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## **LEARNING FROM THE SOUTH KOREAN RISK MANAGEMENT PLAN FOR THE SHIPBUILDING INDUSTRY DURING THE DIFFICULT 2004-2005 YEARS**

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**ABSTRACT:** With the world in financial recession, the general trend of global trade is declining. As a result, the world leading shipbuilding industries are confronted with an even more difficult task of mitigating various risks associated with the industries. How well the three shipbuilding industries, Japan, Korea and China, can adapt and manage the risks will be crucial. As the youngest of the top three, the Chinese industry faces greater risks. As it happens to share many factors with that of South Korea in 2004-2005, it is necessary to review and evaluate the risk management plan used by South Korea. This paper presents an evaluation of the risk management plan for shipbuilding industry in South Korea during 2004-2005, considering the financial and political environments at that time. This will help us to structure a plan of risk management for the future.

*Keywords: Risk Management, Risk Management Plan, Shipbuilding Industry in South Korea, Industry Crisis*

### **1. INTRODUCTION**

Almost 80% of global trade is transported by sea. As a result, it can be expected that as the financial crisis affects the world trade again, shipbuilding industry will face a difficult period in the following years. Among the top three shipbuilding industry worldwide, the shipbuilding industry in China has the least experience to confront with this crisis. As a matter of fact, how well it can deal with the crisis will largely affect the structure of this industry worldwide. In this case, it is crucial for Chinese shipbuilders to learn from those of experienced industries. Evidence that shows many amazing similarities could be found between Chinese Shipbuilding Industry in 2007 and that of South Korea in 2004, as well as the years around for both of them.

Shipbuilding industry is definitely one of the traditional core industries of South Korea. Especially at USD 43.1 billion in 2008, the industry ranked first among Korean exports for the first time in history, outpacing automobiles and semiconductors. Shipbuilding is expected to maintain its number one status throughout 2009. In terms of Compensated Gross Tons (CGT), the year of 2004 is also a glory year for South Korean Shipbuilding Industry. The size of

shipbuilding industry had a sharp increase from 2003 and its CGT surpassed that of Japan, ranking first in the world, while Chinese shipbuilding industry experienced a similar boom in 2007 and made it to rank third largest in the world for the first time. However, the shipbuilding industry in South Korea in 2004 seemed great with plenty of orders. It was just superficial prosperity. Many companies in this industry suffered declined profits or even deficits, mainly because of the increase in steel price and appreciation of the won, which happened to share very much in common with the situation confronted by Chinese companies in the shipbuilding industry in 2007. All of these evidences point to an old saying: history repeats itself.

Under these circumstances, research on risk management of shipbuilding industry in China in the following years could be based on the relevant experiences of South Korean shipbuilders. Chinese companies may learn a lot from South Koreans about how they dealt with risks in the past through the cooperation with shipbuilders, companies in other industries and, more importantly, with the government. Meanwhile, it is also a valuable lesson how the Korean shipbuilders successfully sought new opportunities to grow itself through global perspective.

## 2. RISK ANALYSIS OF SOUTH KOREAN SHIPBUILDING INDUSTRY

During the years around 2004 and 2005, various risks stared South Korean shipbuilding industry in the face and the difficulties they brought could hurt badly the steady structure as well as the development of this industry. Among them, the major ones fall into the following categories:

### *Risk of supply chain market*

Fluctuation of steel price always brings a serious problem to the shipbuilding industry. Not only because steel is the major material of a ship (a ship hull consists more than 85% steel), but also because of steel's high shipping freight. Generally speaking, the cost of steel plates is about 18% of a shipbuilder's costs. As a result, local steel price, to a large extent, controls the benefits of the shipbuilding industry. Especially in South Korea in 2004-2005, steel price did control the shipbuilding industry to some extent.

In 2004, steel price increased by 75% based on previous price in 2003, and in 2005, it increased by 60%. According to statistics of Fairplay [1], the three major shipbuilding companies in South Korea, Hyundai Heavy Industries, Daewoo Shipbuilding & Marine Engineering and Samsung Heavy Industries, witnessed a sharp decline of their profits or even loss from 2003 to 2004 due to the constant increase of prices of materials and equipments, among which the dominant was steel price. To be more precise, a paper published in The Journal of Commerce Online Edition in 2004 [2] qualified the suffering of the three corporations: the profit for Hyundai Heavy and Daewoo Shipbuilding & Marine Engineering Company may had slumped 21% in the second quarter of 2004, and profit for Samsung Heavy was 8.6% less than the year before, 2003.

### *Risk of foreign exchange rate*

Appreciation of the won is well up in the list of killers of benefit in shipbuilding industry in South Korea, for the fact that orders in this industry in South Korea, just like that in China, are usually paid in US dollars. Like depreciation of won contributed to the financial success of shipbuilding industry in South Korea before 2003, the fact that the won had appreciated by 15% against the US dollar in 2004 was a big calamity of shipbuilding industry.

### *Risk of financial environment*

In South Korea, a terrible recession happened in 2003, which is widely regarded as Korea's first serious downturn since the Asian crisis of 1997-1998. In 2003, the fact was that even if the economy showed growth of around 3% for all of that year, it was still less than half the 6.3% rate of expansion registered in 2002. Although this recession was over by 2004, a sustained expansion of economic downturn still affected the whole nation and all its industries. Moreover, social problems followed this downturn, like labor strikes, also hit areas like shipbuilding.

### *Risk of shipbuilding market*

South Korean shipbuilders were confronted with a dilemma considering the risks of that period of time in the shipbuilding market. On one hand, because shipbuilding could lead to downside profits or even loss at that time, more orders, or more building, meant more loss,. On the other hand, they had to fight for more orders to maintain their market share during the downfall of this market, which meant that they might even accept an order at a price below the cost of production in an attempt to boost their share of a declining market.

## 3. EFFECTIVE MEASURES OF RISK MANAGEMENT ADOPTED IN SOUTH KOREA

With an effective risk management plan, South Korean shipbuilding industry overcame the difficulties during the period around 2004-2005 and even developed new opportunities for itself. The crucial risk management measures are summarized and listed with their relevant risks in Table 1, which includes every single risk mentioned in risk analysis phases.

To elaborate on the system of risk management, it is clearer if the effective measures South Koreans adopted are divided into internal adjustment and external support.

**Table 1.** Major Risk Management Measures in Connection with Their Relevant Risks

Major Risks Faced by Shipbuilding Industry in South Korea		Risk Management Measures They Adopted
Risk of Supply Chain Market	<input type="checkbox"/> Steel price kept raising in worldwide <input type="checkbox"/> Local steel price increased by nearly 68% in 2004 and 2005	Exploit overseas steel channels through branches all over the world
Risk of Foreign Exchange Rate	<input type="checkbox"/> Appreciation of won against US dollar happened in 2004 and 2005	Develop shipbuilding bases abroad to reduce foreign exchange rate by balancing various currencies
Risk of Financial Environment	<input type="checkbox"/> The terrible recession happened to South Korea in 2003 <input type="checkbox"/> The recession still affected economic growth in the following years	<input type="checkbox"/> Devoted into growth of this industry to boost local economy <input type="checkbox"/> Seeking opportunities in economical upcoming nations
Risk of Shipbuilding Market	<input type="checkbox"/> Under circumstances of that period, more orders meant more loss <input type="checkbox"/> However, obviously less orders meant smaller market share	<input type="checkbox"/> Reduce the total cost by importing cheap raw materials <input type="checkbox"/> Switch the focus to high valued-added products

### 3.1 Internal Adjustment

#### *Global strategy*

Plentiful labor force, cheap raw materials, better sites for shipbuilding, and higher reputation worldwide, the most successful strategy of the South Korean shipbuilding industry was a global strategy [3]. Instead of total dependence on Japan, the shipbuilding industry in South Korea began to evolve into an advanced one with its own strength and style.

More importantly, it began to expand its own territory. Branches overseas could make full use of cheap local materials and the steady exchange rates to avoid relevant risks which were quite notable in South Korea in 2004. A great example is concerning Korea Daewoo Shipbuilding Ocean Project Company. Up till 2005, it already had branches or cooperation projects over Asia, Africa and Latin America.

However, for Chinese shipbuilding industry, it might be hard to practice this global strategy in a short period of time. To start with, this industry in China includes a large number of newly-built companies, which lack research awareness as well as investment strength. Besides, some major shipbuilders in China are branches of foreign companies, such as branches of Korea Daewoo Shipbuilding Ocean Project Company.

#### *Adjustment to pricing and production*

To deal with the rising steel prices, South Korean shipbuilders managed to import steel plates from Europe and Latin America, instead of only from Japan.

“Less building, less loss” was the realistic situation during the difficult period, while market share should not be reduced because of it. To deal with this market

dilemma, companies in South Korea raised prices of ships with additional clause of floating prices, and began to decrease their orders in 2004.

More importantly, South Korea’s shipbuilding industry agreed on switching of production focus to higher valued-added products to broaden its market share in this underdeveloped regime.

The existing technical strength and limited market share to some extent block the way for Chinese shipbuilders to switch production focus or to refuse orders of non-high valued-added products.

In this case, Chinese shipbuilding industry also needs imported steel to deal with steel price, but its needs of local market are probably the dominant one. So efforts are needed to build up a positive interaction relationship between shipbuilding industry and steel works. The alliance of these two industries did a great work on solving the problem in 2004 for China [4].

#### *Ambition of technical strength*

Working as strong support of its production focus switching, South Korea’s shipbuilding industry is always devoted to increasing its technical strength. The keywords of its success are consistent learning and, more importantly, innovation, which includes innovative ship forms, manufacturing techniques, and future plans of innovation steps [5].

At the mention of innovative ship forms, shipbuilders in South Korea started to prepare for this from the very beginning of the 21<sup>st</sup> century. They paid close attention to research on possibility of building new ship forms applying learning experience of advanced techniques of European and Japanese shipbuilding industries. When it comes to 2003, the saturation year of local shipbuilding industry, they were able to share orders of LPG

(Liquefied Petrochemical Gas), LNG (Liquefied Natural Gas) and other high value-added vessels with competitors from Europe and Japan. In the following years, they kept on relevant research which contributed the most powerful strength to make the market share of South Korea shipbuilding industry grow from 32% in 2001 to 40% in 2010 [6].

During their production process, South Korean shipbuilders also invented several manufacturing techniques in order to realize shipbuilding on land. Skid method, Dam method and others, all of them are still the pillar techniques of modern shipbuilding industry worldwide.

The future plans of South Korea shipbuilding industry are amazingly forward looking. Compared with those of the Japanese and Chinese shipbuilding industry, which are still reactive ones, theirs are more instructive and, as a result, more successful.

Nowadays, Chinese shipbuilders are aware of the importance of innovative ship forms, but the process of this innovation might be much slower. After all, they lack the investment ability or funding for relevant research.

#### *Devoted to R&D*

Not only concerning its technical strength but concerning the fact that the production capacity of shipbuilding industry in South Korea could surpass that of the Japanese shipbuilding industry, heavy investment on research and development is the crucial factor. According to Yang [6], several facts would speak for themselves: the amount of investment offered by the top five companies in the industry during the seven years from 1995-2001 was nearly six times of that in the last seven years from 2001-2006. Korean government invested on an institution, Korean Research Institution of Ship and Ocean, for research on shipbuilding industry. Of this investment, nearly 70% of its capital source is from government investment, 20% from donation of other organizations, and only 10% from investment of shipbuilding companies. Korean government always values the research level of shipbuilding industry. Therefore, relevant majors in Korean college are also highly valued and able to attract enthusiastic learners dedicated to shipbuilding industry, which well prepares the future success of R&D in this industry.

#### *Work ethic*

Work ethic, combined with innovative management models in South Korea, affected shipbuilding industry enormously. South Korea companies learned fast from the Japanese to prove shipbuilding industry to be one with digital management skills. For example, HHI (Hyundai Heavy Industries) adopted PCC (Product Collaborative Commerce) to organize the separate job sites of production and to enable each department to be aware of the latest relevant information. Similar attempt is made in the Chinese shipbuilding industry.

### **3.2 External Support**

The marked feature of Korean economy is the macro-directing of government, and shipbuilding industry is the

perfect example. In the palace of shipbuilding industry as a whole, there is no doubt that government support is the main pillar.

All the external supports of this industry, no matter what the sources of them, are motivated by the steady and strong support from the South Korean government. Or as Cha [7] stated, the evidence showed that the Korean government provided credible commitment consisting of the government's delegation, monitoring and punishment in the IT sector, the shipbuilding industry, and the financial sector. In response, private investors voluntarily put their limited resources into production even during economic downturns.

Looking at the larger picture, the Korean government drew up the Heavy and Chemical Industry (HCI) program as the major target of its third Five-Year Plan (1972-1976). To guide the development of HCI, Korean government showed active manipulation of fiscal, monetary and trade policies, and inducing the top conglomerates and chaebols to take part in this program [7]. To a large extent, Korean shipbuilding industry made it to the top of the world based on this.

Specifically on the financial side, Liu [8] summarized the major policies that Korean government took to guarantee proper benefits of shipbuilding industry:

1. Value added tax and commodity tax were waived for shipbuilding industry;
2. Corporation tax rate was varied by the profits of the corporations in this industry;
3. Exchange rate was adjusted in order to ensure the profits of the industry;
4. Long term low-interest-rate loans (the amounts could be up to 65% of the total investment) were provided by the government if they were used to set up new factories or to extend existing ones.
5. Buyer's credit was also offered to support ship exportation;
6. Charging the imported ships to protect local shipbuilding industry.

The prosperity of South Korean shipbuilding industry should definitely be attributed to the constant and strong support from its government. Inspired by this situation, the State Council of the People's Republic of China agreed on the Medium to Long-term Project of Shipbuilding Industry Development. This project determined the objective of Chinese shipbuilding industry in the following ten years: to improve our market share from less than 20% up to 35%. It also provided the development guidelines on the aspects of technology, products, investments, management and cooperation with foreign countries. Moreover, this project mentioned that three large-scale modernized shipbuilding bases would be built in Bohai Bay region, Yangtze Estuary and Pearl River Delta. The establishment of the bases is important to shipbuilding industry as they can work efficiently as excellent leaders in groups with outstanding shipbuilders. However, apart from supporting shipbuilding bases, Chinese government should also make an effort to promote the form of large-scale shipbuilding industrial groups [9] to boost our international competitiveness, by integrating companies of small and large scales and

integrating the companies with research institutions and financial groups. Hopefully, the project of development in China can lead its shipbuilding industry to success as that in South Korea did.

#### 4. CONCLUSIONS

During the difficult period around 2004 and 2005, the South Korean shipbuilding industry survived on its accurate analysis of the major risks at that time and even developed new opportunities because of adopting effective risk management measures. Confronted with the coming crisis of shipbuilding industry, Chinese shipbuilders should learn valuable lessons from the South Koreans to maintain the vitality and even extend its market share in the constantly changing framework of shipbuilding industry worldwide.

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