

An Analysis on the Distribution of Transshipment Container Cargoes in Northeast Asia: with particular reference to Korea and China

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Abstract : This paper tries to draw some implications for Korean seaports in terms of management and development of ports with respect to attracting more transshipment container cargoes. For this the results of the Origin-Destination(O-D) analysis between major Korean ports and top 20 Chinese ports were presented. They also contained the O-D analysis between Chinese major ports and their inland hinterlands.

Key words : Transshipment Cargo, O-D Analysis, Northeast Asia, Port Competition

1. Introduction

Containerised cargoes in Northeast Asia region have increased rapidly in recent years. The amount of the traffic in the region was 54.7 million TEU in 2000, representing 27% of the world's containerised cargoes. In 2000, Port of Busan handled 7.54 million TEU of which 2.39 million TEU were transshipment cargoes(T/S cargoes), mainly due to a large increase in T/S traffic in relation to China. T/S containers handled in Busan port in 2000 increased at a rate of 25.1%, which was much bigger than that of 11.3% of total containers. This was mainly because of the lack of port facilities in China and partly because of shallow water depths and geographical location, resulting in deviations from the regional trunk route.

The evolution of super post-Panamax container ships and the large-scale integration of mainline container shipping companies, as well as their increasing participation in global logistics chain activities, puts an emphasis on the demand for effective strategic transshipment, particularly to those ports which would like to take a position of hub in the region.

The purpose of transshipping cargo is not only to reduce the total cost of collecting and/or distributing containers carried by a mega-mainline container vessel a variety of origin and destination ports, each of which only contributes a part of the mainline vessel cargo, but also to improve

just-in-time delivery of cargo, reduce transit inventory, and make the total origin-to-destination movement of containerised cargo more seamless. In particular, one of the many advantages of T/S containers is an opportunity for cargo consolidation or deconsolidation and value-added activities which resulted in about US\$200 per TEU¹⁾ The purpose of this paper is briefly to find some implications for Korean seaports in terms of management and development of ports, in particular for attracting more T/S container cargoes into major Korean seaports. This will be accomplished by employing an Origin-Destination (O-D) analysis between major Korean seaports and top 20 Chinese ports. Further in order to visualise the flow pattern of the T/S cargoes in terms of inland transportation, the O-D analysis between Chinese major seaports and their inland hinterlands will be made by investigating bill of lading(B/L) data in 2000.

2. Data collection and analytical method

2.1 Data collection

Data for making an O-D analysis for container cargoes between Korea and China was available through shipping companies, terminal operating companies, customs service office, KT-Net, Port-MIS, and etc. Accuracy of data from each source was very much dependent upon the extent to

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1) Loading and discharging charges US\$100, shuttle charges US\$35, CY handling US\$25, lashing & unlashng and check US\$17, wharfage US\$3.5, and etc(as of 2002. 11)

which data was available and how they were counted. In this paper, as far as the availability and the usefulness of data collection are concerned, those data from shipping companies and KT-Net at which computerized data were most appropriate. By carrying out pre-feasibility study for the usefulness of data, shipping lines' data based upon B/L were mostly accurate and very easy to collect and analyse.

Table 1 Classification of Container Flow Pattern between Korea and China

	Classification
Inbound Cargoes	Direct Export Cargoes from Korea to China
	Through Cargoes for China transshipped in Korea
Outbound Cargoes	Direct Import Cargoes from China to Korea
	Chinese Cargoes for Third Countries transshipped in Korea

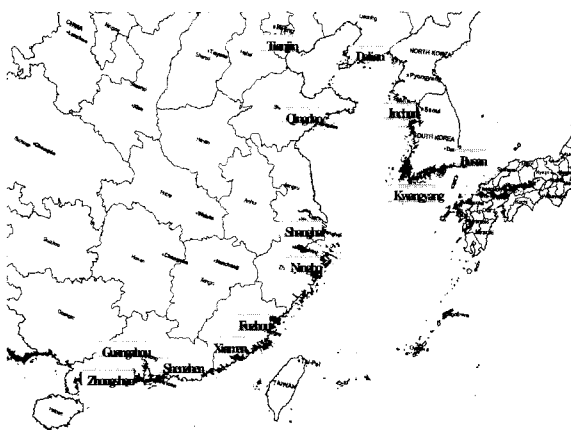


Fig. 1 Major Chinese and Korean Ports

Further, it was confirmed that KT-Net has provided database for container cargoes by export, import, and T/S; loading port, discharging port, T/S port, customs office in the region, cargo specification, weight by container, and etc. Based upon the results of the pre-feasibility study, 3.5 million items were taken for preparing O-D analysis and T/S data of container cargoes between Korea and China. An analysis for export cargoes from Korea to China was made from 1,163,592 B/L cases for export cargoes and 2,452,615 B/L items for import.

2.2 Data analysis method

For an efficient analysis of origin and destination container flow pattern to/from Korea and China are classified into four types: Direct Export from Korea to China, Direct Import from China to Korea, Through Cargoes for China transshipped in Korea, and Chinese Cargoes for Third Countries transshipped in Korea. According to this classification, an O-D analysis was made in terms of throughput between Korea and China, container

handling performance in Chinese ports. Further inland O-D analysis in China was done. While ports for this analysis were Busan, Incheon, Gwangyang in Korea, those in China were top 20 ports.



Fig. 2 Chinese Provinces for Analysis

3. O/D analysis by ports

3.1. Handling performance by Chinese ports

1) Container handling statistics to/from China

As shown in <Table 2>, total container flow between Korea and China was 1,786,788 TEU for export, import, and T/S in 2000. Containers outflow from Korea to China, including T/S cargoes, were 756,915 TEU, and containers inflow from China to Korea 1,029,873 TEU. Exported containers from Korea to China were 569,122 TEU, and imported containers were 393,291 TEU from China to Korea. Cargoes for China transshipped in Korea were 187,793 TEU while cargoes for third countries through Korea 636,582 TEU which represented about 3.4 times of the former. It is known that most of T/S containers to/from China were cargoes to the third countries via Korea.

Table 2 Container Flow between Korea and China

	Classification	TEU
Inbound Cargoes To China	Direct Export Cargoes from Korea to China	569,122
	Foreign Cargoes for China transshipped in Korea	187,793
Outbound Cargoes From China	Direct Import Cargoes from China to Korea	393,291
	Chinese Cargoes for Third Countries through Korea	636,582
Total	Total Inbound Cargoes from China	756,915
	Total Outbound Cargoes to China	1,029,873
	Total	1,786,788

2) Containers throughput by ports in China

As shown in <Table 3>, Shanghai captured more than a quarter of a direct export from Korea to China, with 148,457 TEU, whereas Qingdao represented more than a quarter of direct import cargoes from China to Korea. In terms of both direct export and import cargoes to/from

Korea, four major Chinese ports (Shanghai, Qingdao, Tianjin, and Dalian) are dealing with around 68.8% of the total containers moved to/from Korea.

same time handled 21.4%(136,086TEU) of the total Chinese cargoes for third countries through Korea.

Table 3 Container Handling Performance by Top 20 Major Ports in Chin

Rank	Direct Export from Korea to China			Direct Import from China to Korea		
	Port	TEU	%	Port	TEU	%
1	Shanghai	148,457	26.1	Qingdao	103,970	26.4
2	Qingdao	113,876	20	Shanghai	79,677	20.3
3	Tianjin	66,921	11.8	Tianjin	54,358	13.8
4	Dalian	52,633	9.2	Dalian	41,905	10.7
5	Shenzhen	17,446	3.1	Xiamen	11,600	2.9
6	Xiamen	12,913	2.3	Lianyungang	8,243	2.1
7	Ningbo	11,031	1	Yantai	7,627	1.9
8	Lianyungang	7,222	1.3	Ningbo	7,388	1.9
9	Yantai	6,066	1.1	Nantong	4,097	1
10	Nanjing	5,765	1	Shenzen	3,698	0.9
11	Fuzhou	4,632	0.8	Zhangjiagang	3,633	0.9
12	Zhangjiagang	2,524	0.4	Nanjing	2,914	0.7
13	Shantou	1,852	0.3	Yingkou	1,746	0.4
14	Taiping	1,272	0.2	Shantou	1,189	0.3
15	Nantong	934	0.1	Fuzhou	1,001	0.3
16	Zhongshan	808	0.1	Zhuhai	66	0
17	Yingkou	758	0.1	Zhongshan	14	0
18	Zhuhai	155	0	Guangzhou	0	0
19	Quanzhou	79	0	Quanzhou	0	0
20	Guangzhou	56	0	Taiping	0	0
	etc.	113,724	20	etc.	60,164	15.3
	Total	569,122	100	Total	393,291	100

Table 4 T/S Containers Throughput by 20 Major Ports in China

Rank	Foreign cargoes for China transshipped in Korea			Chinese Cargoes for Third Countries through Korea		
	Port	TEU	%	Port	TEU	%
1	Shanghai	48,243	25.7	Shanghai	136,086	21.4
2	Dalian	23,849	12.7	Qingdao	122,497	19.2
3	Qingdao	23,773	12.7	Tianjin	122,494	19.2
4	Tianjin	23,082	12.3	Dalian	92,300	14.5
5	Ningbo	9,838	5.2	Ningbo	24,918	3.9
6	Shenzhen	2,307	1.2	Shenzhen	7,607	1.2
7	Xiamen	2,185	1.2	Nanjing	4,957	0.8
8	Yantai	2,144	1.1	Xiamen	4,840	0.8
9	Lianyungang	1,630	0.9	Fuzhou	2,747	0.4
10	Nanjing	1,409	0.8	Lianyungang	2,551	0.4
11	Zhangjiagang	1,023	0.5	Yantai	2,486	0.4
12	Fuzhou	752	0.4	Zhangjiagang	1,991	0.3
13	Nantong	526	0.3	Shantou	1,865	0.4
14	Yingkou	288	0.2	Nantong	1,666	0.3
15	Shantou	237	0.1	Zhongshan	146	0
16	Zhuhai	137	0.1	Zhuhai	103	0
17	Taiping	99	0.1	Guangzhou	80	0
18	Zhongshan	20	0	Yingkou	64	0
19	Guangzhou	3	0	Quanzhou	2	0
20	Quanzhou	0	0	Taiping	1	0
	etc.	46,251	24.6	etc.	107,181	16.8
	Total	187,793	100	Total	636,582	100

3) T/S Containers Throughput by 20 Ports in China

As indicated in <Table 4>, Shanghai handled a quarter of foreign cargoes for China transshipped in Korea and at the

<Table 4> illustrates that top five ports were Shanghai, Qingdao, Tianjin, Dalian, and Ningbo are dealing with 76% of the whole T/S containers cargoes. It was found, therefore, that most Korean T/S cargoes to China were

Table 5 O/D analysis of Korean export cargoes in China : between ports and inland final destination

Inland(D) Ports(O)	Shanghai	Beijing	Fujian	Hongkong	Jiangsu	Liaoning	Sangdong	Tianjin	Zhejiang	etc	Total
Shanghai	58,324	11,068	1,376	16,047	36,482	149	1,034	107	12,676	11,194	148,457
Shenzen	341	64	7	15,529	0	0	3	0	0	1,502	17,446
Qingdao	252	2,453	462	5,013	47	348	97,492	4	2,452	5,353	113,876
Tianjin	448	18,645	61	2,146	511	718	919	31,775	76	11,622	66,921
Guangzhou	7	31	0	6	0	0	0	0	0	12	56
Xiamen	23	7	12,416	456	0	0	2	0	0	9	12,913
Dalian	76	2,141	23	771	27	40,447	262	244	242	8,400	52,633
Ningbo	449	143	12	2,037	7	0	0	0	8,377	6	11,031
Zhongshan	0	0	0	576	0	0	0	0	0	232	808
Fuzhou	0	8	3,578	1,013	0	0	0	0	33	0	4,632
Zhuhai	0	0	0	51	0	0	0	0	7	97	155
Nanjing	152	136	2	55	4,534	9	0	0	52	825	5,765
Nantong	2	0	0	0	908	0	0	0	2	22	934
Quanzhou	0	0	73	6	0	0	0	0	0	0	79
Yingkou	0	0	0	0	0	751	0	0	0	7	758
Zhangjiagang	10	16	0	47	1,524	0	2	0	9	916	2,524
Taiping	31	0	0	1,163	0	0	0	0	4	74	1,272
Yantai	0	50	0	116	0	111	5,630	0	32	127	6,066
Lianyungang	12	8	0	93	5,269	77	913	0	65	785	7,222
Shantou	92	28	0	299	0	0	0	0	53	1,380	1,852
Total	60,219	34,798	18,010	45,424	49,309	42,610	106,257	32,130	24,080	42,563	455,400

bound for the northern part of China.

3.2 O/D Analysis between Chinese ports and inland destination/origin in terms of Export /Import and T/S Cargoes

1) O/D analysis between inland O/D and Chinese ports in terms of Export/Import Container

The analysis focused on the top 20 Chinese ports on the basis of throughput, and 32 regions including 22 states, 5 autonomous provinces, 4 metropolitan cities and Hong Kong.

(1) O/D analysis of Korean export cargoes to China : between ports and inland final destination

(2) O/D analysis of cargoes for China transshipped in Korea: between ports and inland points

Most cargoes through port of Shanghai has its own hinterland near own city followed by Jiangsu province, Beijing city, and etc.

<Table 6> explains O/D analysis of cargoes for China via Korea. Containers transshipped in Korea for imports to China were mostly destined for Shanghai, Beijing, Fujian, HongKong, Jiangsu, Liaoning, Shandong, Tianjin, and Zhejiang.

Table 6 O/D analysis of cargoes for China through Korean seaports

Inland(D) Port(O)	Shanghai	Beijing	Fujian	Hongkong	Jiangsu	Liaoning	Sangdong	Tianjin	Zhejiang	etc	Total
Shanghai	21,376	6,241	276	1,356	8,880	101	1,741	25	5,249	2,998	48,243
Shenzen	0	21	0	1,971	0	0	108	0	8	199	2,307
Qingdao	540	823	84	1,541	286	6	19,260	30	10	1,193	23,773
Tianjin	285	6,881	87	908	824	97	967	8,875	523	3,635	23,082
Guangzhou	0	0	0	0	0	0	0	0	3	0	3
Xiamen	466	3	1,629	34	11	0	32	10	0	0	2,185
Dalian	353	1,520	3	1,501	161	16,974	773	73	251	2,240	23,849
Ningbo	503	195	0	1,602	184	26	50	5	7,273	0	9,838
Zhongshan	0	0	0	20	0	0	0	0	0	0	20
Fuzhou	0	5	541	206	0	0	0	0	0	0	752
Zhuhai	0	0	0	91	0	0	0	0	0	46	137
Nanjing	3	22	0	0	1,354	0	0	0	0	30	1,409
Nantong	12	0	0	0	514	0	0	0	0	0	526
Quanzhou	0	0	0	0	0	0	0	0	0	0	0
Yingkou	0	0	0	0	0	160	0	0	0	128	288
Zhangjiagang	49	130	0	21	660	0	0	0	10	153	1,023
Taiping	0	0	0	99	0	0	0	0	0	0	99
Yantai	12	174	9	41	0	165	1,720	3	14	6	2,144
Lianyungang	47	159	0	212	596	0	195	0	65	356	1,630
Shantou	0	90	0	18	0	0	0	0	0	129	237
Total	23,646	16,264	2,629	9,621	13,470	17,529	24,846	9,021	13,406	11,113	141,545

(3) O/D analysis between Chinese Inland(O) and Chinese Ports(D) for export cargoes to Korea

As shown in <Table 7>, origin of Korean import cargoes from China originated from the same previous nine(9) provinces that occupy about 95% of the total 333,137TEU.

Table 7 O/D analysis between Chinese Inland(O) and Chinese Ports(D) for export cargoes to Korea

Port(D) Inland(O)	Shanghai	Qingdao	Tianjin	Xiamen	Dalian	Ningbo	Yantai	Lianyungang	etc	Total
Beijing	1,189	1,005	4,372	24	845	63	5	14	810	8,327
Fujian	389	297	36	10,819	3	40	5	28	745	12,362
Hongkong	3,692	3,672	1,400	341	891	35	2	211	3,994	14,238
Jiangsu	13,840	826	443	29	88	8	6	4,427	7,273	26,940
Liaoning	621	676	714	7	33,708	40	14	56	994	36,830
Sangdong	895	92,131	1,257	223	1,055	75	7,449	2,070	1,063	106,218
Shanghai	44,168	278	114	2	72	174	8	197	238	45,251
Tianjin	321	424	32,578	10	185	0	0	0	21	33,539
Zhejiang	10,388	804	789	71	339	6,820	6	0	56	19,273
etc	4,174	3,857	12,655	74	4,726	133	132	1,240	3,168	30,159
Total	79,677	103,970	54,358	11,600	41,912	7,388	7,627	8,243	18,362	333,137

(4) O/D analysis between Chinese Inland(O) and Chinese Ports(D) for export cargoes to third countries via Korea

<Table 8> shows O/D analysis between Chinese Inland(O)

and Chinese Ports(D) for export cargoes to third countries through Korean seaports. Among a total of 529,401TEU, cargoes from Beijing were handled in the port of Tianjin, while port of Shanghai accommodated the most cargoes from Jiangsu province. It was found that the majority of cargoes mentioned above originated from the main 9 regions(Shanghai, Beijing, Fujian, HongKong, Jiangsu, Liaoning, Shandong, Tianjin, and Zhejiang) constituting 91.7% of the total 52,401TEU. Shanghai, Qingdao, Tianjin, Xiamen, Dalian, Ningbo, Yantai, and Lianyungang were used for handling those export cargoes to third countries.

Table 8 O/D analysis between Chinese Inland(O) and Chinese Ports(D) for Export Cargoes to third countries through Korea

Port(D) Inland(O)	Shanghai	Qingdao	Tianjin	Xiamen	Dalian	Ningbo	Yantai	Lianyungang	etc	Total
Beijing	2,127	1,151	21,028	18	1,523	3,758	271	26	366	30,268
Fujian	489	637	487	4,252	85	117	0	52	2,415	8,534
Hongkong	8,216	5,785	30,701	477	4,166	1,208	5	4	2,376	52,938
Jiangsu	12,262	2,020	1,067	0	362	59	0	2,090	5,962	23,812
Liaoning	212	372	1,133	0	77,625	238	0	4	93	79,677
Shandong	2,284	105,794	2,447	9	966	272	2,201	134	720	114,827
Shanghai	90,621	1,914	1,493	12	970	2,261	7	47	872	98,197
Tianjin	589	859	46,807	0	466	84	0	0	18	48,823
Zhejiang	10,348	1,436	277	12	227	16,135	2	30	64	28,531
etc	8,938	2,529	17,054	60	5,910	786	0	164	8,353	43,794
Total	136,086	122,497	122,494	4,840	92,300	24,918	2,486	2,551	21,229	529,401

(5) Inland O/D Analysis of Chinese Export/Import Cargoes transshipped in Korea

Based on the previous analyses the 9 regions in <Table 9> were considered the most important areas for generating origin-destination flow of container cargoes between Korea and China. <Table 9> shows the order of relative importance of each region, making Shandong province top of the regions.

Table 9 Inland O/D Analysis of Chinese Export/Import Cargoes transshipped in Korea

Rank	Region	Quantity(TEU)	Ratio
1	Shandong	352,148	24.13%
2	Shanghai	227,313	15.57%
3	Liaoning	176,646	12.10%
4	Tianjin	123,513	8.46%
5	Hongkong	122,221	8.37%
6	Jiangsu	113,531	7.78%
7	Beijing	89,657	6.14%
8	Zhejiang	85,290	5.84%
9	Fujian	41,535	2.85%
-	etc	127,629	8.74%
Total		1,459,483	100.00%

(6) Inland origin and destination of Chinese cargoes transshipped in Korea

As far as transshipped Chinese containers in Korea are concerned, cargoes from Shanghai were ranked first, with 23.8%(159,732TEU) of the total, followed by Shandong province 20.8%, Liaoning province 14.5%, HongKong 9.3%, Tianjin city 8.6%, Beijing city 6.9%, and etc. <Table 10> reflects the inland origin and destination of Chinese cargoes passed in Korean seaports.

Table 10 Inland Origin and Destination of Chinese Cargoes transshipped in Korea

Region	Quantity(TEU)	Ratio
Shanghai	159,732	23.81%
Shandong	139,673	20.82%
Liaoning	97,206	14.49%
Hongkong	62,559	9.32%
Tianjin	57,844	8.62%
Beijing	46,532	6.94%
Zhejiang	41,937	6.25%
Jiangsu	37,282	5.56%
Fujian	11,163	1.66%
etc	17,018	2.54%
Total	670,946	100.00%

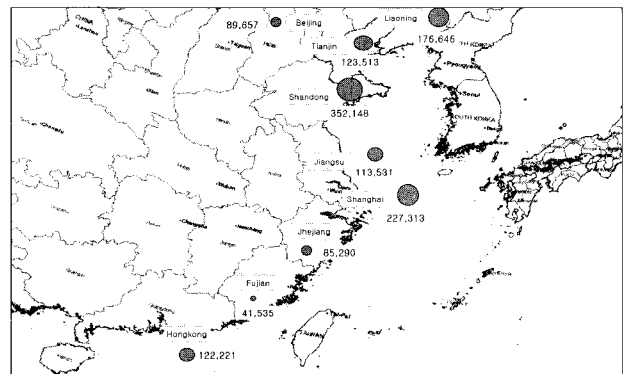


Fig. 3 Inland Distribution of Export, Import, and T/S Cargoes in China

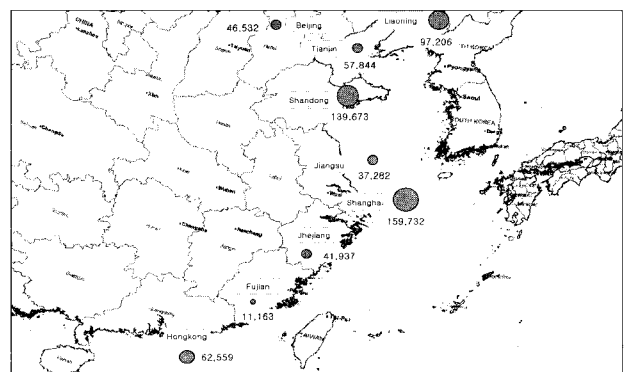


Fig. 4 Inland Distribution of Cargoes Transshipped in Korea

According to <Table 11>, the 9 regions are located near the major ports and their hinterlands form Free Trade Zones in China. It was confirmed that the main counterparts of Korean commercial business were northern part of China.

Table 11 Major Chinese Ports and their Hinterlands

Region	Near Port	FTZ	Area(km ²)
Beijing	Tianjin	Tianjin	5
Fujian	Xiamen	Xiamen	2.36
Jiangsu	Qingdao	Qingdao Special Economy Area	2.5
Liaoning	Dalian	Dalian Special Economy Area (East)	1.25
Sangdong	Qingdao	Qingdao Special Economy Area	2.5
Shanghai	Shanghai	Waigaoqiao	3.28
Tianjin	Tianjin	Tianjin	5
Zhejiang	Ningbo	Ningbo	2.3

4. Implications for the management and development of ports in Korea

4.1 Port management

1) Diversification of T/S ports in Korea

The inland O/D analyses of Chinese T/S cargoes in Korea revealed that most Chinese T/S containers were passed through the Port of Busan with the result that the port deals with 90.7% of cargoes for China by T/S in Korea and 96.5% of cargoes for third-party countries by T/S in Korea. Thus Korea needs to develop the port of Gwangyang which has surplus handling capacity to accommodate more T/S cargoes rather than port of Busan which has already exceeded its handling capacity.

As far as cargoes for China are concerned, with the origin of Port of Busan, Chinese destination was diversified among four primary ports: Shanghai(20.4%), Dalian(13.8%), Tianjin(13.2%), Qingdao(13.1%). Whereas with the origin of port of Gwangyang, most of the cargoes were headed for Shanghai which shares 84.2% of the total, Inchon was the main origin port for Qingdao which dominates 85%of the total. Therefore, diversification strategies for Chinese destinations are required for Gwangyang and Inchon from which cargoes are bound for China.

2) Incentive strategy for transshipment cargo

In order to attract more transshipment container cargoes to Korean seaports, several strategies can be implemented. One of the strategies is to form alliances with container terminals in China for the purpose of attracting container lines as well as transshipment container cargoes. In

particular, as Shanghai, Dalian, Tianjin and Qingdao handle 60% of total transshipment cargoes to/from Port of Busan, it is necessary for Busan to form alliances with those ports in China. And alliance ports provide shipping lines with various incentives, such as reduction or exemptions from port charges, and volume incentives.

Secondly, providing cooperative transport services with Chinese shipping companies can be a useful strategy for inducing T/S cargoes. Based on the O/D analysis, Korean liner shipping companies need to provide joint services with Chinese container lines in main trade routes.

Thirdly, according to the results of the O/D survey, Port of Busan needs to implement its port marketing strategy for Shanghai, Dalian, Tianjin, and Qingdao port, as those ports are main O/D ports handling more than 90% of T/S cargoes bound for China. In fact, it is argued that both ports of Busan and Gwangyang lack a promotion activity among marketing elements in comparison with competing ports. Therefore, shipping lines, local governments, and chamber of commerce should work together to promote port marketing. In addition it is also necessary for Korean local governments and Korea Container Terminal Authority (KCTA) to form a cooperative organisation with Chinese local governments and related organisations. Also formal arrangements should be implemented to promote interchange between local chamber of commerce of both countries. Finally, consideration should be given to exemption of cargo dues (4,200Won/TEU) charged on T/S cargoes. As cargo dues only consist of about 5.5% of cargo handling charges, it is more likely reasonable to increase profits from cargo handling charges by providing exemption of cargo dues on T/S cargoes.

4.2 Port development

1) Build-up of port capacity based on forecast of T/S cargo volumes

There has been always a lack of supply in port facilities in Korea considering the demand for them. Although 'New Port Development Plan' produced by Korean government was amended in 2001, the plan did not forecast properly the rapid growth of Chinese T/S cargoes. This was mainly because the plan was made based on the Korean economic situation, with little or not reflection of other regional influences, such as Chinese rapid economic growth. As it is expected that the growth of Chinese economy will increase the quantity of T/S cargoes being handled in Korean ports, it is necessary to expand cargo handling capacities of Korean ports and revise the existing 'New Port Development Plan'.

This paper also conducted a survey to examine whether the port development of five major Chinese ports would meet the growth of container volumes forecasted during the same period of the port development. The result shows that there would be a shortage in supply of port facilities (see < Table 12>).

In 2005 Shanghai, Tianjin, Dalian, and Ningbo will have a lack of handling capacity of about 7.11 million TEU, 0.34 million TEU, 1.19 million TEU and 1.51 million TEU respectively. Container cargo volumes in China will increase rapidly with the growth of Chinese economy and its entry into WTO. However, government-driven port development will not supply port facilities in a timely manner. Taking this into consideration, the Korean government should be able to table a proper port development plan and develop port facilities in the near future in order to attract more Chinese T/S cargoes, thus taking advantage of the Chinese weakness.

Table 12 Expected Lack of Major Port Facility in China
(Unit : 10,000TEU)

(section)		2000	2005
Shanghai Port	The estimated volume	561	1,259
	Handling of capacity	383	548
	overs and shorts	-178	-711
Qingdao Port	The estimated volume	212	458
	Handling of capacity	380	590
	overs and shorts	168	132
Tianjin Port	The estimated volume	171	374
	Handling of capacity	100	340
	overs and shorts	-71	-34
Dalian Port	The estimated volume	101	239
	Handling of capacity	120	120
	overs and shorts	19	-119
Ningbo Port	The estimated volume	90	241
	Handling of capacity	90	90
	overs and shorts	0	-151

1. Values are based on real volume and discharging ability in 2000.
2. In case of 2005, the demand was estimated by time series analysis. Handling capacity of the future was calculated by reflecting the existing port development plan.
3. If handling capacity was not presented, it was calculated handling capacity that the ministry of maritime affairs and fishery presented handling capacity 0.3 million TEU per berth.

2) Active participation in the port development project of China

The port development in China is driven by the Chinese government and the government raises money from various sources, allows foreign investor to establish joint ventures with Chinese companies and participates in developing, operating, or leasing the port facilities. Accordingly, it is necessary for KCTA, Korean carriers providing services in China, and the newly established port authorities in Busan and Incheon to invest in port development project in China with the aim of attracting more cargo handling in Korean ports. In particular, before investing, careful examination should be made on Chinese government policy, foreign company's investment strategy, and limitations of port operation etc.

5. Summary

In 2000 container cargo volumes transported between Korea and China was 1.78 million TEU and among them value-added T/S cargoes were 0.82 million TEU. In particular, cargoes for China transshipped in Korea were 187,793TEU, while cargoes for third countries through Korea 636,582TEU represented about 3.4 times of the former. As more than 90% of the transshipment cargoes were handled in Port of Busan, it can be assumed that Busan has the potential to become a regional hub port. In addition, from the pattern of transshipment cargoes most O/D ports in China are located northern part of Ningbo port, including Shanghai, Qingdao, Tianjin, and Dalian.

It is estimated that in 2005 the container trade volumes in northeast Asia including China and Korea will reach around 70 million TEU which is 1.3 times of current volumes. Furthermore, due to the lack of port facilities in China, the growth of T/S cargoes in Korea ports is expected. Therefore, in order to attract more T/S cargoes into Korean seaports, it is required to gain the position of a hub-port in northeast Asia.

Most importantly timely port development and implementation of port marketing strategies such as exemption from port dues on T/S cargoes and flexible port charges are necessary.

Furthermore, it is also necessary to diversify trade routes between Korea and China. This should be initiated by the Korean government. As a long term strategy, to attract T/S cargoes port investment strategy in China should be established.

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