

4. COMPARISON OF ACTUAL PORT TARIFF LEVELS

4.1 Methodology

The comparison of port tariffs between ports is a difficult task owing to many factors such as the diversity of tariff systems; differences in legal charges, regulations and other miscellaneous factors; confidentiality of tariff data in dedicated terminals; and the reality that tariff levels are often determined based upon individual negotiations between the port authority and users. Another difficulty in comparing port tariffs is the different currencies by which port tariffs are charged in individual ports.

Therefore some simplifications are required to compare different port tariffs on the same basis and in the same measure. First, two hypothetical containerships are created so that total costs in ports accruing to each of the hypothetical ships can be compared. Cost data were collected from ports in a standardized form based on the modified ESCAP/UNDP Model Port Tariff Structure. Port tariff levels were surveyed and calculated in local currencies and converted into United States dollars for comparison.

4.2 Hypothetical ships and cargo throughput assumptions

Two hypothetical containerships were created, the detailed specification including assumptions on cargo exchange/throughput described below.

(1) Hypothetical Ship I (3,000 TEU class)

- Standard specification: 40,000 G/T, 22,322 N/T, 43,600 DWT, 252 metres in length
- 3,000 TEU capacity, draft of 9.5 metres
- 1,000 TEU exchange in each port (loading and unloading 500 TEU each): assumed throughput profile is given in table 4-1 based on the actual case of the port of Busan
- Seven days of dwell time, including free time
- Berthing time: 16 hours

COMPARISON OF ACTUAL PORT TARIFF LEVELS

Table 4-1 Container throughput profile for 3,000 TEU hypothetical ship

		Import	Export	Trans-shipment	Total
20F	Full	67	72	37	176
	Empty	9	9	5	24
	Subtotal	76	81	42	200
40F	Full	135	144	74	353
	Empty	18	20	10	47
	Subtotal	153	164	84	400
Total	Full	337	360	186	882
	Empty	44	49	25	118
	Subtotal	381	409	211	1,000

(2) Hypothetical Ship II (1,100 TEU class)

- Standard specifications: 9,800 G/T, 5,469 N/T, 13,000 DWT, 147 metres in length
- 1,100 TEU capacity, draft of 8.3 metres
- 600 TEU exchange in each port (loading and unloading 300 TEU each): assumed throughput profile is given in table 4-2 based on the actual case of the port of Busan
- Seven days of dwell time, including free time
- Berthing time : 10 hours

Table 4-2 Container throughput profile for 1,100 TEU hypothetical ship

		Import	Export	Trans-shipment	Total
20F	Full	101	108	56	265
	Empty	13	14	7	35
	Subtotal	114	122	63	300
40F	Full	50	54	28	133
	Empty	7	7	4	17
	Subtotal	57	61	32	150
Total	Full	202	216	112	530
	Empty	27	29	15	70
	Subtotal	229	245	126	600

4.3 Comparison of port tariff levels and competitiveness

4.3.1 Purchasing Power Parity

For an international comparison, port tariff levels estimated in local currencies of individual countries should be converted to an internationally comparable measure. Conversion to United States dollar terms based on exchange rates is frequently used in various international comparisons.

However, there are some drawbacks to using exchange rates to convert local currency values to a common currency when making international comparisons. First, exchange rates fluctuate and sometimes change abruptly according to changes in interest rates or because of speculations against a currency. This volatility of exchange rates may produce a misleading result. Particularly, when the comparison is made for a certain period of time, this approach may not provide a steady picture, although it can be overcome to some extent by using average exchange rates over the period.

A second drawback of using exchange rates for conversion is that exchange rates do not reflect the relative prices of goods and services produced in the countries, so they do not provide consistent estimates for comparison. A way to overcome this shortcoming is to use a conversion rate that reflects how many goods the local currency buys within the country instead of how many dollars it will buy in the exchange market. This is known as purchasing power parity.

Purchasing power parities (PPPs) are the rates of currency conversion that equalize the purchasing power of different currencies by eliminating the differences in price levels between countries. Because PPPs provide approximations of the real purchasing power of specific currencies, they are very often used as key statistical tools for international comparisons. However, it should be noted that PPPs are not a perfect substitute for exchange rates in making international comparisons. In fact, they are complementary in that PPP based comparisons are useful in specific situations, such as when comparing output levels or productivity levels between countries, while exchange rate based comparisons are more appropriate in others.⁵

In this study, both nominal exchange rates⁶ and PPPs are applied to convert the port tariff levels of local currencies into the United States dollar term.

⁵ <http://www1.oecd.org/std/ppp/pppfaq.htm>

⁶ Average exchange rates during the first three quarters of 1999.

COMPARISON OF ACTUAL PORT TARIFF LEVELS

Table 4-3 Economic indicators of individual countries

Country	Population (million)	GNP (billion US\$)	GNP per capita (US\$)	GNP (PPP)	PPP	Exchange rate	
						1997	1999
Australia	19	382.7	20,142	362	1.4	1.3439	1.5484
China	1227	1055.4	860	3770	1.9	8.2898	8.2782
Hong Kong, China	7	163.8	23,400	158	8.4	7.7421	7.7534
India	962	357.4	372	1599	8.8	36.313	42.925
Indonesia	200	221.5	1,108	679	893.9	2909.4	8076.0
Japan	126	4812.1	38,191	3076	167	120.99	117.03
Malaysia	22	98.2	4,464	168	1.6	2.8132	3.800
Myanmar	44	23.0	523	-	1.4	6.2418	6.305
New Zealand	4	59.5	14,875	59	1.5	1.5083	1.8672
Pakistan	128	64.6	505	202	12	40.158	46.000
Philippines	74	88.4	1,195	270	9.4	29.471	38.643
Republic of Korea	46	485.2	10,548	618	673.7	951.29	1192.6
Singapore	3	101.8	33,933	91	1.6	1.4848	1.7020
Sri Lanka	19	14.8	779	46	19.3	58.995	69.949
Taiwan Province of China	21	263	12,345	465	15.54	28.703	28.703
Thailand	61	165.8	2,718	393	11.9	31.364	37.518
Viet Nam	77	24	312	122	2,359.3	11,085	13,912

Source: <http://www.worldbank.org>; International Monetary Fund, *International Financial Statistics*, 2000.

Notes: Exchange rates are ratios of local currencies to the United States dollar.

GNP = gross national product PPP = purchasing power parity

4.3.2 Comparison of total port costs

A survey was undertaken to estimate nominal port tariff levels of individual ports. In the questionnaire for the survey, respondents were asked to provide their current port tariff schedules. The approach adopted in the study and the two hypothetical container ships with detailed specifications were explained in the questionnaire to assist the respondents in providing information and data as accurately as possible. Then, the respondents were asked to fill in the tables provided for each of the hypothetical ships with the estimates of individual port tariff items in local currency, as grouped in the modified ESCAP/UNDP Model Port Tariff Structure. The survey questionnaire is provided in annex I.

The local currency amounts were converted to United States dollar terms using nominal exchange rates as well as exchange rates based on PPP. Total port costs that would be paid by the hypothetical ships (or their cargoes) were compared among the regional ports surveyed.

The total port costs the 3,000 TEU and 1,100 TEU hypothetical container ships are summarized in tables 4-4 and table 4-5 respectively.

In terms of the total port costs based on nominal exchange rates, the 3,000 TEU class hypothetical container ship costs least in the port of Manila, among 21 ports included in the analysis. The port of Yokohama appears to be the highest, costing more than six times the costs of Manila, as charged in nominal United States dollar terms. The costs of the ports of Hong Kong, Singapore, Sydney, Yangon are more than three times as high as the port of Manila.

When PPP rates are applied, however, the tariff level of Osaka port is the lowest among the regional ports. The port of Yangon is ranked as the highest cost port in the region, while it is considered as one of the lowest cost ports in terms of nominal United States dollar terms.

In most of the developing country ports in the region, port tariff levels based on PPP rates are relatively higher than those based on nominal exchange rates, as can be seen in Shanghai, Tianjin (China); Mumbai, Madras (India); Jakarta (Indonesia); Yangon (Myanmar); Karachi (Pakistan); Manila (Philippines); Colombo (Sri Lanka); Bangkok, Laem Chabang (Thailand); and Saigon (Viet Nam). This implies that the ports of the developing countries levy higher port tariff levels than those that would be appropriate under their price levels. It is not a surprising result in view of the fact that in developing countries, price levels are generally low and purchasing power is higher than exchange rates indicate.

COMPARISON OF ACTUAL PORT TARIFF LEVELS

On the other hand, in the countries where price levels are high and local currencies have low purchasing power, the port tariff levels based on PPP tend to be lower than those based on nominal exchange rates.

It is interesting to note that Port Klang in Malaysia and the ports of Bangkok and Laem Chabang in Thailand show comparatively low levels of port tariffs among the ports of the region in both cases where PPP rates and nominal exchange rates are applied. It was also found that in some countries, including India, Japan, Myanmar, Pakistan, Sri Lanka and Taiwan Province of China, port tariff levels are relatively high regardless of the approach applied compared with other countries in the region.

The total port costs for the 1,100 TEU hypothetical containership shows very similar results to those of the 3,000 TEU ship.

COMPARISON OF ACTUAL PORT TARIFF LEVELS

Table 4-4 Comparison of port tariff levels (3,000 TEU class ship)

Country	Port	Nominal exchange rate		Purchasing power parity	
		Tariff (US\$)	Manila=100 (Rank)	Tariff (US\$)	Osaka=100 (Rank)
Australia	Sydney	181,991	351 (18)	201,282	198 (9)
China	Shanghai	84,033	162 (8)	366,129	361 (15)
	Tianjin	75,706	146 (5)	329,848	325 (13)
Hong Kong, China	Hong Kong	205,000	395 (20)	189,221	187 (6)
India	Mumbai	92,429	178 (9)	450,857	444 (16)
	Madras	93,663	181 (12)	456,877	450 (17)
Indonesia	Jakarta	77,819	150 (6)	703,060	693 (20)
Japan	Osaka	144,746	279 (16)	101,435	100 (1)
	Yokohama	359,882	694 (21)	252,198	249 (12)
Malaysia	Port Klang	68,928	133 (4)	163,703	161 (2)
Myanmar	Yangon	189,935	366 (19)	855,384	843 (21)
New Zealand	Auckland	132,250	255 (15)	164,625	162 (4)
Pakistan	Karachi	92,883	179 (11)	356,052	351 (14)
Philippines	Manila	51,848	100 (1)	213,145	210 (10)
Republic of Korea	Busan	92,535	178 (10)	163,809	161 (3)
Singapore	Singapore	157,459	304 (17)	167,497	165 (5)
Sri Lanka	Colombo	132,149	255 (14)	478,948	472 (18)
Taiwan Province of China	Kaohsiung	123,926	239 (13)	228,896	226 (11)
Thailand	Bangkok	63,424	122 (2)	199,961	197 (7)
	Laem Chabang	63,769	123 (3)	201,049	198 (8)
Viet Nam	Saigon Port	81,836	158 (7)	482,562	476 (19)

COMPARISON OF ACTUAL PORT TARIFF LEVELS

Table 4-5 Comparison of port tariff levels (1,100 TEU class ship)

Country	Port	Nominal exchange rate		Purchasing power parity	
		Tariff (US\$)	Manila=100 (Rank)	Tariff (US\$)	Osaka=100 (Rank)
Australia	Sydney	115,143	355 (19)	127,348	195 (9)
China	Shanghai	44,054	136 (7)	191,942	294 (15)
	Tianjin	40,120	124 (4)	174,801	268 (13)
Hong Kong, China	Hong Kong	129,026	398 (20)	119,095	183 (8)
India	Mumbai	45,873	141 (8)	223,763	343 (16)
	Chennai	50,187	155 (11)	244,806	376 (18)
Indonesia	Jakarta	48,509	150 (9)	438,258	672 (20)
Japan	Osaka	93,031	287 (16)	65,194	100 (1)
	Yokohama	226,229	697 (21)	158,536	243 (12)
Malaysia	Port Klang	43,353	134 (6)	102,962	158 (4)
Myanmar	Yangon	107,168	330 (18)	482,637	740 (21)
New Zealand	Auckland	69,638	215 (13)	86,685	133 (2)
Pakistan	Karachi	49,587	153 (10)	190,084	292 (14)
Philippines	Manila	32,437	100 (1)	133,347	205 (10)
Republic of Korea	Busan	54,993	170 (12)	97,351	149 (3)
Singapore	Singapore	99,419	306 (17)	105,757	162 (5)
Sri Lanka	Colombo	82,781	255 (15)	300,023	460 (19)
Taiwan Province of China	Kaohsiung	78,808	243 (14)	145,562	223 (11)
Thailand	Bangkok	34,163	105 (2)	107,708	165 (6)
	Laem Chabang	36,619	113 (3)	115,451	177 (8)
Viet Nam	Saigon Port	40,818	126 (5)	240,693	369 (18)