

“China’s Merchant Marine”
A paper for the China as “Maritime Power” Conference
July 28-29, 2015
CNA Conference Facility
Arlington, Virginia
by

Dennis J. Blasko¹

Introductory Note: The Central Intelligence Agency’s *World Factbook* defines “merchant marine” as “all ships engaged in the carriage of goods; or all commercial vessels (as opposed to all nonmilitary ships), which excludes tugs, fishing vessels, offshore oil rigs, etc.”² At the end of 2014, the world’s merchant ship fleet consisted of over 89,000 ships.³ According to the BBC:

Under international law, every merchant ship must be registered with a country, known as its flag state.

That country has jurisdiction over the vessel and is responsible for inspecting that it is safe to sail and to check on the crew’s working conditions.

Open registries, sometimes referred to pejoratively as flags of convenience, have been contentious from the start.⁴

¹ Dennis J. Blasko, Lieutenant Colonel, U.S. Army (Retired), a Senior Research Fellow with CNA’s China Studies division, is a former U.S. army attaché to Beijing and Hong Kong and author of *The Chinese Army Today* (Routledge, 2006). The author wishes to express his sincere thanks and appreciation to Rear Admiral Michael McDevitt, U.S. Navy (Ret), for his guidance and patience in the preparation and presentation of this paper.

² Central Intelligence Agency, “Country Comparison: Merchant Marine,” *The World Factbook*, <https://www.cia.gov/library/publications/the-world-factbook/fields/2108.html>. According to the *Factbook*, “DWT or dead weight tonnage is the total weight of cargo, plus bunkers, stores, etc., that a ship can carry when immersed to the appropriate load line. GRT or gross register tonnage is a figure obtained by measuring the entire sheltered volume of a ship available for cargo and passengers and converting it to tons on the basis of 100 cubic feet per ton; there is no stable relationship between GRT and DWT.”

³ Richard Scott, “China-owned ships: a rapid rise to become one of the world’s largest fleets,” *International Shipping News*, March 17, 2015, <http://www.hellenicshippingnews.com/china-owned-ships-a-rapid-rise-to-become-one-of-the-worlds-largest-fleets/>.

⁴ “Why so many shipowners find Panama’s flag convenient,” BBC, August 5, 2014, <http://www.bbc.com/news/world-latin-america-28558480>.

The BBC goes on to say that shipowners may register their ships in foreign countries “to avoid the stricter marine regulations imposed by their own countries.”

In the *Factbook*, the “merchant marine” entry for each country starts with the “total” number of merchant marine ships (of 1,000 gross register tonnage or above) and a breakdown of types of ships included in that number (as of 2010). It then gives the number of “foreign-owned” ships, which fly the flag of that country but belong to owners in another; and ships “registered in other countries,” which belong to owners in that country but fly the flag of another. The *Factbook* does not specify how many ships are both owned and registered (fly the flag) in each country listed.

Unfortunately, comparing the world’s merchant marine fleets with one another is fraught with difficulty, due to different methods of accounting (for example, by number of ships, where they are registered, deadweight tonnage, or gross register tonnage); inconsistencies in data; old information; and constant changes in information as fleets add newly built ships, scrap old ships, and buy and sell existing ships.⁵

There appears to be no single, “one-stop shopping” source of information (freely available) that aggregates pertinent, up-to-date information about all the world’s merchant fleets. Accordingly, the numbers and rankings in this paper, gathered from a variety of sources over a number of years, should be considered general estimates, subject to change, rather than precise measurements. Nonetheless, one general trend is readily apparent from the information available: China’s merchant marine fleet is growing and becoming an increasingly important element of the country’s maritime power.

⁵ Due to the limited and inconsistent data, I have made no attempt to calculate the merchant marine sector’s economic, i.e., monetary, contribution to or percentage of the

China is a major maritime as well as land country.

— *The Diversified Employment of China's Armed Forces*
Chinese Ministry of National Defense, April 2013

The seas and oceans bear on the enduring peace, lasting stability and sustainable development of China. The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests. It is necessary for China to develop a modern maritime military force structure commensurate with its national security and development interests, safeguard its national sovereignty and maritime rights and interests, protect the security of strategic SLOCs and overseas interests, and participate in international maritime cooperation, so as to provide strategic support for building itself into a maritime power.

— *China's Military Strategy*
Chinese Ministry of National Defense, May 2015

Introduction and Industry Overview

Maritime power consists of many elements and sub-elements, including civilian/commercial, government/law enforcement/paramilitary, and military organizations and entities. China's quest to establish itself as a maritime power includes developments in all these sectors. Its civilian, commercial merchant marine already has become a major component in building the PRC into a major maritime *economic* power; and its merchant marine also potentially is a significant component of the country's *military* power. Despite a slow start after the founding of the People's Republic of China (PRC), China's merchant marine force, overseen by the Ministry of Transport, naturally has grown as China's international trading footprint has expanded over the past three and a half decades. Undoubtedly it will be an essential element in moving goods along the Maritime Silk Road in the future.⁶

A 2011 CNA study observed that ideological factors inhibited the development of China's merchant marine in the first decades of the PRC's existence:

⁶ According to the "Vision And Actions On Jointly Building Silk Road Economic Belt And 21st-Century Maritime Silk Road," from March 2015, "The 21st-Century Maritime Silk Road is designed to go from China's coast to Europe through the South China Sea and the Indian Ocean in one route, and from China's coast through the South China Sea to the South Pacific in the other." See http://news.xinhuanet.com/english/china/2015-03/28/c_134105858.htm.

Chinese economic policy before 1979 focused on self-reliance and minimized the role of trade in economic development. China was not integrated into the world market; nor did it seek to be.... a key component of Mao's national defense strategy focused attention away from the sea and into the interior of the country. *Not surprisingly, development of China's merchant marine was slow. China did not establish its own shipping firm until the early 1960s, and throughout the Maoist period its merchant fleet remained underdeveloped.* China's overseas interests were primarily ideological, not economic or maritime.⁷ (Emphasis added.)

But then national development policy changes, led by Deng Xiaoping, promoted China's "reform and opening," and the PRC's merchant marine started to grow. Since then, China has become one of the world's top-tier ocean shipping nations.

In 2014, a document entitled the "Opinion of the State Council on Promoting the Sound Development of the Shipping Industry" (国务院促进海运业健康发展的若干意见) declared China's maritime shipping industry (海运业) to be an "important basic industry for economic and social development."⁸ It outlined a number of reforms to strengthen the industry, including optimizing the structure of the fleet, improving its global network, transforming and upgrading shipping enterprises, deepening reform of the industry, enhancing its international competitiveness, and promoting green development. As the Opinion was released, the vice minister of transport stated China ranked fourth among the world's shipping industries, with a total carrying capacity of 142 million in deadweight tons, amounting to 8 percent of the world total. China's merchant fleet was said to be distributed among 240 shipping companies.⁹ Over 90 percent of China's international trade is shipped by sea, but Chinese shipping companies carry only 25 percent of its

⁷ Thomas J. Bickford, Heidi A. Holz, and Frederic Vellucci, Jr., *Uncertain Waters: Thinking About China's Emergence as a Maritime Power*, CNA Research Memorandum D0025813.A1, September 2011, p. 11.

⁸ "国务院促进海运业健康发展的若干意见" [Opinion of the State Council on Promoting the Sound Development of the Shipping Industry], State Council Document #32, dated August 15, 2014, http://www.gov.cn/zhengce/content/2014-09/03/content_9062.htm. The Opinion did not identify the shipping industry as a "strategic industry" (战略产业 or 战略工业), but rather, somewhat ambiguously, was "first time that the State Council drew up policies for long-term, systematic development of the shipping industry, *lifting the industry's status as of strategic importance for the country*," (emphasis added) according to Jing Yang and Ray Chan, "State Council issues guidelines to reform shipping industry," *South China Morning Post*, September 4, 2014, <http://www.scmp.com/business/china-business/article/1584738/state-council-issues-guidelines-reform-shipping-industry>.

⁹ "Opinions on the Sound Development of the Maritime Industry, Maritime strategy at the national level," September 4, 2014, <http://www.safety4sea.com/opinions-on-the-sound-development-of-the-maritime-industry-21915>.

imports and exports.¹⁰ Therefore, the sector is seen as having major potential for expansion.

Demonstrating the problem of consistency in data, a year before the Opinion was released, a UN organization credited China with a 4.226 percent of the total world merchant fleet in 2013 and Hong Kong with a 7.94 percent share (apparently based on DWT).¹¹ Nonetheless, by any method of counting, China's merchant marine fleet ranks as one of the world's top shipping fleets.

According to Ministry of Transport statistics, "China had about 172,000 civilian ships at the end of last year [2014]. More than 11,000 were dedicated to inshore transportation operations and around 2,600 performed ocean transportation."¹² The number 2,600 is assumed to represent Chinese-owned ships (it is unclear whether this means that the ships necessarily are registered in China), most of which probably could be considered merchant marine, and appears credible when compared with estimates from foreign sources. Though some of the following information is several years old, analysis of multiple types of data provides an idea of the Chinese shipping fleet's size and growth.

According to the *CIA World Factbook*, in 2010, China's merchant fleet ranked third largest in the world, with 2,030 "total" ships, behind Panama with 6,413 and Liberia with 2,559 (these numbers represent ships owned by and registered in the country *plus* foreign-owned ships registered in that country). If Hong Kong's 1,644 merchant ships were included, China would move into second place. By contrast, the United States is listed as number 26, with 393 ships. Of the 2,030 Chinese ships, 22 are listed as foreign owned (including 18 owned by Hong Kong) and 1,559 are registered in other countries (including 500 in Hong Kong and 534 in Panama).¹³ Table 1 shows the top 10 rankings (plus the United States) for the various merchant fleets, according to the *Factbook*.

Table 1. Number of Ships in the Top 10 Merchant Fleets Registered in That Country
(Source: *CIA World Factbook*)

¹⁰ Zhao Lei, "FTZ to allow foreign, private players in shipping industry," *China Daily*, September 4, 2014, http://usa.chinadaily.com.cn/epaper/2014-09/04/content_18548081.htm.

¹¹ "General Profile: China," United Nations Conference on Trade and Development (UNCTAD) <http://unctadstat.unctad.org/CountryProfile/156/en156GeneralProfile.html>, <http://unctadstat.unctad.org/CountryProfile/344/en344GeneralProfile.html>.

¹² "New rules mean ships can be used by military," *PLA Daily*, June 18, 2015, http://english.chinamil.com.cn/news-channels/china-military-news/2015-06/18/content_6546905.htm.

¹³ "Country Comparison: Merchant Marine," <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2108rank.html#ch>; "Field Listing: Merchant Marine," <https://www.cia.gov/library/publications/the-world-factbook/fields/2108.html>.

Country	Total	Foreign owned	Registered in other countries
Panama	6,413	5,162	1
Liberia	2,559	2,581	N/A
China	2,030	22	1,559
Malta	1,650	1,437	2
Hong Kong	1,644	976	341
Singapore	1,599	966	344
Marshall Islands	1,593	1,468	N/A
Indonesia	1,340	69	95
Antigua & Barbuda	1,257	1,215	N/A
Bahamas	1,160	1,063	6
U.S. (#26)	393	85	794

Another way of comparing the numbers is to subtract foreign-owned ships flying flags of convenience from a country's total, leaving only ships owned by and registered in that country. As shown in table 2, China leads this list, followed by Indonesia and Panama. If ships owned by and registered by Hong Kong are added, then China's lead increases considerably.

Table 2. Number of Ships in the Top 10 Merchant Fleets Owned by and Registered in the Country of Ownership (Source: *CIA World Factbook*)

Country	Total	(Minus) Foreign owned	Owned by and registered in country
China	2,030	22	2,008
Indonesia	1,340	69	1,271
Panama	6,413	5,162	1,251
Hong Kong	1,644	476	1,168 (500 owned by mainland China)
Russia	1,143	155	988
Greece	860	42	818
ROK	786	31	755
Japan	684	0	684
Singapore	1,599	966	633
Italy	681	90	591
U.S.	393	85 (None by China/HK)	308

If one simply calculates the total number of ships owned and registered in the country *plus* the number of ships owned and registered in other countries, thus flying many flags, Table 3 shows that Japan has the largest merchant fleet (flying flags of all countries), with China close behind and Greece in third place. However, if the fleet owned and operated by Hong Kong is added to China's numbers, then the combination of the two surpasses Japan with over 4,500 ships. Though these numbers are old, the rankings

probably have not changed too much over the following years. The point being that China by itself already has a world class merchant marine, when the 1168 Hong Kong (greater China) ships with Hong Kong or Chinese owners are added it has the largest merchant fleet in the world directly controlled by Chinese (including Hong Kong) owners.

Table 3. Number of Ships in the Top 10 Merchant Fleets Registered in All Countries
(Source: *CIA World Factbook*)

Country	Total	(Minus) Foreign owned	(Plus) Registered in other countries	Total owned and registered in country <u>plus</u> owned and registered in other countries
Japan	684	0	3,122	3,806
China	2,030	22	1,559	3,567
Greece	860	42	2,459	3,277
Hong Kong	1,644	476	341	1,509 (Total owned by China and HK, flying all flags, is 5,076)
Norway	585	81	974	1,478
Russia	1,143	155	439	1,427
Indonesia	1,340	69	95	1,366
Turkey	629	1	645	1,273
Panama	6,413	5,162	1	1,252
ROK	786	31	457	1,212
U.S.	393	85	794	1,102

To summarize these calculations, *based on numbers of ships*:

- Ships owned by and registered in China and Hong Kong *plus* ships owned by foreign countries and registered in China and Hong Kong (ships of *all nationalities* flying Chinese and Hong Kong's flags): second in the world, behind Panama
- Ships owned by *and* registered in China and Hong Kong (flying Chinese and Hong Kong flags): first in the world
- Ships owned by and registered in China and Hong Kong (flying Chinese and Hong Kong flags) *plus* those owned by China and Hong Kong and registered in *another* country (flying the other country's flag): first in the world.

However, if the unit of measure is switched from ship count to *gross tonnage*, British expert Richard Scott from the China Maritime Centre, University of Greenwich, has calculated that Chinese-owned ships rank third in the world, behind Greece and Japan.

The rate of growth of the merchant fleet has been phenomenal, Scott reports that the Chinese-owned fleet tripled in size from 2004 to 2014 due to purchases of second-hand ships from foreign countries and the acquisition of a vast number of newly built ships, with the bulk carrier fleet undergoing the most rapid advance. At the same time, the average vessel size grew from 9,859 GT to 18,242 GT, an 85 percent increase, as newer ships were added to the fleet. At the end of 2014, 80 percent of China's tankers were less than 10 years old, while the corresponding percentages were 68 percent for bulk carriers and 51 percent for container ships. Scott states that after two consecutive years (2009 and 2010) of 25 percent surges in growth, "a marked deceleration has occurred," down to only 2 percent in 2014.¹⁴

With regard to registration, Scott observes that 63 percent of China's merchant fleet was registered in foreign countries in 2013, up from 49 percent 10 years earlier. (The *Factbook* indicated in 2010 that number was 56 percent, consistent with the rising trend described in Scott's article.) Scott's conclusion is: "It has been clear that the Chinese government's intention is to achieve a larger proportion of the country's seaborne trade transported by ships owned by companies based within China" (emphasis added). The Chinese government's target, reportedly, is for as much as 85 percent of the foreign crude oil purchased by China to be carried by Chinese-controlled ships. China is apparently making great progress toward this goal as indicated by the fact that of that 625 ships on order for Chinese ship owners at the end of 2014, includes up to 80 VLCCs oil tankers. Once these ships are actually delivered, China will become the largest tanker owner by owner nationality. Most of these purchases are scheduled for delivery by 2017. China is clearly bent on making certain that it has the ability to control the shipment of China bound oil under any international circumstances.¹⁵

Finally, a third way to measure the size of a country's merchant fleet is *based on deadweight tonnage*, according to United Kingdom government statistics, in 2014 China ranked eighth for registered ships (100 gross tons and over) and Hong Kong was fourth:

1. Panama (328.9 DWT in millions)

¹⁴ Scott, "China-owned ships." In his article, Scott explains how his analysis differs from analysis using the data provided by the United Nations Conference on Trade and Development, which is compiled in DWT. Furthermore, he notes, "When UNCTAD changed data providers in 2012, the identified China-owned fleet's deadweight capacity jumped by 53 percent in just one year."

¹⁵ Ibid.

2. Liberia (194.2)
3. Marshall Islands (172.0)
4. Hong Kong (150.4)
5. Singapore (114.2)
6. Malta (86.3)
7. Greece (75.1)
8. China (66.9)
9. Bahamas (64.8)
10. UK (36.8)¹⁶

Obviously, depending on the unit of measure (ships or tonnage), and how the units are counted (by country or by registration), country rankings vary according to source and change from year to year. Nonetheless, by any methodology, especially if Hong Kong’s merchant fleet is added, China ranks at or near the top in every category.

The Chinese Ministry of Transport’s number of 2,600 ships in 2014 compared to 2030 ships in 2010 suggests about a 30 percent growth rate for the merchant fleet over this five-year period. In this same time period, the UK website shows tonnage growing from 50.9 million DWT to 66.9 million DWT, about a 31 percent rate of growth. Thus, both sources (Chinese and British), using different means of measurement, end up with a similar growth rate for the sector.

Maritime infrastructure

In world port rankings, China has 6 of the top 10 ports in total cargo tonnage and 7 (including Hong Kong) for container traffic (TEUs, Twenty-Foot Equivalent Units):

Table 4. World Port Rankings (Chinese Ports in **Bold**)¹⁷

¹⁶ “World fleet registered trading vessels of 100 gross tons and over,” <https://www.gov.uk/government/statistical-data-sets/fle05-world-fleet-registered-vessels#table-fle0502>. According to this source, Japan was not in the top 10, with 30.0 million DWT. The Statistics Portal comes up with a different DWT listing, according to ships’ country of domicile: 1. Greece (250.3 million), 2. Japan (228.9), 3. China (144.5), 4. Germany (123.6), 5. ROK (72.9), 6. U.S. (56.3), 7. Hong Kong (48.6), 8. Taiwan (44.5), 9. Singapore (41.5), 10. Norway (40). See “Deadweight tonnage of world merchant fleets by country of domicile in 2013 (in millions),” <http://www.statista.com/statistics/263889/dwt-of-merchant-fleets-worldwide-by-country-of-domicile/>.

¹⁷ “World Port Rankings – 2012,” World Shipping Council, <http://aapa.files.cms-plus.com/Statistics/WORLD%20PORT%20RANKINGS%202012.pdf>. In 2013, Shenzhen surpassed Hong Kong to reach the number 3 slot on the list of container ports, while all other ports in the top 10 remained the same as in 2013. See Roger Hailey, “Ports seize growth opportunity,” *Lloyd’s List*, March 17, 2014, <https://www.lloydlist.com/ll/sector/containers/article438293.ece?service=print>.

Ranking	Total Cargo Volume (2012)	Container Traffic (2013)
1	Shanghai	Shanghai
2	Singapore	Singapore
3	Tianjin	Shenzhen
4	Rotterdam	Hong Kong
5	Guangzhou	Busan
6	Qingdao	Ningbo
7	Ningbo	Qingdao
8	Dalian	Guangzhou
9	Busan	Dubai Ports
10	Port Hedland	Tianjin

As expected, China's total container throughput far exceeds other countries' numbers. According to World Bank statistics, in 2013 China's container port traffic amounted to over 174 million TEUs, not including over 22 million at Hong Kong, compared to over 44 million in the United States, 33 million in Singapore, more than 22 million in South Korea, over 21 million in Malaysia, and nearly 20 million each in Japan, the United Arab Emirates, and Germany.¹⁸

The number of companies that make up China's merchant fleet varies according to source and how the companies are counted. In 2009, the Ministry of Transport approved 214 companies for *international* shipping. Of these, about two-thirds (about 140) were state-owned enterprises (SOEs), while some were China-foreign joint ventures and the rest were private.¹⁹ As mentioned earlier, in 2014 the vice minister of transport reported "more than 240" Chinese shipping companies. Presumably, the "more than 240" number represents companies conducting both domestic and international shipping. Comparing the 2009 and 2014 numbers suggest that several dozen companies focus on domestic routes.

However, China has not been immune to the global downturn in shipping profitability since the 2008 global economic crisis. In the first six months of 2014, the top 10 shipping companies reported a total loss of nearly 1.5 billion yuan (\$243 million).²⁰ Many

¹⁸ "Container port traffic," The World Bank, <http://data.worldbank.org/indicator/IS.SHP.GOOD.TU/countries?display=default>. Greg Knowler reports, "Total container throughput at China's top 20 ports reached 175 million TEUs in 2014, an increase of 5.3 percent over the previous year." See Greg Knowler, "China ports grow on back of robust US trade," IHS JOC, January 21, 2015, http://www.joc.com/port-news/china-ports-grow-back-robust-us-trade_20150121.html.

¹⁹ Greg Knowler, "China's audit office issues damning report on Cosco finances," IHS JOC, June 29, 2015, http://www.joc.com/maritime-news/container-lines/cosco/china's-audit-office-issues-damning-report-cosco-finances_20150629.html.

²⁰ Zhao, "FTZ to allow foreign, private players."

financial problems are the result of over-capacity in the world shipping industry and concomitant low freight rates, as well as the large capital expenditures necessary to create and maintain a modern fleet. The mere number of shipping companies and the sector's financial problems likely will lead to many mergers and acquisitions as China's SOE sector undergoes massive reorganization in the near future.²¹ Additionally, Beijing is encouraging overseas investors to establish their own shipping companies in China.²²

Assuming that China's economy continues to grow, albeit more modestly than in past decades, and its government can maintain political stability and cope with the many environmental, demographic, social, political, and security challenges it faces, its merchant marine force is expected to expand further in the coming decades. In early 2015, the Shanghai International Shipping Institute released its "2030 China Shipping Development Outlook" report, which predicted by 2030 China will surpass Greece and Japan with the world's largest fleet by DWT and its "international shipping capacity" will double to account for 15 percent of the world's shipping volume.²³ This report also predicted a shift in China's top ports in 2030, with major port clusters in east Liaoning province, Tianjin-Hebei, Shandong peninsula and north Jiangsu province, the Yangtze River Delta, the southeast coast, the Pearl River Delta, and the southwest coast.

A similar growth trend in the size of China's merchant fleet, but with different numbers, is found in a joint study by QinetiQ, Lloyd's, and the University of Strathclyde: "China will see the largest growth in fleet ownership above all regions, growing from 15% in 2010 to 19-24% in 2030, rivaling Greece and the rest of the European countries."²⁴ (Percentages of ownership of specific types of ships—for example, tankers and bulk carriers—are predicted to vary.)

China will not be constrained because of a shortfall in ship building capacity. South Korea has long dominated the commercial shipbuilding market, but in 2013 China

²¹ "China Exclusive: Massive M&A expected for Chinese SOEs," Xinhua, April 27, 2015, http://news.xinhuanet.com/english/2015-04/27/c_134187956.htm.

²² Zhao, "FTZ to allow foreign, private players."

²³ Jason Jiang, "Report suggests China will overtake Greece as top shipping nation by 2030," Asia Shipping Media, April 1, 2015, <http://splash247.com/report-suggests-china-will-overtake-greece-as-top-shipping-nation-by-2030/>. For details of the report itself, see "SISI releases 2030 China Shipping Development Outlook," May 4, 2015, <http://en.sisi-smu.org/index.php?c=article&id=13534>.

²⁴ QinetiQ, Lloyd's Register Group Limited, and the University of Strathclyde, Glasgow, "Global Marine Trends 2030," p. 83, <http://www.lr.org/en/marine/projects/global-marine-trends-2030.aspx>.

reportedly became the world's largest shipbuilding nation with approximately 45 percent of global orders, surpassing long-time leader South Korea.²⁵

BIMCO, self-identified as the world's largest international shipping association, analyzes the development of China's merchant marine fleet as follows:

The emergence of China as a modern industrial powerhouse has been matched by the equally explosive growth of this country's merchant marine. In a relatively short space of time we have seen the modest and elderly fleet, mostly acquired in the second hand market, transformed into a group of the best equipped internationally trading shipping companies.

None of this of course happened by accident, with the growth of the merchant marine seen as part of the command economy's strategy for large-scale industrialization, first manifesting itself in the coastal provinces then gradually spreading westwards inland....

Beijing has also long taken the pragmatic view that the country's interests are best served if a reasonable proportion of the shipping necessary for this task is Chinese owned or controlled....

In modern times the fleet has become younger and younger, with the purchase of new ships, predominantly from the fast-growing domestic shipbuilding industry.... Chinese companies, which now own some of the world's biggest container ships and have large modern fleets of tankers and bulk carriers, have also established subsidiaries abroad and register their ships in a variety of flag states....

In parallel with the fleet expansion has come the spectacular modernization of the port sectors, with some of the world's biggest container terminals in operation.²⁶

Though it does not address the Chinese merchant marine structural and financial problems, BIMCO's professional assessment generally is corroborated by facts and statistics, inconsistent (and confusing) as they may be. It does not, however, address the potential for this civilian fleet to support the People's Liberation Army (PLA).

²⁵ "TTS Group signs breakthrough marine package equipment order in China," *Shipbuilding News*, April 17, 2015, <http://www.hellenicshippingnews.com/tts-group-signs-breakthrough-marine-package-equipment-order-in-china/>.

²⁶ "China's Merchant Marine," BIMCO, February 7, 2014, https://www.bimco.org/Education/Seascapes/Maritime_Matters/2014_07_02_Chinas_Merchant_Marine.aspx.

The remainder of this paper describes the organization of China's commercial merchant fleet and briefly discusses how some of its assets may be used to support military operations.

China's merchant marine organization

Given the size and complexity of China's merchant marine organization, it is a pity that there appears to be no single source that provides details about the entire sector. A reasonable place to start, however, may be the China Shipowners' Association (CSA, 中国船东协会). However, (unsurprisingly) there are inconsistencies in details between its English and Chinese webpages. According to the English site, the CSA has "197 members operating a merchant fleet of over 70 million deadweight metric tons (DWT), which accounts for about 85% of the country's total carrying capacity."²⁷ The Chinese page accounts for "208 members, operating more than 60 million DWT, accounting for over 80 percent of the country's total capacity."²⁸ In either case, most of the previously mentioned 214 or 240 Chinese shipping companies are CSA members.

The English-language CSA website lists only seven member companies, in the following order: Fujian Shipping Company; Minsheng Shipping Co., Ltd.; China Merchants Energy Shipping; HOSCO Company; Sinotrans Limited; China Shipping (Group) Company; and COSCO. The following paragraphs use these companies to provide a thumbnail description of the scope of the Chinese merchant marine fleet.

Perhaps the most famous Chinese shipping company is COSCO, the China Ocean Shipping Company Group (中国远洋运输 (集团) 总公司, abbreviated as 中远集团), with over 540 ships.²⁹ It is listed as 37th in size on the list of 112 large state-owned enterprises managed by the State-owned Assets Supervision and Administration Commission (SASAC).³⁰ Its fleet consists of over 160 container ships, 230 large bulk carriers, 46 liquid bulk carriers, 100 general cargo and specialized carriers, and several passenger ships. The group controls over 43 percent of China's total shipping capacity

²⁷ "China Shipowners' Association (CSA) Brief Introduction," November 9, 2007, http://eng.csoa.cn/about_csa/Introduction/200711/t20071109_445319.htm.

²⁸ "CSA Introduction" webpage, undated, <http://www.csoa.cn/jieshao/>.

²⁹ COSCO Group homepage, <http://en.cosco.com> and <http://www.cosco.com/?stc=1>.

³⁰ "央企名录" [Directory of Central Enterprises], February 9, 2015, <http://www.sasac.gov.cn/n86114/n86137/c1725422/content.html>.

and is the world's fifth largest container shipping company based on fleet size.³¹

COSCO also runs four joint ventures that operate regular passenger and cargo shipping services between China and Japan and China and Korea.³² Six of its companies—China COSCO Holdings, COSCO Corporation, COSCO Pacific, COSCO International Holdings, COSCO Shipping, and China International Marine Containers (Group) (CIMC)—are listed on the Hong Kong, Shanghai, Shenzhen, and Singapore stock exchanges. Its headquarters is in Beijing and, in addition to shipping; the company provides logistics, terminal, and shipyard services. COSCO Pacific made headlines when in 2009 it took over terminal operations in Piraeus, Greece. Subsequently, the Piraeus Container Terminal has become one of Europe's top 10 container ports, with higher rates of growth than other European container ports.³³

Mr. Ma Zehua is COSCO's chairman of the board and secretary of the Party committee. Li Yunpeng is director of the board, president, and Party committee member. Unlike in military organizations, which have a commander and political commissar who share responsibility for their unit, a single person often fulfills both roles in commercial enterprises. However, like in the military, leaders are held responsible for the actions of their companies.

In 2013, the man called "China's most powerful man in shipping," Wei Jiafu, was removed from his job as COSCO chairman because of corruption and financial losses. Between 2009 and 2013, COSCO Group lost \$5.5 billion. It also falsified its earnings between 2008 and 2013, omitting \$48 million in revenue and \$27 million in expenses, for a net profit that was \$20 million less than reported. Moreover, in that same time period, a vice president of the group and a general manager and vice general manager of two COSCO subsidiaries were removed for corruption. Two subsidiaries, COSCO Logistics and COSCO Dalian Shipyard, also were found to have engaged in illegal activities, including bribery and operational violations.³⁴ In June 2015, SASAC disciplined a COSCO official for playing golf with company funds and otherwise using company money inappropriately.³⁵ In order to stay afloat, COSCO and other larger shipping

³¹ Knowler, "China's audit office," and Joanne Chiu, "Two Chinese Shipping Companies Form Alliance," *Wall Street Journal*, February 25, 2014, <http://www.wsj.com/articles/SB10001424052702304834704579404541001553168>.

³² Links to webpages for each category of shipping can be found at <http://en.cosco.com/col/col778/index.html>.

³³ John Pagni, "Privatised Piraeus port terminal hailed as success," *IHS Maritime 360*, June 4, 2015, <http://www.ihs maritime360.com/article/18166/privatised-piraeus-port-terminal-hailed-as-success>.

³⁴ "Listed Companies," <http://en.cosco.com/col/col768/index.html>.

³⁵ Angela Yu, "China authorities discipline senior executives from China Shipping, COSCO," *IHS Maritime 360*, June 12, 2015, <http://www.ihs maritime360.com/article/18246/china-authorities-discipline>.

companies have received generous subsidies from the central government for several years. (More details follow after the description of the China Shipowners' Association's six other named member companies.)

China Shipping Group (CSG, 中国海运) has over 530 total ships, amounting to 3.6 million DWT, in three main fleets: container, tanker, and bulk.³⁶ China Shipping follows COSCO, at number 38 on the SASAC list. Its headquarters is in Shanghai, and the group has four subsidiaries, China Shipping Development Co. Ltd (CSDC, 中海发展股份有限公司), China Shipping Container Lines (CSCL, 中海集装箱运输股份有限公司), China Shipping Haisheng, and China Shipping Science & Technology, listed on the Shanghai, Shenzhen, and Hong Kong stock markets. In particular, CSDC has over 207 ships, with its business focusing on coastal and ocean shipping crude of oil and refined oil, coal, and iron ore. It currently is exploring the importation of liquefied natural gas (LNG).³⁷ CSCL's businesses include container shipping, vessel chartering, cargo conversing and booking, custom clearance, warehousing, container depot, manufacturing, trade and repair of containers, and ship management. It controls 156 container ships, including five of the world's largest container ships, built by South Korea's Hyundai Heavy Industries, with the capacity of 19,100 TEUs each.³⁸ CSCL is the world's seventh largest container shipping company by capacity and the ninth largest based on fleet size.³⁹ China Shipping's chairman of the board and Party secretary is Xu Lirong.

Sinotrans & CSC (中国外运长航集团有限公司) has more than 542 ships and is number 86 on the SASAC list. It is headquartered in Beijing and was formed in March 2009 from the merger of China National Foreign Trade Transportation (Group) Corporation (Sinotrans) and China Changjiang National Shipping (Group) Corporation (CSC). It is said to be the "biggest comprehensive logistics service supplier in China with world-wide businesses in integrated logistics, shipping, and shipbuilding industry."⁴⁰ Its fleet comprises more than 20 ro-ro ships, 190 container ships, 240 tankers, and 46 dry bulk vessels, including two multi-purpose vessels, 10 Handysize dry bulk vessels, nine Handymax dry bulk vessels, 19 Panamax dry bulk vessels, and six Capesize dry bulk

[senior-executives-from-china-shipping-cosco](#). Three officials from China Shipping were also reported to have committed the same offenses.

³⁶ China Shipping homepage, <http://en.cnshipping.com> and <http://www.cnshipping.com>.

³⁷ "About Us" webpage, <http://222.66.158.218/cndev/en/b-1.asp>.

³⁸ "China Shipping's Fifith [sic: should be fifth] 19100TEU Container Ship CSCL ATLANTIC OCEAN," China Shipping, May 8, 2015, http://en.cnshipping.com/art/2015/5/8/art_489_25535.html.

³⁹ "Company Profile" webpage, <http://www.cscl.com.cn/english/profile.asp>, and Chiu, "Two Chinese Shipping Companies."

⁴⁰ "Group Introduction" webpage, <http://www.sinotrans-csc.com/col/col206/index.html>.

vessels.⁴¹ COSCO, CSC, and Sinotrans & CSC are considered the big three of Chinese shipping companies, with the latter being the largest in inland (domestic) shipping.

Less is known about the Hebei Ocean Shipping Group, or HOSCO Company (河北远洋运输集团), except that its cargo fleet transports mainly iron ore, grains, crude oil, coal, etc.⁴² The size of HOSCO's fleet is not specified.

China Merchants Energy Shipping (CMES, 招商局能源运输股份有限公司) is a joint venture with over 57 ships. It was formed in 2004 by the Sinopec Group, Sinochem Group, COSCO Group, and CNOOC Group, and is affiliated with the Hong Kong-based China Merchants Group (whose scope of business includes transportation and related infrastructure, financial investment and asset management, and real estate businesses in Hong Kong and internationally)⁴³. It has headquarters in Hong Kong and Shanghai, and is listed on the Shanghai stock exchange. CMES controls 38 oil tankers, 13 bulk carriers, and 6 LNG ships, with 20 more vessels on order to be delivered from 2015 to 2017.⁴⁴

Minsheng Shipping Co., Ltd. (民生轮船股份有限公司) is a joint venture formed by the Minsheng Industrial (Group) Co., Ltd., and Shanghai International Port (Group) Co., Ltd., in 2009. It has 40 ships, including 18 ro-ro ships and 6 seagoing container vessels. Its headquarters is in Chongqing, and it has a wide scope of businesses, including rail, container, automobile, aviation, and warehousing and distribution.⁴⁵

Fujian Shipping Company (FUSCO, 福建省海运集团有限责任公司, formerly 福建省轮船有限公司) is located in Fuzhou and operates or has under construction some 45 ships. It is listed as the ninth largest national shipping company with routes covering 200 ports in mainland China, Hong Kong, the United States, Canada, Brazil, Australia, India, Pakistan, Russia (Far East), South Korea, Japan, Southeast Asia, Europe, and Africa.⁴⁶ Its fleet includes Handysize, Handymax, and Panamax vessels.⁴⁷

⁴¹ "Our Business" webpage, <http://www.sinotrans-csc.com/col/col12486/index.html> and Company profile <http://sinotranship.sinotrans-csc.com/col/col3372/index.html>.

⁴³ "Company Overview of China Merchants Group Limited," <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=6561945>.

⁴⁴ "About Us" webpage, <http://www.cmenergyshipping.com/en/About/index.html>.

⁴⁵ "About Us" webpage, <http://en.msshipping.cn>.

⁴⁶ "Company Introduction" webpage, <http://www.fusco.com.cn/gsjj.asp>.

⁴⁷ "Company Introduction" webpage, <http://www.fusco.com.cn/Html/gsjj.asp>. (Note: this is an older website than the one cited in footnote 45.)

This brief description of seven shipping conglomerates indicates the vast difference in size of the companies in the sector. The big three companies—COSCO, CSC, and Sinotrans & CSC—among themselves operate over 1,600 vessels, making up some 71 percent of China’s total merchant marine fleet gross tonnage.⁴⁸ Each of the big three companies, which have fleets of 500-plus ships, is an order of magnitude larger than the ninth largest shipping company, FUSCO, which has some 45 ships. The big three companies and their subsidiaries account for more than 60 of China’s total shipping companies,⁴⁹ leaving fewer than 180 companies to operate the remaining 1,000 or so vessels in the total fleet. Obviously, most of these companies are relatively small and many are likely to be gobbled up by larger companies in the sector’s restructuring, which will likely be part of the country’s larger SOE restructuring program. As a result, many of the names and structures described in this paper are likely to change in the coming years.

Many of China’s smaller shipping companies (smaller both in the size of their fleets and in their ship capacity) probably move people and cargo domestically along China’s inland waterways, along its coast, and out to its islands in the three near seas.

As could be expected, the largest SOEs have benefited from their size and what likely is their political influence. In March 2015, Reuters reported that COSCO and China Shipping’s CSDC and CSDL “received at least 2.4 billion yuan (\$359 million) in subsidies over 2014, a five-fold increase compared to the previous year.” This was accomplished by increasing cash grants for scrapping old ships in an effort to accelerate fleet renewal. As a result, COSCO had a 2014 net profit of 350 million yuan because of subsidies of at least 1.38 billion yuan. Likewise, CSDC registered a net profit of some 300 million yuan after receiving 456 million in grants in 2014. Similar subsidies allowed CSCL to report profits in 2014.⁵⁰ No information is available on the government subsidies granted to the other companies in the shipping sector.

The two giants, COSCO and China Shipping, were reported to have agreed to form a “strategic alliance” in early 2014 in which they “cooperate and share resources in crucial business areas, including ports, logistics and shipbuilding, in addition to actual shipping.” Their goal is to “improve the influence of Chinese shipping companies in the world shipping industry.”⁵¹ Other reporting suggests that COSCO and China Shipping may

⁴⁸ Greg Knowler, “China’s audit office issues damning report on Cosco finances,” IHS JOC, June 29, 2015.

⁴⁹ Ibid.

⁵⁰ Brenda Goh, “Beijing aid keeps China shipping lines in profit despite waterlogged market,” Reuters, March 25, 2015, <http://www.reuters.com/article/2015/03/25/china-shipping-results-idUSL6NOWL1YS20150325>.

⁵¹ Chiu, “Two Chinese Shipping Companies.”

combine their container fleets to create the world's fourth largest container carrier.⁵² Moreover, in May 2015, stock trading for COSCO and China Shipping was halted temporarily, pending announcement of a “significant overseas co-operation agreement.”⁵³ A day later, CSDC and COSCO announced that they had established a joint venture, China Ore Shipping, in Singapore. China Ore then signed an agreement with the Brazilian mining company Vale for the purchase of four Very Large Ore Carriers (VLOCs) for \$445 million, which will be chartered to Vale for 20 years, with an option to extend for another 5 years. (Naturally, both companies' stocks jumped immediately after that announcement.)⁵⁴ To spread the wealth, that same week Vale concluded a deal with China Merchants Energy Shipping for the sale of four VLOCs.⁵⁵

Several universities and vocational and junior colleges should be mentioned as part of the organizational structure of China's merchant marine. The Shanghai Maritime University (SMU, 上海海事大学), under the joint management of the Shanghai Municipality and the Ministry of Transport, supports the industry by preparing its students for a full range of commercial maritime responsibilities. Its history goes back to 1909 as the Shipping Section of Shanghai Industrial College. SMU has 12 colleges, with a full-time student body reported to be from 16,000 to 20,000, with 11,000 to 17,000 undergraduates, 2,000 to 3,000 postgraduate students, and 800 to 1,000 teachers and professors.⁵⁶ It offers cooperative and exchange programs with 30 foreign universities, international organizations, and shipping and port enterprises, and seeks to expand its enrollment of foreign students. The Shanghai International Shipping Institute (SISI, 上海国际航运研究中心) is affiliated with the SMU and has a member list of organizations in the

⁵² “China: Mergers likely to benefit state-owned shipbuilders, construction contractors,” *Shipbuilding News*, May 26, 2015, <http://www.hellenicshippingnews.com/china-mergers-likely-to-benefit-state-owned-shipbuilders-construction-contractors/>.

⁵³ Shuli Ren, “UPDATE: China COSCO, Shipping Jump On Merger Bet: Could Just Be A Deal With Vale,” *Barron's Asia*, May 20, 2015, <http://blogs.barrons.com/asiastocks/2015/05/20/china-cosco-shipping-jump-on-merger-bet-could-just-be-a-deal-with-vale/>.

⁵⁴ “China stocks rise again, with ChiNext still soaring; Hong Kong flat,” Reuters, May 21, 2015, <http://www.reuters.com/article/2015/05/21/markets-hongkong-china-stocks-midday-idUSL3N0YC21R20150521>.

⁵⁵ Jason Jiang, “China Shipping Development and Cosco establish Singapore jv for Vale VLOCs,” *Asia Shipping Media*, May 21, 2015, <http://splash247.com/china-shipping-development-and-cosco-establish-singapore-jv-for-vale-vlocs/>.

⁵⁶ Different information about SMU is found at the “About the University” webpage, <http://www.at0086.com/shmy/Whyus.aspx>, and the “Overview” webpage, http://en.shmtu.edu.cn/controller.asp?action=list_en&tid=0016&id=0023. Information about programs and courses is found at <http://www.study-in-china.org/School/shanghai/shmu/Programs.html>.

commercial shipping sector as well as from a wide variety of government and academic organizations and institutions.⁵⁷

The Dalian Maritime University (DMU, 大连海事大学) was also founded in 1909 and falls under the purview of the Ministry of Transport. Its student body consists of about 20,000 undergraduates and postgraduate students in 19 colleges and research institutions. It has recruited foreign students since 1955 and has established relations with 102 international maritime institutions throughout the world.⁵⁸

The Wuhan University of Technology (WUT, 武汉理工大学) was founded in 2000 from the former Wuhan University of Technology, Wuhan Transportation University, and Wuhan Automotive Polytechnic University. The Wuhan Transportation University traces its ancestry back to National Maritime Vocational School, later known as the Wuhan River Transportation College and then the Wuhan University of Water Transportation Engineering. With about 53,000 undergraduates and postgraduate students, it is much larger than the two maritime universities and has about 10 marine programs among roughly 200 areas of study.⁵⁹

The Jimei University (集美大学) founded in 1918 in Xiamen, Fujian province, with about 26,000 undergraduates and postgraduate students, has the Navigation Institution, focused on international shipping requirements, and the Marine Engineering Institute, among 14 colleges and institutes. According to the university's website, "Its maritime education tops the nation and has great impact at home and abroad. It serves as an important training base to cultivate skills of the senior seafarers in China."⁶⁰

A number of maritime vocational and junior colleges support the industry in training sailors, such as the Tianjin Maritime Vocational College,⁶¹ Qingdao Ocean Shipping Mariners College under COSCO,⁶² Shanghai Maritime Vocational and Technical College, Jiangsu Maritime Institute, Zhejiang International Maritime College, Quanzhou

⁵⁷ "Introduction" webpage, <http://en.sisi-smu.org/index.php?c=article&a=type&tid=25>.

⁵⁸ "School introduction" webpage, <http://www.dlmu.edu.cn/html/hdgc/xxjj/> and "Introduction" webpage, <http://www.csc.edu.cn/studyinchina/universityabouten.aspx?collegeId=109>.

⁵⁹ "About WUT," <http://english.whut.edu.cn/profile/aboutwut/>.

⁶⁰ Jimei University "Introduction" webpage, <http://english.jmu.edu.cn/s/46/t/56/p/1/c/465/list.htm>, and "Prospectus for International Students" webpage, <http://oec.jmu.edu.cn/Item/DInfo/58>.

⁶¹ Tianjin Maritime Vocational College, <http://www.tradeteda.org/en/enterprise/detail.asp?id=891>.

⁶² Qingdao Ocean Shipping Mariners College, <http://www.coscoqc.com.cn/zd/en/?action=content&m=4345>.

Titan Maritime Institute, Shandong Maritime Vocational College, Guangzhou Maritime College, and Wuhan Maritime Institute.⁶³

This system of maritime universities, colleges, and vocational and junior colleges provides the merchant marine officers and licensed crew members for China's shipping fleet, as well as for the merchant fleets of a few other countries, most importantly Panama. A 2006 study by the U.S. Department of Transportation Maritime Administration indicated that Chinese crewmembers generally sailed as part of a primarily Chinese crew and not as part of a crew of diverse nationalities. Moreover, "crewing levels on PRC crewed vessels tended to be higher than most other vessels." Chinese crews were found mostly in the fleets flying the flags of Panama, China, Hong Kong, Liberia, and Singapore.⁶⁴

Merchant marine and related companies on the mainland and in Hong Kong all are able to provide some degree of support to Chinese military operations. For example, Hong Kong-based China Merchants Holdings International holds 85 percent of the Colombo International Container Terminal in Sri Lanka and is investing heavily in another container terminal at Hambantota.⁶⁵ In September 2014, a PLA Navy Type 039 submarine docked at Colombo International Container Terminal just prior to Xi Jinping's visit to Sri Lanka and then again later in November after taking part in the PLA Navy's escort mission in the Gulf of Aden.⁶⁶

But, it seems reasonable to assume the Chinese military would turn first to mainland companies for support rather than Hong Kong-based companies, if only because the Chinese government would have more control over most mainland companies. Furthermore, much of China's merchant marine fleet operates on inland and coastal

⁶³ List of Chinese Higher Education Institutions, http://eacea.ec.europa.eu/erasmus_mundus/ecw/funding/documents/2007/third_countries/China.pdf.

⁶⁴ U.S. Department of Transportation Maritime Administration, *Foreign-Flag Crewing Practices: A Review of Crewing Practices in U.S. – Foreign Ocean Cargo Shipping*, November 2006, http://www.marad.dot.gov/wp-content/uploads/pdf/Crewing_Report_Internet_Version_in_Word-update-Jan_final.pdf.

⁶⁵ Greg Knowler, "Strong growth for Asian terminal operators in 2015, HSBC predicts," IHS JOC.com, January 5, 2015, http://www.joc.com/port-news/strong-growth-asian-terminals-2015-hsbc-predicts_20150105.html; and "HK's China Merchants opens Colombo International Container Terminal," China Transport Shipping, August 8, 2013, <http://www.chinatrtransport.com.cn/en/html/info94.html>. As noted earlier, China Merchants Energy Shipping is a joint venture among several mainland companies and Hong Kong's China Merchants Group.

⁶⁶ Rahul Bedi, "India reacts cautiously to PLAN submarine visit to Sri Lanka," *IHS Jane's Defence Weekly*, September 30, 2014, <http://www.janes.com/article/43909/india-reacts-cautiously-to-plan-submarine-visit-to-sri-lanka>; and "Defense Ministry's regular press conference on Nov. 27, 2014," Ministry of National Defense, December 22, 2014, http://eng.mod.gov.cn/Press/2014-12/22/content_4559939.htm.

waterways and might be more available to support military operations than much of Hong Kong's merchant fleet, which travels on international routes.

China's merchant marine and support for military operations

China's merchant fleet has been used by the military in training and for limited operational purposes for at least the past 15 years.⁶⁷ Civilian ships have frequently participated in troop movements and amphibious landing exercises, which are conducted routinely as part of the PLA's annual training cycle. In an example of real-world operational use of the merchant marine, five Chinese merchant ships were used in the 2011 evacuation of Chinese civilians from Libya.⁶⁸

The use of civilian merchant ships for long distance transportation and replenishment is not novel, most large militaries, including the United States, have capitalized on the merchant marine to augment logistic requirements. In China, many mechanisms exist that allow for civilian support to military operations under the rubric of "civil-military integration"⁶⁹ or "socialization (or outsourcing) of logistics support." The Chinese military routinely contracts (and pays) for civilian assets to support exercises or operations. The like many western nations, the Chinese government considers chartering merchant ships to be more cost-effective than having active duty units of the PLA own and operate the ships themselves.

Civilian support to the military is accomplished through a system of National Defense Mobilization Committees. This organizational structure extends from Beijing to county level and integrates Party, government, and military officials.⁷⁰ National Defense Mobilization Committees work in conjunction with logistics departments in headquarters of all levels, they also work with PLA transportation (also called "navigation") and

⁶⁷ Chinese merchant ships have probably been used to transport heavy equipment, such as large engineering equipment and armored personnel carriers, for several UN peacekeeping missions that China is participating in, but I cannot find citations to support the specifics of such support.

⁶⁸ "35,860 Chinese evacuated from unrest-torn Libya," Xinhua, March 3, 2011, http://news.xinhuanet.com/english2010/china/2011-03/03/c_13759456.htm. Changhong Pei, Wen Zheng, *China's Outbound Foreign Direct Investment Promotion System*, Springer, 2015, p. 167, says, "The Chinese government sent 91 civil charter aircraft, 12 military aircraft, 5 cargo ships, and 1 military ship, along with 35 rented foreign charter aircraft, 11 foreign passenger ships, and over 100 rented buses within 12 days to evacuate Chinese nationals." The "military ship," the frigate *Xuzhou*, provided escort but did not pick up personnel.

⁶⁹ The Chinese term for "civil-military integration" is "军民融合." Though the Chinese themselves usually translate these characters as "civil-military integration," in fact, the character for military precedes the character for civilian and the term is more accurately translated as "military-civilian integration."

⁷⁰ The Chinese defense-related white papers issued in 2000, 2002, 2010, and 2015 all discuss China's defense mobilization system in some detail.

logistics military representative offices (MRO), to plan, coordinate, and implement civilian support with local governments. The 1997 National Defense Law (Article 48), the 2010 National Defense Mobilization Law, and most recently, the 2015 “Technical Standards for New Civilian Ships to Implement National Defense Requirements” all codify the mobilization of civilian means of transportation when deemed necessary by the State Council and the Central Military Commission and acknowledges the need for compensation to those who have sustained “economic losses” due to these activities.⁷¹

The new “Technical Standards” are particularly significant. They require that all civilian shipbuilding companies, meaning private and locally owned shipbuilding companies as well as SOEs, ensure that the following five classes of ships are suitable to be used by the military in emergency situations: container, ro-ro, multipurpose, bulk carrier and break-bulk ships. The “Technical Standards” establish specifications and design requirements for military use. These guidelines include provisions for the government to provide funding to shipbuilders to cover the extra costs in making ships suitable for military use and to provide insurance in case of damage to vessels during military operations.⁷² While the news about these “Technical Standards” generated a flurry of foreign press reports, the Chinese Ministry of National Defense website indicates that since 2004, a number of civilian ships have already been constructed according to military specifications, entered the civilian fleet, and have also been used in exercises.⁷³

Civilian merchant ship support to PLA operations has been well documented in the Chinese media. These reports record the pick-up and delivery of personnel, equipment, and materiel, usually, but not exclusively, from one port facility to another. Multiple articles have examined the requirements for organizing and preparing civilian ships to support military operations. For example, one essay from 2004 addressed the following

⁷¹ “Law of the People’s Republic of China on National Defence,” March 14, 1997, http://www.npc.gov.cn/englishnpc/Law/2007-12/11/content_1383547.htm. This language strongly suggests that in addition to paying for lost or damaged equipment, payment for the actual usage of civilian assets is authorized since the assets are “lost” to the enterprise while they are being used by the military. No details are available on how this compensation works. Payment for the use of civilian goods and services is a routine part in the “socialization” or “outsourcing” of logistics support and would seem a logical part of mobilization. The recent headline Breitbart headline, “China: Military May Now Hijack And Use Civilian Ships At Any Time,” June 19, 2015, <http://www.breitbart.com/national-security/2015/06/19/china-military-may-now-hijack-and-use-civilian-ships-at-any-time/>, is an unsupported exaggeration, especially as the text of the article itself states, “The government is working on passing a bill which would provide funding to private owners of ships in order to pay for the renovations, essentially buying the option of military use from every private ship owner.”

⁷² “New rules mean ships can be used by military,” *PLA Daily*, June 18, 2015.

⁷³ “贯彻国防要求标准船：海上投送的“第二力量”” [Implement National Defense Requirements Standards Ships: Maritime Projection “Second Force”], China Ministry of National Defense, September 1, 2014, http://www.mod.gov.cn/mobilize/2014-09/01/content_4534216.htm.

considerations in employing civilian ships in amphibious landings: (1) Proper selection of ships based on size and missions. Different ships would be optimal for equipment transport, troop transport, logistics, at-sea rescue and medical support, and transport of fuel, ammunition, and other hazardous cargo. (2) Proper organization in retro-fitting civilian ships for specific missions according to what echelon they will be used in during the operation and what sorts of equipment they will need, such as common-use communications, navigation, and firefighting gear or specialized modifications for securing equipment and loading and off-loading. (3) Proper planning for onboard defensive measures, military escort, and sufficient fuel, water, and provisions for the crew and passengers.⁷⁴

Obviously, integrating civilian ships into military operations can be quite a complex affair requiring extensive staff planning and coordination with the civilian ship operators, not to mention long lead times if ship modifications and crew training are necessary. Further complicating the issue is the likelihood that the mix and availability of numbers and types of civilian ships and their crews will differ over time (and season), location, and commercial commitments, such as sailing schedules.

Overcoming this challenge is aided by the ability of Beijing to track Chinese merchant ships at the PLA Navy Control Center and the Ministry of Transport's China Search and Rescue Center. The China Ship Reporting (CHISREP) System requires "all Chinese-registered ships over 300 GT engaged in international routes" to report their positions daily to the PRC Shanghai Maritime Safety Administration.⁷⁵ The system is part of the part of the Global Maritime Distress & Safety System and includes information on ships' sailing plans, modifications, locations, and dangerous cargoes transmitted by multiple means.⁷⁶ Thus, the PLA has a reasonable idea of where China's merchant ships are at any specific time, but long range planning is required with shipping companies in order to incorporate civilian ships into training or use them on operational deployments without adversely affecting the civilian ships' main commercial activities, especially those that operate on specific schedules along specific routes, such as many roll-on/roll-off ships.

The Chinese have recognized that roll-on/roll-off (ro-ro) ships can greatly improve the

⁷⁴ “民船在登陆作战中运用的几点浅见” [Thoughts on Employing Civilian Ships in Amphibious Assault Landing Operations], *National Defense*, October 1, 2004, <http://mall.cnki.net/magazine/article/GUOF200410015.htm>.

⁷⁵ Andrew Erickson, “Chinese Sea Power in Action: The Counterpiracy Mission in the Gulf of Aden and Beyond,” in *The PLA at Home and Abroad*, eds. Roy Kamphausen, David, Lai, and Andrew Scobell, Strategic Studies Institute, 2010, p. 320.

⁷⁶ China Ship Reporting System, http://www.cccsh.com/eversion/project_detail2.asp?lantype=e&ik_id=18.

efficiency of many maritime transport operations. Several Chinese civilian companies operate several dozen ro-ros of varying sizes on commercial routes. In 2012, the first of four 36,000-ton displacement ro-ro ships, designed according to national defense requirements, began sailing out of Yantai, Shandong province. The “Bohai Emerald Bead” (渤海翠珠) can carry over 2,000 personnel and over 300 vehicles.⁷⁷ This equates to a single-lift capacity of multiple infantry battalions or nearly an entire armored or artillery brigade. By the end of 2014, three similar ships, the “Bohai Crystal Bead” (渤海晶珠), “Bohai Diamond Bead” (渤海钻珠), and “Bohai Mary Pearl” (渤海玛珠), had joined the Bohai Ferry Company (渤海轮渡股份有限公司) fleet. The Bohai Ferry fleet also has six other ro-ros, not constructed to national defense specifications, including the 19,847-ton, 1,128 passenger, 200-vehicle “Bohai Golden Pearl” (渤海金珠).⁷⁸ Another ro-ro in operation with military significance is the 7,800-ton “Sansha #1” (三沙1号), which went into operation between Hainan and Yongxing Island/Sansha City in the Paracels. This ship can carry 456 passengers and 20 standard container vehicles and has a helicopter platform.⁷⁹

It will be relatively easy to plan the use of these four large, military-specification ro-ros in military operations because of their similarities and because they are all from the same company. The company has provided ships for military exercises since 2000, including

⁷⁷ “Launch of new civilian ship helps PLA enhance strategic projection capability,” *PLA Daily*, August 9, 2012, http://eng.chinamil.com.cn/news-channels/china-military-news/2012-08/09/content_4987597.htm.

⁷⁸ “亚洲最大客滚船“渤海晶珠”轮投入运营” [Asia’s Largest RoRo “Bohai Crystal Bead Begins Operations,” China Shipping Information, October 11, 2012, <http://www.chinashippinginfo.net/phone/phpage.aspx?imgId=964&cateName=7>; “山东威海造豪华客滚船“渤海钻珠”轮下水” [The Weihai-made Luxury Ro-Ro “Bohai Diamond Bead” Launched], Xinhua, September 13, 2014, http://www.sd.xinhuanet.com/tpzx/2014-09/13/c_1112465854.htm; “客滚船“渤海玛珠”轮在山东威海下水” [Ro-Ro “Bohai Mary Pearl” Launched in Weihai Shandong], Xinhua, November 6, 2014, http://www.sd.xinhuanet.com/tpzx/2014-11/06/c_1113147903.htm; “渤海金珠号客轮(山东渤海轮渡)” [Bohai Golden Pearl Ro-Ro (Shandong Bohai Ferry), Dalian Bay Ferry Network, October 2, 2009, <http://dalianwan.0535-0411.com/177.html>; “Company Introduction,” <http://www.bohailundu.cn/info/?id=1>. Other company ro-ros are the “Bohai Silver Bead” (渤海银珠), “Bohai Pearl” (渤海珍珠), “Bohai Jade Bead” (渤海玉珠), “Bohai Precious Pearl” (渤海宝珠) and “Bohai Kingfisher Pearl” (渤海翡珠). Many of the names listed above are the author’s translations and may differ from translations made by others.

⁷⁹ “China-New Ship/Sansha,” CCTV News, December 13, 2014, <http://newscontent.cctv.com/NewJsp/news.jsp?fileId=273271>. The Knud E. Hansen A/S maritime consulting firm designed the Sansha #1, which was built by the Bohai Shipyard.

the “Vanguard series” and “Joint-2008.”⁸⁰ Other examples of companies providing ro-ros in support of PLA exercises, include China Shipping’s “Bangchui Island” (棒捶岛), which was used to transport elements of 40th Group Army Artillery Brigade in September 2014 as part of “Firepower-2014.”⁸¹

In 2010, the Nanjing Military Region Navigation MRO was reported to have successfully overseen the conversion of “more” container ships, through retrofitting equipment to achieve standardization and implementing new civilian vessels’ military standards.⁸² The exact number and size of the ships converted was not revealed; nor were the companies for which they work.

At least two civilian oil tankers have been constructed according to national defense mobilization standards. In May 2014, the 4,000-ton tanker “East Sea 215” (东海215), built with military specifications, passed its inspection and was accepted as ready for operations. Later, at the end of August, the Nanjing Military Region Navigation MRO accepted the second oil tanker built to military specifications, this one an 11,000-ton ship.⁸³ Civilian oilers have been used to supply PLA Navy ships at sea and troops ashore in exercises and during deployments. For example, a China Shipping oil tanker was used to supply PLA Navy ships in the South China Sea that were in transit to perform escort duty in the Gulf of Aden.⁸⁴

As another part of the military-civil integration program, transportation infrastructure is being built all along China’s coast with dual military and civilian use in mind. For

⁸⁰ “渤海轮渡坚持走军民融合发展之路(图)” [Bohai Ferry adheres to military-civilian integration development path” (Figure)], Jiaodong Net, December 19, 2014, <http://www.jiaodong.net/news/system/2014/12/19/012530145.shtml>.

⁸¹ “我军首次采取 4 种方式实施军地一体联合投送” [The First Time the PLA Uses Four Methods to Implement Military-Civilian Integrated Joint Projection], *PLA Daily*, September 3, 2014, http://www.81.cn/syjd/2014-09/03/content_6123640_19.htm.

⁸² “南京军区改装集装箱船提高海上军交输送能力” [Nanjing Military Region Converted Container Ships Increase Maritime Transport Capacity], *China Defense News*, January 28, 2010, <http://info.cndsi.com/html/20100128/77399113802.html>.

⁸³ “我国首艘贯彻国防要求油船通过验收” [The Country’s First National Defense Requirement Oil Tanker Passes Inspection], *PLA Reporter*, May 27, 2014, http://bj.81.cn/content/2014-05/27/content_5919034.htm; and “贯彻国防要求标准船：海上投送的“第二力量” ” [Implement National Defense Requirements Standards Ships: Maritime Projection “Second Force”], China Ministry of National Defense, September 1, 2014.

⁸⁴ “借力民企，军交运输直达战场” [Leverage Civilian Enterprises, Military transport Direct to the Battlefield], Sina.com, September 21, 2014, <http://mil.news.sina.com.cn/2014-09-21/0550802178.html>.

example, by the end of 2012 Fujian province had built 18 ro-ro docks and equipped them with large cranes and other handling equipment. Reportedly, all major harbors in the province are capable of day and night troop and equipment loading. Also in Fujian, Xiamen city developed a 5,000-ton semi-submersible landing dock at a port in Ludao, serving both civilian and military loading and unloading requirements.⁸⁵

Though ships can use either civilian or military docks and piers for transport operations, the PLA also is experimenting with “pierless unloading” using semi-submerged barges and docks for loading and unloading.⁸⁶ Likewise, the PLA has created a number of mobile, oil pipeline units that can transfer fuel over the shore to and from anchored ships where no docks are available.⁸⁷ Pipeline units float flexible pipes (hoses) out to anchored ships that can then transfer fuel either to or from shore.

While performing transport and supply missions, civilian ships may be required to defend themselves and be defended by military ships and aircraft. To meet national defense requirements, ships will probably need some modifications, including the installation of gun mounts—most likely for machine guns, small cannons, or grenade launchers—for limited close-in surface and air defense. Man-portable surface-to-air missiles (SAMs) may also be issued to civilian ships supporting the military. Arms rooms for the storage of weapons and ammunition may need to be built on many ships. Civilian crews will need to be trained in the operation and maintenance of these weapons, and integrated into military command and control networks for these defensive weapons to be employed effectively. Ship crews will also need to be familiar with military air and sea escort operations so that they can move in coordination with PLA forces protecting them. (Specially trained PLA reserve or militia personnel possibly could be assigned to merchant ships to perform these functions.) Such coordinated movements may require additional communications and navigation gear to be installed on some civilian ships. Communications and navigation, however, have benefitted greatly from the increased

⁸⁵ “立体军交，畅行八闽”[Three Dimensional Military Transport, Navigating Fujian], China Social Sciences Network, January 6, 2014, http://www.cssn.cn/jsx/201401/t20140106_936687.shtml. This report described how civilian ground, rail, air, and sea assets supported the “Mission Action 2013” exercise.

⁸⁶ “广州军区民船成建制实兵重装投送演练举行” [Guangzhou Military region Holds Exercise for Civilian Ships to Transport Personnel and heavy Equipment], *PLA Daily*, June 21, 2014, http://www.81.cn/jmywyl/2014-06/21/content_5987352.htm; and “厦门市推进军民融合式发展建设纪实” [Documentary on Xiamen Promoting Military-Civilian Integration Development and Construction], Chinese Central Television, December 9, 2011, <http://military.cntv.cn/20111209/120503.shtml>.

⁸⁷ “战场血脉畅通陆海” [Battlefield Blood Flows Land and Sea], *China Navy*, September 26, 2013, http://navy.81.cn/content/2013-09/26/content_5544442.htm; and “陆岸海一体化保障直通‘战场’” [Land and Shore Integrated Support to the Battlefield], *China Navy*, September 2, 2013, http://navy.81.cn/content/2013-09/02/content_5461965.htm.

availability and civilian use of computers, data systems (such as electronic maps and charts), and positioning systems (such as the *Beidou* satellite system) over the past decade.

A decade ago, television and the internet often showed photos of artillery or rocket launchers secured on the decks of civilian ships to provide fire support to amphibious landing operations. If effective fire control systems and methods for these ship-mounted guns and rockets had been developed, they might have contributed some level of area bombardment in support of landing operations, but less so than naval gunfire, which is designed for such purposes. Recently, fewer photos of ship-mounted artillery have been published, possibly reflecting less of a need for such ad hoc measures due to improvements in PLA Navy, Air Force, and Second Artillery capabilities to provide joint firepower support to landing operations. PLA planners now have a much larger array of long-range weapons to choose from when providing fire support than they did 10 to 15 years ago. Now these include attack helicopters, unmanned aerial vehicles, advanced fighters with precision guided munitions, long-range multiple rocket launchers, and conventional ballistic and cruise missiles.

Some smaller merchant vessels could be modified to lay mines, though the literature on the subject suggests that civilian fishing vessels, not merchant ships, would be used for this mission.⁸⁸

The last category of missions that China's merchant marine fleet could be assigned is intelligence collection and clandestine insertion operations. Little to no open source information from China provides insight into these missions, but their potential cannot be disregarded. Once more, due to improvements in communications and positioning technologies, it would be feasible for crews (or selected personnel) on merchant ships to report on the movement of foreign military and civilian vessels in the course of their own commercial activities. Chinese crewmembers could submit such reports either out of feelings of nationalism and the resulting desire to support PLA operations or because they were tasked to do so specifically in times of tension.

Finally, in the realm of unsupported speculation, Chinese merchant ships that routinely call on foreign ports where military operations may be necessary could be used for intelligence collection and perhaps the clandestine insertion of intelligence operatives or special operations personnel and equipment in peacetime or in periods of increased

⁸⁸ Andrew Erickson, Lyle Goldstein, and William Murray, *A PLA Navy "Assassin's Mace": Chinese Mine Warfare*, China Maritime Studies Institute, May 2010, <http://www.andrewerickson.com/wp-content/uploads/2010/05/Chinese-Naval-Mine-Warfare-Presentation-to-Mine-Warfare-Association-MINWARA-2009-04-19.pdf>.

tension.

Conclusions

Over the last three decades, China's merchant marine fleet has become a significant factor in the country's economic development and will continue to play a large role as China develops into a major "maritime power." Though the commercial shipping sector currently has structural inefficiencies and financial problems, and shares in the nationwide corruption challenge, it appears to be poised for additional growth in the future. As the industry grows, however, it will also undergo reorganization through mergers, acquisitions, and company failures. The large structure of over 200 major enterprise groups, subsidiaries, and companies is likely to become smaller in number even as the size of the fleet expands to carry more of China's and the world's cargo.

The Shanghai International Shipping Institute's study entitled "China Shipping Development Outlook 2030" concludes that China will account for about 17 percent of global shipping in 2030. Without specifying a total number of ships, the study predicts that bulk cargo carriers will expand to 70 percent of the fleet, oil tankers will increase slightly to 18 percent, and container ships will drop slightly to 9.5 percent. A percentage for ro-ros was not mentioned specifically, but "roll-on-roll-off shipping" will important to business efficiency of major ports. Significantly, container throughput in China is expected to nearly triple, to 505 million TEUs. Shipping enterprises will expand their services from "ocean carrier" to "global logistic service provider." Because of industry reorganization, "private shipping enterprises will account for over 70 [percent] of the total [fleet] by 2030." The study does not expect the number of Chinese crewmembers working on foreign ships to increase significantly, but foresees Chinese-flagged ships hiring more foreign sailors.⁸⁹

An interesting projection in the report is that by 2030 "foreign-flagged ships will make up 85-90 [percent] of the ships for international shipping controlled by Chinese ship owners." (The article by Richard Scott identified this trend, stating that 63 percent of the fleet was foreign flagged in 2013, compared to 49 percent in 2004.) But for national security reasons, "China will still take some measures to maintain a certain number of Chinese-flagged ships."⁹⁰ In short, Chinese-owned ships increasingly will be registered in countries other than China, but an unspecified number of Chinese-owned, Chinese-registered ships will remain; these presumably will be the prime candidates to be built or converted for military purposes.

⁸⁹ "SISI releases 2030 China Shipping Development Outlook," May 4, 2015.

⁹⁰ Ibid.

The number of Chinese merchant vessels on the high seas and their importance to the national economy already has had an impact on how the PLA operates. The escort mission in the Gulf of Aden, which has lasted an unprecedented length of time (seven-plus years), demonstrates how seriously China's civilian and military leaders take protection of China's merchant fleet on international shipping lanes. Likewise, the second Arctic voyage of the COSCO ship *Yong Sheng*, registered in Hong Kong, reminds us that China will constantly be looking to shorten shipping distances and lower costs along its trade routes.⁹¹ If new threats to civilian shipping arise in other areas of the world, the PLA Navy is now better trained and equipped to respond to new missions than it was merely a decade ago. In that regard, the United States and China share the objective of keeping sea lines of communication operating freely and safely.

At the same time, China's merchant marine is becoming more integrated into routine PLA operations, compensating for shortcomings in the PLA's organic, long-distance sealift capacity. Civilian ships routinely participate in PLA exercises and support troop and unit movements for all services. Their participation will increase as more civilian ships built to national defense specifications enter into the fleet and as the PLA operates farther from China's coasts.

It seems likely that for multiple reasons most of the ships retrofitted or newly built to military specifications will be small or medium-size vessels and not the giant oil, container, and ore transports in the fleet's inventory. Large carriers likely are committed to long-distance, international routes, making them less available for military purposes and causing greater financial losses to the company if diverted. Furthermore, small to medium-size ships may be able to operate at more austere ports and harbors than the fleet of giants that carry hundreds of thousands of tons of cargo. The trend toward smaller ships is seen in the size of the first two oil transports built to military specifications.

On the other hand, the four newly built 36,000-ton displacement civilian ro-ro ships are roughly twice as large as the four new state-of-the-art Type 071 Yuzhao-class amphibious transport docks in the South Sea Fleet. The near-simultaneous introduction of these two types of ships, however, reflects their complementary missions. The Type 071s will likely be used in the initial delivery of amphibious assault troops to the beachhead, while the civilian ro-ros will be used to deliver second- or third-echelon troops in larger numbers to secure or capture ports and harbors. The construction of semi-submerged barges demonstrates that the PLA also is preparing for contingencies where port facilities

⁹¹ Jason Jiang, "Cosco ship starts second Arctic voyage," Asia Shipping Media, July 9, 2015, <http://splash247.com/cosco-ship-starts-second-arctic-voyage/> and "Yong Sheng," Vesseltracker.com, <http://www.vesseltracker.com/en/Ships/Yong-Sheng-9243813.html>.

are damaged. Likewise, the over-shore delivery of fuel using military or civilian tankers and pipeline units suggests that the PLA does not necessarily assume it will capture ports and associated infrastructure intact.

The growth and modernization of China's civilian merchant marine fleet give PLA planners more options and capabilities than they had only a decade ago. The dual-use development of the merchant marine fleet and port infrastructure is an example of the importance of military-civilian integration to both the Chinese economy and the PLA. As we watch how the PLA changes in the coming years in order to operationalize its objective to "abandon" the "traditional mentality that land outweighs sea," we should also monitor how the merchant marine contributes economically to China becoming "a major maritime as well as land country," along with the merchant fleet's potential to support Chinese military operations away from China's home waters and shores.

During the past 10 years, the China-owned fleet has more than tripled in size. This pace of growth has been faster than that seen in the entire world fleet, and has covered all ship types. The bulk carrier fleet almost quadrupled between 2004 and 2014. The tanker and container ship fleets tripled in size over the same period. As a result of this rapid growth, China's current merchant fleet is composed of relatively young ships. At the end of 2014, 80 percent of its tankers were less than 10 years old (built in 2005-2014). The comparable figure for bulk carriers was 68 percent, and for container ships 51 percent. Newer ships are normally more efficient to operate and have added environmental protections.⁹²

The Chinese government has been actively involved in this growth. More recently, presumably in response to the Party's decision for China to become a maritime power, the Ministry of Transport published plans for upgrading the shipping industry, improving services and competitiveness. The stated aim is to build an efficient, safe, and environmentally friendly Chinese shipping system by 2020.

Expert observers note that the Chinese government's goal is for a larger proportion of its seaborne trade to be transported by Chinese-owned ships (not necessarily Chinese flagged, as we have seen). While trying to forecast growth is difficult because of economic considerations, every indication is that China's desire to become a maritime power will not be held at risk by its merchant marine. It already is one of the top two or three merchant marines in the world, and the Ministry of Transport's goals for the future strongly suggest continued growth and modernization, as does President Xi Jinping's vision of a 21st-century Maritime Silk Road. China's current merchant fleet is already

⁹² Scott, "China owned ships."

world class, and if Beijing's plans come to fruition it will become the preeminent merchant fleet in the world.⁹³

⁹³ Ibid.