



Vertical integration and exclusivities in maritime freight transport



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ABSTRACT

A key recent theme in maritime freight transport is the involvement of shipping lines in terminal management. Such investments are costly but allow liners to provide better service. Most of these new terminals are dedicated terminals but some are non-exclusive and let rivals access them for a fee. In this paper, we show that a shipping line that builds its own terminal finds it strategically profitable (i) to continue routing part of its cargo through the open port facilities, and (ii) to keep its terminal non-exclusive. In this way, the liner investor pushes part of the rival's freight from the open to the new terminal. Besides, under non-exclusivities, the shipping lines offer a wider variety of services, total freight increases and the resulting equilibrium fares are higher than with a dedicated terminal.

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1. Introduction

Over the last decades the liner shipping market has witnessed extensive changes both in sea transport and the stevedoring market. The move towards increasingly converging and integrating markets has produced a substantial growth in the scope of activities performed by carriers, in terms of geographic coverage, frequency of services, faster transit time and supply chain management. An increase in the complexity of the maritime logistics chain has indeed occurred. The usual competition between individual shipping companies and between ports has changed to competition between logistics chains (Suykens and Van de Voorde, 1998), basically composed of three large sections: the purely maritime services, the freight handling in the port and the hinterland services. An improved organization of these sections becomes fundamental regarding what “product” is offered by a shipping line at a particular port. A key recent theme is the involvement of shipping companies in terminal management. The objective of our paper is to analyze the derived effects of vertical integration between maritime services and terminal port activities on prices, demand and profits; we wish to assess whether it is strategically profitable for a shipping line to have a dedicated terminal of exclusive use and/or continue to employ the port's open infrastructure.¹

The port and maritime industry has recently evolved toward various forms of concentration and cooperation. The main types are horizontal cooperation between shipping companies, horizontal cooperation between terminal operating companies

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¹ We shall refer to open port facilities to mean that any shipping line can access them on equal conditions, regardless of the type of property, be them public or be them independently operated multi-user facilities.

(TOCs), and vertical cooperation between TOCs and shipping companies (see e.g. Heaver et al., 2001). As a consequence of port reform, and over the last couple of decades there has been a decrease in the number of state-owned terminal facilities. This process of port privatization has led to private investment in container terminals, as a means to overcome shortages in port infrastructures.² Mega-vessels cannot be handled at all terminals, thus bringing about a significant increase in stevedoring costs, and the loading/unloading operations require more time. With a growing complexity in global transport networks, managing the time factor becomes crucial for current liner service design. Shorter waiting times and delays redound in benefits to customers that save on logistics costs (Notteboom, 2006). Specifically, Wilmsmeier et al. (2006) find that port efficiency is the most determinant element of international transport costs, followed by port infrastructure, private sector participation and inter-port connectivity. Doubling port efficiency in a pair of ports involved in bilateral trade has the same impact on international transport costs as halving the distance between them. All these factors have driven liners to control a number of terminal facilities all over the world. Within the structural evolution in ports, many shipping lines have established their own terminal operating branch. To illustrate, the A.P.Møller-Mærsk group operates approximately 50 container terminals around the world. This certainly introduces an element of strategy in such vertical integration arrangements. In particular, a key decision for carriers is whether to manage a dedicated terminal and keep it exclusive or whether to have a dedicated terminal accessible to all users (thus keeping it non-exclusive). Indeed, most global carriers run their own terminals; others are shifting to common-user (non-exclusive) terminals, as done by Mærsk creation of APM Terminals and Japanese Yusin Kaisha.

The liner shipping market is characterized by a number of recent features. The most relevant are: First, it is a relatively concentrated oligopolistic market since 80% of vessel capacity is held by the top 20 carriers. Second, the trend toward consolidation in the industry, via mergers and cooperation agreements, accelerated in the past few years. Since the 1990s, carriers have been pooling vessels on main commercial routes and profiting from scope and network economies prompted by the formation of strategic alliances. Third, shipping companies now establish forms of vertical integration to get a tighter grip on logistics chains, in particular, as a means of gaining control over port capacity. Recently, Notteboom (2007) and two OECD works by Frémont (2009) and Van de Voorde and Vanellander (2009) underline the significance of market power and of integration in the understanding of the maritime sector. The emergence of dedicated container terminals over the last years may be due to the increasing gap between the objectives of ports and those of shipping lines. Haralambides et al. (2002) provide a detailed discussion and analysis of the costs and benefits of dedicated terminals. Among the benefits, they note that dedicated terminals offer carriers greater flexibility, reliability, short turnaround times, and enhanced efficiency in the management of global supply chains. Among the costs, the presence of diseconomies of scale in ports is quoted. These are related with availability of cargo-handling equipment. The utilization of larger vessels shifts up the ship-time curve; hence average costs are minimized at a lower level of port production. Kaselimi et al. (2011) further mention that the benefits that ocean carriers may exploit when operating a fully dedicated terminal include the delivery of value added, the provision of a “one-stop-shop” service to customers, and increased profitability.³ Fourth, in the strong competition environment that characterizes the industry, product differentiation (through a wider range of services offered) has a strong influence on performance (Panayides, 2003).

Regarding maritime transport there are some recent papers devoted to analyze how dedicated terminals can affect the different actors of the port industry. Reynaerts (2010) empirically studies the merger between two terminal operators using a Bertrand competition model to assess its impact on profits and social welfare. Van Reeve (2010) uses a horizontal product differentiation model in which two ports compete for cargo trans-shipments. The model shows that the landlord port governance scheme without intra-port competition is a Nash equilibrium yielding the highest profits for the port industry, and the highest prices for its customers. Finally, the paper by Kaselimi et al. (2011) merits to be cited. These authors analyze a model of competition between non-dedicated terminals using a typical Hotelling specification. The impacts on the industry when one of the terminals moves towards a fully dedicated operator are evaluated. It is shown that non-dedicated terminals can result in price and profits increases. However users of these terminals clearly lose. Our paper differs from and complements the analysis by Kaselimi et al. (2011), because once a shipping line adds a new terminal, it might find it profitable to offer the terminal services to rival shipping lines.

The issues related to vertical integration and exclusivity have been widely discussed in the industrial organization literature. A question much analyzed in the field has been the foreclosure theory. The idea is that an incumbent firm might profitably exclude rivals by using exclusivity clauses. In a recent paper, Spector (2011) examines the circumstances for socially inefficient exclusion and offers an excellent discussion of earlier related literature. Also related and recent contributions have studied the competitive effects of vertical mergers: the cost efficiency of suppliers and the potential provision of specialized inputs affect the pricing behavior of downstream firms and the incentives to integrate (see e.g. Chen, 2001; Choi and Yi, 2000). In contrast with these papers, the initial situation has one input supplier whose access cannot be denied, the open terminal. The new liner terminal creates an additional input thus making the existing terminal less of an essential input; this opens the possibility for shipping lines to offer differentiated services and indeed become multiproduct firms, where demand

² Midoro et al. (2005) survey the recent history of liner shipping and talk about one evolution (growth in vessel size and in ports) and three revolutions (containerization, intermodal ship-rail transport, and transshipment). The current wave of the integration and globalization of the terminal business and liners is to be put in the transshipment revolution.

³ There are pure TOCs and also other forms of partnerships between shipping lines and stevedores (such as joint ventures, contracts, and the creation of partially owned subsidiaries). See Soppé et al. (2009) for a recent review on reasons leading to the integration of vertical activities in the maritime industry. Zhang et al. (2007) provide an analysis of intermodal integration in transport chains in the airline industry.

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