

Analysis of the Shipbuilding Industry and Potential of China

Yasin GULTEKIN

A dissertation submitted in partial fulfilment of the requirements
of London Metropolitan University for the degree of
Master of Science in International Trade and Transport

September 2009

Declaration of authorship

I, *Yasin GULTEKIN* hereby declares that the material contained in this dissertation is my own work, and that all material drawn from other sources has been fully acknowledged and referenced.

Signature

Date: 03 September 2009



ACKNOWLEDGMENTS

I should like to thank:

- My tutor Dr. David Glen, for his supervision and advice during the time that I was writing this dissertation. I would also like to thank my first supervisor Dr. Heather Leggate for her help during the planning and developing my report.
- My parents, for all the help and support they have provided during my studies.

Without the above-mentioned help, this dissertation would never come to an end. As any dissertation, this specific one may also include errors and omissions the responsibility of which will be entirely on my own account.

Abstract

The shipbuilding industry has been part of the global economy, and they have to face new competitors over and over again. In the second half the 20th century, the economic positions of the traditional maritime countries were challenge by newly industrialized countries. As a result of this new challenge the shipbuilding industry has changed place from the earlier dominating region Europe to Asia. Even within Asia there has been a struggle to gain the top position where South Korea claimed the top position leaving Japan and China behind, while China has also jumped ahead of Japan to become the second player. Moreover, the positions these countries have gained are not just within the Asian region but are on a global level.

In general, the objective of this study is to make general analyze of shipbuilding sector; how the shipbuilding industry works and is structured, what has been changed during the last century. What are the reason of the global shifting in shipbuilding industry and structural changes in major shipbuilder countries?

In 2008, Chinese accomplished shipbuilding output was 28.81 million deadweight tonnages, rising by 52.2% of last year. But the recently undertook ship orders were 58.18 million deadweight tonnages, a reduction of 40.9% of last year. Recently shipbuilding industry unpredictable for future improvement like many industries, but china could get out of tough market circumstances quicker with more advantages than other shipbuilder countries.

According to this study probably the Chinese industry will take a leading share of the world market within the coming decade. That is the hypothesis of this report. Therefore, in this study, it is analyzed recent and past industry after that it focuses on behind of the positive reasons such as low labour cost and law material advantages.

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CHAPTER: 1

INTRODUCTION

World trade has grown rapidly in the last 50 years and it is clear that demand for shipping services grew significantly the same time. According to LMIS, 2003 about 77% of world's merchandise trade was moved by sea transport. The same time demand for new vessels also grew rapidly. Therefore, the shipbuilding sector is one of the most essential sectors, which is playing significant role in shipping market. Many investors, even who have never attended any business regarding to shipbuilding, ship operating or chartering before were attracted to these markets by high freight rates and good revenues. Shipyards were overbooked by new orders and ship owners were ready to pay more than previous price for new vessel every single year during upward market. This fact pushed up prices on second hand market as well as for ship repairs. Owners tried to sail vessels as long as possible. For instance, with high rates in dry bulk sector, many owners decided to rebuild their old single hull tankers, which are banned in many parts of the world at the present time, to bulk carriers and they were successfully in their intentions.

Established shipbuilding nations are constantly challenged by new entrants with more advantageous factor costs which lead to dramatic adjustments in these sectors. The once dominant position of Europe was successfully challenges by Japan, which in turn was challenged by South Korea, which in turn is being challenged by China. It widely anticipated in the shipbuilding market that the Chinese industry will take a leading share of the world market within the coming decade.

Opportunities in the Chinese shipping market are abound. It is clear that, the recent success in China's rapid economic development has made it one of the most attractive shipping markets in the world. The maritime market in China is being flooded by foreign investment from several different sectors and industries.

The main purpose of this study finds reasonable factors how China could be world shipbuilder leader country in future. There are many reasons in China for taking advantage for future such as;

Huge ship market

Low labor cost

Government's policy supports

Abundant raw materials (steel)

Development of information technology etc...

In the dissertation, it will consider every single reason elaborately and it also looks at market situation and recent development of shipbuilding market such as affect of recent crisis.

After introduction, the second chapter of this study is methodology. The aim of this chapter is to demonstrate the methods that are adopted to research the proposed problems. Therefore this chapter consists of brief discussion about main data collection methods, data analysis methods.

The third chapter is literature review. The aim of this chapter is to explain examine the previous scholars related to shipbuilding evolution in different countries especially in China and how shipbuilding sector works and structured.

Fourth chapter of this study is statistical data analysis. The aim of this chapter is to demonstrate past and present numerical analysis to shipbuilding sector, the analyse gives us foreknowledge regarding to shipbuilding market trend in the world.

The fifth chapter focuses on which factors can help to China for leading in the shipbuilding industry. As it mentioned above there are many reasons for that.

Sixth chapter of this study is research background. The aim of this chapter is to provide brief information about Effects of recent global economic crisis in shipbuilding sector and what kind of precaution has been done by states against severe circumstances.

Seventh chapter of this paper is conclusion part of the study and also consists of suggestions for future Chinese shipbuilding sector.

CHAPTER: 2

2.1 METHODOLOGY

The study has to answer of these questions in order to achieve objectives and hypothesis.

How shipbuilding sector works and structured?

Which shipbuilding nations have been dominated in shipbuilding industry so far?

How is the past and present shipbuilding market?

What is the potential of China in shipbuilding sector?

Which factors are makes the China the largest shipbuilding nation in following years?

How effective to recent recession to shipbuilding industry in particularly China?

In order to present answer of them, it should be employ several academic approaches during the dissertation.

The literature review must be a description and critical analyses of previous researches (Jankowicz, 2000). Firstly, the main purpose of the literature review is to help the author to develop a good understanding and insight into relevant previous research and the trends that have emerged. Research projects author will be planning to explore his data and developing theories from them and subsequently it will be related to the literature. This method is known as an *inductive approach* (Saunders, Lewis, Thornhill, 2009). The inductive approach is applied in literature review in order to make background information regarding to shipbuilding industry from variety previous literatures and research.

It requires highly structured methodology and quantifiable observations in order to conduct statistical analysis.

The main objective of second part explains statically development of industry. Quantitative analysis techniques such as graphs, charts and statistics allow us to this; helping us to explore, present, describe and examine relationships and trends within our

data (Saunders, Lewis, Thornhill, 2009). This approach is going to help us in factor analyses in fifth chapter.

For prediction of future business, it should be analyses past and present numerical data that could be usefully be quantified to help dissertation to answer research questions and achieve to objectives.

Whereas descriptive approach plays a major role at the preliminary stage of the dissertation as it helps to understand a topic. Descriptive studies aim to provide a precise idea or image of phenomenon (Saunders, Lewis, Thornhill, 2009). In this regards, descriptive studies are not recommended in the writing of the dissertation because they don't provide a critical analysis of the topic. Therefore, in the main part of dissertation to achieve hypothesis of dissertation is applied explanatory approach highlights the advantages of China shipbuilding industry against its competitors and try to explain every single reasons fairly, which interpret what behind of the Chinese shipbuilding advantages. Last part of dissertation again with statistical information examines the recent shipbuilding market satiation and result of current global crisis.

2. 2 DATA COLLECTION METHODS

To achieve the objective of this study, secondary data is collected. Saunders (2009) defines secondary data is the data that have already been collected for some other purpose and include both raw data and published summaries.

Secondary data is collected in first stage of this study. In the first stage, the aim is to form the theoretical framework of this study. This is achieved by reviewing the previous studies. Therefore, a number of articles, reports and books specialized in shipping construction, ship finance, shipping government policies and global crisis are reviewed and primarily used. Also secondary research is conducted to form the research background of this study. The aim of that research is to provide general information about China, reason of development shipbuilding industry in China and the shipping potential of China. The secondary data is collected from the libraries, journals and government web sites.

There are plenty of books regarding to shipbuilding but many of them are out of date. But there are still update books such as Shipping Innovation, Maritime Economics and ship construction.



CHAPTER: 3 LITERATURE REVIEW

3.1 INTRODUCTION

The main objective of literature review is to examine the previous scholars related to shipbuilding evolution in different countries especially in China and how shipbuilding sector works and structured.

In the first part of literature review we will examine the regional structure of world shipbuilding, in particularly it focuses on major shipbuilding region namely, Europe, Japan and South Korea. This part proves which regions efficiently have taken advantage previous years in shipbuilding sector and what are the major reasons for shifting shipbuilding region in the past.

In the second section it gives information regarding to potential of China's shipbuilding industry and economy. The first part considers the changes in the shipbuilding industry of China. Secondly, it gives answers of what has been changed in China's economy recent years and how is the China's economy and trade in world. After that the third part examines the role of China's government in developing and supporting the shipbuilding industry.

The aim of third section is to find the answer how shipbuilding sector work and structured; this chapter is to provide firstly brief information about the shipbuilding production process, secondly it gives information about purchase of ship and financed, how purchase and finances new building ship and second-hand vessels. Lastly it discusses subsidy by shipbuilder countries government especially it focuses on one of the most serious shipbuilder disputes between European communities and Korea. The final part presents the summary of literature review.

3.2 THE REGIONAL STRUCTURE OF SHIPBUILDING COUNTRY

Stopford M. (2009) define the shipbuilding, which is a heavy engineering business, selling a large and sophisticated product built mainly in facilities located in the industrialized countries of Japan, Europe, South Korea, and China now. It requires substantial and management expertise to design and produce merchant ship.

It was explained in Research and Marketing analysis of Global Shipbuilding Market (2009) that over the years the industry has shifted its base from the earlier dominating region Europe to Asia. Even within Asia there has been a struggle to gain the top position where South Korea claimed the top position leaving Japan and China behind, during China has also jumped ahead of Japan to become the second player. Moreover, the positions these countries have gained are not just within the Asian region but are on a global level as well.

Success of shipping and shipbuilding industries seem to be linked to each other or at least move in one behind the other one. For nearly three decades in the post World War II era, both the industries were controlled by European nations and United States. However, high labour costs in the yards of Europe and USA, one of the major decisive factors in this cost competitive industry, has led to a gradual shift of the center of shipbuilding to these Asian nations over the last three decades.

The increase of Asia in the shipping and shipbuilding industries has become all the more pronounced over the last decade. Marcus Hand reported in Lloyds List (2009) that at the present time Asia is a dominant power in many sectors of the industry. In shipbuilding the region's dominance has continued to grow with the rise of China's shipbuilding industry challenging South Korea and Japan. The global economic crisis has undoubtedly brought some major problems for China's shipbuilding industry, with owners seeking to delay or cancel orders. It should act to ensure that it develops in a sustainable fashion.

3.2.1 Europe

1900s European shipyards, including the UK, accounted for over 80% of world production, similar to the market share the Asian shipyards achieved a century later. One of the most significant shipbuilding countries was Britain during the last century in the Europe and world.

It was written by Martin Stopford (2009) in Maritime Economics that Britain held dominant position until 1950 when started to lose market share. The downward trend is apparent, as is the close correlation with the decline of the UK merchant fleet. At the beginning of the twentieth century, the UK merchant fleet had a 45% market share and shipbuilding about 55%, but by the end of the century the share had dwindled to virtually nothing. Britain was slow in adapting to the new highly competitive shipbuilding market after the Second World War. The final blow was the UK's strong change rate when North Sea oil came on stream during the 1980s, at the trough of the 1980s recession.

Germany's shipbuilding industry, which had been not particularly dynamic in the 1980s gradually revived throughout the 1990s with expanding orderbook. Germany had become vulnerable because of its specializations. Korean shipbuilders were increasingly able to beat German owners on price for container ship orders while the sharp downturn in the cruise industry, exacerbated by the September 11 terror attacks, hit passenger ship builders like Mayer Werft very hard (Grammenos C. Th. 2002).

There was many reasons for serious decline of shipbuilding share, one of the reasons put forward for the decline of British shipbuilding was the industries failure to graduate from a production process based on manual skills to the more closely integrated production technology that was developed in Japan during the twentieth century.

Consequently, the labour force at West –Europe shipyards decrease significantly between 1975 and 2002 as table 1 shows. As we can see that the significant decrease of

amount of production affected employment numbers seriously during this period in Europe.

Table 3.1: European shipyard labour force 1975 and 2002

Labour force	1975	2002	Labour force	1975	2002
Germany	105,988	23,300	Norway	29,000	5,266
UK	55,999	7,000	Denmark	18,900	3,360
Romania	47,000	20,400	Finland	18,000	6,150
France	40,354	6,800	Portugal	17,100	2,350
Netherlands	39,850	9,000	Greece	10,159	3,000
Italy	36,260	13,438	Total	461.988	136.029

Source: AWES, 2003

In order to explain how European countries became narrow in shipbuilding sector, this data obviously demonstrate that there was a considerably declined from 1975 to 2002. some of European countries data **are not** available such as Croatia, Swedeen and Poland. If these numbers would have been added, then the reduction in the labour force at the European shipyards would have even exceeded 70% over this period. The displacement of so many workers created major social and political problems. However, the loss for European shipbuilding countries meant a gain for other countries, in particular in Japan and South Korea. These countries are in turn challenged by China. And so, the cycle will continue to repeat itself (Wijnolst & Wergeland 2009).

3.2.2 Japan

Like Britain, Japan is one of the examples of the shipbuilding growth model, Japan is island nation and the growth of the economy after the Second World War made excessive demands on shipping transport. Initially the development of the Japanese shipbuilding industry drew strength from coordinated shipping and shipbuilding plan. The domestic shipbuilding plan certainly contributed to the success of the Japanese shipbuilding industry.

According to Joon Soo Jon (2002), the profitability of the Japanese shipbuilding industry is greatly dependent on exchange rate with the US dollar. Because ship prices are usually denominated in US dollars the sharp appreciation of the yen meant that prices realized by the Japanese yards effectively fell dramatically. In 1994, the yen rose further to a daunting level of ¥95 per US dollar. Although it then returned to ¥100, these successive surges in the yen caused the shipbuilding industry to become less and less price competitive. However, since the late 1990s the weakening Japanese Yen has once again strengthened the price-competitiveness of Japanese shipbuilders (Grammenos C. Th. 2002).

During the 1990s Japan was challenged by South Korea, and its shipyards faced high labour costs and strengthening currency. However, the Japanese shipyards were remarkably successful in maintaining their competitive position despite disadvantages. Until 2005 Japan was still the market leader with 16.1 million gross tons of ship compared with South Korea's 15.4 million gross tons (Stopford M. 2009).

It is amazing that even in 2002 Japan maintained this output share. The reason behind this productivity and continuously improves its performance. Therefore, some countries like South Korea and China had a hard time in competing with this country in spite of their lower factor costs, although they have surpassed Japan since.

3.2.3 South Korea

South Korea, which is by a large margin the world's largest shipbuilding country in terms of tonnage and number of vessels built, in spite of high labour cost, producing more ships than the all-world product combined in 2008. This is largely due to its highly advanced shipbuilding technology and high productivity and efficiency of its shipyards.

According to Pierre Sirois (2006) The Korean maritime industry is characterized by a tremendous vitality, great professionalism, a lot of rigors, an exceptional organization and well qualified workers and staff. It is a concentrated industry. The competition between shipbuilders, with their numerous and demanding foreign clients, pushed them to great

progress, reaching an exceptional level of quality. More than anywhere else, in particular Japan or China who have significant demand from their domestic shipping companies,

In the early 1970s a major investment programme was planned, starting with the construction of the world largest shipbuilding facility by Hyundai at Ulsan, designed in the UK, with a 380 metre dry dock capable of taking vessels up to 400,000 dwt. After that in the decade second major facility was built by Daewoo, with a 530 metre dry dock capable of taking vessels up to 1 m.dwt. other South Korean major group Samsung built new shipbuilding facilities by the middle of 1990s South Korea had a 25% market share and four out of the five largest shipyards. By 2005 South Korea had matched Japanese output in gross tons and overtaken Japan in ctg terms. In 2005 Hyundai, Samsung and Daewoo were the world's three largest shipbuilders and accounted for two thirds of South Korea's production (Stopford M. 2009). Next chapters will provide more information regarding to major shipyards in the world.

According to Joon Soo Jon (2006) in the early 1990s South Korean shipbuilders embarked on an ambitions expansion strategy, despite warnings from the rest of the global shipbuilding industry that the move threatened price stability by creating a large excess of capacity included new building docks at Hyundai Heavy Industry, modifications at Samsung allowing the building of VLCCS and similarly sized vessels and the construction of the large, modern VLCC capable Halla yard at Mokpo (Grammenos C. Th. 2006).

3.3 CHINA

Between 1405 and 1433 China has one of the biggest fleets in the world, commanded by Zheng He. When you look at the present shipbuilding industry it seems that China is going to be once more one of the leading navel powers (PRLog, 2009).

In the shipbuilding sector there is always a fresh entrant preparing to challenge the market leaders and China emerged as the next challenger in the 1990s. Some ships were built for export, at very competitive prices, but the volume of business was limited, and Chinese built ships generally sold at the discount in the second-hand market.

China and South Korea were in a close fight for market share, going by the world's outstanding vessel order books as at end 2008. They captured market shares of 36.2% and 36.7%, respectively, by dwt (deadweight tonnage) (Kih S. 2009).

He Rongguang, president of Bohai Shipbuilding Heavy Industrial Co. Ltd based in northeast China's Liaoning Province said that "a booming shipbuilding industry will boost China's overall manufacturing industry, particularly the production of iron and steel, electronic and mechanical products, and will create more jobs." He added, on the other hand, a booming shipbuilding industry will help rejuvenate the country's northeastern rust-belt, as most shipbuilders are based in the traditional heavy industrial base. China's shipbuilding industry faces a golden opportunity for expansion since a growing number of international investors have eyed China, a developing nation, as an ideal manufacturing base, he said. "Meanwhile, sustained growth of the national economy has created a sound environment for the industry to prosper." (People's daily, 2005).

China intends to build more ships in the years ahead to cope with a raising demand from the international market and turn itself into the world's largest shipbuilding country. There are many opportunities in Chinese shipbuilding industry; at the same time there are many risks such as extremely competition, fluctuating prices, technical problems, market risks, policy risks, exchange rate risks and global economic crisis, etc.

China's economy supported by expanded domestic markets supporting about 1.3 billion people, has changed structurally with exports and imports becoming more important. The volume of newbuilding orders received by Chinese yards has kept increasing since the second half of the 1980s. According to Lloyd's Register, orders totaled 777,000 GT in 1994 and reached 3,011,000 GT in 1999. Chinese yards then accounted for 10.4% of the total world orders. China will certainly continue with its ambitious shipbuilding expansion plans (Grammenos C. Th. 2006).

According to Clarkson Research Services data, as of the beginning of 2009 May, South Korea's newbuilding orderbook stood at 61.71m cgt, holding 34.4% market share. China's orderbook totaled 58.57m cgt, taking 32.7% share and the gap between the two countries narrowed to just 1.7% points.

China Intelligence and Research reported that Norway is leading in the concepts and technologies of ship design, manufacturing, environment protection and offshore oil and gas development. At the present, many Norway enterprises have entered Shanghai and Dalian while some are active in South China. These businesses provide the equipment, technologies and services needed by China's shipbuilding industry.

At present, China has acquired the objective conditions as the shipbuilding center in the world: huge ship markets, low costs, governments' policy supports and abundant raw materials, especially the huge ship markets and low costs will become the advantages ahead of Japan and South Korea. (Courtesy: PRLog.org) chapter 4 will be explain every single reason elaborately.

3.3.1 Changes in China's Economy

Barry Naughhton said that China began its transition to a market economy nearly thirty years ago under an authoritarian and hierarchical political system. Today, after market transition has wrought fundamental changes in China's society, which political system survives, with its basic features intact (Brandt L, al. 2008).

After the opening its economy in 1978, China has become the fastest growing nation in the world. Especially in 1990s and after joining WTO in late 2001 China' economic growth had been triggered.

According to World Bank figures, China is now only behind the United States, whose economy was worth 13.8 trillion in 2007, and Japan, at 4.4 trillion. China's economy is the second largest in the world after that of the United States with a GDP of \$7.8 trillion (2008) when measured on purchasing power parity (PPP) basis. It is the third largest in the world after the US and Japan with a nominal GDP of US\$4.4 trillion (2008) when measured in exchange-rate terms. China's economy increased by 13.0 percent in 2007, up from a previous calculation of 11.9 percent, the National Bureau of Statistics said.

According to Joon Soo Jon (2006) the two-digit growth rate of economy experienced by China since the early 1990s has grabbed the world's attention. Growth has been so

strong that the Chinese government has had to put a brake on its overheated economy. In the first half the 1990s, China further promoted the policy of opening up its economy to the outside world in accordance with its Eighth five years plan(1990-1995). As a result its economy grew at the high average annual rate of 12.6% between 1992 and 1994. (Grammenos C. Th. 2006).

Most people believe that China's economic success depends on exporting cheap goods to the rich world. If so, its growth would be seriously dented by a stuttering American economy. Headline figures show that China's exports swelled from 20% of GDP in 2001 to almost 40% in 2007, which seems to suggest not only that exports are the main driver of growth, but also that China's economy would be hit much harder by an American downturn than it was during the previous recession in 2001. If exports are measured correctly, however, they account for a surprisingly modest share of China's economic growth. (The Economist, China's Export, 2008).

The mass movement of farmers from countryside to these coastal regions as ample source of low wage labour for has significantly contributed to the boosting of China's export industry, thereby allowing it to shift from the exporter of primary goods to that of secondary and finished products.(JAMRI 1995) Thus, China's economy, supported by expanded domestic markets embracing about 1.3 billion population, has structurally changed to assume a more important role in the export and import trades with not only Japan and Southeast Asian countries, but also western countries, including the US, thereby considerably affecting the development of the world economy (Grammenos C. Th. 2006).

3.3.2 The Role of China State Shipbuilding Corporation (CSSC)

Shipbuilders belonging to diversified corporations have the advantage of being able to rely on corporate resources for expansion and support which are independent of the state of the shipbuilding market. Consequently, in periods of shipping recession, the shipbuilding member of the group can call upon reserves acquired in other market areas in order to overcome short-term cash flow difficulties. Moreover, this shipbuilder may be able to use group resources to modernize its production facilities at time when

independent shipbuilding firms are being obliged to cut back their overheads and capacity. This enables the shipbuilding member of the group to boost its competitive position compared to other shipbuilders. The flexibility inherent in within group transfer of resources to the benefit of shipbuilding operations has been important to the success of Japanese and South Korean shipbuilders. Access to well organized and funded marketing, and research and development, can be another advantage of being part of a conglomerate. Conglomerates have political clout (Grammenos C. Th. 2006).

China State Shipbuilding Corporation (CSSC) was established in 1999, which is an extra large state-authorized and conglomerate investment organization directly administered by the government of China, which has been the mainstay of the shipbuilding industry in China. Under its wing, there are totally 60 sole ownership enterprises and shareholding institutions, including a group of most powerful and some renowned shipbuilding and ship repairing yards, research and design institutes, marine-related tools or other equipment manufacturers and trading firms in China.

CSSC is one of the state-owned mammoth enterprises belonging to the Ministry of Machine –Building Industry. With its headquarters located in Beijing, CSSC exercises general control over major shipyards throughout China through nine regional shipbuilding corporations located in Shanghai, Dalian, Tianjin, Guangzhou, etc. CSSC has control over the Merchant Ship Design & Research Institutes which are located in regional centers such as Shanghai and Wuhan. (Grammenos C. Th. 2006).

The China State Shipbuilding Corporation (CSSC) became the world's third largest shipbuilding conglomerate last year, behind the Republic of Korea's Hyundai Heavy Industries and Japan's Imabari Shipbuilding Company. CSSC, which ranked fifth in the world in 2005, finished manufacturing 103 new ships for civil use, about 6.02 million dead weight tons (dwt) in total, last year, accounting for 43 percent of China's total output and 8.2 percent of the world's total (Chinadaily 2007).

So far, CSSC has already exported a large number of ships to more than 50 countries and regions all around the world. Since entering the new century, CSSC has put forward a strategic objective called “5-3-1 goal”, with which CSSC shall put itself in the rank of the

top 5 and the top 3 shipbuilding groups in the world respectively in 2005 and 2010. Furthermore, CSSC, with its endeavors and efforts for another five years, shall achieve its objective of being the world's number one shipbuilding group in the year 2015, thus bolstering China to be the number one shipbuilding country in the world. In order to achieve its target as set above, CSSC shall lay emphasis on the construction of two shipbuilding bases, namely, Changxing Island shipbuilding base in Shanghai and Longxue shipbuilding base in Guangzhou. As a result, CSSC shall have upgraded its shipbuilding capability from the 4 million dwt by now to 14 million dwt by 2015, with a wider range of products of high-tech ships or vessels such as the LNG carriers and luxury cruise ships and so on (CSSC 2007).

3.4 SHIPBUILDING PRODUCTION PROCESS

Shipbuilding is an extremely complex business. The time between order and delivery is very short which means that all amount of tasks must be performed in parallel. To perform these tasks it is essential to have good tools for co-ordinating and managing the complex flow of information between everyone involved. Basically the production process is mainly one of the gathering, and few or the tasks require sophisticated technical skills, though some automation of cutting, welding and repetitive assembly is possible.

Ten main stage in the shipbuilding production process (Stopford m 2009)

Stage 1: Design and estimating

Stage 2: Materials reception

Stage 3: The steel stockyard

Stage 4: Surface preparation

Stage 5: Plate and stiffener preparation

Stage 6: Assembly into blocks

Stage 7: Coating

Stage 8: Pre-outfitting

Stage 9: Assembly in the dock

Stage 10: Outfit at outfit quay

These tasks spread around the shipyards, at the end one unit moved from one place to another by loaders. To delivery vessels on time, shipyards have to consider every single stage carefully. For example, all materials must be ordered and arrive on time.

3.5 PURCHASE OF SHIP AND FINANCED

There are three alternatives way to purchase a ship for the ship owner, who may contract to have new ship built, buy a ship currently under construction or purchase secondhand ship.

3.5.1 Financing of new building

There have been two sources of traditional finance. First one the buyer obtained bank finance to pay for the ship in full on delivery, bank loans are the most important source of ship finance. They provide with quick and flexible access to capital, while leaving them with full ownership of the business.

This is also an important business for banks, and 2007 the various institutions leading to the shipping industry had loan portfolios ranging in size from \$1 billion to \$20 billion (Stopford M. 2009). Secondly the buyer agreed to purchase the vessel on delayed payment terms with credit provided by the builders.

Before contracts gave ship owners to option to pay cash on delivery or take yard credit, with the buyer having the right to select his preferred payment terms. A number of factors, such as decreasing willingness of governments and commercial banks to provide new building finance, the greater flexibility of leading banks, and, perhaps most importantly, low US dollar interest rates which made the generally fixed-rate government subsidized schemes un attractive, combined to make yard credit much less widely available today than previously, although they are still used from time to time.

Shipbuilding contracts will normally provide for the buyer to pay for the construction and delivery of the ship in installments over the duration of the contract. Payment of contract price will fall due at specific contract might provide for an installment schedule as follows:

Signing of contract.....	5%
6 months after contract....	4%
beginning of keel laying...	4%
launching	4%
delivery	3%
port delivery	80%

on a cash contract, a possible split would be.

signing of contract	15%
cutting of first steel plate... ..	15%
beginning of keel laying.....	10%
launching	10%
delivery	50% (Word J. 2006)

Payment to the shipbuilder is usually made as progress payments. A typical payment schedule may have been five equal payment spread over the contract period but in recent years payment arrangements advantageous to the purchaser and intend to attract buyer to the shipyard have delayed higher percentage of payment until delivery of the ship.(David J. Eyres)

Of course, in recent time the recession effective to banks seriously, as result of that for instance, China's Export-Import Bank has provided \$22.5bn in support to the local state owned shipbuilding industry since 1994 and more recently offered \$3.7bn to private shipbuilder Jiangsu Ronsheng (Lloyds list 2009).

As Western banks teetered on the edge of insolvency traditional global financiers in Norway and Germany would retrench, offering what credit they had to their domestic

owners under the direction of their respective governments, with Greek owners suffering the biggest impact.

"More than 50% of the world fleet may be owned by Western shipowners today. But these owners have material illnesses and capex overhangs, leverage issues and no earnings. Many will fail and their businesses will be acquired by Asian owners," said Julian Procter of Tiger Group Investments, the financier behind major owners and leasing firms such as Seaspans (Lloyd's 2009).

Asian banks, unlike their US and European counterparts, have less exposure to structured products and continue to benefit from a massively larger deposit funding base with consequent greater liquidity. As we can see that all ship owners are in hard times currently, therefore financing ship is getting a bit complicated.

3.5.2 Secondhand ship purchase

Secondhand ship means one already been registered. An unregistered new building may be dealt with in a similar manner from a contractual point of view, but purchaser would have to be careful to take with into account the registration requirements in relation to new building and the possible liens attaching to the vessel as a new building (Brookes D. 2006).

Buyer may provide market conditions are in his favor, significantly improve his position by adding appropriate terms to his contract. Secondhand ship is sold depends on the shipping market. For a given price shipbuilding demand is influenced by shipping freight rates, secondhand prices, market expectations and sentiment, and liquidity and credit availability. Most of potential investors want vessel immediately during the spot market in stead of waiting around 2 or 3 years for new building ship, so initially when freight rates rise owners try to buy secondhand ships, bidding prices. Only when the secondhand prices increase do new buildings start to look a better deal and the rise in second hand prices works through into new building prices (Stopford M. 2009).

3.6 GOVERNMENT SUPPORT

Many governments have considered it politically desirable to take steps to support their domestic yards and any owner wishing to have a new ship built would have been wise to consider possible availability of some form of governmental support, either directly or indirectly, for financing of their project. In the late 1980s and 1990s Western governments sought to provide governmental financial support in various forms to prop up their ailing shipbuilding industry. In the new millennium the governments of Eastern Asia began to recognize the benefits of export credits. Sure, there are many other factors that a buyer will have to consider, not least the technical expertise available in any particular yard, the reputation of that yard for reliability and punctuality, and the stability of the political regime in the country in question, but the effect of governmental or quasi-governmental support either on the price or the payment terms on offer has been, and will continue to be, a material consideration (Ward J. 2006).

3.6.1 European communities dispute with Korea

One of the most serious matters is subsidies to shipyards between shipbuilder countries; The EU argues that South Korea has granted substantial subsidies to its shipyards, contravening the WTO's 1994 Subsidies Agreement. South Korean shipbuilders deny EU charges that they benefit from illegal subsidies.

The case concerned allegedly unfair competitive practices in the Korean shipbuilding industry. Broadly speaking, two main issues were raised by the community: export subsidies and restructuring subsidies to Korean yards following the Asian financial crisis at the end of the 1990s. The final panel reported that the export subsidies were illegal but did not follow EC's claim's concerning the restructuring subsidies. (Sánchez Rydelski M. 2006)

3.6.2 European support

The European community has authorized operating aid to shipbuilding since the early 1970s. For many years aid rates were very high. The 1987 Sixth Directive on shipbuilding introduced a tighter, more restrictive policy in order to ensure increased efficiency and improved competitiveness in the sector, to spur further restructuring to that end, and to ensure fair intra-EU competition. The report provided that between 1987 and 2000 EU aid ceilings was reduced from 28% to 9%. The commission was not happy that it had not been decreased further. (EC 2000) Because some governments provide considerably less support than others such as Netherlands, implying relative price distortions.

In 2000 Korean yards had accepted new shipbuilding contracts at less than cost of production, as result of high amount of subsidy by government. In around that year for European shipbuilder nations, the market share reduced to significantly low levels for new orders. As a result of unfair competition, became to dispute between two parties.

The EU's complaints have focused on South Korea's second largest shipbuilder, Daewoo Shipbuilding and Marine Engineering, which is that a first-quarter of 2001 profit of 100.4bn won (\$77m) on sales of 682.7bn won (BBC 2001).

But in same year a visit by EU inspectors to South Korean shipyards in March to investigate allegations of unfair subsidies found "serious difficulties continue to affect the EU shipbuilding sector as a result of unfair trading practices by South Korean competitors".

The Commission said that "There is mounting evidence that state-owned and state-controlled banks in South Korea have been instrumental in financing unviable shipyard operations and South Korean shipyards incurred losses averaging 14% on orders.

EU and South Korean negotiators have been engaged in tough negotiations on shipbuilding for more than two years. South Korean trade officials have rejected the EU

allegations and their government threatened on Sunday to file a counterclaim against the EU with the WTO. The South Korean shipbuilders say their success is due to exchange rate factors, increased productivity, quality and on-time delivery.

June 2002, the European commission decided to make a final approach to Korea to discuss the issue of non-market prices for new buildings. The Korean government refused to enter into such discussions, which prompted the commission to initiate moves to use the WTO Panel producers. This was initiated on 21 October 2002 (EC 2003).

Formal meeting with Korea were held in November 2002 and may 2003 but did not solve the issue. The EU claimed that Korean Export-Import Bank (KEXIM) provided such loans, as a matter of principle, at rate less than the market would offer, either in terms of period of repayment or in terms of commercial interest rates. The panel rules that in principle, the KEXIM scheme did not subsidize Korean yards (WTO 2005).

The implication is that the EU, despite winning its case in a number of specific issues, has lost the fight to establish that there was significant price suppression of ships as a consequence. The panel reviewed the position in three specific ship types, namely LNG vessels, products/chemicals tankers and container vessels.

There is still maintaining dispute between both parties. There is probably to no such a agreement will be reached in the short term. But this dispute might turn out to be desirable things, such as elimination of subsidy and application of consistency across the manufacturing sectors.

3.7 CONCLUSION

During the literature review, it looked at the main shipbuilding player nations involved development of shipbuilding industry in the world and brief explanation of structure of shipbuilding sector.

This short overview of the evolution of shipbuilding suggests that the business lends itself to a few dominant producers, with a succession of new challengers creating a highly competitive market environment which drives technical change. It also suggests that the market focus on domestic customers in the first half the twentieth century gave way in the second half to the broader role of the export market which exist today. Martin Stopford (2009) said that The European and Scandinavian yards were more effective in improving their production technology, but ultimately this could not overcome their high-cost labour costs and aggressive competition from efficient Asian yards using the same techniques.

The shipbuilding industry is simply a player in the commercial market, so any form of subsidy distorts the price and damages free market mechanisms. Government subsidy to shipyards merely undermines the strength of the commercial market for new merchant ships. This has resulted in a situation where the taxpayers of many countries pay substantial sums to support uneconomic national shipbuilding industries (Grammenos C. Th. 2006).

Chapter 4

4) Statistical development of shipbuilding industry

4.1 Introduction

As it mentioned in literature review that Shipbuilding industry is one of the maritime industries, which is always create new competitor countries, like Japan, later on South Korea and currently China. The meaning of falling European shipbuilding countries is rise for other countries, especially in Japan and South Korea. Nowadays, these countries are in turn challenged by China. And so, the cycle will continue to repeat itself. In order to understand historical development of shipbuilding industry, it should be examined past year's statistical data.

Before the present and past market shipbuilding output statistics, difference between gt and cgt should explain, which use in statistical information during the whole dissertation.

The statistical analysis tries to explain numerical result into three-time periods; 1947-1975, 1976-1990, 1991-2007 and 2008. First period covering from 1947 to 1975, it starts from 1947, because in the second half of the 20th century, the positions of traditional maritime countries were challenged by the newly industrialized nations from Asia like Japan, South Korea and China respectively. Secondly it is divided from 1975 because of oil crisis.

Afterwards, second period, which started after oil crisis from 1975 to 1990, nearly 1990 after long term downturn, dramatic revival of world shipbuilding capacity especially because of development of Asian and China generated recovery in trade. In last period the growth of shipbuilding started from around from 1990 and that trend continue. Finally, it examines the 2008 because of steady significant increase of shipbuilding sector has changed again, because of recent economic recession.

Furthermore, in last part gives statistical information regarding to major shipyards and volume of vessel types in recent years.

4.2 Measurement of shipbuilding output (GT and CGT)

First, GT is calculated from the total of volume of all enclosed areas calculated in cubic meters, using a standard formula. But this measurement for some ship types, in particularly those with complex hull forms such as LPG carriers and passenger ships can not present reliable tonnage. For instance, a passenger carrier of 1.000 gross tons might involve the shipbuilder in as much work as a bulk carrier of 3.000 gross tonnages. In order to find solution for that problem, it was developed new standard unit, which was called compensated gross tonnage (cgt).

In 1984, a set of standard cgt conversion factors were agreed, there is four main factors that:

1-) Different ship types demand not similar amount of work in their production. For instance, dry bulk easier than chemical tankers. Calculating all typed of shipbuilding output with similar way, it does not make sense.

2-) Different yards have differing ratios of the work sub-contracted out to other companies, therefore the calculation of labours directly working for the “yard of assembly” would present less than the numbers of labours involved in construction of the ship.

3-) Shipyards might build a mix of civilian and naval contracts.

4-) Date for single year may be affected by different cycles of activity between the shipyards. (Glen D, 2006)

Many shipyards have specialized some types of vessels or civilian and naval work. After ctg OECD pressure to make information much more transparent.

A set of standart cgt changing factors were agreed in 1984, but they were replaced by a formula in 2005. this formula is used to calculate cgt of the ship from the gt:

$$Ctg = A * gt(b)$$

A= represents the influence of ship type

B= the influence of ship size and gt is the gross tonnage of the ship.

The internationally agreed A and B parameter developed on the basis of sampling shipyard output.

4.1 Table: Approximate cgt coefficients calculated using the 2005 formula.

Ship type	Parameters		Ship size (gt)						
	A	B	4.000	10.000	30.000	50.000	80.000	100.000	150.000
Crude oil tanker	48	0.57	1.36	0.91	0.57	0.46	0.37	0.34	0.29
Chemical tankers	84	0.55	1.48	1.46	1.42	1.41	1.40	1.39	1.38
Bulk carriers	29	0.61	0.57	0.60	0.64	0.66	0.68	0.69	0.71
Combined carries	33	0.62	1.24	1.25	1.26	1.27	1.27	1.28	1.28
General cargo	27	0.64	0.97	0.98	1.01	1.02	1.03	1.03	1.04
Reefers	27	0.68	1.39	1.45	1.51	1.54	1.57	1.58	1.61
Container ships	19	0.68	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Ro-o	32	0.63	1.11	1.06	1.01	0.98	0.96	0.95	0.93
Car carriers	15	0.7	0.84	0.89	0.96	1.00	1.03	1.05	1.08
LPG carriers	62	0.57	1.41	1.25	1.08	1.01	0.95	0.93	0.88
LNG carriers	32	0.68	1.29	1.42	1.60	1.70	1.79	1.83	1.91
Ferries	20	0.71	0.80	0.82	0.85	0.86			
Passenger ships	49	0.67	1.76	1.69	1.62	1.59			
Fishing vessels	24	0.71	0.68	0.71	0.74	0.76			
Other non-cargo	46	0.62	0.91	0.84	0.76	0.72			

Note: the cgt of a ship is calculated by multiplying the gross tonnage by the appropriate factor in the table. For ship sizes not shown, the cgt coefficients can calculate by interpolation. **Source: Martin Stopford 2009**

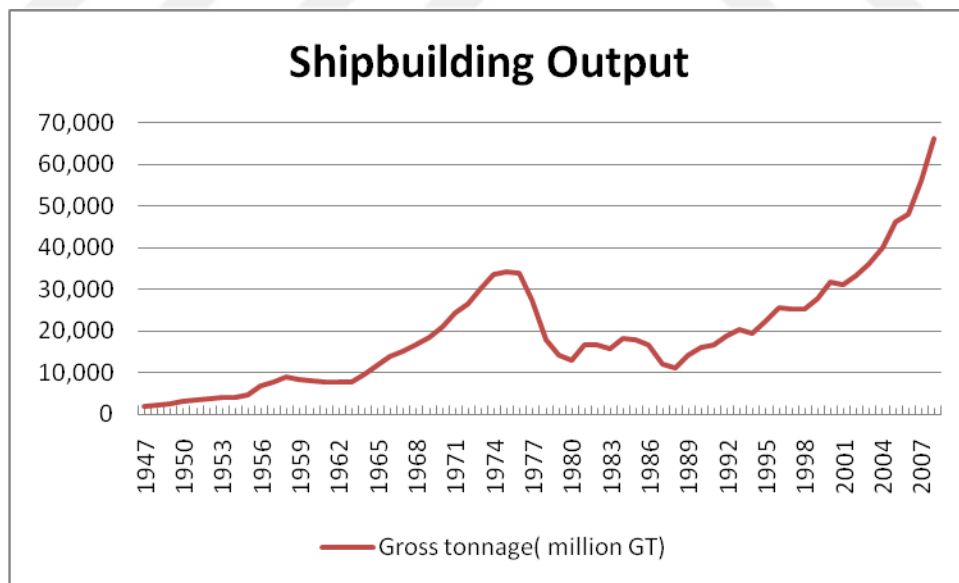
The table 3.1 illustrates some examples of ctg, for instance a 500.000 combined carrier-vessel has cgt coefficient of 1.27, whilst a 50 gt tanker. With this table, it could be understanding relative work content of different ship types.

4.3 MARKET CYCLES

4.3.1 Global shipbuilding (1947- 1975)

This part discusses the development in the main shipbuilding countries of the after-World War 2 period. First of all, it gives some general data regarding to World shipbuilding out put between 1947 and 1975, secondly it illustrates which nations were dominated in shipbuilding industry in this period and how change nations output during this period.

Graph 4.1: world shipbuilding output 1947-2007



Source: Lloyd's Fairplay Register (2008)

The figures show the world shipbuilding output from 1947 to 2007 over the 60-year period. But in this part focus on only between 1947 and 1975. During this period there was exceptional growth. Since war damaged had decreased the output of the German and Japan industries, there was an acute shortage of shipbuilding capacity. This maintains

into the late 1950s. The graph provides that until 1958 the output of shipbuilding increased slightly but between 1958 and 1961 there was slight decline around from 9million grt (gross register tonnage) to 8 million gtr. By 1963, however, became steady upward trend in orders, especially Japan and Europe improve their economics' and trade flow.

In 1961 Japan was already the first shipbuilding nation in the world, based on GT, followed by United Kingdom, Germany, Sweden, France, The Netherlands, USA, Italy and Norway. The European countries were dominated in shipbuilding industry in early 1960s, which is more than half of the world in that time. After first half of 20th century the *United Kingdom* was one of the main shipbuilder nations in the world. With output of 1.4% million GT and more than 250 vessels.

As result of steady unprecedented expansion of shipbuilding capacity reached to more than 34 million gt in 1975. The meaning of that in single year the industry produced more shipping tonnage than was built all period between two wars. In this period top country was Japan, therefore how was the output of Japan during the period. According to Lloyd's statistics covering ships of 100GT and above, volume of new completions in Japan reached a peak of about 16,991 million GT in 1975.

4.3.2 Global Shipbuilding (1976-1990)

In second period, which started after the oil crisis and maintained until 1990, was unyielding years for the shipyards. After the oil crisis in 1973, many yards have been struggled to keep on in critical shipbuilding industry. The table shows downturn trend clearly. There was almost 20 million gt reduce between 1976 and 1989. Especially shipyards overcapacity was increased by the entry of South Korea as a major shipbuilder country. Shipbuilding industry already was tough circumstances, and it was further aggravated by the entry of South Korea with attempt for a major share of the shipbuilder market. As a result of that there was cruelly battle between three major parts namely, Japan, South Korea and West Europe. In this situation, the sector swung suddenly from

fast growth to serious recession. It should be pointing especially first 5 years of this downturn period that Shipbuilding output declined more than 20 million gt from 33 million gt to 13 million gt in 1980. During the 1980-81 sector enjoyed in short term, but after following years market demand again decreased slightly. Shipyard output declined to 11 million gt, which is the lowest since 1962 and reduce more 70% from the 1975 peak. Sure, ship price went down significantly as well, even some of the major players sold vessels without profit.

Table 4.2: Shipbuilding output by GT 000, 1976-1989

YEAR	1976	1977	1978	1979	1980	1981	1982
Total 000 GT	33.203	27.532	18.194	14.289	13.101	16.932	16.820
YEAR	1983	1984	1985	1986	1987	1988	1989
Total 000 GT	15.911	18.334	18.157	16.845	12.259	11.312	14.482

Source: Lloyd's Register's "World Fleet Statistics" 2005

Of course number of employment decrease significantly as well, almost halved (Tugendhat 1968) and many small shipyard were closed. In that time, some of the yards have focused in offshore ships, since the oil crisis, for example, Norway offshore sector has been increased significantly. There are number of European shipbuilding countries as well. But UK has not been maintained foremost position in shipbuilding industry anymore. The Netherlands After the significant expansion around the 1970s, after that date as result of new industry model, the shipyards became less flexible and more cost, but high-technology ships. The Norway similar the Netherlands, specialists in smaller ships as well. In this term even very competitive South Korea shipyards declared high losses.

4.3.3 Global Shipbuilding (1990-2007)

Table 4.3: Shipbuilding output by GT 000, 1976-1989

YEAR	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total 000 GT	11,312	14,482	16,054	16,810	18,928	20,538	19,669	22,652	25,837	25,537
YEAR	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total 000 GT	25,464	27,822	31,696	31,292	33,383	36,131	40,171	46.300	51.5	56.100

Source: Lloyd's Fairplay Register (2008) and Lloyd's Register's "World Fleet Statistics" 2005

The table 4.2 provides the volume of gross tonnage output considerably increased again, after the expansion of China and Asia generated a recovery in trade. By the 1993 the volume of output had doubled to 20 million gt and 2007 It had reached more than 56 million gt, almost five times the volume of output in 1988 trough. But at the same time after 1990s, the number of ships has not been went up like amount of GT during this period, it is clear that the shipbuilding nations has become to build bigger capacity and size of ships, as a result of high technology. In the process South Korea had consolidated its position as the leading shipbuilder, at the same time China positioning itself in a bid for market leadership.

The two countries (Japan and South Korea) had a market share measured in GT in 2002 of 75%, but at the same time China has been increasing share of output every single year last 20 years, especially after 1990s.

There are some of the European shipbuilding countries share went down considerably, for instance UK has not been maintained foremost position in shipbuilding industry and it almost stopped product merchant ships in 2002.

In particularly after 2000 it started sharply rapid increase in shipbuilding output. The period spanning 2000-2007 can be described as a 'golden era' for the global shipbuilders,

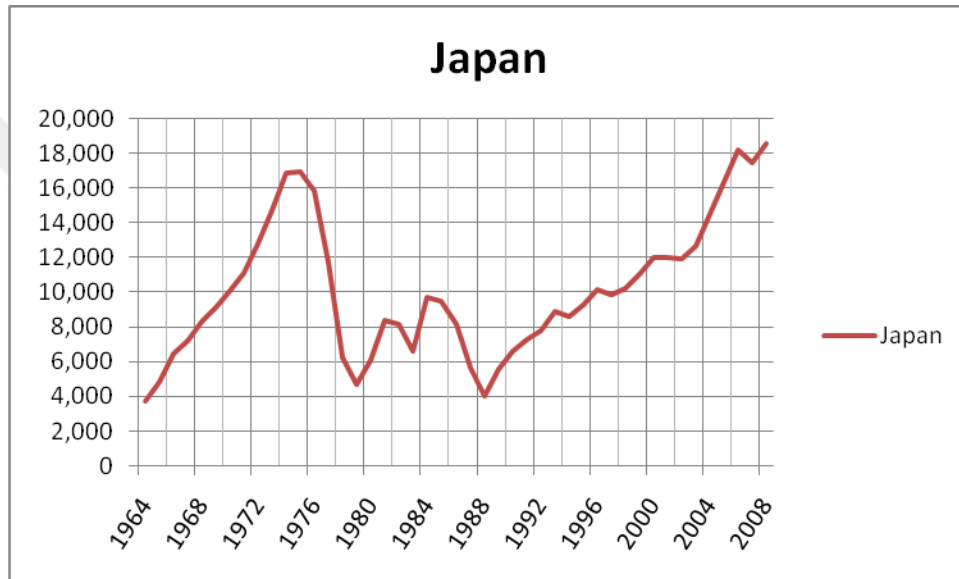
with the global order book position surging from 78.3 million GT in 2000 to 332.9 million GT in 2007 at a CAGR of 22.9 % (source: research and market report 2009). These numbers provide that the investment of shipbuilding sector have been growing considerably after 2000.

The world shipbuilding 2000-2007 with amount of major shipbuilding country output million GT and order book by country million CGT. Especially, the year 2002 was with hindsight a turning point global shipbuilding as table presents. After 2002 there was a significant increase in global shipbuilding. The volume of shipbuilding output increased from 33.8 million GT to 33.6 million GT during this period and at the same period the volume of order book has increased rapidly from 45.1 million cgt to 178.8 million cgt. (Source: Wijnolst & Wergeland 2009). In particularly, the significant rise in investment ships since the dramatic year 2002 when just over US\$ 20 billion was invested. Between 2000 and 2007 some nations have risen considerably their market share such as China, South Korea and some of them have increased slightly like some European countries. But at the same time some countries have declined their percentage of market share such as Japan and USA. In particularly, Chinese, South Korean and Japanese shipbuilding sector saw remarkable changes in their new order book and amount of ship output.

4.4 MAJOR SHIPBUILDING COUNTRIES

4.4.1 Japan

Graph 4.2 Japan shipbuilding output 1961-2001



Source: (Wijnolst & Wergeland 2009) and Lloyd's Fairplay Register (2008)

The graph shows that after fluctuation long time from 1980 to beginning of 1990, there was a considerably increase in Japanese shipbuilding sector, but on the other hand percentage of world output share declined during the this spot market term because of unexpected increase of competitors. In 2008 the Japan continues as a one of world leaders' shipbuilding countries with 28.1% of the total completed gross tonnage for cargo carrying ships.

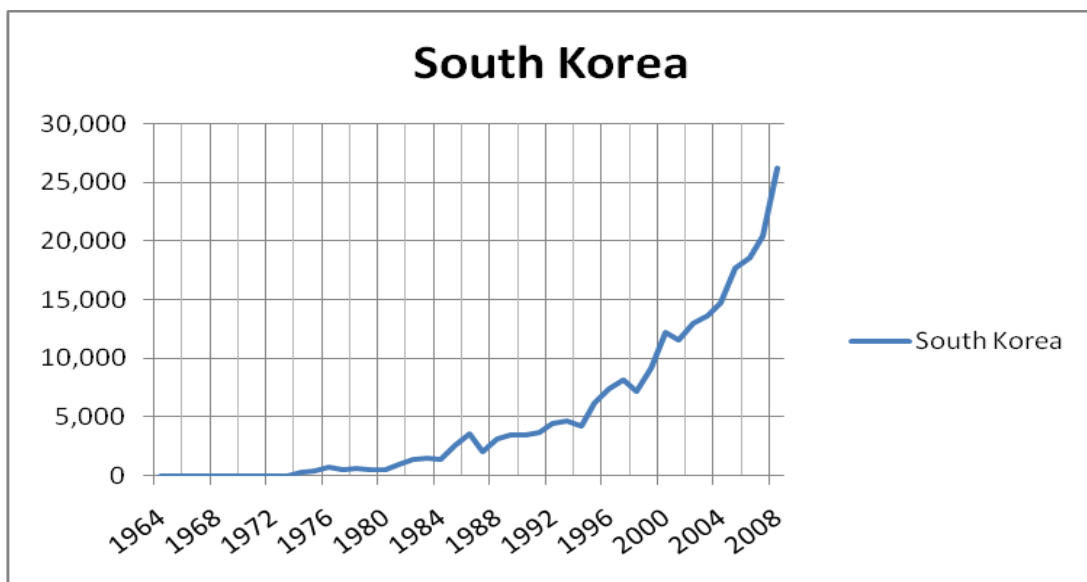
Japan was dominant in the global shipbuilding arena during 1960s gradually seems to be losing its top position. Japan had a considerably shipbuilding output of nearly 2 million GT, it was by significantly far the largest shipbuilder country until 1990s. After that date there was some tough competition in market such as South Korea and China with lower cost factor at that time. Consequently, following years the top position of Japan has changed in the world shipbuilding ranking. The lack of investments and the

rising labour costs compared to new shipbuilding destinations such as China etc. are the factors that have caused go quickly the Japanese downfall. Despite the problems encountered the Japanese still rank third in terms of global order books with the growing from 12.1 million CGT in 2000 to 30.0 million CGT in 2007(Wijnolst & Wergeland 2009). However, with become harder competition in the industry.

Japan was the former leader in shipbuilding sector until 2002 in terms of GT (Lloyd's register fairplay 2002). Shipbuilder leading has been taken by the South Korea. There are many reasons for that, but one of the most important is that diminishing labour force, it has become difficult for Japan to understand in the large, specialized vessels segment as well. To confirm its second place in world shipbuilding in 2002, it is investing in technology which will enable the construction of conventional vessels in a short span of time. There is clear that if immediate remedial measures are not undertaken, the Japanese might be worse in the following years.

4.4.2 South Korea

Graph 4.3: Shipbuilding output South Korea 1964-2008



Source: (Wijnolst & Wergeland 2009) and Lloyd's Fairplay Register (2008)

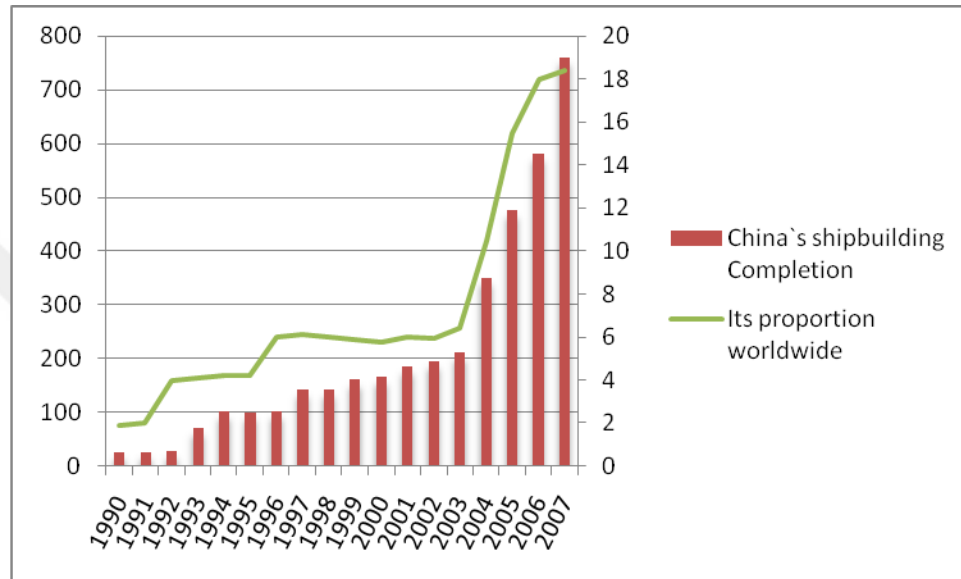
The shipbuilding output of South Korea during the started around 1970s and amount extraordinary 119 million GT in around 30 years and consisted of 3,310 ships. South Korea has extremely growth during this period. They entered the industry quite late even South Korea has become the largest shipbuilding nation in 2002 in the world. The previous table presents that after 1970s when South Korea enter shipbuilding market.

It was in 2002 that South Korea definitively got holds of the title of world's largest shipbuilding nation from Japan in terms of million GT. During this period South Korea is focusing more on large, specialized vessels because in the past, the bulk carriers segment was obstructed because of higher labour cost. Korea is further development its reach into developmental areas like LNG carriers and ice-breaker ships. In 2006, Korean shipbuilders re-confirmed the image of a strong shipbuilding nation by securing orders for 25 LNG carriers among the total of 31 ordered throughout the world, according to Lloyd's list (2006).

Krc research claimed (2007) that it is not just in 2006 but, also Korean shipbuilding industry won orders for 47 and 33 LNG carriers, respectively, in 2004 and 2005 as well, among a total of 64 and 42 ordered each year, clearly claiming an unchallenged position. Experts predict that in the next 10 to 15 years, global LNG demand will considerably rise to around 400 million tons a year, leading to the full-scale manufacture of ultra-large LNG carriers in every corner of the world. According to Wijnolst & Wergeland (2009) for Korean builders went up from 15.0 million CGT to 64.5 million CGT, It is provided that South Korea was much higher than China and Japan between 2002 and 2007.

4.4.3 China

Graph 4.4: Shipbuilding output China 1990-2007



SOURCE: RESEARHINCHINA 2007

China entered market latest between largest shipbuilder nations. China started only in the 1980s, since entered the shipbuilding market in the 1980s, the share of the China measured in gross tonnage is 2% and 1.9% in number of ships. But really took off in 1990s. China's shipbuilding industry reached record levels in the first eight months of 1993 constructing vessels totaling 840,000 dwt. The graph illustrates that especially after 2002 there was sharply increase in Chinese shipbuilding sector. At the same time the proportion of China is considerably went up as well, it increased to more 18% of the total completed gross tonnage for vessels. That is the excellent percentage for 6 years.

After Chinese shipbuilding industry saw sustainable and rapid development, which attracted enormous capitals to shipbuilding industry, leading to the surplus of shipbuilding capacity and the tardy of creativity.

China is focusing more on large conventional vessels like tankers, bulk carriers, containerships and conventional freighters after 2000. Between 2002 and 2007, China has benefited from the strong demand for tankers and big sized bulk carriers. Despite a highly competitive market, Chinese builders are proposing more competitive prices than main competitors. Chinese orderbook was leaped up from 29.1 million CGT to 53.1 million CGT in those days. After this remarkable numbers, most people from shipbuilding sector expect that China become a huge shipbuilding nation.

4.5 Shipbuilding outlook 2008

The order books of global shipyards reflect the size of shipping industry. While currently the shipyards are sitting on huge order books to be delivered through the coming few years, the global meltdown has dented the demand for the same, as the scale of the global trade has not remained what it was just about a year ago. There was a rapid growth in amount of order book from 2002 to 2007 in world, especially in Asia. But in 2008 there is no similar elating increase compeering with previous 5 years in terms of new order.

According to the Clarkson, in 2008, the global newly undertook ship orders were totaled at 150 million deadweight tonnages, a reduction of 42.7% of last year. Especially in Q4 2008, the global newly undertook ship orders were only totaled at 4.76 million deadweight tonnages, which mean each month had an order as small as 1.59 million deadweight tonnages during this quarter, which was only 1/10 of the monthly average during the previous nine months of 2008.

The order book increased slightly from 178.8 CGT to 180.2 between 2007 and 2008. Major shipbuilding nations had quite similar amount of order book in 2007 and 2008 such as Japan, China and South Korea. In terms of order book in 2007, South Korean shipbuilders have around 3% points larger market share than China, but last year the gap narrowed to nearly 2% point level. (Wijnolst & Wergeland 2009)

Table 4.4: World shipbuilding production by countries (2008)

RANK	Country	10.000GT	%
1	South Korea	1.240	50.6%
2	China	840	34.4%
3	Europe	140	5.7%
4	Japan	90	3.7%
5	Rest of the world	140	5.6%
	World Total	2.450	100.0%

Source: Metal Network Korea Company 2008

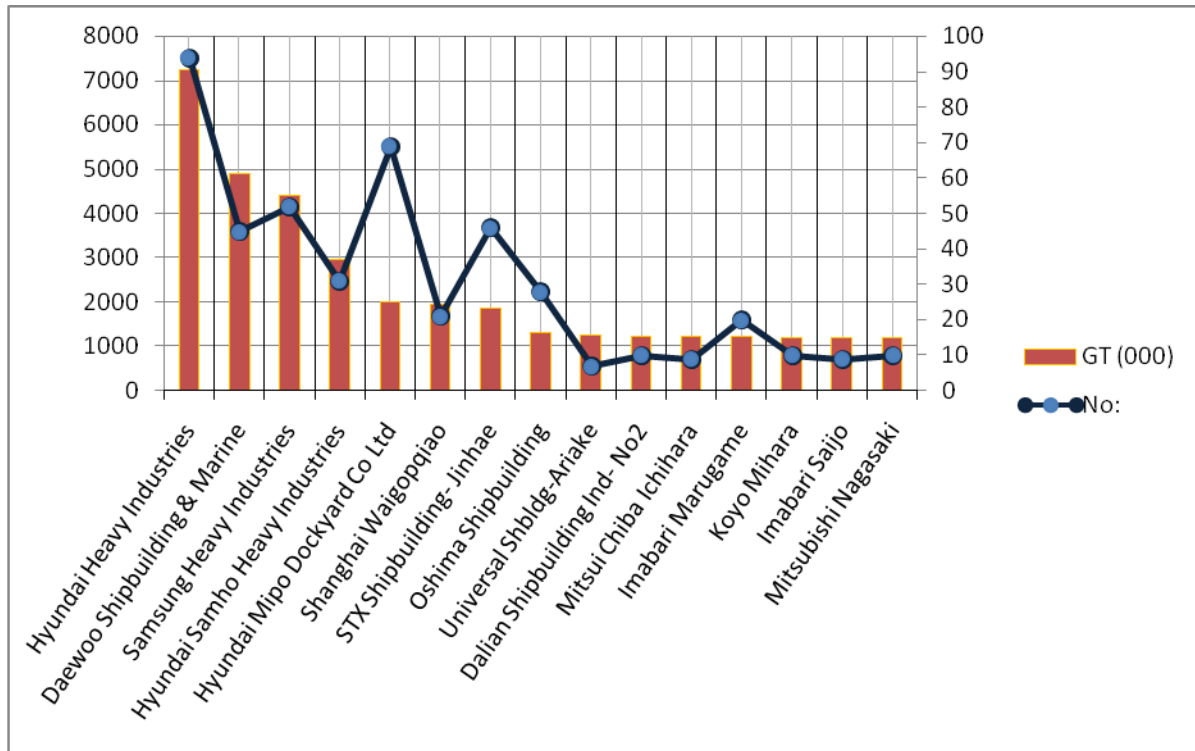
At the present time, the global shipbuilding industry is dominated by South Korea, which is the world's largest shipbuilder country number of vessels built and in terms of tonnage. The Korea still produced more vessel than all rest of the world's output combined in 2008, despite the labour cost is higher than some serious rivals such as China. According to table China has been getting closer to South Korea in terms of output tonnage. However, output of Japan has declined by 3.7 % share in world shipbuilding production in 2008. Recent data shows that, Japan's newbuilding orderbook has reduced by over 12% since the market highs of September 2008. The Japan Ship Exporters' Association (JSEA) reported that at the end of April the orderbook was 62.3mgt and at the end of September it was 70.9mgt. Between October 2008 and April 2009 JSEA member yards reported only 61 orders for new ships. In September 2008 there were orders for 43 ships alone. In that same time frame the yards have delivered a total of 214 ships of around 10.9mgt, of which over 60% were bulkers. In April JSEA yards declared orders for just eight ships of 410,710-gt.

According to the global shipbuilding statistics of Clarksons Group, the market shares of Chinese accomplished shipbuilding output 29%, recently undertook ship orders

37% and ship orders in hand accounted 35.5% in the world, in which Chinese accomplished shipbuilding output and ship orders in hand kept a rapid increase for six consecutive years and led to the three indicators standing the second place in the world. In 2008, Chinese accomplished shipbuilding output was 28.81 million deadweight tonnages, rising by 52.2% of last year. The recently undertook ship orders were 58.18 million deadweight tonnages, a reduction of 40.9% of last year. Ship orders in hand were 204.6 million deadweight tonnages, increased by 28.7% compared with 2007. As result of international financial crisis, Chinese shipbuilding industry has also felt the coming of strikes. In 2008, the newly undertook ship orders were 58.18 million deadweight tonnages and only 2.61 million deadweight tonnages in the fourth quarter, less than 5% of the whole year's. Chinese accomplished shipbuilding output exceeded the new undertook orders from October of 2008, first consecutive reduction of monthly orders in hand over the past five years (Clarksons 2009).

4.6 Major Shipyards in the world

Graph 4.5: Top 15 Ship Builders by GT 2008



SOURCE: Lloyd's Fairplay Register (2008)

The graph presents major shipbuilding yards by GT and number of ships. The Korean shipyards have dominated with Hyundai, Daewoo, Samsung, STX, Hyundai Sonho, and Hyundai Mipo raking in top 15 shipyards. The world largest shipyard in Ulsan operated by Hyundai Heavy Industries, the world's biggest shipyard is extremely efficient that a new \$80 million vessel slips into the sea every four working days. (Brooks J 2005). South Korea's other two major shipyards, which are called Daewoo shipbuilding & Marine Engineering and Samsung Heavy Industries, are following Hyundai with second and third position respectively in 2008.

Korean big three focus on generally large size of ship type in particularly, container, crude oil tanker, LNG tanker, LPG tanker. In 2008 Hyundai shipyard produces 43 container ships with 3.407.754 GT. However crude oil tanker 1.495.716 GT, LNG 1.153.030 GT and LPG tanker 857.983 GT. Samsung produce more than 1 million GT in container, crude oil tanker and LNG tanker as well. Especially, Daewoo in crude oil tanker and LNG tanker volume of output is the most in the world by 1.615.213 GT and 1.885.490 GT respectively in 2008. in China, the largest shipbuilder is Shanghai Waigaoqiao, which is specialize two types of vessel bulk dry and crude oil tanker. Shanghai produced 11 each of these ship types with 1.002.552 GT and 775.528 respectively. Japanese shipbuilders in top 15 are Mitsui Chiba Ichihara, Oshima Shipbuilding, Universal Shbldg-ariake and Mitsubishi Nagasaki. Generally Japanese shipyards can build all types of ships, but Japanese yards are very efficient in building tankers, container ships and general cargo ships (Lloyd's Fairplay Register 2008).

Different shipbuilders are specialized different specific type and size of ships, in stead of building every type of vessels. For instance, in fifth and seventh position shipyards Hyundai Mipo and STX are second and fourth position in terms of number of ship production, because they build tankers and smaller size of container ships, which are under 3.500 TEU.

CHAPTER: 5

5.1Introduction

Some of the Chinese shipbuilding companies could not imagine 10 years ago, amount and types of China's shipyards are building now. Generally, there was a real optimism between China's shipbuilding community that the country would become a main force in world shipbuilding into the previous years. There were definitely capacity, skills, workforce and commitment ten years ago. But Capital investment and modern technology was lacking at that time.

At the present time, China has acquired the objective conditions as the shipbuilding center in the world: huge ship markets, low labour costs, government's policy supports and abundant raw materials, especially the huge ship markets and low costs will become the advantages ahead of Japan and South Korea. There are many risks such as fluctuating material prices, some technical problems, and the fierce competition, market risks, policy risks, exchange rate risks, economic crisis risk etc.

Under the present economic situation, the competitions between Chinese, Japan and South Korea are getting extreme because of supply exceeding demands in the international market. If you want to receive more orders, you should provide high-cost performance of the products. The shipbuilding costs in China are lower than the major competitors of Japan and South Korea. The biggest advantage for Chinese shipbuilding enterprises lies at their prices.

Recently, it widely anticipated in shipbuilding market the Chinese shipbuilding industry will take a leading share of the world market within the coming decade, there are many reasons as mentioned above. This part explains every single factor, which are affecting the development of Chinese shipbuilding next years. At the same time, it gives

information regarding to other competitors countries such as South Korea, Japan etc. The main factors affecting the development of Chinese shipbuilding:

5.2 Huge ship market

We should ask what it is about shipbuilding that allows a single country to obtain the commanding position achieved by Britain, Japan, South Korea and China; and why has the balance changed so much over the year? To answer this question, it is instructive to take a brief look at the recent history of the shipbuilding industry, and in particular the relationship between the shipping and shipbuilding industry (Stopford M. 2009).

World trade has grown rapidly in the last 50 years and it is clear that demand for shipping services grew significantly the same time. According to LMIS, 2003 about 77% of world's merchandise trade was moved by sea transport. The same time demand for new vessels also grew rapidly. As we can see that the shipbuilding sector is one of the most essential sectors, which is playing significant role in world trade.

Wei Jiafu said that (2004), who is the CEO and chairman of the China Ocean Shipping Company (COSCO) "China may have provided one third of goods transported in containers, which is the most important mode of international transportation for manufactured products in the world,"

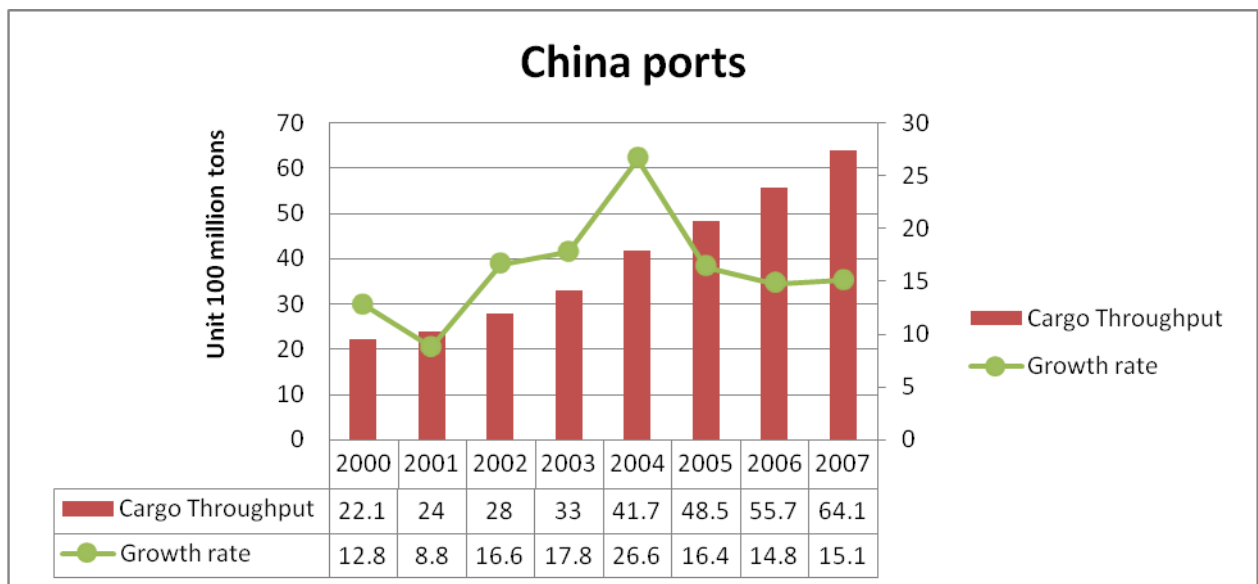
The shipbuilding sector is one of the most essential sectors, which is playing significant role in world trade. Many investors are from different sectors, they had never started in any business regarding to maritime, and in order to benefit high freight rates and good revenues, new enterpriser began ship operating and chartering business. Shipyards were overbooked by new orders and ship owners were ready to pay more than previous price for new vessel every single year during upward market. This fact pushed up prices on secondhand market as well as for ship repairs. Owners tried to sail vessels as long as possible. For instance, instead of paying high rates in dry bulk sector, many owners decided to rebuild their old single hull tankers, which are banned in many parts of

the world at the present time, to bulk carriers and they were successfully in their intentions.

5.2.1 Chinese ports

One of the most important factors is a port in ship market. Ports are not simply transfer points of cargo but are part of networks, linked to a hinterland, industrial activities etc. The ports sector has seen a similar rapid development with the majority of the world's top container **ports** now located within Asia. Huge the coastline of China have been converted into modern container terminals. Hong Kong's shipping community has also gone ahead of rest in terms of a greater voice for Asian shipping in terms of international forums and influence over regulations. According to recent research, the total number of port berth was 35,947, among which, 1,337 berths have the handling capacity over 10,000 tons

Graph 5.1, Cargo Throughput and Growth Rates of China Ports, 2000-2007



Source: Ministry of Transport (2008)

China's port cargo throughput has maintained to grow rapidly in recent years. In 2007, China's port cargo throughput increased to 64.1 billion tons from 22.1 billion tons in

2000 and the CAGR (compound annual growth rate) was 16.4% in the period 2000 to 2007. China's port cargo throughput in 2007 rose 15.1% which was more than 2006.

Shanghai, Shenzhen and Tianjin are three biggest China's port. China has been the world's biggest cargo producer since 2004, with Shanghai being the world's largest port in handling tonnage. Ten out of the 25 largest world's seaports are already in China.

China's economic growth will continue to decelerate, due to inflationary pressure and a slowdown of real estate investment. In addition, China's strong export development will also slow down, because of impact of slow demand in the United States of America and Europe as well as RMB (Chinese currency) appreciation. China's port industry is strongly associated with its national economy and import & export, so the industry will see its development of cargo throughput slow down. However, it will maintain the momentum of a relatively fast growth.

5.2.2 Shipyards in China

In order to be largest ship maker nations, Chinese state has built and developed many shipyards. China's central government has established a plan to lead the development of the shipbuilding industry. According to China's government, China will attempt to expand its shipbuilding market share to around 35% toward 2015. For that reason, China will build 3 modern shipbuilding bases in Bohai area, outlet area of Changjiang River and outlet area of Zhujiang River.

The government offers powerful support for the shipbuilding industry, investing huge amounts of money in new shipyards. The industry is dominated by two huge state-owned enterprises: China State Shipbuilding Corporation and China Shipbuilding Industry Corporation, the parent of the Dalian company. But in recent years, it has also seen a large number of new entrants, in the form of smaller shipyards administrate by local governments or private companies or set up as collaboration. There are 3,000 of these smaller shipyards now, up from just 350 a decade ago (COSTIND, 2009). At the same time, Chinese shipyards have getting successful in building up a good reputation.

Jasmine Yap (2005) claimed that China State Shipbuilding Corp, the nation's number 1 commercial builder, is spending US\$3.62 billion to build the world's largest shipyard on an island at the mouth of the Yangtze River in Shanghai. The new shipyard has excellent deepwater access and lies on the main sea lanes midway between Shanghai and Hong Kong. Due to be completed in 2015, the yard will have an annual capacity of 8 million deadweight tons 14 % more than Hyundai Heavy's.

5.2.3 Ship repair in china

After the reform and opening-up, China's ship industry began to work worldwide, and Chinese enterprises received many foreign ship repair orders. More than 100 specific ship repair stations and paint bonded warehouses were established in such around coastal areas and cities as Shanghai, Guangzhou, Qingdao,

China is getting toward the world ship repair center with the abundant labor resources, low prices and increasingly advanced technologies. According to the Clarkson statistics (2009), China's major ship repair companies fixed up 5,310 ships in 2008, totaling 100 million DWT; more than 1,784 foreign ships were repaired, totaling 81.84 million DWT. The market size of ship repair industry in 2008 reached nearly 10 billion USD. Especially, the ship repair industry has grown considerably last ten years. Almost every kind of ships can be repaired in China now.

Since the second half of 2008, not only the ship building industry but also the ship repair industry has been seriously affected by the global financial crisis. In 2009, both the output value and the number of ships repaired see a year-on-year decrease around 30 percent. Due to the flat market, declining demand and decreasing shipping volume, ship owners have not adequate capital for ship repair and thus risks of abandoning ships and canceling orders up. There is also an obvious decline in the amount of container ships arriving China's ports because of the sudden slump of European and American sources. It is said that the amount of container ships arriving at China's ports showed a year-on-year reduce around 50 percent, of course, which affected the number of foreign container ships repaired in China. At the same time, China's steel output is also seriously affected

by financial crisis. Fewer foreign ore carriers come to China, which hampers the repair and refit of ore carriers.

It could be seen that the lower labor cost allow to China's ship repair industry to take an advantageous position on international market, but the ship repair price began to drop after October 2008, which also made lower the profit of ship repair industry.

5.3 Development of information Technology

Shipyards expenses and production costs in general are very sensitive to technological change- supply factor.

The development of global information, new communication technology and modern manufacturing technology brings challenge and opportunity for the shipbuilding sector. Obviously, technological change is having a dramatic impact on demand. All shipbuilding nations have to focus on high technology seriously, which is one of the most important keys in development of shipbuilding industry. High technology vessels are more preferable than low tech and cheaper vessels by ship-owners, because in long term high tech is always more economical and efficient.

Chinese shipbuilders have still less development technology, which is behind other countries such South Korea. In order to revive the Chinese shipbuilding industry, capital and technology sides have to be well integrated. China urgently needs hi-technology, machinery and management for the shipbuilding industry.

The key to becoming in the shipping industry lies in design capability, large-scale shipbuilding construction, marine equipment supplies and optimizing the three main ship types: oil tankers, bulk-carriers and container vessels. Emphasis will be put on hi-tech ships, new ship designs and ocean engineering equipment, which have extra added value. China, as one of the main shipbuilding nations in the world, pays much more attention to strengthening its capability in this sector. As a result of this attention the technological gap narrowing with South Korea and other major shipbuilding countries.

But, the top shipbuilding countries are more advanced in many ship functions, structural design and technology than China. It is leagues behind the other major players in many key technologies, there is no domestic marks to provide support products for exported ocean vessels, a lot of key parts simply can not be produced in China at the present time. Basically, China still depends on foreign designs for some high-tech and high value-added ships and China has a long way to go before catching up with the world's advanced level in contracting, designing and construction of main marine projects. China-built ships are not highly competitive on the international market, and China relies on the import of foreign patent technology in many kinds of ship equipment. So, China still could not produce some of ship models. For instance, Norway is leading in the concepts and technologies of ship design, manufacturing, environment protection and offshore oil and gas development. At present, many Norway enterprises have entered Shanghai and Dalian while some are active in South China. These businesses provide the equipment, technologies and services needed by China's shipbuilding industry. (China Intelligence and Research reported 2009)

China is focusing more on large routine ships such as tankers, bulk carriers, containerships and conventional freighters. In 2007 bulk carriers dominated in the market but, in the first half of 2008, (orders of) oil tankers, especially very large crude carriers have rebounded quickly, but during that period, China would not have the advantages of building many VLCCs and other high-tech ships.

Therefore, China has looked for to improve their shipbuilding technologies and some of the ship models, designed and made completely in China, have entered into the world trend shipbuilding markets. According to figures collected by China Association of the National Shipbuilding Industry (CANSI), (2005), a 170 000-ton bulk carrier model designed and made by China received 18 orders, accounting for 45% of the total sales of such ship types in the world. A 300,000-ton ultra-large crude oil carrier made by China has captured 20% of the world market for such vessels. China has also successfully developed an 8 000 teu container vessel and is understood to be able to manufacture container vessels up to 10 000 teu. The first, large Chinese built LNG vessel was

successfully delivered in April 2008(the China Shipbuilding Economy Research Center, 2009).

However, In order to get better technical ability, China has been importing modern production methods and main items including complete production lines, as well as using foreign sourced hardware and software for computer-aided design and computer-aided manufacturing (CAD/CAM). This has made possible Chinese naval architects to become more skillful in the design of ship hulls, compartment layouts, and propeller-rudder combinations that develop speed, efficiency, and structural unity. Joint ventures between Chinese shipbuilding enterprises and set up Japanese and Korean yards are transferring technology, engineering skills, and production know-how to China.

Furthermore, in order to improve advanced technology and management abilities and to encourage foreign involvement to ensure sustained development in the sector, the government also needs foreign joint ventures to establish technical centers to take in and spread technologies transferred by foreign investors. Such joint ventures have provided China with an operational ability that might not have otherwise existed, and also provided a short-cut way to close the gap between China and the established market, both in terms of technology and structure.

After receiving record orders in 2004 - for 102 ships worth \$8.3 billion - Hyundai can afford to be particular. With more than three years of work already booked, Hyundai can afford to let Chinese yards win contracts for low-end jobs like simple tankers or bulk carriers. Hyundai has three joint ventures in China, and it already farms out some of its low-technology shipbuilding to these companies. South Korea's other two major shipbuilders, Daewoo Shipbuilding & Marine Engineering and Samsung Heavy Industries, are juggling a similar wealth of orders.

The 11th National 5 Year Economic Plan (2006-2010) provides for China to increase its local supply capability and the technological level of marine equipment, in order to optimize the industrial chain supporting the shipbuilding sector. After recent global

economic crisis, China's State Council approved a stimulus package for the country's shipbuilding industry. The plan will also support the industry in upgrading technology and self innovation. China urgently needs hi-technology, machinery and management for the shipbuilding industry.

5.4 Government policy

This chapter looks at the impact of Chinese government policy on shipbuilding sectors. Governments often intervene in their shipbuilding industries. Intervention can range from macro economic management to direct intervention at enterprise level. Government sponsored shipbuilding program with favorable financing (in terms of interest rate and repayment period) provides a great power to the development of the domestic shipbuilding industry.

The industry's success in the Asian countries of South Korea, China and Japan can be explain with the huge governmental support in terms of subsidy grants, development of ancillary units and other favorable governmental regulations. In order to improve shipbuilding sector, The Chinese shipyards operating under the two governmental organizations; China Shipbuilding Industry Corporation (CSIC) and China State Shipbuilding Corporation (CSSC) have carried out significantly well since the last decade.

In order to get advantage against major shipbuilding nation, china should support by state like other countries have done before. Chinese government may take business from South Korea and Japan in the same way next decade, those countries growth in shipbuilding took business from European yards two decades ago by supporting their governments. For instance, The Clarkson indicated that China's 600 shipyards are mostly State-owned, charge about 10 per cent less than competitors and are more flexible in building to specifications.

In order to encourage foreign investment since the 1980s, the Chinese government has set out several Special Economic Zones in which foreign investors receive privileged tax, tariff, and investment treatment. In terms of shipbuilding and ship repairing, these

investments have largely taken the form of joint venture operations between the state or domestic investors, and foreign investors.

In China, shipbuilding is one of the main sectors, China has been trying to develop during the 11th Five-Year Plan period (2006-10). In 2006, The State Council passed a mid- to long-term development blueprint for the industry that sets a target that would achieve at least 25 percent of the world's total output by 2010. If goals are succeed, China would become the world's largest builder of bulk carriers and the world's second-largest builder of oil tankers by that time. In 2005, Although South Korea and Japan control around 70 per cent of global shipbuilding, China has attracted considerably new orders following years.

The Chinese government can introduce many financial supports intended to assist its shipbuilders to compete in the world shipbuilding markets, thus enhancing the likelihood of China achieving its stated medium to long term objective of becoming one of the largest and strongest shipbuilders in the world. Those precautions include:

Export tax rebates: Chinese shipyards can claim export tax rebates for the construction of ships for export. According to explanation from the China Shipbuilding Economy Research Center, the purpose of the export tax rebates is to avoid repeated collection of tax and is in line with international practice and WTO rulings.

Investment funding reforms: Shipbuilding companies are allowed to raise capital for plant and site development from public issues or corporate bond sales.

Stabilisation of material costs: To secure a steady flow of steel supplies for the shipbuilding industry, the government plans to deliver up to 80% of the required steel through domestic steel producers. In order to reach this target of supplying high-end materials domestically, the government has introduced measures to support the technological innovation and development of the steel companies.

Involvement of foreign partners: The government's plan is aimed at increasing the local production of key components used in shipbuilding. Therefore, it has allowed Chinese maritime suppliers to create joint-ventures with foreign partners, and has also allowed foreign maritime suppliers to build up their own production plants in China. However, foreign investors in new shipbuilding and marine engine manufacturing units

are only allowed to own up to 49% of those ventures, with the Chinese partners retaining a majority (and therefore controlling) interest. Such ventures must also provide shipbuilding technology support by establishing their own R&D units (Thorsten Ludwig, Lochen Tholen, 2006).

Especially previous chapters give information regarding to ship orders statistic and statistics provide that during this period the volume of new orders has been increased considerably against other major shipbuilding countries, the development of capacity provided success of 11th Five-Year Plan period in the beginning years. Chinese state has achieved their target until 2008 global crisis, after that the market has been changing completely.

After global economic crisis, Chinese state issued the Adjustment and Revitalization Plans of Chinese Shipping Industry, showing the Chinese government's determination to support shipbuilding industry in February 2009. The plans point out following measures: firstly, to stabilize the production; secondly, to enlarge the market demand; thirdly, to develop marine engineering equipment; fourthly, to actively promote the ship repairing; fifthly, to support the merge & acquisition; sixthly, to strengthening the technical innovations (ResearchInChina 2009).

But also, Chinese shipbuilding industry should consider aware of potential risks in the market. Chinese shipyards must remember that they are not the only one wants to expand shipbuilding sector.

5.5 Low Labour Cost

Many outside China express interest or concern with China's labor costs, which are assumed to be China's key competitive advantage in manufacturing. For instance, there is no doubt that the U.S. dollar rate of Chinese wages and salaries is extremely low. Even a Chinese currency rate increase of 25-40% against the U.S. dollar, as sought by some U.S. industries and Members of Congress, would do little to equalize them with equivalent U.S. wages and salaries.

Table 5.1 the cost composition of representative vessels

Cost components	Product tanker (40,000dwt)	VLCC
LABOUR	36%	43%
STEEL	13%	19%
MAIN ENGINE	13%	11%
EQUIPMENT	38%	27%
TOTAL	100%	100%

Source: McKinsey

The table illustrates that the most main components in building ships is the labour cost and how it is important for manufacturing and especially shipbuilding nations. China's principal advantage on the world market has always been the price of its vessels, which is largely a function of generally lower production costs, in particular its abundant supply of skilled, low cost labour. The low cost of labour is particularly important as wage costs represent roughly one third of the overall cost of constructing a vessel. Therefore, cheap labor in the Chinese shipbuilding industry is an obvious strength in comparing to other major shipbuilding players.

In particular China has benefited its relatively low-cost labour force, which is one of China's strongest natural advantages against its major competitors. According to Clarkson, Labour costs in China are about 15 per cent lower compared with South Korea and Japan. However, since the 1990s, the average production cost in China have increased, in part due to the surging prices of production materials, but more importantly from the perspective of Chinese competitiveness, because of the increasing cost of labour without commensurate improvements in productivity, which is low by international standards. According to a report by COSTIND (2008), the average production output in Japan and South Korea is around 10-15 times more than that in China, and furthermore Japan and South Korea's average output value is 20 times higher than in China.

The situation of surplus production capacity grows worse. As a result of explosive growth of demand on the shipping market, China's infrastructure facility capacity of the shipbuilding industry has grown many folds in the past few years, including some newly completed enterprises that lack experience and those still under construction. These enterprises, especially small and medium-sized ones, are weak in technical force, lack professionals, and do not have good production conditions. That advantage is partly offset by the number of workers needed to perform tasks already automated in other countries.

The lower labor cost also enables the China's ship repair industry to take an advantageous position on international market. But the ship repair price began to drop after October 2008 as well, which also pulled down the profit of ship repair industry.

A more recent appraisal by the China Shipbuilding Economy Research Center suggests that the production efficiency has been increasing rapidly, and that at present the per capita output and per capita production values are about 1/6-1/4 of those of Japan and Korea.

Korea is in spite of higher labour cost than some Asian countries, producing more ships than the entire rest of the world's output combined in 2008. This is largely due to its

highly advanced shipbuilding technology and high productivity and efficiency of its shipyards.

5.6 ABUNDANT RAW MATERIALS (Steel&iron)

Ship costs are strongly affected by the costs of procuring materials. This part gives information about raw materials in china, specifically about steel. The table 5.1 provided that steel is one of the key components with 13% in product tanker (40,000) and 19% in VLCC type's vessels.

In many developed economies, shipbuilding is mostly closely related to the iron & steel industries. For example, America's General Dynamics Marine Systems covers the two industries. The Korean steelmaker POSCO invested in the Korean Daewoo shipyards to ensure a closer integration of those activities, and Japan's JFE Steel Corporation has also acquired a world-class shipbuilding enterprise. From the perspective of steelmakers, the integration with shipbuilding enterprises would provide a steady and relatively predictable demand for their products. In China, many iron and steel enterprises have expressed their willingness to build up manufacturing, processing and distribution centers with shipbuilding enterprises in order to improve production efficiency and decrease production costs. China is one of the most fortune shipbuilder nations that which is top steel producer country in the world. The table 5.2 clearly present that how China benefit from steel-producing industry.

Table 5.2: Top 10 steel-producing countries

country	Rank	2008	2007	2006	% 07/06	% 08/07
China	1	500.5	489.0	422.7	15.7	2.3
Japan	2	118.7	120.2	116.2	3.4	-1.2
United State	3	91.4	97.2	98.6	-1.4	-5.6
Russia	4	68.5	72.2	70.8	2.0	-5.1
India	5	55.2	53.1	49.5	7.3	3.8
South Korea	6	53.6	51.4	48.5	6.0	4.3
Germany	7	45.8	48.5	47.2	2.8	-5.6
Ukraine	8	37.1	42.8	40.9	4.7	-13.3
Brazil	9	33.7	33.8	30.9	9.3	-0.3
Italy	10	30.6	32.0	31.6	1.2	-4.4

(Worldsteel association 2009)

China's steel production in 2008 reached more than 500 mmt(Million Metric tons), there was a rise by 15.7% from previous year between 2006 and 2007. But in after 2008 generally speeds of increase reduce considerably. However, China remains the driving force behind the still strong world production figures. Without China, world crude steel production would have grown significantly less than total production. Some countries also maintained relatively high growth such as India and Brazil recording 7.3% and 9.3% increases respectively from 2006 to 2007, but in 2008 in these countries increase slowdown as well, even Brazil steel produce decrease slightly. In the US steel production showed negative growth in the 2007. Total crude steel production for the US was 97.2 mmt, a 1.4% reduction on 2006 figures. Also US slowdown maintained by 5.6% from 2007 to 2008. The most reduction of steel producing countries was Ukraine with 13.3 per cent.

If the price of steel increase in market, the cost of shipbuilding will increase as well, but some shipyards have found it difficult to generate profit from orders based on

contracts signed before the steel price rose. This happened to some shipyards in 2003 when they sold VLCC'S for \$70 million, only to find when they delivered them in 2006 that their value had escalated to \$125 million and rising steel prices meant they had made a loss. Investors face to opposite problem-investors who ordered new tankers at the top of the cycle often found that by the time their tankers were delivered their value has slumped, but of course they can never be sure.

The steel price index declined significantly to 95 points in middle April of 2009, even 5 per cent lower than that of 15 years ago. However, the reducing steel price did not increase the profits of ship manufacturing enterprises. It was partly because steel, as the main raw material, should be bought early. For instance, steel used in Q1, 2009 were bought in Q1, 2008, when the steel price was still upward.(China research intelligence 2009)

CHAPTER: 6

6. Effects of recent global economic crisis in shipbuilding sector

Recently almost everyday we have read some fresh news about global economic crisis in particularly regarding to shipbuilding sector. The ship building industry has affected significantly from recession as well. This economic crisis is one of the biggest the world has ever seen, and it will not be easy to come out of it. All sectors are trying to get over the crisis with as little damage as possible. In this chapter it examines how become to global economic crisis and what is the effect of shipbuilding industry, particularly on china's shipbuilding industry.

6.1 Recent Economic Crisis

Financial stability is very important, and its effects can penetrate other aspects of living and not just the economy, such as social, politics to even the daily lives of normal people. Changes in the economy will have a knock-on effect on those other aspects, all varying in severity. The past couple of years, the global economic condition has been widely discussed and predictions have been made about a recessions, until it finally came true. It has constantly been in the news especially in the past year or so due to the severity of the recession caused by the credit crunch. In the news, one can read about the collapse of financial institutions, major companies, job losses, rising prices of food, petrol and the list goes on.

The global credit crisis has weakened many economies, mainly due to the lack of available credit, which is important because credit is needed to finance transactions and operations if a party is not liquid enough to finance it themselves.

Cable (2009) went on to explain that trade is suffering due to the drying up of trade credit and a significant decrease in consumer spending. It is widely covered in the news

that countries are reacting to help their major industries. Cable (2009) stated that the main countries directly affected by the crisis have “reacted quickly and aggressively to rescue and recapitalize banks, to provide a fiscal stimulus to demand and to relax monetary policy”.

6.2 Shipbuilding sector

The order books of global shipyards reflect the size of shipping industry. The shipyards are still sitting on huge order books to be delivered through the coming a few years, but the global meltdown has dented the demand for new vessels, because the scale of the global trade has not remained what it was just about a year ago. As a result of global crisis, even some of the investor attempt to cancel their booked ships or some ship-owners would shift their attention towards acquiring secondhand ships because of their competitive prices.

New shipbuilding orders worldwide dropped 52 percent last year, hit by the global economic crisis. The orders which South Korean shipbuilders won also fell 47 percent last year (Clarkson 2009). Big shipyards have what to do until the end of 2011, but shortage of future orders has made influence on industry already. The reason is that shipyards use money that they get from new orders to complete existing orders. Experts from National Bank of China say that (2009) “The cash levels have dropped since the fourth quarter of 2008 because while they haven’t received any fresh cash from new orders, they have spent money on expansion and material purchases to meet existing orders”.

According to Hellenic Shipping News report, after almost 6 months during which almost no new ship orders have been placed, shipyards around the world and particularly in the two biggest shipbuilding countries of South Korea and China are facing serious problems. Also, their immediate need for fresh cash, both shipbuilder nations are faced with the extra pressure by many of their customers to either delay the scheduled deliveries of new ships, but also to cancel some of their orders. This circumstance is more

apparent for smaller shipyards, which were appearing like mushrooms in China during the past couple of years. Major shipbuilder nations have done new plans against result of recent crisis. South Korean yard's goal is to make a stronger their position by subsidizing their lack of any recent new business.

6.3 Chinese shipbuilding during the recession

There is no doubt that the global economic crisis has brought some major problems for China's shipbuilding industry, with owners seeking to delay or cancel orders. It should react to ensure that it develops in a sustainable fashion. According to the Ministry of Industries and Information Technology (MIIT) China's shipbuilding industry has been badly hit by the global financial crisis. New orders placed with the country's shipyards decrease 95% during the first four months of 2009 to 990,000 dwt in April. The nation's shipbuilding sector is suffering from a shortage of funds after economic recession. China's shipbuilders only received 1.18 million (DWT) of new orders in the first five months of 2009, a decline of 96 percent year-on-year, according to statistics from MIIT. Meanwhile, orders of 55 ships, or 2.32 DWT, were canceled during the same period, about 1.2 percent of the industry's total holding orders as of the end of May, said the ministry.

At the same time, however, there are ongoing plans to build new shipbuilding facilities in Brazil, China and India. Chinese yards have had the biggest problems with regard to cancelled orders in the past year or so, and a number of privately owned shipbuilders have gone to the wall.

For instance, in the first quarter of 2009, Chinese yards saw 44 newbuildings cancelled with Norwegian owners pulling out of a number of high-profile contracts, including a series of large tankers for John Fredriksen's Frontline and two 4,900 capacity car carriers for Hoegh Autoliners at Xiamen Shipyard. Frontline's cancellation involves four suezmax vessels at Jiangsu Rongsheng Heavy Industries and two VLCCs at Zhoushan Jinhaiwan Shipyard.

At the present time, Shipbuilders in China are still busy because most orders are due to finish by 2011 or 2012. After two or three years, the Chinese shipbuilding industry will face a real result of recession and the situation of shipyards will be worse this period. Even now, with the more and more intensive of financial crisis, the buyers are hard to fund and some even deserted the ship orders.

Compared with the difficulty in delivery and takeover, Chinese shipbuilders concerned more about the capitals. The most difficulty for shipbuilding enterprises is the capital turnover. The enterprises depended on the buyers` advance charge to maintain their capital turnover. If they did not receive new orders and breakthrough their capital chains, they would be hurt extremely. Once the capital turnover problems occurred, they had to loan from the banks, thus the operation costs added.

VSM (German Shipbuilding Industries Association) said that South Korea was supporting the nation's shipbuilders with a \$7bn rescue package, and quite similar situation was about to happen in China. In February 2009, Chinese government issued the Adjustment and Revitalization Plans of Chinese Shipping Industry, showing the Chinese government's determination to support shipbuilding industry.

Chinese shipbuilding industry, worried by the difficulty in takeover, delivery and capital turnover, had very great hopes of the Adjustment and Revitalization Plans of Chinese Shipping Industry. Chinese shipbuilding industry benefited most from the preferential policies on credit loan and tax.

7. CHAPTER

CONCLUSION

In this dissertation, it has discussed the global shipbuilding industry and potential of China's shipbuilding. The study provided that the industry of shipbuilding countries ranking has been changed many times in the past. However, it is likely to change again and again in the future. The general analyse of past and present data provided how the industry works, is structured and what kind of evolution has been experienced so far in the sector. Therefore, it could be said that China is in hot pursuit of South Korea to become the world's No. 1 shipbuilding nation. Some say China might become the world's largest shipbuilding nation in terms of order backlog within this year. But many industry sources say that the reduced gap has resulted mostly from South Korean shipbuilders' punctuality in delivering newbuildings and Chinese yards' delay in deliveries. They also say the gap is unlikely to narrow further as order cancellation pace is faster at Chinese yards than at South Korean (Lloyds list 2009).

This study proves that there are many advantages for Chinese shipbuilding industry, therefore China is able to be number one position following years. But the market conditions are considerably important for that, because, recent global crisis affect to shipbuilding sector substantially. And most of experts do not estimate how long it takes recovering economic downturn. Without international trade, shipping industry could not come through. But in this point, Chinese shipbuilding industry could turn to opportunities this tough circumstance against competitors. China has the right combination of huge home market and low costs to become a real competitor to the two giants. The combination of low labour costs and a huge domestic market may make it inevitable that China will surpass South Korea and Japan but it may well be much further into the future than most observers would have predicted a decade ago.

Especially previous chapters give information regarding to ship orders statistic, and statistics provide that during this period the volume of new orders has been increased considerably against other major shipbuilding countries, the development of capacity

provided success of 11th Five-Year Plan period in the beginning years. Chinese state has achieved their target until 2008 global crisis, after that the market has been changing completely.

After global economic crisis, Chinese state issued the Adjustment and Revitalization Plans of Chinese Shipping Industry, showing the Chinese government's determination to support shipbuilding industry in February 2009. The plans point out following measures: firstly, to stabilize the production; secondly, to enlarge the market demand; thirdly, to develop marine engineering equipment; fourthly, to actively promote the ship repairing; fifthly, to support the merge & acquisition; sixthly, to strengthening the technical innovations (ResearchInChina 2009).

As it mentioned before, Chinese shipbuilding sector have many strengths such as low labour cost, abundant material advantages, high political support from government, development of information technology and huge ship market. In order to place number one position in shipbuilding industry, China has to analyse competitors and market condition widely. For instance, one of the significant success factors to developing shipbuilding sector to improve technology and skillful labour. In order to improve productivity, Chinese state should provide adequate education and training opportunities to young professionals. Furthermore, the state should encourage to universities to establish relevant shipbuilding courses or programs by providing government's subsidy. China's state should try to be more active in shipbuilding industry and try to find how they can help to this industry more.

But also, Chinese shipbuilding industry should consider aware of potential risks in the market. Chinese shipyards must remember that they are not the only one wants to expand shipbuilding sector.

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