

CHINA'S EXTRA- AND INTRA-ASIAN LINER SHIPPING CONNECTIONS, 1990-2000

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ABSTRACT : The growth of China's economy during the 1990s has both shaped and reflected changes in the span and function of the country's shipping connections both within Asia and with the rest of the world. Although sea-land developments within China have been studied, less attention has been paid to the wider global implications stemming from the transformation of the country's maritime geography during a decade of further market reforms and greater integration into the world economy. Consequently, there is a need to comprehend how China's state-owned shipping industry has been reorganized during the 1990s to meet the new requirements, with special reference to the country's liner shipping connections between and within Asia respectively. More purposely, these topics are addressed by examining changes in the organization, approach and set of connections of the state-owned China Ocean Shipping (Group) Company (Cosco) and its post-1993 offshoot COSCO Container Lines Company Ltd (Coscon). This review provides a springboard for a detailed analysis of shifts in both extra- and intra-Asian shipping patterns between 1990 and 2000 and consideration of their strategic implications. Finally, short-sea shipping is defined and the phenomenon's operational strengths and weaknesses discussed.

Keywords : *China, China Ocean Shipping (Group) Company, liner shipping, short-sea shipping*

I. INTRODUCTION

The 1990s heralded the emergence of China as a major world economy. Annual growth domestic product exceeded 7 per cent per year throughout the 1990s. China now accounts for most foreign direct investment in Asia having increased from US\$3.5 billion in 1990

Submission Date : 3/15/2005 Acceptance Date : 4/20/2005

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to over US\$40 billion in 2000 (DSC, 2003). These figures reflect the explosive economic growth triggered by China's 1978 'open door' policy and market reforms that have generated new production and trade linkages between expanding urban centers concentrated around the Bohai Rim, the Yangzi River and the Pearl River delta. In turn, these key regions export textiles, garments, footwear and electronic products.

This increased economic activity is reflected in the increase in China's container throughput from 6.4 million twenty-foot equivalent units (TEUs) in 1990 to over 35 million TEUs in 2000 (CIY, 2002). As shown in Table 1, the throughput is almost entirely handled by the top ten ports. Over the period under review, however, there was marked volatility in the rankings with a pronounced lessening in Hong Kong's overall dominance as the throughput of Mainland China's ports grew apace.

Table 1. Top-10 container ports of China, 1990-2000

Port	1990		Port	2000	
	Traffic Thous TEUs	Per cent		Traffic Thous TEUs	Per cent
Hong Kong	5,100.6	79.6	Hong Kong	18,100.0	51.0
Shanghai	456.1	7.1	Shanghai	5,613.0	15.8
Tianjin	286.0	4.5	Yantian	2,148.0	6.1
Qingdao	135.4	2.1	Qingdao	2,120.0	6.0
Dalian	131.3	2.1	Tianjin	1,708.4	4.8
Jiuzhou	85.2	1.3	Guangzhou	1,429.9	4.0
Guangzhou	80.7	1.3	Xiamen	1,084.7	3.1
Nanjing	41.8	0.7	Dalian	1,011.0	2.9
Chiwan	40.0	0.6	Ningbo	902.0	2.5
Xiamen	30.0	0.5	Shekou	720.3	2.0
Top-10	6,387.1	99.6	Top-10	34,837.3	98.2
China	6,411.6	100.00	China	35,483.0	100.00
Total East Asia	32,289		Total East Asia	106,598	
Total World	87,783		World	235,026	

Note : East Asian and World figures are from Drewry Shipping Consultants,

Source : CIY (1990-2002); DSC (2003)

The accelerated growth has both influenced and mirrored changes in the scope and operation of China's shipping connections within Asia and with the rest of the world between 1990 and 2000. Although Ernst Frankel (1998) has provided a broad conspectus of sea-land developments within China, there is a pressing need to examine the wider ramifications of changes in China's maritime environment, prompted by deepening

trading ties to assist our comprehension of the role and importance of short-sea shipping (SSS).

This focus raises a series of broad issues: how has China's maritime economic geography been transformed during a decade marked by further market reforms and the country's increased participation in the world economy? More specifically, how has the corporate framework of China's shipping industry been restructured to meet the new demands of global commerce and what have been the repercussions on China's extra- and intra-Asian container shipping networks between 1990 and 2000?

In addressing these issues attention is focused on changes in the structure, strategies and networks of the state-owned China Ocean Shipping (Group) Company (Cosco) and its post-1993 offshoot COSCO Container Lines Company Ltd (Coscon). The choice of this Group is apposite not only because it includes China's leading container carrier but also because the company's strategic adjustments to its intra- and extra-Asian shipping patterns closely parallel shifts in the country's economic geography and the increasingly competitive global economic environment. Following an analysis of the company's restructuring, an analysis is undertaken of changes in both extra- and intra-Asian shipping patterns between 1990 and 2000. Based on this analysis, there is discussion of their strategic implications and a concluding comment on the definition of short-sea shipping and the phenomenon's operational strengths and weaknesses.

II. CORPORATE RESTRUCTURING, 1990-2000¹

By 1990 Cosco had already been in existence almost thirty years. When it was established the company was based in domestic ports stretching from Dalian in the north to Guangzhou in the south (Fig. 1). In elaborating the maritime environment within which China's leading shipping company operates the country's container ports are allocated to one of three regions or port ranges: the northern range around the Bohai Rim, the central range focused on the Yangzi River Delta and southern range centred on the Pearl River delta. This division of China's maritime geography echoes Dr Sun Yat Sen's 1919 plans for China's regional port development (Rimmer, 1997).

¹ This section is based on Rimmer and Comtois (2002).

FIGURE1. Selected container ports within China's maritime ranges

Source : Comtois and Rimmer (2004)

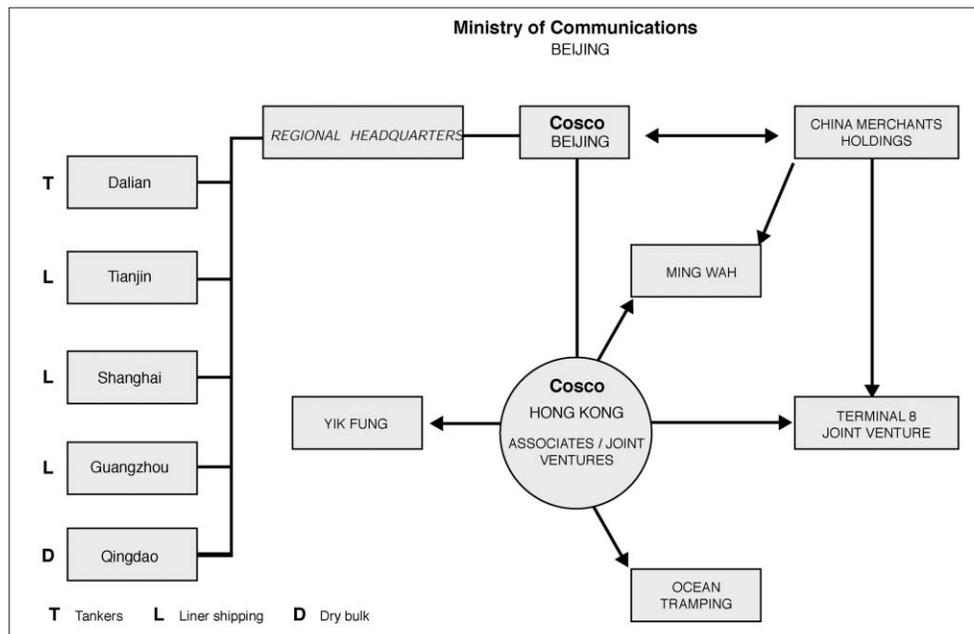
At the time of its inception Cosco had four vessels totalling less than 30,000 dwt. For many years its general cargo, dry bulk and tanker fleet was renowned for its ageing and second hand ships, port delays and uncertain sailing schedules. The company only survived and prospered because of the Chinese Government's practice of reserving cargo for its national shipping line. In the mid-1980s Cosco carried 80 per cent of all Chinese cargoes (World Bank, 1988). This was possible because Cosco was well represented in coastal and inland areas throughout China by 70 subsidiaries of the China Ocean Shipping Agency (Penavico). Cosco was also supported by cargo from Sinotrans, the national freight-forwarding agency operated by the Ministry of Foreign Economic Relations and Trade (MoFert).

With the onset of containerisation Cosco extended its operations from Asia and Australia in the late 1970s, and to North America and Europe in the early 1980s (LSE, 1995). As Cosco expanded overseas there were pressures on China to allow foreign operators equal access to cargoes and shipping services at its ports because at the time only the Danish-owned Maersk Line had a foothold in China's ports. This pressure led to the abandonment of the national cargo reservation system in the mid-1980s. Discriminatory practices involving dual pricing of stevedoring at local ports were also discontinued and ports, previously closed to foreign ships, were opened (World Bank, 1988). Sinotrans also undermined Cosco's position in China because the MoFert freight

forwarder was able to charter its own vessels after 1988 and compete for local cargoes.

By 1990 China's shipping planners pursuing a central planning paradigm, had established Cosco as a maritime corporation with virtual ministry status (Heine, 1989). Regional headquarters for Cosco's liner shipping operations were established in each of the three port ranges: Tianjin in the northern range, Shanghai in the central range and Guangzhou in the southern range (Fig. 2). Collectively, the regional headquarters controlled the wholly owned and diversified contained fleet that drew on both overseas and local shipyards (Song, 1990; Flynn, 1999; Lu and Tang, 2000). Dalian was the company's national base for tankers and Qingdao the national base for dry bulk (Rimmer and Comtois, 2002). Beijing served as the company's headquarters.

FIGURE 2. Cosco's organizational structure prior to 1993



Source: Rimmer and Comtois (2002)

Extensive strategic use was made of Hong Kong to earn much-needed foreign currency and to base the container fleet. Apart from the currency advantages, this enabled the company to circumvent restrictions on Chinese vessels entering hostile overseas ports. A related strategic thrust was corporate diversification through the acquisition of Hong Kong-based subsidiaries and offshore companies including Ocean Tramping and Yick Fung which engaged in spot and time charter bulk shipping markets around the world using Liberian and Panamanian registered vessels. These companies were also used to update Cosco's shipping fleet free of any restrictions that purchasers must buy from local shipyards.

Another offshore company, Ming Wah, specialising in the dry bulk trades, was the shipping arm of the Cosco-related China Merchants Holdings based in Hong Kong. Under the direct control of China's Ministry of Communications, China Merchant Holdings invested in port development, insurance and shipping. Hong Kong was also an 'offshore' base for operating Cosco's liner shipping fleet offering scheduled services for containerized cargo. Cosco had invested in Hong Kong's port development through a joint venture with Hong Kong International Terminals owned by Hutchison Whampoa. This cooperation was extended to the joint development of Shekou Container Terminal in the Shenzhen economic zone adjacent to Hong Kong.

Cosco's organisational superstructure was too unwieldy. While it was admirably suited to a planned economy, it was inefficient in the emerging market-oriented economy. In 1991 Cosco had a fleet of 620 vessels aggregating 14.5 million dwt including 71 full container vessels, 183 bulk carriers and 242 general cargo vessels (Tang, 1991). Such a large company was not easy to manage. Threat of retaliatory action by the Federal Maritime Commission in the early 1990s against Cosco and Sinotrans ships calling at United States ports led to foreign carriers, notably American President Lines and Sea-Land, being given greater access to cargoes in China previously handled by Cosco, Sinotrans and other domestic carriers. However, foreign firms were still precluded from operating ancillary pick up and delivery services.

Shipping reforms 1993

In 1993 Cosco abandoned its organisational structure. Instead the China Ocean Shipping (Group) Company was created with separate business units for container liner, intermodal and bulk shipping services. Attention here is focused on changes within the container shipping group - Cosco Container Lines (Coscon) - the company's core business, which has its headquarters in Beijing.

The newly-formed Coscon sought to provide a reliable and cost effective service with a range of fully-integrated distribution, logistics and landside options similar to those of the global players, notably Maersk-Sealand. In the process Coscon transformed itself from a wholesaler of port-to-port services to a retailer of door-to-door services through mainly the adoption of information technology. As part of this new global strategy, regional headquarters were established in Tokyo, Hong Kong and Singapore (Asia-Pacific), Hamburg (Europe) and Secaucus, New Jersey (North America). Australia, South Africa and the Middle East were added later.

In transforming itself, Coscon tried to shrug off its past image as a state-controlled outsider in which strategic decisions were dictated by price and market share. Links with the Ministry of Communications were severed to allay criticism that this connection was being used to curb competition (e.g. revocation of carrier licences). Past avoidance of conferences was abandoned as Coscon took part in trade lane discussions and shipowner associations such as the North Europe/Israel Conference, the Box Club, the Asian Shipowners Forum and the Intra-Asian Discussion Agreement. It has also held

discussions in London with the Far Eastern Freight Conference. As its prices are no longer lower than some conference carriers, the new convert is preaching the gospel of stability.

In 1996 Coscon was reluctant to enter joint ventures when the initial global alliances were formed. Yet two years later Coscon had repositioned itself as a cooperation-minded carrier. Cosco became part of a world-spanning Asian alliance with Japan's K-Line and Taiwan's Yangming Line in the two major east-west trades: Trans-Pacific and Trans-Suez. Within this loose alliance the three shipping lines operate independently but exchange container slots on each other's ships. Limited pooling of equipment is taking place at nominated ports but the agreement is a much freer arrangement than the Grand Alliance or New World Alliance, which are designed to negotiate with their larger customers or global companies on a more equitable basis.

Since the establishment of this agreement Coscon has allocated additional capacity to the Trans-Pacific trade to accommodate the increased cargoes from China. Also an agreement has been made with CP Rail to ship containers via Vancouver to the midwest of the United States. A more intriguing development is an arrangement between Coscon and the Taiwan-based, Evergreen group, which also has offices in both Beijing and Shanghai (Boyes, 1999). As a result Coscon developed an arrangement with Evergreen on the Asia/South Africa/East Coast South America route and one with Evergreen's subsidiary, Uniglory, to the Middle East. This prompted speculation about a merger of Chinese shipping lines that could involve the Orient Overseas Container Line (OOCL) based in Hong Kong and currently limited by complex laws involved in the establishment of foreign-owned companies. This move seems unlikely but it did demonstrate Cosco's newfound importance and emphasize - in an ever more privatized world - that a state company may still engage effectively with the market to benefit the national economy.

Hong Kong Connections

The handover of Hong Kong to China has not had a marked impact on Coscon's activities. Coscon was already the largest single customer of the port of Hong Kong and a partner in Hong Kong's Terminal 8, with Hutchison Port Holdings (HPH) Ltd, which also has investments in the ports of Shanghai, Xiamen and Yantian. In addition, Cosco was a major investor in Hong Kong businesses with over 100 wholly owned companies. Ostensibly, Cosco Pacific Ltd (previously the Florens Group) was engaged in container leasing but it had honed its skills in raising finance from foreign financial institutions (Comtois and Rimmer, 2004).

Furthermore Cosco Network Limited has been established in Hong Kong (incorporated in the Cayman Islands) to engage in global transport and logistics - the tracking, tracing and real time information on the whereabouts of shipments. Already Cosco Network has a strategic alliance with Hutchison Port Holdings' Portsportals which provides online logistics support for 1,000 textiles companies in China. This new venture is part of Cosco's diversification into high technology and environmental protection activities in Hong Kong. Such activities complement its investment in

infrastructure and property, and include Cosco Tower in Hong Kong and Henan Power Plant in China. Further, Cosco has an investment centre in Singapore. Although Coscon's decision-making power is concentrated in Beijing, both the company's Hong Kong and Singapore offices have a measure of independence.

Between 1990 and 2000 Cosco/Coscon underwent a large-scale fleet modernisation. The company reduced its fleet to 118 vessels - a 19 per cent reduction in number. Many small cellular vessels with a capacity of less than 1000 TEUs were phased out, while 21 container ships with capacities exceeding 3000 TEUs joined the fleet (Table 2). By 2000 Cosco's container fleet (excluding the Yangzi and Pearl River delta fleets) had a carrying capacity of over 220,000 TEUs. Six post-Panamax vessels with capacities of 5,200 TEUs were on order. On balance, this combined divestment/investment strategy virtually doubled capacity and maintained the company's position as the world's seventh-largest carrier (CIY, 2000). New equipment was purchased including orders for post-Panamax vessels capable of carrying over 5000 TEUs - two to be constructed by Cosco's own private shipyard facility at Nantong near Shanghai.

Table2. Cosco/Coscon's container fleet, 1990-2000

Vessel size (TEUs)		Cosco 1990	Coscon 2000	On order
Under 1,000	Number	108	69	
	Capacity (TEUs)	35,786	35,769	-
1,000-1,999	Number	34	47	-
	Capacity (TEUs)	46,659	68,049	-
2,000-2,999	Number	6	13	-
	Capacity (TEUs)	16,412	31,313	-
3,000-3,999	Number	0	15	-
	Capacity (TEUs)	0	54,097	-
Over 4,000	Number	0	6	6
	Capacity (TEUs)	0	31,200	31,200
Total	Number	148	150	6
	Capacity (TEUs)	98,857	220,428	31,200

Source : CIY (1990-2002)

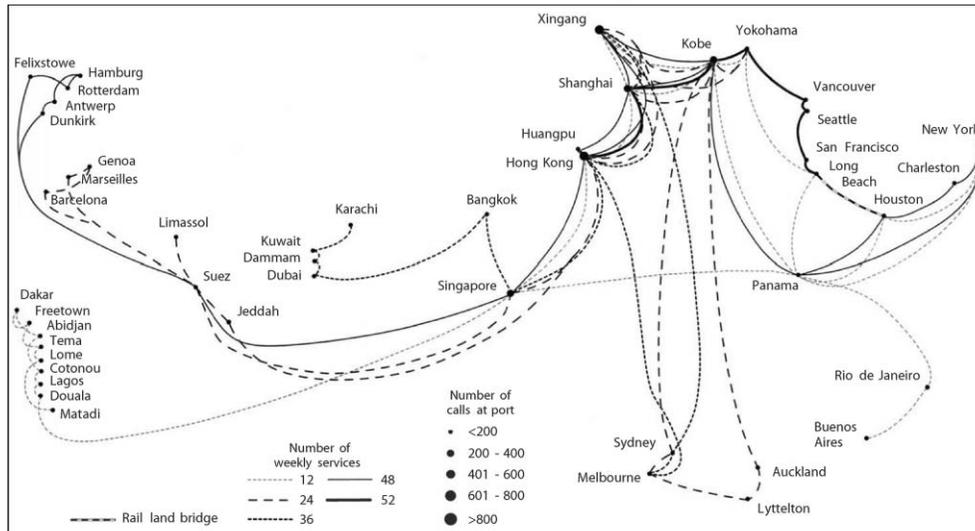
The company combined the new corporate outlook and the modernized fleet to transform the geography of shipping services between 1990 and 2000, as it benefited from increased world trade with the Asian market, the new growth center of the world economy (Comtois, 1999). In discussing these changes, an important distinction is made between extra-Asian and intra-Asian services. Although the intra-Asian services are the prime concern of those interested in short-sea shipping liner services, there are important connections between the two spheres of operation, which necessitates a consideration of

both. We begin with the extra-Asian shipping patterns as they reveal the extent to which Cosco has been transformed from a cosseted national champion into a global player.

III. EXTRA-ASIAN SHIPPING PATTERNS

In 1990 Cosco's pattern of extra-Asian shipping services was relative simple (Fig. 3). Only three ports - Xingang, Shanghai and Hong Kong - were dominant as international hubs. Very few services extended beyond two port ranges (i.e. Europe and west coast North America). While the company transited the Panama and Suez canals, it did not serve the trans-Atlantic route and had no round-the-world services. Even though the East-West trades were limited, the carrier's investment was distinctly biased towards them in terms of capacity and services. Approximately, two-thirds of its shipboard capacity was allocated to the three trans-Pacific and three trans-Suez routes. Although six routes served the Middle East and smaller markets in the South Pacific, Africa and South America the container slot capacity of the North-South trades was markedly inferior to the East-West trades.

FIGURE 3. Coscon's extra-Asian traffic and ports-of-call, 1990



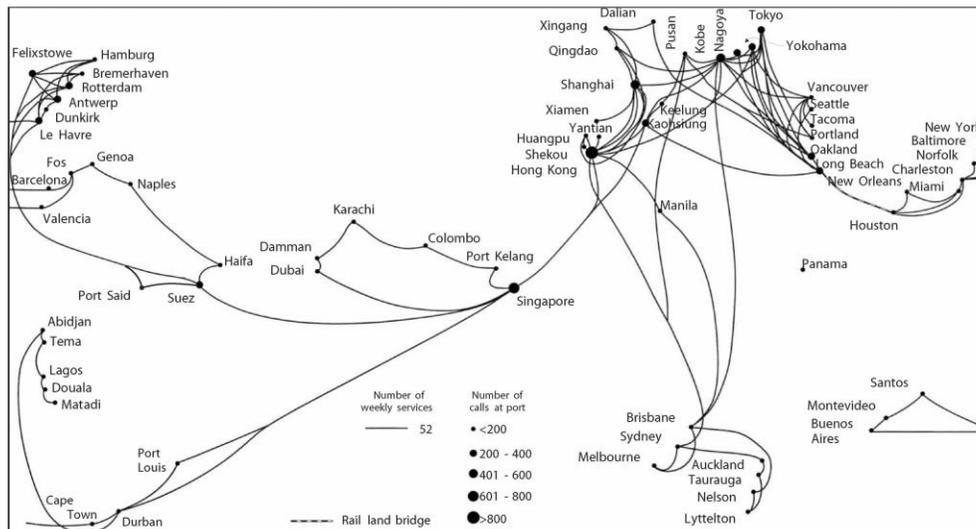
Source: Comtois and Rimmer (2004)

By 2000 Coscon's limited extra-Asian operations of a decade earlier had given way to a weekly service network structure, with pendulum services between three or more port ranges (Fig. 4). Between the two dates the carrier had added twenty-three new ports to its extra-Asian schedules, including the Middle East (Table 3). Services to twenty-four ports were maintained. Only eleven ports were dropped from the schedules.

Table 3. Turnover of ports in Coscon's Extra-Asian maritime ranges, 1990-2000

Range	1990	Dropped	Added	2000	Alliance services	Global terminal operators
Mediterranean	4	2	2	4	2	2
Northern Europe	5	1	3	7	5	4
West Coast N. Am.	4	1	3	6	5	6
East Coast N. Am.	2	0	3	5	3	1
Gulf	1	0	1	2	0	0
Middle East	4	2	3	5	1	1
South Pacific	4	0	3	7	0	3
Africa	9	4	3	8	0	0
South America	2	1	2	3	0	1
Caribbean	0	0	0	0	0	0
Total	35	11	23	47	16	18

Source: CIY (1990-2002).

FIGURE 4. Coscon's extra-Asian traffic and ports of-call, 2000

Source: Comtois and Rimmer (2004)

A feature of the trunk Trans-Pacific and Trans-Suez routes, operated jointly by Coscon with Japan's K-Line and Taiwan's Yangming Line, has been the integration of Chinese ports into its schedules as direct ports of call. They include Qingdao and Xingang (Tianjin) in the northern range of ports around the Bohai Rim; Shanghai and Ningbo in the central range on the Yangzi, and Yantian and Shekou in the southern range focused on the Pearl River delta. At this stage most are first ports of call/last ports of discharge because the ports lack the depths to handle fully laden container ships. Most of Coscon's

competitors have also incorporated direct Chinese ports of calls into their schedules and are seeking to develop extensive inland logistics networks covering most provinces (e.g. Maersk Sealand, Overseas Orient Container Line and P&O Nedlloyd).

Clearly, Coscon's trunk East-West trades have undergone an ambitious expansion programme between 1990 and 2000. The new pattern is marked by an intensification of activities across the Pacific through seven weekly services. A rail land bridge from North American west coast ports reduces transit time to the east coast (Slack, 2001). Links between Hong Kong/Singapore and Europe have been strengthened, with Suez established as a pivot port. Based on Suez, there are four weekly services through the canal to and from Mediterranean and North European ports, including one weekly service that extends to the east coast ports of North America. Operations have also expanded into new markets, with two weekly services originating and terminating in the Atlantic. In effect, a 'Main Street' has emerged between the hub ports of Rotterdam, Antwerp, Felixstowe, Suez, Singapore, Hong Kong, Shanghai, Busan, Kobe and Long Beach.

The feeder North-South network pattern in Africa and South America has been restructured and augmented. Thus a weekly service from Hong Kong to South America, with important stopovers in Durban and Cape Town, is complemented by another weekly service between Durban and other African ports. Other features are the persistent links between China and Australia and New Zealand, together with weekly services between ports in Japan, South Korea and Australasia. Although most of Coscon's slot capacity is committed to the East-West routes, the new alignment of the North-South trades clearly highlights the carrier's interplay between extra-Asian and intra-Asian traffic patterns. For example, in addition to its extra-Asian function, the rail land bridge to Houston permits intra-Asian freight to and from the Gulf Coast region of North America to be handled by west coast ports (Slack, 2001). More generally, container flows at the hub ports on the 'Main Street' have been reorganized, allowing ships travelling between Europe, Asia and North America to be loaded with North-South traffic.²

As much of Cosco's restructuring has occurred outside Asia there is the prospect that a liner network will connect a hub port in Asia with a counterpart in either Europe or North America by the shortest route. Most two-way connections have not reached the point for them to become an independent trade. Consequently, there is mix of (1) feeder traffic destined for markets outside Asia, (2) import/export traffic between Asian countries, and (3) cargo flows within national boundaries (cabotage) (DSC, 2003). Both cargoes are concentrated at hub ports where larger-sized vessels are connected with the feeder cargoes. These intra-Asian cargoes are a critical factor for the management of Coscon. The company's strategic response has been defensive rather than offensive as management has sought to rationalize and consolidate the intra-Asian trades.

² The only drawback to Coscon's progress has been the fact that the United States government still regards the shipping line as a 'controlled-carrier' under the Ocean Shipping Reform Act 1998. As a state-managed company Coscon is required to give the United States government 30 days notice of any change in freight rates compared with 24 hours notice by its rivals.

IV. INTRA-ASIAN SHIPPING PATTERNS 1990-2000

Before examining the management of Cosco's intra-Asian shipping patterns in 1990 it is important to define short-sea shipping. Hideo Yamada (1989), then of the Japan Maritime Research Institute (JAMRI), was in no doubt that all intra-Asian services could be defined as short-sea liner trades. As shown in Table 4, most countries are located within two to three days reach of Shanghai or Kobe by ships with a speed of 12 knots with a ten-day voyage on the longest route between Kobe and Jakarta.

Table 4. Voyage distance and time from Shanghai and Kobe

Port	From Shanghai		From Kobe	
	Distance nautical miles	Time days	Distance nautical miles	Time days
Shanghai	-	-	787	2.7
Keelung	419	1.5	926	3.2
Pusan	497	1.7	623	2.1
Dalian	552	1.9	857	3.0
Kobe	787	2.7	-	-
Hong Kong	823	2.9	1,387	4.8
Yokohama	1,039	3.6	362	1.3
Singapore	2,181	7.6	2,699	9.4
Jakarta	2,519	8.7	3,034	10.5

Source : Yamada (1989)

Benchmark

After defining the short-sea liner trades, Yamada (1989) proceeded to provide an important benchmark for examining Cosco's intra-Asian services in 1990 by profiling operating conditions late in the preceding year (Table 5). He reported that the average size of vessels sailing between Kobe and Busan in less than two days was one-third the size of those running over the longer distance between Kobe and Keelung. The frequency of the Japan-China trade had not yet reached a daily basis even when conventional vessels added to the full-containerships. An examination of local and feeder cargoes shows that the latter accounted for almost 50 per cent of cargo between China and Japan. There are many point of similarity between short-sea shipping and coastal shipping: small capital base and interchangeability of managerial resources to expand business opportunities and facilitate hedging risks. Water transport was prominent in handling domestic freight in both China and Japan. Although Cosco/Coscon has to face competition for rail and road transport within China the company's immediate competitors are other shipping firms within the country. As this situation affects shipping adversely, Yamada suggests dialogue among shippers in a bid to even out peaks and troughs in demand for shipping services to meet

the needs of shippers for convenience, speed, reliability and a reasonable price.

Table 5. Profile of operating conditions in the intra-Asian short-sea trades, 1989

1. Average size of containerships		
Route	Average size TEUs	Distance Nautical miles
Kobe-Busan	138*	623
Kobe-Shanghai	323	787
Kobe-Keelung	472*	926

* Note: excludes large-size containerships bound for North America and Europe.

2. Frequency of service		
Route	Full containerships Vessels per week	Conventional ships Vessels per week
Kobe-Busan	28	44
Kobe-Keelung	30	11
Kobe-Hongkong	27	5
China		
Kobe-Shanghai	4	4
Kobe-Dalian	3	1
Kobe-Tianjin	4	2
Kobe-Qingdao	2	1
Kobe-Others	3	2
Sub-total	16	10
Total	53	70
Kobe-WCNA*	16	0

Note: Reference point. Compiled from Shipping and Trade News, five-week period 18 August 1989-1 October 1989.

3. Development of feeder services, 1987		
	Local TEUs	Feeder TEUs
Japan-China	66,900	12,300
China-Japan	63,100	55,100

Note: Derived from Japan-China Association of Economy and Trade, 1988.

4. Relationship with inland shipping		
Mode	Japan bill. ton-km (%)	China bill. ton-km (%)
Water transport	201 (45.1)	1,0007 (43.5)*
Road transport	224 (50.2)	322 (13.9)
Railways	21 (4.6)	988 (42.6)
Total	446 (100)	2,317 (100)

Note: * Includes deep-sea shipping 697 (30.1%).

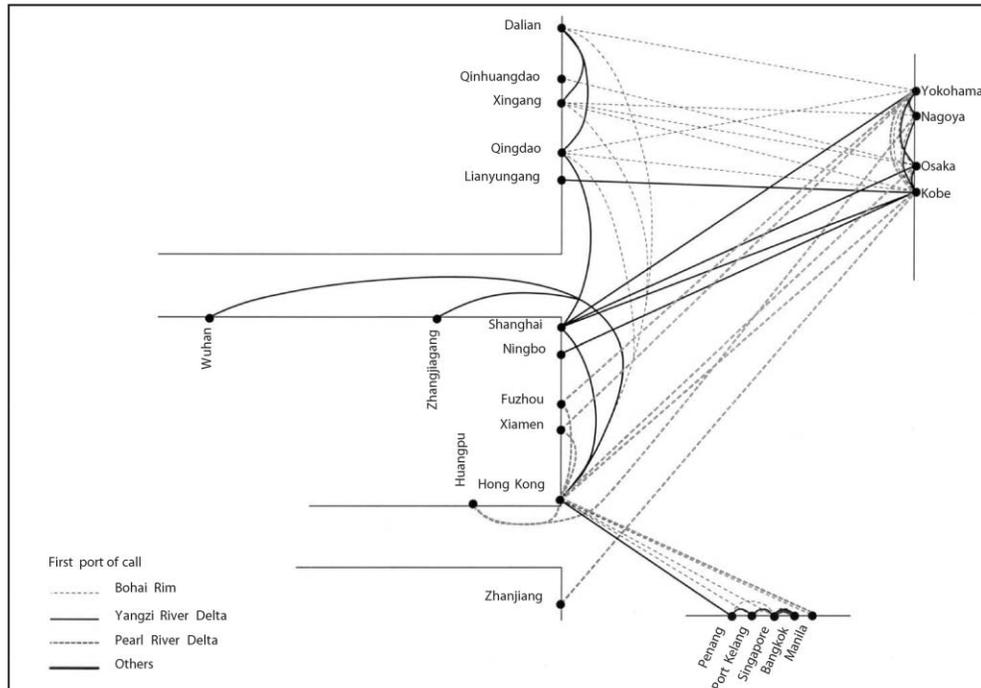
Source: Abstracted from Yamada (1989)

Writing on the cusp of the 1990s decade, Yamada (1989) anticipated the overall volume of the Asian short-sea trades would grow rapidly during the 1990s with an increasing share of extra-Asian traffic in addition to the intra-regional trades. Although not optimistic about the region's straight-line growth he argued the region had great potential from a long-term perspective. The key indicators were high-speed growth, the trend towards a bloc economy in the Pacific Basin, the high degree of export ties among Asian economies, higher levels of income to boost consumption and liner cargoes, and strong competitive pressure among shippers. Once shipping is involved in competition among its consumers, freight rates come under pressure. This results in competition among shipping firms, causing rates to fall, often below cost level. In turn, this leads to overcapacity and the need to even out the range of fluctuations in the volume of cargo movements throughout the year due to seasonal factors and changes in the economy. The average demand-gap ratios between the peaks and bottoms in the Japan-China trade between 1986-88 were 31 per cent northbound and 26 per cent southbound. These ratios were typical in the short-sea trades and point to the need to curb excess capacity where supply exceeds peak demand. A freeze on reserve capacity among shipping companies would assist in the stabilization of freight rates and prevent freight dumping when there is a slump in cargo movements. Given these important insights into the nature of the short-sea liner trades, we can proceed to analyse changes in Cosco's shipping networks between 1990 and 2000.

Shipping networks

In 1990 proximity was an important determinant of Cosco's intra-Asian shipping network (Fig. 5). Six routes operated between Northeast Asia and Southeast Asia, including a weekly service between Bangkok and Singapore. Marked ties between China and Japan were revealed by the presence of more than 37 monthly services, the Kobe-Yokohama-Hong Kong triangle being pivotal to the network. Inland, the domestic connections were limited in China, and the network's threshold did not extend beyond the country's coastal area. There were only three inland waterborne connections and all of them radiated from Hong Kong. These linked the hub port with Zhangjiagang and Wuhan in the Yangzi River delta, and Huangpu in the Pearl River delta.

FIGURE 5. Coscon's intra-Asian traffic and port-of-call, 1990



Source: Comtois and Rimmer (2004)

During the 1990s the average size of Cosco vessel on intra-Asian routes increased, particularly after 1995 when ships were redeployed from the East-West trades as larger mother ships were introduced (DSC, 2003). Over this period the carrier played a pivotal role in containers becoming part of China's industrial and social fabric. In particular, Coscon was largely responsible for the deconcentration of container activities within the Bohai Rim, Yangtze River delta and Pearl River delta port complexes. Generally, the carrier has found China's inland rail facilities too poorly equipped and the leasing of equipment too expensive for widespread use.³ However, Coscon now has an agreement with the China Railway Container Transport Center (CRCTC) to run block container trains from the company's main ports of call - Shanghai, Qingdao, Tianjin and Dalian - to key inland cities such as Beijing, XIan and Chengdu (DSC, 2003). Trucking is superior to

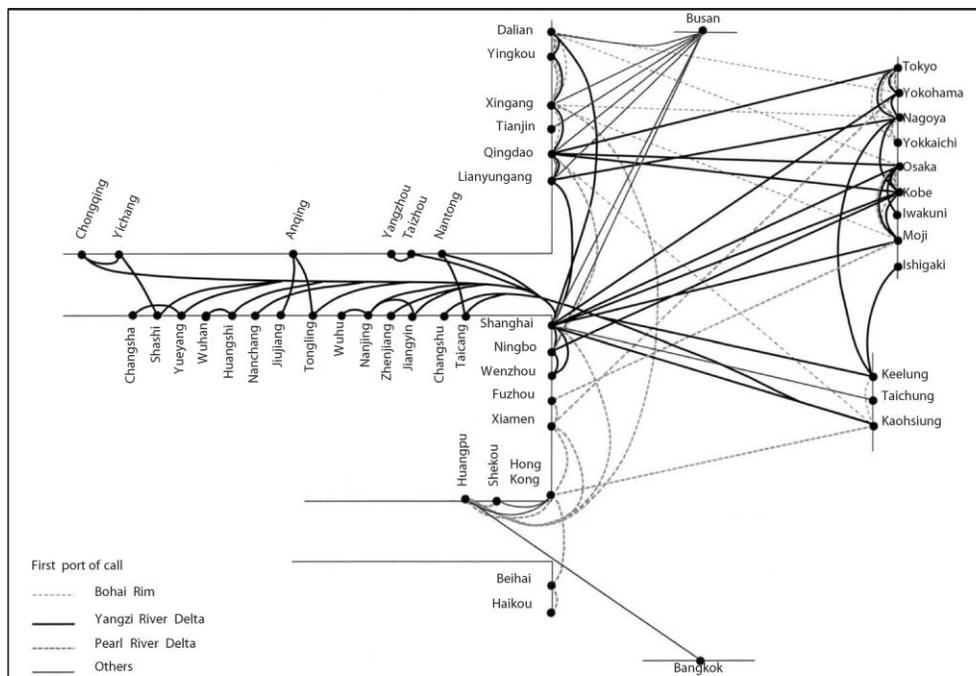
³ According to Zhongguo Jiaotong Nianjian [Yearbook of China Transportation and Communications] only 87,468 TEUs were carried by rail in China as a whole during 2000 (ZJN, 2001: 583).

⁴ Away from the river basins road-based transport was the dominant transport mode. In 1990 rail transport was confined to moving non-ISO (International Organization for Standardization) containers (Comtois and Rimmer, 2004). Subsequently weekly rail shuttles were introduced to Qingdao. In 1995 the first container trains connected to Hong Kong commenced. Five years later the container trains connected twenty-three locations, though there was no direct line to the port's Kwai Chung container terminals. A container rail service also linked Dalian with the Russian Far East. The initiatives suggest that rail has the potential to compete with road but container movement ranks behind fuel, agricultural goods and military goods traffic in tonnage.

rail within a 500 km radius of China's port complexes.⁴ Moving to a Pan China trucking network is inhibited by rigid licensing systems operated by provincial bureaucrats and local tolls.

By 2000 Coscon's feeder and local cargoes were sufficient for the carrier to be ranked among the region's 'millionaire' TEU carriers (DSC, 2003). However, the carrier's extensive intra-Asian network was under close scrutiny as the carrier sought ways to turn its loss-making operation around. Excluding the company's fleet of barges and inland waterway vessels plying the Yangzi River and Pearl River delta, the company was deploying fifty vessels with an aggregate capacity of 40,000 TEUs. Although the number of vessels had not increased since 1996 the carriers overall slot capacity had risen. Larger vessels had been introduced on several routes, particularly within the China-Japan-Korea triangle. Between 1990 and 2000 Coscon had increased its weekly liner services from twenty to fifty-six between 1990 and 2000 (Fig. 6).

FIGURE 6. Coscon's intra-Asian traffic and port-of-call, 2000



Source: Comtois and Rimmer (2004)

Thirty-six new ports were added to Coscon's intra-Asian schedules; twenty-ports were maintained and three were dropped (Table 6). The number of ports incorporated into global alliances reflect Coscon's establishment of partnership arrangements to pool resources with a cluster of market-economy carriers: Japan's 'K' line; the Taiwan-based Yangming Line and Uniglor Marine Corp (Evergreen Group); the Hong Kong-based Orient Overseas Container Line (OOCL); the Korean-based Hanjin Shipping; and Pacific

International Lines (China/Southeast Asia). As with other strategic alliances, this association has led to some service gains, particularly nine weekly sailings to Korea and the extension of Coscon's services to Taiwan within a conference agreement with OOCL. These arrangements are designed summarily to reduce slot costs, extend the company's reach, increase sailing frequencies and boost cargo liftings. As with other strategic alliances, this association has led to some service gains, particularly nine weekly sailings to Korea and the extension of Coscon's services to Taiwan within a conference agreement with OOCL.

Table 6. Turnover of ports in Cosco's Intra-Asian maritime ranges, 1990-2000

Range	1990	Dropped	Added	2000	Alliance services	Global terminal operators
China	13	2	29	40	7	9
Other Northeast Asia	4	0	6	10	6	0
Southeast Asia	6	1	1	6	3	4
Total	23	3	36	56	16	13

Source : CIY (1990-2002)

These new developments include the reefer services introduced between China and Northeast Asian ports, especially those in Japan (DSC, 2003). More specifically, several services - referred to as the Green Express - are offered between China's Shandong ports of Qingdao and Lianyungang and the Japan's metropolitan cores of Keihin (Tokyo/Yokohama) and Hanshin (Kobe/Osaka). By 2000 the Green Express had been in operation for one year and provided shippers with fast cargo delivery times, fixed schedules and accelerated Customs clearance procedures. An incidental outcome is the consideration being given by the company to introducing just-in-time services for raw material and semi-manufactured goods so that the shipping schedules could become part of a company's supply chain. Agreement has been reached with the Shanghai Port Authority and the Port State Control Agency to run the Green Express on a time definite schedules.

A more striking feature of change between 1990 and 2000 has been retrenchment. For example, in sharp contrast to Cosco's network pattern of the previous decade, Coscon has ceased operations on five itineraries in Southeast Asia, only maintaining a weekly service between Bangkok, Huangpu, Hong Kong and Shekou. Similarly, the company has cancelled seven itineraries with Japan, consolidating this traffic onto the new Korean services. What are the strategic implications of these changes in Coscon's extra- intra-Asian shipping network between 1990 and 2000?

V. STRATEGIC IMPLICATIONS

Between 1990 and 2000 Coscon had addressed the company's network weaknesses using a mixture of offensive and defensive strategies in a highly dynamic environment, which quickly posed new challenges once China joined the World Trade Organization (WTO) in 2001. Central to these challenges was the Chinese government's new policy allowing other maritime carriers to compete with Coscon to operate within the booming China hinterland and have access to the country's key maritime gateways. Hutchison Port Holdings (HPH), Port Authority of Singapore (PSA) and P&O Ports have made investments (Table 7). All foreign investors are keen to consolidate and develop their hinterland connections by introducing improved logistics. Since major liner shipping alliance members on the East-West routes make direct calls at China's main ports, both state forwarders and foreign groups compete for the business of moving containers through the Chinese hinterland (DSC, 1996; Browning, 2003).

Table 7. Global operators with major terminals in China, 2001

Port range	HPH *	MTL *	Cosco **	PSA* *	APM **	Pacific Ports	P&O Ports**	CSXWT *	Total
Northern range									
Dalian	-	-	-	√	√	-	-	-	2
Yingkou	-	-	-	-	-	-	-	-	1
Tianjin	-	-	-	-	-	√	-	√	2
Qingdao	-	-	√	-	-	√	√	-	3
Sub-total	0	0	2	1	1	2	1	1	8
Central range									
Taicang	-	-	√	-	-	-	-	-	1
Zhangjiagang	-	-	√	-	-	-	-	-	1
Shanghai	√	-	-	-	-	-	-	-	1
Sub-total	1	0	2	0	0	0	0	0	3
Southern range									
Fuzhou	-	-	-	√	-	-	-	-	1
Xiamen	√	-	-	-	-	√	-	-	2
Shantou	√	-	-	-	-	-	-	-	1
Shekou	-	√	-	-	-	-	√	-	2
Hong Kong	√	√	√	-	-	-	√	√	5
Yantian	√	-	-	-	√	-	-	-	2
Guangzhou	-	-	-	√	-	-	-	-	1
San Shan	√	-	-	-	-	-	-	-	1
Jiangmen	√	-	-	-	-	-	-	-	1
Gaolan	√	-	-	-	-	-	-	-	1
Sub-total	7	2	1	2	1	0	2	1	16
Total	8	2	5	3	2	2	3	2	27

Note : HPH Hutchison Port Holdings; MTL Modern Terminals Limited; Cosco China Ocean Shipping Company; PSA Port of Singapore Authority; APM AP Moller; CSXWT CSX World Terminals.* Global stevedores.** Global carriers. The status of Pacific Ports was not specified. Cosco's Hong Kong terminal is shared with HPH.

Source : Compiled from DSC (2002)

Intensified competition within the domestic port system has not been confined to the state-facilitated entry of foreign companies. Coscon's success has even led the Ministry of Communications to seek a second Chinese player: in 1999 the Shanghai-based China Shipping Container Lines (CSCL) was established to compete with Cosco by offering mirror-image schedules and cheaper prices.⁵ CSCL has been active in intensifying its intra-Asian activities on the trunk routes between China, Northeast Asia and Southeast Asia (DSC, 2003).⁶ Subsequently, links have been forged with both South Asia and the Middle East and both sub-regions have been incorporated in CSCL's pendulum shipping services linking Asia with West Coast United States. Thus Coscon's monopoly over China's main container ports has been broken by foreign and domestic competition.

As with Coscon's aggressive investment in a new fleet, its strategic response to these challenges has been primarily offensive. Above all, feeder services have been mounted within China to ports as yet ignored by foreign carriers. No less than twenty-nine additional Chinese ports were brought into the network (see Table 6). Only two ports were dropped. This boosted the number of Chinese ports from thirteen in 1990 to forty in 2000. In this way Coscon has intensified traffic within a fully-fledged domestic cabotage maritime circuit between the three port ranges of the Bohai Rim, the Yangzi River delta and the Pearl River delta.⁷ This process has confirmed Qingdao, Shanghai and Hong Kong as national hubs, the indisputable pivots within these ranges for a large number of domestic links and the bases for tangential services to secondary ports. Moreover, reinforcing this trend, the company has increasingly integrated its new Chinese ports into its schedules as direct ports-of-call on the trunk trans-Pacific and trans-Suez routes. In turn, these way ports were enmeshed in intra-Asian shipping patterns between 1990 and 2000.

⁵ In 1999 the Maritime Transport Companies of Dalian, Guangzhou and Shanghai formed the China Shipping (Group) Company (CSG) (LSE, 2000). Hitherto, CSG had a monopoly of domestic bulk shipping movements under the control of the Ministry of Communications and had consolidated its dominance of intra-China container movements (about 70 per cent of all liftings). Its new subsidiary China Shipping Container Lines (CSCL) - potentially China's second global player - has 80 chartered container vessels with an estimated annual capacity of more than 75,000 TEUs (e.g. Australia/Asia, North Europe/Asia and Asia/North America trades). With the aid of the China Import/Export Bank, four new container vessels have been purchased from shipyards at Dalian and Shanghai. A holding company has been established in Hong Kong to supply the necessary investment.

⁶ Drewry Shipping Consultants (DSC, 2003; 206) estimates Cosco and CSCL control 1.1 million TEUs of intra-Asian container traffic.

⁷ No specific information is available on Cosco's internal distribution network in China. More general data on the modal split between waterways and highways for Qingdao, Shanghai and Hong Kong, the leading ports in the northern, central and southern port ranges respectively, reveals an increasing use of water transport, both sea-inland navigation and sea-sea feeder traffic (Comtois and Rimmer, 2004). Only 11 per cent of containers were moved by waterway in 1990 but this had increased to almost 50 per cent by 2000. Reliant on landlocked regions, with few or no river systems, Qingdao had the smallest proportion of traffic by waterway as almost 87 per cent moved by road in 2000. This is sharp contrast to Shanghai where waterway transport has outstripped highway movements over the decade - a reflection of improvements in terminal facilities along the Yangzi River for containerized cargo shipped downstream from Chongqing and way ports. Waterway movements are less pronounced in Hong Kong with increases in river traffic reliant on western delta ports.

Cosco is bolstering its regional policy by investing in marine terminals, container depots and related service companies. Besides its long standing Hong Kong base, the carrier has equity interests in both the ports of Shanghai and Yantai and a financial interest is being sought in the PSA [Port of Singapore Authority] Corporation. As depth problems have limited Coscon's hub development in the largest port of Shanghai, the company is seeking to be involved in the new deepwater cargo handling complex being built at Shanghai's Yangshan deepwater port on the islands of Xiao Yang Shan and Da Yang Shan because the Yangzi region is expected to generate 14.6 million TEUs by 2010 (Fossey, 2000). The realisation of these developments could lead to an overhaul of Coscon's intra-Asian liner services.

Other Coscon options include making use of Singapore as an offshore hub to boost the company's performance in Southeast Asia. Already, the company has a presence in Singapore through Cosco Investments that operate bulk ships and monitors container operations. Penavico and Cosco Freight Forwarding have been merged to create Cosco Logistics to improve the company's competitiveness in physical distribution within the Asian region and meet the challenge within China posed by foreign logistics providers associated with global liner shipping companies, notably APL Logistics, Maersk Logistics PONL (China Logistics) and Overseas Orient Container Line. All companies are offering third party logistics services (3PLs) to manage their client's supply chain; and all are looking ahead to becoming fourth party logistics services (4PLs) providers by integrating the 3PLs with trucking companies, warehouse operators and barge companies, the second party logistics providers (2PLs), to manage the logistics flow necessary to resolve the supply chain problem (DSC, 2003).

VI. CONCLUSIONS

The study of Cosco/Coscon's extra- and intra-Asia shipping networks between 1990 and 2000 raises questions about the definition of the short-sea shipping trades. While feeder vessels and sea-river ships are covered in this study, there is no consideration of either single-deck bulk carriers employed on a voyage basis, ferries or fleets of bulk carriers and tankers (Marlow and Paixao Cascara, 2004). However, the inclusion of these other ships would not alter the geographical boundaries of short-sea shipping in Asia. Unlike Europe, there is little need to take account of supranational political blocs. Regulation has had a political dimension as the freedom of performing domestic services by foreign firms in China has conflicted with trade reservation to Cosco but this cabotage arrangement is to be phased out. Given this study's focus on Coscon's organizational structure, no attempt has been made to distinguish short-sea shipping by ship size or according to the nature of cargo. A distinction was noted between feeder cargoes that were part of extra-Asian routes and local cargoes but both are included in the functional definition of short-sea liner shipping. Territorially, all waterways and rivers can also be considered as short-sea shipping in an intra-Asian context (Browning and Lee, 2004).

As evidenced by this study of Cosco/Coscon, the strengths of short-sea liner shipping

stem from the ability to use the self-sealing maritime corridor stretching from the Russian Far East to the Indonesian archipelago. Where there are competing land-based modes, sea transport offers a good safety record and environmental and social benefits. The prime disadvantage is that door-door-transport services cannot be offered except where dedicated and private terminals are available. The lack of integration is compounded by the lack of flexibility on service departures/arrivals. Coscon's Green Express goes some way to meeting this need and overcomes the disadvantages of double handling and the amount of paper work required by offering a high level of customer service. A common complaint is the absence of good rail links in China on which to base intermodal and combined services. Coscon's services can become a realistic choice in multimodal logistical transport chains in the intra-Asian market by building on the strengths of the short-sea liner trades and minimising any weaknesses.

ACKNOWLEDGEMENT

Dr Sue Rimmer made helpful comments on the text.

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