



# Cooperation among freight forwarders: Mode choice and intermodal freight transport

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## ABSTRACT

The objective of this paper is to compare vertical and horizontal cooperation among freight forwarders. The paper analyses three freight forwarders ('players') with two different means of transportation. The first two players are truck-operating freight forwarders. The third player is a freight forwarder with its own ship. For the purposes of analysis, the paper applied a two-stage game. The results revealed that the best form of cooperation is the one in which the large truck-operating company would establish a coalition with the ship-operating company; that is, vertical cooperation. This cooperation would generate better payoffs in the form of profit, not only to the members of this coalition, but also to the player that has not joined the coalition. However, user surplus is negative in all coalitions, which shows that the establishment of these kinds of cooperation is not beneficial (in terms of prices) for the users of these service providers.

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## 1. Introduction

Freight forwarders have long played an important role in commerce and the international carriage of goods. Traditionally, the freight forwarder has been the link between the owner of the goods and the carrier, and provided forwarding or clearing services. The forwarder acted as the agent for the owner of the cargo or the carrier.

Researchers have failed to agree on a definition of the international freight forwarders sector. Most definitions imply that freight forwarders play the role of the intermediary in international transport. Common definitions portray International freight forwarders (IFFs) as logistical specialists for export shipments (Cateora & Keaveney, 1987). Other views, however, indicate that IFFs provide both export and import services (Pope & Thomchick, 1985).

In the recent past, however, freight forwarders have assumed another role, not only helping the parties get the goods transported, but also 'undertaking' to have the goods transported by their own means of transport (truck/train/ship) or making arrangements with other transport providers. In this role, the freight forwarder acts as a principal rather than an agent. The United Nations Conference on Trade and Development (UNCTAD, 1995) has categorised freight forwarders in "ocean-based" Multimodal Transport Operators (MTOs) or Vessel Operating Multimodal Transport Operators

(VO-MTOs), and those that do not operate vessels –Non-Vessel Operating Multimodal Transport Operators (NVO-MTOs).

Some of the functions included in the freight forwarders' activities are:

- Acting on the customers' behalf to procure the most suitable mode/combination of transport modes, be it road, rail, sea or air. However, road, sea and air transport is most commonly used, while very few freight forwarding companies deal with railway transport, even casually (Kokkinis, Mihiotis, & Pappis, 2006).
- Undertaking the arrangement of the routing and choice of mode for the customer, together with any ancillary service such as customs clearance or packing. This level of involvement introduces a higher level of expertise, which the shipper may not always be able to provide.
- Offering stand-alone ancillary services, such as warehousing, customs clearance, packing and port agency.
- Moreover, freight forwarders must work closely with shippers as they must adapt and provide more value-added logistics activities in order to respond effectively to the ever-changing needs of customers' logistics requirement. This has led freight forwarders to effectively become third-party logistics service providers (3PLs), particularly with regard to international freight logistics services. In order to compete, many 3PLs have utilised price competition and sales-influenced strategies. As a result, only arms-length relationships between 3PLs and trading firms are developed (Banomyong & Supatn, 2011).

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Many enterprises outsource transportation tasks by entrusting independent freight forwarding companies with their transportation activities. The forwarding company is allowed to choose the mode of fulfilment; that is, it can use its own vehicles to execute the corresponding entrusted tasks (self-fulfilment), or an external freight carrier (subcontractor) receives a fee for the request fulfilment (subcontracting). The subcontractor receives independent shipment contracts of different types and specifications for completion. According to (Chu, 2005) there are two incentives for involving a subcontractor. Firstly, when the total demand is greater than the overall capacity of owned trucks, logistics managers may consider using outside carriers. Secondly, integrating the choice of fulfilment mode into transportation planning may bring significant cost savings to the company because better solutions can be generated in an extended decision space. This extended problem is known as integrated operational freight carrier planning.

A freight forwarding company's profit is the difference between the price that the customer is obliged to pay for the request execution and the costs of request fulfilment. These costs result either from fulfilment by the company's own transportation capacity or from the external processing of orders as a consequence of involving a subcontractor (Krajewska & Kopfer, 2006).

As globalisation proceeds, large international freight forwarding companies have a competitive advantage over small companies due to their wider portfolio of disposable resources and market power position. This leaves medium- and small-sized carrier businesses with the option of establishing coalitions in order to extend their resource portfolios and reinforce their market positions (Krajewska & Kopfer, 2006). Moreover, the structure of large freight forwarding companies often assumes autonomously operating subsidiaries that should cooperate in order to maximise business' overall profit.

The purpose of having freight forwarders cooperate is to find equilibrium between the demanded and the available transport resources within several carrier entities by interchanging customer requests (Kopfer & Pankratz, 1999).

### 1.1. Players

In this paper following three players are defined:

1. A freight forwarder with its own means of land transport (trucks). This is assumed to be a large truck-operating company.
2. The second player is a small truck-operating company that also works as a freight forwarder.
3. The third player is a freight forwarder with its ship. This type of player is known in the literature (see UNCTAD, 1995) as a vessel-operating multimodal transport operator (VO-MTO). VO-MTOs are ship owners that have extended their services beyond carrying the cargo from port to port to include carriage over land and even by air. They may or may not own the other means of transport, in which case they arrange for these types of transport by subcontracting with such carriers.

### 1.2. Different combinations of coalitions

Various combinations of coalitions are possible in this situation (see Fig.1).

#### 1.2.1. Coalition between players 1 and 3 or between players 2 and 3

For instance, if player 1 or player 2 cooperated with player 3, this would result in an *intermodal freight transportation* situation. This type of cooperation is considered vertical cooperation because it involves two different means of transportation; that is, trucks and ships.

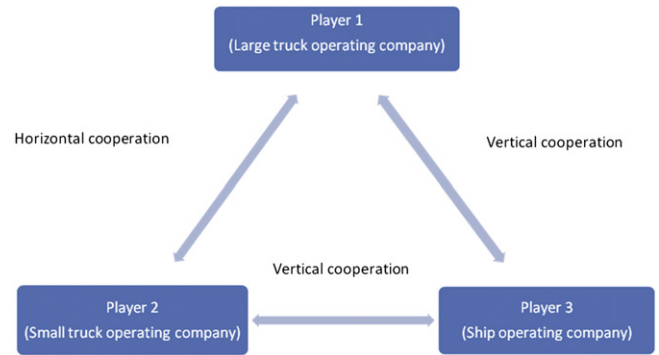


Fig. 1. Different combinations of cooperation among freight forwarders. Source: Author.

#### 1.2.2. Coalitions between players 1 and 2

Similarly, players 1 and 2 could cooperate with each other. This is considered horizontal cooperation because it involves two players with the same means of transportation; that is, trucks.

### 1.3. Expected incentives to form coalitions

The following are some of the expected benefits from the formation of coalitions:

- *Potentially higher profit due to improved service quality:* After collaboration, freight forwarders will gain a competitive advantage that will increase the profit margin. Even if prices increase, customers may appreciate the corresponding increase in service quality. Many researchers have found that customers selecting freight forwarders place greater emphasis on factors other than price, such as travel duration, reliability, and quality of transportation (Bardi, 1973; Bell, 2000; Gibson, Rutner, & Keller, 2002; Lambert, Lewis, & Stock, 1993; McGinnis, 1979). After collaboration, players will be able to improve the service quality in terms of travel duration, reliability, etc.
- *Economies of scale:* Freight forwarders that form a coalition will have large volumes of cargos to transfer and will therefore be able to negotiate better agreements with the carriers, load their means of transport to capacity, and decrease costs. In so doing, they will achieve economies of scale by transferring large quantities per cargo.
- *Economies of scope:* Having established cooperation, freight forwarders can also provide value-added services to their customers, which will yield economies of scope.
- Moreover, one of the disadvantages of sea transport (second player) compared to road transport (first player) is low frequency. In order to offer a satisfactory level of frequency and flexibility in service, sea transport needs a certain volume of cargo 'critical mass'. The formation of a coalition will help the sea transport to achieve this critical mass.
- Other disadvantages of sea transport (second player) are slow speed and low flexibility. However, there may be room to improve these drawbacks by combined transport solutions, using faster modes of transport on part of the journey. This is illustrated by an example of a differentiated set of transport alternatives between Kobe, Japan and Amsterdam. A customer could choose pure sea transport, which would take 28 days but at a very low cost. A faster alternative would be the 'landbridge' solution of transporting the cargo by train over the USA. An even faster alternative would be a combined air-sea alternative, or an air-only transport alternative.

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