

World Conference on Transport Research - WCTR 2016 Shanghai. 10-15 July 2016

## Behaviors of containerized freight shipments

S. Ko <sup>a,\*</sup>, R. Shabanpour <sup>a</sup>, A. Mohammadian <sup>a</sup>

<sup>a</sup>*Department of Civil and Materials Engineering, University of Illinois at Chicago, 842 West Taylor Street, Chicago 60607, USA*

---

### Abstract

Recently recovered international trade status and initiated plans to increase capacities of maritime network facilities around the U.S. encouraged local governments and economic parties to attract international trading partners, especially in Asia where exports 60% or more of container freights to the U.S. Under the economic and facility condition changes, identifying attributes affecting port choice is important in policy and decision-making processes to attract more containerized freights from the Asian trading partner countries and to improve the sustainability of international trade flow into the U.S. This research, therefore, considers a port choice model into the U.S. at a disaggregate level. Model estimation results suggest that alternative ports show different attributes that can affect the probability of being chosen by shipments from the Asian countries. However, different trends were observed by alternative ports.

© 2017 The Authors. Published by Elsevier B.V.

Peer-review under responsibility of WORLD CONFERENCE ON TRANSPORT RESEARCH SOCIETY.

*Keywords:* Port choice model, International container freights, Import shipments, Multinomial Logit

---

### 1. Introduction

The recent economic recession has seen a decrease in containerized shipments in the United States since 2007, and these reduced container shipment volumes have somewhat recovered and reached 101 million metric tons during the first half of 2010; exceeding the record of 94 million metric tons during the same period in 2009. According to this report, the United States' primary trade partner in terms of inbound container shipments is China, which accounted for 25% of the total containers imported by volume in 2000 and 48% in 2009. Furthermore, the top five partners for containerized import trading to the U.S. in 2009 were all in Asia: China, Japan, South Korea, Taiwan,

---

\* Corresponding author. Tel.: +1-312-996-3441; fax: +1-312-996-2426.

E-mail address: [sko21@uic.edu](mailto:sko21@uic.edu)

Singapore, and Hong Kong. The report also details that the weights of ocean freight from these six Asian countries made up 10% of the total U.S. imports between 2007 and 2010. However, the values amount to 40% of the total ocean freight values coming into the U.S. from 169 countries.

It is also important to note that more than half of the imported container shipments originate in Asia and then are distributed throughout the U.S. mainly by rail or truck. Since the container shipments change transportation modes at the receiving port, various factors such as dwelling time on the ocean, shipping costs, congestion expectancy, rail or trucking costs, etc. are very important to determine the best route from several alternatives. When the path of a containerized shipment to a location in the U.S. is considered, it almost always utilizes a connection between the port and a rail or highway system. Depending on the U.S. arrival port, alternate routes would be different. Currently, the most popular connection routes are between ports on the Pacific coast and the interstate rail and/or highway systems. The second most popular connection is between ports on the Gulf coast and rail and highway systems, while the third connection is between ports in Canada and rail systems into the United States. Through these connection ports, international trade deals between trading partner countries and the U.S. are carried out.

When the maritime shipments are narrowed down by the mode of containerized cargos, weights and volumes of container shipments from the six Asian countries become a significant portion of the total weights and volumes of container cargos into the United States. Chinese shipments make up almost 40% of the weight and 50% of the volume of the total imported container shipments into the U.S. and the volumes of shipments originating in Asian countries reaches over 50%, meaning that one in two containers imported into the U.S. is from one of the six Asian countries.

From the viewpoint of the U.S. ports, the top 10 busiest ports handled more than 85% of the containerized shipments from 2007 to 2010. Those include five ports on the West Coast (Los Angeles, CA, Long Beach, CA, Oakland, CA, Seattle, WA, and Tacoma, WA) and five ports on the East and Gulf Coasts (New York, NY, Savannah, GA, Norfolk, VA, Houston, TX, and Charleston, SC). The two ports of Los Angeles and Long Beach handled more than 40% of the total container freight volumes that came into the U.S. and the inbound containers are distributed to destinations throughout the U.S. by rail or truck. Among them, there are smaller shares that are locally distributed by trucks from the port, but relatively voluminous containers are loaded on rail and moved through the highly populated rail routes.

Thus, considering the current trade circumstances and international containerized freight movements, it is important to find the attributes affecting port choice behaviors on the containerized shipments coming from the major Asian trading partner countries. In this research, factors that affect the decision processes for containerized freights will be reviewed by estimating port choice behaviors of the shipments into the U.S.

## 2. Literature Review

In the U.S., an international trade good should be transported from a port to a destination in the import case or from an origin to a port in the export case. For the import case, in one example, the choice analysis of modes between rail and truck has been researched using binary logit and probit models by Samimi et al. (2011). Based on a survey for freight companies, they concluded that the rail mode is primarily sensitive to shipping costs and the truck mode to haul time between a port and a destination.

For export shipments, representative freight choice analysis from an origin to a port in the U.S. was proposed by Tae Hoon Oum et al, using an elasticity method. In their study, port selection was subjected to exporters' preferences, and they measured port competitiveness among alternatives. They found that freight demand differed by market, and noted that each market had to be individually considered due to a port's unique conditions. In 2006, port choice models using a conditional logit approach were suggested by Blonigen et al. They included trade flow in addition to port choice analysis, and used a gravity model for trade flow estimation. In their study, import volumes were obtained from the National Data Center (NDC) of the Army Corps of Engineers (ACE) and market size was estimated using the World Bank's World Development Indicators data. In their findings, distance and transport prices were very significant factors with elastic responses by shipments. Another port choice analysis was proposed by Malchow and Kanafani (2004). They listed alternative ports and tried to measure port competitiveness among them based on volumes and distance datasets from the Journal of Commerce and MaritimeData.com. Malchow assumed that vessel schedules are fixed in the short-term and examined the assignment to ports for exports of

Download English Version:

<https://daneshyari.com/en/article/5125225>

Download Persian Version:

<https://daneshyari.com/article/5125225>

[Daneshyari.com](https://daneshyari.com)