China's Port Logistics Industry

The Case for Inland Waterways

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"There is a tide in the affairs of men, which, taken at the flood, leads on to fortune"
-Shakespeare, Julius Caesar

Over the course of the following several months, ChinaVest will provide summary research on the logistics infrastructure in China. We have a long track record in the industry, having owned logistics companies (such as TAIT) and advised multinational firms that utilize China's complicated logistics infrastructure. Our firm, a merchant bank based in Shanghai, has been operating in greater China since 1981. Our research on China's logistics infrastructure will focus on the port industry. We begin with a big picture perspective and then narrow in on several important inland water ports along the Yangtze River.

Summary of the Chinese Coastal Port Industry

The map below shows China's largest ports and their annual container throughput. For purposes of this piece we will classify port size using annual container throughput, which is measured in twenty-foot equivalent units (TEUs).

Figure 1: CHINA'S TOP PORTS IN 2005

Port	TEUs (000's)	1-yr Growth
Shanghai	18,084	24.3%
Shenzhen	16,197	18.6%
Qingdao	6,307	22.7%
Ningbo	5,208	30.0%
Tianjin	4,801	25.8%
Guangzhou	4,683	41.7%
Xiamen	3,342	16.4%
Dalian	2,655	20.0%

We state the obvious. China's port growth is massive. The industry expanded at a compounded annual growth rate (CAGR) of more than 27% for over a decade. In 1995, China only accounted for about 4% of the world's container throughput. Today, that number is 20%. In comparative terms, China's top ports are much larger than those in the United States. Below, we compare each country's top 5 ports.

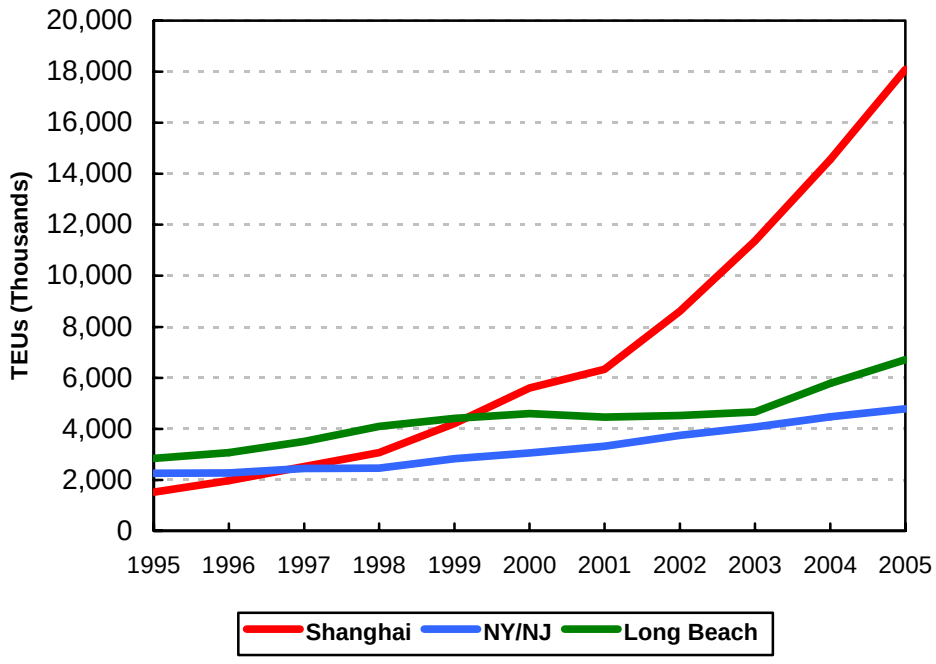
Figure 2: TOP 5 PORTS IN THE U.S. AND CHINA

China Top 5 Ports 2005	
Port	**TEUs (000's)**
1) Shanghai	18,084
2) Shenzhen	16,197
3) Qingdao	6,307
4) Ningbo	5,208
5) Tianjin	4,801
TOTAL	**50,597**

U.S. Top 5 Ports 2005	
Port	**TEUs (000's)**
1) Los Angeles	7,485
2) Long Beach	6,710
3) NY/NJ	4,793
4) Oakland	2,273
5) Seattle	2,088
TOTAL	**23,349**

The graph below contrasts the port of Shanghai with two of the largest American ports, Long Beach and New York. In 1995, Shanghai wasn't even in the list of the world's top 10 ports.

Figure 3: CONTAINER THROUGHPUT COMPARISON



China's ports today are among the largest in the world. The table below shows the global top 10 ports (ranked by TEUs) in 1995 and then in 2005. In 1995, none of the world's top 10 ports were located in China.

Figure 4: WORLD TOP 10 PORTS IN 1995 AND 2005

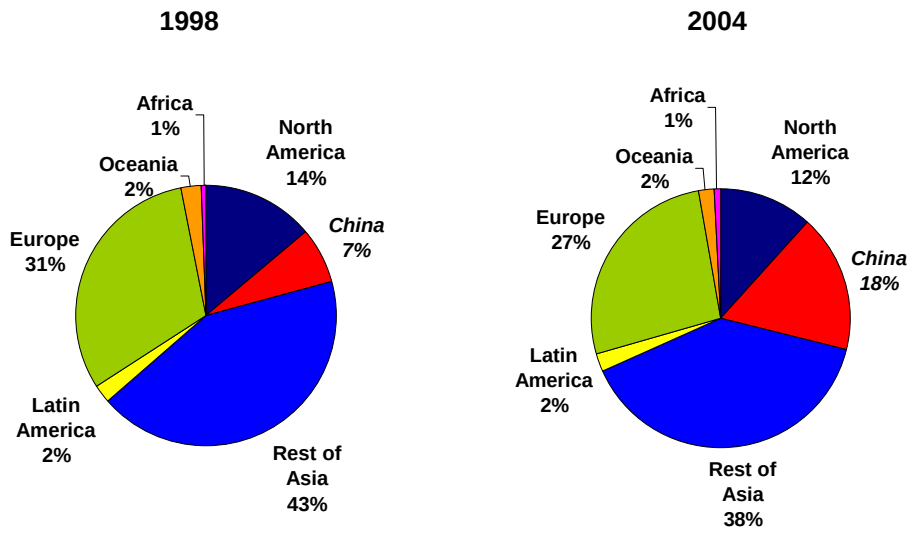
World Top 10 Ports 1995	
Port	**TEUs (000's)**
1) Hong Kong	12,250
2) Singapore	11,846
3) Kaohsiung, Taiwan	4,900
4) Rotterdam	4,787
5) Busan, S. Korea	4,503
6) Hamburg	2,890
7) Long Beach	2,844
8) Yokohama	2,757
9) Los Angeles	2,555
10) Antwerp	2,329

World Top 10 Ports 2005	
Port	**TEUs (000's)**
1) Singapore	23,192
2) Hong Kong	22,602
3) Shanghai*	18,084
4) Shenzhen*	16,197
5) Busan, S. Korea	11,843
6) Kaohsiung, Taiwan	9,471
7) Rotterdam	9,287
8) Hamburg	8,088
9) Dubai	7,619
10) Los Angeles	7,485

*In 2006, Shanghai and Shenzhen's container throughput grew to 21.72 million and 18.47 million TEUs respectively, representing annual growth rates of 20.1% and 14%. During the first quarter of 2007, Shanghai passed Hong Kong for the first time, and now occupies the No. 2 position. By 2008, Shenzhen is also expected to surpass Hong Kong.

The pie charts show the percentage of the world's total throughput by region in 1998 and in 2004, highlighting China's growth compared to the rest of the world.

Figure 5: 1998 AND 2004 WORLD CONTAINTER THROUGHPUT BY REGION



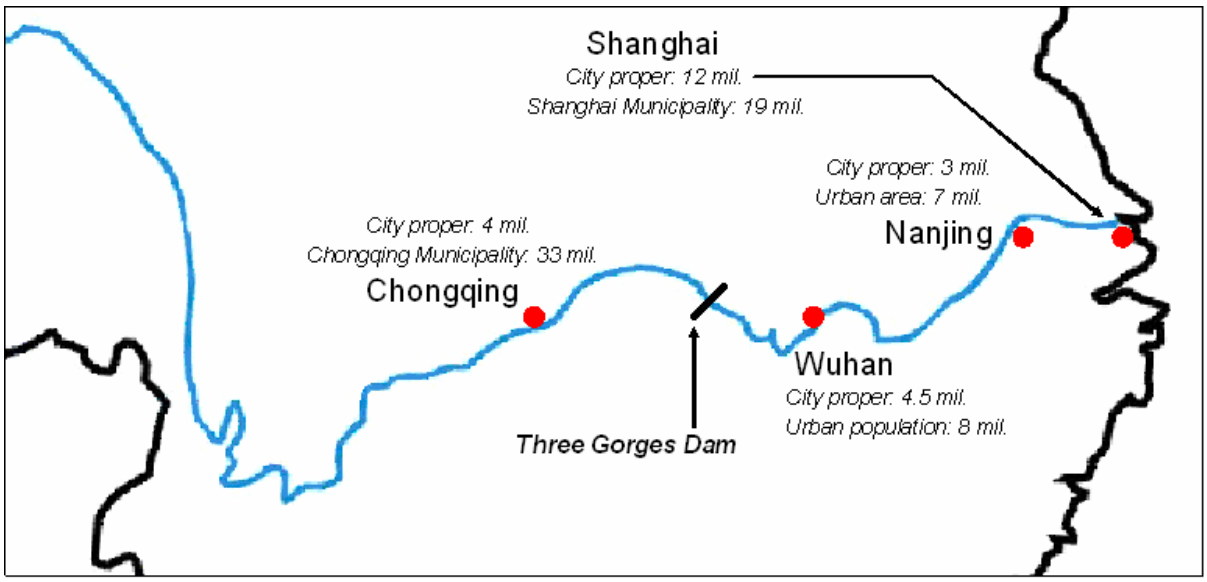
Many of our readers are familiar with the material we highlight above. “Tell us something we don’t already know,” you tell us. Rather than write another “me too” piece, we at ChinaVest hope to bring our clients more insightful analysis and a deeper perspective. To that end, we will spend the next several months discussing *inland ports*. We begin our analysis by studying ports along the Yangtze River.

China’s Yangtze Inland Ports

Inland ports play a more crucial and ever-expanding role in moving goods throughout the country than coastal ports.

About 80% of total inland waterborne cargo shipments move along the Yangtze River. At almost 4,000 miles long, the Yangtze is the world’s third-longest river. Its headwaters begin in the mountains of Tibet. In Shanghai, the river flows into the East China Sea. About 400 million people live in the Yangtze River area, a population greater than that of the United States and almost the size of the European Union.

Figure 6: THE YANGTZE RIVER—A CLOSER LOOK

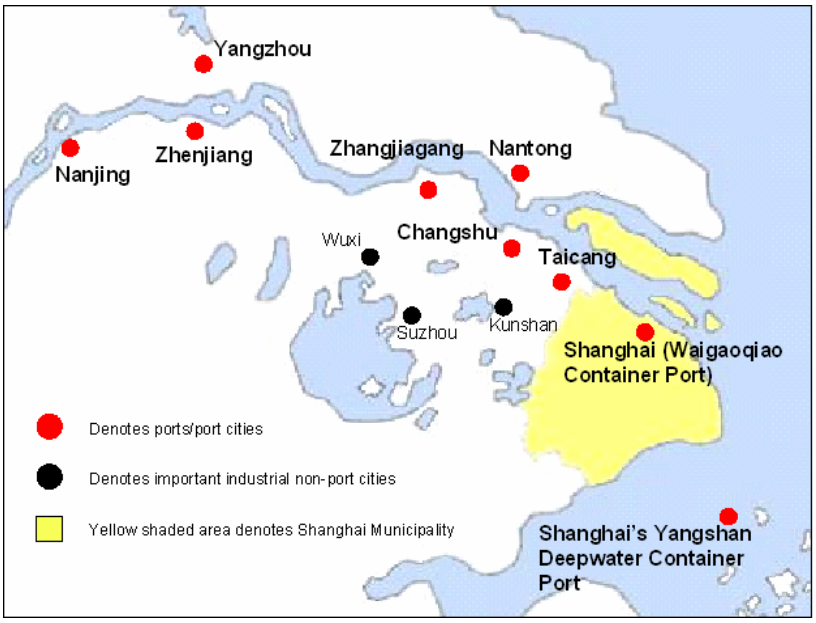


The three largest inland cities, east to west (upstream) on the river are Nanjing, Wuhan, and Chongqing. Nanjing (population 7 million), the capital of Jiangsu province, is located only a few hours from Shanghai by car. Wuhan (population 8 million) is located in central China’s Hubei province. Chongqing is the westernmost major city on the river, situated in its own city-province municipality in southwest China. The city proper houses about 4 million, while the Chongqing metropolitan area is home to over 33 million. The Three Gorges Dam sits between Wuhan and Chongqing.

Trade through the river's ports is significantly unbalanced. "An estimate of the ratio of exports to imports is 70%-30%," points out Dr. Albert Veenstra, Assistant Professor of Maritime Economics at Holland's Erasmus University and currently living in Beijing. What this implies, of course, is that the Yangtze River area is a major Chinese export region. Most of the export goods shipped out of Yangtze ports are for transshipment. They are eventually transferred at Shanghai to be exported abroad. The rest of the goods are shipped internationally from the Yangtze ports themselves.

When we discuss inland shipping in China, we refer almost exclusively to one river—the Yangtze. The Yangtze's disproportional 80% share of China's *entire* inland shipping industry is due, of course, to the length and size of the river. But it also mirrors the growth of Yangtze delta region, an area stretching from Nanjing to Shanghai.

Figure 7: INLAND PORTS IN THE YANGTZE DELTA REGION



The delta has directly benefited from the economic boom of the past two decades, and flourishes as a major manufacturing center for many industries. Dr. Veenstra points out that the 70-30 export/import imbalance is concentrated in the delta region (i.e. upstream port trade is less skewed), further highlighting the region's importance as an international manufacturing center. While the delta has prospered, the inland areas along the Yangtze in central and southwest China remain relatively underdeveloped and underinvested. Economic underdevelopment creates opportunities, and lower labor costs, government incentives, and other factors are spurring growth in these inland areas. The "Go West" mentality will only pick up steam as China's boom continues.

Major investment projects are underway in central and southwest China, including public and private investment in ports along the Yangtze. For example, in 2005, the Chinese government set aside almost US$2 billion for the expansion of ports in Nanjing, Wuhan, and Chongqing. Even a group of the river's smaller, non-top-10 ports is currently putting together a pool of over US$1 billion to fund major growth projects. Because current traffic on the Yangtze only fills 20% of the river's capacity, these investments will increase waterborne transport growth. And, as manufacturing expands in the interior (i.e. areas west of Nanjing), the river will transport the majority of the goods. The Yangtze is far and away the cheapest method to move product from central China to the coast. China's rail infrastructure, while growing, is not yet sufficiently developed. Trucking has become more expensive due to higher fuel costs and increased vehicular traffic.

Looking at the statistics below for the top Yangtze ports, those in the delta region (in boldface) are expanding rapidly.

Figure 8: 2005 CONTAINER THROUGHPUT AT YANGTZE RIVER PORTS

Port	TEUs (000's)	1-yr Growth
1) **Nanjing**	587.7	20%
2) **Zhangjiagang**	377.1	15%
3) **Nantong**	301.2	20%
4) **Taicang***	250.9	156%
5) Wuhan	178.0	27%
6) Chongqing	170.1	15%
7) **Yangzhou**	157.0	20%
8) **Changshu**	110.0	51%
9) **Zhenjiang**	98.4	29%
10) Chenglingji	68.0	55%

Yangtze delta ports shown in **boldface**

*Taicang's container throughput grew 139% to 601,200 TEU in 2006; the port is now the second-largest on the Yangtze in terms of container throughput, trailing only Nanjing.

Port of the Month: Taicang

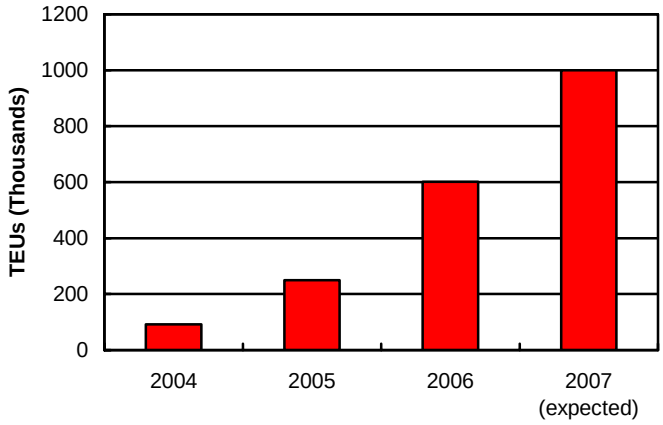
Over the next few months, we plan to highlight individual ports along the Yangtze. We will focus on those ports where there are: (a) important developments, (b) growth opportunities, or (c) other noteworthy features. Our first "port of the month" is Taicang (pronunciation: *tie-TSUNG*). The city of Taicang, with a current population of about 450,000, is situated in Jiangsu province, only 40-50 kilometers from downtown Shanghai (see map on Figure 7).

Taicang city has a rich maritime legacy, as it served as the launching point for China's legendary explorer Admiral Zheng He. In the 15th century, Admiral Zheng purportedly traveled to the Middle East, India, and Africa to create trade routes and open diplomatic relations. Taicang's history as a modern port, however, is just beginning.

With support from the Chinese central government, the city of Taicang is undertaking a major initiative to become one of the leading and most advanced Yangtze River ports. Highlighting this growth, container throughput jumped from 250,000 TEUs in 2005 to over 600,000 in 2006, making it the second-largest on the Yangtze and one of the fastest growing in China. Throughput is expected to exceed 1 million TEUs in 2007, surpassing Nanjing as China's top inland port. By 2010, container throughput will reach 4 million TEUs. One of the major limitations of the Yangtze is its relative lack of depth. To combat this issue, Taicang underwent a major dredging project, increasing its depth from less than 7 meters to 12.5 meters. Its depth allows the port to accommodate the largest container vessels that can navigate the mouth of the river. In addition to shipping to other Chinese cities, Taicang has five direct international shipping routes (all within Asia), four of which opened in 2006.

The chart below shows Taicang's annual growth in container throughput.

Figure 9: TAICANG PORT'S CONTAINER THROUGHPUT



Operation of the Port

In 2004, Modern Terminals, one of Hong Kong's oldest port operators, took a majority stake in the existing container facility at Taicang. The company also took a 70% stake in the US$300 million second-phase expansion project, which is set to increase capacity to 2 million TEUs by the end of 2008.

The Rise of Taicang

Growing the port, however, involves more than just expanding the port facilities. Other crucial infrastructure is required. The actual port area was basically farmland as late as a decade ago. To build a functional port district, the city of Taicang poured huge investments into major infrastructure projects, including bonded logistics parks, administrative and customs facilities, power generation facilities, petrochemical storage tanks, etc. The "Taicang New City" is also under construction around the port area. This will be an enormous office and residential community with many of the features of a modern international city, including hotels, restaurants, parks, and schools. It already boasts an 18-hole golf course.

The Taicang municipal government is luring multinational businesses to the area using tax breaks and other incentives. Every few weeks, at least one major international logistics provider or major international manufacturing company sets up near the port. According to Dr. Veenstra, this will be a major factor in the success of the Taicang, as ports generally serve the area within about a 25-50 kilometer radius.

Taicang is part of the greater Suzhou area. This area is home to about 12 million people, as well as the operations of many of the world's most recognized manufacturers. It includes the area surrounding industrial cities of Suzhou, Kunshan, and Wuxi. In 2006, 62% of the goods that were shipped out of Shanghai to international terminals originated in greater Suzhou, a fact that is especially eye-opening considering that Shanghai is now the world's second-busiest container port. Foreign firms will continue to invest in the Suzhou area due to its convenient location and relatively developed infrastructure.

Taicang acts as the "land-onto-ship port" for some of the goods shipped abroad out of Shanghai's Yangshan deepwater port, meaning the containerized goods are brought by land (truck or rail) and initially loaded onto vessels at Taicang. These goods are generally manufactured within the 25-50 kilometer radius of the port. With its location in greater Suzhou, its status as the Yangtze port closest to the sea, and adequate depth to handle larger vessels, Taicang is ideally situated for this task. Land-onto-ship handling accounts for 40-45% of container traffic.

The port's proximity to the sea and to Yangshan also makes it an ideal intermediate transshipment center, meaning smaller barges traveling downstream on the Yangtze transfer containerized goods to larger "bluewater" vessels at Taicang (bluewater means the vessel can travel into the sea; barges can only travel along the river). The much larger Shanghai Waigaoqiao container port is also ideally located at the mouth of the river, but is not well-equipped to accommodate the river barges, making Taicang and other delta ports better choices for handling both barges and bluewater ships. Roughly 25% of Taicang's throughput is comprised of this type of transshipment activity. Taicang's disadvantage compared with other Yangtze ports in the intermediate transshipment area lies in its channel fees. These fees, paid by vessel operators, help cover the dredging costs that maintain the port's depth. However, Taicang's municipal government is providing subsidies to reduce the burden on shippers. We believe that intermediate transshipment from upstream should continue to account for about 25% of the port's container throughput in the future.

Taicang is working to improve its status as an international port. As we mentioned earlier, Taicang has recently increased its number of international shipping lines to five. However, the younger Taicang port is still less established in the international shipping arena than some of the older delta ports like Nanjing and Zhangjiagang. Aside from just adding routes, Taicang must continue to persuade international shippers to include the port in their itineraries. Inter-Asia trade currently accounts for 30-35% of Taicang's container throughput.

Conclusion

We believe that Taicang leverages its geographic location to act as a facilitator between one of the world's largest, most modern container ports (Shanghai), and a heavily populated river with antiquated facilities upstream. Its proficiency as a rapid waterborne transport facilitator will also certainly prove an important factor in the growth of interior Yangtze ports, as the time it takes to move goods from the city of origin to the destination is one of the major cost drivers when manufacturers move farther west.

Taicang is another astonishing example of China's growth. By 2010, the port will have evolved from farmland to the size of one of the top 5 container ports in the United States. We believe the story of China over the next five years, and the place in which savvy investors will make money, is in infrastructure. Upstream, less developed ports along the Yangtze are only starting their metamorphosis. In our next installment, we discuss the port of Nantong.