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**REPORT FROM THE COMMISSION TO THE COUNCIL**

**On**

**THE SITUATION IN WORLD SHIPBUILDING**

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## **1. Introduction**

The world market for merchant ships and the world shipbuilding industry are facing serious difficulties, with shipbuilding prices plummeting and future demand likely to remain weak for some years. Over-capacity in the shipbuilding industry is expected to grow in coming years, due to a combination of the coming on line of new facilities (also in emerging shipbuilding nations such as China), the potential conversion of naval shipyards to commercial production and increased productivity.

A competitive shipbuilding industry is important to the European Union and contributes to its economic and social development by providing a substantial market for a range of industries and by maintaining employment in a number of regions, many of which are already suffering a high rate of unemployment. Shipbuilding also employs a number of advanced technologies for products and production and therefore is an important element in a developed industrial culture.

Unfortunately all efforts to create a sustainable environment for EU shipyards have been severely hampered by the impact of the Asian crisis, and by the fact that the OECD Agreement "Respecting Normal Competitive Conditions in the Commercial Shipbuilding and Repair Industry" of 21 December 1994 did not enter into force – an Agreement which the Community ratified, believing that it would be the best option to enable Community shipyards to compete under fair trading conditions. In particular, Korean yards have, mainly between 1994 and 1996, expanded shipbuilding capacities in a way that is not justified by global market conditions, and they now need to fill these surplus capacities.

The Council Regulation (EC) No 1540/98 establishing a new set of rules for state aid to the sector for the period 1999-2003 was designed to address the global question of the future of the EU shipbuilding industry in a context where, in absence of the OECD Agreement, international disciplines in this sector are not to be expected soon. The regulation also requires the European Commission to present to the Council a report on the market situation and appraise whether European yards are affected by anti-competitive practices. If it is established that anti-competitive practices of any kind are causing injury to industry, the Commission is, where appropriate, to propose to the Council measures to address the problem.

This report analyses the current market situation, especially concerning the production in Asian shipyards, and presents a first set of possible lines of action that could address problems from individual damaging shipbuilding contracts or non-market business practices by Far-Eastern competitors. It thus responds to the request laid down in Council Regulation (EC) No 1540/98. As this report is the first in this respect and others will follow, it does not aim to cover the entirety of world shipbuilding in all its technological and economic aspects, but rather highlights the most important and recent problems and developments, thus providing guidance for future actions. Additional measures may be required and would be addressed as appropriate in forth-coming reports.

## 2. General Market Analysis

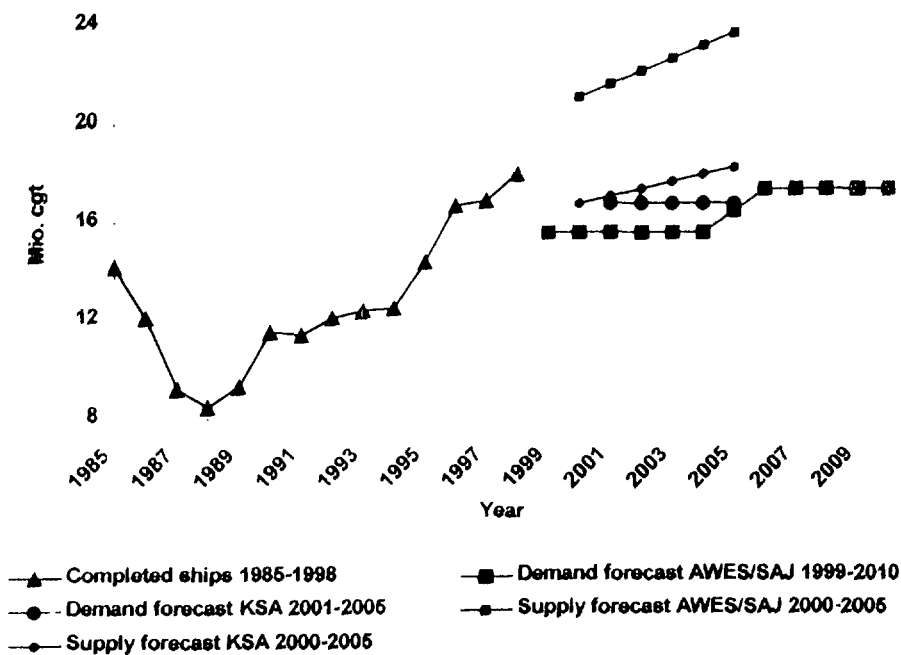
### Demand and Supply

The world shipbuilding market has been in imbalance over a long period of time and all relevant market participants expect this situation to persist and even deteriorate. The demand side in particular is now widely considered to be on a longer-term downturn. As can be seen in Figure 1 the supply forecasts continue to exceed the demand forecasts. Although the major shipbuilders' associations AWES (Association of European Shipbuilders and Shiprepairers) and SAJ (Shipbuilders' Association of Japan) on the one hand, and KSA (Korean Shipbuilders' Association) on the other, see future demand and supply at different levels (with demand in general staying stable), and though they also have different opinions regarding the volume of the resulting lack in demand, both sides agree that the gap between supply and demand will widen.

The total new building capacity world-wide currently amounts to nearly 20 Mio. cgt (compensated gross tonnes, a measurement combining ship size and shiptype-specific building effort). Total new shipbuilding orders were 20.935 Mio. cgt in 1997 and 18.359 Mio. cgt in 1998. For the first half of 1999 new orders of 7.86 Mio. cgt were reported, which indicates that demand is indeed increasingly out of line with supply and that 1997 and 1998 were exceptional years with regard to the demand/supply ratio.

Fig. 1\*

Completed ships 1985-1998, supply and demand forecasts by AWES/SAJ and KSA, in Mio. cgt



\* The data underlying the graphical representations and the source references can be found in Annex III.

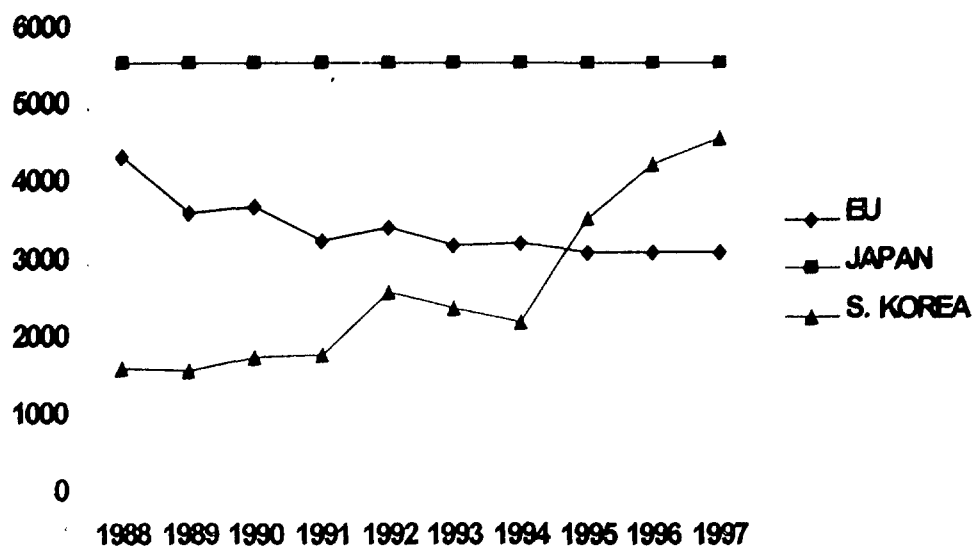
It is notable that production in 1998 had only reached the level of 1978 after many years of decline. Moreover 1998 was a year that saw a high number of orders and completions, partly due to an abnormal decrease in prices since the beginning of 1997 and a booming demand for passenger vessels as the cruise market continued to expand.

Under these conditions stable market conditions are unlikely to evolve soon, unless new building capacity is removed from the market on a significant scale.

The most disturbing element is the steep decline in prices for newly built vessels (see next paragraph) which has a significant impact on demand. Ship owners react to historically low prices by placing orders that can be considered a "bet on the future", i.e. at higher prices some ships would be ordered only later or not at all. It can be expected that this type of additional demand in recent years will be compensated by a significantly lower demand later which makes it difficult for shipyards to keep a balanced order book and a consistent level of employment.

The supply side of the market is still dominated by three major regions: South Korea, Japan and the EU which take a combined market share of some 80%. This report therefore focuses on these regions and their most important shipbuilding products. Niche markets and shipbuilding activities outside the three main regions will not be addressed here.

Fig. 2  
Available building capacities in Japan, Korea and the EU in thousands of cgt, 1988-1997.



Shipbuilding capacity in Korea has grown from around 1.7 Mio cgt in 1988 to 4.6 Mio cgt in 1997 (+170%). In the same period capacities in the EU have been reduced from 4.4 Mio cgt in 1988 to 3.1 Mio cgt in 1997 (-29.5%). Capacities in the third major shipbuilding area, Japan, have remained stable at 5.6 Mio cgt. The increase on the supply side has mainly to be attributed to South Korean expansion since 1994. As Korea did not report figures on cgt capacities to OECD in the past, these figures were calculated from completed gross tonnes using varying conversion factors which reflect the evolution in the product mix of Korean yards (see Annex III).

### Price Developments

As already mentioned prices for new vessels have suffered severely as capacities were increased, and some competitors are desperate to attract orders to fill these capacities. Specific cases in this regard will be discussed in chapter 3. It is obvious that the decline in achievable prices is not homogeneous: different shiptypes are used in different business environments, freight rates (as a major parameter for the attainable return on investment) depend on the commodities and the trading areas in question, and shipowners show different attitudes depending on the particular market. The table below gives some indications on the decline in prices for some selected shiptypes which can be considered as representative for the bulk of new merchant ships. The prices are calculated averages, derived from available contract information. Prices have gone down across the board and have now reached a level that in many cases do not allow shipyards to cover operating costs.

Table 1  
*Evolution of prices for newly built ships (in Millions of US Dollars)*

	1997	1998	March 1999
<b>Panamax Container Carrier</b>	53.0	42.0	37.5
<b>1100 TEU Container Carrier</b>	20.0	18.0	17.0
<b>Very Large Crude Oil Carrier (VLCC)</b>	83.0	72.5	69.5
<b>Capesize Bulk Carrier</b>	40.5	33.0	31.5
<b>Panamax Bulk Carrier</b>	27.0	20.0	18.5
<b>Tweendecker 15,000 dwt</b>	165	14.0	13.5

Source: Clarkson World Shipyard Monitor.

1997 and 1998 prices are the average of reported prices in the respective years. For 1999, prices are the average reported prices during the first quarter of that year.

Table 2  
*Evolution of prices for newly built ships (annual changes in percent)*

	1997/1998	1998/1999	1997/March 1999
<b>Panamax Container Carrier</b>	-20.75%	-10.71%	-29.25%
<b>1100 TEU Container Carrier</b>	-10.00%	-5.56%	-15.00%
<b>Very Large Crude Oil Carrier (VLCC)</b>	-12.65%	-4.14%	-16.27%
<b>Capesize Bulk Carrier</b>	-18.52%	-4.55%	-22.22%
<b>Panamax Bulk Carrier</b>	-25.93%	-7.50%	-31.48%
<b>Tweendecker 15,000 dwt</b>	-15.15%	-3.57%	-18.18%

The biggest price decreases are recorded with Panamax bulk carriers and Panamax container vessels. Both types of ships are very important to the Korean shipbuilding industry in general and to some investigated yards in particular. This report will try to indicate the extent to which these market segments have been targeted by Korean competitors and how this has affected prices (and consequently created an "artificial demand").

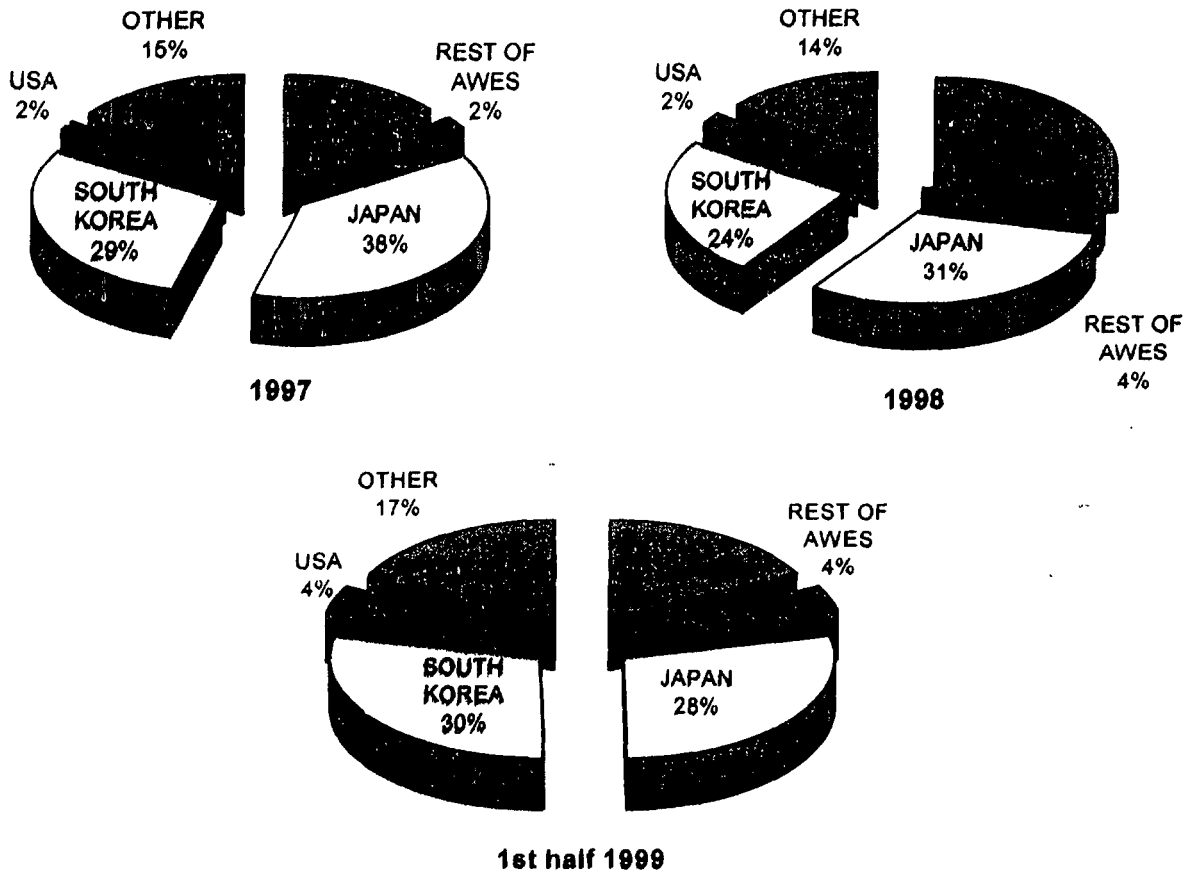
It should be noted that this significant decline in prices, affecting all major shiptypes, not only threatens the profitability of shipyards, it also poses problems to the shipping community as tonnage ordered before the price decline needs to be reassessed in its asset value. With a lower asset value creditors ask for additional collateral coverage, thereby increasing financing costs and cutting into the profits of ship owners.

### Market Shares

As a consequence of the fierce competition in the shipbuilding market and the dramatically lower prices, market shares have shifted. Figure 3 shows the breakdown of market shares by countries and regions for the period 1997 to the first half of 1999. It can be argued that this period was exceptional for various reasons, however, it would be beyond the scope of this report to analyse the market movements in a larger timeframe. A wider perspective would also not change the overall picture of a market in difficulties.

Fig. 3

World market shares by country/region (new orders, based on cgt), 1997, 1998 and 1st half of 1999



The significant increase of EU market share in new orders in 1998 was due to the Asian crisis and the financing problems that came with it and cannot be considered as part of a larger trend. There were almost no orders awarded to South Korean shipyards in the first half of 1998 as owners took a "wait and see" position and banks were unable to provide financing. This makes the recovery of Korean market share in the second half of 1998 even more remarkable. As can be seen, Korean market share is on the rise again after the specific financing problems and economic uncertainties in 1998 were overcome. South Korea has now its largest market share ever and has also overtaken Japan (a declared objective of the Korean government and industry). China has also managed to increase market share which is reflected in the increase of "others". The USA plays a minor role in world shipbuilding, but various protectionist elements (Chapter XI, Jones Act, navy orders) assure that US yards are able to stay in business and could,

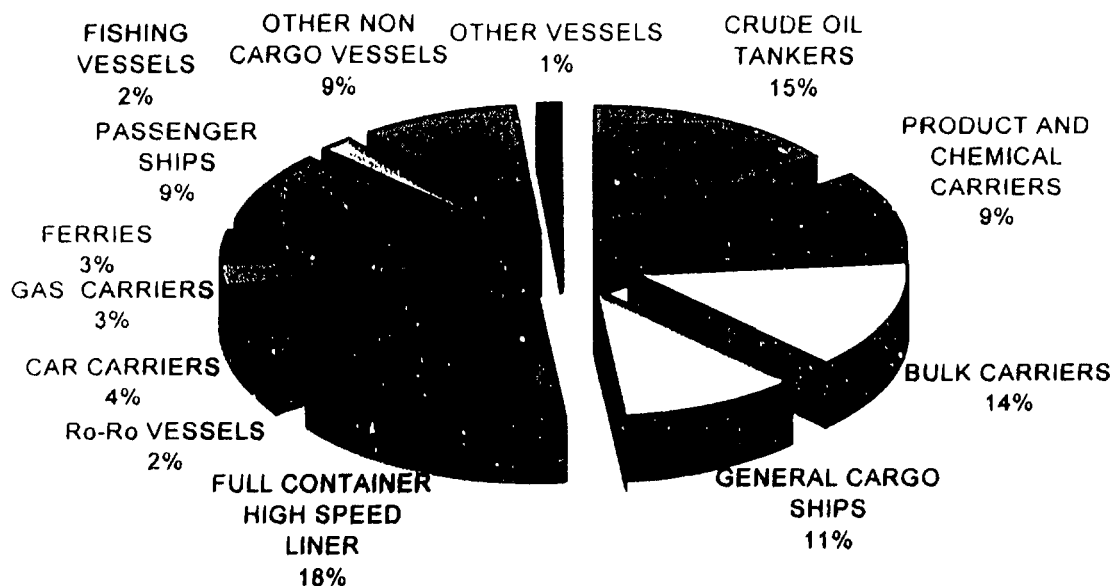
under certain conditions, come back into commercial shipbuilding in the future. Information on completed tonnage shows a similar structure; the relevant data can be found in the annexes.

Japan which until now has been able to "buffer" the negative market trend through domestic demand, has seen a decline of some 20% in new orders in the first six months of 1999. As a result yards have started to reorganise and there is persistent talk of consolidating the seven major Japanese shipyards into four groups. The EU's market share decreased in the first half of 1999 which is in line with the longer term trend. EU shipyards are coming under increasing pressure which is also reflected in the fact that the British-Norwegian Kværner Group (Europe's largest shipbuilding group) decided in early 1999 to sell all its shipbuilding operations, claiming that the return from shipbuilding operations was too low to keep them attractive to Kværner's investors and shareholders. Moreover two shipyards in Europe have been closed or are about to close (Aarhus Flydedok in Denmark and Les Ateliers et Chantiers du Havre in France, respectively).

### Market Composition

Figure 4 provides a snapshot of the distribution of ship types ordered in 1998. The largest market segments are those for crude oil tankers, bulk carriers, product/chemical carriers, general cargo ships, container vessels and passenger ships. EU yards which have basically ceased to produce ships in the large volume market segments of crude oil carriers, bulk carriers and general cargo ships are now also facing increasing competition in the segments of product/chemical carriers, ferries and full container ships. Only passenger ships and some types of ferries remain areas in which Europe dominates because EU yards are technological leaders and therefore still attract the majority of orders. It should, however, be noted that a major EU cruise operator has recently awarded two important contracts to a Japanese shipyard which could ultimately endanger the dominant market position that EU yards still enjoy. EU yards have continuously lost market shares to Asian competitors even in segments which they traditionally dominated, despite major efforts to innovate and to raise productivity.

Fig. 4  
World market shares by shiptype (orders, based on cgt), 1998



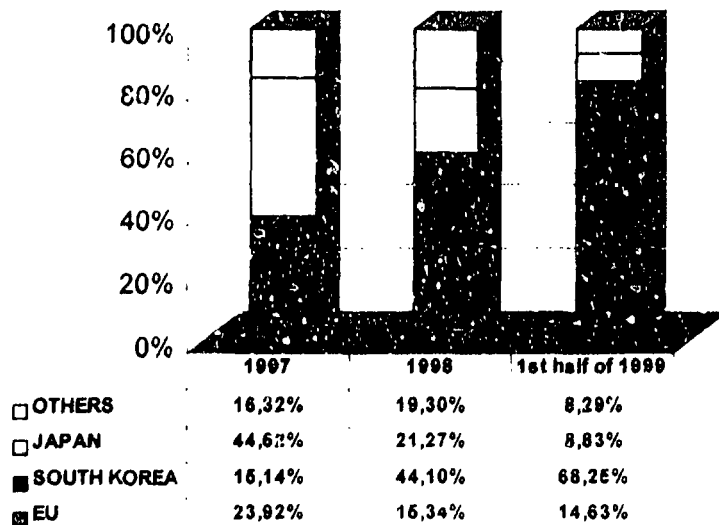


## The Container Ships Segment

In terms of cgt, container vessels represented the largest market segment in 1998. Container ships have been a major product of Japanese and EU yards in the past and they are the "backbone" of world liner shipping. European yards have had a particular expertise in very large container ships (Post-Panamax), as these vessels are technologically demanding and follow different and more complex design paradigms. As Korean competitors are obviously targeting the whole container ship market segment, this merits a closer look. Figure 5 shows the development in market shares for Japan, South Korea and the EU and the overall order volume in 1997, 1998 and the 1st half of 1999.

Fig. 5

Development of market shares for Japan, South Korea and the EU in container vessels (orders, based on cgt), 1997 to the first half of 1999



Korean yards have made very significant inroads into the market for container vessels since 1997. Although the statistics indicate that Korean yards have expanded market share at the expense of Japanese and other non-EU competitors, EU shipyards have clearly failed to participate in the 1998 order boom on the same scale as Korea, and seem bound to concentrate on maintaining their comparatively low market share of ca. 15% whereas the Korean share has now reached nearly 70% in terms of cgt. It should be noted that overall orders (world total in cgt) for container vessels increased by 30% from 1997 (2.43 Mio. cgt) to 1998 (3.16 Mio. cgt) and stood at 1.12 Mio. cgt for the first half of 1999.

There is concern that the developments in the market for container vessels could be repeated for ferries and cruise vessels. Asian competitors have a track record of attracting orders for sophisticated tonnage through extremely low prices, hoping that they will improve their technical abilities in the course of the project and gain the reputation that is needed to attract more orders. In the case of the two cruise vessels ordered in Japan, there are clear statements from the building yard that the order does not have to be profitable as long as the yard is able to deliver the quality that the market demands, thus putting the yard on the map of cruise operators. The investigated ferry order at Samsung (see chapter 3) seems to follow the same business strategy.

### **Conclusions for Chapter 2**

- Overcapacities in the shipbuilding market exist and are very likely to grow due to both decreasing demand and increasing supply.
- South Korean capacity expansion, especially in the period 1994 to 1996, has been the main reason for the continuing and growing imbalance, and Korean yards have great difficulties in attracting a sufficient number of orders to cover costs.
- Prices have plummeted in particular for ship types for which Korea competes, bringing demand forward and shifting market shares to Korean yards. Most significant is the shift in market shares with regard to container vessels where Korea is probably nearing a dominant position. China which is seen by many as a future shipbuilding power has also increased market share in the period covered by this report.

### **3. Detailed Market Monitoring and Analysis**

#### **Nature of shipbuilding contracts**

Merchant ships are capital goods with some distinctive features that make it difficult for outsiders to analyse their true building costs. A precise calculation very much depends on information about the particular building project and the yard facilities used, both of which are normally kept confidential.

- Ships are very large technical objects, typically consisting of a steel hull and steel deckhouse and a great number of technical sub-systems and outfitting items.
- Ships are rarely produced in large series and their design is therefore not uniform. Various materials from a great number of suppliers are used in the construction of ships which requires close co-operation between yards and suppliers. As production is often "one-off", the specific conditions of the building yard play a significant role with regard to costs, quality and delivery schedule.
- Typically shipowners are single entrepreneurs or are represented by a small group of people. Orders are placed with one yard per project, giving a combination of large order volumes and rather close and intimate business relations that are rarely transparent to the public. It should, however, be noted that the shipping industry is undergoing a concentration process that will also affect shipbuilding through a demand for larger series and standardised designs.
- The shipbuilding market for merchant ships is a global one. European shipowners in particular place orders around the world, reacting to advantageous conditions and exploiting the differences in prices and financing conditions. Korean and Japanese owners, however, traditionally tend to source with domestic yards, giving them a certain amount of demand they can rely on.
- Shipowners often have preferences for the procurement of certain equipment items, depending on previous experience and the composition and training of their crews. Shipyards on the other hand prefer to have a limited set of suppliers to achieve a high productivity and smooth production flow. These diverging interests often result in detailed negotiations on the composition of makers' lists which also affect prices.
- It takes a significant amount of time to construct a ship. Shipowners who have to react to the fast changing demands of the freight market and the global economy therefore prefer to have the shortest delivery time possible and are willing to pay a premium. Shipyards that are able to deliver swiftly and reliably can therefore afford to charge higher prices.
- Another important set of players in shipbuilding projects are the classification societies which are in charge of the technical approval of design and construction. For certain sophisticated tonnage using non-standard design features, details are subject to discussions between yard, classification society and owner. This can result in higher or lower costs, depending on the particular project.
- The financing of ship construction differs from the financing of other large scale engineering projects. Financing costs can have important implications for individual projects and the overall price. Financing schemes range from "front end payment" to "tail end payment". In the first case a significant down-payment is made by the buyer, resulting in financial gains for the shipyard from interest. In the latter case the shipyard has to finance a great part of the building costs, resulting in additional costs for the particular project.

These characteristics lead to a great number of variables that need to be factored in when analysing the true production costs for individual vessels and prove (or disprove) allegations of unfair pricing.

### **Study on Shipbuilding Market Monitoring**

In order to collect the necessary data, the European Commission has recourse to independent, reliable consultants. Their ongoing study covers the following elements:

- Definition of a cost breakdown model, including all relevant cost components both of the direct ship production and the shipyard in general. The model is based on cost elements covering direct costs (materials, labour, equipment, etc.) and indirect costs (financing of the ship and of the production equipment, overhead, insurance, etc.). More details of the cost model can be found in Annex I.
- Criteria to evaluate whether damage is caused to EU yards due to unfair practices on the part of competitors outside the EU. Two elements are considered for the evaluation: injurious pricing and injury, and subsidies. Concerning injurious pricing the contract price is compared to the price for a like vessel when sold to a buyer of the exporting country (this "normal value" should be based on the price paid or payable in the normal course of trade). Concerning countervailable subsidies an analysis is made whether there appears to be any subsidy as defined in the WTO Agreement on Subsidies and Countervailing Measures (e.g. financial contribution from the government or any public body involving either a direct transfer or non-collection of funds otherwise due, or provision of goods or services which would normally be borne by the company).

The study covers shipyards in Korea, Japan, China and Singapore and a range of shiptypes (>5000 gross tonnes), mainly: crude oil tankers, bulk and OBO carriers, product and chemical carriers, general cargo ships and reefers, containerships, RO-RO vessels, gas carriers, passenger ships and off shore vessels. A total of 33 ships contracts are to be analysed within the study.

Orders for new ships are selected for analysis in co-operation with the European shipbuilding industry to ensure that technical data from comparable projects is available and technical and economic assumptions can be kept to a minimum. Given the critical nature of such an investigation, parameters are to be kept on the "safe side" to assure that calculated minimum costs for particular projects cannot be challenged.

#### **Investigated orders**

To date nine orders for new ships have been analysed, all awarded to South Korean yards. The European Commission assured a balanced selection of cases while taking into account the overall political objective of the exercise, the relative urgency of the matter and the availability of meaningful data for comparison. Investigations may be extended to shipyards in other Asian countries in the course of the study if necessary. The cases covered so far are:

- Cable layer (series of 13 ships), 9,280 cgt, to be built at Hyundai Mipo yard
- 3,400 TEU container ship (series of 5), 27,750 cgt, to be built at Samsung Heavy Industries
- Passenger Ro/Ro ferry (series of 2), 25,200 cgt, to be built at Samsung Heavy Industries
- 6,800 TEU container ship (series of 2), 52,390 cgt, to be built at Hyundai Heavy Industries
- 3,500 TEU container ship (series of 2), 28,500 cgt, to be built at Halla Engineering and Heavy Industries
- Panamax bulk carrier, 19,500 cgt, to be built at Halla Engineering and Heavy Industries
- Panamax bulk carrier, 22,600 cgt, to be built at Daedong Shipbuilding Co. Ltd.
- Product carrier, 19,074 cgt, to be built at Daedong Shipbuilding Co. Ltd.
- Very Large Crude Oil Carrier (VLCC), 47,100 cgt, to be built at Daewoo Heavy Industries

Not all of the selected projects are confirmed orders and in some cases the financing is not yet in place, which could lead to higher or lower order prices, depending on the particular situation. The European Commission is, however, convinced that the information entered into the analysis is at present the best

available and that the selected shipbuilding projects give a fair illustration of the abnormal financial conditions at which orders have recently been taken by Korean yards. As the cost model is constantly refined and previous analyses are updated accordingly, a final assessment can only be provided in a later report. However, as mentioned above, all parameters are set conservatively and changes should only occur in the direction of even greater differences between order price and normal building price. Another factor of uncertainty is the actual order price. Different sources often quote different prices and for larger series the individual order price might be lower because of (real or perceived) economies of scale. In this context it also needs to be mentioned that the model tries to reflect the actual behaviour of Asian competitors, e.g. costs for currency hedging are not factored in for Korean shipyards as it is known that these precautions typically are not taken.

The following tables summarises the findings so far:

*Table 3*

*Comparison of order prices and calculated construction prices for selected new ships*

	Reported order price in Mio. US Dollars	Calculated building price in Mio. US Dollars	Loss/gain in percent of calculated building price
Cable layer (Hyundai)	37.3	45.4	-17.84%
Container ship 3.400 TEU (Samsung)	36	56.4	-36.17%
Passenger Ro/Ro ferry (Samsung)	69.5	90.9	-23.54%
Container ship 6.800 TEU (Hyundai)	73.5	86.9	-15.42%
Container ship 3.500 TEU (Halla)	38	52.3	-27.34%
Panamax bulk carrier (Halla)	18.9	31.8	-40.56%
Panamax bulk carrier (Daedong)	18.5	24.9	-25.70%
Product carrier (Daedong)	21.5	24.9	-13.65%
VLCC (Daewoo)	68.5	84.3	-18.74%

At first sight the results presented in Table 3 seem to indicate that all orders investigated are loss making. However, it may be considered as acceptable business practice that a yard renounces any profit for a specific contract or accept to build a ship at a small loss if this allows it to make a strategic foray into a new market segment, provided that this does not become a permanent policy and that the loss from one contract is covered through other profitable contracts. Under these circumstances, and allowing a certain error margin for the cost model, a reported contract price of up to 10-13% lower than the calculated "normal price" could be considered as acceptable. Consequently one of the investigated orders (the product carrier from Daedong) can be seen as in line with normal business practice. The remaining eight orders are, however, clearly loss-making, with losses between 15 and 40% of the calculated normal building price. Since Halla and Daedong are technically bankrupt and have been operating under court receivership since December 1997 and February 1997 respectively, further investigation is needed to find

out why such orders are accepted and how the loss is accounted for. The cases of Halla, Daedong and Daewoo are discussed later in the report in Annex II.

There are indications that Korean yards fix vessel prices according to the level the shipyard perceives the market will bear, rather than through a bottom-up estimate, and production and purchasing targets are set accordingly. Reports indicate that Korean yards work backwards from the ship price to allocate the value to each item of supply. Often initial bid prices by suppliers are ignored by Korean shipyards and a target price is given. This policy is acceded to by Korean equipment suppliers, irrespective of the effect it may have on their own business. One European equipment manufacturer questioned has undertaken significant research into his competitors in Korea. He found that his biggest competitor published a loss of about 30% of turnover and that other Korean manufacturers were facing similar problems. As equipment suppliers in South Korea are often part of the same larger conglomerates, the so-called chaebols, as the shipyards, true costs for particular operations are difficult to establish.

### **Impact on EU yards**

A negative impact on EU yards is assumed when the order is made at a price which does not cover costs and which is low enough to keep the order out of reach of EU yards. This is particularly true if the owner has traditionally placed orders with EU yards. However, even where Asian competitors had significant market shares in the past (e.g. for container ships or bulk carriers) the depressive nature of this pricing policy will have a negative effect on the market in general and, on this basis, the price may be perceived to be injurious. Whilst this contract may not take work directly from an EU builder there will be a "trickle down" effect in the market as a whole, which will have a detrimental effect on shipbuilding in the EU.

All of the 9 orders investigated had an impact on EU yards. The key elements for the investigated cases are as follows:

- The cable layer order at Hyundai fits into the portfolio of the yard which has past experience with specialised tonnage, but the building of cable layers has so far been a European domain and the order is the first of this kind for Hyundai Mipo yard. The owner is a complete newcomer and has not ordered any ships before.
- The 3400 TEU container ship order at Samsung is common practice for this yard. The owner has, however, had a very close relationship with EU yards in the past, and this order is a major departure from past ordering practice.
- The passenger Ro/Ro ferry order at Samsung marks a departure from the traditional portfolio of the yard and for the owner this is the first order placed outside Europe. Ferries of this type and size have been a domain of EU yards and the fact that Korean competitors are targeting this market segment will put significant pressure on EU shipbuilding.
- The 6800 TEU container ships ordered at Hyundai Heavy Industries represent a class of high-tech products which are new to Korean yards. The owner has in the past ordered vessels of this size and specification in Europe (and Japan) and for this particular order a European yard competed but failed to attract the order as it could not match the price.
- The 3500 TEU container ship built at Halla represents a standard product of this yard and the owner has placed all of his container ship orders with Halla in the past. However, the price is extremely low and Halla yard seems to benefit from financial advantages that are unavailable to EU competitors (see also Annex II).
- The Panamax bulk carrier order at Halla has the same characteristics as the previous case.

- The Panamax bulk carrier from Daedong has an offer price that is below the operating costs and well below what should be regarded as an economic price.
- The product tanker built at Daedong shows a smaller gap between offer and normal building price which reflects the less fierce competition in this market segment as compared to Panamax bulk carriers. Nevertheless the price offered is well below the calculated break even price of 23.7 Mio. USD (excluding a profit, but including overheads and debt servicing).
- Given the extremely high debts of the Daewoo shipyard (6.7 Bn USD), the calculation of the costs for debt servicing has a severe impact on the normal building price as derived from the cost model. The VLCC order at Daewoo has to carry a calculated contribution to debt servicing of 16.0 Mio. USD which makes the offer underpriced. Without debt servicing the offer price would cover the total direct costs and overheads.

### **South Korean financial sector**

The conditions under which shipyards such as Halla or Daedong operate (for more details see also Annex II) merit a closer look to the South Korean banking system in general and to the way in which export and operational credits are awarded.

The Korea Export/Import Insurance Corporation (KEIC) was established by the Government of South Korea with the express purpose of guaranteeing risks related to exports borne by all Korean companies. This role has been revised and KEIC now guarantees that buyers receive their advance payments back in case a company (in this case a shipyard) goes bankrupt and the bank that has given the refund guarantee also fails to cover the payment. This basically means that buyers of Korean-produced tonnage have their payments guaranteed by the Korean State.

The Export Import Bank of Korea (KEXIM) which is fully owned by the South Korean Government provides instruments to exporters to boost South Korea's exports of capital goods such as ships. Two subject matters are of relevance here: The "export financing facility" hands out loans to shipbuilders during their production period, before the delivery of the ship. The "refund guarantee facility" guarantees the refund of down-payments when shipbuilding contracts are not fulfilled.

Under western European markets conditions these facilities could be established with interest at LIBOR + 2 to 3 percent, depending on the shipyard's creditworthiness. KEXIM provides the "export financing facility" with interest rate at LIBOR plus mark-up 2.66% plus risk premium starting at 0.25% depending on the shipyard's creditworthiness and collateral, and the "refund guarantee facility" with guarantee commissions starting at 0.4%, according to creditworthiness. Given the high indebtedness of the South Korean yards it is clear that the rates offered by the KEXIM bank do not cover the risk related to these facilities. For some Halla contracts the costs of KEXIM guarantees are reported to be 1% of the contract price because of the precarious situation of this yard. This is considered very low

As 92% of the total guarantees provided by KEXIM were for shipyards in the period of January to November 1998 the provision of export guarantees by KEXIM can, at least for this period, be considered a sector specific operation. Moreover, the fact that the bank is state owned and that the state has covered its losses by means of capital injections can be assimilated to a sector specific state aid case.

KEXIM has also taken over refund guarantees from weaker commercial banks. This additional risk is balanced through KEIC in case of failure. As a result, buyers of Korean-produced tonnage can rely on risk coverage through the Korean government, even if non-KEXIM guarantees are used.

Korea Exchange Bank, the main creditor of Halla, is owned by the Bank of Korea (32.1%), Commerzbank AG (Germany's third largest bank, 30.4%) and private investors (37.5%). Korea Exchange Bank has received fresh capital from various investors, including Commerzbank AG and KEXIM. In addition the state-owned Bank of Korea has made a direct investment of 700 Billion Won in KEXIM, to allow it continuing the provision of financial support to exporters and to raise its capital adequacy ratio. KEXIM in turn invested in the Korea Exchange Bank (thus helping, at least indirectly, Halla). Other Halla creditors are SeoulBank, Industrial Bank of Korea and the Foreign Exchange Bank of Korea, all of which are at least partially under public interest. SeoulBank, which was until recently 95% state-owned, has been declared a non-viable lender by the Financial Supervisory Commission and is now entirely under state control. Its bad loans have been transferred to Korea Asset Management Corporation, a state agency, and it remains to be seen if the credits to Halla will be treated according to standard commercial terms.

This closely knit network of financial institutions and the continued government influence in the banking sector provides the ground for a possible non-market-oriented behaviour of the creditors vis à vis the shipbuilding industry. Following a Council request the previous Commissioner for Industrial Affairs Martin Bangemann visited South Korea in May 1999 to discuss the issue with the Korean Government and the shipbuilding industry. In response to the Commissioner's oral and written inquiries, notably in relation to the possible use of IMF Funds, the South Korean Government replied that such funds are only used to bolster currency reserves and noted that they do not follow up on the use of funds once they have been disbursed to commercial banks, even if these commercial banks are under public control.

Given the particular nature of shipbuilding contracts, and the paramount importance of financing schemes, it seems crucial to gain more insight into the issue of the financial funding of South Korean shipyards.

### **Conclusions for Chapter 3**

- The shipbuilding market monitoring study commissioned by the European Commission has provided first tangible results (see above). The cost model employed is stable and suited to analyse the true costs of shipbuilding in Korean yards (the only ones investigated so far).
- None of the nine investigated orders for new vessels was clearly profit making and there are convincing indications that Korean yards offer ships at below cost price; in some cases prices do not even cover operational costs, let alone the servicing of debts.
- Halla, and to a lesser extent Daedong, exhibit business behaviour which would be considered as unacceptable in the EU. As both yards are under bankruptcy proceedings the financial context in which these yards operate needs further in-depth scrutiny. Of particular concern are past and current debt forgiveness and debt moratoria, as well as advantageous interest rates, fresh credits and guarantees for new ship construction projects.
- The financial system in South Korea, as far as it is used for the financing of shipyards and shipbuilding projects, remains opaque and, as there is substantial scope for government intervention with large parts of the banking sector being owned by the state, interference in financial and organisational matters could have occurred. Credits and guarantees given to shipyards do not follow global business practices, and such commercial risk assessment as has been undertaken does not seem to follow the laws and logic of a market economy.



#### 4. Conclusions and Recommended Actions

There can be no doubt that the market for merchant ships is in crisis. Although this industrial sector has seen problems over a long period of time, the situation is becoming increasingly critical as capacities continue to grow, competition from low-wage countries is getting stronger and prices are nose-diving. For certain shiptypes, profits from shipbuilding operations seem to be almost unachievable. This process has been dramatically accelerated by the Asian crisis.

At the onset of the crisis, Asian manufacturers did not enjoy an immediate advantage from currency devaluations. Instead, the crisis deeply affected Asia's financial sector and made ship financing difficult. The emergency measures for the revitalisation of the Asian financial markets have improved financing conditions, leaving Asian yards with competitive advantages from wage cuts and devalued local currencies.

It should, however, be recognised that Asian shipyards, in particular in South Korea, are strong competitors in their own right. Yard facilities are often state-of-the-art, the work force is skilled and flexible and the product quality matches shipowners' demands. Moreover the local supplier base is able to provide major equipment at significantly lower prices. This, however, does not excuse unfair business practices and price offers that are below costs. There are indications that injury to competing EU yards has indeed been caused to some extent and that Korean yards have received and may continue to receive support under non-market conditions from state controlled banks. This gives rise to concerns regarding possible indirect state support.

Capacity cuts in the market are necessary in order to return to a balanced and healthy shipbuilding market. Only then will prices recover to allow shipyards to operate profitably. Unfortunately the OECD agreement has not entered into force and even were this now to be achieved, capacities would not be immediately affected as the agreement does not address this issue. Voluntary capacity cuts by Korean yards, which are chiefly responsible for the increase in capacity, seem to be similarly elusive as most companies are regarded as "too big to fail" and from past experience expect the government to bail out the industry. The cases of Halla, Daewoo and Daedong indicate that further investigations on a potential indirect bail-out of these yards are necessary.

Looking at forecasts for demand and capacity, a quick improvement in the situation cannot be expected. Answers to the problem therefore need to be given under various timeframes, with more in-depth investigations on the general market developments being performed in parallel:

- Damaging or non-market business practices, in particular on the part of Korean manufacturers, need to be stopped as quickly as possible. It must be ensured that the conditions and assumptions under which the IMF-led rescue package was given to Korea and to which the Korean government agreed, are fully respected. **The IMF, in the context of the economic programme supported by the stand-by arrangement, can help to ensure that budgetary subsidies and other possible forms of government support are not given to ailing shipyards. Member States could instruct their Executive Directors to stress this point at the IMF Board.** The particular issues that need to be addressed are: the degree of state control in each of the major creditors of Korean shipyards, especially in those who participated in the debt write-offs and/or moratoria; the question of whether the latter's actions are justified under market economy criteria; the question of whether the Korean government's undertaking to the IMF not to bail out ailing companies has been fully respected in the cases of Halla, Daewoo and Daedong.

- Trade remedies are an important line of action. Traditional anti-dumping or countervailing measures are not applicable to shipbuilding as ships are not imported and since the OECD agreement has not entered into force, there are no direct instruments to combat injurious pricing. However, in the multilateral disciplines section, the "Agreement on Subsidies and Countervailing Measures" (ASCM) of the WTO (which has so far not been applied to the shipbuilding sector) provides a dispute settlement mechanism that can be employed against subsidies granted by a WTO member and causing adverse effects to the interests of other WTO members. The ASCM currently establishes a presumption of serious prejudice when it is demonstrated that subsidies of 5% ad valorem, or subsidies to cover operating losses and direct forgiveness of debts exist. Information recently collected appears, for the first time, to contain some initial indication that the debt forgiveness arrangements from which at least one Korean shipyard has benefited might constitute a subsidy within the definition of the ASCM. However, given the very strict conditions which have to be met under the Agreement, such information is clearly insufficient for WTO action to be launched at this stage. If elaborated and structured in the appropriate way, **the information collected could form the basis for the preparation and lodging of a Trade Barriers Regulation complaint by industry. This would give rise to an examination procedure during which the Commission would thoroughly investigate all factual and legal aspects of the prima facie evidence submitted** and collect additional information to substantiate an action which would meet the WTO standards and would have a chance to be successful. The appropriateness of resorting to a WTO action would then be assessed on the basis of the Commission's investigation report. In that context it is worth noting that Korea or any other WTO member could also challenge the EU state aid regime on the basis of the multilateral disciplines section of the ASCM, provided it can be established that adverse effects have occurred on the side of the complaining party.
- To support the above approach more information is urgently required on the financial structures and instruments employed in Korea in general. This includes the relationships between banks and other financial institutions active in shipbuilding, the principles under which credits and guarantees are awarded, and the probability of debt repayments under normal market conditions. **The European Commission through its continued monitoring efforts will, in co-operation with industry, continue to examine allegations of subsidisation through such activities and present its findings to the Council.**
- For the future the conclusion of **an agreement establishing a level playing field in the sector should be pursued.** It should include as many players as possible, at least the important and the emerging shipbuilding countries, and cover all important issues that need to be addressed to establish a healthy shipbuilding environment in the long run. Working Party 6 of OECD, during its last session in June 1999, agreed to aim at improved transparency in the sector by intensifying work on supply and demand and by providing governments and industry with information and analysis of the market conditions, especially in relation to the supply side. This will encompass the production of common forecasts on supply and demand to be updated annually, and the creation of a database on prices of vessels. In addition to the transparency exercise on recent policy developments this will provide a forum to exchange views on capacity and potential price problems. **Member States should give maximum support to this approach.** Notwithstanding the clear difficulties of putting a global shipbuilding agreement in place in the near future, efforts must continue in this direction.

Maritime business is a global one by its very nature, and the shipbuilding market has become subject to globalisation earlier and to a greater extent than other capital goods markets. The distortions resulting from different business cultures and practices, including the level of state intervention and the attitude towards such intervention, should not be accepted as an unavoidable side effect of globalisation. Rather these distortions need to be addressed proactively before the market balance is finally and irreversibly destroyed.

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### Details of cost model used

The cost model employed for the shipbuilding market monitoring study (see chapter 3) distinguishes between the following items:

- Material costs (steel, engine and propulsion system, auxiliary engines, automation and control equipment, cargo handling and cargo treatment equipment, specialised equipment, etc.);
- Labour costs (engineering, administration, management and production) both in-house and concerning sub-contractors;
- Financing costs including guarantees, etc.;
- Other direct costs such as classification costs, risk insurance, warranty reserve, commissions, etc..

The estimate of material and equipment costs in the cost model is based on an estimate of costs within the EU, and applying a variation factor which takes account of the fact that material and equipment prices are lower for Asian competitors. This has been accomplished by undertaking a survey of over 100 equipment manufacturers within Europe who are competing against domestic suppliers in Asia for contracts in Asian yards. In each of the categories the prices offered by South Korean manufacturers to domestic buyers were found to be approximately 25% lower than the equivalent price in the European industry. This competitive advantage is taken into consideration in the model.

The analysis of wages is based on officially published statistics. In the case of South Korea there has been much talk of wage cuts since the economic crisis. The cost model evaluates the actual extent of this fall in wages. The conclusions drawn from this analysis are that whilst there was, as expected, a decrease in wages in 1998 over 1997, following the economic difficulties, the decrease was fairly low and was certainly lower than press reports of 50% wage cuts (and more) have suggested. It also appears from the statistics analysed that there has been little resolve to maintain lower wages, with the recovery in earnings heralded by the very large bonus payment at the end of 1998, following a year of restraint. Further analysis has been carried out to take into account the effect of exchange rate changes on the level of earnings expressed in US Dollars. Dollar equivalent earnings fell by almost 50% between October 1997 and February 1998 but have been rising since that time. Taking into account the average over the period February to December, dollar denominated earnings fell by 34% between 1997 and 1998. The average for first quarter 1999 was around 20% below the same period in 1997.

Assumptions on total working hours are also based on official statistics, complemented with a specific adaptation of the figures to the shipbuilding industry. The same approach is used to evaluate the overall productivity of Asian shipyards, taking industrial productivity in general as a basis and adapting it to the specific situation of each yard under investigation. Productivity is expressed as man-hours needed to produce one cgt at the facility in question.

Direct financing costs included are those for the working capital for the contract and those for the repayment guarantees. The contribution that each order has to make to the debt servicing of the building yard (if there are debts to be serviced) is included under indirect costs. However, where yards received debt forgiveness, these debts are no longer considered.

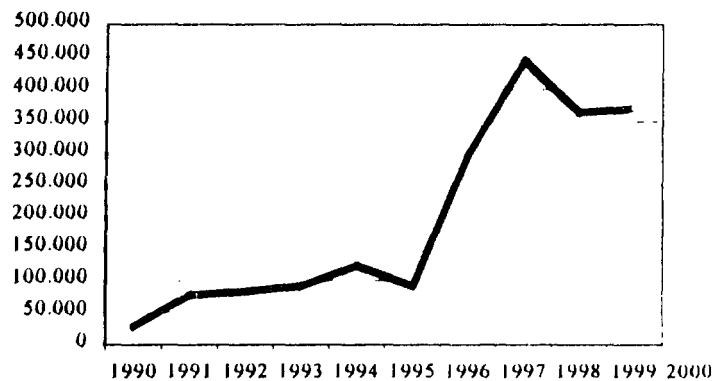
For each selected order the items mentioned above are specified and complemented with assumptions on indirect costs such as overhead, yard-specific amortisation of shipbuilding equipment and profit margin. It is obvious that many elements in the cost model can only be specified through in-depth knowledge of the particular ship on order and the building yard. The analyses are continuously updated as soon as additional information becomes available.

## Details of investigated shipyards

### A. Case of Halla shipyard

Shipbuilding operations at Halla were transferred from the original site in Incheon to a purpose-built new facility in Mokpo, known as Samho, in 1996. The new Samho shipbuilding facility, operated by Halla Heavy Engineering (HHE) boosted the capacity of the shipyard by around four times, and Halla now ranks the 5th largest shipbuilder in the world. The average output from Samho in the three years since it became fully operational (operations commenced in 1996) has been 430,546 cgt (including expected output in 1999). The output from Halla (including Incheon and Samho) in terms of cgt by year is illustrated in the following chart.

Fig. 6  
Development of Halla's shipbuilding output (cgt), 1990-1999



The boost in output following the hand-over from Incheon to Samho in 1996 is clearly visible from this chart. The yard has been troubled since its opening, suffering from problems of design of the facility, and from its location on the East Coast of the country, away from the main areas of shipbuilding employment at Ulsan and Busan. Soon after becoming operational it was clear that the design of the yard was inadequate to achieve the steel throughput needed to meet the capacity target. The inadequate design of the facility leads to performance penalties which are further increased by the dated systems installed in the yard to support production. Performance also suffers because of the location of the shipyard. Higher wages than paid by other shipbuilders have had to be offered to attract workers to the region, and the quality of workers employed is not thought to be as high as found in other main shipyards in South Korea.

In December 1997, South Korea sustained one of its largest corporate failures with the collapse of the Halla Group. Halla has since survived with intensive financial restructuring. This has included one of the most important component parts of the group, the shipbuilding subsidiary HHE. Despite bankruptcy the shipyard is still operating with the support of its creditors (with Korea Exchange Bank as the main creditor). Support has taken two primary forms, debt forgiveness and bridging finance from the international finance markets.

HHE has been generating a net loss in 1996, 1997 and 1998 (the period after Incheon closed and operations were moved to Samho). The shipyard has failed to make even an operating profit. The accounts indicate that Halla has been pricing contracts at a level which does not cover direct cost of

sales, let alone contribute to selling and administrative expenses and other costs, notably the cost of financing the new facility. The level of these operating losses is very high, at 17,5% of sales in 1997 and 29,5% of sales in 1998. This strongly suggests that the level of pricing was very significantly below costs and that the company has a very fundamental problem in operational terms.

Since December 1997 HHE has been under court management, a form of official receivership. It has continued to compete for shipbuilding work in the international markets. Various reported shipbuilding contracts at extremely low prices have aroused a hostile reaction from competitors on the grounds that the company has received illegal finance. These contract prices are well below the international average, and based on the trading history of the company there is a very legitimate concern that the company may be continuing to take orders at a loss-making level, in the face of an urgent need for orders to utilise capacity from next year onwards.

In November 1998, Halla announced that the creditors of HHE had agreed to write-off up to 52% of the company's collateralised debt and 78% of unsecured debt. In addition, interest charges were waived from much of the remaining debt. The debt reduction amounted to 978 Billion Won (742 Million US Dollars). The overall debt amounted to 3,6 Trillion Won at the time. Most of the financial creditors of HHE were major domestic banks in South Korea who collectively had sourced funds on the international markets for economic stabilisation.

The rescue package for HHE has caused considerable controversy not only because of the size of the funding required, but also because many of the company's debt problems originate from the construction cost of the new facilities in the early 1990s. Further concern has been expressed on the continuation of KEXIM bank to offer guarantees to Halla which is in effect bankrupt, and which in a normal commercial sense would not be available. KEXIM argues that it charges a premium to take this into account, although it is unlikely that a company such as Halla would be able to attract such guarantees in a purely commercial situation.

Due to the serious problems at Halla all efforts to sell the yard have so far failed. Hyundai which was rumoured to be interested in the yard has frequently denied this, but seems now to have agreed to take over Halla's management and send 150 top executives to help in the reorganisation of the yard. At the same time another debt moratorium has allegedly been agreed. Given the prominent role that state-controlled banks play with regard to Halla, providing finance and participating in the debt write-offs and moratoria, these developments require further scrutiny, as far as possible government intervention is concerned.

As the cases of Daedong and Daewoo show a similar patterns as Halla a few words need to be said about these two shipyards.

#### **B. Case of Daedong Shipbuilding Co.**

Daedong Shipbuilding Co Ltd is a private limited company, registered in South Korea in 1967. Daedong is solely involved in shipbuilding. Its main construction site moved from Pusan to a brand new shipyard at Chinhae, 40 miles down the coast from Pusan, in 1996. As of February 1997, Daedong has been operating under a court protection plan. Daedong is currently trading under a corporate reorganisation package approved by the courts. Between February and October 1997 the company operated under the direction of a court-appointed receiver, who put together a restructuring package which aims to enable Daedong to pay back creditors over an agreed period of time and the yard to carry on trading. This plan was accepted by the courts in October 1997, and permitted the company to continue operating in receivership. The company's main creditors finally approved the rescheduling of

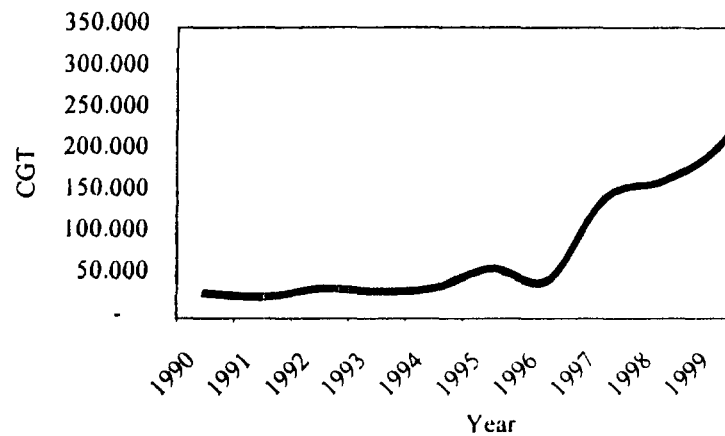
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the debt in August 1998 (Daedong's total debts are ca. 204 Mio. USD). Under the reorganisation plan Daedong has agreed to repay its debts over a period of 14 years (1998-2012) at an interest rate of 7% to 8%, and it has been granted a moratorium on repayments until 2003. Until then, the company will have to pay interest on its debts, but will not be required to repay any of the principal. Although Korea emphasises that the rescue measures for Daedong were taken by independent private creditors, it is at least questionable whether these measures are compatible with the market oriented practices Korea has committed itself to in the context of the IMF reform programme.

Daedong's original shipyard in Pusan specialised in the construction of chemical tankers, product tankers and mini-bulkers up to 10.000 tonnes deadweight. Daedong's new yard opened in June 1996, and the new capacity effectively replaced the existing capacity at the Pusan yard.

Output from the two yards since 1990 is presented in the following graph.

*Fig. 7  
Development of Daedong's shipbuilding output (cgt), 1990-1999*



The boost in capacity following the opening of the new yard in 1997 is clear from this chart. Output has increased from a steady level of around 50.000 cgt per annum in the old yard to in excess of 300.000 cgt on order for delivery in 2000.

After all the problems encountered during 1997 Daedong achieved relatively strong results in 1998. Sales were increased by 32%, while direct costs were better controlled and rose less steeply, to allow gross profits to be doubled. The company's 1997/1998 balance sheet shows that, although the long-term debt total was virtually doubled, the short-term debt was sharply reduced. It should be noted that Korean interest rates fluctuated greatly during the course of 1998 with a fall in commercial paper rates from 23% in the first quarter to 8% in the last quarter. These movements are likely to have contributed to the reduction in interest charges for the year. However, a Daedong management spokesman has indicated that when the banks approved the debt rescheduling in August 1998, they reduced their interest rates. If this is the case, it raises the question why banks have abandoned market-oriented lending practices.



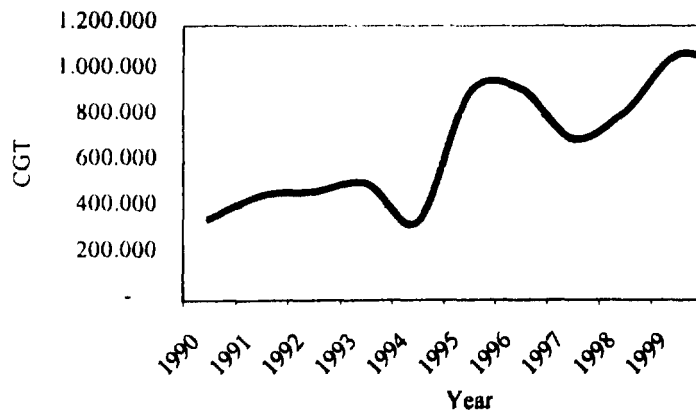
### C. Case of Daewoo Heavy Industries

The Daewoo Group is one of Korea's top 5 conglomerates or chaebol. It is active in a wide range of business sectors, including electronics, shipbuilding, automotive, construction, trading and financial services. The group is headed by the publicly quoted Daewoo Corporation, which was formed in 1967 by its current Chairman, Mr Kim Woo-choong. Apart from its role as parent company, Daewoo Corporation manages the group's construction and trading activities.

As part of the general Korean government attempt to induce a reorganisation of the chaebols' businesses, Daewoo is currently in the midst of a major divestment programme aimed at selling 31 of its 41 group companies by early 2000. The chaebols seem to be responding to the enforced change with varying degrees of enthusiasm and most are reluctant to sell off profitable businesses. Nevertheless, Daewoo's own programme has been given a much greater urgency as it has become increasingly clear that the group is teetering on the edge of bankruptcy. The Korean government is acutely aware that it cannot afford a failure on this scale for the sake of the economy as a whole. The short-term debt was originally due for repayment at the end of July but it has been reported that the bankers have agreed to roll over the debt for another six months. The new funds will replace debts called in by creditors in the last couple of months. At the same time, the creditor banks will be able to dispose of the collateral in any way they see fit if the group does not keep to its restructuring targets. The Korean government has commissioned Arthur Andersen to oversee the restructuring in an attempt to show that the plan will be executed fairly.

In addition to the group reorganisation, Daewoo Heavy Industries (DHI) under which the shipyard operates, is itself restructuring. It is reported that it is selling off various business units and real estate, and the sale of its car division to Daewoo Motor was the key to it being able to increase its net profits in 1998. DHI is regarded as fundamentally one of the most profitable parts of the group. DHI has in the meantime come under control of local banks, but the question of collaterals is still being discussed. The shipbuilding division of DHI operates two shipyards: the Okpo Shipyard in South Korea and the Mangalia Shipyard in Romania. The Okpo yard is active not only in shipbuilding but also in repair and conversion, and production of offshore platforms, drilling rigs and industrial plants. The Mangalia yard specialises in repairs and conversions. Output since 1990 is presented in the following chart.

Fig. 8  
*Development of DHI's shipbuilding output (cgt), 1990-1999*



The latest accounts of DHI to be published are for the year ended 31 December 1998. Whilst improved pre-tax and net profits might suggest a steady improvement in the company's performance during

1998, a closer inspection reveals that this is too simplistic an interpretation. Despite an 11% climb in sales, this was outstripped by the increases in both direct sales costs and overhead costs, resulting in a decrease in profits at gross and operating levels.

There is little hard information available regarding DHI's specific debt repayment plans. As stated, the company's gearing at the end of 1998 can be considered quite healthy when compared with the current average for Korean shipyards. Nevertheless, much of the Daewoo group's future appears uncertain at present and there are disturbing reports that the Financial Supervisory Commission of South Korea has decided to soften the rules for Daewoo's domestic creditor banks, basically exempting them from domestic regulations governing lending practices and allowing them to add non-performing loans during Daewoo's restructuring process.

### Annex III

Data for Fig. 1: Completed ships 1985-1998, supply and demand forecasts by AWES/SAJ and KSA, in Mio. cgt

Year	1985	1986	1987	1988	1989	1990
<b>Completed ships 1985-1998</b>	14,20	12,10	9,20	8,50	9,30	11,50
<b>Demand forecast AWES/SAJ 1999-2010</b>						
<b>Demand forecast KSA 2001-2005</b>						
<b>Supply forecast AWES/SAJ 2000-2005</b>						
<b>Supply forecast KSA 2000-2005</b>						
<b>Year (cont.)</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
<b>Completed ships 1985-1998</b>	11,40	12,10	12,40	12,50	14,40	16,70
<b>Demand forecast AWES/SAJ 1999-2010</b>						
<b>Demand forecast KSA 2001-2005</b>						
<b>Supply forecast AWES/SAJ 2000-2005</b>						
<b>Supply forecast KSA 2000-2005</b>						
<b>Year (cont.)</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>Completed ships 1985-1998</b>	16,90	18,00				
<b>Demand forecast AWES/SAJ 1999-2010</b>			15,60	15,60	15,60	15,60
<b>Demand forecast KSA 2001-2005*</b>					16,80	16,80
<b>Supply forecast AWES/SAJ 2000-2005</b>				21,14	21,66	22,18
<b>Supply forecast KSA 2000-2005*</b>				16,79	17,08	17,38
<b>Year (cont.)</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Completed ships 1985-1998</b>						
<b>Demand forecast AWES/SAJ 1999-2010</b>	15,60	15,60	16,49	17,38	17,38	17,38
<b>Demand forecast KSA 2001-2005*</b>	16,80	16,80	16,80			
<b>Supply forecast AWES/SAJ 2000-2005</b>	22,69	23,21	23,73			
<b>Supply forecast KSA 2000-2005*</b>	17,68	17,98	18,27			
<b>Year (cont.)</b>	<b>2009</b>	<b>2010</b>				
<b>Completed ships 1985-1998</b>						
<b>Demand forecast AWES/SAJ 1999-2010</b>	17,38	17,38				
<b>Demand forecast KSA 2001-2005</b>						
<b>Supply forecast AWES/SAJ 2000-2005</b>						
<b>Supply forecast KSA 2000-2005</b>						

\* Due to lack of cgt data the KSA forecasts were re-calculated from completed gross tonnes applying a conversion factor.  
(1 gt = 1,6 cgt)

Source: OECD and European Commission

v

**Data for Fig. 2: Construction capacities in Japan, Korea and the EU, cgt \* 10<sup>3</sup>**

<b>Year</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>
<b>EU</b>	4400	3684	3783	3311	3489	3264	3285	3168	3168	3168
<b>JAPAN</b>	5600	5600	5600	5600	5600	5600	5600	5600	5600	5600
<b>S. KOREA**</b>	1671	1633	1821	1841	2648	2437	2270	3619	4307	4648

\*\* Due to lack of cgt data the figures for South Korea were calculated from completed gross tonnes, using OECD data and applying conversion factors that reflect the evolution in the product mix of Korean yards.

(1988-1991: 1 gt = 1,9 cgt; 1992-1994: 1 gt = 1,8 cgt; 1995-1997: 1 gt = 1,7 cgt)

Source: OECD, Lloyd's Register of Shipping and European Commission

N.B.: Figures are based on national statistics using partly different definitions.

**Data for Fig. 3: World market shares by country/region, 1997, 1998 and 1st half of 1999, cgt and percent, orders**

	1997		1998		1. half 1999	
	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %
EU	2950,4	14,09%	4513,3	24,58%	1346,3	17,13%
REST OF AWES	473,1	2,26%	725,7	3,95%	332,5	4,23%
JAPAN	7930,4	37,88%	5741,8	31,28%	2228,5	28,35%
SOUTH KOREA	6115,9	29,21%	4486,8	24,44%	2272,4	28,91%
USA	331,4	1,58%	345,6	1,88%	324,3	4,13%
OTHER	3133,8	14,97%	2545,8	13,87%	1356,2	17,25%
<b>GRAND TOTAL</b>	<b>20935,0</b>	<b>100,00%</b>	<b>18359,0</b>	<b>100,00%</b>	<b>7860,2</b>	<b>100,00%</b>

Source: Lloyd's Register of Shipping and European Commission

**Additional data: World market shares by country/region, 1997, 1998 and 1st half of 1999, cgt and percent, completed**

	1997		1998		1. half 1999	
	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %
EU	3246,4	19,09%	3585,7	19,92%	1345,2	15,18%
REST OF AWES	784,2	4,61%	881,4	4,90%	365,6	4,13%
JAPAN	6294,9	37,01%	6834,4	37,96%	3363,3	37,96%
SOUTH KOREA	4053,3	23,83%	3656,2	20,31%	2426,9	27,39%
USA	129,0	0,76%	360,4	2,00%	157,3	1,78%
OTHER	2501,5	14,71%	2686,0	14,92%	1202,9	13,57%
<b>GRAND TOTAL</b>	<b>17009,3</b>	<b>100,00%</b>	<b>18004,1</b>	<b>100,00%</b>	<b>8861,2</b>	<b>100,00%</b>

Source: Lloyd's Register of Shipping and European Commission

**Data for Fig. 4: World market shares by shiptype, 1998, cgt and percent (orders)**

	cgt*10 <sup>3</sup>	share in %
CRUDE OIL TANKERS	2688,7	14,65%
PRODUCT AND CHEMICAL CARRIERS	1646,7	8,97%
BULK CARRIERS	2548,3	13,88%
GENERAL CARGO SHIPS	1969,9	10,73%
FULL CONTAINER HIGH SPEED LINER	3163,4	17,23%
Ro-Ro VESSELS	441,4	2,40%
CAR CARRIERS	780,2	4,25%
GAS CARRIERS	637,8	3,47%
FERRIES	553,2	3,01%
PASSENGER SHIPS	1632,2	8,89%
FISHING VESSELS	336,2	1,83%
OTHER NON CARGO VESSELS	1692,7	9,22%
OTHER VESSELS	268,3	1,46%
<b>GRAND TOTAL</b>	<b>18359</b>	<b>100,00%</b>

Source: Lloyd's Register of Shipping and European Commission

**Data for Fig. 5: Market shares of Japan, South Korea and the EU in container vessels  
(orders, based on cgt), 1997, 1998 and first half of 1999**

	1997		1998		1st half of 1999	
	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %	cgt*10 <sup>3</sup>	share in %
<b>EU</b>	581,8	23,92%	485,2	15,34%	164,0	14,63%
<b>SOUTH KOREA</b>	368,3	15,14%	1395,1	44,10%	765,1	68,25%
<b>JAPAN</b>	1085,2	44,62%	672,7	21,27%	99,0	8,83%
<b>OTHERS</b>	397,0	16,32%	610,4	19,29%	92,9	8,29%
<b>WORLD TOTAL</b>	2432,3	100%	3163,4	100%	1121,0	100%

Source: Lloyd's Register of Shipping and European Commission

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