OECD publishing

REPORT ON CHINA'S SHIPBUILDING INDUSTRY AND POLICIES AFFECTING IT

OECD SCIENCE, TECHNOLOGY AND INDUSTRY
POLICY PAPERS
April 2021 **No. 105**

OECD
BETTER POLICIES FOR BETTER LIVES

This paper was approved and declassified by the OECD Council Working Party 6 on Shipbuilding (WP6) on 26 November 2020, and was prepared for publication by the OECD Secretariat.

Note to Delegations:
This document is also available on O.N.E under the reference code:
C/WP6(2020)8/FINAL

Report on China's shipbuilding industry and policies affecting it

OECD Shipbuilding Unit[1]

Abstract

This report analyses the structural characteristics of China's shipbuilding industry, notably through comparison of other major shipbuilding economies. Building upon previous reports drafted in 2008 and 2011, it aims to analyse China's shipbuilding sector from a holistic and multidisciplinary perspective (e.g. the interconnection between trade, competition, monetary, financial, fiscal and industrial policies), with a particular emphasis on government support measures. Key findings from these analyses suggest that: 1) China's shipbuilding industry has been labelled as a strategic industry, which may equally explain China's intention to move up the shipbuilding value chain, 2) State-owned conglomerates hold a lot of influence in China's shipbuilding industry, 3) Government support to the Chinese shipbuilding industry is alleged to have contributed to global excess capacity.

Keywords: Shipbuilding, China, State-owned enterprise, Support measures, Excess capacity

[1] For further information please contact the OECD Directorate for Science, Technology and Innovation at sti.contact@oecd.org or shipbuilding@oecd.org.

Table of Contents

Tables

Figures

List of abbreviations

ECA: Export Credit Agency

CANSI: Chinese Association of the National Shipbuilding Industry

CBRC: China Banking Regulatory Commission

CDB: China's Development Bank

Cexim: Chinese Export-Import Bank

CMIH: China Merchants Industry Holding

COSTIND: Commission of Science, Technology and Industry for National Defence

CSSG: China State Shipbuilding Group

CSIC: China Shipbuilding Industry Corporation

CSSC: China State Shipbuilding Corporation

CSSRC: China Ship Scientific Research Center

LNG: Liquefied Natural Gas

NDRC: National Development and Reform Commission

MARIC: Marine Design and Research Institute of China

M&As: merger and acquisitions

MIIT: Ministry of Industry and Information Technology

MOFCOM: Ministry of Commerce

PBOC: People's Bank of China

Sinosure: The China Export and Credit Insurance Corporation

SOA: State Ocean Administration

SOE: state-owned enterprise

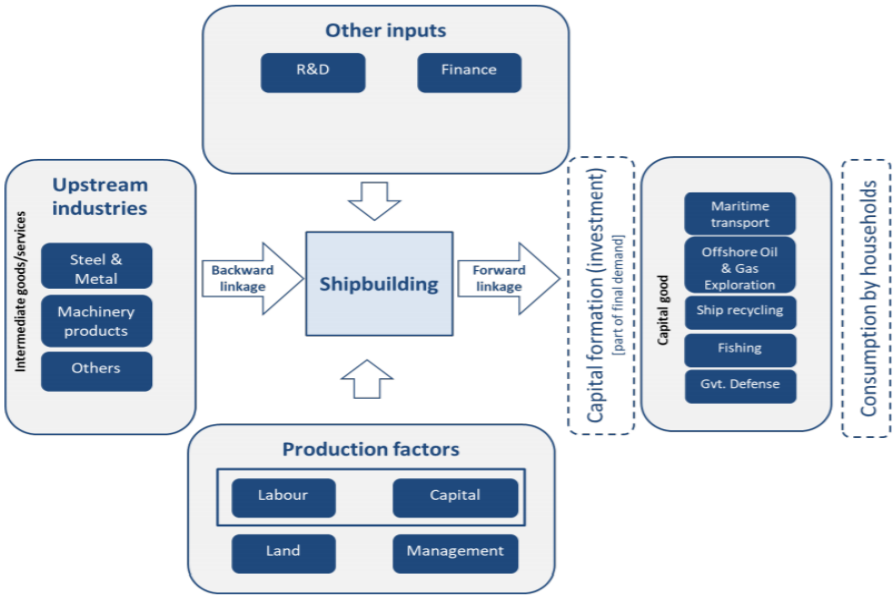
VLCC: very large tankers for crude oil and chemicals

1. Introduction

The OECD drafted reports on the shipbuilding industry in the People's Republic of China (hereafter 'China') in 2008 and in 2011.[1] While the present report intends to build on the observations of these previous reports, it significantly expands the analysis of Chinese shipbuilding policies. China has become a major player in the shipbuilding sector since the previous WP6 reports and certain government policies may have had an impact on the global shipbuilding market.

The report mainly focuses on the construction of ships used for the shipping of goods (i.e. bulkers, tankers and container ships), as China has built a strong reputation in these segments of the shipbuilding market. While China's overall influence in more high-value added segments of the market is at present less noticeable, Chinese policy documents clearly articulate the ambition to move up the value chain. Therefore - at times - references are equally made to other segments of the shipbuilding market such as passenger ships (i.e. cruises or ferries), specialised ships (e.g. research vessels and dredgers) or marine equipment. To the extent possible, the report assesses the Chinese shipbuilding industry from the perspective of the entire value chain. The shipbuilding value chain can be visualised as follows:

Figure 1. Overview of main industries involved in the shipbuilding value chain



Source: Chart taken from K. Gourdon and Ch. Steidl, '*'Global Value Chains and the Shipbuilding Industry*'', OECD Working Papers 2019, 16.

China is also a major producer of naval vessels. Several Chinese policy documents indicate that China is actively promoting a system of dual-use[2], allowing shipyards to both build civilian and naval vessels and share technologies between both ship types.[3] It has been argued that this civil-military integration could be a possible element to explain the large amounts of resources invested by the Chinese government in its shipbuilding sector.[4] It should be noted however that this report does not include an analysis of naval shipbuilding or marine technologies with dual-use, as these types of activities fall outside the scope of the WP6's mandate.

The report mainly draws upon public sources including documents of listed companies, academic journals, and news articles. To the extent possible, reference is made to primary sources, including Chinese laws and official press, supplemented with secondary sources, including external authors providing comments on primary sources, and the Secretariat's analysis. However, the paucity of available

data has restricted the Secretariat in undertaking a thorough evidence-based analysis. While drafting the report, it became clear that not all primary sources are publicly accessible. Additionally, only the companies that are listed on the stock market, and hence are required to issue public statements about their activities, were researched. Their parent companies are often not listed and were consequently not scrutinised in detail. This implies that the analysis may suffer from data gaps.

The results of this study show that China's shipbuilding industry has grown rapidly since the year 2000 and that China became the world's largest shipbuilding economy in 2010. This is – amongst other factors - attributable to the large-scale expansion of facilities by China's shipbuilders during the historic boom period from 2003 to 2008 and the Chinese government's policy efforts to promote the shipbuilding industry as a major strategic export industry since 2001.

China's shipyards have been involved in the production of a wide variety of vessel types in the past ten years. While China has traditionally been focusing on bulk carriers, tankers and containers, in more recent years China increasingly built highly specialised vessels such as gas carriers, offshore service vessels, passenger ships, car carriers, and roll-on/roll-off (ro-ro) vessels. In terms of completions in CGT, 45 of the largest 100 Chinese shipyards are owned by the central and local governments and these shipyards represented 59% of China's shipbuilding production in 2019.

The growth of the Chinese shipbuilding industry seems linked to the government's industrial policies, including its Five-Year Plans, Scrap-and-Build schemes, and specific Action Plans accompanied by state-led strategies such as the Belt and Road Initiative and Made in China 2025. These policy measures contributed to the fast expansion of the Chinese shipbuilding industry and, according to some experts, were accompanied by a considerable subsidisation of the industry (see 3.2.2.).

After the Global Financial Crisis in 2008 and 2009, which led to a negative shock in ship demand from 2011 onwards and exacerbated the excess capacity situation, many private Chinese yards exited the market. Subsequently, the Chinese government installed policies such as the White List to rationalise and promote the concentration of the shipbuilding market. These developments are notably articulated by the merger between the two large shipbuilding State-Owned Enterprises (SOEs), i.e. CSSC and CSIC.

The report also addresses the impact of the COVID-19 outbreak on the Chinese shipbuilding industry. Chinese yards had to stop their operations because of the lockdown promulgated in many Chinese provinces but managed to recover quickly during the spring and summer of 2020. The relatively better performance of Chinese yards compared to yards located in other countries can be explained by the numerous domestic ship orders in China. However, as a consequence of the economic downturn, the decrease of seaborne trade is expected to weigh on certain ship segments' demand in the coming years.

2. The Chinese shipbuilding industry

2.1. Global Perspective

China is the world's largest manufacturing economy and exporter of goods. In 2018, the added value of China's manufacturing industry corresponded to USD 4 trillion, accounting for 28.2% of the world's total production. China accounted for 12.6% of the world's exports. The value added of China's manufacturing industry increased by about 13% per year on average during the last fifteen years.[5] Of all 116 industrial sectors in China, 97 are associated to the shipbuilding sector[6] as the shipbuilding industry is heavily connected with other upstream and downstream sectors (China Association of the National Shipbuilding Industry). Therefore, it will be important to approach the Chinese shipbuilding sector from the perspective of the entire global shipbuilding value chain.[7]

While the Chinese shipyards delivered only 0.9% of all worldwide built ships in terms of GT (Gross Tonnage) in 1985, this number increased to 4.7% in 2000[8]. China's ship completions reached 2 million of CGT in the early 2000s, which was three times the level registered in the second half of the 1990s, driven by big investments and some policy measures which were implemented in the mid-1990s. The growth of the Chinese shipbuilding industry is highly linked to and driven by industrial policies and state-led strategies, which are presented in detail in the next section of this report.

Like most of China's heavy industry sectors, the shipbuilding industry has grown rapidly since 2000. While China accounted for less than 10% of global ship completions of seagoing vessels in 2000, it became the world largest shipbuilding economy in 2010. While first driven by exports, this strong growth in China's shipbuilding industry was closely linked to the growth in domestic seaborne transportation services. Unlike other emerging economies that used foreign shipping services, China built up its own domestic fleet in parallel. Domestic orders and government-led strategies are envisaged as two of the main determinants of the Chinese shipbuilding industry's development.

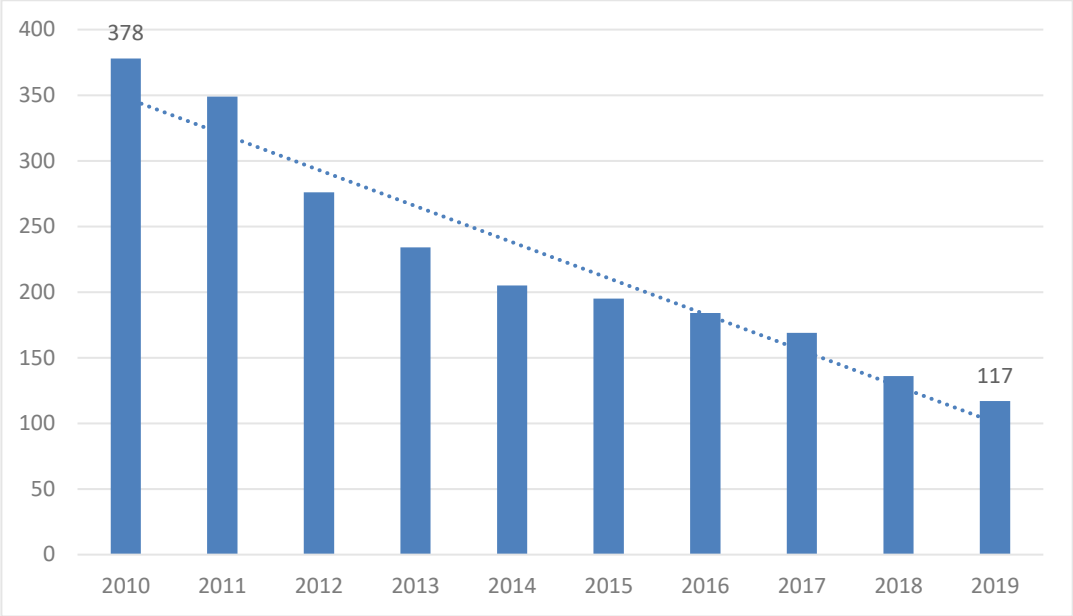
During the period of the 10th and 11th Five-Year Plan (2001-2010), the Chinese shipbuilding production reached 21 million CGT, which accounted for 37% of world completions and which represented a compound annual growth rate of 31%. Barwick, Kalouptsidi and Zahur (2019) have estimated that the Chinese shipbuilding industry received CNY 540 billion (USD 90 billion) in subsidies between 2006 and 2013. According to this study, this had a direct impact on the Korean and Japanese shipbuilding industries, which saw their respective market shares decrease in the same period from 47% to 38% and from 24% to 21%, respectively. This decrease in market share corresponded to a loss of CNY 140 billion (USD 21 billion) for the two countries combined.[9] The fast expansion of the Chinese shipbuilding industry also weighed on the EU's shipbuilding industry. In recent years, Chinese shipyards have for instance been able to attract several new build ferry orders, in line with the Chinese objectives of targeting the higher value ship building and marine equipment segments. In addition to the price, access to innovative forms of financing were important elements to attract these orders.[10]

China's newbuild orderbook (m. GT) illustrates the rapid rise of China in the shipbuilding sector. Based on orderbook figures, China ranked second in 2007, after Korea and before Japan. By 2010, China had already surpassed Japan and Korea. This rapid expansion of China's shipbuilding industry correlates with the large-scale expansion of facilities by China's shipbuilders during the historic boom period from 2003 to 2008 and the Chinese government's policy efforts to foster the shipbuilding industry as a major strategic export industry since 2001.

Weak demand in the global shipbuilding market after the global financial crisis of 2008 and accumulated excess capacity have triggered the restructuring of the Chinese shipbuilding industry. The Ministry of Industry and Information Technology (MIIT) of China established a so called "White List"[11] in 2014 to establish a guide of shipyards that were considered the most efficient by public authorities and implicitly would be eligible for public support. However, its presumable underlying objective was to concentrate

ship orders at strong and viable facilities, thereby enhancing the consolidation and competitiveness of these top shipyards. The number of active shipyards (with at least one vessel over 1000 GT on order) fell in China from 379 in 2010 to 117 at the end of 2019 (Figure 2). During this period, a large number of small private shipyards exited the market. Following a number of revisions, MIIT eliminated the White List in March 2019.

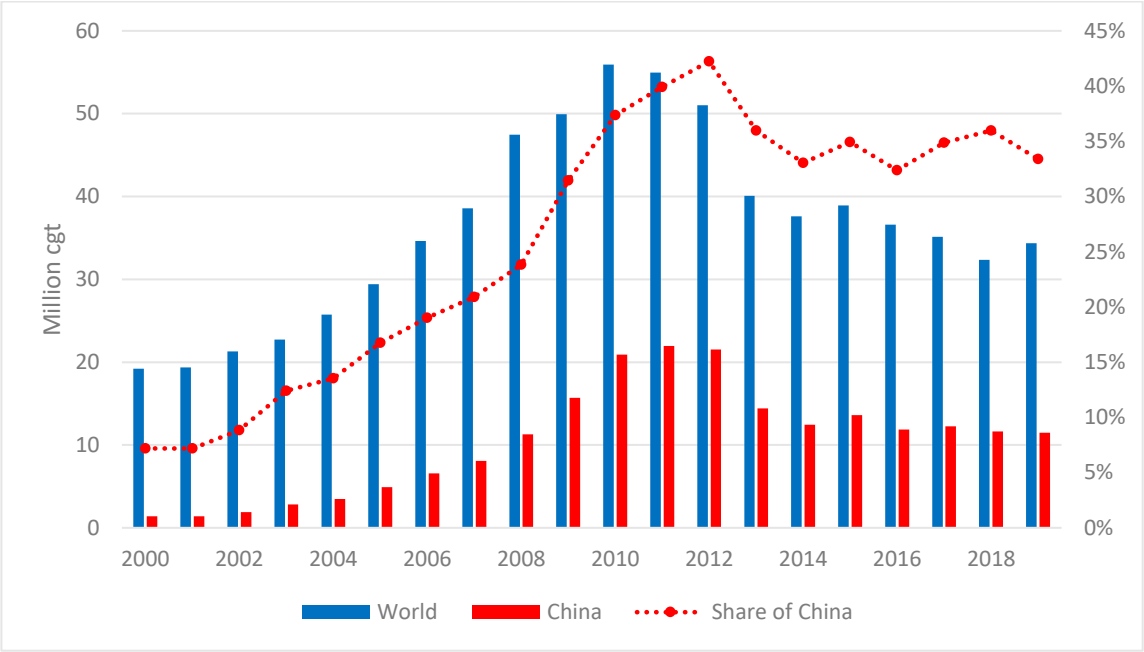
Figure 2. Number of active shipyards in China, 2010-2019



Note: An active shipyard is a yard with at least one vessel over 1 000 GT in its order book at the end of each year.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

Nevertheless, China remained the largest shipbuilding economy in 2019 with ship completions in China accounting for 11.4 million CGT representing 33.4% of world total (Figure 3).

Figure 3. Completions of seagoing vessels in China, 2000-2019



Note: This figure includes all seagoing vessels above 100 GT.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

At the end of 2019, China's orderbook ranked first, accounting for 25.7 million CGT and representing 33.3% of the world total (Table 1). Korea, EU and Japan followed China with 27.7%, 14.9%, and 14.3% of the orderbook respectively.

Table 1. Orderbook for selected shipbuilding economies, December 2019

Country	Number of ships	Million CGT	% of total
China	1 519	25.7	33.3%
Korea	457	21.4	27.7%
European Union	419	11.5	14.9%
Japan	674	11.0	14.3%
Russia	124	1.6	2.1%
Turkey	180	0.8	1.0%
Viet Nam	131	0.7	0.9%
Philippines	42	0.6	0.8%
Brazil	45	0.6	0.8%
India	94	0.5	0.6%
Others	657	2.7	3.5%

Note: The figures of EU are calculated based on member states of EU at the end of 2019.
Source: IHS Markit Maritime & Trade, World Shipbuilding Statistics 2019

2.2. Typology of the Chinese shipbuilding sector

China's shipbuilding industry can be divided into three broad categories: state-owned enterprises (SOEs), private domestic shipbuilding enterprises, and joint ventures consisting of foreign and domestic

companies. In terms of completions in CGT, 45 of the Chinese largest 100 shipyards are owned by the central and local governments and thus are State-Owned Enterprises (SOEs). These shipyards represented 59% of China's shipbuilding production in 2019 (Table 2).

Table 2. Ownership structure of the top 100 Chinese shipyards in 2019

Ownership Type	SOEs		Private companies	
	National government	Local government	Domestic owner(s) only	Foreign owner(s)
Number of shipyards	35	10	49	5
Completions in CGT ('000s)	6 010	719	4 089	517
% of completions	53%	6%	36%	5%

Note: This table includes all seagoing vessels from 100 GT. The ownership type is based on the information of yard administration (meaning a majority state ownership) in *World Fleet Register* of Clarksons Research Services.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

2.2.1. Major shipbuilding conglomerates

The two main Chinese shipbuilding conglomerates are CSSC and CSIC. These two SOEs are supervised by the central government. As of 2018, shipyards owned by CSSC and CSIC accounted for 36% of all CGT delivered and 35% of all CGT contracted in China (Table 3).

Table 3. Deliveries and contracts of shipyards owned by CSSC and CSIC in 2018

	Deliveries (CGT in '000s)	Contracts (CGT in '000s)
China's shipbuilders in general	11 645	10 593
CSSC group	2 978	2 769
CSIC group	1 253	975

Note: This table includes all seagoing vessels from 100 GT.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

These two groups merged on 25 October 2019, in accordance with the decision of the Party Central Committee and upon approval by the State Council. The new entity's name is the China Shipbuilding Group Corporation (CSGC), which owns 147 subsidiaries, including shipyards, equipment manufacturers, research institutes and other firms and accounts for 310 000 employees. Its combined assets amount to CNY 790 billion (approximately USD 112 billion). The new group is one of the largest merchant shipbuilding entities globally and represented a combined global market share of 20.85% in 2018.[12] According to data from Clarksons Research, CSGC's subsidiary yards have delivered around 210 vessels per year on average between 2009 and 2019.

Another major shipbuilding conglomerate is COSCO Shipping Heavy Industry, which is a subsidiary of the COSCO shipping group (*i.e.* the largest state-owned shipping operator in China). COSCO Shipping Heavy Industry has nine shipyards. Major shipyards under its direction are COSCO HI (Zhoushan), COSCO HI (Yangzhou), COSCO HI (Guangdong), COSCO HI (Dalian), Nantong COSCO KHI, and Dalian COSCO KHI. The two COSCO KHI shipyards are both joint ventures with Kawasaki Heavy Industry of Japan. As of 2019, the shipyards of COSCO shipping heavy industry accounted for 14% of all CGT delivered and 13% of all CCT contracted in China.

Table 4. Ship deliveries and contracts of shipyards owned by COSCO shipping heavy industry in 2019

Shipyards	Deliveries		Contracts	
	CGT ('000s)	Rank in China	CGT ('000s)	Rank in China
Nantong COSCO KHI	421	6	58	31
COSCO HI (Zhoushan)	384	7	52	35
Dalian COSCO KHI	314	13	158	18
COSCO HI (Yangzhou)	291	14	350	7
COSCO HI (Guangdong)	133	23	58	32
COSCO HI (Dalian)	75	35	131	21
COSCO HI (Qidong)	41	49	-	-

Note: This table includes all seagoing vessels from 100 GT.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

The Yangzijiang Shipbuilding Group, established in 1956, is China's largest private shipbuilder. The group owns four shipyards, which are located along the Yangtze River in the province of Jiangsu. These yards are named Jiangsu New Yangzi Shipbuilding, Jiangsu Yangzi Xinfu Shipbuilding, Jiangsu Yangzijiang Offshore Engineering, and Jiangsu Yangzijiang Shipbuilding. Also, the group established Jiangsu Yangzi-Mitsui Shipbuilding through a joint investment with Mitsui of Japan in May 2019.

Table 5. Two major shipyards of the Yangzijiang shipbuilding group

Shipyard	Overview	Key figures
Jiangsu New Yangzi Shipbuilding	Founded in 2005, it is located in Jingjiang & Jiangyin industrial zone, Jingjiang city. It is engaged in the production of large and medium-sized ships and ocean engineering equipment design and manufacturing, with 30 vessels or 3 million deadweight tons annually in shipbuilding capacity. Its shipbuilding capacity and output are in the top 5 of Chinese shipbuilding enterprises. Its product covers series of container vessels (1 100 TEU to 10 000 TEU), bulk carriers and multipurpose ships (36 000 DWT to 93 000 DWT), LNG ships (27 500 m^2), etc.	Deliveries (2019) : 995 259 CGT (No. 1 in China) Contracts (2019) : 236 512 CGT (No. 12 in China) Employees : about 2 300 Total assets : over CNY 17 billion
Jiangsu Yangzi Xinfu Shipbuilding	Founded in 2011, It is located in Hongqiao Industrial Park, Taixing City. It focuses on the construction of large ships and offshore engineering equipment. Major products include 10 000 TEU container vessels, 11 800 TEU container vessels, 208 000 DWT bulk carriers, 261 000 DWT VLOC and 400 000 DWT VLOC.	Deliveries (2019) : 455 797 CGT (No. 4 ranked in China) Contracts (2019) : 178 410 CGT (No. 16 ranked in China)

Source: Website of Yangzijiang shipbuilding group (http://www.yzjship.com) and OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

2.2.2. Geographic distribution of main ship construction facilities

The Chinese shipbuilding and ship repair industry is composed of a large number of yards, ranging from yards capable of building VLCCs to small yards generally building small boats and local craft. These

yards are located in various geographical areas, both coastal and inland, reflecting the development of marine industries along the main Chinese rivers.

China's major shipyards are primarily located along the eastern coastline between the Yangtze River and the Pearl River, and at the mouths of these rivers. China is considering to connect these two waterways by excavating two canals (i.e. the Gan-Yue Canal and the Xiang-Gui Canal).[13] In Northern China, shipbuilding is concentrated at the mouth of the Yellow River and in the coastal areas bordering the Bohai Gulf.

The major shipbuilding and repair activities are concentrated in specific areas, notably Zhejiang, Jiangsu and Shanghai. These areas accounted for 74.1% of total Chinese completions in 2019 (Table 6).

Table 6. Shipyard distribution and ship construction by province in China, 2019

Province	Number of shipyards	Completions (CGT in '000s)	% of Completions
Jiangsu	41	5 217 272	45.5
Zhejiang	31	1 673 796	14.6
Shanghai	7	1 601 112	14.0
Guangdong	18	1 115 686	9.7
Liaoning	6	747 926	6.5
Shandong	7	424 367	3.7
Fujian	3	251 040	2.2
Anhui	4	170 993	1.5
Tianjin	1	117 280	1.0
Hubei	5	83 827	0.7
Hebei	1	21 292	0.2
Hunan	2	18 191	0.2
Jiangxi	2	15 618	0.1
Shenzhen	1	13 168	0.1
Total	129	11 471 567	100.0

Note: This table includes all seagoing vessels from 100 GT.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

China's largest shipbuilding cluster is located in the Yangtze River Delta region. The Yangtze River rises in the far West and ends in Shanghai, where it merges into the Yellow Sea. Important private shipyards, including the Jiangsu New Yangzijiang, New Times and Jiansu Yangzi Xinfu shipyards, and the main shipyards of state-owned enterprise CSSC are located in this region (Table 7).

Table 7. Main shipyards in the Yangtze River area

Province	Name of shipyard	Parent Company	Administration
Jiangsu	Jiangsu New Yangzijiang Shipbuilding	Jiansu Yangzijiang shipbuilding group	Independent
	New Times Shipbuilding	-	Independent
	Jiangsu Yangzi Xinfu Shipbuilding	Jiansu Yangzijiang shipbuilding group	Independent
	Nantong COSCO KHI Ship Eng.	COSCO Shipping	National government
	Jinling Shipyard	CMI	National government
	Chengxi Shipyard	CSSC	National government
	COSCO Shipping HI (Yangzhou)	COSCO Shipping	National government
	Nantong Xiangyu Shipbuilding and Offshore Eng.	Xiamen Xiangyu	Local government
	New Dayang Shipbuilding	SUMEC group	National government
	Jiangsu Hantong ship HI	Jiangsu Hantong group	Independent
Shanghai	Shanghai Waigaoqiao shipbuilding	CSSC	National government

	Jiangnan shipyard Group	CSSC	National government
	Shanghai Jiangnan Changxing Shipbuilding	CSSC	National government
	Hudong Zhonghua shipbuilding	CSSC	National government
Anhui	Wuhu Shipyard	-	Local government
Hubei	Wuchang Shipbuilding Industry Group	CSSC	National government

Source: OECD Secretariat and yard administration in *World Fleet Register* of Clarksons Research Services.

China has an extensive coastline from the south of Shanghai down to the Pearl River. It includes Zhejiang, Fujian, Hainan provinces and Hong Kong (China). The main shipyards in the region are listed in Table 8.

Table 8. Main shipyards of the East and South China coasts

Province	Name of shipyard	Parent Company	Administration
Zhejiang	COSCO Zhoushan shipyard	COSCO Shipping	National government
	Tsuneishi Group(Zhoushan) Shipbuilding	Tsuneishi Group	Independent (FO)
	Yangfan Group	-	Independent
	Samsung HI Ningbo	Samsung HI	Independent (FO)
Fujian	Fujian Mawei Shipbuilding	Fujian Shipbuilding industry group	Local government
	Fujian Southeast Shipbuilding	Fujian Shipbuilding industry group	Local government
	Xiamen Shipbuilding Industry	Fujian Shipbuilding industry group	Local government

Source: OECD Secretariat and yard administration in *World Fleet Register* of Clarksons Research Services.

The Pearl River is the largest river in South China. As for the Yangtze River, numerous shipbuilding facilities are located near the mouth of the Pearl River, especially around the Guangdong province. The main shipyards in this region are shown in Table 9.

Table 9. Main shipyards of the Pearl River area

Province	Name of shipyard	Parent Company	Administration
Guangdong	Guangzhou Shipyard International	CSSC	National government
Guangdong	Huangpu Wenchong Shipbuilding	CSSC	National government
Guangdong	COSCO shipping HI (Guangdong)	COSCO shipping	National government
Guangdong	Jiangmen Nanyang Ship Engineering	-	Independent

Source: OECD Secretariat and yard administration in *World Fleet Register* of Clarksons Research Services.

Another cluster of shipbuilding facilities is located in the area located between the Yellow River and the Heilong River in northern China. The main shipyards in this region are presented in Table 10.

Table 10. Selected shipyards of the Yellow River, Heilong River and North China coast area

Province	Name of shipyard	Parent Company	Administration
Liaoning	Dalian COSCO KHI Ship Engineering	COSCO shipping	National government
Liaoning	Dalian Shipbuilding Industry	CSIC	National government
Liaoning	COSCO Dalian Shipyard	COSCO shipping	National government
Liaoning	Bohai Shipbuilding HI	CSIC	National government
Shandong	Qingdao Beihai Shipbuilding HI	CSIC	National government

Shandong	Shandong Huanghai Shipbuilding	-	Independent
Tianjin	Tianjin Xingang Shipbuilding HI	CSIC	National government

Source: OECD Secretariat and yard administration in *World Fleet Register* of Clarksons Research Services.

2.2.3. Chinese shipbuilding associations

China accommodates several interest groups that represent different industries associated with shipbuilding. Their roles are to provide a forum for industrial news, analysis and developments, as well as to provide consultancy services. Some of the associations represented are shown in Table 11 .

Table 11. The role of Chinese shipbuilding associations

China Association of National Shipbuilding Industry (CANSI) (http://www.cansi.org.cn)	· The most significant organisation in the shipbuilding industry with its members accounting for 95% of the total production. · Consisting of shipbuilders, ship repairers, marine equipment producers, as well as shipbuilding research institutes and related universities. · Publishes statistics about the Chinese shipbuilding sectors each year.
Chinese Society of Shipbuilding Engineering (CSNAME) (www.csname.org.cn)	· Non-profit organisation with a membership of more than 30 000 national professionals from research institutions, academies and industry. · Aims to promote the development of the shipbuilding industry by exchanging knowledge and promoting advanced technology and consultancy services.
Chinese Classification Society (CCS) (https://www.ccs.org.cn)	· Technical organisation providing classification and statutory surveys of ships, offshore installations, containers and other related equipment and materials, as well as providing technical consultancy services. · Member of the International Association of Classification Societies (IACS) and has established 120 offices across the globe.
China Classification Society Industrial Corporation (CCSI) (http://en.ccsi.com.cn)	· Subsidiary to CCS with the status of an independent legal entity, engaged in the supervision and inspection of engineering equipment, and enterprise management consulting. · With Headquarters located in Beijing, 17 branches covering large and medium-sized cities along the sea and the river in China.

Source: The shipbuilding industry in China (OECD, 2011) and websites of each institution.

2.2.4. Marine equipment

The Chinese marine equipment industry is concentrated around shipyard locations, mainly in Jiangsu, Shanghai, Liaoning, Hubei, Chongqing, Zhejiang, Shandong and Guangdong. According to CANSI, the sales revenue of the marine equipment industry was 55.3 billion CNY (USD 8.1 billion) in 2018, a decrease of 33.7% from the previous year, and the total profit amounted to 3.75 billion CNY (USD 0.55 billion) in 2018, i.e. a decrease of 30.8%.

According to CANSI, there were 420 marine equipment manufacturers in 2018. The major enterprises are mostly state-owned, many of which are affiliates of CSIC and CSSC. As of 2018, 18 of the top 20 companies are SOEs, of which 13 are affiliates of CSSC and CSIC (Table 12).

Table 12. China's major marine equipment manufacturers in 2018

Company name (Ownership type)	Revenue (billion CNY)	Main products

Wuhan marine machinery (State-owned, CSSC)	4.01	Winch, steering gear and crane
Hudong heavy machinery (State-owned, CSSC)	3.93	Low-speed marine diesel engines
China shipbuilding industry corporation diesel engine (State-owned, CSIC)	2.22	Low-speed marine diesel engines
Ningbo C.S.I. power & machinery group (State-owned)	1.86	Marine diesel engines and generator sets
Shaanxi diesel heavy industry (State-owned, CSIC)	1.60	Medium and high speed marine diesel engines
China shipbuilding industry group power (State-owned, CSIC)	1.19	Marine diesel engines and generator sets
Weichai Holding group (State-owned)	1.13	Marine diesel engines
Jiangsu Yaxing anchor chain (Private)	0.99	Marine anchor chain and offshore mooring chain
Henan diesel engine industry (State-owned, CSIC)	0.87	High-speed marine diesel engines
Zhongnan equipment (State-owned, CISIC)	0.86	Optical devices
Wuhan heavy industry casting and forging (State-owned, CSIC)	0.85	Marine shaft, rudder, propeller and diesel engine crankshaft
Nanjing Luzhou machine (State-owned, CSSC)	0.80	Deck machinery
Zibo TAA metal technology (Joint venture with Japanese TAA)	0.75	Metal abrasive
Qingdao Shuangrui marine environmental engineering (State-owned, CSIC)	0.65	Marine ballast water management system
Yichang marine diesel engine (State-owned, CSIC)	0.56	Low-speed marine diesel engines
Hangzhou advance gearbox group (State-owned)	0.54	Marine gearboxes
Qingdao Haixi marine diesel engine (State-owned, CSIC)	0.51	Marine diesel engines
Zichai power (State-owned)	0.45	Marine diesel engines and generator sets
Guangzhou diesel engine factory (State-owned)	0.42	Medium-speed marine diesel engines
Anqing marine diesel engine (State-owned, CSSC)	0.41	Medium-speed marine diesel engines

Source: 中國船舶工業年鑑 2019 (China shipbuilding industry yearbook 2019), CANSI and websites of each company

The main product of China's marine equipment manufacturers is a marine diesel engine. In 2018, China produced 11 272 marine diesel engines with a capacity of 9.3 million kW (Table 13). China is one of the world-renowned marine diesel engine producers, along with Korea and Japan, accounting for one third of the global production[14]. Deck machinery and cabin equipment equally constitute major segments of China's marine equipment production. However, for high-tech product lines such as high-end diesel engine, propulsion systems, and communication and navigation equipment, China still relies heavily on imports from Korea and the EU. In 2017, China's total imports of marine equipment amounted to 1.45 billion USD and exports to 0.97 million USD[15]. To upgrade their product portfolio with more high value-added ship types, Chinese shipbuilding and marine equipment companies were focusing in recent years on technology introduction and cooperation, localisation of equipment, new product development and the establishment of joint ventures with foreign companies.

Table 13. Major products of China's marine equipment industry in 2018

Product	Quantity
1. Power system and device	
Low speed diesel engine	223 units (3 759 thousand kW)
Medium speed diesel engine	5 525 units (4 069 thousand kW)
High speed diesel engine	5 524 units (1 518 thousand kW)
Propulsion device	161 pieces
Low speed diesel engine crankshaft	169 pieces
2. Deck machinery	
Mooring equipment	1 082 units
Loading and unloading equipment	374 units
Steering gear	205 units
Anchor chain	177 060 ton
3. Cabin equipment	
Fan	4 804 units
Marine boiler	26 units
Marine environment protection equipment	261 units

Source: 中國船舶工業年鑑 2019 (China shipbuilding industry yearbook 2019), CANSI

2.3. Production and Orders

China's shipyards have been manufacturing a wide variety of vessel types in the past ten years. While China has traditionally been focusing on bulk carriers, tankers and containers, in more recent years China also became active in the construction of highly specialised vessels such as LNG carriers, offshore service vessels[16], passenger ships[17], dredgers[18], car carriers, roll-on/roll-off (ro-ro) and naval ships, thereby facilitating the sharing of technology between naval and civilian ships [19]. Between 2010 and 2019, China has accounted for 53% of the global production of bulk carriers in CGT terms, for 30.1% of the global production of tankers, for 30.2% of the global production of containers, for 41.1% of the global production of offshore service vessels, and for 10.3% of the global production of gas carriers (Table 14). China is also engaged in the instalment of scrubbers and ballast water treatments[20].

Table 14. Global completions of seagoing vessels by selected ship types, 2010-2019

Type	World		China			
	CGT ('000s)	GT ('000s)	CGT ('000s)	% of World total	GT ('000s)	% of World total
Bulk Carrier	142 538	331 787	75 519	53.0%	175 147	52.8%
Tanker	86 828	175 667	26 168	30.1%	52 098	29.7%
FCC (fully cellular carriers)	66 930	136 613	20 214	30.2%	35 490	26.0%

Offshore Service	20 899	12 296	8 583	41.1%	4 929	40.1%
Gas Carrier	33 577	43 458	3 465	10.3%	3 975	9.1%
PCC (pure car carrier)	8 724	15 587	1 850	21.2%	3 150	20.2%
Cruise	10 252	9 743	20	0.2%	8	0.1%
Passenger/Ferry	8 050	4 361	2 395	29.8%	1 471	33.7%
Ro-ro (roll-on/roll-off)	3 580	5 443	595	16.6%	1 071	19.7%
Dredger	2 572	1 635	1 232	47.9%	766	46.9%
Others	33 011	26 549	12 023	36.4%	11 455	43.1%

Note: This table includes all seagoing vessels from 100 GT. The category "Bulk carriers" includes the groups of "bulk carriers", "bulk ore carriers", and "bulk/oil".
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

In 2019, China's ship completions amounted to 11.3 million CGT. New contracts have declined over the past three years (2017-2019). The order book in 2019 fell considerably, by about 12% compared to 2018.

Table 15. Activity indicators of China's shipbuilding industry, 2017-2019

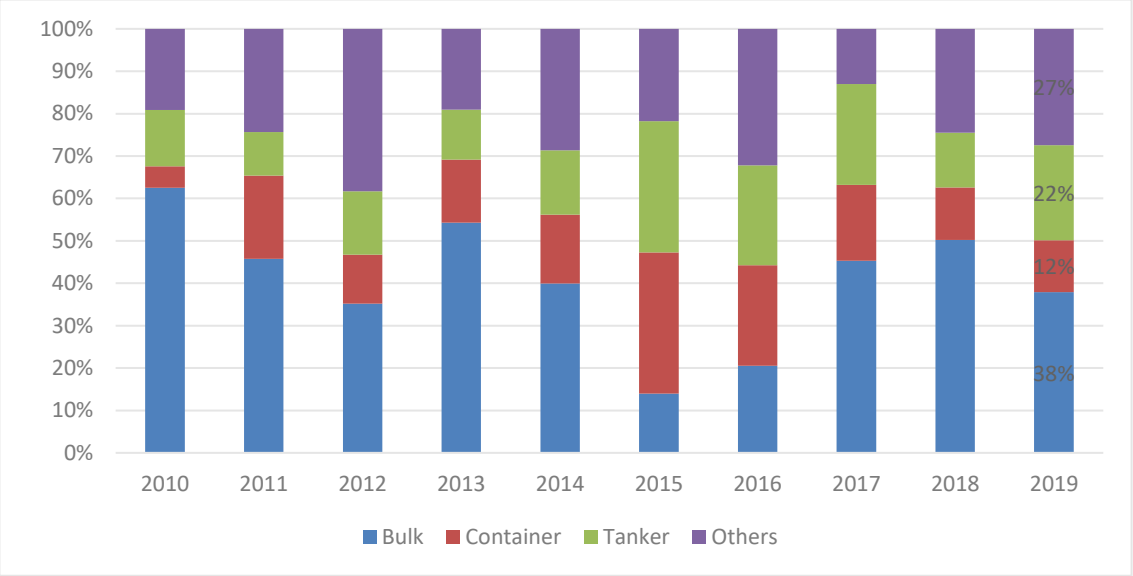
Year	Completions		Contracts		Order book at the end of year	
	Million CGT	Million GT	Million CGT	Million GT	Million CGT	Million GT
2019	11.3	23.0	8.9	18.1	27.3	53.5
2018	11.4	23.3	10.6	21.3	31.1	60.8
2017	11.9	23.8	12.2	25.0	32.9	64.5

Note: This table includes all seagoing vessels from 100 GT.
Source: World Shipyard Monitor (February of 2020), Clarksons Research.

The recent decrease in Chinese ship completions in CGT is associated with the weaker global demand for ships and the excess capacity characterising the shipbuilding market. In addition, Chinese manufacturing costs are increasing, notably because of the rising labour costs and land prices. As a result, Chinese yards are targeting higher value added segments in the marine sector such as marine equipment, LNG carriers, yachts and cruise ships, in accordance with the Chinese governmental strategies.[21]

From the chart below, one can observe that the Chinese shipbuilding industry's dependence on bulk carriers has highly fluctuated over the last decade (Figure 4). The share in CGT of this ship-type in contracts sharply declined from 63% in 2010 to 14% in 2015, but rebounded in 2016 to 21%. In 2019, bulk carriers still accounted for the largest share of ships manufactured in China(38%).

Figure 4. Share of contracts of Chinese yards by shiptype, 2010-2019

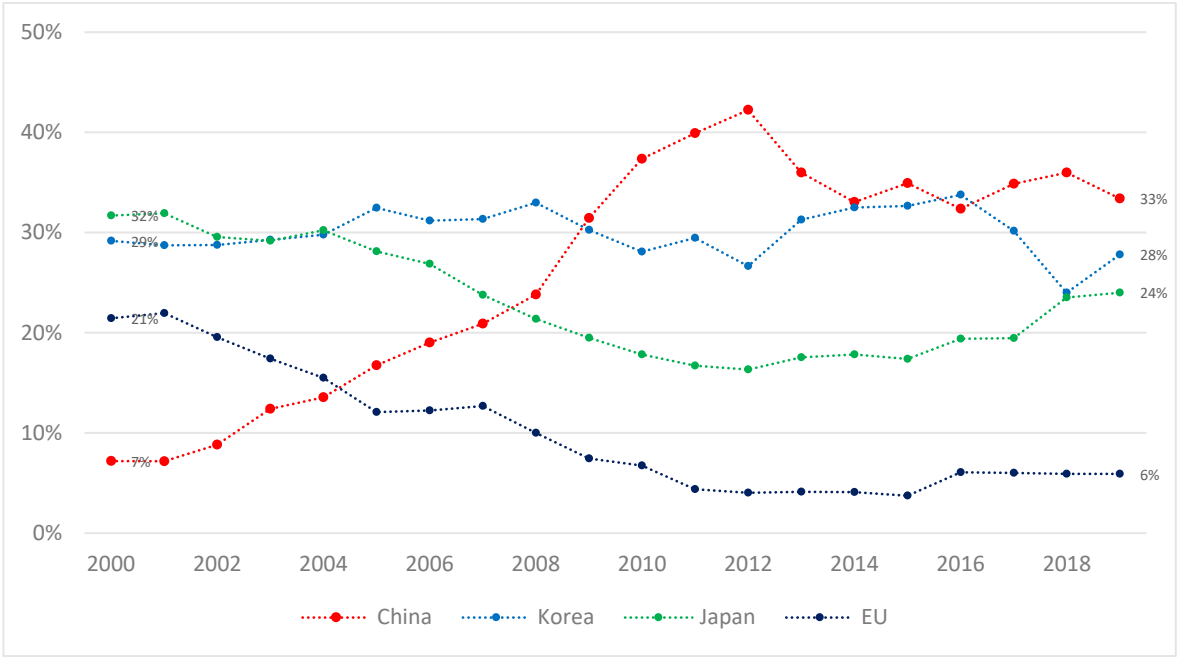


Note: The shares are based on CGT, including all seagoing vessels from 100 GT and the category "Bulk" includes the groups "bulk carriers", "bulk ore carriers", and "bulk/oil".
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

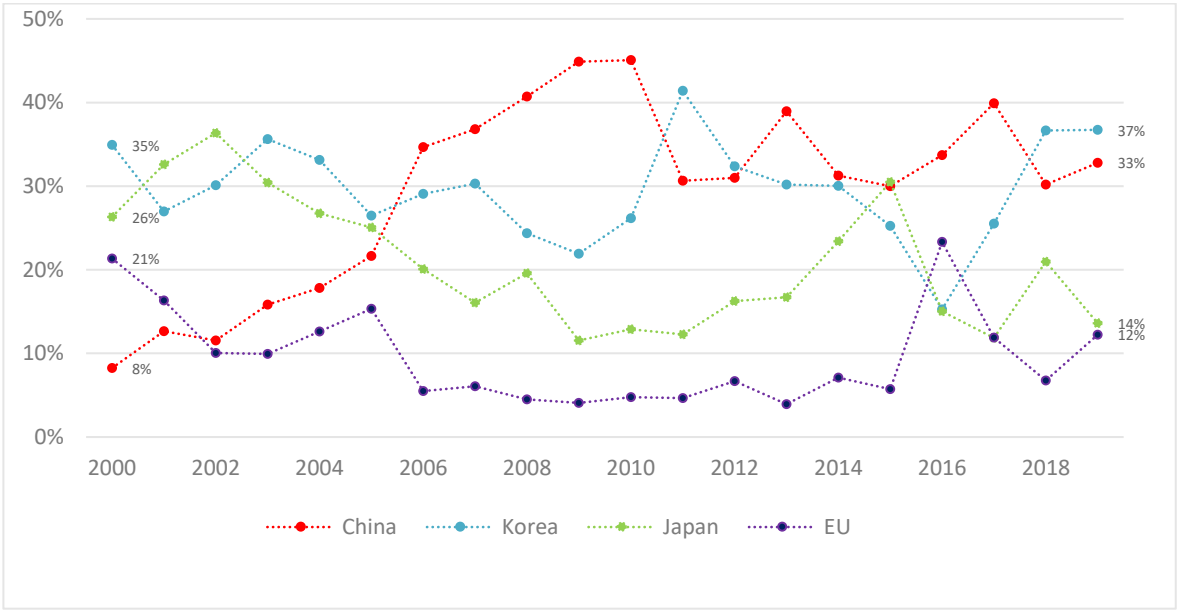
China's global market share in shipbuilding rose sharply from 7% in 2000 to 42% in 2012 (Figure 5). During the same period, EU's market share dropped from 24% to 4%. China, Korea and Japan represented 85% of all CGT delivered and 84% of all CGT contracted in 2019. During the last ten years – with the exception of 2016 - China ranked first in terms of completions. Regarding new contracts, China ranked second after Korea - both in 2018 and 2019 - due to higher demand for LNG and VLCC vessels (Table 16).

Figure 5. Global shipbuilding market shares of China, Korea, Japan and EU, 2000-2019

(a) Production



(b) New contracts



Note: The market shares are based on CGT, including all seagoing vessels from 100 GT. The figures of the EU are calculated based on the member states of the EU at the end of 2019.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

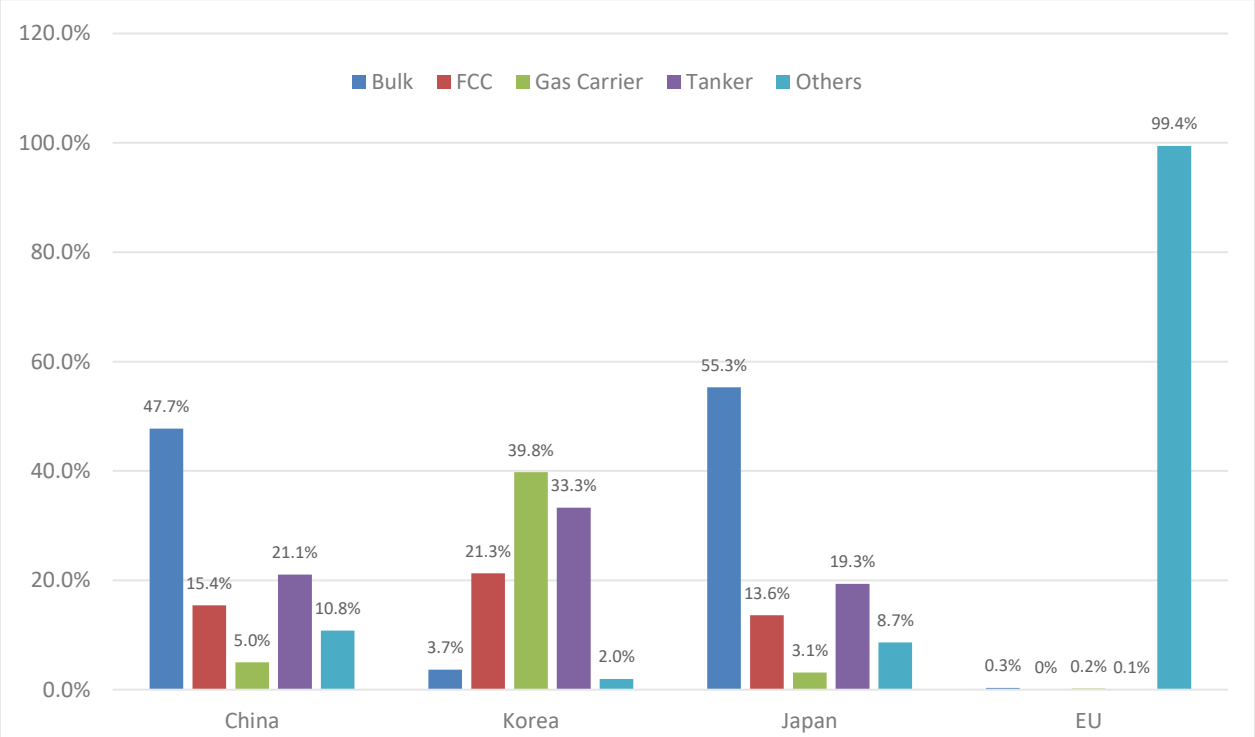
Table 16. Global contracts of LNG carriers and VLCCs, 2016-2019

Year	LNG carrier		VLCC	
	Number of ships	CGT ('000s)	Number of ships	CGT ('000s)
2016	10	731	14	616
2017	18	1 284	56	2 480
2018	77	5 940	49	2 147
2019	60	4 489	31	1 334

Source: Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr.

New orders between 2017 and 2019 show that China and Japan have relatively similar product portfolios, i.e. highly depending on the market of bulk and ore carriers (Figure 6). Korea, by contrast, has moved away from the bulk carrier market and focused on building gas carriers and large-sized tankers. The EU has a very different product portfolio from China, Korea, and Japan. Cruise/passenger ships accounted for 90.8% of EU's new orders, while bulk, gas carrier, and tanker represented only 0.6% during that period (Figure 6).

Figure 6. Share of contracts by ship type in China, Korea and Japan, 2017-2019



Note: The shares are based on CGT, including all seagoing vessels from 100 GT and the category "Bulk" includes the groups "bulk carriers", "bulk ore carriers", and "bulk/oil". The figures are calculated based on the member states of the EU at the end of 2019.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr

Korea ranks first in the segments of very large tankers for crude oil and chemicals (VLCCs), LNG carriers, and large container vessels, representing global market shares (GT) of 42%, 92% and 52%, respectively (Table 17). China has a significant share of the VLCC and large container vessel market, amounting to

29% and 28% respectively. However, China's market share of 7% for LNG carriers remains relatively low. Building LNG carriers namely requires more advanced technologies than manufacturing a conventional storage tank. For example, building LNG carriers requires the ability to design and build storage tanks which can resist temperatures up to minus 162 °C. In China, only the Shanghai-based shipbuilding company Hudong Zhonghua (part of CSSC) has experience in building large LNG carriers and LNG equipment.[22] The shipyard has produced 23 LNG tankers so far, which makes it the fourth-largest LNG vessel builder in the world,[23] and aims to double its annual output of LNG carriers to 12 by 2025[24]. A recent order for a first slot of eight 174 000 cubic meters (cum) LNG carriers by Qatar (and an option for eight more)[25], its plan to deliver the largest LNG carrier in the world (270 000 cum) in the next years[26], an order by Cosco and PetroChina for three 174 000 cmb LNG carriers[27], and the delivering of the world's first ultra-large container ship with LNG[28] all underscore this objective. Other Chinese shipyards have uttered their interest to expand the production of LNG carriers and other gas carriers. Dalian Shipbuilding (part of CSIC) for instance already declared that it wants to attract more resources to focus more on niche industries such as LNG carriers.[29] Dalian In (part of COSCO) already delivered a small LNG carrier, although the project was heavily delayed.[30] COSCO Shipping Heavy Industry signed several cooperation agreements to further develop LNG ship repair and construction.[31] Chinese leasing houses have also ordered two large dual fuel ethane carriers already at Jiangnan Shipyard (part of CSSC).[32] Finally, Yangzijiang Shipbuilding concluded a joint venture with Mitsui Engineering (i.e. Jiangsu Yangzi Mitsui Shipbuilding Co.) in May 2019 to construct LNG carriers - amongst other commercial ships. In June 2020, Yangzijiang Shipbuilding announced a joint project with Tiger Gas for the construction of LNG carriers.[33] In addition to manufacturing LNG carriers, China is also entering the market of LNG carrier designing.[34]

Table 17. Orderbooks of China, Korea and Japan for large-sized and high value-added vessels, February 2020

Country	VLCC (200,000+ DWT)		LNG carrier		Container (8,000+ TEU)	
	Number of ships	Million GT (% of total)	Number of ships	Million GT (% of total)	Number of ships	Million GT (% of total)
China	18	2.8 (29%)	25	1.0 (7%)	30	4.8 (28%)
Korea	27	4.1 (42%)	120	13.1 (92%)	64	10.0 (57%)
Japan	18	2.8 (29%)	2	0.0	24	2.6 (15%)
Others	-	-	2	0.2 (1%)	-	-
World Total	63	9.7	149	14.3	118	17.4

Source: World Shipyard Monitor (February of 2020), Clarksons Research.

Only one large cruise ship has been built in China to date[35]. However, CSSC plans to expand its activities in the high value-added niche market of large cruises. In September 2016, CSSC, Carnival Corporation and Fincantieri jointly signed a Memorandum of Understanding (MOU) for the construction of large luxury 133 500 GT cruise ships. As a follow-up to the MOU, the project partners concluded a binding agreement in February 2017 for the construction of two cruise ships, with an option for four additional ships. The first ships are scheduled to be delivered in 2023 and 2024[36]. The ships will be built at the shipyard of Shanghai Waigaoqiao Shipbuilding (SWS), i.e. a subsidiary of CSSC.[37] China Merchant Industry Holding has equally announced to expand its activities in the construction of cruises.[38]

China has commenced with the construction of dredgers too. State-owned enterprise China Communications Construction Company (CCCC), part of the China Communications Construction Group (CCCG), is the largest dredging company in China.[39] Other companies that are involved in the

construction of dredgers and associated equipment are Qingzhou Yong Dredging Machinery Co. and Shandong Haohai Dredging Equipment Co. [40] Chinese dredging companies for instance already manufactured dredging equipment, mineral processing equipment, a salt mining dredger, an amphibious dredger and the largest cutting by suction dredger in Asia. According to a Chinese press agency, the Ministry of Commerce has prohibited the export of large cutter-suction dredgers without approval. This requirement is deemed to avoid foreign purchases of large-scale engineering ships.[41]

Box 1. The Chinese shipbuilding industry and the effect of COVID-19

The COVID-19 outbreak has consequences for global GDP growth, seaborne trade, and global supply chains, which are key factors for developments in the shipbuilding industry. The COVID-19 outbreak affected the Chinese shipbuilding industry with a number of yard closures in February and March 2020. Many shipyards delayed the restart of their operations after the Chinese new-year holidays and some invoked the force majeure clause as they could not meet the deadline of their contracts. Yards notably had to stop their operations because of the lockdown announced in many Chinese provinces. According to Clarksons, in the first half of 2020, ship deliveries by Chinese yards decreased by 22% in compensated gross tonnes compared to the same period in 2020, which is a similar drop as the one experienced by yards at the global level.

Major shipbuilding companies in China are located at the coast and have only minor capacity in Hubei province. But a relatively high number of COVID-19 cases were registered in the coastal provinces of Guangdong and Zhejiang, which are respectively the fourth and second largest provinces in terms of ship completions where many yards had to stop temporary their activities. The Chinese government supported the resumption of work with policies encompassing social insurance deductions, tax benefits and subsidies. As reported by Clarkson Research (February, 2020) guidelines issued by MIIT on resuming production highlight that sectors with the potential to promote economic growth, such as shipbuilding, will be given priority in resuming production. Chinese shipbuilding SOE CSSC issued a short term (i.e. maturity of 270 days) "Corona bond" similarly to COSCO (a major Chinese shipping SOE which also has shipbuilding activities). According to Tradewinds, Chinese authorities promote the use of corona bonds among domestic investors to meet short-term capital needs via a fast track approval process. To be eligible, the bond seller has to spend at least 10% of the funds raised in actions taken by companies linked to the adaptation of the work to the pandemic situation.

Chinese yards are now reported to return to their activity level before the COVID-19 outbreak. The major global demand shock as well as supply disruptions affecting the maritime sector led to a drop of ship orders to Chinese yards by 25% year-on-year in the first half of 2020, compared to a decrease by 59% at the global level. The relative better performance of orders at Chinese yards can be explained by the numerous domestic ship orders in China and by the fact that some other shipbuilding economies were more heavily affected by the pandemic than China. Moreover, according to TradeWinds, Chinese yards decreased their prices up to 20% compared to prices seen six months ago to attract shipowners[42]. Thomson Reuters reported in 2012 that Chinese yards' price decreased by 5 to 20% after the financial crisis, which could indicate that Chinese yards have the capability to decrease sharply their prices during crises.[43]

2.4. Orders from domestic ship owners

The growth of China's shipbuilding industry has been notably driven by the fast development of its shipping industry linked to the Chinese exports of industrial products and imports of energy and mineral resources[44]. In 2019, China's ship owners owned the second largest fleet in the world, after Greece, representing 304 million dead weight tonnes (DWT), and accounting for 15.5% of the world tonnage[45]. Most of China's shipping companies are SOEs.

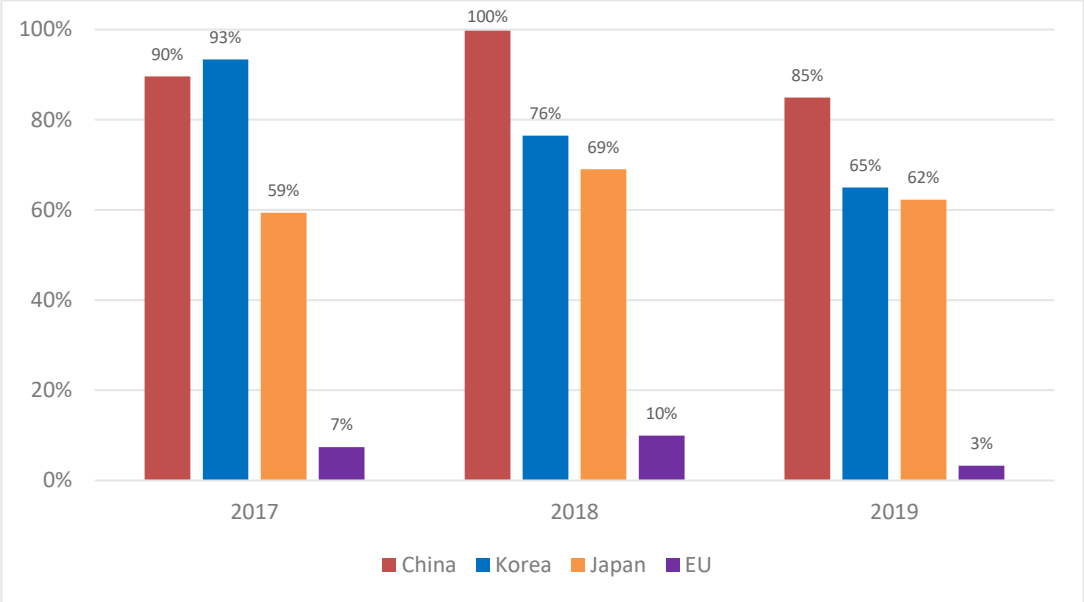
Chinese shipping companies have a strong impact on the Chinese shipbuilding market. Chinese ship owners accounted for 13.2% of global new contracts between 2017 and 2019, which is the world's second largest volume of orders after Japanese ship owners (Table 18). During this time period, about 90% of Chinese ship owner's orders were placed with Chinese shipbuilders. Figure 7 shows that Chinese ship owners are inclined to concentrate their orders more often at domestic shipyards than their Korean and Japanese counterparts.

Table 18. New contracts by owner countries in CGT, 2017-2019

Country of ownership	2017	2018	2019	Average of 2017-2019	
	CGT ('000s)	CGT ('000s)	CGT ('000s)	CGT ('000s)	% of total
Japan	4 051	7 611	3 572	5 078	16.6%
China	4 487 (656)	3 051 (882)	4 559 (1 343)	4 032 (960)	13.2% (3.1%)
Greece	3 225	5 184	2 733	3 714	12.1%
Korea	1 640	2 676	1 920	2 079	6.8%
Singapore	2 377	2 280	1 531	2 063	6.7%
United States	2 446	1 480	1 459	1 795	5.9%
Others	12 141	12 805	10 618	11 854	38.7%

Note: The table includes all seagoing vessels from 100 GT. In this table, China includes Hong Kong.
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr

Figure 7. Share of domestic shipbuilders in domestic orders in CGT, 2017-2019

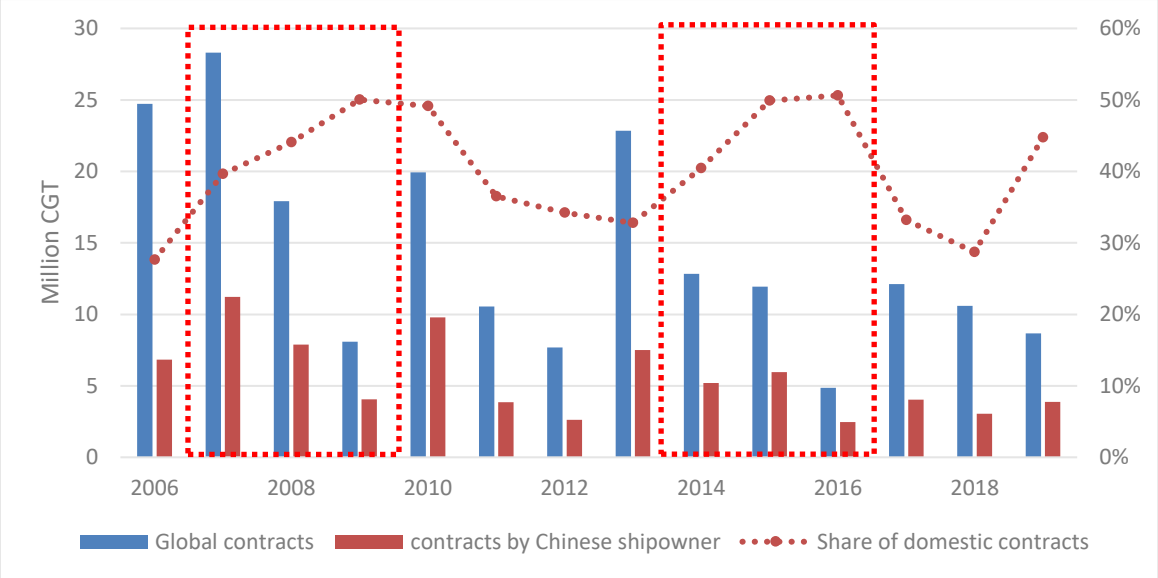


Note: The figure includes all seagoing vessels from 100 GT. Chinese ship owners include those based in Hong Kong (China). The figures of EU are calculated based on member states of EU at the end of 2019.
Source: OECD calculations based on Clarksons Research (2020), *World Fleet Register*, https://www.clarksons.net/wfr

The share of domestic orders placed at Chinese shipyards tended to increase particularly during periods of weaker global ship demand. From 2007 to 2010, the share of domestic contracts increased from 40% to 50%, and from 2013 to 2016 it increased from 33% to 51% (Figure 8). Despite the weak market conditions, Chinese – notably state-owned - ship-owners tried to maintain a level of orders placed at Chinese shipyards. As illustrated in the sections below, government-led strategies, state finance and attractive financial packages played an important role in attracting these domestic orders. In the context of the COVID-19 crisis, countercyclical investments and domestic orders equally increased in China.[46]

Figure 8. Share of domestic contracts in new contracts of Chinese shipbuilders, 2006 -2019

Rectangles represent periods when the share of domestic orders increased



Note: The figure includes all seagoing vessels from 100 GT. In this figure, Chinese ship owners include ship owners of Hong Kong (China).
Source: OECD calculations based on Clarksons Research Services Limited (2020), *World Fleet Register*, https://www.clarksons.net/wfr

3. Policies affecting the Chinese shipbuilding industry

The Chinese government has implemented ambitious industrial policies[47] to support strategic sectors such as shipbuilding.[48] This is also confirmed by previous OECD work on semiconductors and aluminium.[49] The following sections of the report describe how the shipbuilding industry in China has benefited from these strategic industrial policy instruments. This report touches upon the main elements of each strategic policy to assess its impact on the shipbuilding industry. While doing so, there is a particular emphasis on government support measures. This analysis of government support measures stems from an independent assessment by the Secretariat and is predominantly based on primary sources of the OECD Secretariat in its yearly Inventory on Support Measures of non-WP6 Members as well as on documents drafted by or statements made by Chinese officials. These sources are supplemented with secondary information from research papers by experts and other public sources, notably where primary sources were not available.

3.1. Overview of strategic policy instruments

The current subsection provides an overview of the most important centrally-led strategic Chinese policy documents that govern the shipbuilding industry. These central strategies are supplemented by provincial and local initiatives. A paper by Y. Wu and X. Zhu indicates that local governments are incentivised to mirror and complement Beijing's central policies.[50] Therefore, selected regional policy initiatives are also touched upon in this report – though to a lesser extent.

China has taken several initiatives to spur the development of its shipbuilding sector. Some of these policies are specific to the shipbuilding industry, while others couple with programmes that are more general in nature. To grasp the impact of the Chinese policies that directly or indirectly apply to the shipbuilding sector, one consequently will have to examine how all these different policies interact.

For the sake of completeness, the box below offers an overview of the different legal and administrative documents in China. For more information about the Chinese legislative process and the interactions between different public and private institutions, reference is made to a paper by the Center for Strategic and International Studies.[51]

Box 2: classification of Chinese legal and administrative documents[52]

After the Constitution, **laws**, which are exclusively passed by the National People's Congress (NPC) or its Standing Committee, are the highest-ranking legal documents.

Regulations, which in effect make administrative directives on the implementation of laws, rank just below laws, and are issued by the State Council, China's highest executive authority.

One step below in the hierarchy are **departmental rules**, which are usually titled "provisions" or "measures". These are issued by ministry-level bodies, and have full legal validity.

Most documents are titled "opinions", "notices", "guidelines" or "circulars", and thus fall into the category of so-called **regulatory documents**, which can be issued both by the State Council and ministry-level bodies, but are not legally binding.

As a general caveat one has to keep in mind that Chinese policy makers often ''learn by doing''.[53] Therefore, Chinese policies are often adaptable to changing circumstances. Also, there may remain important gaps between the strategic objectives of a policy and their implementation. A paper by K.A. Jaros and Y. Tan for instance demonstrates how provinces have used their so-called ''development space'' to divert from central objectives towards provincial priorities, notably to strategic investment projects with tangible results.[54] For these reasons, there may be less coherence between all different policy initiatives than assumed.[55] The establishment of the Leading Group for the Building of a National Manufacturing Power[56] intends to meet this need. It aims to coordinate China's industrial policies, although practical challenges seem to persist.

A first and second part of this subsector focus on two particularly important horizontal strategies, namely the 13th Five-Year Plan, and the Made in China 2025 Plan. The subsection further provides a short overview of some principle policy documents regarding the shipbuilding and maritime sector, which were in place in the 1990s and 2000s. The intention of this short overview is to highlight some general historic tendencies.

3.1.1. The 13th Five-Year Plan (2016-2020) and sectoral implementation

The 13th Five-Year Plan (2016-2020)

The Chinese Five-Year Plans incorporate the general strategic objectives and priorities of the Chinese central administration for economic, ecological and social development in a given five-year period. The 13th Chinese Five-Year Plan was ratified in March 2016 and runs from 2016 until 2020.[57] The plan's goals include innovation-led[58] economic growth, high-value added manufacturing, regional development and inclusive growth, green growth and an increasing openness to expand China's international outreach. In line with these objectives, the plan reinforces the support for the Made in China 2025 plan, the SOE reforms of 2015 and the Belt and Road Initiative (ANNEX 1). The 13th Five-Year Plan is supported by numerous ministerial[59] and industrial initiatives at several policy levels[60], which include more concrete proposals to encourage private actors to implement some of the public objectives.[61]

The 13th Five-Year Plan also covers the shipbuilding industry, marine engineering equipment and high-tech vessels. More specifically, it refers to "developing equipment and systems for deep-water exploration[62], ocean drilling, seafloor resource development and utilisation, and marine operations support; promoting the development and engineering of deep-sea stations and large floating structures; focusing on breakthroughs in technologies for cruise ships and other high-tech vessels, as well as for the integrated, intelligent, and modular design and manufacturing of key accessory equipment for such vessels''.[63] These objectives build upon the 12th Five-Year Plan (2011-2015)[64], the Implementation Plan of the Shipbuilding Industry to Accelerate Structural Adjustment and Promote Transformation and Upgrading (2013-2015)[65], the Ministry of Industry and Information Technology (MIIT) Guidelines for Research Projects on High-Tech Ships (2014)[66], and the National Medium-And Long-Term Program for Science and Technology Development (2006-2020)[67]. The Guidelines for Research Projects on High-Tech Ships encompass R&D projects and desired outcomes to further develop the Chinese high-tech shipbuilding industry. They include research initiatives on - amongst others - the promotion of LNG carriers (e.g. research on the design of LNG fuel storage and supply systems, manufacturing of core components for LNG fuelled ships, LNG fuel supply monitoring and security system design and integration of key technologies) and cruise ships (e.g. research on structural design technology and hydrodynamic performance of medium-sized luxury cruise ships). These research initiatives often constitute collaborations between universities (e.g. Shanghai Maritime University or Dalian Maritime University), the government and (state-owned) companies (e.g. Shanghai Electrical Apparatus Research Institute, the Shanghai Merchant Design and Research Institute, the Guangzhou Marine Engineering Corporation or the Marine Design & Research Institute of China).

The strategy to target higher value marine industries indicates that China aims to move up the shipbuilding and marine equipment value chain. A document issued by CSSC for instance highlights that the excess capacity and low profit margins in the sector incentivise Chinese industry players to shift to high-end shipbuilding and marine technology segments.[68] The 13th Five-Year Plan and the China Ocean Agenda 21 (2009) also encourage Chinese firms to ''go global'' by engaging in international cooperation on production capacity and equipment manufacturing as well as to build overseas industrial clusters suitable to local conditions.[69]

Sectoral implementation

The Chinese Ministry of Industry and Information Technology (MIIT), the National Development and Reform Commission (NDRC) and other departments published a policy document in 2017, unveiling an industry specific shipbuilding plan (Updated Five-Year Shipbuilding Action Plan (2016-2020).[70] This blueprint aims at reforming and transforming the shipbuilding industry to align its sector specific objectives with the national 13th Five-Year Plan. The overall goal is to improve the competitiveness of the Chinese shipbuilding industry so China can transform from a shipbuilding ''power'' into a shipbuilding ''giant''. Further on, the shipbuilding plan intends to strengthen state-owned enterprise (SOE) cooperation, targets a domestic market share of 70% by 2020 for China's biggest shipbuilding yards, and includes a target for Chinese high-tech ships of 34% to 40% of the global market by the same date.[71] Next, the blueprint focuses on extending technological and innovative applications (including green and smart shipping), streamlining capacity, incorporating intelligent manufacturing, refining quality and branding, promoting military-commercial shipbuilding cooperation, and expanding global investments and partnerships.[72]

The Boosting Capabilities of Marine Equipment Plan (2015-2020) adheres to similar principles, narrowed down to the marine equipment industry.[73] The Plan aimed that, by 2020, 80% of the equipment used in Chinese newbuild bulk carriers, oil tankers, and container ships and 60% of the marine equipment deployed in Chinese newbuild high-tech ships would be produced by Chinese manufacturers. By 2025, the average target for Chinese marine equipment is set at 85%. To achieve these objectives, the Plan proposed to implement fiscal and financial support policies, to increase support for R&D, and to establish domestic and international networks.

Coupled with this Plan is the Catalogue of High-Quality Ship-Supporting Products (2017).[74] This Catalogue lists recommended marine equipment suppliers of high-speed diesel engines and marine cranes. In line with the objectives of the different policy documents, the Marine Design and Research Institute of China (MARIC), a CSSC research unit, for instance already indicated that it has accelerated the pace of industrialisation of high-end marine equipment such as water jet propulsion[75] or electric propulsion technology[76]. In summary, as considered by Professor J. Holslag, China's industrial sectoral shipbuilding plans are targeting "fewer, but bigger and more innovative, shipyards supplied by advanced domestic component producers."[77] This policy for shipbuilding also seems to align with a broader Chinese strategy to enlarge the role of its state-owned sector.

Integrated policy-making

The shipbuilding and marine equipment industries are part of a larger maritime cluster. The State Council's Opinions on Promoting the Healthy Development of the Maritime Industry (2014)[78] for instance indicate that the Chinese shipbuilding sector is strongly interconnected with other maritime sectors. The Opinions posit that China needs to address some structural deficiencies in its maritime industry first before it can increase its international competitiveness. Some of the remaining challenges included optimising its merchant fleet, improving its global shipping network, and promoting the transformation and upgrading of its shipping companies.

Like other ocean economies, China equally set the goal to expand its ocean economy space.[79] It has for instance already intensified the construction of manned submersibles for deep-sea explorations[80], the manufacturing of unmanned and smart ships[81], the building of research vessels[82], and the construction of deep-sea intelligent breeding equipment (aquaculture)[83]. The Ministry of Natural Resources is in charge for setting out the strategic guidelines and for drafting laws related to the ocean economy. The Ministry recently integrated its predecessor, i.e. the State Ocean Administration (SOA), into its administrative structure.[84] NDRC and SOA issued a document in 2016 to implement the 13th Five-Year Plan for the ocean economy.[85] This plan reaffirmed the strategic status of the shipbuilding industry, maritime engineering, maritime services and maritime finance for the development of the Chinese ocean economy,

which could result into a preferential position of these industries in terms of government support.[86] A recent study from the Center for Strategic and International Studies shows that China is rapidly upscaling its marine research in the Indo-Pacific area.[87] Indeed, the China Ship Scientific Research Center (CSSRC) serves as China's largest ship and ocean engineering institute and was already involved in projects on the hydrodynamic performance of ships, propulsion systems, high performance ships, underwater engineering and marine and offshore structures.[88] Also, the joint science marine research between China and Myanmar that will be conducted by China's research vessel Xiangyanghong 06 is one example of international cooperation in the ocean industries (cfr. ''going out'' strategy).[89] A final example is the establishment of the China-Korea Joint Ocean Research Center.[90]

The OECD report on the ocean economy (2016) includes estimations by other authors about the size of the Chinese ocean economy, ranging from 4.3% to 13.8% of GDP.[91] According to Xinhuanet, China's ocean economy is estimated to account for 9.3% of GDP in 2018.[92] In pursuit of the ocean economy's potential, China declared to speed up its presence in the oceans. The financial package that endorses this goal is presented in the Guiding Opinions on Improving and Strengthening Financial Services for Marine Economic Development (2018). These Guiding Opinions amongst others encourage Chinese financial institutions "to set up specific maritime finance divisions, financial service centres and special authorised institutions aimed at improving professional services (1), […] to support highly competitive ship and marine engineering equipment manufacturing enterprises listed in the "White List"[93] (4), […] to encourage localities to subsidise marine fishery insurance (9), […] to support the establishment of financial leasing companies (11), […] to develop and strengthen the China Oceanic Development Foundation and actively play a role in supporting the development of the marine economy (14), […] to guide financial institutions to increase credit support to the marine sector and guide the financial institutions to enhance their risk pricing capabilities and increase the flexibility of loan interest rates for marine economic enterprises (17), […] and to strengthen the coordination of financial and industrial policies (19)".[94] The establishment of the Blue Ocean Information Network is related to the Chinese plans to develop its ocean economy.

To underpin the ocean economy agenda, some Chinese conglomerates have already announced to increase their participation in several areas of the ocean economy. For instance, China Merchants Industry Holding (CMIH) describes itself on its website as "taking the development of the ocean economy as its duty" and is already involved in shipbuilding and ship repair (including cruises), marine engineering, container trafficking, offshore facilities, port infrastructure, and deep-sea research.[95]

In 2019, the CPC Central Committee and the State Council issued the Outline of Building a Powerful Country for Transportation. The Outline presents the objectives to coordinate and promote the construction of a strong transport network in China. On the side of the shipbuilding sector, it mentions "strengthening the capacity of independent design and construction of medium-sized and large cruise ships, large-scale LNG ships, polar sailing ships, intelligent ships, and ships alimented with new energy sources".[96] In the wake of this document, the NDRC also updated its Guide Catalogue of Industrial Structure Adjustment in 2019.[97] Revolved around shipbuilding, this document urges for the optimisation, upgrading and construction of various types of ships and marine equipment in accordance with international shipbuilding regulations and standards.

3.1.2. Made in China 2025

The Made in China 2025 plan was launched in 2015[98] and is part of China's overarching ambition to become a global technological leader by 2049. The objectives of the Made in China 2025 plan also appear to align with the overall goal of China to integrate technologies and industries more deeply[99]. The year 2049 symbolises momentous significance as it will usher in the 100th anniversary of the People's Republic of China. The blueprint is subdivided into three stages (2015 to 2025; 2026 to 2035 and 2036 to 2049). During each of the stages, China aims to move up a step in the value chain so it can gradually increase its global prominence and reduce its dependence on foreign technologies (''from big to strong'').[100] The

Made in China 2025 plan focuses on ten core industries to achieve the ''Chinese dream'' of becoming a global manufacturing power[101] and sets different priorities amid these core industries. In the shipbuilding sector, maritime engineering equipment and high-tech ships are targeted as key industries. Compared to other core industries of the Made in China 2025 strategy, high-tech marine equipment and vessels merely hold an intermediate priority.[102] The Chinese government declared to support the Made in China 2025 policy through fiscal and taxation policies.[103] All regions and government departments are encouraged to implement the Made in China 2025 strategy at their respective level.[104] Indeed, the visit by the Jiangsu Taxation Bureau of one of China Merchant Industry Holding's shipyards suggests that shipbuilding companies receive preferential tax rates if they align with Chinese strategic policies.[105]

The 13th Five-Year Plan includes several proposals to implement the Made in China 2025 plan.[106] The concrete objectives for the maritime sector are fleshed out in the ''Interpretation of Made in China 2025: Promoting the Development of Marine Engineering and High-tech Ships''.[107] This Interpretation is aimed at transforming China to a global maritime power by 2025. To attain this goal, the Made in China 2025 Implementation Plan incites the Chinese development of a number of strategic high-value maritime sectors, such as equipment for the exploration of ocean resources (e.g. deep sea detection equipment, equipment for offshore oil and gas drilling, and support equipment for offshore operations), high-tech shipbuilding (e.g. LNG carriers, LPG carriers, icebreaking cargo ships, car carriers, fishing vessels, and luxury cruise ships), and green ships. The current Chinese shipbuilding industry is namely highly dependent on foreign nations for its core technologies and marine equipment. China intends to provide for domestic alternatives so it can move up the value chain.[108] Building on the strategic role for China's technological ambitions, a 2017 statement by the Chinese Ministry of Industry and Information Technology (MIIT) for instance indicated that China plans to grasp 40% of the global high-end equipment market by 2020.[109] Next, China aims to accommodate more than five internationally renowned high-tech manufacturing companies for marine equipment and shipbuilding and to supply 50% of high-tech ship design and manufacturing equipment by 2025.[110] In addition, China intends to update the management skills of its companies to increase coordination of the shipbuilding supply chain.

The Made in China 2025 Implementation Plan mentions the Chinese plans to increase spending in smart shipbuilding to improve productivity and to invest in green technologies (see 3.2.6.). The MIIT's Action Plan to Promote Smart Transformation Shipyards and Shipbuilding (2019-2021)[111] and the Intelligent Ship Development Action Plan for 2019 — 2021[112] feed into these objectives of promoting smart shipping. The main outline and principles of the Intelligent Ship Development Plan 2019-2020 are described in annex II.

Additionally, several Chinese provinces have drafted their own implementation guidelines (e.g. the Shanghai Industrial Transformation and Upgrading Special Programme and the Hubei Provincial Ocean Engineering Equipment and High-Tech Industry Development Action Plan)[113].

There are various routes to achieve China's knowledge intensive technological aspirations. These routes for instance include target quota for the deployment of smart equipment, providing direct subsidies, activating state-owned and private business partners to align their policies with national targets, foreign technology transfers and strategic outbound investments.[114]

The Made in China 2025 policy has raised concerns in other countries.[115] China justifies this policy by putting forward the ageing of its population and the increase of local governments' and corporate debt levels, which may result in a China that is caught in the so-called ''middle-income trap''. China therefore wants to make rapid use of its current window of opportunity to innovate.[116]

Recently, China seems to have rescinded any explicit reference to the Made in China 2025 plan.[117] Some experts nonetheless state that this recent tendency does not revoke the plan's underlying aspirations.[118] For the sake of clarity and consistency, this report will continue to use the terminology "Made in China 2025", since the plan was not officially revoked (yet).

3.1.3. Historic overview of policies in the 1990s and 2000s

It is not the first time in history that China has taken a prominent place in the shipbuilding market. Both during the Song Dynasty (960-1279) and the early Ming Dynasty (1368-1476), China's shipbuilders for instance enjoyed a widespread international reputation. Given that this report follows-up on the earlier OECD reports about shipbuilding in China (2008 [119] and 2011 [120]), the historical overview will predominantly focus on the period from the year 2011 onwards.

In 1996, the Chinese State Oceanic Administration (SOA) enacted the Ocean Agenda.[121] This initiative has to be read against the backdrop of the UN Agenda 21 (1992), urging countries to develop sustainable development strategies about the oceans. The Ocean Agenda called for a sustainable exploitation and development of the oceans and the Chinese maritime economy, and already highlighted the importance of technology and innovation as driving factors. At the time of the Ocean Agenda's drafting, the total value of the Chinese maritime sector accounted for CNY 140 billion (USD 21 billion).

In 1999, the Chinese government split the China State Shipbuilding Corporation (CSSC) into the China State Shipbuilding Corporation (CSSC) and the China Shipbuilding Industry Corporation (CSIC). CSIC is based in the north and east of China, while CSSC is located along the southern side of the Yangtze River. The purpose of this dismantling process was to increase productivity through competition and to facilitate partnerships and joint-ventures with foreign enterprises to attract foreign investments, expertise and skills. These changes took place in the context of China's accession to the WTO in 2001.[122] Thereafter, the Chinese government expressed its ambition in its 10th Five-Year Economic Plan (2001-2005) to develop its shipbuilding industry into a major world-leading industry. The two large state-owned conglomerates CSIC and CSSC sharply expanded their business activities in the subsequent period of time, with the support of the Chinese central and local governments.

In 2003, the State Council published its plan to promote the economic development of the Chinese maritime industry. In the Outline for the Maritime Economy Development[123] different strategic objectives are set out for the period 2003-2010. The Outline put a target for the total production value of the maritime sector to represent at least 5% of overall Chinese GDP by 2010, and at least 10% of Chinese coastal provinces' GDP. To attain this goal, structural transformations were encouraged in several key maritime economic sectors, including the ocean fishery industry, shipbuilding, and offshore oil and gas. Regarding the shipbuilding sector, the document specifically highlight the importance of the Bohai Rim Shipbuilding Industry Belt, the East China Sea Shipbuilding Industry (Shanghai), and the South China Sea Shipbuilding Industry (Guangzhou) for the development of high-tech ships such as LNG carriers and ro-ro ships, and the promotion of the marine equipment industry, notably drilling platforms and offshore platforms.

The Ocean Agenda and the Outline for the Maritime Economy Development illustrated that China deployed a holistic strategy as regards its maritime industry. Through interconnections between the different segments of the maritime industry, the sharing of technologies and expertise was expected to create network effects between the actors involved. In addition, the maritime sector was envisioned to play an important role for the development of new jobs, the export sector and the security and defence sector. From the start, the shipbuilding and marine equipment sector have been considered as key pillars to induce structural reforms of China's maritime industry. Secondly, these policy documents emphasise the importance of science, technology and innovation to upgrade the value of China's maritime sector. These highlights have continued to play a role in China's future sector-specific strategic policy documents.

The Medium and Long-Term Development Plan for the Shipbuilding Industry (2006-2015) by the NDRC[124] for instance specified that the reform plans for the shipbuilding sector needed to be accelerated. The Plan mentions that while the Chinese shipbuilding industry accounted for CNY 150 billion (USD 18.7 billion) in 2012, this number had already increased to CNY 180 billion (USD 22.4 billion) in 2015. China continued increasing its efforts to become an internationally competitive player in the shipbuilding

sector. More specifically, the Chinese shipbuilding sector insisted at becoming more innovative and more efficient. The restructuring of shipyards through mergers and acquisitions, the integration of industrial resources, the focus on specific areas to develop large-scale shipbuilding bases (e.g. Bohai Bay, Yangtze and Pearl River), the development of independent technologies leading to the increase of the annual production of medium and low speed diesel engines, and the establishment of large enterprise groups with strong product development, marketing and management skills were some of the elements in the Chinese tool-box to achieve these objectives.

The paragraphs 40 to 50 of the Development Plan specified the policy measures that should substantiate all of the different elements that were needed to build an internationally competitive shipbuilding sector. These policy instruments ranged from upscaling the financial methods to attract ship financing (e.g. corporate bonds, financial leasing or investment funds[125]), to encourage partnerships between different shipbuilding groups, improving the ship export financing system (i.e. export credit and export insurance), and providing support to domestic companies to invest more in research and development of marine equipment and high-tech vessels. The Medium and Long-Term Development Plan for the Shipbuilding Industry (2006-2015) aligned with the 11th Five-Year Economic Plan (2006-2010).

Under the auspices of this policy, the COSCO's Dalian branch was established through a joint venture with the COSCO group and Kawasaki Heavy Industries in 2007. Yangzijiang Shipbuilding, China's largest private shipyard, was listed on the Singapore Stock Exchange in 2007. CSIC founded its subsidiary CSIC Limited, which was listed on the Shanghai Stock Exchange in 2008.

In the wake of the financial crisis in 2008, China's shipbuilding industry was confronted with a sharp drop in demand and accumulating excess capacity. In response, there were several initiatives taken to shape the future of the Chinese shipbuilding industry. These initiatives coupled with the Twelfth Five-Year Plan (2011-2015) and aimed to accelerate some of its objectives. In 2009, the State Council issued its Restructuring and Revitalization Plan for the Shipbuilding Industry.[126] The plan proposed a package with policy measures for the shipbuilding sector to respond to the global financial crisis, which intended to sustain growth, expand domestic demand for ships and restructure the shipbuilding sector. Despite the market circumstances, the Chinese shipbuilding industry remained relatively resilient to absorb the negative external shock caused by the financial crisis. After the financial crisis of 2008, China seemed to have pivoted its strategy from increasing production levels to accelerating its plans to move up the value chain by targeting high-tech industries.

The State Council's Plan for Strategic Industries (2010)[127] provided an overview of the development and acquiring of strategic emerging industries (SEIs), which was substantiated by fiscal, taxation and financial lending policies. These industries mainly targeted innovative, high-tech market segments. It further stated that the targeted share of all emerging strategic industries should account for 8% of GDP by 2015 and 15% of GDP by 2020. The Plan briefly mentioned the maritime sector, in which high-end maritime engineering equipment and marine biotechnology were considered vital industries. The SEIs were interlinked with research projects on key technologies. The development of these key technologies aimed at strengthening the independent innovation capabilities of China. The State Council's 2010 document called for accompanying financial and fiscal support to sustain the development of the SEIs. The SEIs also coupled with other important policy documents such as the Five-Year Plans (e.g. 13th Five-Year Plan - Chapter 23) and Made in China 2025.

The NDRC's Innovation Development Strategy for the Maritime Engineering Equipment Sector (2011-2020)[128] built on the SEIs and aimed to ramp up China's position in the strategic emerging industries of high-tech marine engineering and marine equipment. By 2015, China intended to grasp the key elements of key supporting equipment systems and their design and manufacturing. By 2020, China aimed to establish a complete supply chain for a number of internationally-recognised Chinese marine equipment products, including the research and development, design as well as the manufacturing and the after-sales technical service. Specific attention was given to the development of offshore engineering equipment

(e.g. LNG-FPSO), marine engineering equipment (e.g. mining equipment), and key technologies and equipment (e.g. deep sea technology and underwater equipment).

MIIT's 12th Five-Year Implementation Plan for the Shipbuilding Industry (2011-2015)[129] provided the sectoral implementation of China's 12th Five-Year Plan. The Plan promoted the development of China to become a global shipbuilding power, which included the formation of more than 50 well-known international brands and the creation of at least five marine equipment suppliers. More specifically, it emphasized the upscaling of Chinese innovation in the shipbuilding industry (e.g. large shipbuilding companies should at least invest 2% of their sales revenue on research and development, speeding up the construction of ultra-large container ships, LPG ships, LNG ships), the increase of the industrial structure and productivity of the Chinese shipbuilding industry (e.g. the 10 largest Chinese shipbuilding companies should gain a domestic market share of at least 70% and Chinese marine equipment suppliers should capture at least 20% of the international market share, implement lean shipbuilding production processes), and the upgrading of the Chinese local supply chain and the support industries (e.g. cultivating large-scale key shipbuilding enterprise groups and spur small and medium-sized enterprises to specialise in the manufacturing of intermediate products that can be integrated in key shipbuilding companies). The Chinese State was assigned an important policy role to shape these objectives. The Plan for instance mentioned its role to actively implement research and development policies (including the establishment of a Scientific Research Fund to support key enterprises); to improve fiscal, tax and financial policies (e.g. export tax rebate, equipment insurance, ship mortgage financing); to attract highly-skilled talent (e.g. disciplining leadership and promoting training centres); to promote cooperation with international players; and to encourage improved management systems in shipbuilding.

The State Council's 2013 Notice to Accelerate the Implementation of Structural Adjustment Programs to Promote the Transformation and Upgrading of the Shipbuilding Industry[130] linked with MIIT's Five-Year Implementation Plan. At the time, China respectively accounted for 25% and 20% of the international market share for high-tech ships and marine equipment. At the same time, the Chinese shipbuilding sector was suffering from a decline in new orders. To sustain the development of its shipbuilding sector, the Notice therefore highlighted the importance of accelerating the efforts in innovation. It further mentioned several framework conditions to alleviate the structural transformation of China's shipbuilding into an industry that focuses on innovation, high-end products and strong shipbuilding support industries. These guiding principles included the strengthening of demand for green and high-tech vessels (e.g. ocean-going fishing vessels, luxury yachts) as well as for corresponding marine equipment (e.g. ballast water treatment systems and LNG ship propulsion systems) by encouraging the early scrapping of old ships, promoting technological innovation to compete internationally, improving the policy framework and encouraging financial support (e.g. export buyer credit and credit insurance, develop loan securitisation of key shipping companies, support key shipping companies to issue non-financial corporate debt financing and corporate bonds).

3.2. Implementation of strategic policy instruments

This subsection will appraise the implementation of the strategic policy instruments mentioned in subsection 3.1 through the deployment of support measures, financing tools and involvement of strategic SOEs ('national champions'). Policy documents, academic articles, and practical observations suggest that strategic SOEs are able to set a lower price for some of their ships - perhaps in some cases even below production cost - than their competitors because they benefit from cheaper financing and a wide range of government support measures. These practices would have had an influence on the global oversupply in the shipbuilding sector. Because of the strategic importance of the shipbuilding sector, lower priced ships and shipbuilding SOEs with a lower profitability rate in the short-term can nonetheless contribute to the long-term objectives of China to become a dominant player in the international maritime industry. While it has to be noted that the Chinese subsidies and privileges are attributed on the basis of a broader set of criteria than ownership per se - and are therefore not limited to SOEs -[131], the market distortive effect

seems more apparent in the case of SOEs, as elaborated in the SOE section of this report and in the latest WP6 report on SOEs[132]. Reference can be made to the OECD Guidelines on Corporate Governance of State-Owned Enterprises, which recommend SOEs to compete on a level playing field and in fair competition in the marketplace when they undertake economic activities, and to ensure a strict separation of ownership, regulatory and policy functions within government to avoid conflicts of interest if SOEs are used as a delivery vehicle for specific public policy goals, such as industrial policy.[133]

The subsequent sections illustrate that the allocation of funds to strategic SOEs, in combination with a bank-centric system and administrative policies to resort to SOEs for strategic purposes, have shaped the Chinese growth model, but may also have resulted into a policy framework that not necessarily rewards the most competitive companies.[134]

3.2.1. Overcapacity

At the JECKU meeting of 24 October 2019, the participating shipbuilders from Japan, Europe, China, Korea and the U.S. endorsed the following joint statement:

"Overcapacity and low profitability haunt the shipbuilding industry. We call for a joint effort by all parties involved to address these core problems and thereby create framework conditions that allow industry to forcefully tackle maritime sustainability."[135]

Indeed, the global shipbuilding sector is characterised by overcapacity[136]. This contributes to a weakening of the shipbuilding sector's financial health and results into lower ship prices. A recent OECD report examining data between 1995 and 2015 highlights the massive excess supply of vessels in the global shipbuilding industry. Between 2005 and 2015, the cumulated oversupply reached 297 million gross tonnes in total and the oversupply accounted for 23% of the world fleet in 2015. This situation is particularly severe for most large vessel categories such as tankers, bulkers and containers. Future vessel requirements are expected to only equal in 2030 the peak of completions that was reached in 2011.[137] Indeed, TradeWinds already reported that the year 2019 marked the lowest amount of newbuilds in 15 years' time. As a consequence, the total number of active shipbuilders has even decreased by 60%, to less than 130 worldwide.[138]

Overcapacity in the shipbuilding sector is notably severe in China[139]. The impact of overcapacity on the financial health of shipbuilders is exacerbated by rising input prices[140] and a stronger Chinese currency.[141] However, it does not seem that China has taken extensive measures in the past to cut its shipbuilding overcapacity. Instead, the State Council's Shipbuilding Industry Adjustment and Revitalisation Plan (2009) called to increase demands for ships, to maintain shipbuilding output, to accelerate the elimination of old ships, to consolidate shipyards, and to embark on the construction of new vessel types, ship repair, and marine equipment. In addition, banks and ECAs are instructed to continue their financial support to the Chinese shipbuilding industry.[142] This policy illustrates that China aimed to stabilise its shipbuilding capacity rather than reducing it.

Overcapacity has been argued to be a key factor explaining the high share of 'zombie firms' (i.e. companies that are being artificially kept alive by public money and beneficial credit schemes)[143] and hence an increased risk of non-performing loans and solvency problems; severe cost cutting by the shipyards to sustain profitability levels; lower budgets for research and development (R&D); and growing trade tensions with third countries.[144] In its 2018 trade review of China, the WTO equally described the negative implications of overcapacity for medium-term growth, the environment and financial stability.[145]

The China Shipbuilding Industry Association (CANSI), by contrast, announced that China's Shipbuilding Capacity Utilisation Monitoring Index (CCI) increased by 8.2% (i.e. from 607 to 657 points) in 2019 year-on-year.[146] This implies that the Chinese rate of excess capacity would have decreased in 2019.

Possible causes of overcapacity

According to the European Chamber of Commerce in China, the overcapacity in China's shipbuilding sector is the result of:

- Easy access to finance;
- Strong policy support for the expansion of China's shipbuilding sector;
- Huge modifications in industry dynamics and long-term demand for vessels.[147]

W. E. Kovacic equally describes the current industrial overcapacity as a direct result of China's industrial policies – amongst others:

"*Most industries currently suffering from severe excess capacity, as well as most insolvent 'zombie' SOEs, are in the regulated industries targeted by industrial policy in China. This gives the false impression of excessive competition, but excess capacity that creates this impression arises from, and is sustained by, non-market determined interventions – by vertical policy actions, by the exercise of administrative monopoly, or preferential support for SOEs against private or foreign owned enterprises."*[148]

D. Xu and Y. Liu argue that "excessive government intervention" has precipitated overinvestment and overcapacity. They present five possible reasons for China's overcapacity in the shipbuilding sector. First, the lack of economic pressure and crisis awareness in China's state-owned enterprises. Second, the mentality of managers in shipbuilding companies to "*blindly follow orders of higher authorities, set unrealistic targets, and [a] lack [off] sensitivity to market changes. (…)''*. Third, the strong focus by certain local governments to boost local GDP and employment by virtue of an elevated shipbuilding capacity. Fourth, monetary policies that inordinately stimulated lending by state-owned banks and policy banks. Fifth, a (perceived) lack of understanding of international shipbuilding markets.[149]

Indeed, research by P.J. Barwick, M. Kalouptsidi and N.B. Zahur indicated that part of the overcapacity generated between 2006 and 2013, notably for bulkers, is a direct result of Chinese industrial subsidies, particularly subsidies for establishing new shipyards.[150]

Another cause of overcapacity may be the ambitious production targets that shipyards and local governments have to meet. Jiangnan shipyard (part of CSSC) for instance had an annual sales target of CNY 5.5 billion (USD 781.5 million), which it exceeded with twice the amount. Each year the annual sales target of Jiangnan is enlarged with another CNY 1 billion.[151] A 2015 survey provided an illustration of the regional effects of overcapacity problems in various sectors, including the steel and shipbuilding sector. The survey processed the answers of 696 industrial enterprises that were active in the province of Jiangsu. The main observations suggested that a misalignment between the strategic policy documents of the central Chinese government and the implementation at the local level existed.[152] The reasons for this mismatch remained uncertain. They possibly could have included limited coordination and communication at the central level, different interests between the central and local level, or a lack of enforcement measures.

Proposed solutions to tackle overcapacity

The current overcapacity in the shipbuilding sector is not sustainable and may hinder the sector from making important investments. Moreover, it is hurting domestic and foreign competitors that do not benefit from as much government support. Several initiatives were already taken to lower the impact of overcapacity. China's 13th Five-Year Plan for instance aims to address the problem of overcapacity in China's industrial sectors and presents a blueprint to reduce overcapacity. This includes the set-up of a *"fund to provide rewards and subsidies for structural adjustments in industrial enterprises (…)"*.[153] Indeed, China earmarked CNY 100 billion in 2016 to support local governments dealing with the impact

of capacity reductions on employability.[154] The report on the budgetary expenses for 2019 and the draft budget for 2020 by the Ministry of Finance announced that it had provided CNY 2 billion (USD 300 million) in rewards and subsidies in 2019 to cut overcapacity in key industries, which is however a relatively low number compared to other budgetary expenses.[155] Subsequently, Party Committee members of central SOEs are encouraged to implement the party's ideology about dwindling excess capacity and zombie firms.[156]

China develops policies to direct its shipbuilding activities to new high-value added markets such as the marine equipment market or polar vessels. This type of policies could reduce China's overcapacity in the current segments of the shipbuilding sector but could also lead to overcapacity in other segments[157]. Other policy measures like China's scrap and build subsidy aimed to support ship demand and subsequently increase ship production and reduce excess capacity. This measure, which artificially supported demand, could, however, have had other negative effects such as the distortion of markets by favouring Chinese producers - especially SOEs - vis-à-vis foreign competitors[158].

According to the IMF, many SOEs with activities in overcapacity sectors contain high levels of debt.[159] This may raise questions as to the effectiveness of the corporate decision-making process. China has been promoting consolidation as one of the tools to tackle the problem of overcapacity.[160] The Supply-Side Structural Reform (2015) policy and the Guiding Opinions of the General Office of the State Council on Promoting the Structural Adjustment and Reorganisation of Central Enterprises (2016) should be interpreted against this backdrop. The Guiding Opinions for instance clarify that the further centralisation of prominent SOEs and a stricter control on its investment decisions should facilitate the reduction of overcapacity.[161] By the same token, it is stated that Chinese credit policies intended to limit credit lines to shipyards suffering from overcapacity so the consolidation of shipbuilding companies could be facilitated.[162] In that regard, China Merchant Bank's annual report of 2018 for instance noted that *"For the 16 industries that we have reduced or withdrawn from such as coal, iron and steel, shipbuilding, photovoltaic and coal chemicals (...), the Company (...) focused on supporting leading enterprises in industries and regional quality enterprises with competitive advantages in the industry, (...), devoted to reducing and withdrawing from customers associated with significant risks and low-end overcapacity, especially for customers in the process of reducing production capacity, deleveraging, and those meeting the "zombie enterprise" standards."*[163]

CEXIM equally prompted that ''*The Bank also adopted differentiated credit policies for five industries with excess capacity, including steelmaking, shipbuilding, aluminium smelting, cement and glassmaking, and exercised strict control over new loans to such industries.''*[164]

In light of the consolidation objective, the number of active shipyards (with at least one vessel over 1 000 GT on order) decreased in China from 379 in 2010 to 117 at the end of 2019 (Figure 2). The large yards, especially those operated by SOEs, account for more than half of the capacity, while smaller yards and non-SOE yards are mostly suffering from overcapacity.[165] Therefore, one may wonder if the mere consolidation of SOE shipyards, including the recent merger between CSIC and CSSC, will sufficiently contribute to mitigating the overcapacity problem.

Despite China's statements, overcapacity in the shipbuilding sector does not seem to be significantly reduced. Prior research by the OECD illustrates that Chinese policies to reduce capacity in the shipbuilding sector in fact only had a marginal effect.[166] It has to be reiterated that China's state-owned enterprises hold a significantly large share of the shipbuilding market and that state-owned enterprises are often used as vehicles to implement policies. While acknowledging the complexity of the overcapacity problem, and the interaction of different factors that may contribute to it, one may nonetheless pose the open question if China is taking sufficient measures to cut its overcapacity in the shipbuilding sector. In 2013, the State Council for instance requested that "key enterprises shall keep stable production and operation"[167], even though overcapacity was severe at that point in time.[168] Data from the Chinese Statistical Yearbook 2015 demonstrate that the Chinese net weight capacity of civil ships rose by 20.11%

in 2009, 26.69% in 2010, 19.89% in 2011, 7.99% in 2012, 7.10% in 2013 and 5.58% in 2014. In 2013, the capacity utilisation rate was about 71% for China's top 10 shipyards, while the capacity utilization rate of the entire sector between 2013 and 2015 was around 50%.[169]

It appears that China is willing to accept overcapacity in the short term if this contributes to the overall industrial objectives of its shipbuilding sector in the longer term. In practice, the pledged reduction of overcapacity rather seems to take the form of reducing investments in those segments that are haunted by overcapacity (e.g. bulkers), while redirecting government support to higher value-added segments of the shipbuilding sector where there is less overcapacity at present.[170] Therefore, the state of industrial development might be a more effective indicator to understand capacity levels in China than government statements pledging to reduce overcapacity. Moreover, the strategy to redirect funding to high value-added segments of the shipbuilding sector does not seem to resolve the structural overcapacity of the sector in the longer term as extensive support to segments with lower overcapacity levels at present may contribute to the creation of overcapacity in these segments in the future. For this reason, it is recommended to structurally diminish capacity levels and to phase-out corresponding policies (e.g. tax incentives) in the shipbuilding sector in order to accrue firms' production levels, let inefficient zombie firms exit the market and to root ship prices on features of quality and supply-demand interactions. In suit of D. Xu and Y. Liu's observations, the Chinese government could also consider further strengthening its institutions, its rule of law and its rules on corporate governance. These alterations should fortify the regulatory framework in which the markets can autocorrect the current overcapacity problem.[171]

3.2.2. Support measures

Subsidies as part of wider government support measures

Subsidies are a commonly used feature of the shipbuilding industry, notably in the start-up phase of an infant industry.[172] P.J. Barwick, M. Kalouptsidi and N.B. Zahur illustrate that China's industrial subsidy programme in the shipbuilding sector, estimated at CNY 540 billion (approximatively USD 90 billion) between 2006 and 2013, increased China's world market share by 40% within that same timeframe. Given that the domestic size of the Chinese shipbuilding revenue was estimated to be CNY 1 700 billion, the overall subsidy stimulation programme consequently corresponded to nearly one third of the domestic industry's revenue. The subsidies that were deployed can be subdivided into three types. The first type lowers a ship's production costs and therefore is called a production subsidy. Between 2006 and 2013, Chinese production subsidies are estimated to amount to CNY 159 billion. Some examples of production subsidies are subsidised input materials such as cheap steel, export credit or buyer financing in the form of collateral loans. A second form of subsidy are investment subsidies, amounting to CNY 51 billion between 2006 and 2013. They can be provided as favourable loans or preferential tax policies. A last category of subsidy relates to entry subsidies, accounting for CNY 330 billion between 2006 and 2013, such as subsidised land or simplified licensing procedures.[173] A more recent study by the Center for Strategic and International Studies contends that Chinese shipping and port management firms received USD 3.4 billion in direct subsidies between 2007 and 2019, of which USD 2.1 billion was attributed to the shipbuilding sector. These direct subsidies encompass cash payments and rebates for taxes and levies[174], which are more confined in scope than the study conducted by P.J. Barwick, M. Kalouptsidi and N.B. Zahur.

While providing subsidies one will have to limit - to the maximum extent possible - the potential distortive effects on societies, trade and competition. Thereby, the nature and scale of the support will serve as an important determinant, especially in a context where state-owned enterprises both act as providers as well as recipients of subsidies.[175]

On the one hand, industrial subsidies significantly increased China's market share in the shipbuilding sector, especially if they were targeted towards the most productive firms and if they were implemented in times where the global shipbuilding markets were facing a drop in orders.[176] However, this is not a plea

for more industrial subsidies, as the mere fact that China's shipbuilding market share has increased does not imply that its industrial subsidies were allocated effectively from an economic point of view. On the other hand, these subsidies resulted into lower overall prices for ships, also benefitting foreign ship-owners for CNY 230 billion (between 2006 and 2013); lower profitability levels for shipyards; a significant misallocation of subsidies to less efficient shipyards; and a lack of coordination of the subsidy policies, which resulted into lower rates of return for China as well as in a higher distortive effect of the subsidies vis-à-vis third countries.[177] A large part of the direct subsidies seem to have been dismantled since 2017, although tax exemptions remain prevalent.

Government support is not limited to subsidies. China's shipbuilding policies for instance also aim at creating a favourable regulatory framework and ecosystem that supports its key enterprises. Strategic state-owned enterprises (SOEs) are an important vehicle for the implementation of industrial policies. There are strong indications that governmental strategies, support measures (including financial incentives) and SOEs are intertwined. For this reason, some of the (indirect) support measures or policies will be touched upon in other sections of this report. Against this backdrop, the caveat has to be made that indirect forms of support measures are harder to detect than direct forms of support. Due to limited accessibility to data from unlisted companies and the restriction to primarily base the research on public sources, the report does not include data from unlisted companies or support measures that are harder to identify such as below-market loans[178, 179], below-market equity injections or non-market based advantages. Also, the observations are limited to the shipbuilding sector. Even though, the impact of subsidies to the shipbuilding sector needs to be approached from the entire global value chain, methodological and time constraints urged the Secretariat to largely exclude analyses about subsidies to the shipping sector, the port sector, or the upstream sectors (e.g. steel) from the report so their cumulative effect cannot be estimated. Therefore, the support measures mentioned in this report may still constitute a rather conservative mapping of China's overall government support to the shipbuilding industry and the distortive effects that may result from them.

The current section describes some examples of specific Chinese support measures in the shipbuilding industry, although references may be made to horizontal support measures as well. According to M. Kalouptsidi, China's subsidies to the shipbuilding sector lowered the production costs of Chinese shipyards by 13 to 20% between 2006 and 2012.[180] Similar estimates with a similar scope are not publicly available for the period after 2012. This report mainly focuses on providing some examples of potentially distortive support measures but does not claim to be exhaustive. It excludes any taxonomy based on the WTO's Agreement on Subsidies and Countervailing Measures (ASCM)[181] and it refrains from making any judgments on the legality of the support measure.

The Secretariat has based its analysis on international and domestic sources and on its independent assessment as conducted in the non-WP6 members Inventory. As data on specific business deals are often missing, it is difficult to identify if these deals were concluded at terms more favourable than those offered by market conditions. Consequently, it will always depend on the specific characteristics of a measure to envisage its supportive nature. To conduct more effective research in the future, a call is made for enhanced transparency on government support, notably on the ownership structure of shipbuilding companies and on the policy reasons to provide support.

Insurance Premium Compensation

In 2015, the MIIT published the Directory for the Promotion and Application for the First Set of Major Technical Equipment (''the Directory'') to facilitate the development of some categories of major Chinese technical equipment. The MIIT planned on modifying the Directory every 2-3 years bearing into account the development of these major technical equipment categories in Chinese industries. Narrowed down to the shipbuilding and marine equipment industries, the Directory comprises projects such as the

dynamic position of ships, high-speed diesel engines, large vehicle carriers, large cutter suction dredgers, C-type LNG carriers and a crane for a deep-water pipe laying vessel.[182]

The equipment listed in the Directory has to meet at least one of the following three criteria:

1. Contributing to the development of new strategic industries and the upgrading of traditional industries. The equipment is urgently needed for the national economic construction and major national projects.

2. Consisting of outstanding energy-saving, material-saving or environmentally friendly features. The equipment must also entail economic and social benefits.

3. Being a new type of major technical equipment that has just gained market access.[183]

To promote the equipment included by the Directory, MIIT, MOF, and the China Insurance Regulatory Commission jointly issued a policy to Implement an Insurance Compensation Mechanism for the First Set of Major Technical Equipment. In light of this policy, the China Insurance Regulatory Commission and the Insurance Association of China instigate Chinese insurance groups to insure the equipment encompassed by the Directory. The firms that manufacture the equipment listed on the Directory are deemed to insure themselves, whereas the Chinese government - under certain conditions - subsidises the corresponding insurance premiums.[184]

Loans and grants

There are various initiatives at the central and the local level to support the shipbuilding sector. Article 15 of the Chinese General Rules for Loans (1996) for instance explicitly provides for the possibility to grant interest discounts:

"To promote the development of certain industries and regional economies, relevant departments may grant interest discounts for loans pursuant to state policies."[185]

This subsection both covers loans and grants. It has to be reiterated that the mere fact that a loan/grant is mentioned in this section of the report does not necessarily imply that it provides some form of government support. The extent of the government support would depend on the conditions at which the loan/grant is provided, i.e. at terms more favourable that what would have been provided by the market.

Some authors have contended that the financing costs for listed SOEs in China tend to be 40-50 basis points below the benchmark interest rate.[186] This statement aligns with prior OECD research on measuring distortions in the international aluminium market.[187] In addition, loans can be restructured after they were issued by extending its tenor or lowering its rate, or even waiving lending interest.[188] Indeed, over the past years there seems to be a declining trend in direct subsidies to state-owned enterprises in the shipbuilding sector. It is not unlikely that a shift took place in the type of support measure (e.g. an increase in indirect forms of domestic market protection through government procurement procedures or through informal networks of state-owned companies).

There are no sufficient data to confirm with certainty that certain financial instruments - some of which happen to be provided in the spirit of China's industrial policies - would predominantly have been granted against more favourable conditions than what a company would have secured on the private market. Though, in some circumstances the overall framework against which the loan/grant is provided (e.g. strong interconnection between state-owned institutions or loans/grants provided to companies with a low profitability ratio), in combination with precedents[189], may raise assumptions that the loan was indeed provided at terms more favourable than market conditions.

Indeed, if a central, highly leveraged, and low profitable SOE, whose top executives enjoy ties with the Chinese Communist Party, declares to subscribe to China's industrial ambitions and subsequently

receives a high amount of credit by Chinese state-owned banks, while bearing in mind that Chinese policy banks and state-owned banks align with China's industrial ambitions (see section 3.2.3.) and that these banks are legally entitled to provide more favourable loans, one may in fact argue that there could be a (refutable) presumption of a credit granted at more favourable terms.

According to the European Chamber of Commerce, Chinese leasing and financing companies develop their activities in line with the industrial ambitions of the Chinese government (see also section 3.2.3.). Such lending practices correlate with the accrued overcapacity in the shipbuilding sector.[190]

The leasing company of China's Development Bank constitutes a case study where a bank seemed to have access to favourable government incentives. In its annual report of 2018, CDB Leasing for instance declared that it would be rewarded a municipal grant from Shenzhen, corresponding with around 30% of the land usage price. However, the annual report only mentions a great likelihood to receive the grant. There were no data to verify if the grant was provided in the end. The annual report does, by contrast, state that the company already received a similar grant in 2011 for the amount of CNY 144,3 million, and that the company group received a grant from the Shenzhen government of CNY 800 000 and CNY 13 million in 2017 and 2018 respectively for ''encouraging the development of the financial industry''. [191]

According to its annual report of 2019, CSSC Offshore and Marine Engineering (COMEC) received CNY 338.37 million (USD 49.5 million) in government grants (including grants, tax benefits and direct subsidies) by 2019.[192] In the first quarter of 2020, the company received for CNY 8.26 million (USD 1.2 million) in government grants.[193]

Another example are the credit lines that the state-owned company China Communications Construction Company (CCCC), whose activities include dredging, received from Chinese banks. J. Holslag claims that, in 2017, CCCC received USD 30 billion from the China Development Bank and USD 30 billion from the Postal Saving Bank of China. Between 2014 and 2017, the China Harbour Engineering Company (i.e. a daughter company of CCCC) would in addition have obtained a combined amount of USD 17 billion from China Guangfa Bank, CDB Tianjin branch, the Postal Saving Bank of China, Bank of China Tianjin and China Merchants Bank. The author contends that these loans intend to bolster China's industrial ambitions to expand its dredging companies overseas.[194] The company's annual report of 2018 would indeed correspond to such an interpretation:

"The Company responded actively [to] the national strategic deployment of "Going Global", participated extensively in cooperation and competition for foreign economic aid programs and international contracting projects, and acted as a leader in implementing the initiative of "the Belt and Road".

(...) and shouldered the responsibility as a pillar of a great power in respect of developing China into a transport power as well as a maritime power, and building a green China.

(...)

The Company was committed to promoting reform precisely and delicately, promoting the construction of the "Belt and Road" in both substance and depth, driving high-dimensional development through high-end connection and high-end operation, and proposed "China's Plans" and made "China's Voice" at major diplomatic and business events of the State, such as the Beijing summit meeting of Sino-African Cooperation Forum and the First China International Import Expo (CIIE).''[195]

A subsequent illustration of alleged state support is the combined credit line of almost USD 82 billion between 2013-2016 to China's state-owned shipping and shipbuilding company COSCO. J. Holslag argues that, despite making significant losses, this company received USD 8 billion from China Merchants Bank, USD 14.4 billion from the Bank of China, USD 1.75 billion from the Chinese Exim Bank, USD 13 billion from ICBC, and USD 26 billion from the China Development Bank to support the Belt and Road Initiative. The author furthermore refers to a statement of COSCO itself, wherein it

accentuated its strategic importance to *"[p]romote the stable development of Chinese global supply chains and national industrial development"*.[196] The later financial reports of COSCO equally indicate continuous state support. In 2018, COSCO reported for USD 230 million in state support, whereas the net income of the company accounted to USD 251 million. In 2019, COSCO declared CNY 907.06 million (USD 129.31 million) as government subsidy and reported for CNY 944.46 million (USD 6.34 million) as deferred income tax and CNY 2.34 billion (USD 333.59 million) in deferred tax liability. It has to be remarked that the lower direct subsidies for 2019 are a result of the discontinuation of the scrap-and-build subsidies. For the first quarter of 2020, the company declared CNY 42 million (USD 5.99 million) in subsidies. The financial statement however explains that these subsidies are ''exclusive of government subsidies which are closely related to normal operating business of the Company and are entitled continuously pursuant to unified standard quota or amount under the State government policy.'' The deferred income tax was estimated at CNY 64.14 million for long-term deferred expenses and CNY 776.83 million for deferred income tax.[197]

CSSC and CSIC would also at least have received USD 44 billion in credit from China's state-owned banks and other state-owned enterprises between 2009 and 2019.[198] The annual reports of the companies indicate that CSIC received CNY 302.77 million as ''non-operating income'' for 2017, while CSSC obtained CNY 334.84 million for the same year.[199] While not all forms of non-operating income are subsidies per se, some of it might be. However, the Secretariat lacks the specific data to confirm this hypothesis.

In light of this remark and as indicated at the beginning of this section, it needs to be reiterated that the mere fact that large amounts of credit or grants are provided to a company does not provide by itself any evidence of a subsidy. The degree of the subsidy would depend on the extent to which loans or grants are offered at terms more favourable than the terms that would have been provided by the private market. However, the surrounding circumstances may raise the presumption that certain loans or grants were indeed part of a larger framework to support the Chinese domestic industry. More extensive research is needed to confirm this hypothesis.

Debt-equity swaps

Highly-leveraged companies that operate in sectors characterised by overcapacity, such as shipbuilding, may face financial difficulties to repay their debt.[200] In light of its supply side reforms, China re-introduced its debt-to-equity swap programme in 2016[201], after it was first introduced in 2000[202]. Debt-to-equity swaps are a financial instrument to provide equity (e.g. shares or some types of convertible bonds) in exchange for debt relief. In its 2019 Economic Survey of China, the OECD acknowledged that debt-to-equity swaps can play an important role in tackling the high levels of debt in Chinese SOEs.[203] In fact, equity financing does not raise concerns if it stems from the normal operation of market forces. However, equity financing may become more controversial when governments or state-owned enterprises inject equity in companies that the markets would not deem equity- or credit-worthy, if there are no restructuring plans attached to the injection, if the capital injection does not value the debt at market conditions, or if there is no clear exit strategy, as such circumstances could provide for advantages to some firms that are not available to others.[204]

In 2019, China implemented debt-to-equity swaps in various sectors for an amount of USD 203 billion in total.[205] In 2020, the China Banking and Insurance Regulatory Commission announced to encourage further expansion of investments in debt-to-equity swaps.[206] However, the debt-to-equity swap programme has been criticised as the amount of money involved would be insufficient to tackle China's debt problem and because of a perceived lack of a fair pricing mechanism of the swaps.[207] The current section discusses the case study of China's biggest shipbuilders' debt-equity swaps, i.e. CSIC and CSSC.

In the case of CSIC, eight investors injected CNY 21.9 billion (USD 3.27 billion) in 2017 in two of CSIC's subsidiaries (CNY 16.5 bn. for Dalian Shipbuilding Industry and CNY 5.4 bn. for Wuchang

Shipbuilding Industry Group). In exchange, investors received shares of the parent company (i.e. CSIC Ltd.). By virtue of this financial construction, CSIC Ltd. could eventually acquire Dalian Shipbuilding Industry and Wuchan Shipbuilding Industry Corp. The China Cinda Asset Management Co. and China Orient Asset Management, both controlled by the Ministry of Finance, ventured CNY 7 billion (USD 1 billion) in return for equity. The other six investors, including state-owned enterprises Venture Capital Investment Fund Co Ltd[208], Enterprises Structural Reform Fund Co Ltd[209], and China Life Insurance Group Co, invested for CNY 14.8 billion (USD 2.2 billion) in cash-for-equity deals.[210] While the specific terms and conditions of the debt-to-equity swap are not known, it seems likely that the investors required a restructuring plan in exchange for their capital investments. Indeed, in the following years CSIC further focused on internal restructurings (e.g. Dalian Shipbuilding acquired Bohai Shipbuilding) to reduce its costs and to increase its efficiency.[211]

CSSC equally engaged in debt-to-equity swaps, gauged at CYN 16.9 billion (USD 2.5 billion) since 2018. CSSC Holdings Ltd. swapped the shipbuilding assets of Huangpu Wenchong Shipbuilding and Guangzhou Shipyard International from its subsidiary CSSC Offshore & Marine Engineering Company Ltd. (COMEC) in exchange for the marine propulsion assets of Hudong Heavy Machineries. In addition, CSSC Offshore & Marine Engineering Company Ltd. (COMEC) acquired the marine propulsion assets from CSSC Marine Power, CSSC Propulsion Research Institute and CSSC-MES Diesel. Finally, CSSC Holdings Ltd. acquired Jiangnan Shipbuilding from China State Shipbuilding Corp. (i.e. the parent company).[212] The financing for the debt-to- equity swaps in 2017 amounted for CNY 7.5 billion (USD 1.1 billion) and came from the China Construction Bank Corporation and the China Life Insurance Group.[213]

After the restructurings, CSIC would mainly focus on shipbuilding (i.e. China Shipbuilding Industry Co. Ltd), power equipment manufacturing (i.e. China Shipbuilding Industry Group Power Co. Ltd.), and information technology (i.e. CEC CoreCast Corp.). CSSC would further specialise in shipbuilding (i.e. CSSC Holdings Ltd.), marine propulsion (i.e. CSSC Offshore & Marine Engineering Company Ltd.), and steel structures and mechanical engineering (i.e. CSSC Science and Technology Co.).[214]

Following the sequencing of the debt-to-equity swaps, the internal restructurings, the subsequent merger of CSIC and CSSC - and the similar sequencing pursued in other sectors characterised by overcapacity[215]- it seems that these decisions were inspired by wider governmental policies. For this reason and the fact that several state-entities are involved in the debt-equity swap transactions, the suspicion is raised that the terms and conditions of the debt-to-equity swaps took place at conditions more favourable than what would have been offered by the private market. However, the Secretariat lacks the data to confirm this hypothesis.

While the restructuring of debt through debt-equity swaps may reduce the debt burden of a company, one may pose the question as to its long-term effect. In line with prior research by W. R. Lam, A. Schipke, Y. Tan, and Z. Tan, the OECD Secretariat suggests that the deleveraging of firms will have to be accommodated by the restructuring of zombie-firms and SOEs, for instance by focusing on core activities, diminishing subsidies and reducing implicit support.[216]

Guarantees

One example of a 'guarantee'[217] in the shipbuilding sector is the irrevocable and standby letter of credit provided by the Bank of China for the issuance of EUR 500 million in credit enhanced bonds by CSSC in 2015. The credit rating agency Moody's explicitly mentions the letter of credit as one of the main reasons to grant the bond 'A1' status (i.e. upper medium grade with low credit risk).[218] This suggests that the guarantees provided by the Chinese state-owned banks improve the creditworthiness and hence the financing and capital conditions of a company. It is, however, not clear at which particular conditions the letter of credit was issued.

Apart from explicit guarantees, other support measures with a similar effect also need to be taken into account. Research illustrates that industrial subsidies in China for instance had increased the cash position of businesses so they could lend more and at more favourable terms, notably in cases where companies were facing an internal financing gap.[219] Some companies moreover enjoy a reputation of being closely connected to the Chinese government. Because of this status, certain credit providers believe that the company will be backed-up and bailed-out by the state (i.e. implicit guarantee).[220] For this reason, the company can benefit from more favourable access to credit, credit at more favourable terms, and higher levels of debt, compared to most private counterparts. State-owned enterprises and local government investment vehicles[221] are the main actors of this privileged category. These implicit guarantees, however, lead to a situation where credit is granted on the basis of a company's perceived reputation rather than on the project's economic viability. This may lead to a misallocation of funds.[222]

Taxes

The Chinese central and local governments have launched a series of initiatives to attract foreign expertise in high value-added sectors and to stimulate the domestic shipbuilding sector. It is beyond the scope of the current report to discuss all of these incentives in detail. By way of example the present report will refer to some illustrations of tax incentives in the shipbuilding and marine equipment industries. Moreover, one has to bear in mind that specific tax regimes may apply in certain types of industrial zones (e.g. Free Trade Zones) and that local governments may reduce a company's tax burden on a case-by-case basis.[223]

Since 2017, China provided VAT support - in the form of refunds for excess input VAT credit - for innovative firms that were active in the 10 key areas of the Made in China 2025 policy, including marine engineering equipment and high-tech marine vessels.[224] In similar vein, since 2009 China enacts the Catalogue of State-supported Key Technical Equipment and Products[225] and the Catalogue of Imported Key Components and Raw Materials of Key Technical Equipment and Products[226], which are both updated regularly. Products covered by the latter catalogue can benefit from customs duty and import VAT relief if they are deployed to manufacture the products that are included in the former catalogue.[227] Manufacturing companies not only benefit from lower VAT rates and customs duties, but also from lower fees or other types of taxes. According to the China Daily the overall reductions for the sector was estimated at CNY 1.65 trillion (USD 240 billion) in 2019, and could be further reduced in the future. The freed resources can be used by companies to invest in research and development. The exact amount that was received by the shipbuilding sector is unknown and is hard to measure given that large conglomerates may be active in several manufacturing industries. The article, however, makes clear that the shipbuilding sector equally falls under these beneficial rules. A representative from Dalian Huarui Heavy Industry records the following statement:

"Besides factories, we have also benefited from reduced charges on roads, railways and ports, and regulate charges for banking and intermediary services. As an equipment and machinery exporter, these moves have effectively reduced the burden on our operations in the domestic and export market,".[228]

The financial statements from COMEC (part of CSSC) equally suggest that the company benefited from preferential taxation, including reductions in VAT, enterprise income tax, property tax, and land use tax.[229]

Subsequently, the Chinese Circular on the Following Administrative Work of Fixed Assets Depreciation's Examination and Approval after the Related Power Delegated to Lower Levels (2003), provides for accelerated depreciation of certain types of machinery and equipment used by shipbuilding enterprises under Chinese tax laws.[230]

Also, there are various instruments to promote financial leasing activities in the shipping sector, both at the central and the provincial level. According to the Circular on the Stamp Tax Policies relating to Financial Leasing Contracts[231] , leasing contracts are taxed at 0.5% of the loan contract. Stamp duties are

even exempted in certain sale and lease back contracts. Secondly, Tianjin has issued a one-year export tax rebate (VAT exemption) to promote the financial leasing of ships. It is not clear if this tax rebate was extended.[232]

Vessel demolition (scrap and build subsidy)

The scrap and build subsidy[233] promoted the demolition of Chinese owned vessels that had not reached the statutory service life and encouraged new orders of vessels. The scheme aimed to mitigate the problem of excess supply in the shipbuilding industry and promoted a technical upgrade of China's national fleet. In addition, the subsidy was likely to sustain activities in some of the yards that were most grievously hit by the global market slump in 2008 by reconverting them into scrapping activities. The first scheme started in 2009 but has been officially promulgated in June 2010 and the government extended it to 2013, 2015 and 2017.[234] The scrapping scheme combined a mandatory scrapping age for ships with a subsidy for ships navigating under Chinese flag that were scrapped before that time.[235]

In practice, the scrap and build subsidy nudged Chinese ship-owners to place newbuild orders at Chinese shipyards. According to Danish Ship Finance, this policy contributed to a growing Chinese domestic shipbuilding market share from 28% in 2013 to 51% in 2015. Moreover, one may observe that Chinese state-owned yards have attracted 94% of orders (CGT) placed by Chinese ship-owners in practice.[236]

China has never publicly released any data on the total amount of money that was spent on the scrap and build subsidy. Given that non-publicly listed companies have no duty to publicly declare this kind of information, it is hard to make any assessment. Therefore, this report is limited to an enumeration of some examples. The Cosco Group for instance received a high amount of the scrapping subsidy. In 2015, the Cosco Group reported that it received USD 637.8 million in scrapping subsidies. It remains unclear over which period this amount was due or how much accumulated support the company would receive in the following years. The subsidy is often reported in the companies' financial statements as 'non-operating income'.[237] A more recent report by the International Transport Forum specifies that COSCO received USD 230 million in subsidies in 2018, of which USD 122 million were granted in effect to the vessel demolition scheme and USD 107 million in subsidies were received on other terms.[238]

Other Chinese shipping groups equally benefited from the scrapping subsidies. Sinotrans shipping (part of China Merchant Group) stated in its financial statement of 2018 that the scrapping subsidy was applied in accordance with the Implementation Plan for Early Retirement and Replacement of Obsolete and Worn-out Transportation Vessels And Single-hull Oil Tankers (2013)[239] and the Administrative Measure For The Special Subsidies Given By The Central Finance To Encourage Retirement And Replacement Of Obsolete and Worn-out Transportation Vessels And Single-hull Oil Tankers (2014)''[240].[241] These rules aimed to regulate the arranged funds to subsidise the early scrapping and renewal of obsolete ships. Lastly, China Merchant Energy Shipping (CMES) received for USD 116 million in scrapping subsidies (i.e. part of ''non-operating income'') in 2016.[242]

Research, Development and Innovation

China has significantly increased its spending in research, development and innovation. Cross-sectoral figures from the OECD show that Chinese investment on research and development, relative to GDP, has risen from 0.89% in 2010 to 2.19% in 2018, although big differences may remain between the different provinces. Meanwhile, China has almost closed its gap with the OECD average, i.e. 2.4%.[243]

Unfortunately, there are no industry specific figures on the total amount of money that China spends in the form of R&D support to its shipbuilding industry. Generally speaking, governmental policies such as the State Council's Notice to Accelerate the Transformation and Upgrading of the Shipbuilding Industry (2013), MIIT's Five-Year Plan for the Shipbuilding Industry (2013) and MIIT's Interpretation on Made in China 2025: Promoting the Development of Marine Engineering Equipment and High-Tech Ships (2016) seem to encourage the independent development of marine and high-tech vessel technologies. The

increased investments in R&D funds and research centres[244] is one way to contribute to this goal. Opening up collaborations with foreign players in the short-term is another way to attain this longer term objective.

In the wake of the financial crisis of 2008 and in line with the corresponding Shipbuilding Industry Adjustment and Revitalisation Plan (2009)[245], the Medium and Long Term Development Plan of Marine Engineering Equipment Manufacturing[246], the National Strategic Emerging Industry Development Plan[247], and the Ocean Engineering Equipment Engineering Implementation Plan, MIIT unveiled guidelines to speed up the research and development in the marine engineering industry, notably in the field of offshore and deep-sea oil and gas. More specifically, China supported projects on the construction of mobile drilling platforms, floating production units, offshore engineering and auxiliary ships. The guidelines also articulated the wish to sustain concrete projects in 2012, 2013, and 2014.[248]

The Chinese Ministry of Science and Technology initiated its State High-Tech R&D Program (''863 Plan'') to incite the development of high-tech sectors. This program couples with the 11th and 12th Five-Year Plans as well as with the National Medium and Long Term Scientific and Technological Development Plan Outline. These plans are horizontal in nature. Narrowed-down to the marine technology sector, the plans want to upgrade China's integrated transport system by virtue of developing independent, cutting-edge technologies.[249] To be eligible for the funding, the applying institution must be registered in Mainland China for at least one year and should cooperate with a Chinese partner.[250]

Additionally, some projects couple with MIIT's high-tech shipbuilding R&D plan (2014)[251], and the Plan to accelerate the implementation of structural adjustment programs to promote the transformation and upgrading of the shipbuilding industry (2013-2015). The aim of these plans is to encourage the technical development of the shipbuilding industry, improve China's own independent innovation capacity and improve the Chinese shipbuilding industry's global competitiveness.

A non-exhaustive list including some examples of national Chinese initiatives that aim to encourage R&D investments in the shipbuilding and marine equipment sector can be found in Annex III. These national initiatives may be supplemented by local initiatives. The province of Guangdong has for instance launched a subsidy programme to support R&D in projects regarding deep-sea autonomous underwater vehicles or intelligent equipment for damage detection and repair of large marine structures.[252]

While there are good economic arguments to provide R&D support – such as correcting market failures and fostering innovation – care should be given to its design. Emphasis should preferably be placed on transparent and non-discriminatory policies that benefit firms that face financial constraints or on pre-competitive research that undertakes fundamental R&D, which might be undersupplied by the private sector.[253] The European Chamber of Commerce has for instance already expressed its concerns as to the practical feasibility for foreign firms to access Chinese R&D funds.[254]

3.2.3. Financing

The impact of China's industrial policies extends beyond the field of industrial subsidies. Industrial policies also largely interact with a variety of economic and financial tools, ranging from direct funding through investment vehicles[255] to the deepening of capital markets. A substantial part of the financing is provided with the assistance of policy banks and state-owned banks. These banks tend to be constrained by the Chinese rules on financial repression[256] and are claimed to contribute to China's industrial policies[257] such as the revamping of China's domestic shipbuilding industry.[258] Indeed, DSIC's (part of CSSC) website for instance mentions that its achievements were ''inseparable from the support of CCB [China Construction Bank] Dalian Branch in [the] financial field''.[259]

Lloyd's List announced that Cexim had signed a strategic cooperation agreement with CSSC in 2019. According to the news article, the recent merger of CSSC with CSIC elicits important policy and financial considerations: "*Now CSSC has been merged by Beijing with its northern cousin, China Shipbuilding Industry Corp and reincarnated into a new and larger CSSC, it means the combined group will receive*

more consolidated support from the state lender." Also, it is argued that Cexim would be one of the most important financial institutions to back-up the USD 4 billion newbuilding orders that CSSC had signed at the end of 2019 (i.e. at Marintec).[260] Additionally, CSSC mentioned in a statement that it has signed loan agreements with the China Development Bank, China CITIC Bank, Bank of Communications and China Everbright Bank. Moreover the statement posits that CSSC has issued for USD 485 million (2018), EUR 300 million (2018) USD 800 million (2013) and EUR 500 million (2015) in corporate bonds.[261]

Financial policies are of particular importance in the shipbuilding sector as cheap financing is one of the key factors for concluding an order. Cheap financing may be associated with an indirect form of domestic market protection, notably if it is provided to companies with low profitability levels and high levels of debt. A Korean newspaper mentions that foreign ship-owners receive favourable shipping finance from the Chinese government in exchange for the commissioning of new orders at Chinese yards.[262] A recent large order for LNG carriers by Qatar is equally alleged to benefit from favourable government funding.[263]

In addition, there are many examples of large orders made at Chinese state-owned yards that are commissioned by other Chinese state-owned enterprises, and that are financed by state-owned financial institutions such as export credit agencies and/or financial leasing houses. Some examples in 2019 were the newbuild orders at Marintec for the China State Shipbuilding Corporation (merger between CSIC and CSSC), accounting for USD 4 billion; the CSIC deal for 24 newbuilds and other projects, accounting for USD 2.8 billion; the order of 36 newbuild vessels by CSSC, corresponding to more than USD 1.5 billion; and the commissioning of 12 oil tankers for USD 650 million by the Bank of Communications Financial Leasing at Guangzhou and Shanghai Waigaoqiao shipyards.[264]

Some elements to take into consideration while assessing the protective nature of a deal relate to the terms of financing, the profile of the companies involved, the extent to which the deal aligns with industrial policies, the procedure for ordering the vessels (e.g. government procurement), the size of the deal, and the overall investment and trade climate.

Monetary and financial policies

The People's Bank of China (PBOC) appears to support China's industrial policies via its monetary policies. Firstly, the PBOC used to put a maximum cap on deposit interest rates. It has been argued that deposit interest rates were kept artificially low to transfer money from Chinese households as an indirect form of cheap credit to the Chinese corporate sector, notably to SOEs.[265] While the interest rate ceiling policy was officially abandoned in 2015, some scholars argue that in practice commercial banks perpetuate aligning their interest rates with the official benchmark rates set by the PBOC.[266] According to L. Zheng, P. Wang and Z. Xu, the liberalisation of the interest rates accelerated the flow from deposit savings to SOEs as these firms enjoy more favourable access to finance, in addition to the incentive to boost production sales. This would exacerbate capital misallocation to SOEs across sectors.[267] Figures show that the share of state-owned corporate loan borrowings in China have continued to increase between 2010 and 2016, from respectively 36% to 83%, while the private sector respectively represented 48% in 2010 and 11% in 2016.[268]

Secondly, the PBOC already noted in its Quarterly Report of 2017 that *"sound financial services will be delivered on a continuous basis for infrastructure construction and the upgrading and transformation of key areas and industries, such as railways and shipbuilding.*"[269] This engagement feeds into the 2019 Report on the Execution of the Central and Local Budgets by the Chinese Ministry of Finance to "*give full play to the leveraging role of government funds in guiding capital and resources toward key areas of strategic importance, to help shore up weaknesses in major equipment manufacturing and create new service platforms in key industries, and promote innovations and breakthroughs in key strategic areas."*[270] Read against the backdrop of broader Chinese policy documents, this preceding paragraph by the PBOC may consequently suggest that the PBOC intends to promote the Chinese industrial objectives in the shipbuilding sector through its monetary and financial policies.

According to the Financial Stability Board, the stricter banking policies in China in combination with a strong demand for credit, the search for higher yield and the implicit guarantees may have contributed to the rapidly evolving shadow banking industry.[271,272] There is a strong interaction between the banking and the non-banking sector in China. Larger companies (private and SOE) can for instance receive more attractive funding from commercial banks and deploy their creditworthy position to grant entrusted loans [273] to other, usually smaller and medium-sized SOEs or private companies. Yangzijiang Shipbuilding, a private company, for instance already provided direct loans to other businesses through the intermediation of its financial subsidiaries.[274] Beijing has issued several policies to regulate shadow banking more strictly, as reinforced by the Financial Stability Report of the PBOC (2018).[275] The impact of these policies on lending practices in the shipbuilding sector yet remains to be seen.

In addition to China's domestic financial policies, China seems to be eager to export some of its financial norms abroad. The scholars T. Kenderine and H. Ling argue that China's policy of International Capacity Cooperation (ICC) [276], while aimed at "promoting foreign cooperation in competitive production capacity", essentially must be understood in such a way as exporting China's policies and industrial capacity abroad (cfr. Belt and Road Initiative). The authors furthermore indicate that the Chinese banks financing these operations subscribe to Beijing's industrial strategies and policies (cfr. Made in China 2025). More concretely, the People's Bank of China, State Administration of Foreign Exchange, and China Investment Corporation are suspected to channel funding through Chinese policy banks and the big four commercial banks to investment funds such as the Silk Road Fund. The Chinese regulatory framework[277] seems to confirm this assertion. These investment funds then venture - often through SOEs - industrial plants abroad. The implementation of the projects is managed at the provincial level.[278] The authors notice that the Chinese International Capacity Cooperation system could create a parallel trade and investment architecture and that the export of local Chinese government debt may export a debt-deflation model to other countries, thereby causing a systemic risk to global capital transfers.[279]

Financial leasing

In the aftermath of the financial crisis in 2008, Chinese leasing companies have been building a prominent position in the international financing of ships and continued to expand their influence.[280] This rise of the Chinese leasing industry has been supported by several regulatory initiatives issued by the State Council, the China Banking Regulatory Commission (CBRC) and MOFCOM, such as the Guiding Opinion on Accelerating the Development of Financial Leasing Industry (2015)[281], the Interim Provisions on the Administration of Specialised Subsidiaries of Financial Leasing Companies (2014) [282] and the Administrative Measures for Financial Leasing Companies (2014)[283]. According to estimations by the Center for Strategic and International Studies, Chinese bank lending and leasing to shipping companies accumulated to - at least - USD 127 billion over a time period between 2010 and 2018.[284] The fast growth of the Chinese leasing companies was facilitated by i.e. fiscal and taxation policies, government procurement policies, the targeting of specific sectors such as ships or marine equipment, and an increase in export credits.[285]

The share of Chinese leasing companies in the global portfolio increased sharply between 2010 and 2019 to represent almost 20% of the world total in 2019 (approximately USD 64 billion).

There are several types of financial leasing companies that operate in China such as foreign-funded enterprises, non-banking financial leasing companies, domestic-capital financial leasing pilot enterprises, and financial leasing entities pertaining to conglomerates.[286] Some renowned companies active in the Chinese ship finance market are AVIC International Leasing[287], China's Merchant Bank (CMB), the Bank of Communications (BoCom), the Industrial and Commercial Bank of China (ICBC), and Minsheng Leasing. These leasing companies, owned by banks, are the main drivers of the Chinese ship leasing market.[288] Large Chinese shipbuilding conglomerates such as CSSC, CSIC or COSCO also have their own financial leasing subsidiary. [289] While their leasing activities are significantly lower than their

banking counterparts, it has to be noted that these conglomerates also hold shares in leasing companies of big Chinese banks.[290]

A ranking publised by Tradewinds[291] provides an overview of Chinese lease financing and shows that five Chinese leasing companies managed each more than USD 5 billion of shipping assets at the end of 2018. According to some press articles, the assets of Chinese lessors are often an underestimation as a large share of the deals remains unreported.[292] Also, Chinese leasing companies are likely to restructure in the future (e.g. public listing) to pursue higher financial gains.[293]

Chinese leasing companies tend to favour domestic shipbuilding companies[294] and Chinese policy banks may even require a 'Chinese element' when selecting potential project partners. Chinese leasing companies were for instance already involved in the construction of cruise ships[295], the sale-and-lease-back of 200 LNG-fuelled vessels[296], the ordering up to 10 VLOCs[297], and the construction of eight ultramax ships.[298] The sale-and-lease-back formula remains the dominant form of leasing and is a way to provide liquidity to shipping companies.[299] Examples show that some Chinese leasing deals are conducted on more competitive terms than traditional banking.[300] Additionally, other forms of ship finance provided by private entities are increasingly difficult to access.[301] This could explain the rising popularity of leasing as the preferred form of ship finance.

Lloyd's List reports that MIIT, upon complaints from CSIC and CSSC, would have requested Chinese leasing houses in 2017 to no longer finance newbuilding projects at foreign shipyards. However, given that Chinese leasing institutions are supervised by the China Banking Regulatory Commission (CBRC), it is unclear which impact MIIT's request has in practice.[302] The Secretariat did not find any explicit law or abstract prescription for policy banks to adhere to such constraints. Therefore, each case needs to be assessed individually. The annual report of China's Development Bank (CDB), a policy bank, for instance appears to indicate that the China Development Bank supports the Chinese party line. Some of the statements in this annual report include *"in an effort to implement the overall plan for Party building in a new era, we made sure that the Party's leadership is present throughout our corporate governance and management", "as a lead financial institution for economic growth, we supported priority areas and major programmes and projects, issuing (...) CNY 1.3 trillion loans to priority areas such as the Yangtze Economic Belt (...)"*, and *"looking ahead, CDB will keep to the Xi Jingping Thought on Socialism with Chinese Characteristics for a New Era, implement the strategies and plans of the CPC Central Committee and the State Council, and move forward steadily"*.[303] Commercial banks, by contrast, seem to have abandoned any compulsory prerequisite of a 'Chinese element'.[304]

Provided that Chinese leasing institutions have gained a large share of the ship financing market and assuming that foreign shipbuilders have in fact no access to cheap financing by Chinese policy banks and commercial banks, foreign shipbuilders may in practice be forced to finance their transactions with internal funds or with external funding against more stringent conditions. Given the current situation of overcapacity and the resulting low profit margins, it may, however, be difficult to aggregate internal funds for the financing of new shipbuilding projects.

Export credit agencies

Export credit is one tool[305] to promote exports. The China Export and Credit Insurance Corporation (Sinosure) and the Chinese Export-Import Bank (Cexim) are the two most common providers of ship finance in China. In addition, the China Development Bank offers financial packages that closely resemble official export credits. These institutions already pledged to support China's Belt and Road policies and the Made in China 2025 programme.[306] While many large economies provide export credits, China awarded in 2014 for USD 58 billion in export credits, which is four times higher than the financing by any other state, and which is more than the export credits by all of the G7 members combined. In addition, scholars have argued that China's export credits may serve as an indirect form of state support or tied aid given that the credit is offered at terms outside the scope or at more favourable terms than the

provisions of the OECD Arrangement on Officially Supported Export Credits.[307] A recent document from the State Council indicates that China is planning to further expand its export credits to tackle the negative impact of the COVID-19 crisis. This includes the possibility to change the payment term of short-term export credit insurance or to extend the grace period.[308]

China's Export Credit Agencies (ECAs)[309] prioritise lending to companies intending to construct their ships at Chinese shipyards and may combine forces with Chinese leasing houses.[310] Cexim acts as a policy bank and supports the plan of the Chinese government to move up the value chain in shipbuilding. It provides export credit insurance, shipbuilding credits, loans and shipbuilding guarantees.[311] According to its website, Cexim has provided for more than CNY 300 billion in export credit to the shipbuilding industry since 2013.[312] Cexim has already pledged to guarantee shipbuilding orders and to support the production of high-value ships, notably LNG carriers and stainless steel chemical tankers.[313] Moreover, its financing is often provided at attractive terms, which may persuade ship owners to commission vessels at Chinese yards.[314] Lloyd's List reports that Cexim issued more than USD 15.1 billion in ship loans between 2016 and 2017, which led to the construction of 688 vessels and offshore projects in China.[315] In 2017, Cexim for instance financed a USD 1.5 billion project for nine newbuilds for CMA-CMG and granted USD 4 billion in loans for an order of 50 new vessels for COSCO Shipping. In 2018, Cexim funded six dry bulkers (USD 94 million) for a Bulgarian ship owner and three lake bulkers (USD 34.2 million) for a Polish ship owner. All new vessels would be built in China.[316]

Sinosure equally provides export credit guarantees. One illustration relates to the retrofitting of ships to install a scrubber in light of the IMO 2020 sulphur regulations. The shipping company MSC for instance installed scrubbers on 86 of its vessels. The retrofitting would be carried out by Chinese shipyards (incl. state-owned companies CSIC and COSCO), while the financial loans were backed-up by export credit guarantees of Sinosure.[317] Sinosure has also expressed its intention already to support the further development of the China Merchant Industry Holdings into a global shipbuilder.[318]

3.2.4. State-Owned Enterprises

Chinese state-owned enterprises (SOEs) have been discussed extensively in the literature. SOEs may enjoy various forms of preferential treatment such as privileged access to government contacts and contracts, smoother licensing procedures, higher levels of debt, or favourable financing. A significant portion of the literature focuses on subsidies to and by SOEs. However, to capture the actual impact of SOEs on trade and competition, the broader regulatory and policy framework by which Chinese SOEs are governed will equally be examined. In that respect, George Magnus (Oxford and SOAS University) for instance notes that *"[i]t is not only subsidies to state-owned enterprises (SOEs), it is also the principle of the state extending privileges and advantages to local companies, including SOEs, in vital sectors (…)."*[319]

In light of this remark, it may be difficult to draw a strict line between SOEs and private companies in practice (i.e. privatised companies may still hold important government contacts). Research by several scholars suggests that the degree of party-building is more important in assessing the political influence of a firm than its mere type of legal ownership (i.e. public or private).[320] Private listed firms for instance received one third of China's subsidies in 2018.[321] Therefore, the current section can only offer a tentative framework. The exact level of political interference and alignment of a company with China's industrial policies will need to be assessed on a case-by-case basis.

SOEs are divided into central SOEs and local SOEs. Central SOEs[322] usually operate in strategically important sectors such as shipbuilding. In practical terms, this strategic nature of a central SOE entails easier access to government officials but also leads to a more direct or indirect (e.g. investment vehicles) form of state control.[323] One of the central SOEs in China, COSCO, for instance already stated that *"we should respond to SASAC's call to central enterprises to hold each other warm in difficult times"* and *"we seek to use our assets overseas to support domestic industries, to help domestic companies to go out*

and to support the export of goods and services."[324] By the same token, China's Law on State-Owned Assets of Enterprises mentions that state owned capital should be directed to important industries.[325] Local SOEs, by contrast, seem to be much smaller in size and influence and are more active in industries or operations of commercial significance. In that sense, it becomes a thin line between local SOEs and private firms that are well-connected politically.

The findings in this section are mainly confined to strategic and central SOEs. For this reason, not all conclusions can be automatically transferred to other types of SOEs.

Organisational structure

Chinese central SOEs are often structured as conglomerates. This structure appears to be encouraged by Chinese policies. MIIT's Twelfth Five-Year Implementation Plan (2011-2015)[326] for instance promotes the cultivation of large-scale enterprise groups, including the establishment of cross-regional, cross-sectoral and cross-ownership structures. Within the conglomerate, a pyramid shaped composition normally unfolds in a holding company, one or more publicly traded subsidiaries, one or more financial company(ies) and one or more research institute(s). Some of the conglomerate's subsidiaries on their turn focus on specific segments of the shipbuilding industry[327], ship trading services such as chartering or ship broking or insurance brokerage.[328] The State-Owned Assets Supervision (SASAC) usually acts as the controlling shareholder of the holding company. The degree of SASAC's control depends on the classification of the SOE.[329] Central SOEs that are fully owned and funded by SASAC encounter the highest degree of political interference.[330] SASAC's main competences (sometimes in cooperation with other ministries such as MIIT) relate to the appointment, rotation, remuneration (i.e. fixed, fringe benefits and bonuses)[331] and evaluation of top managers; administering state assets; and restructuring of SOEs. SASAC on its turn falls under the supervision of the State Council.[332]

SOEs are instigated to collaborate with foreign partners (e.g. joint venture or strategic alliance[333]) and to set-up domestic networks[334]. These networks materialise at the institutional level (e.g. between steel companies, shipping companies and shipbuilding companies and/or between central and local SOEs[335]) as well as at the personal level (e.g. rotation of management between SASAC or other government bodies and central SOEs[336], or cooperation between top management of SOEs[337]). Therefore, a Chinese conglomerate can be labelled as a "networked hierarchy".[338]

The appointment of top executives of the China State Shipbuilding Corporation (CSSC) or the China Shipbuilding Industry Corporation (CSIC) requires political endorsement. By exercising control and influence over the top management of SOEs, China could deploy strategic SOEs as vehicles for the implementation of its industrial policies.[339] Therefore, it appears that strategic SOEs in China are both driven by political and economic forces. The degree of political interference, however, needs to be nuanced as the SOE decision-making process may be fragmented in practice.[340] Besides, the level of political interference also depends on whether the SOE is a "national champion", i.e. a strategic and large conglomerate.[341]

As stated by Ch. Zhang, all SOEs in China represent about 23%-28% of China's GDP and between 5% and 16% of China's total employment.[342] Chinese SOEs in strategic sectors nonetheless hold domestic market shares of around 80%.[343] As mentioned above, the shipbuilding sector is one of China's strategic sectors. Some important SOEs in the shipbuilding and marine equipment sector are China Shipbuilding Industry Corporation (CSIC), China State Shipbuilding Corporation (CSSC), Dalian Shipbuilding Industry Corporation (part of CSIC), COMEC/GSI (part of CSSC), Hudong-Zhonghua Shipyard (part of CSSC), Shanghai Waigaoqiao Shipbuilding Co. (part of CSSC), China Merchants Industry Holdings, and China COSCO Shipping Corporation[344]. Certain academic researchers rank China's central SOEs into 'core companies' and 'secondary companies'. The first type, also known as "important backbone state-owned enterprises", are at the forefront of China's industrial policies and possess vice-ministerial status. The second type enjoy the same hierarchical level as departments.[345] CSSC, CSIC (and all their

subsidiaries) resort under the first category. The other SOEs of the abovementioned list fall under the second category.[346]

In addition, the direct investments that were made by Chinese government funds in some of China's largest SOEs gives the Chinese state a bigger influence over corporate decisions.[347]

The COSCO Shipping Investment Fund of CNY 1 billion (USD 150 million), which was initiated in 2018, provides a good illustration of a central SOE collaborating with the Chinese Ministry of Finance and a state-owned financial institution (Cinda) to nourish investments in shipping.[348] Policies by the central government can be supplemented by local initiatives. The government of Shenzhen for instance set up a CNY 3 billion Shipping Fund in 2019 to promote smart and green shipping.[349]

The mere exertion of some degree of political control over the top management of SOEs will not necessarily be a reason for concern. One would have to examine the extent of the political influence (cfr. corporate governance)[350] and the concrete circumstances, such as the degree of transparency, to assess the practical consequences of political influence on fair competition and trade.

Against this backdrop, one has to assess the broader policy framework. As recorded by the WTO's Trade Review, Beijing, affirms that its "state trading enterprises operate following market mechanisms, with no government intervention".[351] At the 13th National People's Congress, China's Premier mentioned in his report that ''rents for state-owned premises will be lowered or exempted, and all other types of property owners are encouraged to also reduce, waive, or defer payments, and they will receive policy support from the government in doing so. We will take firm steps to stop the unauthorized levy of fees on enterprises.''[352] Some scholars have nonetheless claimed that Chinese administrative rules offer SOEs more favourable conditions, notably with respect to capital and land use, at the expense of the private counterparts. Central SOEs acting as large conglomerates would in addition also reap the financial gains from monopoly rents and lower dividends to the state.[353] In similar vein, the IMF already expressed its concern about central SOEs tending to receive implicit support on matters such as land endowment, favourable credit or cheap natural resources.[354]

Indeed, central SOEs play a salient role in the Chinese economy and industrial development. Their strategic importance is incorporated in Chinese regulations. Article 7 of the Chinese Constitution stipulates that *"the state-owned economy, (…), is the leading force in the national economy. The state ensures the consolidation and development of the state-owned economy."*[355] Subsequently, in the context of competition policies, article 7 of China's Anti-Monopoly Law (2007) reinforces the importance of central SOEs.[356] Next, it is noted that SASAC, in coordination with the Party Committee or Party Organization and/or the board of directors, often compels central SOEs for its regulatory approval before 'critical and important' decisions may be implemented.[357] These contain politically important decisions such as Party-level policies, the appointment or removal of high-level executives, decisions that have crucial implications for the operations of a company such as mergers or external investments, and expenses that were not allocated under the annual budget.[358,359]

Taken into account the broader policy framework, it seems hard to believe that Chinese shipping and shipbuilding SOEs would not be influenced by any political considerations at all. One may observe that there are various examples of Chinese, state-owned shipping companies commissioning vessels at Chinese, state-owned, shipyards, at a time where the ordering of new vessels does not seem to be sustained by market-led indicators. After the COVID-19 outbreak, Chinese state-affiliated shipbuilders for instance attracted a significantly higher number of new orders, despite the global drop in demand and in clear contrast to Korean and Japanese shipbuilders.[360] This seems at odds with the market tendencies, notably taking into account that Chinese shipbuilding SOEs are highly leveraged and significantly less profitable than their private counterparts (see OECD, State-Owned Enterprises in the shipbuilding sector[361]). Additionally, a Chinese market study by China Shipbuilding and Offshore International (CSOC), part of

CSIC, mentions that China's newbuild orders (DWT) were stagnating, a situation that the market study did not foresee to change any time soon.[362]

At the same time, one needs to take into account that Chinese SOEs usually take more extensive roles in society than may be the case in more advanced economies. This includes employing a larger labour force than necessary to meet the SOE's production targets and to meet social-welfare targets. In exchange the Chinese government may accept softer budgets (e.g. higher debt ratios) for its strategic SOEs.[363] These higher level of debts can contain a risk if loans can no longer be repaid. S. Chan argues that the debt issue in Chinese SOEs can only be tackled by structural reforms, including SOE reform policies that cut excess capacity and improve SOEs' efficiency and productivity rate. Coupled with the reform of SOEs are the redesigning of the state and the banking sector as well as corporate governance mechanisms.[364] While acknowledging S. Chan's statement, higher debt levels may be qualified in the sense that Chinese SOEs are – in some circumstances - ought to fulfil wider objectives than purely commercial gains. [365]

Market consolidation

The Chinese entry subsidies have attracted inefficient firms and led to market fragmentation and excess capacity (see 3.2.1.). The initiation of production and investment subsidies in combination with suboptimal exit policies for inefficient firms (e.g. zombie firms) only exacerbated these trends. In the wake of the global financial crisis in 2008 and the resulting drop of ship prices, China adopted several consolidation policies to create Chinese big state-owned enterprises that were able to compete globally (*yangqi*). Moreover, the consolidation policies were assumed to curb excess capacity, limit competition between China's SOEs and introduce economies of scale.[366] In 2015, Sinotrans and Changjiang Shipping Co. (CSC) were acquired by the China Merchants Group, thereby creating the world's largest ports and logistics company. In 2019, China Merchants Industry Holdings signed an agreement to take over the two remaining shipbuilding facilities from Sinotrans-CSC, namely Nanjing Jinling Shipyard and Wuhu Jiandong Shipyard. In parallel, China Merchants Industry Investment bought a majority stake in the shipbuilding unit from AVIC International Holdings, namely AVIC International Maritime Holdings (i.e. the holding company of AVIC Dingheng Shipbuilding and AVIC Weihai Shipyard).[367] One source contends that China Merchants Group is anticipating further integration to form China's third largest shipbuilding conglomerate, focusing on the integration of high value-added segments such as the offshore and marine engineering industry.[368] In 2016, China created the world's fourth's largest container operator through the merger of COSCO and China Shipping. The company was renamed to COSCO Shipping and established the shipbuilder COSCO Shipping Heavy Industries (i.e. merging COSCO Shipyard, COSCO Shipbuilding Industry Company and China Shipping Industry Co.).[369] In 2018, COSCO Shipping Holdings acquired Orient Overseas International (OOIL), i.e. the parent company of Orient Overseas Container Line (OOCL).[370]

The consolidation policies seem to have been facilitated by the overall regulatory framework. The Plan on Restructuring and Revitalising the Shipbuilding Industry (2009)[371] discouraged the entry of new shipbuilding firms but also spurred existing firms to increase their investments. Subsequently, the Shipbuilding Industry Standard and Conditions (2013) policy introduced the 'White List' of Chinese shipyards. This List encapsulated a list of Chinese shipyards that were eligible for enhanced policy support such as preferential access to subsidies or bank financing. These policies encouraged Chinese shipyards to upscale their production and investment levels. This stands in clear contrast with the evolution in global markets, which were hit by stagnating ship prices between 2009 and 2013.[372]

It is observed that China's Law on State-Owned Assets of Enterprises compels SOEs to seek approval by the government for any strategically important decision that affects their rights or interests.[373] The two biggest Chinese shipbuilding companies, China State Shipbuilding Corporation (CSSC) and China Shipbuilding Industry Corporation (CSIC), announced their merger plans in 2019. As the overcapacity in the sector has equally affected Chinese shipbuilders, mergers are one of the possible options to prevent

companies from going bankrupt. To quote Mr. Ka Sam-hyun (Hyundai Heavy Industries): the shipbuilding industry is ''consolidating to survive''.[374] In addition, mergers may mitigate the disruptive social unrest associated with bankruptcies.[375]

Finally, the news agency Caixin posits that the debt-to-equity swaps and subsequent internal restructurings of these two companies preceding the merger are part of a wider strategy to transform the shipbuilders' assets from a region-based approach to a strategy of specialisation.[376] The merger for instance intends to create synergies and economies of scale so China remains competitive vis-à-vis its international rivals, notably on high-end vessels such as LNG carriers, luxury cruise liners, icebreakers or offshore engineering equipment.[377] In addition to creating niche-based shipyards, this strategy seems to induce spill-over effects, such as knowledge sharing, within the same company and/or with other companies.

While consolidation may be effective to gain a higher market share in the short term, one may question its added value in the longer term if consolidation is not accompanied with increased competitiveness and efficiency gains.[378] In addition, it will be interesting to assess the impact of these big mergers on competition, notably with regard to the degree of accumulated control through intra-company technology sharing, economies of scale, as well as the extent of aggregated control over the global value chains. These concerns seem justified as the China Daily highlights the strategic nature of the merger between CSIC and CSSC. Quoting the new chairman of the shipbuilding group, the China Daily records the following:

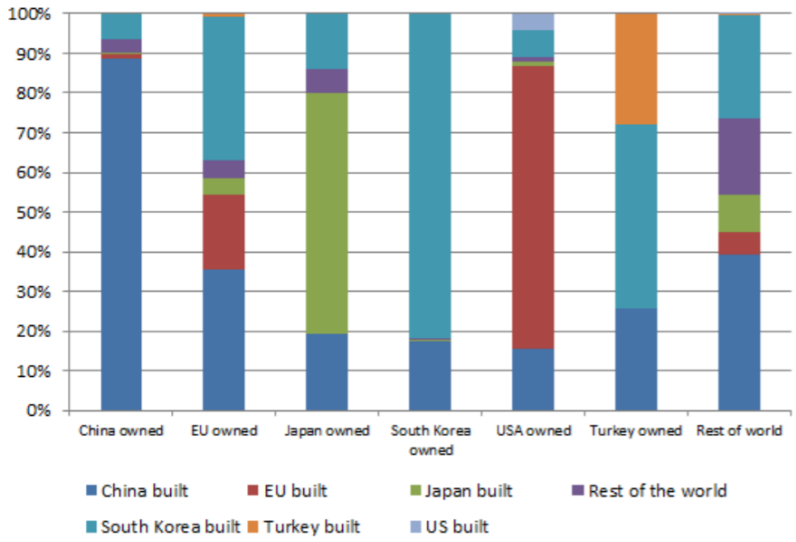
"The strategic merger was guided by the CPC Central Committee and State Council and is very meaningful to improving the competitiveness of our nation's marine and manufacturing sectors and fostering our science and technology."[379]

It is observed that a Korean newspaper already expressed its concern about the impact that the Chinese mergers may have on small and medium-sized Korean shipbuilders.[380]

3.2.5. Market access

The shipping and the shipbuilding sectors are intertwined. Certain subsidies aim to stimulate domestic ship-owners to replace their fleet at domestic shipyards. The scrapping subsidy (3.2.2.) is one example of such a policy. It is observed that almost 90% of Chinese ships were ordered at Chinese shipyards in 2018.[381] This leads to the following worldwide figure:

Figure 10. Orderbook by ownership and building areas, 2018



Source: Data provided by SEA Europe based on IHS Fairplay

Source: Figure taken from ITF, ''Maritime Subsidies. Do They Provide Value for Money?'', 2019, https://www.itf-oecd.org/sites/default/files/docs/maritime-subsidies-value-for-money.pdf, 44.

Domestic orders by ship-owners are not uncommon and Chinese ship-owners may prefer the local Chinese eco-system of shipbuilders and suppliers because of commercial reasons. Chinese shipyards have namely built a steady international reputation. Additionally, some Chinese financial and fiscal policies seem to have stimulated the commissioning of new vessels at local shipyards. The significant high percentage of domestic orders in China, however, may raise questions as to the market access of foreign companies to the Chinese domestic market, in addition to a more privileged treatment for Chinese companies (see previous sections 3.2.3. on finance and 3.2.4. on SOEs).

This subsection confines its research to identifying barriers or constraints for foreign entities to establish itself or to provide services in the Chinese market. To what extent the lifting of these barriers or constraints would result in a higher degree of orders by Chinese ship-owners with foreign shipbuilders or marine equipment suppliers is hard to gauge. Also, this subsection does not discuss any constraints that foreign entities may face once market access was granted. Finally, it will be important to draw connections between the issue of market access and other policy domains such as competition and trade, as a lack of reciprocal market access may facilitate the creation of behemoths that on their turn distort international competition and/or trade.

The degree of foreign market access to the Chinese market will depend on the products and services that the foreign entity provides as well as on the geographic region. In some cases China seems to monitor its market access according to the degree to which it has developed a domestic alternative.

The Medium and Long-Term Development Plan (2006-2015) states in paragraph 37 that Chinese companies shall hold at least 51% of the shares in companies that include foreign investors (i.e. foreign-invested joint ventures, domestic wholly-owned foreign companies and foreign enterprises) and that focus on low and medium speed diesel engines and crankshaft, i.e. the type of diesel engines in which China has built domestic expertise. For other types of marine equipment and cooperation on research and development, by contrast, the ownership restrictions did not apply. To implement these policies, China has drafted negative lists[382] to indicate the sectors that are prohibited or restricted to foreign entities. While in 2007, several shipbuilding activities were restricted, China has gradually opened its shipbuilding market for foreign entities[383], notably in Free Trade Zones[384]. At present, most of the historic restrictions

in the shipbuilding sector have been lifted. Some Free Trade Zones that are active in the shipbuilding and marine equipment sector are the Shandong Pilot Free Trading Zone, Shanghai Pilot Free Trade Zone, the Tianjin Pilot Free Zone and the Zhejian Pilot Free Trade Zone. By way of exception, an FTZ may allow foreign investors to establish foreign-owned companies. Companies that are established in an FTZ can also benefit from preferential tax and trade policies. A European marine equipment supplier has for instance set up a plant in the Shanghai Pilot Free Trade Zone and a European classification society has gained approval to conduct services in China's Free Trade Zones.[385] The 2019 version of the Negative List for a Pilot Foreign Trade Zone further opened market access for fishing and aquatic products.[386] Limited access for foreign investments in other marine sectors that persist at present are the prohibition to invest in marine mapping, restrictions for domestic water transport or restrictions to engage in fishing activities.[387]

While some shipbuilding activities were restricted or prohibited, others are particularly encouraged. The Catalogue of Encouraged Industries for Foreign Investment[388] includes a list per industry and type of activities in which partnerships with foreign entities are promoted. The activities mainly relate to high value-added or niche segments (e.g. exploration and development of seabed combustible ice (methane hydrates)[389]; ship communication and navigation equipment). The identification of these segments corresponds with China's desire to move up the value chain (cfr. section 3.1.). However, the exclusion of the production of marine equipment components from the list has raised concerns with foreign trading partners as this could be perceived as a way to only attract the foreign know-how while entirely leaving the production and selling of marine equipment components to Chinese firms.[390]

The Chinese laws on market access have been criticised by foreign companies and trading partners. They for instance contend that Chinese companies enjoy easier access to foreign markets than vice-versa.[391] Another point of criticism by foreign players is that – in certain cases – market access is made conditional upon the transfer of technology, which combined with a perceived lack of protection of intellectual property rights may cause concern.[392] In a paper about the involuntary transfer of technologies, the OECD Secretariat points out that there are various degrees of technology transfers, which depending on the different degrees of compulsion, different effects on the control of technologies, and the wider policy framework commensurately give raise to different degrees of apprehension. The paper also includes the results of interviews that were conducted with private companies, which tend to second some of the issues associated with involuntary transfers of technology through joint ventures, data localisation requirements and the sharing of sensitive business information in the course of certification and licensing procedures.[393]

To meet some of the concerns, Beijing adopted a new Foreign Investment Law in March 2019. The law took effect together with its Implementing Regulations on 1 January 2020.[394] The Foreign Investment Law serves as a basic law, prescribing the central principles of foreign investment in China, and replaces three previous laws governing foreign-invested enterprises. The law aims at promoting China's investment climate for foreign enterprises. In addition, it accommodates prior concerns by foreign investors on forced technology transfers, the protection of intellectual property rights, and the recalibration of a level-playing field between foreign and domestic firms.

More specifically, the 42-article Foreign Investment Law introduces a set of principles to promote foreign investment, including equal access to government funds, land supply, tax exemptions, and licensing; equal treatment in government procurement; as well as strengthened regulations to protect foreign investment, such as prohibiting forced technology transfers; guaranteed overseas remittances of profits; and more effective measures to protect the trade secrets of foreign investors. The Foreign Investment Law also introduces a foreign investment information reporting system, and a centralised complaint mechanism for foreign-invested enterprises. However, the new Foreign Investment Law remains rather vague on how many of these provisions will be implemented.

The recent laws seem to illustrate that China is willing to gradually open up its markets for foreign investors. While welcoming this process, additional steps will be needed for foreign investors to enjoy

the same level of treatment as their Chinese counterparts. One will for instance need to look at the entire Chinese regulatory system to assess if foreign investors are able to compete fairly with their Chinese counterparts. This includes a non-discriminatory treatment of businesses, transparency about licences and administrative documents, establishment requirements for foreign firms, local content requirements[395], subsidies, or access to government procurement contracts. The European Chamber of Commerce in China has listed some indirect forms of market protection in the Chinese shipbuilding sector. Examples refer to the lack of reciprocity regarding marine equipment certification procedures or the structural prioritisation of Chinese equipment manufacturers in Chinese shipbuilding projects, notably in the commissioning of new vessels by Chinese ship-owners.[396] In addition, some of China's trading partners have raised concerns about obstacles for foreign companies to provide certain maritime services (e.g. life-saving equipment, firefighting systems or navigation safety equipment) to China flagged vessels in the ports and waters of China such as high customs duties for imported foreign marine equipment or the prohibition of the establishment of foreign-owned subsidiaries or local offices in China.[397] Conversely, the restrictions do not seem to apply to foreign maritime service providers that only conduct services on foreign flagged vessels.[398]

Finally, one may raise the question what the impact of the corporate credit system will be on market access for foreign entities.[399] The Opinions of the State Council on Implementing the Negative List System for Market Access for instance already highlighted that ''Market players should be divided into groups and treated differently according to their credit records (…)'', and that ''Market players should be blacklisted if they seriously breach competition norms, disturb market order, or infringe upon the legitimate rights of consumers, workers and other business operators. If the case is extremely serious, the guilty market player should be prohibited from entering the market in accordance with the law.''[400]

3.2.6. Green technologies and smart shipbuilding

At the Marine Technology and Equipment Forum of 2018, several Chinese shipbuilding industry leaders expressed their strategies on how China can develop a ''new era'' in shipbuilding and marine engineering. In addition to the endorsement for the Belt and Road Initiative, the Forum highlighted the vital importance of further developing the Chinese marine engineering industry.[401] The tendencies discussed at this Forum serve as an illustration for the overall strategic goal of China to move up the value chain.

Driven by the Action Plan to Promote the Smart Transformation of Shipyards and Shipbuilding (2019-2020)[402] and the Intelligent Ship Development Action Plan for 2019-2021[403], Chinese shipbuilders have already announced to accelerate investments in smart shipbuilding.[404] According to these plans, China aims to integrate several technologies to become a global innovation centre for smart shipbuilding. In 2015, the Chinese Classification Society (CCS) issued the ''Smart Ship Specifications'', which were revised in 2020.[405] These specifications set out the various components and functions of smart ships. Three years later, the same institute released its ''Unmanned Surface Boat Inspection Guide'', which contains rules on the conception, construction, maintenance and use of unmanned surface boats' key components such as the communication system or navigation equipment.[406] Dalian Shipbuilding (part of CSIC) is focusing on high value- added ships and already manufactured the world's first intelligent VLCCs (i.e. the *New Journey* and the *New Vision*[407]).[408] Some of the vessels' features include smart liquid cargo management and integrated energy efficiency management. Due to their collection of navigation data, the vessels can enable future smart shipbuilding projects such as partially automated sailing. The smart vessels were designed under the aegis of a state-sponsored intelligent ship design programme.[409] Another example of a smart ship is the Great Smart, which was constructed by Huangpu Wenchong Shipbuilding (part of CSSC). These projects are often conducted in close collaboration with Chinese universities and research centres of Chinese SOEs (e.g. CSIC – 702 Research Institute and CSIC 707 – Research Institute, and CSSC - Shanghai Merchant Ship Design, CSSC – Guangzhou Marine Engineering Corporation).[410]

In addition, China has targeted autonomous shipping[411]. Some proclaim that the country might develop into a global leader in autonomous shipping by 2025, although competition from other maritime nations remains fierce.[412] A consultancy firm contends that 96% of the global 3 000 patents[413] relating to autonomous shipping, were registered in China. It is assumed that a large part of the R&D funding for these projects was assigned by the Chinese government.[414] In 2019, China's first autonomous commercial vessel successfully completed its voyage in Guangdong.[415] Next, The Dalian Maritime University is considering to set up a partnership with Dalian Shipbuilding (part of CSIC) to establish an expertise centre on autonomous ships.[416] Finally, ICBC Leasing already declared that it ''would be willing to provide extra incentives to autonomous shipping projects, such as higher loan ratios''.[417]

China is also promoting green policies in the shipbuilding sector. The Chinese Ministry of Transport for instance included a target of 15% for government newbuilds to be LNG powered by 2025. China already constructed an LNG fuelled passenger ship[418] and is building an LNG fuelled containership.[419] In addition, China is investing in LNG refuelling stations and LNG use in ports.[420] Consequently, it is expected that the Chinese demand for LNG will grow significantly[421]. In line with this objective, China is targeting the construction of LNG carriers. As articulated by the Chief Engineer of Jiangnan Shipbuilding, China's efforts to increase its share in LNG carriers will require intense cooperation between shipbuilders, ship owners and classification societies:

"(...) China also needs its own design for large LNG carriers. It is too expensive to obtain patent rights from Korea, and the verification process involves some risk for the shipyard." To achieve this, he concluded, the classification societies and the shipowners will need to work together to overcome technical barriers. "We all need to work together to reduce risk, improve the building process and lower costs."[422]

The importance of cooperation is also illustrated by the conclusion of several strategic cooperation agreements between China LNG and nine Chinese shipyards for the promotion and construction of LNG vessels and accommodating infrastructure. By the same token, CLNG Finance (part of China LNG) and Maifutong already concluded a sale and lease back agreement with LNG Power Shipping for 200 LNG fuelled vessels to be used in China's inland waterways. The vessels were mainly built by Hongua Offshore.[423]

To alleviate the transformation of China's shipbuilding industry to the manufacturing of more environmentally-friendly vessels, it will be pivotal to acknowledge the underlying prerequisites that are needed to make such transformation possible. To enable a shift to green shipping, shipbuilding prices need to be sustainable as well. The JECKU Chairman's note of 24 October 2019 for instance contained the following statement about the interaction between ship prices and investments in green shipping:

''Huge investments are needed to develop adequate technology and implement sustainable shipping.

To this end, profitability of all players involved has to improve significantly.'' [424]

Moreover, the shift to the production of more sustainable vessels will affect the entire shipping and shipbuilding eco-system including notably shipbuilders, marine equipment suppliers, shipowners and classification societies.

3.3. Transparency

China's shipbuilding industry has developed itself rapidly. It grew from a rather small-scale player in the early 2000s to a world leader in the 2010s. One may pose the question what main drivers have contributed to this expansion. Is it a matter of yard efficiency, easier access to capital, superior technology, cheaper labour, or other factors? The shipbuilding industry is labelled as a strategic sector in China and the numerous industrial policy documents on for instance merger consolidation, the Belt and Road Initiative, Made in China 2025 and supply-demand reforms seem to have been underscored by multiple shipbuilding

SOEs. The exact extent to which central SOEs and state-owned financial institutions substantiate China's industrial policies and the exact role of networks to channel knowledge-sharing, however, remains opaque. In similar vein, increased clarity about the different socio-economic purposes of shipbuilding SOEs may enable the understanding of their decision-making process (e.g. excessive employment may result in lower profitability rates but may equally meet a social security purpose).

Two of China's biggest SOEs, China State Shipbuilding Corporation (CSSC) and China Shipbuilding Industry Company (CSIC), have merged in 2019 to form the China State Shipbuilding Group Corporation (CSGC). This new company created the biggest shipbuilding company in the world. Therefore, the actions undertaken by the CSGC will have important consequences for other shipbuilding companies and nations. It does not seem unreasonable in these circumstances to call for enhanced transparency on for instance the corporate governance structure of CSGC, the total amount of subsidies that the company has received, and the extent to which CSGC may benefit from government-backed policies such as implicit guarantees or the commissioning of domestic orders.

Another example of opacity is the recent expansion of LNG carrier orders by Hudong-Zhonghua Shipbuilding (part of CSSC). This company declared in 2019 that it wanted to double its LNG carrier output by 2025 from 4-6 ships per year to 12 ships per year. In 2020, this shipyard already secured a deal for eight large LNG carriers (with an option for eight more) by Qatar, two mid-sized LNG carriers by Petronas, as well as a deal for three large LNG carriers by COSCO and PetroChina. These deals were concluded against the backdrop of falling LNG market prices as a result of the COVID-19 outbreak and low oil prices, which lowered the short-term demand for LNG.[425] As Korean LNG shipbuilders are still seen as more efficient in the construction of LNG carriers, questions have been raised about the competitive pricing set by Hudong-Zhonghua. A Korean newspaper reported that "This agreement was reportedly reached on the condition that China buys natural gas from Qatar. In other words, Hudong-Zhonghua did not beat the Korean companies in the actual tender (…)".[426] Whilst it is hard to verify this statement, one can only observe that Chinese shipbuilders dovetail the deal with Qatar as part of the Made in China 2025 strategy and the Belt and Road Initiative.[427] As stated above, projects falling under this strategy often receive government support. Another article in a Korean newspaper equally mentions that ''Chinese shipbuilders beat technologically superior Korean competitors with advanced technology on the back of the Chinese government's policy financing'' and that ''Hapag-Lloyd intends to place an order with a Chinese shipyard to receive shipping financing from the Chinese government''[428]. In similar vein, it has been observed that an earlier LNG fuelled containership received financial aid.[429] To ensure a level-playing field, more transparency is consequently needed on the role of the government and state-backed sector (including investment funds and trusts) in concluding these deals.

Enhanced transparency should reduce information asymmetries and should instigate an open debate on how the shipbuilding industry can ensure a level-playing field on government support. In addition, increased transparency on subsidies also informs the general public how public money is spent. Finally, more transparency about government support may help other countries to learn from each other's policies and to establish best practices.[430]

In that spirit, the COVID-19 outbreak may have increased the urge to learn from best practices and to provide clarity about government support. Provided that several national governments have introduced several forms of monetary, financial, fiscal, and budgetary support, one may like to ask the question which measure is deemed most effective in which context. This question concerns all nations, as they share a common purpose to tackle the COVID-19 crisis as fast as possible. Therefore, increased transparency about government support also contributes to an effective allocation of government resources and hence to the accountability of politicians to their citizens.

In total, section 3 shows a compelling interconnection between government support, state-owned enterprises and innovative forms of financing. These strong links have implications in terms of market access for private domestic or foreign enterprises.

4. Conclusion

Since 2010, China has become the world's largest shipbuilding economy. China's global market share calculated by CGT has accounted for more than 30% of new orders and ship deliveries. While China may be the largest shipbuilding nation, it still holds a relatively low global market share in high value-added ships. China's main products still consist of bulk and ore carriers, which are less technologically-advanced than VLCC, large container ships, LNG carriers and cruise ships. For the three years 2017-2019, bulk carriers accounted for 48% of new Chinese shipbuilding contracts, whereas gas carriers, which are classified as high value-added and technology-intensive vessels, only accounted for 5%. Nevertheless, China's yards gradually entered high tech/niche segments (e.g. ferries).

China's policies aim to increase China's global competitiveness by targeting higher value added industries. The blueprint of this ambition has been set out in the Five-Year Plans, the Belt and Road Initiative and the Made in China 2025 policy to be realised with a holistic and cross-sectoral strategy. In order to fully grasp the Chinese system, the report adopted a systemic approach, whereby the specific shipbuilding policies are interpreted against this broader background. Furthermore, the report attempted to interpret China's policies in line with China's specific political system, i.e. a "social market-led approach with Chinese Characteristics for a New Era".[431] While it seems that the scope of these "Chinese characteristics" is still debated and even subjected to consistent monitoring, the report aims to highlight some of its cardinal features. These features include the creation of an eco-system, whereby key state-enterprises are part of a network to implement industrial policies.

On the maritime front, China already expressed the ambition to become a "great maritime power". Correlated sectors of the maritime industry that induce spill-over effects may include shipping and container line transport, steel and aluminium, or other modes of integrative transport networks such as railways. To promote the development of these industries, China has a set of policy measures at its disposal. Previous research indicated that China's industrial policies to develop its maritime industry were effective for China, even if misallocation of capital was prevalent. The long-term and holistic approach of China's policies seem to have contributed to the rapid growth of its shipbuilding sector. Some of the instruments to achieve China's ambitions remain, however, more controversial.

First of all, there appears to be a preference to funnel government support to those key state-owned shipbuilding enterprises that act as vehicles to implement strategic industrial policies. Chinese monetary, financial and fiscal policies have created a system which enables state-owned enterprises to provide large sums to other key state-owned shipbuilding enterprises. These funds can be provided by state-owned leasing houses, export credit agencies, state-owned banks or state-owned investment vehicles, and are often backed-up by implicit guarantees by the Chinese government. It will be important to assess at which conditions and under which form (e.g. debt or equity) these funds were installed. While this question has to be ascertained on a case-by-case basis, the wider policy framework clearly suggests that funding to key state-owned shipbuilding enterprises is often provided at terms more favourable than market conditions. It is for instance observed that key state-owned shipbuilding enterprises were able to attract large amounts of funds and that they hold high market shares, despite the fact that they are highly leveraged and that they bear relatively low profitability rates. Other types of enterprises, by contrast, often have to seek financing through the shadow banking system. Favourable financial terms for newbuilds, notably in the form of financial leasing, in combination with other forms of government support may also have convinced foreign enterprises to order their vessels at Chinese yards.

Second, the key state-owned enterprises that provide and receive funding are part of a wider network of people and companies, which are under strategic oversight of the Chinese Communist Party (e.g. via Party Committees and SASAC). There seems to be a preference by partners of the network to conclude deals with other partners that belong to the network (cfr. strategic partnerships). One classic example refers to a Chinese financial lease company that provides cheap credit from Chinese state-owned banks in order

for Chinese shipping companies to place orders at Chinese shipyards.[432] Indeed, Chinese shipping companies, mostly SOEs, have expressed their support for Chinese shipbuilders through the commissioning of domestic shipbuilding orders. For the three years 2017-2019, about 90% of Chinese ship-owners' orders were assigned to Chinese shipbuilders. Amid depressed market conditions, Chinese ship-owners continued ordering vessels at Chinese yards. This is partly attributable to the Chinese government's policy direction to transport Chinese cargo on vessels made in China. At the same time, China has been successful in attracting a lot of orders from foreign shipowners through policy and financing tools, as illustrated in this report.

Third, these network effects of SOEs are intensified by policies on mergers and acquisitions. In 2019, the Chinese government for instance approved the re-merger of CSSC and the CSIC, two giant SOEs accounting for 36% of all CGT delivered in China. While large key state-owned shipbuilders may facilitate the sharing of know-how between the companies that are part of the network, their size poses questions as to the effect on market concentration, trade and competition.

Fourth, given that government support may be provided at the central and the local levels as well as at different segments of the value chain, and taken into account the network effects of key state-owned enterprises, the impact of the government support may be amplified. However, this report was unable to calculate the exact effect of this impact on the shipbuilding industry due to a lack of data. Therefore, more transparency is needed to promote a level playing field on government support.

Considering China's broader regulatory framework and the economic data set out in section 2 of this report, it can be assumed that China's industrial policies have contributed to global overcapacity in the shipbuilding sector. This is related to the competition between different governments and state-owned enterprises to meet China's soft targets of industrial development, the large amount of funding directed to the shipbuilding sector, the fact that overcapacity is more apparent in the segments of the shipbuilding market where China holds a strong position, and illustrations of countercyclical investments by state-owned companies at domestic shipyards. To tackle the issue of overcapacity, it is – amongst other reasons - recommended to structurally diminish capacity levels and to phase-out corresponding policies (e.g. tax incentives) in the shipbuilding sector in order to accrue firms' production levels, let inefficient zombie firms exit the market and to root ship prices on features of quality and supply-demand interactions.

Given the complexity of measuring overcapacity and the interaction of various causes of overcapacity, the exact degree to which China contributed to overcapacity in the shipbuilding sector, however, remains hard to measure. The global situation of overcapacity has forced China to respond. By way of reaction, China redirected part of its funding to other industries, consolidated state-owned shipyards, exported part of its excess capacity and targeted higher value-added segments of the shipbuilding sector.

Indeed, the weak demand in the global shipbuilding market after the global financial crisis, in connection with the excess capacity that characterises the shipbuilding market, which was partially driven by the expansion of the Chinese shipbuilding industry, triggered a restructuring of the Chinese shipbuilding industry. The number of active shipyards in China sharply declined from 379 in 2010 to 117 at the end of 2019. This can be explained by market consolidation and a large number of small private shipyards exiting the market. Approximately 200 of the yards that were closed were in fact opened only 10 to 15 years before, raising the question why these shipyards were opened in the first place and suggesting the corresponding capacity expansion was not required by the market.

Exporting part of the domestic overcapacity, notably where supported by export credit and favourable financing by Chinese leasing houses, enabled China to interact with global players and taps into the broader Chinese policy of 'going out'. This international experience and exchange of know-how also makes Chinese shipbuilders more internationally competitive and offers China a platform to export its norms abroad.

The targeting of the high-tech shipbuilding and marine equipment industry by virtue of intelligent manufacturing is not only a way to deal with overcapacity but should also contribute to the Chinese objective to move up the value chain and to become less dependent on foreign technology (i.e. moving from a 'large to a strong shipbuilding industry'). This couples with the Made in China 2025 strategy and is needed due to higher labour costs combined with the low ship prices in the segments of the shipbuilding market wherein China operates. A strong shipbuilding industry also acts as one of the pillars to develop China's maritime and ocean economy.

To assess the impact of China's policies on the shipbuilding market and to evaluate their potential distortive effect, one needs to analyse their practical impact. It is for instance observed that some of China's strategic industrial policies face implementation difficulties and have not necessarily resulted in higher profitability rates of key state-owned enterprises. Some examples relate to the misallocation of funds, the consolidation of less efficient firms, limited spill-over effects from the shipbuilding sector to other maritime sectors, and the different policy priorities by the central and local governments. In addition, China has promulgated a variety of strategic policies about shipbuilding at different levels and by different departments, supplemented by secondary policy documents to implement or to articulate the main principles in more detail. It is not always clear how these different policies, and their underlying objectives, interact. Admittedly, different and sometimes even conflicting objectives pursued by different governmental departments are not unique to China and should not pose a problem per se. The large amount of policies that are enacted in China and their detailed implementation policies, however, requires more extensive control mechanisms to ensure their effectiveness.

China is of course not the only country to set-up industrial policies and some of the individual policy measures are also included in other countries' industrial policies. In fact, one could even argue that foreign companies, notably while operating from Free Trade Zones, as well as consumers benefited from low-cost ships or the cheap transport of goods. The difference is that China's policies seem to take place in a different political eco-system and that these policies are supported with large funds, so all of the individual measures combined may inflict significant harm upon other countries' shipbuilding (and related) industry(ies) as well as upon some of the (mostly smaller and/or private) shipyards in China. This impact may be exacerbated by the network effects of certain policies such as the combined impact of policies on upstream, downstream and cross-sectoral SOEs, state-owned banks, government support and the 'going out' policies. Therefore, there appears to be a tension between China's objective of economic development to create welfare for its citizens and the (potential) detrimental impact of some of its policies and practices on third countries.

While there seems to have been more leniency at a time when China was still developing its shipbuilding industry as an infant industry, the nature and scale of its government support appears harder to defend the moment China's shipbuilding industry gradually started to mature. Admittedly, China has not yet achieved the same level of technological innovation of its competitors in the high value-added shipbuilding and marine engineering industry. However, one cannot deny that China holds a strong position in the shipbuilding industry. Therefore, there is a growing pressure to reconsider the delicate equilibrium between China's own economic development and the impact of its policies and practices on third countries. This question seems even more urgent in a global context where the economic impact of the COVID-19 pandemic on the shipbuilding sector will require governments to respond rapidly and effectively. In order to foster this debate, increased transparency about some of China's policies such as subsidies, consolidation policies, or investment decisions of SOEs would be highly commended.

The Secretariat has invited the Chinese authorities to cooperate on this peer review of the Chinese shipbuilding industry and to provide comments on the current report in order to offer the Chinese authorities the opportunity to clarify some of the current uncertainties and to fill some of the current data gaps. Until now, the Secretariat has not received a response from China. The standing invitation to join

future WP6 meetings however remains for China to participate in the debate on shaping global policies that improve the level-playing field in the shipbuilding sector.

Existing data gaps and the lack of transparency on some Chinese government policies may compel the WP6 to study alternative ways for assessing the impact of China's shipbuilding policies on third nations. In that regard, the Secretariat refers to other OECD work that estimates the impact of below-market debt and below-market equity on specific industries.[433] A similar methodology could be applied to estimate the size and impact of some of China's industrial policies on the shipbuilding sector. In addition, more research is recommended about the role of state-owned investment funds and cross-equity participations by different SOEs.

ANNEX I: The Maritime Silk Road and the Belt and Road Initiative

The Maritime Silk Road constitutes a network of maritime trade routes connecting Asia and Europe through trade, investment, finance, the exchange of technology[434] and expertise in port development.[435] It is part of China's One Belt, One Road Strategy (2013), rebranded in 2016 to the Belt and Road Initiative[436], and Beijing's blueprint to increase its global outreach. The 13th Five-Year Plan also explicitly mentions an amplified effort to promote the Belt and Road Initiative.[437] It is observed that in ten years' time, China already invested around USD 11 billion into overseas ports.[438] Another example of a project falling under the Belt and Road Initiative is the development of the Special Chinese Economic Zone in southern Bangladesh. This zone will focus on a range of industries, including shipbuilding.[439]

Opinions differ on the actual purpose of the Belt and Road Initiative and whether it solely aims to foster China's economic development[440] or if it must be approached from a more geopolitical angle.[441] Perhaps the answer to this question will depend on the particularities of each individual project. To assess the actual purpose of individual projects under the Belt and Road Initiative, the Center for Strategic and International Studies came up with three distinguishing features: (1) proximity to major shipping lanes; (2) proximity to existing ports; and (3) hinterland connectivity. On the basis of these three criteria, one can endeavour to ascertain the economic viability of a project. The less economically viable a project appears, the more likely it becomes that different interests are at stake.[442] In addition, one needs to evaluate the theoretical framework of the Belt and Road Initiative against its practical implementation. On that front, scholars have for instance emphasised the fragmented implementation and interpretation of the Initiative and the trade-off at the local policy level between economic viability and political desirability of projects to nuance the narrative of the Belt and Road Initiative as a coherent and centralised foreign strategy.[443]

While the financial viability of Belt and Road projects is often criticised (cfr. ''debt trap''), research by the Rhodium Group in 2019 points out that most of the loan renegotiations (USD 50 bn. between 2007-2019[444]) do not result in asset seizures but in write-offs of relatively small amounts, followed by deferments and refinancing, term renegotiations and denials of additional financing.[445] This equally nuances the perception that all Belt and Road projects are part of a clearly defined geopolitical strategy to exert China's power internationally.

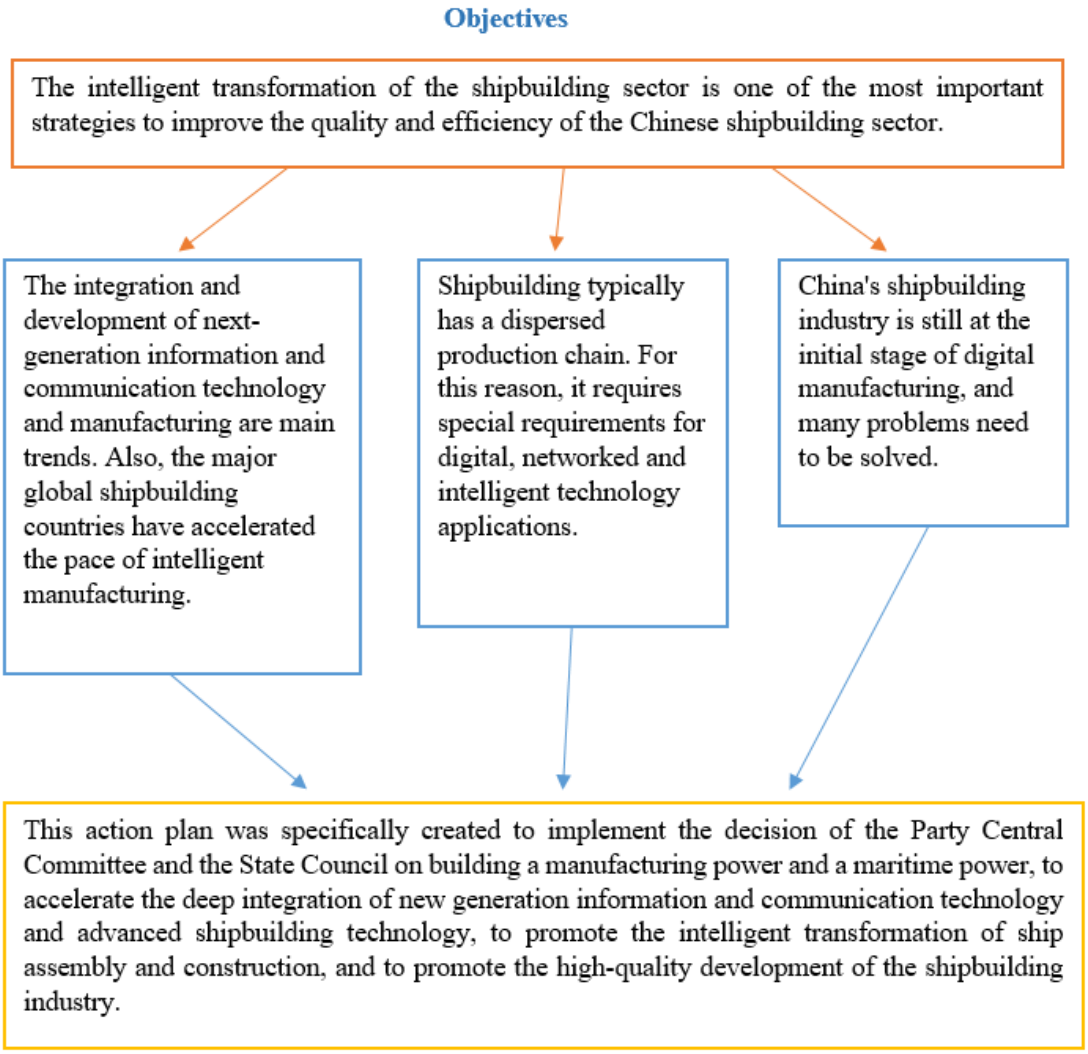
The Belt and Road Initiative indeed accounts for a significant part of China's outbound investments (between 8.5 and 13.6% for the period 2016-2019)[446], notably by SOEs. Given the haziness about its scope and lack of coordination by one specific government agency, it remains opaque how much money is earmarked to the Belt and Road Initiative exactly. According to estimations by Chinese Investment Research, President Xi Jinping would already have pledged to attribute USD 127 bn. to roll out the Belt and Road Initiative. Most of the loans are provided through Chinese policy banks (the China Development Bank and the China EXIM Bank)[447] and state-owned banks (the Bank of China, the China Construction Bank, the Industrial and Commercial Bank of China[448] and the Agricultural Bank of China). To a lesser extent, other international banks such as the Asian Infrastructure Investment Bank and the New Development Bank are involved as well. In addition, the Silk Road Fund[449] was established in 2014 to specifically venture investments in the Belt and Road Initiative.[450] China Investment Research noted that from 2018 a shifting trend could be observed from financing through bilateral loans to public market funding.[451]

In 2017, the Maritime Silk Road was complemented by the establishment of three "blue passages" (China to Africa and the Mediterranean; China to Oceania and the South Pacific and China to Europe). These

blue passages aim to increase international cooperation in the ocean economy (cfr. 2015 Vision and Actions on Jointly Building Silk Road Economic Belt and 21st Century Maritime Silk Road[452] and 2017 Vision for Maritime Cooperation[453]).[454] The China to Europe Blue Passage or Northern Sea Route[455] entangles with the Polar Silk Road initiative[456] and is meant to become the "third arch of the Belt and Road Initiative".[457] Indeed, China seems to slowly but gradually increase its presence in the Arctic. This is illustrated by the construction of China's first domestically built icebreaker (R/V Xuelong 2[458]) in 2018 and the new icebreaker model revealed at the Marintec fair in 2019[459], the construction of the world's first polar condensate oil tanker (*Boris Sokolov*)[460], China's augmented efforts in Arctic scientific research (e.g. China-Nordic Arctic Research Center[461], the Polar Research Institute of China[462] and the joint China-Russian Federation (Russia) joint polar laboratory[463]), China's port and mining investments in the Arctic region (e.g. the Kirkenes port in Norway, the Arkhangelsk port in Russia, the Yamal LNG plant in Russia and the Nunavik Nickel Mine in Canada), and the establishment of a polar satellite programme.[464]

In parallel to expanding its international outreach and in pursuit of China's plans to ensure the intra-connectivity of its provinces, China continues to develop its internal waterways.[465] The Yangtze River Economic Belt (2016)[466] serves as an illustration of this objective. It unites nine provinces and two municipalities between the west and east of China and couples the Yangtze River with international ocean flows. The area covers about 40% of China's population and GDP. Some scholars have proclaimed that "the Yangtze River Economic Belt'' plays a crucial role to drive the global cooperation on the Belt and Road Initiative".[467]

ANNEX II: The Intelligent Ship Development Action Plan for 2019 - 2020



Guiding ideology

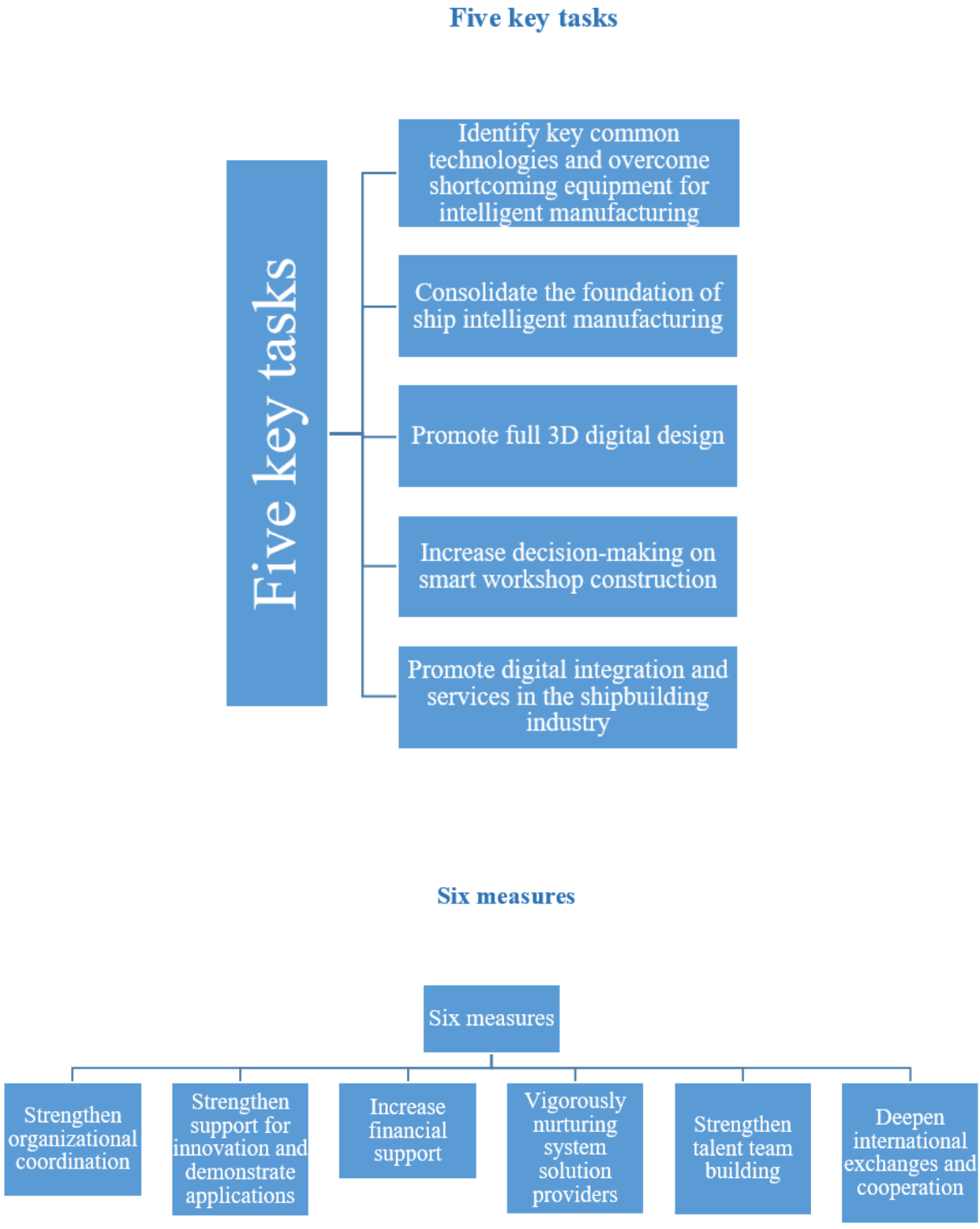
Guided by Xi Jinping's thoughts on ''socialism with Chinese characteristics in the new era'', fully implement the spirit of the 19th National Congress of the Communist Party of China and the 2nd and 3rd Plenary Sessions of the 19th CPC Central Committee, adhere to the new development concept, and closely focus on the strategic goals of building a strong country and a marine power to improve the quality of shipbuilding, efficiency and effectiveness are at the core, focusing on comprehensively advancing digital shipbuilding, and taking the intelligent transformation of key links as the starting point to promote innovation, make up for shortcomings, strengthen the foundation, and promote demonstration to promote the digital network of ship design, construction, management, and services integrated, accelerate the upgrading of shipbuilding technology, increase international competitiveness, and support the transformation of China's shipbuilding industry from large to strong.

The basic principles

- Consolidate the foundation and make up for the shortcomings
- Key breakthroughs and promotion of good work in all areas
- Collaborative innovation, openness and cooperation
- Far and near integration and implementation of different strategies

Development goals

- Preliminary establishment of a ship intelligent manufacturing technology innovation system
- The labour intensity of cutting, forming, welding and painting is heavily reduced, and the number of operators is significantly reduced.
- The refinement of shipbuilding enterprise management and sales have significantly improved
- 2-3 benchmarking companies are the first to build a number of internationally advanced intelligence units, an intelligent production line and intelligent workshops
- Backbone enterprises have realized digital shipbuilding and achieved a reduction in total man-hour consumption of more than 20%, and a reduction in comprehensive energy consumption per unit of gross tonnage by 10%.



Source: *figures based on* http://www.miit.gov.cn/n1146295/n1652858/n1653018/c6566921/content.html

ANNEX III: Overview of research, development and innovation projects impacting the Chinese shipbuilding industry

R&D support measures	Department in charge	Short description of the project	Amount of money	Time period
State High-Tech R&D Program (the ''863 Plan'')	The Ministry of Science and Technology (MOST)	Key technologies and equipment for deep-water oil and gas exploration and development in South China Sea[468]	• CNY 243 million (2006-2012) • CNY 450 million (2012-2015)	2006-2015
		High frequency ground wave radar[469]	• CNY 1 million between 2007-2010 • In 2012, the "863 Plan" mentions to provide additional resources.	• 2007-2010 • 2012 – not specified [Remark: MOST announced that it acquired the high-frequency ground wave radar by 2017]

			Yet, the exact amount of government support could not be verified.	
		Deep-water terminal[470]	CNY 3 million	2007-2010
		Underwater self-reconfigurable robot[471]	CNY 3 million	2007-2010
		Integrated monitoring and control system on ships[472]	CNY 60 million	January 2011 – December 2013
		Over-300-foot jack-up drilling rig[473]	CNY 30 million	March 2011 – December 2013
		Universal connector for deep water production system	CNY 20 million	2013-2016
		Autonomous wave glider observation system[474]	CNY 12 million	2014-2017
		Monitoring system for a hybrid fast unmanned boat[475]	CNY 10 million	2014-2017
		Ocean monitoring and detecting sensor[476]	CNY 1.5 million	2014-2017
		Dynamic positioning of ships (DP3 technology), notably important in the context of specialized ships and offshore platforms [477]	Not specified	The DP3 project was launched in November 2011. The DP3 technology was eventually acquired, tested and used for the first time in 2018
Guidelines for marine engineering scientific research	Ministry of Industry and Information Technology (MIIT)	Drilling ship for oil and gas exploration(> 3000 m depth)[478]	Not specified	2009 - not specified
		Pipe-laying crane ship (> 3000 m)[479]	Not specified	2009 – not specified
		Key components for deep-water pipe systems of offshore drilling platforms[480]	Not specified	2012 – not specified
		Technology for a deep-water winch system of a large pipe-laying vessel[481]	Not specified	2013 – not specified
		Deep-water drilling compensation system[482]	Not specified	2014 – not specified
High-tech shipbuilding R&D plan	Ministry of Industry and Information Technology (MIIT)	Design technology for small C-type LNG carrier[483]	Not specified	2012 – not specified
		Research on applicable technology of marine corrosion-resistant steel, based on the IMO standard[484]	Not specified	2012 – not specified

		Key technologies of emission control for premixed combustion high-speed diesel engine for ships[485]	Not specified	2012 – not specified
		Double-fuel engines[486]	Not specified	2012 – not specified
		Green and safe design technology for a 80 000 DWT Chemical tanker[487]	Not specified	2012 – not specified
		Energy-saving bow and hull design[488]	Not specified	2013 – not specified
		Large (+ 1000) vehicle-carrier[489]	Not specified	2013 – not specified
		Environmental river-sea container ship[490]	Not specified	2014 – not specified
		Sail-propulsion[491]	Not specified	2014 – not specified
		Key technology for a large multi-functional hospital ship[492]	Not specified	2014 – not specified
		Development of high-efficiency hybrid counter rotating propulsion system and energy-saving equipment[493]	Not specified	2014 – not specified
Exemption from import custom taxes and import VAT taxes on a list of foreign high-tech key equipment and technologies.[494]	Ministry of Finance, in collaboration with the NDRC, MIIT, General Administration of Customs, State Administration of Taxation, and the National Energy Administration	Jack-up drilling rig (> 300 foot)[495]	Not Specified	2012-2014
		Scientific research ship[496]	Not specified	2012-2014
		Train ferry[497]	Not specified	2012-2014
		Floating crane vessel (loading capacity > 1200 tons; elevation height above deck > 85 m; installing power > 3500 Kw)[498]	Not specified	2012-2014
		Marine and intertidal wind turbine installation vessel (lifting capacity > 500 tons; offshore wind turbine capacity > 5 Mw)[499]	Not specified	2012-2014
		Floating production storage and offloading unit (FPSO) (> 1 million barrels storage capacity)[500]	Not Specified	2012-2014
		Multi-cable high-performance deep-water geophysical exploration ship[501]	Not specified	2014-2015
		Deep-water pipe laying vessel (water depth > 200m; tensioner capacity > 75 tons; hose-reeling unity capacity > 75 tons)[502]	Not specified	2012-2016

		Large drag suction dredger (mud hopper capacity > 10 000 m^3)[503]	Not specified	2012-2019
		Large cutter suction dredger (production rate > 3500 m^3)[504]	Not specified	2012-2020
		Large vehicle carrier (> 5000 cars)[505]	Not specified	2013-2014
		Semi-submersible drilling rig (> 500 m sea depth)[506]	Not Specified	2014-2020
		C-type LNG carrier (storage capacity > 1000 m^3 for projects between 2014-2017 and > 20 000 m^3 for projects between 2017-2020)[507]	Not specified	2014-2020
		Natural gas and double-fuel engine[508]	Not specified	2017-2020
		Deep-water sea integrated research ship[509]	Not specified	2017-2020
		Arctic research icebreaker[510]	Not specified	2017-2020
		Natural gas and double engine (> 1000 kW; bore size > 200 mm)[511]	Not specified	2017-2022

Endnotes

[1] For the 2008 report, see https://www.oecd.org/china/42033311.pdf; for the 2011 report, see https://www.oecd-ilibrary.org/economics/the-shipbuilding-industry-in-china_gen_papers-2010-5kg6z7tg5w5l

[2] ''*Basic principles: (...) Insist on deepening integration: vigorously develop dual-use technology; promote the two-way transfer and transformation of military and civilian technology; strengthen the sharing of military and civilian resources; comprehensively promote the integration of the military and civilian in ship research and development, ship design and manufacturing and services; in line with the direction of digital networked intelligence manufacturing, vigorously promote the intelligent manufacturing of intermediate products of ships and accelerate the deep integration of ship and offshore engineering equipment, manufacturing technology and information technology'',* MIIT, NDRC, Ministry of Finance, People's Bank, China Banking Regulatory Commission, National Defence Science, and Industry Council, ''The Action Plan for Deepening the Structural Adjustment and Accelerating the Transformation and Upgrading of the Shipbuilding Industry (2016-2020)'', 2017, http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c5459940/content.html and https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzxgh/201707/t20170707_1196828.html;

''(5) Promote the development of in-depth civil-military integration: 13. Promote collaborative innovation between the military and civilian sector. Promote the construction and science and technology collaborative innovation platforms for the integration of the military and the civil. Further strengthen the military-to-civilian and dual-use technology scientific research of ships, and support the two-way transfer and transformation of military and civilian technologies.'', MIIT and National Defence Science and Industry Bureau, ''Notice on Action Plan for Promoting the Intelligent Transformation of Ship Assembly and Construction (2019-2021), 2018, no. 287, https://www.miit.gov.cn/zwgk/zcwj/wjfb/zbgy/art/2020/art_defb12f96bad4b6c8220d49e8c516a08.html and https://www.miit.gov.cn/cms_files/filemanager/oldfile/miit/n1146295/n1652858/n1652930/n3757018/c6567267/part/6567282.pdf

[3] See T. R. Heath (RAND), ''China's Pursuit of Overseas Security'', 2018, https://www.rand.org/content/dam/rand/pubs/research_reports/RR2200/RR2271/RAND_RR2271.pdf, 30; N. Tian and F. Su, ''Estimating the Arms Sales of Chinese Companies'', Stockholm International Peace Research Institute, 2020, https://www.sipri.org/sites/default/files/2020-01/sipriinsight2002_0_0.pdf.

CSSC is an example of a company with a dual-use strategy, see http://www.cssc.net.cn/n5/n18/c17354/content.html

[4] H. Legarda and M. Nouwens, ''China's Pursuit of Advanced Dual-Use Technologies'', IISS Research Paper 2018, https://www.iiss.org/blogs/research-paper/2018/12/emerging-technology-dominance

[5] OECD calculation based on *the world development indicators* of the World Bank Open Data.

[6] http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=12707

[7] For more information on the global value chain of shipbuilding, see OECD, ''Global Value Chains and the Shipbuilding Industry'', 2019, https://www.oecd-ilibrary.org/docserver/7e94709a-en.pdf?expires=1594202346&id=id&accname=guest&checksum=C3DEDEBF785B41525B8124BFABF449B1

[8] Ludwig, T. and Tholen J. (2006), "Shipbuilding in China and its impacts on European shipbuilding industry", University of Bremen. http://www.iaw.uni-bremen.de/downloads/ShipbuildingChina2006.pdf

[9] P.J. Barwick, M. Kalouptsidi and N.B. Zahur, ''China's Industrial Policy: An Empirical Evaluation'', NBER Working Paper, 2019, 29.

[10] https://www.rivieramm.com/news-content-hub/exclusive-new-business-model-boosts-chinese-yards-cruise-and-ferry-construction-27596; https://www.rivieramm.com/news-content-hub/news-content-hub/chinese-yards-boost-ferry-and-cruise-business-56489

[11] The objective of the White List was to differentiate high- and low-efficiency firms so as to send a positive signal to the market for efficient shipbuilding firms and negative signal for inefficient ones. Also see OECD, ''Imbalances in the Shipbuilding Industry and Assessment of Policy Responses'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, 43.

[12] https://www.caixinglobal.com/2019-10-29/cx-daily-what-to-know-about-the-rise-of-chinas-joint-lending-market-101476277.html; https://www.chinadailyhk.com/articles/139/67/176/1574827563456.html?newsId=113898

[13] See Notice of the Ministry of Transport on Printing and Distributing the Outline for the Development of Inland Waterway Navigation, 2020, no. 54, http://www.gov.cn/zhengce/zhengceku/2020-06/04/content_5517185.htm

[14] https://markets.businessinsider.com/news/stocks/global-marine-diesel-engine-industry-report-2018-with-focus-on-china-with-profiles-of-7-global-and-17-chinese-marine-diesel-engine-companies-1027480781/

[15] https://www.marketresearch.com/China-Research-and-Intelligence-Co-Ltd-v3627/Research-China-Ship-Accessory-Equipment-12933729/

[16] E.g. FPSO, http://stcsm.sh.gov.cn/xwzx/kjzl/20200310/0016-163576.html

[17] See also the joint venture between Guangdong Province Navigation Group (GNG) and Brodnene AA for the construction of high-speed passenger ships, http://subsites.chinadaily.com.cn/guangzhou/2017-09/25/c_105558.htm

For another example, see the passenger ships developed by COSCO, http://chi.coscoshipping.com/art/2020/3/24/art_7982_152750.html

[18] For an example, see http://stcsm.sh.gov.cn/xwzx/kjzl/20180409/0016-24181.html

[19] For examples, see https://www.marinelink.com/news/dualfuel-ropax-ferry-mv-visborg-delivered-460850; https://www.worldmaritimeaffairs.com/worlds-fastest-eco-friendly-ro-ro-passenger-ship-named-visborg/; http://www.eguangzhou.gov.cn/2018-01/29/c_132097.htm;

http://subsites.chinadaily.com.cn/guangzhou/2018-09/28/c_276829.htm; http://www.cmindustry.com.hk/?lang=zh-cn&tn=content&id=583.

[20] https://lloydslist.maritimeintelligence.informa.com/LL1132020/Yard-Talk--Ship-repairers-in-virus-gloom

[21] MIIT, ''Interpretation of Made in China 2025: Promoting the Development of Marine Engineering Equipment and High-tech Ships'', 2016, http://www.gov.cn/zhuanti/2016-05/12/content_5072766.htm; https://www.chinadaily.com.cn/a/201911/14/WS5dccaebca310cf3e35577468.html; CSOC (part of CSIC), '' Analysis of the Economic Situation of the Shipbuilding Industry in the First Half of 2019'', http://www.csoc.cn/show/news/795.html .

[22] http://www.csic.com.cn/n5/n26/c16677/content.html; https://www.rivieramm.com/opinion/opinion/chinese-shipyard-secures-more-lng-carrier-orders-36645; http://en.people.cn/n3/2019/0403/c90000-9563232.html

[23] http://global.chinadaily.com.cn/a/202008/20/WS5f3dc8b9a310834817261792.html

[24] https://www.tradewindsnews.com/insight/hudong-zhonghua-to-double-its-output-of-lng-carriers/2-1-705226

[25] https://lloydslist.maritimeintelligence.informa.com/LL1132045/Chinese-yard-lands-$3bn-shipbuilding-deal-from-Qatar; https://www.tradewindsnews.com/gas/qatar-turns-to-china-for-first-of-120-lng-newbuilding-slots/2-1-795486; https://www.chinadaily.com.cn/a/202004/23/WS5ea0df50a3105d50a3d18273.html

[26] http://stcsm.sh.gov.cn/xwzx/kjzl/20190403/0016-153746.html

[27] http://www.dsic.cn/home/xwzxen/jtxwen/347613.htmhttps://lloydslist.maritimeintelligence.informa.com/LL1132095/Coscos-LNG-tanker-investment-linked-to-US-export-projects; https://www.tradewindsnews.com/gas/coscos-tanker-arm-confirms-lng-carrier-trio-at-hudong-zhonghua/2-1-835205

[28] https://www.hellenicshippingnews.com/worlds-first-23000-tank-lng-powered-container-ship-starts-trial-voyage/

[29] https://www.chinadaily.com.cn/a/201909/05/WS5d7077caa310cf3e35569e0c.html; https://www.chinadailyhk.com/articles/148/151/59/1567667169953.html?newsId=94276

[30] https://www.tradewindsnews.com/gas/chinese-yard-finally-delivers-mini-lng-carrier-ordered-in-2013/2-1-795204

[31] http://chi.coscoshipping.com/art/2020/5/19/art_7982_159181.html; http://chi.coscoshipping.com/art/2020/5/14/art_7982_159193.html

[32] https://lloydslist.maritimeintelligence.informa.com/LL1130605/Chinese-leasing-majors-fund-Pacific-Gass-VLEC-orders

[33] https://www.seatrade-maritime.com/shipbuilding/yangzijiang-wins-new-orders-lng-tank-carriers-and-bulkers

[34] E.g. Wison Offshore and Marine, see http://www.wison.com/en/read_page/1026 and http://www.wison.com/en/read_page/1020

[35] China Merchants Heavy Industry (Jiangsu) built the cruise ship with 8 035 GT in 2019 according to Clarksons Research Services Limited (2020), *World Fleet Register.*

[36] Hong Wang, "Report on the Development of Cruise industry in China", 2018, 89; https://www.maritime-executive.com/article/fincantieri-establishes-chinese-cruise-hub; https://www.chinadailyhk.com/articles/8/13/42/1573714564345.html?newsId=112579

[37] https://www.fincantieri.com/en/media/press-releases/2018/fincantieri-extends-the-cooperation-with-china/; http://www.shipol.com.cn/cbjz/348891.htm

[38] http://www.cmindustry.com.hk/?lang=en-us&tn=page&id=1327; http://www.cmindustry.com.hk/?lang=zh-cn&tn=content&id=451; https://www.seatrade-cruise.com/news-headlines/china-merchants-heavy-industry-wins-four-ship-cruise-order

[39] CCCC Annual Report 2019, http://chinaeast.cdn.euroland.com/arinhtml/CN-CYY/2019/AR_ENG_2019/index.htm, 16: *''As the largest dredging enterprise in China and even in the world, the Group enjoys absolute influence in China's coastal dredging market. (...) In 2019, according to the vessel purchase plan, two large vessels were newly constructed with special purpose to serve in the Group's dredger fleets. As at 31 December 2019, the Group's dredging capacity amounted to approximately 788 million cubic meters under standard operating conditions.''*

[40] http://www.qzwealth.com/company.html; http://www.hiddredger.com/about1.asp?/50.html; http://en.ccccltd.cn/business/dredging/

[41] http://en.people.cn/n3/2017/0731/c90000-9249126.html

[42] https://www.tradewindsnews.com/shipyards/chinese-shipyards-slash-prices-in-post-lockdown-bid-to-woo-buyers/2-1-788853 and https://www.tradewindsnews.com/shipyards/three-shipyards-score-880m-in-vlec-orders-from-zhejiang-satellite/2-1-863314

[43] https://www.reuters.com/article/china-shipbuilding/china-shipyards-slash-prices-to-survive-industry-idUSL4E8GV0LE20120531

[44] Yin-Chung Tsai (2011), "The shipbuilding industry in China", OECD publishing, Paris. https://www.oecd-ilibrary.org/economics/the-shipbuilding-industry-in-china_gen_papers-2010-5kg6z7tg5w5l

[45] See Table 2.6. Ownership of world fleet ranked by dead-weight tonnage, 2019, UNCTAD, Review of Maritime Transport 2019.

[46] Lloyd's List for instance reports that from the 99 Chinese vessels ordered in the first four months of 2020, 62 were ordered by domestic owners, https://lloydslist.maritimeintelligence.informa.com/LL1132428/Yard-Talk--A-bet-on-a-nations-fortune

[47] For more information on the rise of Chinese industrial policies, see S. Heilmann and L. Shih, ''the Rise of Industrial Policy in China, 1978-2012'', Harvard-Yenching Institute Working Paper Series 2013, https://www.harvard-yenching.org/sites/harvard-yenching.org/files/featurefiles/Sebastian%20Heilmann%20and%20Lea%20Shih_The%20Rise%20of%20Industrial%20Policy%20in%20China%201978-2012.pdf

[48] E.g. Several Opinions of the State Council on Promoting the Healthy Development of Maritime Industry, Guo Fa [32], 15 August 2014, http://www.gov.cn/zhengce/content/2014-09/03/content_9062.htm

[49] OECD, "Measuring distortions in international markets: the semiconductor value chain", OECD Trade Policy Papers, 2019, No. 234, OECD Publishing, Paris, https://doi.org/10.1787/8fe4491d-en.

OECD, "Measuring distortions in international markets: the aluminium value chain", OECD Trade Policy Papers, 2019, No. 218, OECD Publishing, Paris, https://doi.org/10.1787/c82911ab-en.

[50] Y. Wu and X. Zhu, "Why Geographic Dispersion Before its Time: Industrial Policy and Economic Geography in the People's Republic in China", Asian Development Bank Institute

Working Paper Series 2017, No. 633, https://www.adb.org/sites/default/files/publication/222041/adbi-wp633.pdf, 1-2 and 19-20.

[51] Center for Strategic and International Studies, ''China's Industrial Policymaking Process'', 2013, https://www.csis.org/files/publication/130124_Ahrens_ChinaPolicymaking_Web.pdf

[52] For a more extensive overview of the different categories of Chinese legislation, see Center for Strategic and International Studies, ''China's Industrial Policymaking Process'', 2013, https://www.csis.org/files/publication/130124_Ahrens_ChinaPolicymaking_Web.pdf, Appendix III.

[53] Y. Zhang, ''Theory of Policy Learning'', in A. Farazmand (ed.), *Global Encyclopedia of Public Administration*, Springer, 2017, 9.

[54] K. A. Jaros and Y. Tan, ''Provincial Power in a Centralising China: The Politics of Domestic and International ''Development Space'', The China Journal 2020, 79-104.

[55] M. Rithmire, ''Varieties of Outward Chinese Capital: Domestic Politics Status and Globalization of Chinese Firms'', Harvard Business School, Working Paper 20-009, 2019, 21-22.

[56] Notice of the State Council on the Establishment of a Leading Group for Building a National Manufacturing Power, Guobanfa [2015], no. 48, http://www.gov.cn/zhengce/content/2015-06/24/content_9972.htm

[57] For the Chinese version see http://www.gov.cn/xinwen/2016-03/17/content_5054992.htm. For an official English translation, see https://en.ndrc.gov.cn/newsrelease_8232/201612/P020191101481868235378.pdf
Note that the 14th Five-Year Plan for the period 2021-2025 is in the final drafting stage.

[58] There are many innovation driven plans in China. One of the most renown implementation plans are the Interim Measures for the Management of National Key R&D Programmes, Guo Ke Fa Zi [2017], No. 152, see http://www.most.gov.cn/mostinfo/xinxifenlei/fgzc/gfxwj/gfxwj2017/201706/t20170628_133796.htm

[59] E.g. see the recent MIIT meeting of 24 October 2019, where the need for upscaling China's industrial base was reiterated, http://www.miit.gov.cn/n1146290/n1146402/n7039597/c7483605/content.html

[60] For a paper about the provincial specialisation plans in emerging industries such as high end equipment manufacturing, see D. Prud'Homme, "Dynamics of China's Provincial-Level Specialization in Strategic Emerging Industries", Research Policy 2016, 1586-1603.

[61] S. Kennedy and Ch. J. Johnson (Centre for Strategic International Studies), "Perfecting China Inc. – The 13th Five-Year Plan", 2016, 1-2.

[62] For an example of a support ship for saturation diving, see http://en.people.cn/n3/2019/1230/c90000-9644879.html and https://global.chinadaily.com.cn/a/201912/30/WS5e09f906a310cf3e355818e2.html

[63] See Box 7, Chapter 22, section 7 of China's 13th Five-Year Plan. For more information, see also the article from the China Shipbuilding News Agency about China's plans in the oceans, http://chinashipnews.com.cn/show.php?contentid=13768

[64] For an unofficial English translation of the 12th Five-Year Plan, https://policy.asiapacificenergy.org/sites/default/files/12th%20Five-Year%20Plan%20%282011-2015%29%20for%20National%20Economic%20and%20Social%20Development%20%28EN%29.pdf

[65] http://www.gov.cn/zwgk/2013-08/04/content_2460962.htm

[66]http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740583/content.html

[67] http://www.cutech.edu.cn/cn/rxcz/webinfo/2006/05/1179971197415561.htm

For an unofficial English translation, see https://www.itu.int/en/ITU-D/Cybersecurity/Documents/National_Strategies_Repository/China_2006.pdf

[68] CSSC, ''Analysis of the Economic Operation Of the Shipbuilding Industry in 2017'', 2018, http://www.csname.org.cn/csnameyjdt/329123.htm; China Shipbuilding News Agency, ''Reduce Cost and Boost the Supply-Side Reform of Shipping Companies'', 2017, http://chinashipnews.com.cn/show.php?contentid=13035

[69] See Chapter 49, section 2 of China's 13th Five-Year Plan and the China Ocean Agenda 21 (2009), http://www.npc.gov.cn/zgrdw/huiyi/lfzt/hdbhf/2009-10/31/content_1525058.htm

[70] MIIT, NDRC, Ministry of Finance, People's Bank, China Banking Regulatory Commission, National Defence Science, and Industry Council, ''The Action Plan for Deepening the Structural Adjustment and Accelerating the Transformation and Upgrading of the Shipbuilding Industry (2016-2020)'', 2017, http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c5459940/content.html and https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzxgh/201707/t20170707_1196828.html

[71] Opinions of State Council and Guidance for Cooperation on the Promotion of International Production Capacity and Equipment Manufacturing; State Council, China, 2016, Twelfth Five-Year Programme for the Shipbuilding Industry; J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 110.

[72] https://www.seatrade-maritime.com/asia/china-outlines-blueprint-upgrade-shipbuilding-sector

[73] MIIT, ''Boosting Capabilities of Marine Equipment Plan (2015-2020)'', 2016, http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c5366105/content.html

[74] http://www.csname.org.cn/csnamebztt/328339.htm

[75] http://www.maric.com.cn/component_product_center/index.php?typeid=3

[76] http://stcsm.sh.gov.cn/xwzx/kjzl/20170607/0016-145641.html

[77] J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 110.

[78] State Council, ''Several Opinions on Promoting the Healthy Development of the Maritime Industry'', 2014, Guo Fa [32], http://www.gov.cn/zhengce/content/2014-09/03/content_9062.htm

[79] See Chapter 41 of the 13th Five-Year Plan.

[80] https://www.chinadaily.com.cn/a/202006/21/WS5eee9266a310834817254658.html; http://english.www.gov.cn/news/top_news/2018/12/11/content_281476428774664.htm; http://en.people.cn/n3/2020/0311/c90000-9666906.html; https://www.chinadailyhk.com/articles/22/76/58/1575526246626.html?newsId=114734

See also the website of the Collaborative Center for Advanced Ship and Deep-Sea Exploration, http://cisse.sjtu.edu.cn/

[81] http://english.www.gov.cn/news/top_news/2018/02/13/content_281476046079148.htm; http://english.www.gov.cn/news/top_news/2017/12/06/content_281475966749424.htm;

http://www.csname.org.cn/csnamexshx/336241.htm

[82] For some examples of Chinese research vessels, see http://en.people.cn/n3/2019/1205/c90000-9638282.html; http://english.qdio.cas.cn/rs/fs/rv/; http://lssf.cas.cn/en/facilities-view.jsp?id=ff8080814ff56599014ff56ea053000a; http://stcsm.sh.gov.cn/xwzx/kjzl/20180913/0016-23469.html

[83] https://csoi.hk/en/offshore-intelligent-fishery-project/

[84] http://english.forestry.gov.cn/index.php?option=com_content&view=article&id=1847&catid=21&Itemid=105; http://english.www.gov.cn/state_council/2014/10/06/content_281474992889983.htm

[85] Notice on Issuing the 13th Five-Year Plan for National Marine Economic Development, 2017, no. 861, http://gc.mnr.gov.cn/201806/t20180614_1795445.html

[86] European Council on Foreign Relations, "Blue China: Navigating the Maritime Silk Road to Europe", 2018, https://www.ecfr.eu/page/-/blue_china_navigating_the_maritime_silk_road_to_europeNEW-compressed.pdf, 10.

[87] See CSIS, ''A Survey of Marine Research Vessels in the Indo-Pacific'', 16 April 2020, https://amti.csis.org/a-survey-of-marine-research-vessels-in-the-indo-pacific/

[88] http://www.cssrc.com/

[89] See http://en.people.cn/n3/2020/0220/c90000-9659975.html

[90] http://www.ckjorc.org/en/about.jsp?id=1475; https://www.kmi.re.kr/eng/contents/contentsView.do?rbsIdx=109

[91] see https://www.oecd.org/environment/the-ocean-economy-in-2030-9789264251724-en.htm, p.179

[92] http://www.xinhuanet.com/english/2019-06/08/c_138126648.htm

[93] Note that the "white list" was officially abandoned in 2019.

[94] Guiding Opinions on Improving and Strengthening Financial Services for Marine Economic Development, Yingfa no. 7, 2018, http://www.pbc.gov.cn/jinrongshichangsi/147160/147289/147301/3470241/index.html

[95] http://www.cmindustry.com.hk/?lang=en-us&tn=page&id=1320; https://www.caixinglobal.com/2019-10-18/exclusive-state-shipbuilding-giant-cmih-invites-investors-in-search-for-listing-101472595.html

[96] http://www.gov.cn/zhengce/2019-09/19/content_5431432.htm

[97] Order of the National Development and Reform Commission No. 29, ''Guide Catalogue of Industrial Structure Adjustment'', 2019, http://www.tzxm.gov.cn/flfg/deptRegulations/201911/t20191106_12490.html

[98] See Notice of the State Council, Guofa [2015] No. 28, http://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm

[99] Cfr. the 5th Meeting of the Central Financial and Economic Commission (2019), where the importance for China to be self-reliant, and to build strategic value chains through complementary regional integration and key common technologies across industrial sectors was highlighted, http://en.dl.gov.cn/News/ChinaNews/24747.jhtml

Cfr. the Special Action Plan for the Deep Integration of Industrialization and Industrialization (2013-2018); the Internet Plus (2015); Additive Manufacturing Industry Development Action Plan (2017-2020).

For an example of a project manufacturing and technologies are integrated, see the Nangtong COSCO Shipping Kawasaki project about the Lean Construction of High-Tech Ships, http://chi.coscoshipping.com/art/2019/11/16/art_7982_125044.html

[100] L. Li, "China's Manufacturing Locus in 2025: With a Comparison of "Made-in-China 2025" and "Industry 4.0", Technological Forecasting and Social Change 2018, 68; Interview with Miao Wei (Minister of MIIT), 2015, http://www.gov.cn/zhengce/2015-05/23/content_2867501.htm; CANSI, http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=13094

[101] http://www.gov.cn/zhengce/2015-05/20/content_2865508.htm

[102] MERICS, "Evolving Made in China 2025 – China's Industrial Policy in the Quest for Global Tech Leadership", 2019, 19-21 and 44.

[103] http://www.gov.cn/xinwen/2015-05/19/content_2864566.htm

[104] http://www.gov.cn/xinwen/2015-05/19/content_2864538.htm

[105] http://www.cmindustry.com.hk/?lang=zh-cn&tn=content&id=360: '' *On the morning of August 24, Ge Yuanli, deputy director of the Jiangsu Provincial Taxation Bureau, and his party went to China Merchants Heavy Industry (Jiangsu) Co., Ltd. to investigate and guide the work. (…) In response to some tax-related preferential policy issues and needs related to the cruise industry raised by Jiangsu Heavy Industry, Ge Yuanli said that he would request Nantong City and Haimen City Taxation Bureaus to follow up with companies to hold special meetings to study and solve them, and do their best to support the stable development of the company.''*

[106] Chapter 22 of China's 13th Five-Year Plan.

[107] MIIT, ''Interpretation of Made in China 2025: Promoting the Development of Marine Engineering Equipment and High-tech Ships'', 2016, http://www.gov.cn/zhuanti/2016-05/12/content_5072766.htm.

[108] http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=12707

[109] https://www.reuters.com/article/china-shipbuilding/china-pledges-support-for-shipbuilding-industry-targets-high-end-market-idUSL4N1F223L

[110] https://multimedia.scmp.com/news/china/article/made-in-China-2025/index.html; US Chamber of Commerce, "Made in China 2025: Global Ambitions Built on Local Protections", 2017, https://www.uschamber.com/sites/default/files/final_made_in_china_2025_report_full.pdf, 72-73.

[111] https://www.miit.gov.cn/cms_files/filemanager/oldfile/miit/n1146295/n1652858/n1652930/n3757018/c6567267/part/6567282.pdf; http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=11357

[112] http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c6567267/content.html

[113] For an overview of the provincial implementation plans, see https://www.uschina.org/local-made-china-2025-plans

[114] Council on Foreign Relations, "Is 'Made in China' a Threat to Global Trade", 13 May 2019, https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade; MERICS, "Evolving Made in China 2025 – China's Industrial Policy in the Quest for Global Tech Leadership", 2019, 19-21 and 44.; US Chamber of Commerce, "Made in China 2025: Global Ambitions Built on Local Protections", 2017,

https://www.uschamber.com/sites/default/files/final_made_in_china_2025_report_full.pdf, 17 and following.

[115] Centre for International Governance Innovation, "Made in China 2025 as a Challenge in Global Trade Governance", 2018, 5-6.

[116] European Chamber of Commerce in China, "China Manufacturing 2025 – Putting Industrial Policy Ahead of Market Forces", 2017, 3-4.

[117] https://www.hellenicshippingnews.com/beijings-made-in-china-2025-plan-isnt-dead-its-out-of-control/

[118] MERICS, "Evolving Made in China 2025 – China's Industrial Policy in the Quest for Global Tech Leadership", 2019, 29-30; https://www.hellenicshippingnews.com/beijings-made-in-china-2025-plan-isnt-dead-its-out-of-control/

[119] See https://www.oecd.org/china/42033311.pdf

[120] See https://www.oecd-ilibrary.org/economics/the-shipbuilding-industry-in-china_gen_papers-2010-5kg6z7tg5w5l

[121] State Council, ''China Ocean Agenda'', 1996, published in 2008, http://www.npc.gov.cn/zgrdw/huiyi/lfzt/hdbhf/2009-10/31/content_1525058.htm

[122] https://www.ship-technology.com/news/china-csic-cssc-merger/

[123] http://www.gov.cn/gongbao/content/2003/content_62156.htm

[124] NDRC, ''Medium and Long-Term Plan for Shipbuilding (2006-2015)'', https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzxgh/200710/P020191104623363865929.pdf

[125] See for instance the Tianjin shipbuilding industry fund, https://www.seatrade-maritime.com/asia/chinas-20bn-yuan-shipbuilding-fund

[126] http://www.gov.cn/zwgk/2009-06/09/content_1335839.htm

[127] State Council, ''Decision on Accelerating the Cultivation and Development of Strategic Emerging Industries'', Guo Fa [2010], no. 32, http://www.gov.cn/zwgk/2010-10/18/content_1724848.htm

[128] NDRC, MOST, MIIT and National Energy Administration, ''Notice of the Innovation Development Strategy for the Marine Engineering Equipment Industry (2011-2020)'', 2011, no. 1675, http://www.gov.cn/govweb/gzdt/att/att/site1/20110916/001e3741a2cc0fdd4fd101.pdf

[129] MIIT, ''12th Five-Year Implementation Plan for the Shipbuilding Industry'', published in 2012. http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3757369/content.html

[130] State Council, ''Notice to Accelerate the Implementation of Structural Adjustment Programs to Promote the Transformation and Upgrading of the Shipbuilding Industry'', 2013, Guo Fa [29], http://www.gov.cn/zwgk/2013-08/04/content_2460962.htm.

[131] See C.J. Milhaupt and W. Zheng, ''Beyond Ownership: State Capitalism and the Chinese Firm'', the Georgetown Law Journal 2015, 665.

[132] See: https://www.oecd-ilibrary.org/fr/science-and-technology/state-owned-enterprises-in-the-shipbuilding-sector_5264c49c-en

[133] http://www.oecd.org/corporate/guidelines-corporate-governance-SOEs.htm

[134] Y. Liang, K. Shi, L. Wang and J. Xu, "Local Government Debt and Firm Leverage: Evidence from China", Asian Economic Policy Review 2017, 229.

[135] https://www.sajn.or.jp/files/view/articles_doc/src/4e974c24a2c6d2a385b2a9fda4ceb573.pdf

[136] The annual report (2018) of the private Chinese shipbuilding group Yangzijiang described the situation as follows: "*Overcapacity of shipyard space and cut throat price competition from state-owned Korean and PRC shipyards have contributed to depressed vessel prices."* The International Chamber of Shipping has also warned that overcapacity and low freight rates remain two of the main challenges for the next ten years, https://www.maritime-executive.com/article/ics-oversupply-still-a-major-challenge; Annual report (2019) of the International Chamber of Shipping, https://www.ics-shipping.org/docs/default-source/resources/ics-annual-review-2019.pdf?sfvrsn=3, 30-33.

[137] OECD, ''Imbalances in the Shipbuilding Industry and Assessment of Policy Responses'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, 7-11 and 19;

[138] https://www.tradewindsnews.com/shipyards/shipbuilders-finding-ways-to-adapt-to-challenging-market/2-1-590915

[139] State Council's Guiding Opinions on Solving the Problem of Serious Overcapacity, Guofa [2013] No. 41.

[140] According to the annual report of Yangzijiang Shipbuilding, in 2017 steel prices rose 30% to more than CNY 4000 per ton, and the USD depreciated 5% against the CNY, http://www.yzjship.com/upload/doc/2017%E5%B9%B4%E5%B9%B4%E6%8A%A5.pdf, 7. See also CSSC, ''Analysis of the Economic Operation of the Shipbuilding Industry in 2017'', http://www.csname.org.cn/csnameyjdt/329123.htm

[141] https://lloydslist.maritimeintelligence.informa.com/LL1122217/The-Interview-Ren-Yuanlin

[142] http://www.gov.cn/zwgk/2009-06/09/content_1335839.htm

[143] In 2018, the executive chairman of Yangzijiang made the following statement: *"More than 1,000 shipyards are still registered as being in business in China. But those that have done deliveries or won orders in the past one year number at just slightly more than 100. In my opinion, there are really only 30-40 active yards,"* https://www.seatrade-maritime.com/asia/tough-road-ahead-chinese-yards-yangzijiang; https://www.scmp.com/business/china-business/article/1782782/chinese-shipyards-face-gloom-amid-excess-vessel-capacity

[144] European Chamber of Commerce, "Overcapacity in China. An Impediment to the Party's Reform Agenda", 2016, 32.

[145] WTO (WT/TPR/S/375), Trade Review of China, 2018, 23, para. 1.30.

[146] http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=14458

[147] European Chamber of Commerce, "Overcapacity in China. An Impediment to the Party's Reform Agenda", 2016, 32.

[148] W. E. Kovacic, "Competition Policy and State-Owned Enterprises in China", World Trade Review 2017, 705.

[149] D. Xu and Y. Liu, *Understanding China's Overcapacity,* Peking University Press, 2018, 240-241, and 251.

[150] P.J. Barwick, M. Kalouptsidi and N.B. Zahur, ''China's Industrial Policy: An Empirical Evaluation'', NBER Working Paper, 2019, 30 and 33.

[151] https://www.tradewindsnews.com/shipyards/jiangnan-shipyard-outperforms-beijings-expectations/2-1-705302

[152] http://www.pbc.gov.cn/english/3278277/3278296/2988539/index.html

[153] Chapter 22, section 5.

[154] http://english.www.gov.cn/state_council/ministries/2016/05/19/content_281475352712538.htm

[155] Ministry of Finance, Report on the Execution of the Central and Local Budgets for 2019 and on the Draft Central and Local Budgets for 2020, 13th National's People's Congress, http://www.xinhuanet.com/english/download/centralandlocalbudgets.pdf, 10.

[156] Article 26 Regulations on the Work of Primary Organisations of the Communist Party of China (trial), http://www.csic.com.cn/n6/n27/c16000/content.html

[157] D. Xu and Y. Liu, *Understanding China's Overcapacity,* Peking University Press, 2018, 246-247.

[158] OECD, "Imbalances in shipbuilding and assessment of policy responses", 2017, http://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf

[159] IMF Country Report People's Republic of China, No. 17/248, 2017, 24-25; J. Daniel (ed.), "Resolving China's Corporate Debt Problem", IMF Working Paper No. 16/203, 2016, 17.

[160] Notice of the State Council on Issuing the Implementation Plans on Accelerating Structural Adjustment and Promoting Transformation and Upgrading of the Shipbuilding Industry (2013-2015), Guofa [2013] No. 29, http://www.gov.cn/zwgk/2013-08/04/content_2460962.htm; https://www.scmp.com/business/china-business/article/3041313/outlook-global-shipbuilding-industry-dismal-order-books; https://www.scmp.com/business/china-business/article/1657280/beijing-adopts-selective-lending-force-shipyard

[161] http://www.gov.cn/zhengce/content/2016-07/26/content_5095050.htm

[162] S. Wei, *Shadow Banking in China. Risk, Regulation and Policy,* Elgar Publishing, 2016, 284; https://www.reuters.com/article/idUSL4N0FP0HT20130723

[163] China Merchants Bank, Annual Report 2018, http://file.cmbimg.com/cmbir/201904/476b7790-2259-4f08-a457-f1437d92620b.pdf, 48.

[164] Cexim, Annual Report 2016, http://english.eximbank.gov.cn/News/AnnualR/2016/201807/P020180718670634794046.pdf, 73.

[165] European Chamber of Commerce, "Overcapacity in China. An Impediment to the Party's Reform Agenda", 2016, 31; D. Xu and Y. Liu, *Understanding China's Overcapacity,* Peking University Press, 2018, 263.

[166] OECD, ''Imbalances in the Shipbuilding Sector'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, 45.

[167] Notice of the State Council on Issuing the Implementation Plans on Accelerating Structural Adjustment and Promoting Transformation and Upgrading of the Shipbuilding Industry (2013-2015).

[168] OECD, "Imbalances in the Shipbuilding Industry and Policy Responses", 2017, http://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdfhttp://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf.

[169] Figures cited in D. Xu and Y. Liu, *Understanding China's Overcapacity,* Peking University Press, 2018, 233, 240 and 242.

[170] See for instance the statement by Cexim on its website: ''*Since the State Council issued the Implementation Plans on Accelerating Structural Adjustment and Promoting Transformation and Upgrading of the Shipbuilding Industry in 2013, China Eximbank has provided more than RMB300 billion of financing support to the sector. With concrete actions, the Bank has contributed significantly to the development and growth of the shipbuilding industry.''*, http://english.eximbank.gov.cn/News/NewsR/201912/t20191227_15545.html

[171] D. Xu and Y. Liu, *Understanding China's Overcapacity,* Peking University Press, 2018, 256-257.

[172] See P. Scott for the example of the development of Waigaoqiao Shipbuilding (part of CSSC), P. Scott, 'Competition and Subsidy in Commercial Shipbuilding', 2017, https://theses.ncl.ac.uk/jspui/bitstream/10443/3751/1/Stott%2C%20P.W.%202017.pdf, 55-56.

[173] P.J. Barwick, M. Kalouptsidi and N.B. Zahur, ''China's Industrial Policy: An Empirical Evaluation'', NBER Working Paper, 2019, 6-7 and 29.

[174] Center for Strategic and International Studies (CSIS), ''Hidden Harbors: China's State-Backed Shipping Industry'', 2020, https://www.csis.org/analysis/hidden-harbors-chinas-state-backed-shipping-industry

[175] Cfr. OECD, "Measuring distortions in international markets: the semiconductor value chain", OECD Trade Policy Papers, 2019, No. 234, OECD Publishing, Paris, https://doi.org/10.1787/8fe4491d-en, 94.

OECD, "Measuring distortions in international markets: the aluminium value chain", OECD Trade Policy Papers, 2019, No. 218, OECD Publishing, Paris, https://doi.org/10.1787/c82911ab-en, 30.

[176] Note that Lloyd's List reported on 24 January 2020 that it expects a rise in shipbuilding subsidies due to the current downturn in the market, https://lloydslist.maritimeintelligence.informa.com/LL1130774/Yard-Talk--No-end-to-state-subsidy-seen

[177] P.J. Barwick, M. Kalouptsidi and N.B. Zahur, ''China's Industrial Policy: An Empirical Evaluation'', NBER Working Paper, 2019, 29-32 and 38.

[178] This issue has also been raised in the WTO's Committee on Subsidies and Countervailing Measures, see Minutes of the meeting held on 24 April 2018, G/SCM/M/105 and Communication by Canada, the European Union, Japan, Mexico and the United States, ''Subsidies and Overcapacity: the Role of Below-Market Financing'', 13 April 2018, G/SCM/W/575.

[179] Please see also OECD, "Measuring distortions in international markets: the aluminium value chain", OECD Trade Policy Papers, 2019, No. 218, OECD Publishing, Paris, https://doi.org/10.1787/c82911ab-en, 97 and following.

[180] M. Kalouptsidi, ''Detection and Impact of Industrial Subsidies: the Case of Chinese Shipbuilding'', Review of Economic Studies 2018, 1113, 1131 and 1145.

[181] For more information about the relationship between subsidies and commercial shipbuilding in the framework of the ASCM, see P. Scott, ''Competition and Subsidy in

Commercial Shipbuilding'', 2017, https://theses.ncl.ac.uk/jspui/bitstream/10443/3751/1/Stott%2C%20P.W.%202017.pdf

[182] http://zwgk.cangzhou.gov.cn/article5_new.jsp?infoId=440213; http://www.miit.gov.cn/n1146295/n7281310/c7485099/content.html

[183] http://www.miit.gov.cn/n973401/n1234643/n1234646/c3852367/content.html; http://www.miit.gov.cn/n973401/n1234643/n1234646/c3852372/content.html

[184] http://www.miit.gov.cn/n973401/n1234643/n1234646/c3852352/content.html; http://www.miit.gov.cn/n973401/n1234643/n1234646/c3852357/content.html; http://www.miit.gov.cn/n973401/n1234643/n1234646/c3852377/content.html

[185] https://www.ghbank.com.cn/flfg/fzzdd/201603/P020160322653239582144.pdf. For an unofficial translation in English, see http://en.pkulaw.cn/display.aspx?cgid=1548a3b12364f930bdfb&lib=law

[186] W. Lam and A. Schipke, ''State-Owned Enterprise Reform'' in W. R. Lam, M. Rodlauer and A. Schipke (eds.), *Modernising China – Investing in Soft Infrastructure*, IMF, 2017, 315.

[187] OECD, "Measuring distortions in international markets: the aluminium value chain", OECD Trade Policy Papers, 2019, No. 218, OECD Publishing, Paris, https://doi.org/10.1787/c82911ab-en, 97 and following.

[188] S. Chan, ''China's Mounting Corporate Debt – A Crisis in the Making?'', Asian Survey 2018, 837-838.

[189] See for instance the research paper by Ch.Y. Lim, J. Wang and Ch. Zeng, which examined data about government subsidies of 1 239 Chinese companies listed at the Shanghai and Shenzhen stock markets. The paper indicates that Chinese key state-enterprises have received high amounts of government subsidies, thereby reducing the cost of debt and hence raising their overall debt levels, despite their lower profitability rates. Ch.Y. Lim, J. Wang and Ch. Zeng, ''China's ''Mercantilist'' Government Subsidies, the Cost of Debt and Firm Performance'', Journal of Banking and Finance 2018, https://www.sciencedirect.com/science/article/pii/S0378426617302169

[190] European Chamber of Commerce, "Overcapacity in China. An Impediment to the Party's Reform Agenda", 2016, 32: *"(...) these new leasing and financing companies are creating opportunities for ship owners who in some cases would not be otherwise be able to find financing on the ordinary financial market to purchase ships that have been produced in China. This distorts normal market mechanisms and contributes to the present overcapacity in the shipping industry."*

[191] See Detailed Rules for the Implementation of Suggestions on the Development of the Financial Industry in Shenzhen and CDB Leasing Annual Report 2018, http://www.cdb-leasing.com/Uploads/Uploads/2019-04-27/5cc32d5beed51.pdf, 179.

[192] COMEC, annual report 2019, https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0427/2020042700771.pdf, pages 146, 169 and 183, (194).

[193] https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0429/2020042900955.pdf, 3.

[194] J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 98-99.

[195] CCCC, Annual Report 2018, http://en.ccccltd.cn/investorrelations/reporth/201905/P020190507337868438550.pdf, 2 and 9-10.

[196] J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 103-104; confirmed by https://www.hellenicshippingnews.com/cosco-shipping-development-announces-2018-annual-results-says-will-boost-industrial-development-through-financial-services-and-achieve-greater-synergies/

[197] Cosco Shipping Holdings Co. Ltd., Annual results 2018, https://www1.hkexnews.hk/listedco/listconews/sehk/2019/0329/ltn201903292376.pdf, 20; Financial Report 2019 https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0424/2020042400675.pdf, 150-151 and 258, http://hold.coscoshipping.com/module/download/down.jsp?i_ID=112982&colID=10002; https://theloadstar.com/subsidies-from-china-keeping-ambitious-cosco-in-calm-financial-waters/; Financial Report 2020 Q1, https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0429/2020042902792.pdf

[198] J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 110.

[199] Annual Report CSIC (2017), http://www.shclearing.com/xxpl/cwbg/nb/201804/t20180428_375993.html; Annual Report CSSC (2017), http://www.shclearing.com/xxpl/cwbg/nb/201804/t20180426_372891.html.

[200] S. Chan, ''China's Mounting Corporate Debt – A Crisis in the Making?'', Asian Survey 2018, 827-829.

[201] See also the Guiding Opinions on Promoting SOE Restructuring and Reorganising (2016), http://www.gov.cn/zhengce/content/2016-07/26/content_5095050.htm: "*For high-debt enterprises, the investment scale should be strictly controlled on the principle of not increasing the asset-liability ratio."*

See also, W. Junling, ''Debt-Equity Swaps Promote the Survival of the Fittest in the Market'', 2019, http://www.gov.cn/zhengce/2019-06/10/content_5398708.htm and Lu Haoming, ''Put State-Owned Enterprises' Leverage Reduction as a Top Priority of Deleveraging'', 2017, http://www.gov.cn/zhengce/2017-08/23/content_5219943.htm

[202] For an interesting case-study about Northern Shipbuilding (CSIC) under the 2000 debt-to-equity swap programme, see R. Smyth, J. Wang and X. Deng, ''Equity for Debt Swaps in Chinese Big Business: A Case-Study of Restructuring in One Large State-Owned Enterprise'', Asia Pacific Business Review 2004, 382-401.

[203] OECD, China Economic Survey 2019, http://www.oecd.org/economy/surveys/china-2019-OECD-economic-survey-overview.pdf, 29.

[204] See also J. Daniel, J. Garrido and M. Moretti, ''Debt-Equity Conversions and NPL Securitization in China – Some Initial Considerations'', IMF Technical Note and Manuels, 2016, https://www.imf.org/external/pubs/ft/tnm/2016/tnm1605.pdf

[205] https://www.reuters.com/article/us-china-economy-infrastructure/chinese-firms-implemented-203-billion-debt-to-equity-swaps-in-2019-idUSKBN1ZC0LW

[206] https://www.caixinglobal.com/2020-05-07/china-expands-funding-sources-for-debt-to-equity-swaps-101550801.html; https://www.chinadaily.com.cn/a/202005/13/WS5ebb3beba310a8b24115539e.html

[207] T. Huang (Peterson Institute for International Economics), ''Tracking China's Debt –to-Equity Swap Program: ''Great Cry and Little Wool'', 2019, https://www.piie.com/blogs/china-economic-watch/tracking-chinas-debt-equity-swap-program-great-cry-and-little-wool; W. Gang and B. Yang (Development Research Center of the State Council of the People's Republic of China), ''Market-Oriented Debt-to-Equity

Swap: Problems and Policy Options, Research Report no. 99, 2018, 6-21; X., ''Interview of Ren Yuanlin'', https://lloydslist.maritimeintelligence.informa.com/LL1122217/The-Interview-Ren-Yuanlin

[208] This Fund consists of the state-owned enterprise China Reform Holdings Corporation Ltd., Postal Savings Bank of China Co. Ltd., the China Construction Bank Corporation, Shenzhen Investment Holdings Co. Ltd. and other agencies, http://www.dhl.com.cn/EN/newscontent/0006/006632/2.aspx?MID=0876&AID=

[209] This Fund is managed by SASAC and aims to facilitate state-owned enterprises' structural reforms. It consists of China Chengtong, Postal Savings Bank of China, China Merchants Group, China North Industries Group Corp., Sinopec Group, Shenghua Group, and China Mobile, http://www.cctgroup.com.cn/cctgroupen/business/investment_and_financing/index.html; http://www.chinadaily.com.cn/business/2016-09/27/content_26904633.htm; https://www.caixinglobal.com/2016-09-26/china-chengtong-creates-525-billion-fund-company-100992316.html; https://www.cmhk.com/home/a/2016/i29/a31972_32059.shtml; https://www.chinadailyasia.com/business/2016-08/12/content_15478272.html; https://www.reuters.com/article/us-china-economy-restructuring-idUSKCN11W0ER.

[210] https://lloydslist.maritimeintelligence.informa.com/LL110949/Beijing-to-cover-33bn-debts-for-state-shipbuilder-CSIC; http://www.chinadaily.com.cn/business/2017-08/19/content_30815047.htm; https://www.spglobal.com/en/research-insights/articles/is-china-s-great-debt-for-equity-swap-working-a-reality-check-at-year-three.

[211] https://www.tradewindsnews.com/shipyards/china-shipbuilding-industry-corp-merging-dalian-and-bohai-yards-under-beijing-reform/2-1-570320

[212] https://www.caixinglobal.com/2019-03-30/state-owned-ship-company-swaps-assets-among-units-101399060.html; https://lloydslist.maritimeintelligence.informa.com/LL1130774/Yard-Talk--No-end-to-state-subsidy-seen?vid=Maritime&processId=00665889-0602-49ab-bbfe-5ee62e376d86; https://www.tradewindsnews.com/shipyards/cssc-holdings-set-to-snap-two-year-losing-streak/2-1-523010.

[213] http://www.dhl.com.cn/EN/newscontent/0006/007448/2.aspx?AID=00000000000000001923&Type=YJ; https://www.tradewindsnews.com/shipyards/cssc-gets-help-from-construction-bank/2-1-73344

[214] https://www.caixinglobal.com/2019-03-30/state-owned-ship-company-swaps-assets-among-units-101399060.html

[215] https://www.reuters.com/article/us-china-ccb-debt/china-construction-bank-gets-nod-for-debt-for-equity-swap-subsidiary-idUSKBN1A611C; https://www.scmp.com/business/banking-finance/article/2063650/ccb-way-ahead-other-state-lenders-debt-equity-swaps

[216] W. R. Lam, A. Schipke, Y. Tan, and Z. Tan, ''Resolving China's Zombies: Tackling Debt and Raising Productivity'', IMF Working Paper 17/266 (2017), 16.

[217] While legally distinct, an irrevocable and standby letter of credit performs similar functions as a guarantee (See UCP 600 and URDG 758). Therefore, the word guarantee is put between brackets.

[218] https://www.moodys.com/research/Moodys-assigns-A1-to-BOC-supported-bonds-of-China-State--PR_318535; https://www.moodys.com/sites/products/productattachments/ap075378_1_1408_ki.pdf

[219] Y. Zeng, P. Guo and B. Li, "The Impact of Government Subsidies on Company Debt Financing: New Evidence from Chinese Listed Companies", Emerging Markets Finance and Trade 2019, 14-15.

[220] See for example the credit rating of CCSC (Honk Kong) Shipping by Standard and Poor's (S&P), http://file.finance.sina.com.cn/211.154.219.97:9494/MRGG/BOND/2019/2019-9/2019-09-18/63295.PDF, 18 September 2019: ''*The ratings on CSSCHK reflects our view that the company is a highly strategic subsidiary to China State Shipbuilding Corp. (CSSC Group). We expect CSSCHK to receive timely parent support and indirectly benefit from Chinese government support through its parent CSSC Group, if needed.*''

[221] See for instance the ship finance investment vehicle funded by Cosco and China Cinda Asset Management, https://lloydslist.maritimeintelligence.informa.com/LL1120788/Cosco-thinks-big-in-alternative-ship-finance

[222] D. Anzoategui, M. Chivakul and W. Maliszewski, "Financial Distortions in China: A General Equilibrium Approach", IMF Working Paper no. 15/274, 2015, 5-6; S. Chan, ''China's Mounting Corporate Debt – A Crisis in the Making?'', Asian Survey 2018, 824 and 839; Y. Liang, K. Shi, L. Wang and J. Xu, "Local Government Debt and Firm Leverage: Evidence from China", Asian Economic Policy Review 2017, 214; M. Molnar and J. Lu, ''State-Owned Firms Behind China's Corporate Debt'', OECD Economics Department Working Paper No. 1536, 2019, 8; OECD, Economic Survey of China, 2019, http://www.oecd.org/economy/surveys/china-2019-OECD-economic-survey-overview.pdf, 27 and 34; S. Seki, ''Moral Hazards in China from the Perspective of the Corporate Bond Market'', Pacific Business and Industries 2017, 6-8

[223] See Ch. Li, Y. Wang, L. Wu and J. Z. Xiao, ''Political Connections and Tax-Induced Earnings Management: Evidence from China'', the European Journal of Finance 2016, 413-431.

[224] http://www.gov.cn/xinwen/2017-11/15/content_5239832.htm

[225] For the 2019 version, see http://www.chinatax.gov.cn/chinatax/n810341/n810755/c5140651/5140651/files/8b42acd1cb4649c99222838d7c9845f4.pdf

[226] For the 2019 version, see http://www.chinatax.gov.cn/chinatax/n810341/n810755/c5140651/5140651/files/f6c45159db664ba5bff592603377eb98.pdf

[227] Ministry of Finance, MIIT, General Administration of Customs, State Administration of Taxation, and Energy Bureau, ''Notice on Issuing the Administrative Measures on Import Tax Policies for Major Technical Equipment'', Cai Shui [2020] No. 2, http://www.gov.cn/zhengce/zhengceku/2020-01/14/content_5468912.htm; Ministry of Finance, MIIT, General Administration of Customs, State Administration of Taxation and Energy Bureau, ''Notice on Adjusting the Relevant Catalogue of Import Tax Policies for Major Technical Equipment'', Cai Shui [2019] No. 38, http://www.chinatax.gov.cn/chinatax/n810341/n810755/c5140651/content.html

See also http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shui5.cn/uploads/soft/180108/3-1P10R04545.pdf; http://www.shudouzi.com/shuishou/2746.html; http://www.shui5.cn/article/9a/117553.html; http://www.gov.cn/xinwen/2019-12/09/content_5459584.htm; http://www.gov.cn/xinwen/2019-12/09/5459584/files/a09a2e188cf24941a5292f8ce18118e1.pdf

[228] https://www.chinadaily.com.cn/a/202001/16/WS5e1fb19ba31012821727147f.html

[229] COMEC, annual report 2019, https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0427/2020042700771.pdf, 132-133.

[230] State Administration of Taxation, Guo Shui Fa [2003], no. 113, http://www.chinatax.gov.cn/chinatax/n810341/n810765/n812198/200310/c1205333/content.html; S. Han and W. Wang, "An Overview of the Development of the Financial Leasing Law in China", Unif.L.Rev. 2011, 269.

[231] Ministry of Finance and State Administration of Taxation, Cai Shui [2015], no. 144, http://www.chinatax.gov.cn/chinatax/n810341/n810765/n1990035/201602/c2185946/content.html

[232] Cai Shui [2010], No. 24, http://shanxi.chinatax.gov.cn/zcfg/detail/sx-11400-3815-1697297; http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=10350

[233] Notice of the Ministry of Finance and Other Departments on the Issuance of the Administrative Measures for Special Funds for Retirement and Renewal of Old Ships and Single Hull Tankers, Caijian [2011], no. 4, http://fgcx.bjcourt.gov.cn:4601/law?fn=chl381s210.txt

[234] OECD, ''Imbalances in the Shipbuilding Sector'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, Appendix 6

[235] Z. Yang, Z. Jiang, T. Notteboom and H. Haralambides, ''The Impact of Ship Scrapping Subsidies on Fleet Renewal Decisions in Dry Bulk Shipping'', Transportation Research 2019, 179.

[236] Danish Ship Finance, ''Shipping Market Review'', November 2015, 28-29; OECD, ''Imbalances in the Shipbuilding Sector'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, 44.

[237] https://www.seatrade-maritime.com/asia/cosco-gets-638m-subsidy-fleet-renewal; https://lloydslist.maritimeintelligence.informa.com/LL111576/Cosco-Shipping-Energy-gets-$54m-scrap-and-build-subsidy; https://www.seatrade-maritime.com/asia/cosco-shipping-holdings-benefits-78m-state-subsidy

[238] ITF, ''Maritime Subsidies. Do They Provide Value for Money?'', 2019, https://www.itf-oecd.org/sites/default/files/docs/maritime-subsidies-value-for-money.pdf, 12, 14 and 43; Cosco Annual Report 2018, https://www1.hkexnews.hk/listedco/listconews/sehk/2019/0329/ltn201903292376.pdf, 20.

[239] The Plan mentions a scrapping subsidy of CNY 1 500/gross tonnage. See Jiao Shui Fa [2013], No. 729, http://xxgk.mot.gov.cn/2020/jigou/syj/202006/t20200623_3314113.html

[240] According to these rules, the total scrapping subsidy depends on the gross tonnage, ship age and ship type, see Caijian [2014] No. 24, http://www.gov.cn/gongbao/content/2014/content_2701564.htm

[241] Sinotrans Shipping Limited, Financial Report 2018, https://www1.hkexnews.hk/listedco/listconews/sehk/2018/0427/ltn201804271104.pdf, 138.

[242] https://www.offshore-energy.biz/cmes-receives-scrapping-subsidy-from-china/; http://static.sse.com.cn/disclosure/listedinfo/announcement/c/2017-03-31/601872_2016_n.pdf

[243] https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm

[244] E.g. the China Shipbuilding Marine Equipment Technology Park, http://www.cssc.net.cn/n5/n18/c18279/content.html

[245] State Council (2009), ''Shipbuilding Industry Adjustment and Revitalisation Plan'', http://www.gov.cn/zwgk/2009-06/09/content_1335839.htm

[246] MIIT, Liangui [2011], No. 597, http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3757378/content.html

[247] State Council, Guofa [2012], No. 28, http://www.gov.cn/zwgk/2012-07/20/content_2187770.htm.

[248] http://www.miit.gov.cn/n1146295/n1652858/n1652930/n4509650/c4510298/content.html; http://www.miit.gov.cn/n1146290/n1146402/n7039597/c7057909/content.html

[249] http://www.most.gov.cn/tztg/200703/t20070326_42350.htm

[250] For the application guide on the 863 Program, see http://www.most.gov.cn/tztg/200703/t20070326_42347.htm

[251] See http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

[252] See http://gdstc.gd.gov.cn/zwgk_n/tzgg/content/post_2715952.html

[253] Cfr. OECD, "Measuring distortions in international markets: the semiconductor value chain", OECD Trade Policy Papers, 2019, No. 234, OECD Publishing, Paris, https://doi.org/10.1787/8fe4491d-en, 9 and 91.

[254] European Chamber of Commerce, ''European Business in China Position Paper 2020/2021'', 287.

[255] For an overview of public investment funds in China and their resources, see A. Malking (Centre for International Governance Innovation), "Made in China 2025 as a Challenge in Global Trade Governance", 2018, https://www.cigionline.org/sites/default/files/documents/Paper%20no.183_0.pdf, 4 or T. Huang (Peterson Institute for International Economics), "Government-Guided Funds in China: Financing Vehicles for State Industrial Policy", 2019, https://www.piie.com/blogs/china-economic-watch/government-guided-funds-china-financing-vehicles-state-industrial-policy

[256] *"The policies that cause financial repression include interest rate ceilings, liquidity ratio requirements, high bank reserve requirements, capital controls, restrictions on market entry into the financial sector, credit ceilings or restrictions on the direction of credit allocation, and the government's ownership or control of banks."*, G. Xu and B. Gui, "From Financial Repression to Financial Crisis? The Case of China.", Asian Pacific Economic Literature 2019, 49.

[257] See for instance the specific regulations on China's Exim Bank and the China Development Bank: *"The Regulation highlights the Exim Bank's position as a policy financial institution to serve national strategies and instructs it to provide sound financial services for key and weak areas of national economic development"*, http://www.cbrc.gov.cn/EngdocView.do?docID=94532989DEE041A192D753A0AB05C092 ; "The Regulation highlights CDB's position as a development financial institution and its features of serving national strategies.", http://www.cbrc.gov.cn/EngdocView.do?docID=312518AB448D45FB814A41423BAEF6F0

[258] V. Marantidou (Jamestown Foundation), "Shipping Finance: China's New Tool in Becoming a Global Maritime Power", China Brief 2018, https://jamestown.org/program/shipping-finance-chinas-new-tool-becoming-global-maritime-power/

[259] http://www.dsic.cn/home/xwzxen/jtxwen/322837.htm

[260] https://lloydslist.maritimeintelligence.informa.com/LL1130213/12-Hu-Xiaolian-The-ExportImport-Bank-of-China

[261] https://www.ise.ie/debt_documents/ListingParticulars_1fcc50ba-fee9-40f7-b101-5e139bab0c29.PDF, 96.

[262] http://www.businesskorea.co.kr/news/articleView.html?idxno=43893

[263] "*In other words, Chinese shipyards' large orders for LNG carriers are not the result of their technology, but rather a substantial domestic order by financing support from the government and Chinese banks.",* https://www.rivieramm.com/news-content-hub/news-content-hub/chinese-financing-backs-massive-qatar-lng-carrier-order-says-analyst-59605

[264] https://www.tradewindsnews.com/shipyards/china-s-new-shipyard-giant-poised-for-4bn-newbuilding-order-spree/2-1-713844; https://www.tradewindsnews.com/tankers/china-showcases-its-shipbuilding-power-at-marintec/2-1-720097; https://www.seatrade-maritime.com/asia/csic-inks-208bn-new-contracts; https://lloydslist.maritimeintelligence.informa.com/LL1126033/CSSC-to-finance-36-newbuilds; https://connect.ihsmarkit.com/upstream-insight/article/phoenix/1540919/cssc-announces-new-orders-for-offshore-vessels; https://lloydslist.maritimeintelligence.informa.com/LL1123831/China-to-back-LNG-as-a-marine-fuel ; https://lloydslist.maritimeintelligence.informa.com/LL1124156/Yard-Talk--Chinese-yards-breathe-easier.

[265] L.W. Cong, H. Gao, J. Ponticelli and X. Yang, "Credit Allocation Under Economic Stimulus: Evidence From China", The Review of Financial Studies 2019, 3415; S. Hardy (Peterson Institute for International Economics), "Financial Repression in China", Policy Brief September 2008, 1-2; L. Klapper, M.S. Martinez Peria and B. Zia, "Banking in China" in A.N. Berger, P. Molyneux and J. Wilson (eds.), *The Oxford Handbook of Banking (3rd ed.)*, 2019, 1120; D. He, H. Wang and X. Yu, ''Interest Rate Determination in China: Past, Present and Future'', International Journal of Central Banking 2015, 255-256 and 262.

[266] T. Yuyan, Y. Ji and Y. Huang, "Completing China's Interest Rate Liberalization", China & World Economy 2016, 2.

[267] L. Zheng, P. Wang and Z. Xu., "Interest-Rate Liberalization and Capital Misallocations," Federal Reserve Bank of San Francisco Working Paper 2017-15, 2020, https://doi.org/10.24148/wp2017-15, 3 and 28.

[268] https://www.piie.com/research/piie-charts/state-owned-chinese-firms-borrowing-far-more-private-firms-despite-lagging; https://www.piie.com/blogs/china-economic-watch/state-sector-support-china-accelerating

[269] PBOC China Monetary Policy Quarter One 2017 Report, http://www.pbc.gov.cn/english/130721/3272835/index.html

[270] For an unofficial English translation, see https://www.wsj.com/public/resources/documents/2019NPC_Financial_Report_EN.pdf?mod=article_inline, 26

[271] Shadow banking essentially refers to a system to provide credit beyond traditional loans. The term is defined by the Financial Stability Board as "credit intermediation involving entities and activities (fully or partly) outside of the regular banking system", see FSB, Global Shadow Banking Monitoring Report 2017. Some forms of shadow banking include trusts, entrusted loans, peer-to-peer lending, wealth management products, a finance company of a conglomerate, or a local government financing vehicle (LGFV).

[272] Financial Stability Board, "Peer Review of China", 2015, https://www.fsb.org/wp-content/uploads/China-peer-review-report.pdf, 29; T. Ehlers, S. Kong, F. Zhu (Bank for International Settlements), "Mapping Shadow Banking in China: Structure and Dynamics", BIS Working Papers 2018, No. 701, https://www.bis.org/publ/work701.pdf, 5 and 10-11.

[273] An entrusted loan is defined by Chen, Z., Z. He, and C. Liu as ''[a] loan between two non-bank parties (e.g., industrial firms) using a bank as an intermediate'', Chen, Z., Z. He, and C. Liu., ''The Financing of Local Government in the People's Republic of China: Stimulus Loan Wanes and Shadow Banking Waxes'', 2018, ADBI Working Paper No. 800, 5.

[274] Y. Lian, "Shadow Banking in China: Implications for Financial Stability and Macroeconomic Rebalancing", The Chinese Economy 2016, 150; The Economist, "Shadow Banking in China. Battling the Darkness", 10 May 2014, https://www.economist.com/finance-and-economics/2014/05/10/battling-the-darkness

[275] http://www.pbc.gov.cn/english/130736/3729741/index.html

[276] See Guiding Opinions on the Promotion of International Capacity Cooperation and Equipment Manufacturing (2015), http://www.gov.cn/zhengce/content/2015-05/16/content_9771.htm

[277] The Decision of the State Council on Implementation of Provisional Regulations on Promoting the Industry Restructuring (Guo Fa [2005], No. 40) for instance instructs all financial institutions to provide credit support specifically to "encouraged" projects.

Article 34 of the Chinese Commercial Bank Law (1995) reads as follows: ''*A commercial bank shall conduct its loan business in accordance with the need for the development of the national economy and social progress and under the guidance of the state industrial policy.''*

[278] See for instance the strategic cooperation agreement between the Shanghai Municipal Government and CSSC, http://www.shanghai.gov.cn/shanghai/node27118/node27818/u22ai90905.html; http://jnshipyard.cssc.net.cn/compay_mod_file/news_detail.php?id=805&cart=3

[279] T. Kenderdine and H. Ling, "International Capacity Cooperation – Financing China's Export of Industrial Overcapacity", Global Policy 2018, 42-45.

[280] BRS Group, Annual Review 2019, https://www.brsbrokers.com/BRS-Review-2019.pdf, 3 and 18-19; https://lloydslist.maritimeintelligence.informa.com/LL1130237/04-Zhao-Jiong-Bocomm-Financial-Leasing-and-Zhao-Guicai-ICBC-Financial-Leasing; https://www.seatrade-maritime.com/asia/chinese-leasing-fast-becoming-prime-form-ship-financing

[281] State Council, the Guiding Opinion on Accelerating the Development of Financial Leasing Industry, Ban Fa [2015], No. 68, http://www.gov.cn/zhengce/content/2015-09/07/content_10144.htm

[282]

http://www.cbrc.gov.cn/EngdocView.do?docID=9B015F8F2E5D428F89911FA2041D852C

[283] http://en.pkulaw.cn/display.aspx?cgid=d5a981f1a1361c1ebdfb&lib=law

[284] Center for Strategic and International Studies (CSIS), ''Hidden Harbors: China's State-Backed Shipping Industry'', 2020, https://www.csis.org/analysis/hidden-harbors-chinas-state-backed-shipping-industry

[285] See State Council, the Guiding Opinion on Accelerating the Development of Financial Leasing Industry, Ban Fa [2015], No. 68, http://www.gov.cn/zhengce/content/2015-09/07/content_10144.htm, Chapter 3: policies and measures.

[286] S. Han and W. Wang, "An Overview of the Development of the Financial Leasing Law in China", Unif.L.Rev. 2011, 244.

[287] In 2019, China Merchants Industry Investments acquired 73.87% of the shares of AVIC International Maritime Holdings for USD 22.8 dollar, https://www.caixinglobal.com/2019-08-29/china-merchants-to-take-over-avics-shipbuilding-assets-101456175.html

[288] OECD, "Ship Finance Practices in Major Shipbuilding Companies", 2019, https://www.oecd-ilibrary.org/science-and-technology/ship-finance-practices-in-major-shipbuilding-economies_e0448fd0-en, 30.

[289] The financial leasing company of CSSC is CSSC (Hong Kong, China) Company Ltd. It was for instance involved in the financing of 36 newbuildings by CSSC, https://www.seatrade-maritime.com/asia/cssc-build-and-finance-36-newbuilds. In a prospectus, the company announces that it held a global market share of 3.9% [USD 191.9 million] in 2018. If one looks at the non-banking ship leasing industry, the company takes the first place worldwide, representing a market share of 14.8% [USD 191.9 million] in 2018, https://www1.hkexnews.hk/listedco/listconews/sehk/2019/0528/ltn20190528017.pdf, 67.

[290] CSSC International for instance holds shares in the Bank of Tianjin, the China Development Bank Financial Leasing Co., and Everbright Securities Company Limited, https://www1.hkexnews.hk/listedco/listconews/sehk/2019/0528/ltn20190528017.pdf, 84.

[291] See Chart published in Trade Winds (2019), https://www.tradewindsnews.com/legal/chinese-lessors-seek-to-refine-their-business-models-in-shipping/2-1-570986

[292] https://www.tradewindsnews.com/opinion/china-s-ship-financing-machine-is-still-going-strong-under-the-radar/2-1-643559

[293] https://www.tradewindsnews.com/legal/chinese-lessors-seek-to-refine-their-business-models-in-shipping/2-1-570986

[294] https://www.seatrade-maritime.com/asia/china-banking-regulator-voices-support-financial-leasing-shipping

[295] https://www.icbcleasing.com/node/99; https://www.tradewindsnews.com/cruise-and-ferry/genting-hong-kong-in-900m-sale-and-lease-back-deal-with-chinese-lessors/2-1-738658

[296] https://maritimenews.id/chinese-leasing-firms-ink-leasing-agreement-for-200-lng-fuelled-vessels/

[297] https://lloydslist.maritimeintelligence.informa.com/LL1129057/Yangzijiang-secures-more-Bocomm-Leasinglinked-VLOC-orders

[298] https://splash247.com/cdb-leasing-ordering-eight-ultramaxes-at-new-dayang/

[299] https://www.hellenicshippingnews.com/sale-and-lease-back-of-ships-a-growing-trend-among-ship-owners-with-the-help-of-chinese-financial-institutions/; http://www.businesskorea.co.kr/news/articleView.html?idxno=43893

[300] https://www.seatrade-maritime.com/asia/china-banking-regulator-voices-support-financial-leasing-shipping

[301] OECD, "Ship finance practices in major shipbuilding economies", 2019, https://www.oecd-ilibrary.org/science-and-technology/ship-finance-practices-in-major-shipbuilding-economies_e0448fd0-en

[302] https://lloydslist.maritimeintelligence.informa.com/LL111954/No-more-finance-for-foreignyard-newbuilds-Chinas-leasing-houses-told?vid=Maritime&processId=4b2d3c48-5e9a-4f52-9771-96d21d02ec2a

[303] China Development Bank, Annual Report 2018, http://www.cdb.com.cn/English/gykh_512/ndbg_jx/2018_jx/, 10-11.

[304] A. Oates, "the Rise of Chinese Financial Leasing", 2017, https://www.marinemoney.com/article/rise-chinese-financial-leasing; V. Marantidou (Jamestown Foundation), "Shipping Finance: China's New Tool in Becoming a Global Maritime Power", China Brief 2018, https://jamestown.org/program/shipping-finance-chinas-new-tool-becoming-global-maritime-power/

[305] For an overview of other policy instruments to promote exports such as VAT tax rebates, free trade agreements, exchange rate, or outbound investments, see J. Holslag, "Geoeconomics in a Globalised World: the Case of China's Export Policy", Asia Europe Journal 2016, 173-184.

[306] E.g. Sinosure, http://www.sinosure.com.cn/en/Resbonsiblity/smic/index.shtml and http://www.sinosure.com.cn/en/Resbonsiblity/iec/index.shtml; e.g. Cexim, http://english.eximbank.gov.cn/News/NewsR/201904/t20190410_8833.html, http://english.eximbank.gov.cn/News/NewsR/201807/t20180730_6758.html

[307] K. Dawar, ''Official Export Credit Support: Competition and Compliance Issues'', Journal of World Trade 2020, 386-387; K. Hopewell, "Power Transitions and Global Trade Governance: the Impact of a Rising China on the Export Credit Regime", Regulation and Governance 2019, 1-2, 6-7 and 10-11.

[308] State Council, ''Opinions on Further Improving the Work of Stabilising Foreign Trade and Foreign Capital'', 2020, no. 28, https://www.creditchina.gov.cn/zhengcefagui/zhengcefagui/zhongyangzhengcefagui1/202008/t20200821_207817.html.

[309] For a general overview of China's Export Credit Agencies and their respective programmes, see OECD, "Chinese Export Credit Policies and Programmes", 2015, http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/ECG%282015%293&doclanguage=en

[310] V. Marantidou (Jamestown Foundation), "Shipping Finance: China's New Tool in Becoming a Global Maritime Power", China Brief 2018, https://jamestown.org/program/shipping-finance-chinas-new-tool-becoming-global-maritime-power/

[311] Cexim Annual Report 2018, http://english.eximbank.gov.cn/News/AnnualR/2018/201912/P020191216390734628082.pdf , 60; Cexim, Annual Report 2017, http://english.eximbank.gov.cn/News/AnnualR/2017/201812/P020181205388465253449.pdf , 55

[312] http://english.eximbank.gov.cn/News/NewsR/201912/t20191227_15545.html

[313] https://www.xindemarinenews.com/en/market/2020/0310/18874.html; https://lloydslist.maritimeintelligence.informa.com/LL1130213/12-Hu-Xiaolian-The-ExportImport-Bank-of-China

[314] ''*He added that Cexim was equipped with abundant liquidity and would be able to offer loans at attractive prices for the vessels.* "That is also part of the reason why Shanghai Waigaoqiao Shipbuilding and Hudong-Zhonghua Shipbuilding can snatch the orders from Hyundai Heavy Industries," *the source added.''*, https://lloydslist.maritimeintelligence.informa.com/-/media/lloyds-list/daily-pdf/2017/august/db-240817.pdf; *''Chinese shipbuilders beat technologically superior Korean competitors with advanced technology on the back of the Chinese government's policy*

financing.'', https://www.hellenicshippingnews.com/chinese-shipbuilders-likely-to-win-1-35-tril-won-order-from-hapag-lloyd-over-korean-companies/

315 https://lloydslist.maritimeintelligence.informa.com/LL1120545/Top-10-women-in-shipping-2017

316 https://lloydslist.maritimeintelligence.informa.com/LL1125353/04-Hu-Xiaolian-the-ExportImport-Bank-of-China; https://www.tradewindsnews.com/finance/cash-for-cosco/2-1-110402

317 https://lloydslist.maritimeintelligence.informa.com/LL1126001/MSC-receives-$439m-scrubber-loan-for-86-ships; https://www.seatrade-maritime.com/europe/msc-secures-439m-financing-86-scrubbers

318 http://www.cmindustry.com.hk/?lang=zh-cn&tn=content&id=563

319 https://www.scmp.com/news/china/diplomacy/article/2184707/why-chinas-subsidised-state-owned-enterprises-anger-us-europe

320 A. Garcia-Herrero and J. Xu (Bruegel), ''How to Handle State-Owned Enterprises in EU-China Investment Talks'', 2017, https://www.bruegel.org/wp-content/uploads/2017/06/PC-18-2017_2.pdf, 12; A. Harrison et al., ''Changing the Tiger's Stripes: Reform of Chinese State-Owned Enterprises in the Penumbra of the State'', 2019, https://voxeu.org/article/reform-chinese-state-owned-enterprises-penumbra-state; L. Yu-Hsin Lin and C.J. Milhaupt, "Party Building or Noisy Signaling? The Contours of Political Conformity in Chinese Corporate Governance", European Corporate Governance Institute, Working Paper No. 493/2020, 22-23.

321 Business Europe, ''The EU and China. Addressing the Systemic Challenge. A Comprehensive EU Strategy to Rebalance the Relationship with China'', 2020, 106.

322 For an overview of China's central SOEs, see the list of the Central Enterprise Directory of SASAC, http://www.sasac.gov.cn/n2588035/n2641579/n2641645/index.html. In the field of maritime affairs, the following central enterprises are relevant: COSCO Group, China Shipping Group, Sinotrans Changhang Group, CSIC, and CSSC.

323 China Institute university of Alberta, ''State-Owned Enterprises in the Chinese Economy Today: Role, Reform and Evolution'', 2018, https://cloudfront.ualberta.ca/-/media/china/media-gallery/research/policy-papers/soepaper1-2018.pdf, 12.

324 Annual Report COSCO Group 2017; COSCO statement, quoted in J. Holslag, *The Silk Road Trap – How China's Trade Ambitions Challenge Europe*, Polity Press, 2019, 104-105.

325 Article 7 of the Law of the People's Republic of China on State-Owned Assets of Enterprises (2008), http://www.gov.cn/flfg/2008-10/28/content_1134207.htmhttp://www.gov.cn/flfg/2008-10/28/content_1134207.htm.

326 http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3757369/content.html, para. 4.(2).1.

327 Dalian (part of CSIC) for instance combines expertise on domestic equipment manufacturing, naval ships, shipbuilding, offshore equipment building, heavy industrial projects, ship maintenance and vessel scrapping.

328 See for the example of COSCO Shipping International (Hong Kong, China) Co. Ltd., Annual Report 2019, https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0422/2020042200871.pdf

329 CSSC for instance enjoys A-level status, http://www.cssc.net.cn/n5/n18/c17964/content.html

[330] China Institute university of Alberta, ''State-Owned Enterprises in the Chinese Economy Today: Role, Reform and Evolution'', 2018, https://cloudfront.ualberta.ca/-/media/china/media-gallery/research/policy-papers/soepaper1-2018.pdf, 9.

[331] Some argue that the remuneration of central SOE's executives is ''based on their competence as party members, at least as much (if not more) than their competence as company members. Profit maximisation is sometimes less important for these executives when they make management or investment decisions, particularly when economic and political objectives conflict.'', see China Institute university of Alberta, ''State-Owned Enterprises in the Chinese Economy Today: Role, Reform and Evolution'', 2018, https://cloudfront.ualberta.ca/-/media/china/media-gallery/research/policy-papers/soepaper1-2018.pdf, 15.

[332] http://en.sasac.gov.cn/2018/07/17/c_7.htm; L.-W. Lin and C.J. Milhaupt, "We Are The (National) Champions: Understanding the Mechanisms of State Capitalism in China", Stanford Law Review 2013, 723 - 728 and 734 et seq.; https://www.scmp.com/news/china/economy/article/2098755/how-communist-party-controls-chinas-state-owned-industrial-titans

[333] For instance the strategic cooperation agreement (2018) between Dalian Huarui Heavy Industry and STX Heavy Industry for the production of low speed diesel engines, http://www.dhhi.com.cn/index.php?g=&m=News&a=news&id=143

[334] E.g. collaborations on research and development, see Notice issued by SASAC on the Opinions by the Ministry of Science and Technology on Further Promoting the Innovation and Development of Central Enterprises, Guokefazi [2018] No.19, http://www.gov.cn/gongbao/content/2018/content_5327472.htm
and Opinions on Promoting the Demonstration and Application of the First Set of Major Technical Equipment by the National Development and Reform Commission, 2018, No. 558, https://www.ndrc.gov.cn/fgsj/tjsj/cyfz/zzyfz/201804/t20180417_1149981.html

[335] See for instance the cooperation agreement between the China Huang Group and CSSC, https://www.seatrade-maritime.com/asia/china-huaneng-group-cooperation-agreement-cssc-energy-sector-development; the strategic cooperation agreement between China Re Group and CSSC, http://eng.chinare.com.cn/zzywwzgb/589258/589291/580620/index.html; the strategic cooperation on LNG projects between DSIC (part of CSIC) and Jiangsu Yake (semiconductor materials), http://www.dsic.cn/home/xwzxen/jtxwen/344149.htm; the strategic cooperation on supply chain financing between DSIC (part of CSSC) and China Shipbuilding Capital Holding, CSIC Factoring Corporation, China CITIC Bank and CSSC, http://www.dsic.cn/home/xwzxen/jtxwen/346438.htm; the memorandum of understanding between DSIC (part of CSSC) and state-owned company Cosco Shipping Energy Transportation on dual-fuelled LNG VLCCs, http://www.dsic.cn/home/xwzxen/jtxwen/340210.htm; and the more general collaboration platform between central SOEs and local businesses in Shanghai, http://www.shanghai.gov.cn/shanghai/node27118/node27818/u22ai89094.html

[336] See for an example of rotation between different state-entities, COSCO Shipping International, https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0422/2020042200871.pdf, 47 et seq.

[337] For example the cooperation between central SOEs and SOEs in Shanghai, http://english.sheitc.sh.gov.cn/news/680362.htm or the different positions held by Mr. Li Chaokun (non-executive Director) at a steel company, finance companies and a shipbuilding company, see Bank of Shanghai, Annual Report 2017, 89.

[338] http://en.sasac.gov.cn/2018/07/17/c_7.htm; L.-W. Lin and C.J. Milhaupt, "We Are The (National) Champions: Understanding the Mechanisms of State Capitalism in China", Stanford Law Review 2013, 707, 711, 723 – 728; W. Leutert, ''State-Owned Enterprises in

Contemporary China'' in L. Bernier, M. Florio and Ph. Bance (eds.), *The Routledge Handbook of State-Owned Enterprises*, New York, Routledge, 2020, http://www.wendyleutert.com/research, 8

[339] K.E. Brodsgaard, "Politics and Business Group Formation in China: The Party in Control?", The China Quarterly 2012, 624-625, 633-639 and 644-645; L.-W. Lin and C.J. Milhaupt, "We Are The (National) Champions: Understanding the Mechanisms of State Capitalism in China", Stanford Law Review 2013, 742; B. Naughton, ''The Transformation of the State Sector: SASAC, the Market Economy, and the New National Champions'' in B. Naughton and K. Tsai (eds.), *State Capitalism, Institutional Adaptation, and the Chinese Miracle,* CUP, 2015, 66.

[340] K.E. Brodsgaard, "Politics and Business Group Formation in China: The Party in Control?", The China Quarterly 2012, 643-644.

[341] W. Leutert, "Firm Control: Governing the State-Owned Economy Under Xi Jinping", China Perspectives 2018, 28.

[342] Ch. Zhang, "How Much Do State-Owned Enterprises Contribute to China's GDP and Employment", 2019, http://documents.worldbank.org/curated/en/449701565248091726/pdf/How-Much-Do-State-Owned-Enterprises-Contribute-to-China-s-GDP-and-Employment.pdf, 10.

[343] MERICS, "Evolving Made in China 2025 – China's Industrial Policy in the Quest for Global Tech Leadership", 2019, 45.

[344] While this conglomerate is mostly active in the shipping industry, it also holds shares in shipbuilding and marine equipment facilities, e.g. Nantong COSCO KHI Ship Engineering Co.

[345] W. Leutert, "Firm Control: Governing the State-Owned Economy Under Xi Jinping", China Perspectives 2018, 28.

[346] K.E. Brodsgaard, "Politics and Business Group Formation in China: the Party in Control?", The China Quarterly 2012, 635.

[347] One example are the investments by state-owned enterprises into the debt-for-equity swaps by CSIC, http://www.chinadaily.com.cn/business/2017-08/19/content_30815047.htm

[348] https://lloydslist.maritimeintelligence.informa.com/LL1120785/Cosco-Shipping-launches-$150m-shipping-fund

[349] https://splash247.com/shenzhen-sets-up-428m-shipping-fund/; https://www.xindemarinenews.com/en/market/2020/0102/17244.html

[350] For more information on the link between political performance and the evaluation of SOE executives, see F. Liu and L. Zhang, "Executive Turnover in China's State-Owned Enterprises: Government-Oriented or Market-Oriented", China Journal of Account Research 2018, 129-149.

[351] WTO (WT/TPR/S/375), Trade Review of China, 2018, 87, nr. 3.178.

[352] Premier of the State Council, Report on the Work of the Government, 13th National People's Congress, http://www.xinhuanet.com/english/2020-05/29/c_139099211.htm, 11.

[353] D. Chen, O. Zhen Li and F. Xin, "Five-Year Plans, China Finance and Their Consequences", China Journal of Accounting Research 2017, 190; W. E. Kovacic, "Competition Policy and State-Owned Enterprises in China", World Trade Review 2017, 708.

[354] IMF Country Report People's Republic of China, No. 17/248, 2017, 25-26; W. Lam and A. Schipke, ''State-Owned Enterprise Reform'' in W. R. Lam, M. Rodlauer and A. Schipke (eds.), *Modernising China – Investing in Soft Infrastructure*, IMF, 2017, 314-315

[355] http://en.people.cn/constitution/constitution.html

[356] Article 7 AML: *"with respect to the industries which are under the control of the State-owned economic sector and have a bearing on the lifeline of the national economy or national security and the industries which exercise monopoly over the production and sale of certain commodities according to law, the State shall protect the lawful business operations of undertakings in these industries, and shall, in accordance with the law, supervise and regulate their business operations and the prices of the commodities and services provided by them, in order to protect the consumers' interests and facilitate technological advance."* http://english.mofcom.gov.cn/article/policyrelease/Businessregulations/201303/20130300045909.shtml

[357] See for example article 163 and following of the by-laws of Sinotrans Ltd. (part of China Merchants Group), https://www1.hkexnews.hk/listedco/listconews/sehk/2020/0602/2020060200115.pdf

[358] Article 21 Interim Regulations on Supervision and Management of State-owned Assets of Enterprises (2003): *"The division, merger, bankruptcy or dissolution of key wholly State-owned enterprises or wholly State-owned companies shall, upon the review by the State-owned assets supervision and administration authority, be reported for approval to the people's government at the corresponding level."*, http://en.sasac.gov.cn/2003/11/24/c_118.htm

[359] China Institute university of Alberta, ''State-Owned Enterprises in the Chinese Economy Today: Role, Reform and Evolution'', 2018, https://cloudfront.ualberta.ca/-/media/china/media-gallery/research/policy-papers/soepaper1-2018.pdf, 13-14.

[360] https://www.caixinglobal.com/2020-06-29/chinas-state-backed-shipbuilders-overcome-coronavirus-slump-101573058.html; https://www.maritime-executive.com/article/china-reports-recovery-in-shipbuilding-volumes-in-ongoing-competition

[361] See https://www.oecd-ilibrary.org/fr/science-and-technology/state-owned-enterprises-in-the-shipbuilding-sector_5264c49c-en

[362] http://www.csoc.cn/show/news/795.html

[363] H. Shen, L. Fang and K. Deng, ''Rise of 'Red *Zaibatsu*' in China: Entrenchment and Expansion of Large State-Owned Enterprises, 1990-2016'', London School of Economics Economic History Working Papers No. 260/2017, 10-11.

[364] S. Chan, ''China's Mounting Corporate Debt – A Crisis in the Making?'', Asian Survey 2018, 838-839 and 842.

[365] https://www.chinadaily.com.cn/a/202007/10/WS5f07cc36a310834817258858.html

[366] US-China Economic and Security Review Commission, ''SOE Megamergers Signal New Direction in China's Economic Policy'', 2018, https://www.uscc.gov/sites/default/files/Research/SOE%20Megamergers.pdf. The report also contains an overview of mergers and acquisitions involving Chinese SOEs that are valued at more than USD 1 billion for the period between 2014 and 2017.

[367] https://www.scmp.com/business/companies/article/1896390/another-shipping-conglomerate-born-beijing-approves-merger; http://europe.chinadaily.com.cn/business/2016-03/16/content_23887841.htm; https://www.chinadaily.com.cn/business/2016-03/16/content_23887666.htm; https://www.seatrade-maritime.com/asia/cmih-takes-over-two-major-shipbuilding-facilities-sinotrans-csc; https://www.caixinglobal.com/2019-08-29/china-merchants-to-take-over-avics-shipbuilding-assets-101456175.html;

https://lloydslist.maritimeintelligence.informa.com/LL1130294/AVIC-quits-shipbuilding-after-China-Merchants-takeover

368

http://www.sdgute.com/en/%E6%8B%9B%E5%95%86%E5%B1%80%E5%B0%86%E6%95%B4%E5%90%88%E4%B8%89%E5%A4%A7%E5%A4%AE%E4%BC%81%E6%97%97%E4%B8%8B%E8%88%B9%E8%88%B6%E6%B5%B7%E5%B7%A5%E4%B8%9A%E5%8A%A1.html; https://splash247.com/china-merchants-integrates-yards-into-jinling-brand/

369 https://www.seatrade-maritime.com/asia/cosco-shipping-guide-merger-cosco-and-china-shipping; https://de.reuters.com/article/china-shipping-cosco/update-2-china-launches-new-shipping-giant-to-battle-downturn-idUKL3N15X22N; https://www.wsj.com/articles/cosco-china-shipping-to-merge-shipbuilding-arms-1475688293; https://www.maritime-executive.com/article/chinese-cabinet-approves-cosco-cscl-merger; https://www.wsj.com/articles/china-cosco-shipping-merger-expected-to-kick-off-further-consolidation-in-industry-1454598139; http://www.chinadaily.com.cn/business/2015-12/11/content_22686563.htm.

370 https://www.tradewindsnews.com/boxships/cosco-tables-6-3bn-offer-for-orient-overseas-international/2-1-121155; https://www.joc.com/maritime-news/container-lines/oocl/oocl-keep-brand-63-million-merger-cosco_20170709.html; https://www.tradewindsnews.com/finance/ownership-change-puts-oocl-on-chinas-belt-and-road-map/2-1-560539; https://www.tradewindsnews.com/weekly/cosco-s-6bn-takeover-of-oocl-is-potent-symbol-of-china-s-power/2-1-122497

371 http://www.gov.cn/zwgk/2009-06/09/content_1335839.htm

372 P.J. Barwick, M. Kalouptsidi and N.B. Zahur, ''China's Industrial Policy: An Empirical Evaluation'', NBER Working Paper, 2019, 7-8 and 31-32; H. Shen, L. Fang and K. Deng, ''Rise of 'Red *Zaibatsu*' in China: Entrenchment and Expansion of Large State-Owned Enterprises, 1990-2016'', London School of Economics Economic History Working Papers No. 260/2017, 33-34.; OECD, ''Imbalances in the Shipbuilding Sector'', 2017, https://www.oecd.org/industry/ind/Imbalances_Shipbuilding_Industry.pdf, 45.

373 These decisions include mergers and acquisitions and internal restructurings. See article 30 and following China's Law on State-Owned Assets of Enterprises (2008), http://www.gov.cn/flfg/2008-10/28/content_1134207.htm.

374 Quote taken from an article in the Financial Times, ''South Korean Shipbuilders Brace for Fight After China Mega-Mergers'', 6 August 2019, https://www.ft.com/content/70221848-b35f-11e9-bec9-fdcab53d6959

375 https://www.ft.com/content/253d7eb0-ca6c-11e5-84df-70594b99fc47

376 https://www.caixinglobal.com/2019-03-30/state-owned-ship-company-swaps-assets-among-units-101399060.html

377 http://www.chinadaily.com.cn/a/201907/03/WS5d1c1a4ea3105895c2e7b664.html; https://www.chinadaily.com.cn/a/202003/30/WS5e814dfba310128217282e58.html

378 W, Leutert, ''Challenges Ahead in China's Reform of State-Owned Enterprises'', 2016, https://www.brookings.edu/articles/challenges-ahead-in-chinas-reform-of-state-owned-enterprises/

379https://www.chinadailyhk.com/articles/139/67/176/1574827563456.html?newsId=113898

380 http://www.businesskorea.co.kr/news/articleView.html?idxno=34130

381 ITF, ''Maritime Subsidies. Do They Provide Value for Money?'', 2019, https://www.itf-oecd.org/sites/default/files/docs/maritime-subsidies-value-for-money.pdf, 43-44.

[382] For example the Special Administrative Measures for Access of Foreign Investment (2020 version), https://www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202006/P020200624549035288187.pdf; the Special Administrative Measures for Foreign Investment Access in Pilot Free Trade Zones (2020 version), https://www.ndrc.gov.cn/xxgk/zcfb/fzggwl/202006/t20200624_1231939.html

For more information, see Opinions of the State Council on Implementing the negative List System for Market Access (2015), http://english.www.gov.cn/policies/latest_releases/2015/11/12/content_281475233639218.htm

[383] E.g. compare Catalogue for Guidance of Foreign Investment Industries (version 2007), http://www.mofcom.gov.cn/aarticle/b/f/200711/20071105248462.html; and Negative List of Foreign Investment (version 2017), http://www.mofcom.gov.cn/article/b/g/201708/20170802635610.shtml

[384] For more information about China's Free Trade Zones and development zones, see China-Britain Business Council, ''In the Zone – A Comprehensive Guide to China's Zones and Regions'', 2019, http://www.cbbc.org/cbbc/media/cbbc_media/4.%20Files/CBBC-In-the-Zone-Report-(May-2019).pdf

[385] https://www.wartsila.cn/en/about/contact-us; https://asia.nikkei.com/Economy/China-expands-Shanghai-free-trade-zone-to-pull-in-investment; https://www.seatrade-maritime.com/europe/bureau-veritas-approved-operate-china-free-trade-zone

[386] https://www.china-briefing.com/news/chinas-2019-negative-lists-encouraged-catalogue-foreign-investment/; https://www.china-briefing.com/news/china-fdi-policy-negative-lists-encouraged-catalogues/

[387] Negative List for Foreign Investments (2019 version), http://images.mofcom.gov.cn/wzs/201906/20190629212130154.pdf; Negative List for Foreign Investments in Pilot Free Trade Zones (2019 version), http://images.mofcom.gov.cn/wzs/201906/20190629212301720.pdf

[388] For the 2007 version, see http://www.gov.cn/gongbao/content/2008/content_1018951.htm; Compare with 2019 version, http://images.mofcom.gov.cn/wzs/201906/20190629212356599.pdf

[389] For an example, see https://www.independent.co.uk/news/science/japan-china-combustible-ice-frozen-fossil-fuel-extract-seafloor-energy-methane-hydrate-a7744456.html

[390] European Chamber of Commerce in China, ''Position Paper 2020/21'', 286.

[391] See MERICS and Rhodium, ''EU-China FDI: Working Towards Reciprocity in Investment Relations'', 2018, https://merics.org/sites/default/files/2020-04/180723_MERICS-COFDI-Update_final_0.pdf

[392] US-China Economic and Security Review Commission, ''How Chinese Companies Facilitate Technology Transfer From the United States'', 2019, https://www.uscc.gov/sites/default/files/Research/How%20Chinese%20Companies%20Facilitate%20Tech%20Transfer%20from%20the%20US.pdf; European Chamber of Commerce, ''European Business in China Position Paper 2019/2020'', 269.

[393] OECD, ''International Technology Transfer Policies'', 2019, https://www.oecd-ilibrary.org/trade/international-technology-transfer-policies_7103eabf-en.

[394] State Council, ''Regulations for the Implementation of the Foreign Investment Law of the People's Republic of China'', 2019, http://www.gov.cn/zhengce/content/2019-12/31/content_5465449.htm?trs=1

[395] For more information on local content requirements, see K. Gourdon and J.J. Guilhoto (OECD), ''Local Content Requirements and Their Economic Effect on Shipbuilding'', 2019, https://www.oecd-ilibrary.org/science-and-technology/local-content-requirements-and-their-economic-effect-on-shipbuilding_90316781-en

[396] European Chamber of Commerce, ''European Business in China Position Paper 2019/2020'', 269.

[397] https://www.seatrade-maritime.com/europe/greek-pm-raise-concerns-over-china-tariffs-maritime-services; https://info.lr.org/l/12702/2019-08-29/7x5dcm; https://www.swzmaritime.nl/news/2019/09/12/maritime-service-suppliers-can-only-work-in-china-with-chinese-entity/

[398] https://icsclass.org/uncategorized/new-requirements-for-service-suppliers-in-china/

[399] E.g. https://www.creditchina.gov.cn/hangyexinyong_824/disanfxinyongjianguan/201712/t20171225_104541.html

For an example of a corporate credit score, see Zhanjiang Shipyard, https://www.creditchina.gov.cn/xinyongxinxixiangqing/xyDetail.html?searchState=1&entityType=1&keyword=%E6%B9%9B%E6%B1%9F%E9%80%A0%E8%88%B9%E5%8E%82&uuid=37670cf8f003961cdf50669aa456ca6d&tyshxydm=91440800194382739R

[400] http://english.www.gov.cn/policies/latest_releases/2015/11/12/content_281475233639218.htm, para. 20.

[401] See http://www.csname.org.cn/csnamexshx/336242.htm

[402] MIIT, 2018, no. 287, http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c6567267/content.html

[403] State Council, http://www.gov.cn/xinwen/2018-12/30/ content_5353550.htm

[404] https://global.chinadaily.com.cn/a/201907/08/WS5d22ae83a3105895c2e7c3ad.html; http://www.xinhuanet.com/english/2019-07/08/c_138209016.htm; https://www.hellenicshippingnews.com/china-to-promote-smart-ship-development-maritime-environmental-protection/

[405] https://www.ccs.org.cn/ccswz/specialDetail?id=201900001000009739

[406] https://www.ccs.org.cn/ccswz/specialDetail?id=201900001000008283

[407] http://en.people.cn/n3/2019/0829/c90000-9610205.html

[408] https://global.chinadaily.com.cn/a/201909/05/WS5d7077caa310cf3e35569e0c.html

[409] https://www.rivieramm.com/news-content-hub/news-content-hub/dalian-shipbuilding-completes-sea-trials-of-first-intelligent-vlcc-55294; http://www.xinhuanet.com/english/2019-08/28/c_138345769.htm; https://www.chinadaily.com.cn/a/201907/08/WS5d22ae83a3105895c2e7c3ad.html

[410] http://subsites.chinadaily.com.cn/guangzhou/2017-11/03/c_109056.htm

[411] The IMO defines a Maritime Autonomous Surface Ship (MASS) as *''a ship which, to a varying degree, can operate independently of human interaction*'', http://www.imo.org/en/MediaCentre/PressBriefings/Pages/08-MSC-99-MASS-scoping.aspx

[412] See for instance the recent initiative by HMM and Samsung Heavy to develop smart digital ship technologies, https://www.seatrade-maritime.com/technology/hmm-samsung-heavy-develop-smart-digital-ship-technologies

[413] It has to be noted that the total number of patents is distinguished from the quality of the patents, for more information see P. Boeing and E. Mueller, ''Measuring Patent Quality in Cross-Country Comparison'', Economics Letters 2016, 145-147, https://www.sciencedirect.com/science/article/pii/S0165176516304475

[414] https://thetius.com/china-will-be-a-leader-in-autonomous-shipping-by-2025/; https://lloydslist.maritimeintelligence.informa.com/LL1131938/China-forecast-to-lead-autonomous-shipping-sector-by-2025; https://www.forbes.com/sites/ralphjennings/2018/03/14/china-is-developing-a-fleet-of-high-tech-ships-with-no-captains/#6c7cd86d49be

[415] https://www.chinadaily.com.cn/a/201912/17/WS5df83230a310cf3e3557e8fe.html. For an overview of China's milestones in autonomous shipping, see https://www.rivieramm.com/opinion/opinion/china-achieves-autonomous-shipping-milestones-57333

[416] https://splash247.com/dalian-maritime-university-and-dsic-to-set-up-autonomous-ship-lab/

[417] https://www.tradewindsnews.com/finance/icbc-leasing-eyes-financing-for-autonomous-shipping/2-1-616939

[418] http://www.mot.gov.cn/jiaotongyaowen/201912/t20191212_3308079.html

[419] https://www.hellenicshippingnews.com/chinas-lng-fueled-containership-can-it-be-delivered-this-time/

[420] https://safetyatsea.net/news/2018/china-outlines-plans-to-boost-lng-as-ship-fuel/

[421] For more information, see S. O'Sullivan, ''China's Natural Gas Development Report – Reality Check'', 2019, https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/11/Chinas-Natural-Gas-Development-Report.pdf; Ch. Wan, X. Yan, J. Shi, S. Fu and A.K.Y. Ng., ''Emerging LNG-fuelled Ships in the Chinese Shipping Industry: a Hybrid Analysis on its Prospects'', WMU Journal of Maritime Affairs 2015, 43-59

[422] Mr. Keyi Hu (Chief Engineering at Jiangnan Shipbuilding) was cited in https://new.abb.com/news/detail/24756/the-impact-of-lng-on-maritime-china

[423] https://www.motorship.com/gfsconference/latest-news101/nine-chinese-yards-sign-lng-agreement; https://www.seatrade-maritime.com/asia/chinese-leasing-firms-ink-leasing-agreement-200-lng-fuelled-vessels

[424]https://www.sajn.or.jp/files/view/articles_doc/src/4e974c24a2c6d2a385b2a9fda4ceb573.pdf

[425] https://www.tradewindsnews.com/insight/hudong-zhonghua-to-double-its-output-of-lng-carriers/2-1-705226; https://www.tradewindsnews.com/gas/qatar-turns-to-china-for-first-of-120-lng-newbuilding-slots/2-1-795486; https://www.tradewindsnews.com/shipyards/cosco-and-petrochina-join-forces-for-555m-lng-carrier-order/2-1-798049; https://www.tradewindsnews.com/shipyards/petronas-signs-with-hudong-zhonghua-for-midsize-lng-carriers/2-1-738558

[426] http://www.businesskorea.co.kr/news/articleView.html?idxno=44726

[427] http://www.csic.com.cn/n5/n18/c16852/content.html; http://www.csoc.cn/show/news/818.html

[428] http://www.businesskorea.co.kr/news/articleView.html?idxno=43893

[429] https://www.hellenicshippingnews.com/chinas-lng-fueled-containership-can-it-be-delivered-this-time/

[430] Please see OECD policy brief on government support https://www.oecd.org/trade/documents/covid-19-government-support.pdf

[431] For more information about the ''Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era'', see http://www.xinhuanet.com/english/2018-03/17/c_137046261.htm. Xi Jinping's thought is founded on four pillars (the ''four comprehensives''): 1) building a moderately prosperous society; 2) deepening reform; 3) governing the nation according to the law; 4) tightening party discipline. For more information on the ''four comprehensives'', see J. Garrick and Y.B. Bennett, ''Xi Jinping Thought'', China Perspectives 2018, https://journals.openedition.org/chinaperspectives/7872

[432] For a recent example, see the ordering of five mega-container ships at two COSCO shipyards by the Orient Overseas Container Line (OOCL), a COSCO controlled company, https://www.seatrade-maritime.com/shipbuilding/oocl-orders-five-23000-teu-boxships-cosco-yards-778m; https://www.chinadaily.com.cn/a/202003/11/WS5e6888bfa31012821727e337.html

Another recent example is the ordering of 12 tankers by the SOE Shandong Shipping at New Times Shipbuilding and Cosco, financed by ICBC, https://worldmaritimenews.com/archives/283359/shandong-shipping-orders-12-tankers-bulkers-in-china/

[433] E.g. OECD, "Measuring distortions in international markets: the semiconductor value chain", OECD Trade Policy Papers, 2019, No. 234, OECD Publishing, Paris, https://doi.org/10.1787/8fe4491d-en .
OECD, "Measuring distortions in international markets: the aluminium value chain", OECD Trade Policy Papers, 2019, No. 218, OECD Publishing, Paris, https://doi.org/10.1787/c82911ab-en .

[434] Ministry of Commerce, Ministry of Science and Technology, National Development and Reform Commission and Ministry of Foreign Affairs, ''Notice on the Special Plan for Promoting Scientific and Technological Innovation and Cooperation in the Construction of the ''Belt and Road Technology Innovation Cooperation'', 2016, http://www.most.gov.cn/tztg/201609/t20160914_127689.htm

[435] National Development and Reform Commission and State Oceanic Administration, ''Plan for the Construction of Maritime Cooperation of the ''Belt and Road Initiative'', 2017, http://www.gov.cn/xinwen/2017-11/17/5240325/files/13f35a0e00a845a2b8c5655eb0e95df5.pdf

[436] It has to be remarked that there is no universal definition of the Belt and Road Initiative, so it is hard to define which projects fall under its scope.

[437] Chapter 51 China's 13th Five-Year Plan.

[438] https://asia.nikkei.com/Spotlight/Belt-and-Road/China-drops-11bn-anchors-to-expand-Maritime-Silk-Road

[439] http://en.people.cn/n3/2019/1115/c90000-9632652.html

[440] A recent report by the European Chamber of Commerce in China illustrates the even from a purely economic angle, the BRI remains controversial in terms of transparency, a fair procurement system and fair competition, European Chamber of Commerce in China, "The Road Less Travelled. European Involvement in China's Belt and Road Initiative.", 2020, p.52.

[441] OECD, "China's Belt and Road Initiative in the Global Trade, Investment and Finance Landscape" in Business and Finance Outlook 2018, 33-34; Steer Davies Gleave (European Parliament, Policy Department for Structural and Cohesion Policies), "Research for TRAN Committee: The New Silk Road – Opportunities and Challenges for EU Transport", 2018,

26-29; https://www.economist.com/special-report/2020/02/06/china-wants-to-put-itself-back-at-the-centre-of-the-world.

[442] M. Funaiole and J. Hillman (Center for Strategic and International Studies), "China's Maritime Silk Road", 2018, 21-23.

[443] M. Ye, "Fragmentation and Mobilization: Domestic Politics of the Belt and Road in China", Journal of Contemporary China 2019, 696 et seq.

[444] Note that some of the debt renegotiations are still ongoing. In addition, the note by Rhodium raises the caveat that at least two dozen cases are probably missing in their data analysis. So, the total amount of debt renegotiations is higher than USD 50 bn.

[445] A. Kratz, A. Feng and L. Wright (Rhodium Group), "New Data on the "Debt Trap" Question", 2019, https://rhg.com/research/new-data-on-the-debt-trap-question/

[446] See Ministry of Commerce, http://hzs.mofcom.gov.cn/article/date/202001/20200102932445.shtml; http://hzs.mofcom.gov.cn/article/date/201901/20190102829086.shtml; http://hzs.mofcom.gov.cn/article/date/201801/20180102699459.shtml; http://hzs.mofcom.gov.cn/article/date/201701/20170102504429.shtml.

[447] For more information, see China Investment Research, "Chinese Policy Banks and the Rapid Build Out of the 21st Century Maritime Routes (2013-2015)", 2016, http://www.chinainvestmentresearch.org/wp-content/uploads/2016/03/Article_Chinese-Policy-Bank-Loans_2013-2015.pdf.

[448] MOFCOM announced in 2019 that the ICBC had provided trillions of yuan to the manufacturing industry, including the shipbuilding industry, http://english.mofcom.gov.cn/article/counselorsreport/asiareport/201903/20190302840560.shtml

[449] http://www.silkroadfund.com.cn/enweb/23775/23767/index.html

[450] OECD, "China's Belt and Road Initiative in the Global Trade, Investment and Finance Landscape" in Business and Finance Outlook 2018, 20-21; Steer Davies Gleave (European Parliament, Policy Department for Structural and Cohesion Policies), "Research for TRAN Committee: The New Silk Road – Opportunities and Challenges for EU Transport", 2018, 39-43.

[451] China Research Investment, "BRI Pulse – Structural Changes in BRI Financing", 2019, http://www.chinainvestmentresearch.org/wp-content/uploads/2019/07/BRI-Pulse__Structural-Changes-in-BRI-Financing.pdf

[452] https://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1249618.shtml

[453]http://english.www.gov.cn/archive/publications/2017/06/20/content_281475691873460.htm

[454]http://english.www.gov.cn/state_council/ministries/2017/06/21/content_281475692760102.htm; http://www.xinhuanet.com/english/2017-06/20/c_136380414.htm

[455] While The North Sea Route may significantly reduce sailing distance between Europe and China, this navigation route remains highly controversial (e.g. environmental concerns). Therefore, some argue that its significance should not be overstated, see Malte Humpert (Center for Circumpolar Security Studies), "The Future of Arctic Shipping: A New Silk Road for China?", 2013, 20 and Malte Humpert (Center for Circumpolar Security Studies), "Arctic Shipping: An Analysis of the 2013 Northern Sea Route Season", 2013, 14.

[456] See China's White Paper on Arctic Policy (2018), http://english.www.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm; http://www.cansi.org.cn/ifor/shownews.php?lang=cn&id=13003

[457]http://english.www.gov.cn/news/top_news/2018/06/04/content_281476171710974.htm

[458] http://www.gov.cn/xinwen/2018-09/12/content_5321170.htm

[459] https://thediplomat.com/2020/01/chinas-shipbuilders-seek-new-inroads-in-arctic-shipping/

[460] http://subsites.chinadaily.com.cn/guangzhou/2018-12/05/c_303356.htm

[461] http://www.gov.cn/gzdt/2013-12/12/content_2546677.htm

[462] http://www.pric.org.cn/EN/

[463] http://en.people.cn/n3/2019/0621/c90000-9590285.html

[464] H. Tillman, Y. Jian and E.T. Nielsson, "China's New Frontier of International Cooperation", China Quarterly of International Strategic Studies 2018, 345-362.

[465] See State Council, ''Regulations on the Administration of Domestic Waterway Transportation'', 2017, http://www.gov.cn/gongbao/content/2017/content_5219180.htm; For an overview of China's regional development and its link with the Belt and Road Initiative, see F. M. Cheung and Y. Hong (eds.), *Regional Connection Under the Belt and Road Initiative. The Prospects for Economic and Financial Cooperation*, Routledge, 2019, p.280.

[466] For more information, see the website of the Yangtze River Water Resources Commission of the Ministry of Water Resources, http://www.cjw.gov.cn/xwzx/ztjjx/yjjd/

[467] Ch. Sun, L. Chen and Y. Tian, "Study on the Urban State Carrying Capacity for Unbalanced Sustainable Development Regions: Evidence from the Yangtze River Economic Belt", Ecological Indicators 2018, 150-158; http://www.xinhuanet.com/english/2019-04/16/c_137982056.htm.

[468] http://www.most.gov.cn/kjbgz/201210/t20121009_97154.htm

[469] http://www.most.gov.cn/kjbgz/201708/t20170825_134596.htm; https://pol.ouc.edu.cn/2014/0417/c12359a181595/page.htm; http://download.most.gov.cn/20120224095540968.pdf

[470] http://www.most.gov.cn/tztg/200703/t20070326_42350.htm

[471] http://www.most.gov.cn/tztg/200703/t20070327_42368.htm

[472] http://www.most.gov.cn/tztg/201010/P020101021500064211903.pdf

[473] http://www.most.gov.cn/tztg/200703/t20070327_42368.htm

[474] http://www.most.gov.cn/tztg/201304/t20130416_100890.htm

[475] http://www.most.gov.cn/tztg/201304/t20130416_100890.htm

[476] http://www.most.gov.cn/tztg/201304/t20130416_100890.htm

[477] http://www.edu.cn/rd/gao_xiao_cheng_guo/cheng_guo_zhan_shi/201410/t20141017_1190822_1.shtml; http://www.most.gov.cn/kjbgz/201404/t20140428_112919.htm; http://www.most.gov.cn/kjbgz/201807/t20180713_140547.htm; http://download.most.gov.cn/20120224095540968.pdf

[478] http://www.miit.gov.cn/n1146295/n1652858/n1652930/n4509650/c4510298/content.html

[479] http://www.miit.gov.cn/n1146295/n1652858/n1652930/n4509650/c4510298/content.html

480 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html

481 http://www.miit.gov.cn/n1146290/n1146402/n7039597/c7057909/part/7057910.pdf

482 http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763289/content.html

483 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html

484 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html

485 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html

486 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html; http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740623/content.html; http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

487 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740660/content.html

488 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740623/content.html

489 http://www.miit.gov.cn/n1146285/n1146352/n3054355/n7697926/n7697960/c7740623/content.html

490 http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

491 http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

492 http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

493 See http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c3763285/content.html

494 http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shui5.cn/uploads/soft/180108/3-1P10R04545.pdf; http://www.shudouzi.com/shuishou/2746.html; http://www.shui5.cn/article/9a/117553.html; http://www.gov.cn/xinwen/2019-12/09/content_5459584.htm; http://www.gov.cn/xinwen/2019-12/09/5459584/files/a09a2e188cf24941a5292f8ce18118e1.pdf

495 http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

496 http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[497] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[498] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[499] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[500] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[501] http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shudouzi.com/shuishou/2746.html

[502] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shudouzi.com/shuishou/2746.html

[503] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shudouzi.com/shuishou/2746.html; http://www.shui5.cn/article/9a/117553.html; http://www.gov.cn/xinwen/2019-12/09/content_5459584.htm

[504] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shudouzi.com/shuishou/2746.html

; http://www.shui5.cn/article/9a/117553.html; http://www.gov.cn/xinwen/2019-12/09/content_5459584.htm

[505] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[506] http://www.shui5.cn/article/12/58140.html; http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[507] http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm; http://www.shudouzi.com/shuishou/2746.html; http://www.shui5.cn/article/9a/117553.html; http://www.gov.cn/xinwen/2019-12/09/content_5459584.htm

[508] http://www.shui5.cn/uploads/soft/180108/3-1P10R04545.pdf; http://www.gov.cn/xinwen/2019-12/09/5459584/files/a09a2e188cf24941a5292f8ce18118e1.pdf

[509] http://www.gov.cn/gzdt/2014-02/28/content_2625354.htm

[510] http://www.shui5.cn/uploads/soft/180108/3-1P10R04545.pdf

[511] http://www.shui5.cn/uploads/soft/180108/3-1P10R04545.pdf; http://www.gov.cn/xinwen/2019-12/09/5459584/files/a09a2e188cf24941a5292f8ce18118e1.pdf