

A Study on the Reasonable Service Charges for Incheon North Port (berth 3) under the Private Investment Project

*Jin-Hee Park**

**Lecturing Prof, Dept of Geography, Konkuk University, Seoul 143-701, Korea*

Abstract : *Recently, port development has been actively in progress through a private investment project. Incheon North Port functions as an auxiliary port for Incheon Port to solve its chronic demurrage and freight congestion and to treat materials such as wood, iron material, feed materials. Service charges is one of important factors in the port choice to treat general goods. In general, service charges can be calculated by two methods such as cost accounting method and market price method. This study will review the characteristics of the Incheon North Port (berth 3), which is under the progress of the private investment project and estimate the reasonable service charges for general goods on the basis of market price. This will help a concessionaire to maximize the operation efficiency.*

Key words : *private investment project, general goods, cost accounting, market price, reasonable service charges*

1. Introduction

The port development project is generally initiated by a government or private investors. The private initiated project can be classified into two: port work by non-management agency which is established based on the Port Law, and private investment project developed on the basis of the Act on Private Participation in Infrastructure.

In the traditional port development including port facilities, first of all, a Port authority (or a government) draws up a budget based on the Port law, then ports and relevant facilities are constructed and managed with the assigned funds.

However, as the Korean economy has been growing up, the need of port facilities has exceeded the scale of financial investment. Against this backdrop, along with financial investment the private participation led by non-management agencies emerges as an important development method in order to expand facilities at proper time.

In 2004, 18 private investment projects for port development are under way. Among them, a new outpost in Mokpo was already constructed. Concessionaires for other 7 ports including a new port in Busan were already designated and they are preparing for the further progress. Besides, a huge amount of capital is expected to be invested including 11 trillion won by private attraction (including foreign capital) as well as governmental financial investment (21 trillion won) and industrial complex-initiated investment (5 trillion won) by 2011. Compared to the original draft (8 trillion won), this is a dramatic change and

a huge increase. From this investment plan, 133 berths, 52.2 % against the total, will be established with the help of private investment.

Incheon North Port is going to be open as a private-financed one in 2005. Its development plan aims to solve chronic demurrage and freight congestion of Incheon Port, and the Incheon North Port will serve as an auxiliary handling materials such as wood, iron materials, and other materials.

An important factor in port choice for general goods is a pricing system, or service charges. Therefore, the estimation of reasonable port pricing is a very important in that it can encourage the positive use of port facilities and help operator's efficient management.

Various studies on the estimation of reasonable port pricing have been performed since the middle of 1980 in Korea ; a study to improve the determination systems for port charges (Bang, 1989), studies on service charge modification plan (Jung, 1994; Jung, 1989; Yoon, 2001; Lee, 2004), comparative studies on port charges and their structure in Asia (Jo, 2001; Kil, 2002).

Most of researchers took Busan Port and Gwang Yang Port as their case studies, and investigated reasonable service charges by comparing with domestic and international ports.

For studies to promote the use of Incheon Port, there are several studies as follows ; a plan to enhance the use of Incheon Port by understanding its actual condition (Chu, 1995; 2003), the presentation of port development direction as an option for developing underdeveloped areas (Park,

* Corresponding Author : Jin Hee Park, jinheep@konkuk.ac.kr 02) 2049-6063

2001), study on reasonable port charges (Yoon, 2002) et al.

Therefore, this study will review the characteristics of the Incheon North Port (berth 3), which is under the progress of the private investment project, and estimate the reasonable port service charges for general goods on the basis of the market price. This will help a concessionaire to maximize the operation efficiency. This paper will calculate its reasonable service charges by the comparison with that of other ports, then will analyze its adequacy with the results calculated based on a government-approved price.

2. Characteristics of Incheon Port

2.1 Main users

In case of general goods, the items are various but the bulky demand is not steady enough unlike container goods. Therefore, its regular and large-scale shipping is not likely.

Most of the companies dealing with general goods are running businesses related to China, then Japan. In Incheon Port there are various agencies for these companies such as Sun Ocean Express Co., Ltd, Seohae Marine Service, Phoenix Maritime Co., Ltd, Saehan Marine Co., Ltd and so on.

2.2 User's port preference

In order to analyze the user's port preference, we surveyed the actual condition and the appraisal of ports in 2003, targeting 60 shipping companies and agencies.

The survey results about the important factors in port choice were summarized in Table 1.

In choosing a port for general goods, it is analyzed that the most important factor was service charges (33.74 %), and then free time (24.23 %), service (23.62 %), and port's brand power (18.40 %).

Table 1 Main preference comparison according to ports

Attribute	Total		Shipping company		Agency		
	part-worth	importance	part-worth	importance	part-worth	importance	
Port	Incheon	0.2460	0.1852		0.2424		
	Pyungtak	-0.0159	18.40 %	0.1111	10.16 %	-0.0404	19.05 %
	Gunsan	-0.2302		-0.2963		-0.2020	
Service charge	6,600won	0.5635	1.0000		0.5253		
	7,000won	-0.2540	33.74 %	-0.2222	37.50 %	-0.1717	37.66 %
	7,600won	-0.3095		-0.7778		-0.3535	
Free time	5 days	-0.3571	0.7037		-0.2121		
	7 days	0.0873	24.23 %	0.1111	32.03 %	-0.0505	20.35 %
	9 days	0.2698		-0.8148		0.2626	
Service	Rapidity	-0.2063	0.4815		-0.3232		
	Safety	0.4048	23.62 %	0.0000	20.31 %	0.2121	22.94 %
	convenience	-0.1984		-0.4815		0.1111	
Reliability test	Pearson's R = 1.000 Significance = 0.0001 Kendall's tau = 1.000 Significance = 0.0001						

2.3 Dispositions to use Incheon North Port (berth 3)

When asked about the interest in the development and availability of the Incheon North Port, 55 % of the polled shipping companies and agencies answered a bit affirmatively. And 11.7 % of respondents showed a strong interest, whereas 18.3 % answered in the negative.

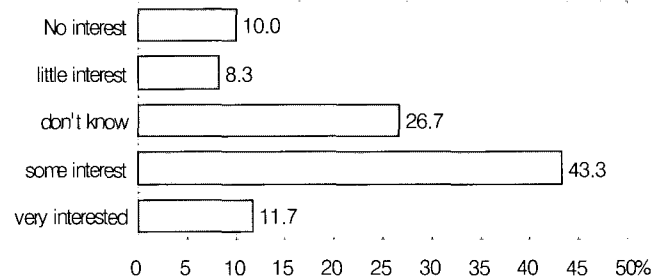


Fig. 1 Interest in Incheon North Port

Also, for the dispositions to use the Port, 33.3 % of the respondents answered 'possibly', 6.7 % for 'not likely'. The other 60 % responded 'don't know', which could be interpreted as potential users. Therefore, it is necessary to implement a promotion strategy to induce them to use the new port.

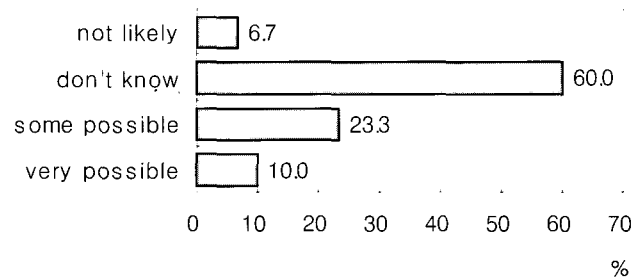


Fig. 2 Dispositions to use the Incheon North Port

3. Estimation of Reasonable Service Charges

3.1 Estimation method

The estimation of service charges for Incheon North Port can be classified in two concepts; one is a cost accounting and the other is a market price.

In a port development project, the most ideal estimation for reasonable charges is based on the cost accounting that can retrieve investment costs. However, in reality, the pricing of other rival ports cannot be ignored.

Therefore, we estimated a reasonable charge per ton for general goods based on the market price to be competitive with other ports.

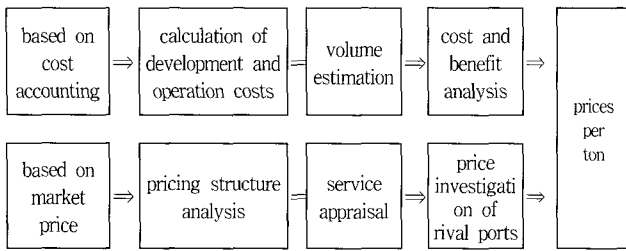


Fig. 3 Price estimation methods

We reviewed 8 wharves in Incheon Inner Port and 1st phase section of Incheon North Port, then estimated stevedoring charges per ton for Incheon North Port (berth 3).

Stevedoring system for general goods is classified as works of in-hold work, ship side work, and ground work. In case of ship side work, the works are classified into two kinds again; one is direct discharging to vehicles, meaning that freight is unloaded, then discharged to vehicles right away, and the other is discharging to open space or storage, meaning that freight is discharged to the wharf or storages then, moved out later.

Service charge structure is different according to freight type and stevedoring work type. And it is essential to understand each volume and revenue. However, it is impossible to get such data in reality. So, for estimating the charges for general goods we used internal sources from several companies, which participate in Incheon North Port as operators such as Sun Kwang Co., Ltd, Youngjin Enterprise Co., Ltd, Union Transport Co., Ltd, and other companies. For dockage we examined previous reports and recent Incheon Port's documents.

3.2 Service charge structure

Port service charges for general goods in Korea can be classified as port dues, stevedoring charges, other charges. Port dues is a charge that shipping companies, shippers, operation companies, and stevedoring companies should pay for offered services and the construction of public facilities. Stevedoring charge is what shipping companies and shippers should pay for the stevedoring services. Other charges are for pilotage, towage, tally, survey, oil supply and so on.

1) Port dues

Port dues is stipulated as fees for port facilities in article 27 of Port Law and in article 20-2 and 21 of the Enforcement Ordinance of the Port Law. It includes port dues, anchorage fee, dockage in respect of ships, and wharfage, equipment fee in respect of freight.

Mostly the port dues reverts to the government. However, in case that the port is built by private investment, the

dockage fee out of the Port dues goes to the port developer. Also, the government gives fee reduction to the port users for securing the competitiveness and enhancing encouragement. For example, the eastern and western wharves of Pyungtak port as a rival port of Incheon North Port are receiving 50 % of fee reduction in pilotage and tugage, dockage and anchorage fee.

2) Stevedoring charges

General stevedoring charges are classified into three parts: basic charge such as in-hold work charge, lighterage, ground charge, transfer charge, surcharge according to stevedoring work type, and other charges such as fixed fee and agreed fee.

In-hold stevedoring charge is applied when freights are loaded and unloaded. Lighterage is for the float-on/off system, which is used for treating non-oxide compounds. And ground charge is paid for loading, unloading, direct retrieval, and direct shipping, and it is different according to freight type such as standardized freight, general package, oxide compounds, other goods.

Tugboat and barge service charge is charged when freights are transferred with the help of tugboat or barge. The service charges are different according to freight type. For instance, It amounts to 80 % of the basic charge inside the lock of Incheon Port and 104 % of the basic charge for outside the lock.

In large, the surcharge is two kinds according to item and working time. Item surcharge is applied according to item's characteristics such as weight, length, danger degree, and the working time surcharge is applied when holiday, night, and summer season.

Table 2 Stevedoring charge

Category	Type	Type Application
Basic charge	service charges for using inboard, ground, lighter, tugboat and barge	standardized freight, general package, oxide compounds, other goods
	item surcharge	weight, length, big size, deterioration, danger degree
Surcharge	working time surcharge	weather, forced stevedoring, work outside bulwark, holiday work, night work, work inside base tank or locker, summer work, transfer of floating pier, stevedoring of coal and cement, oxide compounds and general goods, ship's structure
	fixed fee	in-hold work for overseas ships, shifting work, loading work, loading on lighters, direct loading(unloading) shipping, opening/closing hatch cover, paletting, warship work, money to supply severance payment for stevedoring workers, development fund for port modernization
Other charges	agreed fee	weighing charge, cleaning fee, repackage fee, default interest of wood storage fee, special stevedoring equipment fee, commission, lighter demurrage, additional weight surcharge, fee for storing freight in lighters

The other charges are classified in a fixed fee and an agreed fee. The fixed fee is applied to stevedoring works by imposing relevant ratio on its basic charge, and the agreed fee is what shipping companies and shippers agree on certain stevedoring works through negotiation.

It is almost impossible to figure out the agreed fee because each shipping company treats it as secret.

3.3 Stevedoring charge review

The accurate stevedoring charge in general wharf is estimated based on basic charge, surcharge, and other charges. To find out the surcharge and other charges, it is essential to collect data about freight volume according to charge type. However, in reality, it is almost impossible to obtain them.

In deciding the stevedoring charges for Incheon North Port (berth 3), we kept basic charge as a main component, then compared government-approved stevedoring charge, which were set by using storing ratio and direct discharging ratio according to item, with the real market price, which are being applied to shipping companies using Incheon Port.

1) Government-approved stevedoring charges

① Basic assumption

Incheon North Port (berth 3) deals with mainly general goods. Therefore, in order to understand the level of the charge, firstly we calculated the each proportion ratio out of 18 items, and classified them based on the category for stevedoring charges, then applied the stevedoring charges according to the work type. The calculated proportion ratio was based on the data for general goods except container goods in Incheon Port from 1997 to 2002.

We assumed the stevedoring work in two kinds ; first, in case of direct discharging to vehicles, stevedoring works are composed of in-hold work and ship side loading. Second, in case of using open storage and warehouse, stevedoring works are composed of in-hold work, ships side loading, transfer, unloading and storing work, and delivery loading work.

The direct discharging to vehicles and storing ratio for general goods depend greatly on the characteristics of each item. Therefore, we made three scenarios with above two, ratio of direct discharging to vehicles to storing, 3 : 7, 4 : 6, and 7 : 3, then analyzed the results.

② Government-approved stevedoring charge

As described above, general goods are the main item in Incheon North Port (berth 3). Table 3 shows the each proportion ratio out of 18 items and its stevedoring charge.

Table 3 Classification and composition ratio of general goods unit : won

General goods		Composition ratio	Stevedoring charges		
Classification	main components		inboard	ground	classification
Food	flour, sugars, animals and plants products, fish and shellfish, fat, delicatessen, meat	35.7%	3,573	3,724	apply average fee for freezing, package, and box
Chemical industry	fertilizer, plastic, rubber, chemical industry product	24.0%	1,730	2,631	apply general goods fee
Textile	leather products, weaving fiber and the products	1.7%	1,620	2,798	apply bundle fee
Metal machine	electronics, machinery, plane parts	5.4%	2,200	2,984	apply machinery fee
Mineral	other minerals, rock salt	16.3%	2,231	1,976	apply average fee for mineral and salt
Others	other general goods	16.9%	1,730	2,631	general goods
Total and weighted average fee		100.0%	2,493	2,936	

note : in-hold work charge means the charge for inside lock of Incheon Port (95 % of basic charge)

Data analysis shows that all the wharves of Incheon Port except wharf 4, container exclusive one, are dealing with various items. The use of port cranes in stevedoring works seems to make these works possible. So, we limited the data to the general goods which can be handled with port crane, then compared general stevedoring charges for all the items with that of 'others' classified in the above table.

Table 4 Stevedoring charges according to work type and item group type

unit : won

classification	A type		B type	
inboard	1,730		2,493	
ground	2,631		2,936	
Type	Direct shipping	storage	Direct shipping	storage
in-hold work	1,730	1,730	2,493	2,493
ship side loading	2,631	2,631	2,936	2,936
transfer		2,287		2,287
unloaded and storing		2,631		2,631
delivery loading		2,631		2,631
subtotal	4,361	11,910	5,429	13,588

notes : 1. A type : 'other' goods, B type : the whole composition of general goods
 2. transfer fee means fee for 2 km transfer by vehicle

Table 4 presents the estimated values according to two stevedoring work types after in-hold work, one of which is for direct discharging to vehicles and the other is for storing.

We can figure out the level of government-approved

stevedoring charges if the direct discharging ratio to vehicles and storing ratio are applied to the above values. But, both of the ratio are different according to the freight type or the scale of storage that a port's operator manages. Because of the difficulties in calculating accurate direct discharging to vehicles and storing ratio, we estimated the government approved stevedoring charges for general goods with various scenarios.

Table 5 Stevedoring charge according to the direct discharging ratio to vehicles and storing ratio

unit : won

Classification	Direct discharging ratio to vehicles : storing ratio		
	30% : 70%	40% : 60%	70% : 30%
A type	9,645	8,890	6,626
B type	11,140	10,324	7,877

Considering the government approved stevedoring charges set by direct discharging to vehicles and storing ratios, A type for other goods is 6,626~9,645 won, and B type for the whole items of general goods is 7,877~11,140 won.

These charges are higher than those of actual market. The current charges in market have a variety of discount rate depending greatly on negotiation between shippers and shipping companies, and items and work type. Therefore, there are difficulties in figuring out about the reliable market price. Normally, market price is known as less expensive as much as 20~30 % of the government approved charges.

The main reason of that is owing to the cut-throat competition between stevedoring companies, the companies set up different charges according to freight type in an attempt to survive in the market. Most of shippers decide a package rate with various conditions of works such as from in-hold work to an appointed factory, or to private bonded warehouse outside a wharf. At this time, service charge is decided at the lowest through package bidding or multi estimates.

The government calls upon operation companies to obey the authorized charges, and shippers and shipping companies not to force stevedoring companies to pay unreasonable charges. If they breach the rules, they are supposed to be punished. In this way, the government makes all out efforts for them to obey the approved service charges. But, it is expected to take longer to better the current tough competition.

Therefore, the review of government-approved charges helps the understanding of the current market charges

reflecting these market conditions.

Table 6 Stevedoring charges in Incheon Port according to discount rate

Classification (direct discharging to vehicles)		20% off	25% off	30% off
A type	30%	7,716	7,234	6,752
	40%	7,112	6,668	6,223
	70%	5,301	4,969	4,638
B type	30%	8,912	8,355	7,798
	40%	8,260	7,743	7,227
	70%	6,301	5,908	5,514

Table 6 shows that market prices calculated based on government-approved service charges are in the range of 4,638 (minimum) to 8,912 won (maximum).

The following section will verify the level of government-approved service charges by comparing with the actual service charge that shipping companies charge.

2) Stevedoring charges of port operating company in Incheon Port

At present there are 8 wharves in Incheon Inner Port. And its operating companies are all different from one another. The major operating companies are as follows ; Youngjin Enterprise Co., Ltd for wharf 1, Union Transport Co., Ltd and Dongbang Transport Logistics Co., Ltd for wharf 2, Hanjin Transportation Co., Ltd and Global Enterprises, Ltd for wharf 3, Hanjin Transportation Co., Ltd and The Korea Express for wharf 4, Sun Kwang Co., Ltd for wharf 5, Donghwa E J Co., Ltd for wharf 6, Korea Silo Co., Ltd for wharf 7, Dongbu Corporation and Youngjin Enterprise Co., Ltd for wharf 8, and so on

Considering the properties of Incheon Inner Port, wharves 4 and 7 treat only containers and products, on the other hand, the others deal with all the freights such as general merchandises, grain, wood, iron materials, cars and so on. The main item of Incheon North Port (berth 3) is general goods. But it is not easy to refer wharves or operating companies that handle with the same items as that of Incheon North Port. Therefore, we investigated data of wharves and operating companies with comparatively higher ratio of general goods treatment.

Incheon North Port (berth 3) mainly handles general goods classified into 18 items. However, its stevedoring equipments can not only treat general goods, but also plywood, pulp, iron materials. So the items are also considered in estimating the stevedoring charges of stevedoring companies in Incheon Port, which are weighted average charges by composition ratio.

① Stevedoring charges of A company in Incheon Port

A company deals with various items such as general goods, mineral materials, feed materials, sugar, wood, pulp, plywood, iron materials, container et al. Its main items are iron materials, general goods, and mineral materials. Among them, we investigated stevedoring charges for general goods, pulp, plywood, and iron materials.

Given the figures about direct discharging to vehicles and storing ratios that company A presented on the basis of its experiences, the company has high storing ratio for all the items except iron materials because it possesses comparatively spacious storages and sheds.

Table 7 Stevedoring charges of A company in Incheon Port unit : %, won

Classification	Pulp	Plywood	Iron materials	General goods
Composition ratio	9.8	9.9	49.7	30.6
In-hold/ship side (direct loading)	5,456	5,496	4,160	5,456
Open storage loading	8,500	11,019	6,660	9,500
Direct outgoing ratio	25	10	90	25
Storing ratio	75	90	10	75
Stevedoring charges	7,739	10,467	4,410	8,489
Weighted average fee	6,586			

- notes : 1. composition ratio is the ratio of each item against total of 4 items among various items of A company
 2. open storage loading charge contains inner work, ship side work and ground work charges

In case of A company in Incheon Port, the stevedoring charge for general goods is 8,489 won/ton, and 6,586 won/ton as a weighted average charge when considering the goods that can be dealt with stevedoring equipment.

② Stevedoring charges of B company in Incheon Port

B company deals with various items such as general goods, mineral materials, feed materials, wood, pulp, plywood, iron materials et al. Its main items are iron materials, general goods, and feed materials. Among them, we investigated stevedoring charges for general goods, pulp, plywood, and iron materials.

In case of B company in Incheon Port, the stevedoring charge for general goods is 6,859 won/ton, and 6,306 won/ton as a weighted average charge when considering the goods that can be dealt with stevedoring equipment.

Table 8 Stevedoring charges of B company in Incheon Port unit : %, won

Classification	Pulp	Plywood	Iron materials	General goods
Composition ratio	6.6	9.0	55.9	28.5
In-hold/ship side (direct loading)	3,106	5,469	5,206	5,591
Open storage loading	7,000	11,019	9,040	9,819
Direct outgoing ratio	25	10	90	70
Storing ratio	75	90	10	30
Stevedoring charges	5,832	9,354	5,589	6,859
Weighted average fee	6,306			

caution : 1. composition ratio is the ratio of each item against total of 4 items among various items of B company.

2. open storage loading charge contains in-hold work, ship side work and ground work charges

3.4 Estimation of reasonable charge

1) Stevedoring charges of Incheon Port

The following table shows the summary of stevedoring charges in Incheon Port including the discounted charges of government-approved ones and the charges of stevedoring companies with high ratio of general goods.

Table 9 Summary of the stevedoring charges of Incheon Port unit : won/ton

Classification	charges	Remarks
Government-approved charge (for other general goods)	5,514 ~ 8,912	average charge for 20% off : 7,824 average charge for 25% off : 7,335 average charge for 30% off : 6,846
stevedoring companies in Incheon Port	A company : 8,489 B company : 6,859	average charge : 7,674

The charges, which are calculated by applying market discount rate to the government-approved charges, are within the range of 5,514 to 8,912 won/ton according to the ratio of direct discharging to vehicles. For 20% off, it is 7,824 won/ton, 7,335 won/ton for 25% off, and 6,846 won/ton for the maximum 30 %.

The standard charges in market that are actually imposed by stevedoring companies in Incheon Port are different from one another according to the ratio of direct discharging to vehicles. Their average charge is 7,674 won/ton.

The real market charge of 7,674 won/ton is within the range of the discounted rate of the government-approved charges. It means that the charges of stevedoring companies were discounted in various ways in market.

The stevedoring charges of Incheon Port are different according to the ratio of direct discharging to vehicles. Primary factors of direct discharging to vehicles are various such as shipper's request, insufficient sheds and storages. Considering large-scale shipper's desire to store their goods, storing facilities outside a wharf, it is apparent that the lack of storing facilities causes the direct discharging to vehicles. Therefore, the stevedoring charges of Incheon North Port(berth 3) should be estimated with the average charge of in-hold work/ship side work charges and open storage loading charge in Incheon Port, and also with the ratio of direct discharging to vehicles according to storage capacity in Incheon North Port (berth 3).

2) Estimation of service charges in Incheon North Port (berth 3)

① Stevedoring charge estimation

The storage capacity of Incheon North Port (berth 3) is 1,372,000 ton/year. It can store only 53 % of the whole freight volumes (2,594,000 ton) that is treated annually

As described the above, in case of A and B companies, the ratio of direct discharging to vehicles of berth 3 is judged to be about 45 %. So, we estimated stevedoring charges by applying the average charges of in-hold work/ship side work charges (direct discharging to vehicles) and open storage loading charge(storage shipping) in Incheon Port. Considering its storage capacity, the stevedoring charges of berth 3 was set at 7,592 won/ton.

Table 10 Estimation of stevedoring charges of Incheon North Port (berth 3)

Classification	Inner hold /ships side (direct shipping)	Open storage loading (storage shipping)	The ratio of direct discharging to vehicles	Storing ratio	Stevedoring charge
General goods	5,524	9,660	45%	55%	7,592won/ton

② Dockage estimation

Incheon North Port (berth 3) is constructed by private capital. Therefore, private investors can take stevedoring charges and dockage as their income. The dockage of the berth 3 was based on that of Incheon Port.

In general, the dockage in Incheon Port is set in the range of 367~383 won/ton. Unlike the stevedoring charge, the dockage has not been increased. Considering the dockage in Incheon Port, that of berth 3 in Incheon North Port was set at 380 won/ton.

Table 11 Current dockage revenue in Incheon Port

Year	Freight volume (ton)			Dockage revenue (won)	Price (won/ton)
	import	export	subtotal		
1999	29,464,481	12,558,686	42,023,167	15,430,233,940	367
2000	29,663,076	12,797,053	42,460,129	15,733,469,190	370
2001	30,154,344	8,719,392	38,873,736	14,875,566,910	383
Average	29,770,634	11,358,377	41,129,011	15,346,453,347	373

source : internal data from Incheon Regional Maritime Affairs & Fisheries Office

③ Service charges

The service charges of berth 3 consists of stevedoring and dockage charges, which are set at 7,970 won/ton in total.

Table 12 Service charges of Incheon North Port (berth 3)

Classification	Stevedoring charge	Dockage	Total
Service charge of incheon North Port(berth 3)	7,590won/ton	380won/ton	7,970won/ton

This charge was set at the relatively low price as much as the current market price in order to secure the freight volume and to be competitive with others at the time when the facility opens. However, the charge will be increased by 2 % for 5 years after the operation commencement.

Table 13 Annual service charges of Incheon North Port

unit : won, %

Classification	2008	2009	2010	2011	2012	2013	2014	2015
Annual service charges	7,970	8,122	8,277	8,435	8,640	8,640	8,640	8,640
Against basic charge	92.25	94.00	95.79	97.62	100.0	100.0	100.0	100.0

4. Conclusion

This study estimated the reasonable service charges for port facilities in Incheon North Port (berth 3) through the price estimation method by market price and price comparison with other ports. As a result, the reasonable price that private developers can take in a form of stevedoring and dockage charges is 7,970 won/ton.

When compared with the price which is calculated by applying practical discount rate to the government-approved charges, the estimated price is not far from it.

Over- or underestimation of service charges gives great impacts on the activation and development of a port. Therefore, in case of private investment project, private

enterprisers prefer cost comparison method to cost accounting method in estimating reasonable charges.

After setting the service charges for Incheon North Port (berth 3) at 8,650 won/ton, we posed a question about the propriety of the estimated price in this study. As a result, 85.4 % of the respondents answered it is reasonable.

Additionally, in investigating stevedoring income and treatment quantities of freight by steps, this study have a little limitation to get the detailed reports of companies that participated in the management of port in reality. Therefore, in future, it is requested various studies to overcome the limitation in a level of the actual service charges of ports driven by private investment.

Reference

- [1] Bong-Min Jung(1994), "A Study on the Direction of Policy in Utility Expenses of Port Facilities", Korean Maritime Institute
- [2] Bong-sub Jung(1997), "A Plan on Reorganizing the System of the Port Tariffs", Inha University in Korea, A master's thesis
- [3] Chang-Ho Park(2000), "The Activation Plan on Container Ship of Incheon's Port as the Center of Logistic in Pan-Yellow-Sea-Area", Maritime Korea, No. 326, pp.68-83
- [4] Chang-Ho Park(2001), "A Plan on the Improvement and the Point at Issue in Incheon's Port", Maritime Korea, No. 335, pp.34-41
- [5] Chang-Yeup Chu(1995), "Rationalization Method of Incheon Port for the Curtailment of Logistics Cost", The Korea Logistics Research Association, Vol.5, No.5, pp.21-52
- [6] Chang-Yeup Chu(2003), "A Study on the Vitalization Strategy for the Container pier of Incheon port in an era of North-East Asia", The Korea Logistics Research Association, Vol.13, No.1, pp.27-47
- [7] Hee-Seok Bang(1989), "A Study on the Improvement of Determination Systems of Expenses Rate of Port", The Study of Maritime and Logistics in Korea, No. 8, pp.105-129
- [8] Ho Yoon(2002), "The Role of Incheon port for Hub Port of Logistics in North-east Asia", The Korea Logistics Research Association, Vol.12, No.1, pp.109-127
- [9] Jun Yong Lee(2004), "A Study on the Improvement Measures for the Port Use Fee System at the Korean Trade Ports", Inha University in Korea, A master's thesis
- [10] Jin Haeng Jo(2001), "A Study on the Comparative Analysis of Levels and Structures of Expenses Rate of Port for each Countries in Asia", The Study of Shipping and Logistics in Korea , Vol.32, pp.111-125
- [11] Kwang-Soo Kil(2002), "The Comparative Analysis on Terminal Charges among Major Asian Container Ports", KMI Maritime Review, No. 223, pp.5-30
- [12] Myung-ou Youn;Jong-soo Keum;Yu-Chang Seong (2004), "A Study on Port Development in Korea through Private Investment - Analyzing Port Charge in M Port -", Journal of Korean Navigation and Port Research, Vol.28, No.1, pp.75-81
- [13] Ministry of Maritime Affairs & Fisheries(1999), A Plan on Reorganizing and Establishment of Port Functionality in Metropolitan area in Korea
- [14] Ministry of Maritime Affairs & Fisheries(2001a), A Foundation Plan of Port in Trade Port of the Whole of a Country in Korea
- [15] Ministry of Maritime Affairs & Fisheries(2001b), Stipulation on the Utility and Utility Expenses of Port Facilities of Trade Por in Korea.
- [16] Ministry of Maritime Affairs & Fisheries(2003a), A Report of Investigation on the Propriety of Private Investment Project and Foundation Planning Service in the North Port of Incheon in Korea
- [17] Ministry of Maritime Affairs & Fisheries(2003b), A list of Charges on Port Stevedoring in Korea
- [18] Nam-Jong, Yoon(2001), "A study on the appropriate Level of Port Pricing - A case of Stevedorage -", Korea Maritime University in Korea, A master's thesis
- [19] Stevedoring Companies in Incheon's Port (2003), Inner Report

Received 3 July 2004

Accepted 2 September 2004