

Trends in Shipbuilding: The Class Perspective

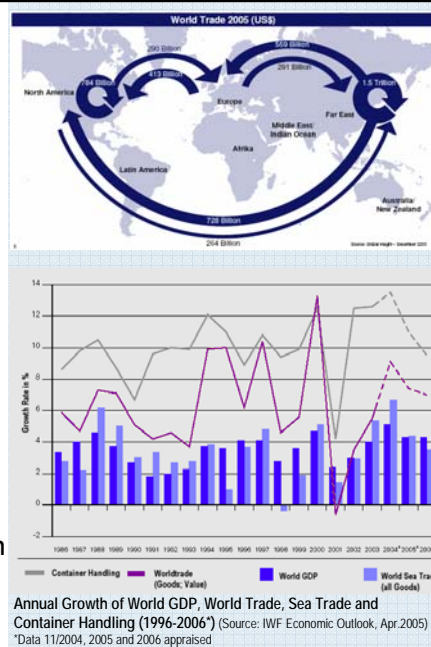
Y C Lam (Speaker) Dr V Wasmansdorff; V Wronka

16th May 2007



Globalisation

- Globalisation is nothing new in history
 - Roman Empire, Commonwealth
 - Admiral Zheng He
- Shipping, world trade and GDP are linked:
 - Each one percent growth of world domestic product causes nearly doubling of growth in world trade
 - World trade growth causes a similar or higher growth in sea trade or container handling
- Asia, as future GDP-hot spot, will change these relationships
 - Inter-Asian trade boosts cargo shipped
- Containerisation is the key to globalisation as one worldwide accepted standard
 - TEU/FEU is the single worldwide accepted standard



Shipbuilding Industry

- After World War II ship building became a European industry in which Britain took the lead
- Japan developed as shipbuilding country No.1, by constructing carriers for the oil thirsty world
- Korean yards took over in creating the work horses for global goods' exchange
- Asian yards entered the path and China will soon become the leader in shipbuilding by GT
- Main tonnage output of newcomers will be absorbed by their own countries' growth



Cargo vessel of the Sixties of last century. Unique and beloved by the operator

New limits in ship construction reached in the Eighties by VLCCs for an oil thirsty world

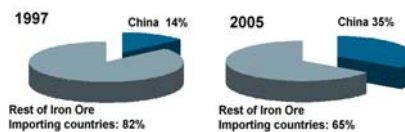


Development of containerships from a substitute of general cargo vessel into a global logistic concept in the Nineties



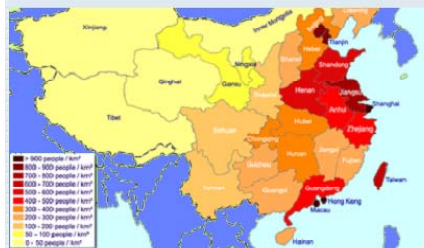
The China Factor

- China's economic growth adds each year a GDP surplus comparable to the GDP of Italy
- China's recent demand of bulk and liquid cargo boosted charter rates
- New trade routes – long haul or mid-distances – established
- China's population is dense at coastal and Yangtze river areas. Transport can best be performed by vessels
- China is the Asia powerhouse No. 1 in economic growth



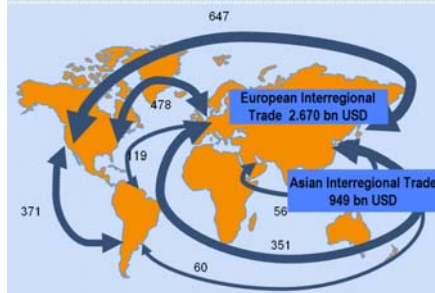
China's world share of ore imports rose dramatically during the last decade

Map of China: Dark red areas indicates > 900 people per km² ; Light yellow areas indicates < 50 people per km²



Asian Economy in 21st Century

- The developing power-houses of Asian trade and production are countries with coastlines and harbours
- The inter-regional trade of raw materials, intermediate products and consumer goods will be performed by vessels to the tune of 90%. An even higher demand in future.
- Asian governments started huge infrastructure projects (ports and terminals in China, India and Vietnam)

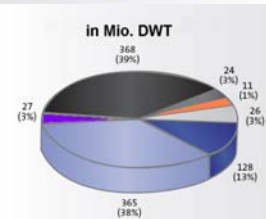
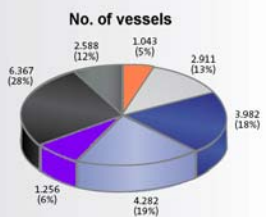


ASIA – Workbench of global economy:
Trade volumes in billion USD (Source: WTO)

Development of Global Fleet

- The fleet in the past was different from today. Small vessels carried small quantities of different cargo around the globe at low speed
- New limits in size and propulsion were reached by VLCCs in the late seventies
- Container as the single worldwide accepted transport standard turned shipbuilding from a single production to serial production business
- World energy demand will change the shares of global fleet segments. We will see more gas tankers and specialized tankers for the distant oil exploration in rough and icy waters

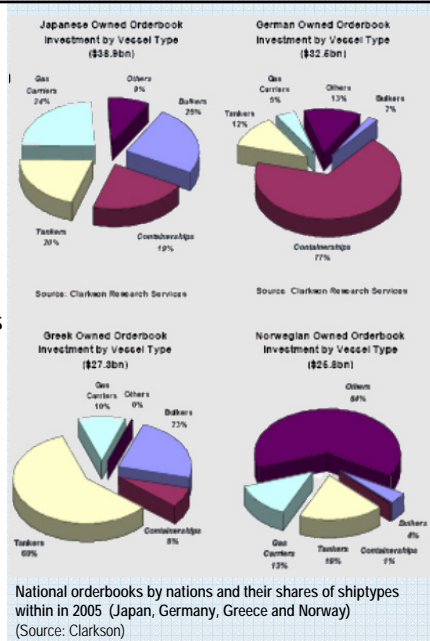
Structure of world fleet 2007; number of vessel and mio. tdw (Clarkson Research Studies, Shipping Intell. Weekly, January 2007)



- Container
- Tanker
- Gas Tanker
- Bulk
- General Cargo
- Multipurpose-Carrier (MPC)
- Others

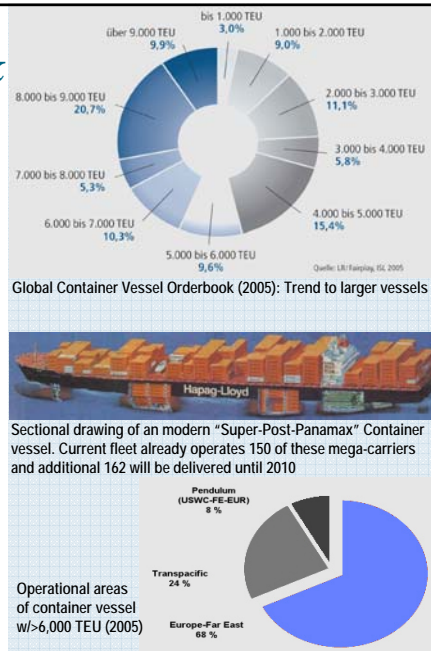
Global fleet: Orderbook by Shipping Nation

- National fleets will be more focused and specialized on selected ship types
- This reflects the higher specialization in operating modern vessels
- This trend is enforced as shipping becomes a crucial part of global industries
- These industries demand specific regulations. A ship operator and his suppliers have to perform
- This was initiated by the "oil majors" in order to keep the supply of oil safe and reliable. These additional industry regulations are maximized in LNG shipping
- In consequence, a typical ship finance scheme for tankers is slightly different from a scheme for container vessels



Container Vessel Orderbook

- Over the last decade, the size of container newbuildings grew dramatically
- The Asian crisis 1997/8 forced Asian yards to lower prices to a level at which liner companies and tramp operators could not resist to buy
- Almost annually the size record was beaten by even larger container vessels
- Due to "economics of scale": plus 100% capacity at only 30% cost increase
- These "Jumbo Carriers" serve the main trade lines via Pacific and Indian Oceans
- Fortune I: These vessels are cost effective and promote the transport of more goods per container
- Fortune II: These vessel are inflexible and that kept container charter rates high



Current Container Market

- Although the container fleet grew strongly during the first order wave (1998-2001) the demand remains strong
- Slow ordering end of 2001 caused an imbalance in the years 2003/4. In consequence, the charter rates reached a peak in 2005
- The expected downturn of charter rates by the growing fleet is moderate, because of
 - increased inter-regional container trades in Asia
 - due to increasing trade within the emerging countries
 - due to larger and more cost effective "Super-Post-Panamax" container vessels.
- There is a strong demand for feeder services to transport containers to their final ports
- Post-Panamax vessels increase demand for feeder vessels. Therefore charter rates remain high in face of an orderbook of 50 % growth in TEU and 33 % in no. of vessels by 2010



Regional shares of container movement 2005 (FHH, Hamburg)



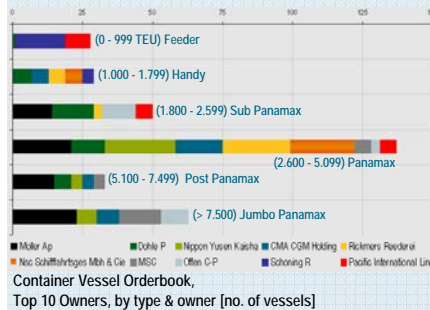
Containership Timecharter Index
Timecharter Index of all container segments
(2006 Dr. Peters, Dortmund)

Container Vessel Outlook

- The imbalance of container handling and container fleet will be eased in future by:
 - Shortage of onshore infrastructure
 - Growing feeder services
 - Rising demand of container services at distant locations
 - Reduced speed of large container carriers
- Orderbook trends
 - Liner Companies tend to order larger carriers
 - Tramp operators concentrate on the Sub-Panamax carriers
 - KG-Finance backed operators (e.g. C-P Offen) split their involvement:
 - Jumbo Panamax carriers for long term charter to the major liners and
 - Highly flexible Sub-Panamax vessels for own services



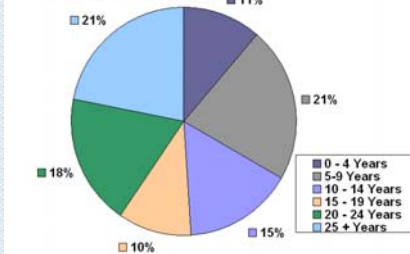
"1 TEU coastal feeders" in West-Africa (Source unknown)



Multi-Purpose Vessel

- Multi-Purpose Fleet suffered from rising containerisation
- Due the development of distant economies, demand in project cargo has increased in the past years
- "Non containerable general cargo" grew on low scale but steadily by 3% p.a. over the last 20 years
- The MPV fleet consists of about 3,600 vessels. About 1,100 vessel (or 9% in tdw) are small with an obsolete design that hardly matches today's demand
- Modern successful MPV like Large Heavy Lift Series (operated by Rickmers, for example), are able to carry containers (up to 2,800 TEU), bulk and project cargo at high speed across the seven seas

Age of MPV global Fleet



Age structure of the MPV global fleet. More than 50% of the vessels are older than 15 years and 39% are older than 20 years.

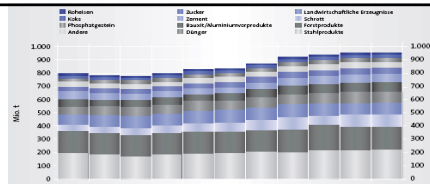
"MS Rickmers Seoul":

Fast, large and "state of the art" Multi-Purpose Vessel

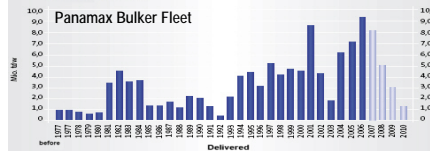


Bulk Carrier Market

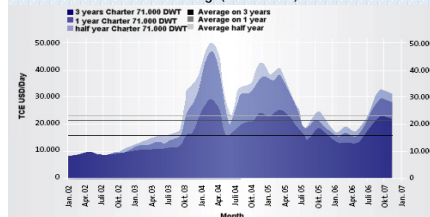
- China's demand for ore and coal boosts the demand in the bulker segment
- Advantage for ship owners: booming economies need these goods for their expanding steel production
 - China is consuming 42% of world ore exports for production of ~ 350 mio. tonnes of steel
 - Volume of bulk cargo increased by 25% up to 2,5 bn. tons during the last 5 years
- Over-aged global Bulker fleet is a threat
 - 37% of the fleet is older than 20 years
 - 1,300 handy-size bulkers out of a fleet of 2,200 vessels is older than 20 years



Sea borne trade - Minor Bulk (1997-2007)* *forecast (FH Hamburg)



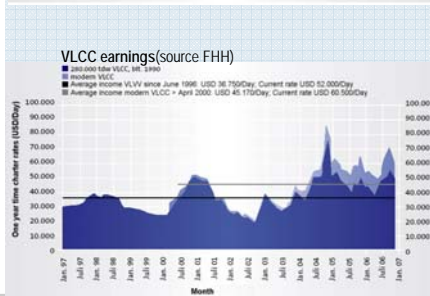
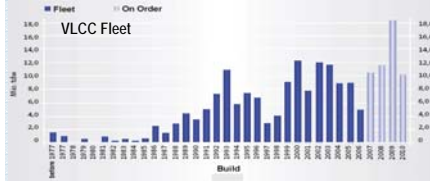
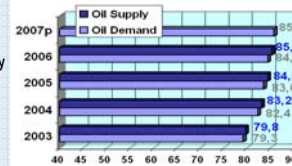
Panamax Bulker Earnings(source FHH)



Tanker Market

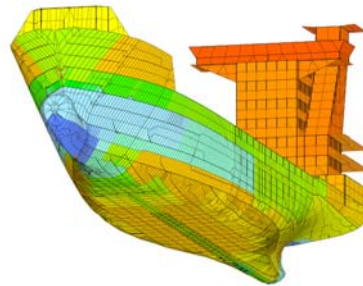
- Crude oil tanker represents 66% (tdw) of the fleet consisting of crude oil-, product, chemical- and gas tankers
- Global oil consumption increased in the last years moderately in a range of 2-3% p.a. In contrast, China's oil imports increased 9-15% p.a. in the same period
- Changing trade routes towards Asia is one main factor boosting tanker rates. Other factors are:
 - Double Hull Introduction
 - Political (Venezuela, Iran)
 - Oil Infrastructure - storm damages (USA)
- In the trend to save and and to switch to clean energy, gas tankers play an increasingly important role

Global oil demand vs. global oil supply [2003 – 2007] (forecast)
(source: International Energy Agency (IEA))



Shipping in ICE Areas

- Shipping is expanding to ice covered areas in order to explore raw materials
- In the past, only few general cargo vessels and small tankers were ice classed. Today even larger tankers up to Panamax size are ice classed
- GL is the most experienced ice class society. Nearly 1/6 of GL registered fleet (or 1,000 vessel) is equipped with ice class acc. to Finnish-Swedish regulation
- The EU initiated "SAFEICE" Project has nominated GL as the classification society to improve construction and management rules for vessels with ice class



POSEIDON* image of steel plate strength of a 800 TEU container vessel with GL E4 (highest) ice class. Blue areas indicate triple strength compared w/standard steel

50,000 tdw product tanker MT Arctic Breeze (built by STX in 2006) in ice operation. This vessel is one of more than 250 GL ice classed Tankers



Operational Class Services: SRA and ERS

- Nowadays the demand of ship operators is much higher than in the past
- Ship operators face the need to operate their vessels on a 24/7 basis
- GL acts proactively in order to combine new technologies, helping customers to increase their performance (SRA)
- GL issues tailor-made services (IMO pilot).
- GL actively monitors oncoming regulations (IMO, ICAS, flag state or a third party) in order to help the operator to be prepared of future regulations (ERS).

"Imagine a car navigation which knows all the rough streets. Never touched one, the value of your car will be much better"



Shipboard Routing Assistance (SRA). The System knows the hull strength of the vessel determined by GL design software POSEIDON. Bad weather and wave conditions will be detected by sensors and the system calculates the resulting forces influencing the hull structure. These Data will be displayed in diagrams (see above) allowing the crew to set course with minimized stress on the hull.

"24/7, a GL-Team of experts is prepared with all structural data of your vessel, to minimize damages at a disaster"

In case of a disaster, ERS/ Emergency Response Service delivers the operator instantly all related data and structural recalculation to prevent the vessel from further damage



Thank you for your attention!

