

A Development of Sea Freight Transportation Index of Thailand

KULSURAT MUANGTHONG, NANTHI SUTHIKARNARUNAI

Abstract—International Trade was significantly influence to the growth rate of Thai economy. In 2009, the amount of sea freight transportation was higher than 95% of the total international freight transportation or was valued approximately 65% of total international freight transportation. It indicated that the sea freight transportation was vital for the growth of trade and has important role on Thailand's economic development. This article examined and analyzed the factor effecting service charge or price of sea freight transportation and the development of the sea freight transportation index of Thailand. It also suggested that the new market, such as, Vietnam should be included in the sea transportation service index series of Thailand.

Index Terms— International Trade, Market Structure, Price Discrimination, Sea Freight Transportation Index.

I. INTRODUCTION

International Trade was significantly influence to the growth rate of Thai economy. The information collected by Custom Department, Ministry of Commerce [1] and Ministry of Transportation [2] found that, in 2009, the amount of sea freight transportation was higher than 95% of the total international freight transportation or was valued approximately 65% of total international freight transportation. It indicated that the sea freight transportation was vital for the growth of trade and has important role on Thailand's economic development. This article examined and analyzed the factor effecting service charge or price of sea freight transportation and the development of the sea freight transportation index of Thailand.

II. LITERATURE REVIEW

Sea freight transportation was the service industry [3], [4] that has various service charges according to the different international commercial terms (INCOTERMS), for example FOB: free on board, CIF: cost, insurance and freight, etc.

The variable on price of sea freight transportation composed of distance between the places, weight of cargo,

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K. Muangthong, is now a researcher at Logistics Research Center, University of the Thai Chamber of Commerce, Bangkok, 10400, Thailand., (phone:+6681046970, fax:+6626923014).

N. Suthikarnnarunai, PhD., is now Associate Dean, Graduate School and Director, Ph.D. program in Logistics, School of Engineering, University of the Thai Chamber of Commerce, Bangkok,10400, Thailand, (phone:+66859071889, fax:+6626923014, email: nanthi_sut@utcc.ac.th)

type of product to be transported, and so on [5]. Apart from the those factors, the sea freight charge might be complicated based on international factor due to international relations and bargaining power of each country [6].

The sea freight service charge index was one of 11 world indices which might cover either sea freight transport service or sea passenger transport service [7]. The maritime transportation service index was first established by Sweden Statistic Bureau in 1995 using Jevons index calculation method [8]. In 1999, New Zealand started to develop the sea freight transport service index [9] and improved the index calculation method in 2005 by using Laspeyres method [3]. In 2000, England has developed the sea freight transportation service index and coastal transportation service index while it categorized sea transportation into 3 groups including coastal transport, EU (European Union) transport, and other region transport [10]. Hong Kong developed its sea freight transportation service index in 2001 [7]. In 2007, Thailand firstly developed road transportation service index by Bureau of Economic Trading Index, Ministry of Commerce, using Modified Laspeyres method [11].

III. FACTORS INFLUENCING SEA FREIGHT TRANSPORTATION SERVICE RATE

The sea freight transportation service rate means the rate or price of transportation service from one port to another port by using the type of maritime transport. It was changing along the market demand and supply, market structure [12] and other factors.

Demand and supply of sea transportation

Demand of sea transportation occurred by the exporter or importer's need on transporting goods. In other word, the demand of sea transportation was the amount of sea transport service that exporter needed to buy in a certain time, at a certain price or at a certain income of exporter.

The factors affecting the demand of sea transportation service were as follows:

(i) World economic condition

The economic growth can be represented by the value of trading between countries. Since the sea transportation is an importation transportation mode in serving the trade in the global market, thus, the need of sea transportation services are correlated directly to world economy's growth.

(ii) Type of products

Each product has different need in transportation mode. It also has the seasonality aspects, such as agricultural products. Therefore, the demand for transporting is unstable or varies.

(iii) Transportation rate

Sea transportation is the mode of transportation which gave the lowest price among every mode of transportation. It is suitable for moving bulky of goods.

(iv) Politics

The politics situations and condition, such as war, or protestation etc. influenced to the amount of the product or goods needed to be transported as well as influenced the change of transporting route.

However, the sea transportation service has the price elasticity characteristic due to several factors - demand of transportation, cost of transportation, and other mode of transportation. Therefore, the sea transportation service rate or price is changeable by the relationship between quantity and cost of shipment.

Supply of sea transport service depended on the following factors:

- (i) Number of available ship for transportation around the world.
- (ii) The number of new ship to be built to serve the demand.
- (iii) Price in selling damage ship as a steel scrap.
- (iv) The efficiency in managing the marine of each liner company in various aspects such as speed of travelling, loading capacity, working days, and so on.

Market structure

Market structure is another influencing factor to the freight service rate. It indicates the behavior of buyers and sellers. Two important types of market structure are as follows:

- (i) Perfect competitive markets may have several distinguishing characteristics, including: Many buyers/Many sellers; Low-entry/Exit barriers; Perfect information; Transaction are costless; Firms aim to maximize profit; Homogeneous products.
- (ii) Monopolistic markets have the following characteristics:
 - (a) Consumers perceive that there are non-price differences among the competitors' products.
 - (b) Producers have a degree of control over price.

Additionally, the sea transportation market structure has a characteristic of price discrimination. Price discrimination exists when sales of identical services are transacted at different prices from the same provider [13]. It has been explained in the theory that price may varies by customer, quantity sold, and by customer segment (individual customer), which called first degree, second degree, and third degree price discrimination [14]. In sea transportation market, the service provider has differentiated customers into classes.

Other factors

From the study, it was found that there were other factors related to sea freight transportation service rate such as ratio of value to product weight, routes and distance of transports, type of product, product weight per cubic foot, product value, Baltic International Freight Futures Exchanges, etc.

Size of liner is another main factor influencing the sea transportation freight rate. The global liner company takes four accounts in to consideration in setting up price in order to maximize global revenue. Those accounts are global account, corporate account, tender account, and local account.

In case of small liner company, the pricing is related to the market mechanism. The small liner observed the price adjustment of large liner or referred to the liners' clubs. The strategy deployed by the small liner was pricing strategy.

However, pricing strategy did not guarantee of service chosen by customer. The small liner has less and smaller ships than the large liner. Therefore, it is risky in delay of the movement of goods, and unavailable of ships when needed.

IV. COMPOSITION OF SEA FREIGHT TRANSPORTATION SERVICE RATE

The international sea freight service rate was separated into two parts covering basic freight rate and freight surcharge. Basic freight rate means the surcharge that the ship owner obtained from the product sender for moving products from one place to another place as requested. There are three criteria in calculating the basic freight rate – full liner term (hook to hook), commodity box rate (CBR), or freight all kind (FAK). CBR is a rate calculated from container based on kind of product or goods. FAK is a rate charged from all product or goods based on size of container with disregards of type of products or goods. Freight surcharges are the expenses occurred in a short period of time such as CAF (currency adjustment factor), BAF (bunker adjustment factor), port congestion surcharge, etc.

The result of the study from both secondary data and the interviewing of the sea freight service provider indicated that the structure of the freight rate has changed based on the origin or destination of the trip. The detail was shown in Table 1.

V. COMPOSITION OF SEA FREIGHT TRANSPORTATION SERVICE RATE

The Sea Freight Transportation Service Index (SFTI) is a normalized average of price for sea freight transportation service, during a given interval of time. It is designed to help to compare how these prices differ between time periods.

In developing of SFTI, the industrial structure was firstly explored as the result shown in Figure 1. The interviewing process has been done. The well-designed questionnaires have been sent to selected entrepreneurs who related to sea freight transportation. The questionnaire composed of the following questions:

- (a) origin and destination of the sea freight
- (b) type of containers
- (c) size of containers
- (d) surcharges
- (e) type of freight
- (f) services expressed in US dollars

Table 1 Structure of freight transportation rate and surcharges

From / To	China	Japan	Europe	East USA	West USA	Persian Gulf
Freight Rate						
Freight Rate	Yes	Yes	Yes	Yes	Yes	Yes
BAF: Bunker Adjustment Factor	Yes		Yes	Yes	Yes	Yes
FAF: Fuel Adjustment Factor		Yes				
CAF: Currency Adjustment Factor			Yes			
Surcharge						
Overweight Surcharge			Yes			
YAS: Yen Appreciation Surcharge		Yes				
Low Sculpture Fuel Surcharge			Yes			
Terminal Handling Charge			Yes			
Winter Surcharge			Yes			
U.K. Congestion Charge			Yes			
Peak Season Surcharge			Yes	Yes	Yes	
Emergency Surcharge (Extra			Yes			
War Risk Surcharge			Yes			
Rate Restoration						Yes
Others (Optional)						
Document Fee	Yes	Yes	Yes	Yes	Yes	Yes
Forwarder Fee	Yes	Yes	Yes	Yes	Yes	Yes

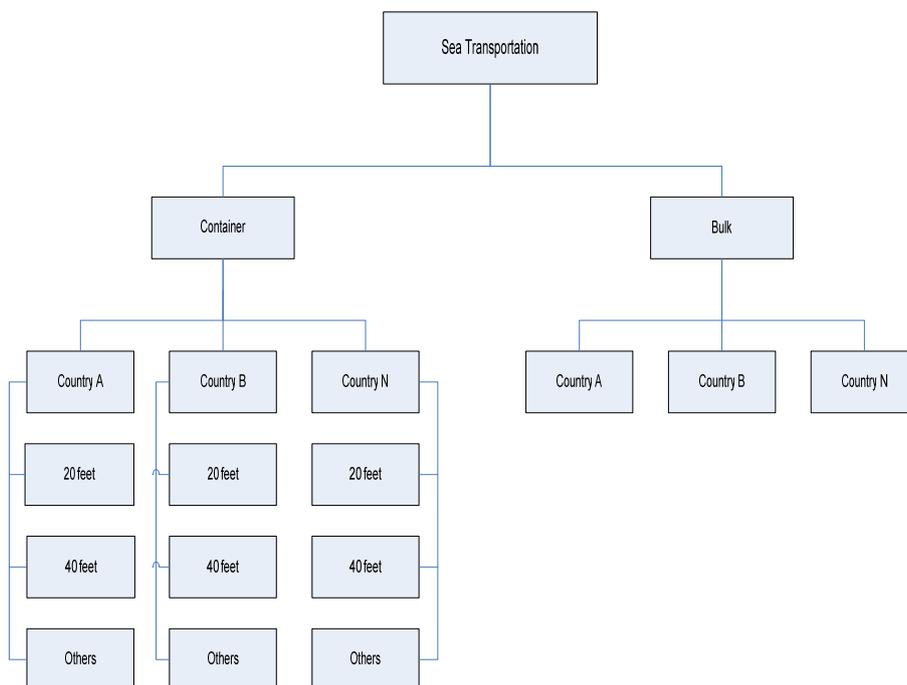


Figure 1 Sea Freight Industrial Structure of Thailand.

VI. SAMPLE DESIGN AND WEIGHT STRUCTURE

Sampling

The sampling was mainly based on the size of service provider. Various data sources have been used to estimate market share. The population of service providers was considered too small to employ sample rotation or random sampling techniques. However, the sampling process was considered important for this study. To ensure that the services being surveyed are representative of the real economy, therefore, 80% of market share has been used in selecting a sample.

Weighting structure

To select representative sea freight transport services for the Price Survey, the weighting structure was used as its basis. The weight structure for the sea freight indexes is based on four different determinants – origin and destination of transport, volume of goods traded, type of freight, and type of containers.

Various overseas trade data was used to determine the most popular export destinations and imports origins, and the most popular goods traded from/to Thailand.

Information on type of freight and type of containers was gathered from selected respondents in the sample.

VI. INDEX DEVELOPMENT

Pricing information used for calculating indexes is collected each month since 2006, by Ministry of Commerce. This means that actual price was collected. Price was also collected in US currencies, due to it was used as a standard freight rate currency in Thailand. Any surcharges for the client are included in pricing. The most common surcharges are a fuel adjustment factor, currency adjustment factor and bulk adjusting factor.

Laspeyres indexing method was selected in this study. The result of SFTI of Thailand was shown in Table 2.

Table 2 Sea Transportation Service Index of Thailand

Year/Month	2006	2007	2008	2009	2010
Jan	95.49	87.69	96.90	100.28	98.00
Feb	89.84	87.69	86.01	98.82	84.21
Mar	88.28	87.69	83.57	99.16	90.90
Apr	96.69	87.69	90.09	100.07	92.11
May	103.64	105.68	92.60	102.84	101.56
Jun	105.84	111.33	91.82	98.08	98.93
Jul	102.70	105.37	93.98	96.36	100.48
Aug	102.26	105.37	102.68	97.66	104.54
Sep	103.37	105.37	115.18	94.85	100.35
Oct	104.37	105.37	115.62	92.80	102.67
Nov	105.00	105.37	115.77	94.97	103.03
Dec	102.55	105.37	115.77	93.21	100.00

VII. CONCLUSION AND RECOMMENDATION

For the further research, the freight rate to new market is needed to consider in developing the sea freight transportation of Thailand. It was found that Vietnam started to be vital for the international trading system. Therefore, when there is the additional and enough information for developing the index, the link co-efficient technique will be used in order to add Vietnam into the index calculation of Thailand.

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