Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 194 (2017) 241 – 246

Procedia Engineering

www.elsevier.com/locate/procedia

10th International Conference on Marine Technology, MARTEC 2016

SWOT Analysis of China Shipbuilding Industry by Third Eyes

Khandakar Akhter Hossain[a,*], N.M.Golam Zakaria[a], M.A.R.Sarkar[a]

[a]*Bangladesh University of Engineering and Technology, Dhaka, Bangladesh*

Abstract

Global major shipbuilding industry has already shifted to the Asian reason, mainly China, South Korea and Japan; the three shipbuilding giant in the world. China has been implementing shipbuilding as a strategic industry at the beginning of this century to establish itself as a major maritime power. It is now the world largest shipbuilder in terms of gross tonnage and value. This paper tries to find out China?s shipbuilding efforts and strategies that have enabled the country to make its shipbuilding industry competitive and efficient. This research is based mainly on data collection from shipbuilding stake holders of China and SWOT analysis of China shipbuilding has been done on this basis. Present world economic status, China economic status, global shipbuilding trend, order and China shipbuilding growth have also been discussed.

Peer-review under responsibility of the organizing committee of the 10th International Conference on Marine Technology.

Keywords: Global trade; Order; Trend; Growth; Strength; Weakness; Opportunity; Threat

1. Introduction

About 90% of global trade in terms of value is seaborne. The seaborne trade is about 7 billion tons annually; usually contributes 15% to global GDP [1]. Global major shipbuilding industry already shifted to the Asian reason, mainly China, South Korea and Japan; the three shipbuilding giant in the world. China has taken an effort and implements a shipbuilding strategy in the beginning of this century to establish itself as a major maritime power. It is now the world largest shipbuilder in terms of gross tonnage and value; leaving behind both Korea and Japan. China is the world largest trading nation and World Bank estimates that, it will continue its economic development in coming future even [2]. CNN [3] reported that Chinese total trade for 2013 reached US$ 4.2 trillion. China overtakes USA and become top trading nation and manufacturing economy in the world in 2014. China?s shipbuilding efforts and strategy has enabled the country to make its shipbuilding industry competitive and efficient and provided an opportunity to describe how a judicious mix of public and private enterprise can kick-start an industry and establish sustainable economic boom [4]. This is a research paper based mainly on primary data collected physically by first author from China from shipbuilding stake holders like renowned shipyards, classification societies, manufacturers of shipbuilding materials and machineries and also secondary information from shipbuilding literatures. Researcher work under CSIC in a renewed shipyard for more than three years in china and analyze the industry by physical involvement. Shipbuilding industry of china is a vast and widely spread around the china coast and riverside. So it is a very complicated and challenging task for a foreigner to analyze the industry. Moreover, language barrier and access to information inside China is also a big challenge. However, everything was under reasonable control due to physical presence in China of the researcher and direct involvement to the industry for three years. This research work mainly focuses on China

* Corresponding author. Tel.:+88017697244420; Fax no: +88031250123
E-mail address: akhter.engineer@yahoo.com

Peer-review under responsibility of the organizing committee of the 10th International Conference on Marine Technology.
doi:10.1016/j.proeng.2017.08.141

economic status in context of world economy, global shipbuilding trend, shipbuilding practice in modern days, global shipbuilding order, china shipbuilding growth and Strength Weakness Opportunity Threat (SWOT) analysis of China Shipbuilding Industry.

2. Justification of Empowering Shipbuilding Industry in China

Shipbuilding is considered to be one of the most strategic, oldest, most open and highly competitive markets in the world. Shipbuilding industry is always dominated by maritime nations and it usually has vast experiences in surviving during peaks and slumps of economy. As shipbuilding is a highly capital intensive industry so strong government support and political stability is prerequisite to survive this industry. Also the key factors that driving the growth of the market are GDP, global seaborne trade, improved economic growth, rising urbanization, fossil fuel price and increase in global steel production. China?s economy has experienced a strong annual GDP growth rate of average 10% during the last decade [5]. It is expected to continue its growth momentum and overtake the USA in GDP by 2020. A high rate of savings, abundant and increasingly skilled labor, healthy export business, social security and potential urban growth reach the China at the top within 2020 leaving behind all countries in the world. Figure 1 shows GDP growth of China that has been forecasted by International Monitory Fund (IMF). On the other hand, China?s socialist market economy is the world?s second largest economy by nominal GDP and the world?s largest economy by purchasing power parity according to the IMF [6] . China is a global hub for manufacturing, and is the largest manufacturing economy in the world as well as the largest exporter of goods in the world leaving behind USA. China is also the world’s fastest growing consumer market and second largest importer of goods keeping USA above. Services Account Balance from 2007 -2011 of China’s economy has always been in slight deficit, and China is a net importer of Services products. China is the largest trading nation in the world and plays a vital role in international trade and has increasingly engaged in trade organizations and treaties in recent years. China has free trade agreements with several nations. Again on the basis of per capita income basis, China ranked 82nd by nominal GDP and 89th by GDP (PPP) in 2013, according to the IMF. The provinces in the coastal regions of China tend to be more industrialized, while regions in the hinterland are less developed. Figure 2shows the ten largest economies in the world in 2050, measured in GDP (billions of USD), according to Goldman Sachs research and this graph clearly demonstrate why China has taken shipbuilding as a strategically industry for the expansion of China in near future.

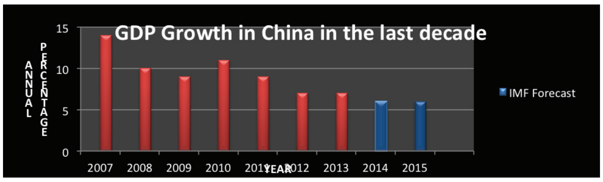

Fig. 1: Trend of GDP Growth of China (forecast by IMF)

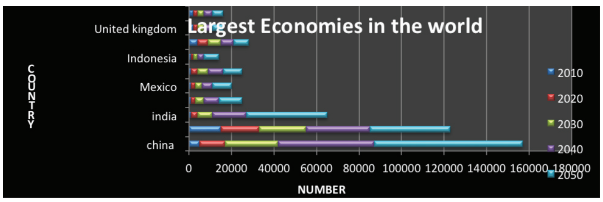

Fig. 2: The ten largest economies in the world in 2050, measured in GDP (billions of USD), according to Goldman Sachs research.

3. China Shipbuilding Strategy and Present State

Shipbuilding has been identified as a key sector for growth in China [7]. There has been significant capacity expansion in recent years, both through the construction of new facilities and the upgrading of existing shipyards. Like all other industries, shipbuilding has gravitated to the East over the last 40 years or so [8]. During this period, Western Europe's shipbuilders have seen their market share eroded - first by Japan, followed by South Korea, and more recently, by China. China is making a concerted effort to establish itself as a major maritime power. It is now the world's largest shipbuilder in terms of gross tonnage and value, leaving behind the Japan and South Korea. China?s development strategy is to change the mode of economic growth from relying on cheap labour and quantity expansion to achieving growth by scientific and technological progress, and by improved efficiency to achieve industrial transformation. China shipbuilding has integrated military and commercial efforts [9]. Shipyards that once built only warships have turned their expertise and facilities to the construction of freighters and other vessels for commercial purposes, while continuing to build and modernize ships in response to requirements from the People?s Liberation Army (PLA) Navy and Army. The China Shipbuilding Industry Corporation (CSIC) is one of the two largest shipbuilding conglomerates in China, in the other being the China State Shipbuilding Corporation (CSSC). It was formed by the government on 1 July 1999 from companies spun off from CSSC. These are State Owned Enterprises (SOEs) and fall under the direct supervision of the State Council (China?s Cabinet). However, more than half of the nation's ship output is actually made by the thousands of private small and medium shipyards. Such yards accounted about half of China's total ship output and around half of total ship sales in years. They also accounted for about half of the jobs in the country's shipbuilding industry [10]. The Chinese-flag merchant fleet named China Ocean Shipping Company (COSCO), numbers more than 2000 ships and about half of which have a displacement over 10,000 deadweight tons (DWT). China has planned to expand its fleet as its trade expands remarkably. Table 1 below has shown the present statistics and important figure of shipbuilding industry of China in 2014.

Table 1: Industry Statistics & Market Size of China Shipbuilding Industry (2014)

Revenue around US$ 80 billion.	Annual Growth average 2.5%
Profit average 10%	Direct Employment around 500,000
Total Businesses 685	Indirect Employment around 5000,000

4. Global Ship?s Order and China?s Shipbuilding Growth in Last Decade

China ship building market has grown up from 2008, just after the global ship building market has been grown up at the peak in the year of 2007. China shipbuilding growth reaches their top point on 2011 and then slows down gradually up to today irrespective to the global shipbuilding fluctuated growth.

5. SWOT Analysis of China Shipbuilding

A SWOT analysis (alternatively SWOT matrix) is a structured planning, method used to evaluate the strengths, weaknesses, opportunities and threats involved in a project or in a business venture or in a industry. This SWOT analysis on shipbuilding industry based on collection field data, closely observation of shipbuilding process, supply chain, project management, infrastructures, Govt. strategies etc during author?s stay in China for constructing Naval Vessel for long 3 years.

5.1. Strength

1. Status of the all industry in Chinese economy keeps rising since last three decades. Now China is the largest Industrial nation leaving USA behind marginally. As shipbuilding nation China is also number one in the world

leaving behind South Korea and Japan. The volume of completions, new orders and holding orders of ships in China remained top of the world in 2014 [11].

2. Shipbuilding industry is developing speedily in China. The completion volume of ships in China has been increasing rapidly since the 1990s, making China one of the shipbuilding centres in the world. Shipbuilding industry has greatly contributed to industries such as water transportation, fishery and marine development since China joined WTO in 2001.
3. Policies of Chinese government played an important role in transformation and upgrading of the industry, which brings more orders and time for shipping and shipbuilding market to recover [12].
4. Resource, shipbuilding infrastructure, capability, engine, gen-set, machinery, equipment, deck fitting items, electrical and electronics items, panelling, insulation, furniture, cable and almost all shipbuilding material manufacturer of China are very much favourable for shipbuilding industry in china.
5. Forward and backward linkage industries of shipbuilding set in China are vast. 95% Shipbuilding material manufactured inside China. Most of the world renowned manufacturer, firm and industries have set up their factory in China and are giving uninterrupted production [13]. That is why shipbuilding material available here and overall cost is less in China.
6. Steady social and political environment is very much helpful to continuous growth of shipbuilding in China [14]. China possesses the easiest and cheapest transportation cost compare to any countries around the world.
7. China matches very well with the prime requirement to flourish the shipbuilding. Few thousands of engineering and technology universities and technical colleges of China provide hundred thousands of shipbuilding and engineering students and diplomas as workforce in the industry in every year [15]. A nation's need to manufacture and repair its own navy and vessels that support its primary industries prior to develop its shipbuilding industry and become maritime power. China is going to become a formidable maritime power in near future leaving behind USA.
8. Joint ventures between the developing Chinese shipbuilding industry and established Japanese and Korean yards helped a lot in transfer technology, engineering skills and production know-how to China. Now the Chinese shipyards already achieve a standard to satisfy the foreign customers and will improve even more in quality and quantity in near future.
9. As Chinese builders have become more competitive in world markets, particularly in dry cargo, container ship, bulk/ore carrier and crude oil tankers. Japan's Kawasaki Heavy Industries formed a joint venture with COSCO to create the Nantong Ocean Ship Engineering Company (NOSEC). This group has already built the largest ship repair facility in China.
10. In China most of the manufacturers have become highly efficient over the last two decades, with the ability to maximize both the productivity of the workers and machines to maximize profits. But China shipbuilding growth and strengths is sustainable.

5.2. *Weakness*

1. China's shipbuilding industry has faced considerable pressure/problems due to economic depression in shipping industry in the world.
2. Present global economic recession is reducing overall trade as well as commercial fleet since five years.
3. Tougher competition experienced by all shipbuilding nations since last few years.
4. Overcapacity and accelerated mergers and acquisitions of shipbuilding since few years, make the entire industry venerable.
5. Low price of orders and increasing cost of labour and raw material in China also deepen the crisis.
6. Shortage of construction supervision, mid level management and skilled work force observed in China shipbuilding industry.
7. Quality of shipbuilding and machinery work in new building in China need to improve.
8. Design capability for specialized vessel (passenger ferry, LNG carrier, pleasure yachts, warship, etc) need to improve.
9. State owned shipyards and related manufacturers (under CSSC and CSIC) have extra and non productive workforce. Those extra workforce become liability for the industry.

10. Accountability and responsibility of shipbuilding personnel need improvement.
11. Weak performance observed in domestic market in China compared to entire industry in the world.
12. Reduction in orders has led to weakening cash flows is a concern.
13. Present shipbuilding industry is quite mature industry. There is heavy competition and little room for growth. As a result, it is no more a cash cow for china as it is already over capacity.
14. Inefficiency is another pressing problem in china shipbuilding industry.

5.3. *Opportunity*

1. Since 2013, bulk orders in Chinese shipbuilding industry encompasses high-tech ships and special ships such as LNG & LPG carrier, VLCC ships, super-large container ships, duplex stainless steel chemical vessels, marine law enforcement vessels, public service vessels and fishing vessels.
2. China shipbuilding enterprises received a large amount of bulk orders since 2013.
3. Shipbuilding industry in China has great potential to develop itself in the coming years. On the one hand the cost is lower in Chinese shipbuilding industry than those in Japan and Korea.
4. Increasing domestic demand in shipbuilding industry in China will attract global investment.
5. China governments take corrective monetary and non-monetary incentives to boost the industry.
6. In view of the ageing fleet of offshore vessels globally with approximately 40% (of the offshore vessels) above 20 years of age. China is suspected to get those orders in competitive prize soon.
7. From recent research it has expected that, minimal chances of order cancellations in shipbuilding will be taken place in coming years (2015 and onward).
8. With the growing competition in shipbuilding industry, acquisition and capital operation among large enterprises become more and more frequent. It?s in line of China shipbuilding trend.
9. The domestic excellent ship enterprises pay more attention to the industry market research. China is following the same path like Japan and South Korea to achieve its maritime goal.
10. Huge opportunity has created if the industry diversifies largely into military equipment production. China is also moving forward in the same way.
11. Government policy, national maritime strategy and other supportive measure help the local shipyards to survive and flourish in the global market.

5.4. *Threat*

1. Achieving acceptable quality from the low-technology, low-wage Chinese shipbuilding industry remains a challenge.
2. International customers find that a good quality-control inspector is a prerequisite for new building in China.
3. Productivity remains low and it is difficult to achieve higher quality standards by Chinese shipyards, as compare with leading Japanese and Korean shipyards.
4. It is difficult to break the monopoly of enterprises from developed countries in the field of advanced equipment design and development in a short term.
5. Status of Korean enterprises in the field of ocean engineering and equipment construction won't be changed.
6. Current problems for Chinese shipbuilding enterprises need to reinforcement by design and development, and the construction capability of high-end equipment.
7. Shortage of construction supervisors, mid level managers and specialized shipyard personnel.
8. Workmanship and shipbuilding quality need more improvement.
9. The global economy slowing down in consecutive last few years on account of fiscal imbalances in the developed nations, the seaborne trading volumes deteriorated, adding threat.
10. South Korean shipbuilders eating away their global market share.
11. Weakening Chinese currency and its economy could be disastrous.
12. The largest threats for China shipbuilding industry are from low wage shipbuilding countries like India, Philippine, Vietnam, Brazil, Bangladesh, etc.
13. Diversified R & D in shipbuilding technology with multi-cultural people is absent in China.

6. Conclusion

With a view to becoming the largest maritime power in the world within 2020, shipbuilding industry is developing speedily in China. As with other industries, China begins by emphasizing its low labour rates and then moves up the value chain to higher-technology (higher-value) products (i.e., more sophisticated ships). Government policy, national maritime strategy and other supportive measure help the local shipyards to survive and flourish in the global market. Now China is number one shipbuilding nation in the world leaving behind South Korea and Japan. The completion volume of ships in China has been increasing rapidly since the 1990s, making China one of the shipbuilding centres in the world. The number of new ship orders in China amounted to around 40% of the global new orders in 2014, which was top of the world for five consecutive years. Delivery amount of new ships in China ranks the first in the world for five consecutive years, accounting for around 45% of the global in the year 2014. The biggest threats for China shipbuilding industry are from low wage shipbuilding countries like India, Philippine, Vietnam, Brazil, Bangladesh, so on. Those countries are even bigger threat to China shipbuilding industry, with their ability to supply highly educated workers at low wages to fill roles in both low and high-tech market segment.

References

[1] Stopford M., 1988. Maritime Economics, Unwin Hyman Press, London, 1988.
[2] Paul G. H., 2012. Environmental Policy and Sustainable Development in China. University of Bristol Press, UK, 2012. [
[3] Cable News Network, USA, edition.cnn.com
[4] Lixing Zou, 2009. Development oriented finance and economy in China: A historical review and prognostic assessment. Printed in Bloomington, Indiana, USA, 2009. [
[5] Michael Dillon, 2010. China: A modern history, I B Tauris and Co Ltd, London, UK, 2010. [
[6] Evan F, 2003. China?s Techno-warriors. Stanford University Press, California, 2003.
[7] Frederick M. H., Cheryl A. W., 2004. The Philosophy of Shipbuilding: Conceptual Approaches to the Study of Wooden Ships. Texas A& M University Press, 2004.
[8] Sawyer, L.A. and Mitchell, W. H. 1985. The Liberty Ships: The History of the "Emergency" Type Cargo Ships Constructed in the United States During the Second World War, pp. 7-10, 2nd Edition, Lloyd's of London Press Ltd., London, England, 1985. [
[9] Jaffee, Capt. Walter W. 1997. The Lane Victory: The Last Victory Ship in War and Peace, pp. 4-9, 15-32, 2nd Edition, Glencannon Press, Palo Alto, California, 1997.
[10] Herman, Arthur, 2012. Freedom's Forge: How American Business Produced Victory in World War II, pp. 135-6, 178-80, Random House, New York, NY, 2012. [
[11] Ship Building Market Research Report, Dec 2014. (http://www.ibisworld.com/industry/china/ship-building.html).
[12] Research Report on China Shipbuilding Industry, 2014-2018 (https://www.bharatbook.com/marine-and-shipping-market-research-reports-354707).
[13] Paul G. H., 2012. Environmental policy and sustainable development in China. University of Bristol Press, UK, 2012.
[14] Jonathan Story, 2003. China: the race to market; what China?s transformation means for business markets and the new world orders. Prentice Hall Press, 2003.
[15] China Shipbuilding Industry Production & Marketing Demand and Investment Forecast Report, 2013-2017 (http://en.qianzhan.com/report/detail/3c9944de618e465f.html).