line, DiGregorio Line and Kent Line. See *The Journal of Commerce*, 5 march 1998.

<sup>58</sup> *Lloyd's List* via <http://pnp.individual.com>, 14 November 1997.



makes the sale worthwhile for the present owner(s) of the company. An example is the recent sale of Ivaran Lines to CP Ships.

(5) Finally, smaller carriers often provide niche services. A niche can be a particular route or type of product. The main characteristic of a niche is that only a limited number of operators can provide the service, which reduces the intensity of competition and usually allows higher margins. Niches are much more volatile markets than the main-haul east-west and north-south markets. They therefore often require small, flexible players. With increasing containerization, however, and with ports investing in container cranes even in developing countries, it is becoming more difficult to separate niches from standard north-south feeder services.

## **J. WILL IMPORTERS, EXPORTERS, AND CONSUMERS BENEFIT?**

Less expensive, more frequent transport directly benefits trade. The question is whether the process of concentration in ports and shipping leads to an improvement of available shipping services.

Importers and exporters may initially suspect that concentration in ports and shipping implies less choice and possibly the abuse of monopoly power. Even taking into account the advantages of productivity improvements and scale economies, these may be outweighed by the disadvantages of oligopolistic market structures.

Market structures in the majority of the shipping routes have become less oligopolistic in recent years. The weakening of the conferences, expansion of Asian carriers into European and North American markets, and the increased presence of east-west liner shipping companies on north-south routes have led to increased competition on individual routes even though worldwide the number of shipping service providers has decreased. With regard to ports, some international port operators are gaining market share, yet, in individual countries their presence has increased the number of choices for shippers.

In addition to increased competition, shippers benefit from the additional choices and increased frequencies that result from trans-shipment. The additional port costs of trans-shipment are often outweighed by the advantages of more connecting services and the use of larger ships for the longer part of the journey. Finally, the measurable cost reductions from scale economies will in the long run lead to lower freight-rates. The cost reductions that can be achieved by using post-Panamax ships, reducing staff and realising scale economies in ports will directly benefit importers and exporters.

Shippers thus benefit from (1) increased competition, (2) more choices thanks to trans-shipment options and (3) lower freight-rates due to productivity increases and scale economies. Shipper organizations, such as the European Shippers Councils (ESC), seem to have gained strength relative to the traditional liner shipping conferences. Importers, exporters, and consumers benefit even more from recent trends in liner shipping than the shipping companies themselves.

## **K. WHAT ARE THE IMPLICATIONS FOR A MARITIME POLICY?**

The three major goals of a maritime policy are (1) the creation of employment in the maritime industries, (2) the promotion of trade and (3) the protection of the environment. How a government or a regional organization should respond to the process of concentration in shipping depends on its priorities with respect to these three goals.

(1) The creation of employment in the maritime industries. A government or regional organization needs to identify the country or region's competitive advantages. A country with low wage levels, a large labour force, possibly high unemployment and good basic education has good chances for exporting the services of its seafarers. A port in a country that lies at the crossroads of several trade routes might become a trans-shipment centre. Countries that already have large open registries, liner shipping companies or shipyards may try to help their companies maintain and expand their market share. In general, it is increasingly difficult and unlikely for a single country to play a major role in several different maritime industries. Specialisation is key to benefiting from the process of concentration in shipping.

(2) The promotion of trade. Global players must be allowed and even encouraged to provide services within a country or region. Competition should be encouraged and not avoided. Cargo reservation regimes such as the Jones Act in the United States directly lead to an increase in the costs of shipping within the country. The same applies to Brazil's bilateral agreements with several other countries and the reluctance of the Chinese authorities to allow foreign operators of intermodal services. The attempt by West African governments to launch a shipping line in order to reduce the dependency on foreign carriers would only hamper African trade. Weaker players should not be protected from competition just because the result might be a smaller number of service providers.

(3) The protection of the environment. Shipping causes far less environmental damage per ton of cargo than any other form of transport. Encouraging shipping over land and air transport thus protects the environment at large, although it increases the pollution of the marine environment. Statistically, liner shipping companies have better safety records than most other types of shipping. Also, larger registries have better safety records than smaller ones, independent of whether they are open or not. The process of concentration in liner shipping may thus lead to less contamination of the environment.

Of the three goals, the promotion of trade is becoming increasingly important. Trade is growing much faster than GDP in most countries, and the proportion of transport costs within the total costs of production is increasing. This is due to the increased use of imported raw materials and components, which outweighs the fact that transport has become less expensive.

## IV. CONCLUSIONS AND RECOMMENDATIONS

### A. CONCLUSIONS

Concentration in maritime transport means that relatively larger ports, shipping companies and their alliances are increasing their market share at the expense of the remaining smaller players. Although this process in itself is not new, it has gained strength in recent years, and its impacts are increasingly being felt in developing countries.

How much further will the industry consolidate? Will the process of concentration really stop at the number of ten major liner shipping companies, as some observers have suggested? Given the speed of consolidation in recent years, there is no reason to exclude the possibility of just five major liner shipping companies. They will no longer be called east-west but rather global carriers. Any line which does not cover all major markets might then be considered a niche carrier.

Trade will continue to expand faster than the world economy as a whole, and containerized trade will grow particularly fast. This on its own does not lead to further concentration in liner shipping. Increasing volumes will encourage the use of larger ships, however, provided that the duration of port calls can be limited. This necessity provides a further incentive to develop new technologies and cargo handling systems that reduce the time a vessel spends in port. Growing trade and its relevance for the national economy will encourage governments to further deregulate, which benefits the larger players more than the smaller ones.

Thus far, the presence of fewer players in the industry has not implied less competition. On the contrary, the expansion of global shipping companies and port operators has actually increased competition on individual routes and in individual countries. Also, relatively little vertical integration has occurred between freight forwarders, carriers, shipyards and port operators. By the end of the next decade, however, process of concentration may reach levels at which the advantage of cost reductions is outweighed by the disadvantage of market domination by few major players. Regulatory measures will have to be formulated to avoid monopoly rents.

Individual companies will continue to expand their capacity to reduce unit costs. This expansion adds capacity to the market as a whole and some observers fear that this may lead to an overcapacity and consequently to a slump of freight-rates. Given that the number of container slots on order at world shipyards as a percentage of existing capacity has recently decreased, such fears of a general overcapacity in liner shipping seem exaggerated. Nevertheless, the expansion of east-west carriers into regional and north-south markets, combined with the redeployment of larger vessels into these markets, may lead to temporary overcapacity on some routes.

Shipping companies, ports and governments should not wait and see when and where the process of concentration is going to stop and only then take long-term decisions. The process of concentration is going to continue in the foreseeable future, and today's commercial decisions and regulatory measures need to target this future rather than the present situation.

An increased proportion of fixed costs among total costs has been identified as a major cause for the process of concentration. This trend is going to continue. This does not mean that marginal costs will become as low as in the computer and telecommunications industries, but the tendency is the same. Ever higher initial capital expenditure on ships, cranes, information technology and deep water ports and channels contrasts with the more efficient use of fuel and reduced man-hours per container move. The results will be more marginal pricing, more slot sharing and more concentration.

For some years, globalization and privatization have dominated discussions in the port and liner shipping industries. Both these catchwords imply risks and opportunities, and it is widely recognised that with the right policies, the opportunities can generate benefits that far outweigh the risks. The same should in future hold true for concentration.

Who gains and who loses from the processes described and analysed in this document? Thanks to technological advances, a growing market and government deregulation, this is not a zero-sum game, but a wealth-creation process in which more parties gain than lose. Consumers, importers and exporters win, because the costs of transport are falling, and, thanks to trans-shipment, more routing options become available. The maritime industries as a whole win, because the share of transport within the world's GDP increases. Port operators win because they benefit from growing trade and from an increased proportion of trans-shipment. Smaller carriers which used to specialize in regional and north-south trades are the most likely to lose.

## **B. RECOMMENDATIONS**

### **1. Liner shipping companies**

This study has shown how and why major east-west carriers are expanding their activities to include traditional secondary markets. The need to fill larger ships and the cascade effect of redeploying medium-sized ships into secondary markets has led to such expansion. This tendency, combined with more trans-shipment, implies severe challenges for traditional north-south and regional carriers.

Carriers that serve a particular north-south or regional trade are increasingly using the same technologies (i.e., containers, ship types, cranes) as carriers on any other route. Even the regulatory framework concerning liberalized shipping services and privatized port operations is increasingly similar in many parts of the world. The service that is being provided is homogeneous, and competition thus focuses on price. To respond to this pressure, carriers need to reduce costs. This can best be achieved by economies of scale, which in turn imply mergers, alliances and larger ships.

Should smaller carriers cooperate among each other or with major carriers? For a big line, no costs are involved in cooperation with traditional north-south lines if these provide feeder services. The risk for the smaller line is that the moment cargo volumes are big enough, the larger carrier can from one day to another establish its own feeder service or even provide the service directly.

Without a long-term commitment within a cooperation agreement, important cost savings cannot be realized, especially concerning administrative and inland transport

costs. Without such savings, the cooperation between two or more lines will always be suboptimal and may be superseded by mergers and acquisitions.

In the medium-term future, any liner shipping company without a global network will be considered a niche operator. Such operators will have to specialize as much as possible within the framework set by containerization. Vessel speed, size, gear and service frequency are the main variables within which a shipping company can adapt to a particular market. The type of vessel may also vary, incorporating both container carrying capacity and other specialized characteristics.

The options for responding to the process of concentration are thus (1) expansion and growth, (2) cooperation with major players, (3) regional cooperation and (4) specialization as a niche operator. If any of the first three options is chosen, the liner company is de facto participating in the process of concentration.

Whenever feasible, fourth option (i.e., the provision of niche shipping services) can provide a higher return on investment than what is on average achieved by east-west carriers. Competition within a niche is limited, and higher freight-rates can usually be obtained. Because niche markets are often more volatile than the major east-west markets, it is crucial to foresee future trends.

In addition to these four options, owners can consider selling the company. The price obtained by such a sale will always be higher if the sale is realized before the company's commercial situation becomes too difficult. Negotiations should be undertaken out of a position of strength. Right now might be a good opportunity to obtain a high price for the sale of a liner shipping company, given low interest rates and a situation in which many major players are searching for ways to strengthen their global networks.

Obviously, no single option is generally valid for each and every shipping company. The option to wait and see, however, should definitely be avoided.

## **2. Ports**

Ports are benefiting from the process of concentration in liner shipping in two ways. (1) Lower freight-rates lead to a general growth of the market, and (2) additional trans-shipment leads to an increased demand for port services. Within ports, private operators are the most to gain. Although it is true that larger ships require additional investments in cranes and dredging and that alliances and mergers have increased the bargaining power of shipping companies, it is equally true that because of privatizations, liberalization, and trans-shipments the demand for port services by private operators is growing faster than the demand for trade moves as a whole.

In the case of so-called land-lord ports, where the state owns the land and a private enterprise the concession to operate a terminal, the public sector often has to finance the dredging and other major infrastructure investments. Depending on the commercial attractiveness of the port, the government may be able to recover these costs from the concessionaire. The public sector may also decide not to recover these costs, which would then be a subsidy. In the European Union, this type of indirect subsidy is presently being intensively debated. Independent of whether such subsidies should be permitted, there should be no question about the need to openly admit and quantify such subsidies.

Especially in situations where concessioned ports have to compete with privately owned ports, such transparency is necessary to assure fair competition.

A clear distinction has to be made between the handling of local cargo and the provision of trans-shipment services. The profits that can be made with local cargo are usually higher than with trans-shipment services. Local cargo is naturally limited, however, and the possibility of generating additional income by handling somebody else's cargo may be an attractive option, although expectations are often overly optimistic. Trans-shipment is a comparatively volatile business and creates relatively little additional employment.

To be attractive as a trans-shipment centre, a port must lie at the crossroads of various shipping routes and provide adequate natural and commercial conditions. It is an advantage to have a local cargo base or at least to be located near another port which has its own cargo base but whose growth potential is limited. Finally, many of the recently established trans-shipment centres that handle little local cargo have some specific characteristics that compensate for this disadvantage. MIT in Panama lies next to the Panama Canal, and Freeport in the Bahamas, benefits from the fact that the United States Jones Act does not apply to transportation between the Bahamas and the United States. Given these different aspects, the so-called Farmouth argument, which holds that a hub port without local cargo is not feasible, is not really refuted but rather has to be amended.

All these different points need to be taken into account when analysing where a trans-shipment centre might or should be located. With regard to the South American west coast, for example, some cargo for Asia is already being trans-shipped in Los Angeles/Long Beach (United States), which has a good location and a high base of local cargo. Containers heading to or coming from the United States East Coast and Europe are to some extent being trans-shipped in Kingston (Jamaica), which lies at the crossroads of major east-west and north-south routes and provides good natural and commercial conditions. The same applies for various new or newly privatized terminals in Panama. In future, Santiago (Cuba) might become an interesting option for European and United States East Coast cargo, because Cuba has a good location and the potential to generate significant local cargo. Along the South and Central American west coast, Panama is the most likely location for a hub port. Further south, major carriers would have to deviate from their main east-west route, and the whole idea of trans-shipment would become less attractive. For a sub-regional hub, Callao (Peru), which is planning to dredge to a 14-meter water depth, has strong advantages over other ports such as Mejillones (Chile) because it is further north and has its own local cargo base. There is no commercial reason why Chilean cargo has to be trans-shipped in a Chilean port.

With all the recent focus on hub and trans-shipment ports, it sometimes seems that being a just a feeder port is something to be avoided at all costs. Even the word outport has been used. Yet the fact that a container is trans-shipped during its transportation does not take any cargo away from its originating port. Whereas trans-shipment ports do gain additional business, the ports of origin and destination do not actually lose any cargo.

To benefit from the process of concentration in liner shipping, ports need to encourage the containerization of cargo, and ports that lie on the same route need to cooper-

ate. Even if one or two ports on a route have gantry cranes and sufficient water depths for large container ships, liner companies still have to take into account restrictions along the entire route.

On the South American west coast, for example, San Antonio and Antofagasta (Chile), Callao (Peru), Guayaquil (Ecuador), and Buenaventura (Colombia) are served by the same ships. If San Antonio competes with Buenos Aires (Argentina) for cargo from Mendoza in the western Argentina, the costs of transporting the cargo via San Antonio are also being influenced by the fact that ships on the west coast are smaller than on the east coast and that they have to carry their own container cranes.

The increased proportion of fixed costs among the total costs of liner shipping implies that port productivity is increasingly important because of the growing opportunity costs for each hour a ship has to spend in port. To the extent that ports achieve productivity increases, they automatically encourage further increases of vessel sizes and, consequently, trans-shipment and concentration in liner shipping.

### **3. Regulatory bodies**

National governments and regional and international organizations such as the European Union and the World Trade Organization must follow and watch the process of concentration very closely. Should vertical integration between shipping lines, port operators and freight forwarders increase, some public intervention might become necessary. So far, however, the largest liner shipping company only controls 6% of the world's slot capacity and the biggest port operator around 10% of container port moves. Shippers themselves have formed associations that should be capable of countering possible abuses of market power by the port and shipping sector.

The public sector should not protect smaller players from competition, even if this results in a smaller number of larger market players. Weaker players become strong by having regulatory and operational structures which allow them to compete. Weaker players do not become stronger by weakening the stronger competition.

Concentration can lead to lower unit costs through scale economies and to higher freight-rates through oligopolistic market structures. Regulatory bodies must encourage cost reductions and at the same time avoid the abuse of oligopolistic market powers.

Developing countries pay almost twice as much for the transport of their imports than do the developed market economies (according to UNCTAD's classification). In the case of the latter, freight costs as a percentage of the c.i.f. import value reached 4.2% in 1995, whereas the developing countries as a group paid 8.3% (UNCTAD, 1997). Among the many variables that influence this figure, the scale economies that the developed market economies achieve through their larger trade volumes are certainly one reason for their lower transport costs.

A government can take one of two possible approaches toward these relatively high freight costs in developing countries. First, it can try to assist its own industry to earn a high proportion of these costs. Possibly through protectionist measures such as cargo reservation and the avoidance of containerization to increase the demand for port labour. Alternatively, it can and should try to reduce the costs of transport, even if this

implies that national shipping lines and local port operators lose business to larger global players.

This document presents a generally positive picture. The word concentration may initially provoke associations with the abuse of market power and monopoly rents. After analysing the causes and impacts of the process of concentration in ports and shipping, however, little abuse of market power was detected. Importers, exporters, consumers, ports and major east-west carriers are all likely to gain from the described process. Traditional north-south liner shipping companies are most likely to lose, but they, too, may identify options for benefiting from the overall growing market.

The concepts of globalization and privatization have not always been accepted by all sectors of the society, especially in developing countries. The protection of national industries, the interests of labour unions and strategic considerations have led to delays in the acceptance of these concepts. This should be avoided with concentration, which is already a reality and which is going to continue in the foreseeable future. Regulatory bodies, including national governments and international organizations, need to accept and understand this reality to ensure that their countries benefit from the process of concentration in liner shipping.



## ANNEX: SERVICES OF MAJOR ALLIANCES

The following tables summarise the services currently offered by major alliances. These services are obviously subject to change without notice.

**Table 14**  
**Services of the Grand Alliance, January 1998**

<b>GRAND ALLIANCE</b> <b>P&amp;O Nedlloyd, Hapag-Lloyd, NYK, OOCL and Malaysia International Shipping Corp.</b>			
Route	Service	Vessels	Port calls
Asia – Europe	Loop 1	8	Southampton, Rotterdam, Hamburg, Rotterdam, Le Havre, Suez, Singapore, Kobe, Hagoya, Shimizu, Tokyo, Singapore, Suez, Southampton
Asia – Europe	Loop 2	8	Le Havre, Southampton, Bremerhaven, Antwerp, Suez, Singapore, Hong Kong, Kaohsiung, Pusan, Kaohsiung, Hong Kong, Singapore, Port Kelang, Suez, Le Havre
Asia – Europe	Loop 3	8	Rotterdam, Hamburg, Southampton, Suez, Singapore, Hong Kong, Qingdao, Pusan, Keelung, Hong Kong, Singapore, Suez, Rotterdam
Asia – Europe	Loop 4	8	Southampton, Hamburg, Rotterdam, Suez, Colombo, Port Kelang, Singapore, Shanghai, Ningbo, Shenzhen Port, Hong Kong, Singapore, Suez, Malta, Southampton
Asia – Europe	Loop 5	8	Rotterdam, Hamburg, Southampton, Malta, Suez, Jeddah, Jebel Ali, Singapore, Shenzhen Port, Hong Kong, Singapore, Colombo, Jeddah, Suez, Rotterdam
Asia – Mediterranean	Loop 6	8	La Spezia, Barcelona, Fos, Damietta, Suez, Singapore, Hong Kong, Pusan, Kobe, Nagoya, Tokyo, Hong Kong, Singapore, Port Kelang, Suez, Damietta, La Spezia
Asia – North America	SSX	6	Long Beach, Kaohsiung, Hong Kong, Singapore, Port Kelang, Singapore, Yantian, Hong Kong, Long Beach
Asia – North America	FEX	5	Long Beach, Vancouver, Seattle, Tokyo, Nagoya, Kobe, Hong Kong, Kaohsiung, Tokyo, Long Beach
Asia – North America	JCX	5	Long Beach, Oakland, Tokyo, Nagoya, Kobe, Hakata, Shanghai, Qingdao, Kobe, Nagoya, Long Beach
Asia – Mediterranean – North America	AEX – PNX	14	Seattle, Vancouver, Oakland, Kaohsiung, Hong Kong, Laem Chabang, Singapore, Colombo, Suez, Malta, Halifax, New York, Charleston, Norfolk, New York, Halifax, Malta, Suez, Jeddah, Colombo, Singapore, Laem Chabang, Hong Kong, Yantian, Kaohsiung, Seattle
Asia – North America – Europe	PAX	13	Long Beach, Oakland, Tokyo, Kobe, Kaohsiung, Hong Kong, Kobe, Nagoya, Tokyo, Seattle, Oakland, Long Beach, Charleston, Norfolk, New York, Halifax, Antwerp, Thamesport, Bremerhaven, Rotterdam, Halifax, New York, Norfolk, Charleston, Long Beach

Source: The 1998 Worldwide Shipping Alliance Guide via <http://web3.asia1.com.sg/timesnet/data/cna/docs/cna3186.html>, 12 January 1998.

**Table 15**  
**Services of the New World Alliance, January 1998**

<b>NEW WORLD ALLIANCE</b>			
<b>APL, Mitsui OSK and Hyundai Merchant Marine</b>			
<b>Route</b>	<b>Service</b>	<b>Vessels</b>	<b>Port calls</b>
<b>Asia – Europe</b>	EU1	8	Rotterdam, Hamburg, Southampton, Le Havre, Suez, Singapore, Kobe, Nagoya, Shimizu, Tokyo, Hong Kong, Singapore, Suez, Rotterdam
<b>Asia – Europe</b>	EU2	8	Le Havre, Rotterdam, Hamburg, Felixstowe, Rotterdam, Suez, Singapore, Hong Kong, Kaohsiung, Kwangyang, Pusan, Hakata, Kaohsiung, Hong Kong, Singapore, Suez, Le Havre
<b>Asia – Europe</b>	EU3	8	Southampton, Antwerp, Bremerhaven, Rotterdam, Suez, Colombo, Singapore, Hong Kong, Shanghai, Yantian, Hong Kong, Singapore, Colombo, Suez, Southampton
<b>Asia – Mediterranean</b>	MED	8	Pusan, Kobe, Nagoya, Yokohama, Kaohsiung, Hong Kong, Singapore, Port Kelang, Jeddah, Suez, Damietta, Genoa, Barcelona, Fos, Damietta, Suez, Jeddah, Singapore, Hong Kong, Pusan
<b>Asia – North America</b>	SAX	6	San Pedro, Seattle, Kaohsiung, Hong Kong, Yantian, Singapore, Port Kelang, Singapore, San Pedro
<b>Asia – North America</b>	PS1	6	San Pedro, Oakland, Kaohsiung, Hong Kong, Laem Chabang, Singapore, Hong Kong, Kaohsiung, San Pedro
<b>Asia – North America</b>	PS2	5	San Pedro, Oakland, Dutch Harbour, Yokohama, Kobe, Kaohsiung, Hong Kong, San Pedro
<b>Asia – North America</b>	PS3	5	San Pedro, Oakland, Tokyo, Nagoya, Quingdao, Shanghai, Kobe, Tokyo, San Pedro
<b>Asia – North America</b>	PSW	5	Long Beach, Oakland, Seattle, Pusan, Kwangyang, Hong Kong, Kaohsiung, Pusan, Long Beach
<b>Asia – North America</b>	PSX	5	Long Beach, Seattle, Yokohama, Kobe, Hong Kong, Yantian, Yokohama, Long Beach
<b>Asia – North America</b>	GAM	6	Manzanillo (Mexico), San Pedro, Oakland, Guam, Kaohsiung, Naha, Pusan, Hakata, Nagoya, Yokohama, Oakland, San Pedro, Manzanillo
<b>Asia – North America</b>	PNX	5	Seattle, Vancouver, Tokyo, Nagoya, Kobe, Kaohsiung, Hong Kong, Kaohsiung, Kobe, Nagoya, Tokyo, Seattle
<b>Asia – North America</b>	PNW	6	Seattle, Portland, Vancouver, Yokohama, Pusan, Kwangyang, Hong Kong, Kaohsiung, Kwangyang, Pusan, Seattle
<b>Asia – North America</b>	ECS	9	Kaohsiung, Hong Kong, Pusan, Kobe, Nagoya, Tokyo, Manzanillo (Panama), New York, Norfolk, Charleston, Manzanillo, Tokyo, Kobe, Kaohsiung

Source: The 1998 Worldwide Shipping Alliance Guide via <http://web3.asia1.com.sg/timesnet/data/cna/docs/cna3186.html>, 12 January 1998.

Note: The New World Alliance has now been joined by Yangming. In April 1998, Yangming started to buy slots from the New World Alliance's weekly service between Asian, Middle East and Mediterranean ports.

**Table 16**  
**Services of the Hanjin, DSR, Cho Yang, United Arab Shipping Co. Alliance,**  
**January 1998**

<b>Hanjin, DSR, Cho Yang, and United Arab Shipping Co.</b>			
<b>Route</b>	<b>Service</b>	<b>Vessels</b>	<b>Port calls</b>
<b>Asia – Europe</b>	CEX	9	Xingang, Qingdao, Shanghai, Hong Kong, Singapore, Rotterdam, Hamburg, Felixstowe, Singapore, Hong Kong, Xingang
<b>Asia – Europe – North America</b>	PS-PDM1	12	Rotterdam, Hamburg, Felixstowe, Le Havre, Gioia Tauro, Singapore, Hong Kong, Kaohsiung, Long Beach, Oakland, Tokyo, Osaka, Pusan, Hong Kong, Port Kelang, Colombo, Rotterdam
<b>Asia – Europe – North America</b>	PS-PDM2	12	Le Havre, Rotterdam, Hamburg, Felixstowe, Colombo, Port Kelang, Hong Kong, Pusan, Osaka, Nagoya, Tokyo, Long Beach, Oakland, Kaohsiung, Hong Kong, Singapore, Gioia Tauro, Le Havre
<b>Asia – Europe – North America</b>	AMA	12	New York, Norfolk, Savannah, Valencia, La Spezia, Gioia Tauro, Jeddah, Khorfakkan, Singapore, Pusan, Kaohsiung, Hong Kong, Singapore, Jeddah, Gioia Tauro, La Spezia, Fos, Valencia, New York
<b>Asia – North America – Europe</b>	AWE-PDM	13	Hong Kong, Kaohsiung, Pusan, Oakland, Manzanillo (Mexico), Manzanillo (Panama), Savannah, Norfolk, New York, Felixstowe, Bremerhaven, Rotterdam, Le Havre, New York, Norfolk, Savannah, Manzanillo (Panama), Manzanillo (Mexico), Long Beach, Yokohama, Kobe, Pusan, Hong Kong
<b>Asia – North America</b>	AWE	9	Kaohsiung, Hong Kong, Keelung, Pusan, Osaka, Kobe, Tokyo, Yokohama, Savannah, Wilmington, New York, Savannah, Pusan, Kaohsiung
<b>Asia – North America</b>	CAX1	5	Shanghai, Pusan, Long Beach, Oakland, Tokyo, Osaka, Pusan, Shanghai
<b>Asia – North America</b>	NAX	6	Hong Kong, Kaohsiung, Pusan, Seattle, Portland, Yokohama, Kobe, Pusan, Keelung, Hong Kong
<b>Asia – North America</b>	CAX2	N/A	Xingang, Qingdao, Pusan, Long Beach, Oakland, Portland, Yokohama, Kobe, Pusan, Xingang
<b>Asia – North America</b>	PNX1	6	Singapore, Hong Kong, Osaka, Tokyo, Seattle, Vancouver, Tokyo, Yokohama, Osaka, Hong Kong, Singapore
<b>Asia – North America</b>	PNX2	5	Hong Kong, Kaohsiung, Pusan, Seattle, Vancouver, Pusan, Kaohsiung, Hong Kong

Source: The 1998 Worldwide Shipping Alliance Guide via <http://web3.asia1.com.sg/timesnet/data/cna/docs/cna3186.html>, 12 January 1998.

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