

# CONTAINER TERMINALS IN EUROPE

## Their Position in Marketing Channel Flows

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This paper aims to address the linkage between logistics (in particular, the management of marketing channel flows) and transport markets, while also the interaction between these two markets and intermodal container terminals is analysed. The marketing channel theory is used to describe all relevant actors and flows that run through marketing channels, starting with customer needs and ending with customer satisfaction. Porter's theory of competitive advantages is used to review competitive forces in both markets. Finally, a competitor analysis is performed for the logistics and transport market. These theories are applied so as to be able to determine the competitive position of intermodal container terminals with a view to the management of marketing channel flows and the physical transport of freight flows. Hence, the central question of this paper is: Which markets are served by intermodal container terminals and with whom are they competing? At present, neither the maritime container terminals nor the continental container terminals appear to have a significant influence in the logistics service market; they concentrate mainly on the physical movement of containers (transshipment). Furthermore, maritime container terminals and continental container terminals are not dominant players in the transport service market. Our conclusion is that continental terminals are predominantly competing with unimodal road transport, with neighbouring continental terminals and with barge transport companies.

Key Words: Container terminals, Marketing channel, Logistics, Competition

## 1. INTRODUCTION

### 1.1 Prologue

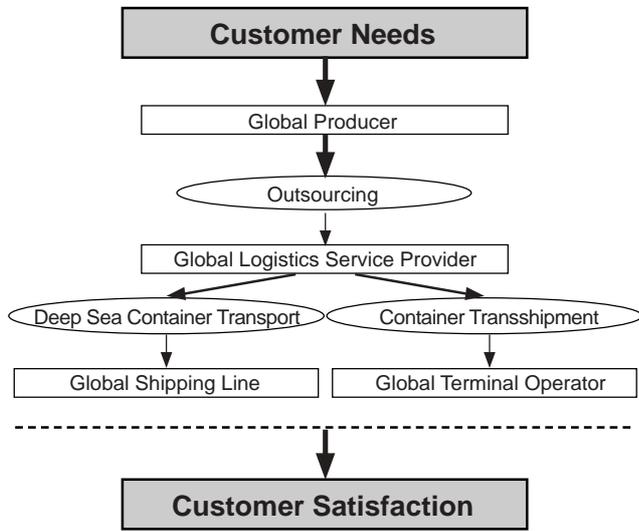
The rapid increase in international container transport has led to substantial bottlenecks in infrastructure networks. One of the solutions to improve efficiency in container transport may be combined transport. The intermodal container terminal that transships the containers between truck, train, ship and/or barge claims a central position in the combined transport chain. This central position holds especially for the physical movement of containers (freight flows). The engagement in other flows (e.g., information) is increasing as well. Much of the current research on freight transport is based on a comparison between different transport modes and their related capabilities and (dis)advantages<sup>1</sup>. The present paper is concerned with the competitive position of intermodal container terminals in logistics and transport markets. Three theoretical perspectives are used in order to review the position of the intermodal container terminal. Firstly, the marketing channel theory offers an operational perspective on the critical elements of logistics<sup>2</sup>. Secondly, the theory about competitive forces<sup>3</sup> offers a perspective on relations between various markets in a marketing channel. From this perspective, each particular transport market is analysed, including the surrounding competitive

forces of suppliers, potential entrants, buyers, substitutes, and regulations. And finally, this paper offers a competitor analysis as elucidated in particular in the Boston Consulting Group Matrix, which provides a clear view on competitor analysis in any transport market in a marketing channel. In this paper we aim to integrate the three perspectives described above into a single framework to analyse the logistics and transport markets in order to be able to determine the competitive position of the intermodal container terminal in the combined transport marketing channel.

### 1.2 The maritime and continental marketing channel

All marketing channels start with customer needs and end with customer satisfaction. Global producers respond to customer needs and this is the start of Figure 1. Most marketing channel operations start with a maritime part including continental pre-haulage, deep sea transport and transshipment, after which the continental part of the marketing channel operation commences (see both Figure 1 and 3).

Logistics – the operationalisation of the marketing channel – is the physical movement of goods from supply points to final sale points to customers, including the associated transfer and storage of the goods at various intermediate points, accomplished in a way that contributes



Boxes: actors  
Ovals: activities

Fig. 1 Actors and services in a maritime marketing channel (maritime terminal)

Source: Wiegman et al., 1999<sup>6</sup>

maximally to the explicit goals of the company<sup>4</sup>. Usually, several actors join forces in complex channel arrangements. The channel should be viewed as a network that creates value for end-users by generating form, ownership, place and time utilities<sup>5</sup>. The marketing channel is to be perceived as logistics service elements that are made operational on a vertical axis. The channel flows run between actors in different markets through which a product must move to reach the industrial users or final consumers (see Figure 2 for an example of two actors).

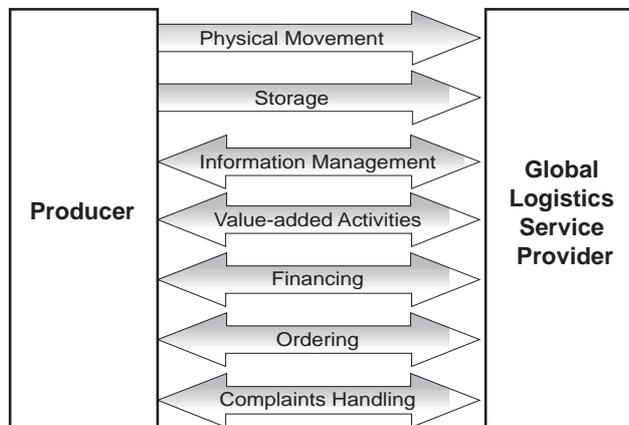


Fig. 2 Outsourcing of marketing channel flows between a producer and a global logistics service provider

Source: based on Stern et al., 1996 and Wiegman et al., 1999

The logistics elements (flows) in the marketing channel that are outsourced by producers of goods and services are depicted in Figure 2. *Physical movement* then represents the transport and transshipment of containerised freight; *storage* is the stocking of freight and warehouse management; *information management* concerns all accompanying information that comes with the physical movement of freight; *value added activities* consist of handling that increases the value of the products transported (e.g., assembly); *financing* is the payment for the services that are provided; *ordering* is the management of the newly ordered products; *complaint handling* is the handling of a dissatisfied final consumer and all actions that are necessary to improve that (e.g., a helpdesk). The marketing channel flows run through the complete channel from global producer to logistics service provider, to global shipping line and global terminal operator. These elements form the maritime part of the marketing channel (also see Figure 2 for an example of two actors).

The continental logistics marketing channel continues with the logistics service provider and is a follow-up of the maritime marketing channel (see Figure 3). The logistics service provider that integrates flow elements, uses transport companies to transport the physical flow (e.g., containerised freight) to its final destination (customer). The services that are mainly outsourced by global logistics service providers are depicted in Figure 4. These services mainly consist of transport and transshipment, the necessary information management, some value added activities, and payment for the services. Added value tends to be lower in this service portfolio than in

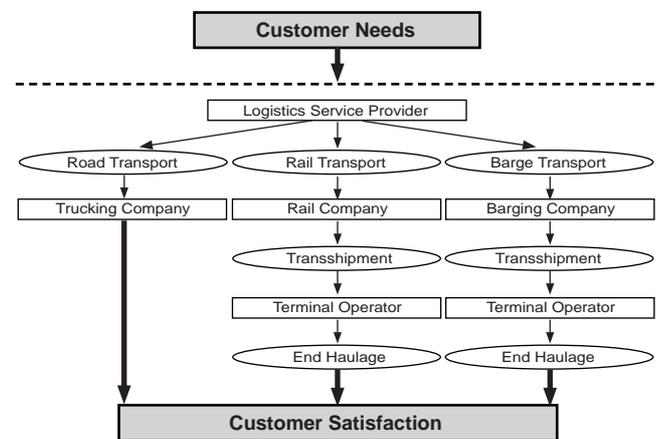


Fig. 3 Actors and services in the continental logistics chain (continental terminal)

Source: Wiegman et al., 1999<sup>6</sup>

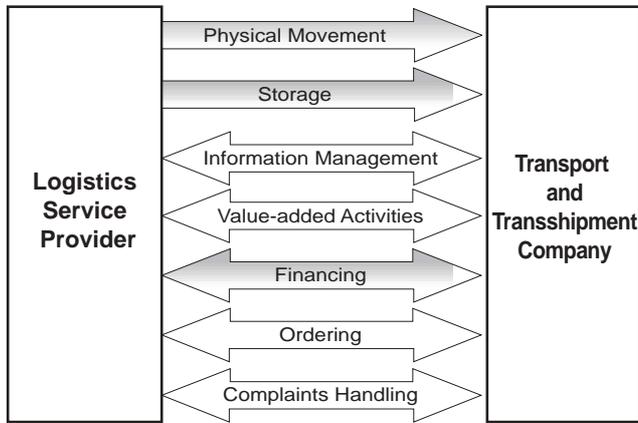


Fig. 4 Outsourcing of marketing channel flows between logistics service provider and transport companies

Source: based on Stern et al., 1996 and Wiegmans et al., 1999

the maritime part of the marketing channel due to the involvement in a smaller number of marketing channel flows (see both Figure 2 and Figure 4).

### 1.3 Competitive forces in markets and competitor analysis

Porter's model of the five competitive forces is a useful framework when describing any market and its competitive forces. In this paper we use the model to analyse the logistics and transport markets in order to determine the competitive position of the intermodal container terminal (maritime and continental) in relation to these markets. Where the marketing channel theory aims at analysing complete marketing channels (more markets), Porter's theory of competitive forces is aimed at analysing one particular market. The model enables the analysis of current and future strengths of competitive forces around a certain market. If markets surrounding competitive forces are strong, this means that the profit potential for industry competitors in that market is lower. In every market, pressure is placed on each company as a result of competition. Competition is more multi-faceted than just winning strategies of the industry competitors in the current market. Substitutes, buyers, suppliers and potential entrants also influence a current market. One additional force is added to our analysis in the form of the terminal environment. The six competitive forces are depicted in Figure 5.

Our theoretical framework will be further extended by using an adjusted Boston Consulting Group Model that is used to analyse more thoroughly the industry competi-

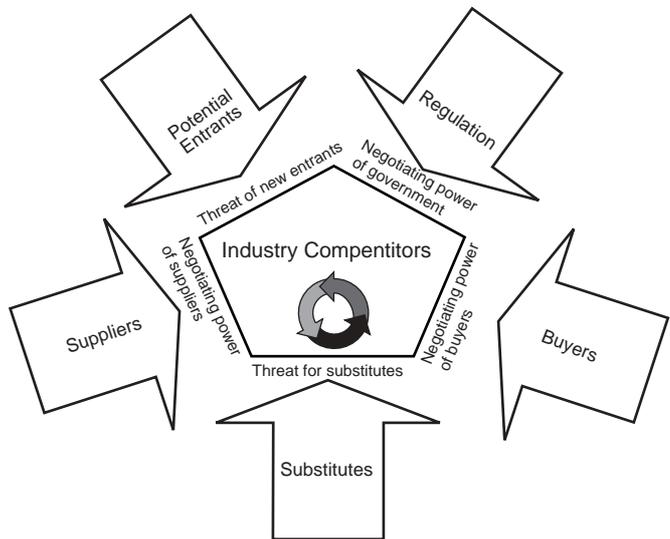


Fig. 5 Six competitive forces in any market

Source: Porter, 1980, adapted

tors in the logistics and transport markets. Our model is based on the historical sales volume development and the market growth rate in a given market. The main businesses of the companies concerned are taken into account as well. The positions of the different companies are depicted in a matrix. The position in the matrix represents the market growth rate and relative sales volume of the company concerned. Our growth-sales matrix consists of four cells: leaders, nichers, followers, and challengers. The four types of businesses require different actions from the corporate level<sup>7</sup>. Competitor analyses, together with the other components, forms the basis for identifying the competitive position of intermodal container terminals (see Figure 6 for an overview). After the start with marketing channel theory to identify the service portfolio of the container terminal, we identify the competitive forces surrounding the container terminal operator, after which we analyse the interaction between industry competitors in the right of the figure.

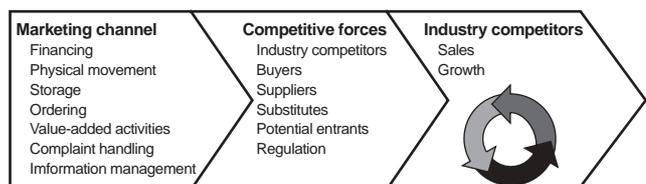


Fig. 6 Theoretical framework to analyse logistics and transport markets

Source: Stern et al., 1996, and Porter, 1980, adapted

#### 1.4 Problem definition

The operations and goals of container terminal operators need to be analysed more thoroughly so as to provide insight in the full potential that is offered by the combined transport services in which they form an important part. The aim of the present paper is to provide insight into the logistics and transport markets and into the relation between these markets and the intermodal container terminal. The marketing channel theory is used to describe all actors and flows that run through marketing channels, starting with customer need and ending with customer satisfaction. Next, Porter's theory of the competitive forces is used to analyse surrounding competitive forces of mainly transport markets. Finally, competitor analysis is undertaken in the logistics and transport market. These theories are applied in order to be able to determine the competitive position of intermodal container terminals towards logistics and transport markets. This brings us to the central question of this paper: *Which markets are served by intermodal container terminals and with whom are they competing?*

For the sake of manageability we will focus on Europe. The rest of the paper contains the following sections: Section 2 describes recent developments in the logistics market in Europe. Section 3 deals with the transport sector in Europe. The final section contains the conclusion of this paper.

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## 2. LOGISTICS: INTEGRATORS OF MARKETING CHANNEL FLOWS

### 2.1 Introduction

Logistics is the management of *all* marketing channel flows, including transport, from customer needs to customer satisfaction. Logistics encompasses the containerised product flows from firms to customers through a network of transportation links, storage, distribution and handling nodes. So-called fourth party logistics service providers (4PL's) are concentrating more and more on the flows of information management and financing<sup>8,9</sup>. Global oriented terminal operators are entering this market as well. Main European terminal operators according to sales volume or container volume are Hamburger Hafen und Lagerhaus Aktiengesellschaft (HHLA) from Germany, Eurokai from Germany, Hessenatie and Noordatie from Belgium, Ceres Marine Terminals Inc. from the USA, European Combined Terminals from the Netherlands (partly owned by Hutchison),

P&O Ports from Australia, and Bremer Lagerhaus Gesellschaft (BLG) from Germany. PSA and Hutchison ports play an important role in transshipment capacity via their participation in European terminals.

World-wide costs for freight transport, warehousing and related IT and administration were estimated at 3,425 billion dollars in 1996<sup>10</sup>. Thus, it is no surprise that physical distribution and logistics play an important role. Among others, this effect has led to the following general **strategic** developments: (i) managers have realised that improving the efficiency of individual logistics operations is useless, if the efficiency of the individual function throws the total system out of balance; (ii) the logistics system has become an important competitive tool; (iii) many of the technological developments over the past 20 years have been system-oriented, which forces us to consider the logistics system as a whole; (iv) logistics is increasingly perceived as an activity that should be outsourced; and (v) logistics is no longer a part of business where costs are minimised, but is instead seen as an important strategic activity.

**Logistics costs** (e.g. transport, handling, inventory) rise disproportionately as customer service levels are increased. The fact is also that logistic costs often have a non-proportional relationship with quality levels<sup>11</sup>. A firm that supports a service standard of overnight delivery of 95 per cent consistency may, for example, have the double logistics costs of one of second morning delivery at 90 per cent consistency. If a transport service lacks consistency, inventory safety stocks will have to be higher to provide safety against the possible lack of transport service, thereby causing higher inventory costs. This suggests that very seldom the lowest total cost or the highest service performance will constitute the best logistics solution. Furthermore, it should be noted that improving individual logistics components is useless if the total logistics performance worsens. Thus logistics is not considered as part of business where costs should be minimised, but instead it is more and more seen as a strategic performance area where the role of combined transport is increasingly important. Moreover, logistics is an important competitive tool and is the area where competition for distribution control takes place.

### 2.2 Competitive forces in the logistics market

The first competitive force in Porter's model in Figure 5 is the 'Industry competitors' in the logistics service market. There is competition among industry competitors because actors see chances or feel pressure to improve their positions. The competition intensity among the in-

dustry competitors depends on a number of factors:

1. Many (or a number of equal) competitors result in instability in any market;
2. Slow industry growth results in competition for market share;
3. High investment cost forces industry competitors to concentrate on capacity;
4. Lack of switching costs is followed by service and price competition.

In the logistics service market we see many competitors, high industry growth, relatively low investment costs, and low switching costs.

In order to provide the logistics services, the marketing channel flow integrator can use his marketing mix: People, Planet, Profit, Product, Price, Promotion, Place, and Process (the 8 P's). *People* are the most important element of the marketing mix. In the logistics service process the skills of all employees are crucial to produce a good service. *Planet* represents the sustainability of the logistics services. *Profits* are the result of the production process and for companies, this is what it is all about. The product of the logistics service providers can consist of a lot of different services. The *price* for the logistics service depends on the negotiation skills of both parties, on the total service portfolio, and on the market power of both parties. The price is also influenced by the quality of the delivered logistics service. *Promotion* of the logistics services especially relies on personal contacts, but other useful promotion channels exist on the Internet and via advertising. The logistics service provider should be comfortably located in order to optimally serve its customers (*place*). Finally, the *process* that leads to the production of the logistics service should be carefully planned in order to produce the best service possible. Generally, continental terminals are not offering logistics services on a large scale, maritime terminals, however, are increasingly present in the logistics service market.

#### **Buyers of logistics services**

The strength of this competitive force depends on the number of buyers and the relative sales volume the buyer represents in relation to the logistics service provider. The buyers will test the profitability of industry competitors by trying to get lower prices, negotiating for better quality and greater service, and by negotiating with more industry competitors simultaneously. The position of the buyer is especially strong if the seller has high investment costs and if the importance of a good capacity utilisation is very high. This is the case in the logistics

service market. Lately, we have seen the development of more co-operative relationships between shippers and logistics service providers through the awarding of long-term contracts.

#### **Suppliers of logistics facilities**

The suppliers of logistics service providers are office and warehouse equipment suppliers and transport suppliers. Suppliers can use their economic power, for example, by raising prices and lowering the quality of their goods and/or services. Another option for the supplier is to threaten to integrate elements of the logistics services into his own assortment. The strength of this force further depends on the number of suppliers; if the suppliers of logistics services are concentrated, in general they have greater economic power. If the threat of substitute products is low, this will also increase the power of suppliers. If the economic prospects of the supplier interfere with the prospects of the logistics service provider, then his attitude will be more reasonable (in terms of prices for supplies). The suppliers of office equipment do not have great economic power towards logistics service providers. The major threat comes from transport companies that are more and more integrating logistics into their own service portfolio, which means that the competition in the logistics market will further increase.

#### **Potential entrants into the logistics market**

Potential entrants to the European logistics market are new logistics service providers. This fourth competitive force imposes a serious threat to current logistics service providers. New logistics companies will increase capacity as well as competition. Entrants will come from the USA and Asia. Entry barriers for potential entrants to the logistics market are not high.

In general, major entry barriers are<sup>5</sup>:

- \* Customer loyalty. If the logistics service provider has loyal customers, it will then be more difficult for a new company to attract new and existing clients.
- \* Extension of logistics service assortment. A broader service assortment will, in principle, create a stronger company. A strong loyalty between the company and its customer groups can be created.
- \* Capital. If major investments are necessary to enter a market, this is also a major barrier. This is obviously not the case in the logistics market.
- \* Government regulation. Government may impose high barriers in international transport, for example, by limiting possibilities of cabotage.

Potential entrants to the logistics market are especially found among transport companies eager to increase their service portfolio. At the macro level, potential entrants are not to be seen as a threat but instead as a chance to ensure better efficiency and improved utilisation of transport networks<sup>1</sup>.

### *Substitutes for logistics*

Substitutes decrease the potential profits of a sector by imposing an upper limit on the prices industry competitors in a sector can charge. Each market will have to deal with options that replace current services or products that industry competitors produce. The most important substitute in the integrators service market is formed by companies (shippers) that perform their own integration of their marketing channel flows.

### *Logistics regulations*

One influential force in the logistics market that is not incorporated in Porter's model of competitive forces is regulation. The logistics service market is increasingly competitive and not directly regulated. The transport suppliers of the logistics service providers however, are under various forms of regulation. Another field where logistics service providers are facing regulation indirectly concerns environmental issues. Overall, the regulation the logistics service provider is confronted with, is more indirectly having an influence via suppliers and buyers.

## **2.3 Competitor analysis of integrator service providers**

In this section we concentrate on the logistics service providers market and analyse the winners and losers according to their historical sales volume and their current growth rate. Also the activity portfolio is integrated into the analysis. Sales volume and growth rate are then used to position the competitors in the logistics market against each other. The constructed matrix is based on the Boston Consulting Group Matrix that has been built to evaluate current businesses of a company. The Boston Consulting Group Model is based on the market growth rate and the relative market share compared with the largest competitor in a certain market. The positions of the different businesses of a company are depicted in a matrix, the so-called growth-share matrix. The position in the matrix represents the market growth rate and relative market share of the businesses concerned. Our adapted growth-sales matrix consists also of four cells that are named: leaders, nichers, followers, and challengers.

Originally, the approach was developed to evalu-

ate businesses of a company. We have applied this approach to the largest companies in the logistics market. The market growth rate indicates the annual growth rate of the company and is compared with the growth rates of its competitors and with the average market growth rate. The relative market share is the sales volume of a company compared with its next largest competitor's sales. In the last years an enormous consolidation wave is taking place in the European logistics service market<sup>12,13</sup>. In the two tables below we depict the two groups of logistics service providers: the freight oriented (focus is on, and sales come from freight) logistics service providers in Table 2 and the container oriented (focus is on, and sales come from containers) logistics service providers in Table 1. For the freight-oriented logistics service providers the focus is on the freight inside the container, while also the sales of the companies concerned come from freight. For the container-oriented logistics service providers the focus is on containers, while the sales come from containers. In general, the freight is of no interest to them.

Due to lack of data it is not possible to construct an BCG-matrix for the European logistics service market for containers. In Table 2 the main competitors of container oriented logistics service providers are presented. Instead of providing services to container flows, these businesses provide services to freight flows. This group of companies provides sufficient data to be able to compare them on profitability, sales, and growth.

Our matrix is based on the 5-year company growth rate and the 5-year sales volume development compared with the main competitors. The positions of the different freight logistics companies are depicted in the matrix above. Our adjusted growth-sale matrix consists of four cells: leaders, nichers, followers, and challengers. *Leaders* are big companies (in terms of sales volume) that are capable of realising high growth rates at the same time (mainly via acquisitions). This does not necessarily suggest that the profits for these companies are high. *Challengers* are companies that manage to realise high growth rates but still have relatively low market shares in terms of sales volume. The companies aim for a few related businesses (focusing), realise high growth rates and have relatively good profits. *Nichers* have low market shares and low growth rates compared with their competitors in the logistics market. These companies may consider how they could become challengers or nichers; otherwise the company should look for a merger or divest. Finally, *followers* are companies with a relatively high market share (sales volume), but with a relatively low growth rate compared with its competitors. The company should try to increase its growth rate, otherwise the com-

Table 1 Overview of container oriented European logistics service providers in the market of containers (1995-99)

Company name	Sales (million Euro's)					Growth 98-99	TEU per year (1999)	Profits (million Euro's)	Activities
	99	98	97	96	95				
PSA (Singapore)	2,420	1,843	–	–	–	31.3%	15,900,000	1,050	International container transshipment
Hutchison Port Holdings (HK)	1,485	1,153	–	–	–	28.8%	17,900,000	591.2	International container transshipment
ABP <sup>1</sup> (UK)	510	493	417	360	343	3.5%	921,000	165	Ports, transport, property
HHLG (D)			429			18.9%	2,275,928	12 (X)	
ECT (NL)	342	332	293	283	296	3.0%	4,700,000	–/– 19	Inland terminals, international container transshipment
CMB (B) (Hessenatie)	321	305	–	–	–	5.2%	2,460,000	9.4	General cargo, container repair, distribution, and forwarding
Noordnatie (B)	–	–	–	–	–	–	900,000	–	Tank storage, fruit
Eurogate (D)	301	–	–	–	–	–	6,355,000	20.8	Transport, container repair, warehousing/distribution
Maersk Sealand	–	–	–	–	–	–	–	–	Deep sea shipping, oil and gas, bulk transport
Barcelona (Sp)	–	–	–	–	–	–	1,250,000	–	
Ceres (USA)	–	–	–	–	–	–	–	–	
CSX Corp (USA)	10,296	8,223	8,851	8,780	8,587	25.2%	–	132.4	Rail, intermodal, container shipping, terminals transshipment
Modern Terminals (HK)	–	–	–	–	–	–	2,594,000	–	
Total									

1 = Associated British Ports handles more than just containers, the containers are transhipped at Southampton  
Source: Annual reports, 1998-1999

pany may become a follower. The low growth rate logically results from problems inherent in integrating new businesses that stem from the diversification process. The matrix is a result of the operations of companies and only shows a temporary overview of the positions of the different companies in the period 1995-1999. We observe that – according to our definition – TNT is a clear leader and Deutsche Post, Schenker, and P&O are challengers. Successful challengers are Hays, Tibett & Britten, and DFDS; the rest contains nichers. The four types of businesses require different actions (build, maintain, harvest, or divest) from the corporate level. In general, most freight-oriented logistics companies are not involved in the container terminal market.

#### 2.4 Conclusions on logistics

Maritime and continental terminals are generally serving the logistics market of containers. Most terminals

are mainly focusing on transshipment of containers as their core business. However, especially global maritime terminals may be expected to further expand their presence in the logistics service market. Producers increasingly outsource their complete logistics operations to specialised logistics service companies. This results in an increasingly important position in marketing channels for logistics service providers. The competitive power of logistics service providers towards their suppliers is also increasing because of the scale enlargement. The logistics service market is a high growth market (double digit) and competition is rising, which offers interesting opportunities for leaders, nichers, followers, and challengers. Scale enlargement is speeding up and the credo is eat or be eaten. However, an important part of the high growth in the logistics market stems from acquisitions and not from a larger market. Furthermore, potential entrants will enter the logistics market, while also the suppliers will

Table 2 An overview of the main European freight oriented logistics service providers market (1995 - 99)

Company name	Sales (billion Euro's)					Growth 98-99	Profit 99 (million Euro's)	Activities
	99	98	97	96	95			
1. Deutsche Post (D) (Danzas)	22.4	14.6	14.1	14.0	14.0	52.5%	864.0	Mail, transport, retail (communication and finance)
2. Stinnes Logistics (D) (Schenker/BTL)	11.8	13.0	10.6	11.0	11.2	-/- 9.2%	164.7	Chemicals, materials, building materials, wholesaling transport
3. P&O (UK)	9.2	8.9	8.9	10.6	9.9	3.4%	788.1	Cruises, ferries, transport, transshipment
4. TNT (NL)	8.5	7.4	6.9	6.2	3.1	14.9%	687	Mail, express, transport
5. NFC (UK) (Exel Logistics)	3.8	3.5	3.6	3.7	3.3	8.6%	163.4	Transport, warehousing, supply chain services
6. Geodis (Fa)	3.1	2.8	2.7	2.3	-	10.7%	31.8	Overseas, groupage, Full Truck Load, transport
7. Hays Distribution (UK)	2.9	2.3	1.7	1.4	1.2	26.1%	348.5	IT, transport, consultancy
8. Ocean Group plc (UK) (MSAS Global Logistics)	2.7	2.0	1.7	1.7	1.7	35.0%	108.9	Mail, customs brokerage, transport, added value
9. Tibbett & Britten (UK)	2.0	1.7	1.3	1.0	0.9	30.8%	48.4	Added value, RDC's, intermodal
10. DFDS Dan Transport (DK)	2.0	1.3	1.2	1.0	1.0	53.8%	41.0	Transport, passenger transport
Total	68.4	57.5	52.7	52.9	46.3	19%	3,245	-

Source: Annual Reports, 1995-1999

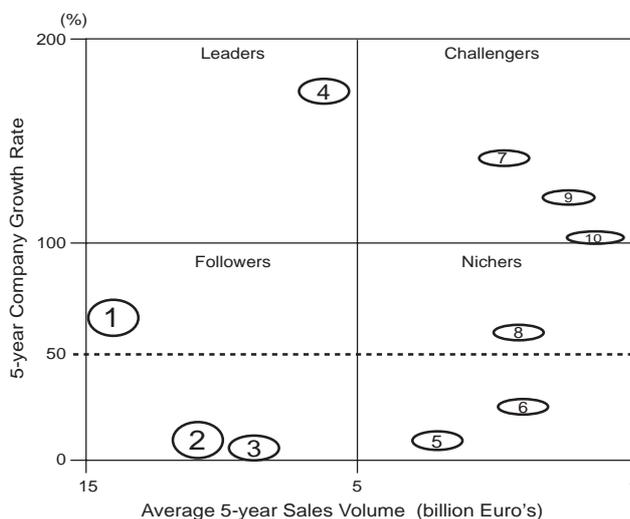


Fig. 7 Sales volume and company growth rate of the big ten in the European freight logistics market

Source: Kotler, 1997, adapted by Wiegman 2000

increase their scale through mergers and acquisitions. Until recently, both maritime container terminals and continental container terminals did not have significant influence in the logistics service market. They were concentrating on the physical movement of containers (transshipment). Maritime container terminals, however, are

increasingly serving other elements of the marketing channel than just transshipment. And in this respect, competition with freight-oriented logistics service providers is heating up. Critical Success Factors for container terminals are then engagement in information management, big logistics contracts with global producers, and the definition of the core-business of the terminal and the corresponding organisations.

### 3. ACTORS ON THE EUROPEAN TRANSPORT MARKET

#### 3.1 Introduction

Waterways have provided vital transport links for moving freight for a very long time. Many of today's important cities developed around water ports along the coasts and along rivers in Europe (e.g., Rotterdam, Duisburg, etc.). Barge transport can be characterised by regular frequencies, high volumes, low penetration and low value goods. In general, barge transport is slow, sometimes the schedules are influenced by severe weather conditions, and traditionally it is limited to bulk freight services. But lately we are seeing some interesting and promising new developments (e.g., faster, bigger, and

cleaner ships) that strengthens the competitive position of barge transport relative to the other parts of the transport market. Other advantages of barge transport are relatively low costs, a low loss and damage rate (costs), while infrastructure is abundantly available<sup>14</sup>. Generally, maritime terminals are not offering barge transport in their service portfolio by themselves; continental terminals, however, are definitely offering barge transport in their service portfolio. A number of barge transport companies originate from continental terminals and most other companies exploit their own continental terminals.

Before World War II, freight transport by rail was the main transport mode. Over the past fifty years however, the rail transport sector has steadily decreased in relative importance. This decline can be attributed to a number of developments: changing needs of customers, increased competition by barge transport, and rise of alternative transport modes with services with a better price/quality performance. Rail has always been considered as the long distance (500km and more) mover of bulk freight such as coal, grain, chemicals, cars, and of low-value manufactured goods. However new developments are taking place: new international actors speed up competition; containerisation opens new markets for rail transport; and congestion lowers the competitiveness of road transport.

The potential of rail transport is impeded by negative economic performances of most companies, different voltage systems in the EU, change of personnel at borders, administrative barriers, technical barriers, long infrastructure planning procedures, and pre- and end-haulage services that are generally insufficient. When one wants to make rail transport competitive, it should pass from bureaucratic management to market oriented operation. A smoother movement of freight trains across national borders should be encouraged, which could lead to an increase in the average speed of 30-40km/hour (including waiting time the average speed is 15 to 20km/h). Maritime terminals and continental terminals are generally not competing in the rail transport market. Terminals do not offer rail transport services in their own portfolio.

The growth and widespread use of road transport in the EU is conceivable when one takes a look at the service characteristics of the road transport mode<sup>15</sup>. The road transport sector has a clear advantage over other sectors in the field of accessibility. This results in access to almost any origin and destination by road transport. A second advantage of road transport is speed. For shipments up to 1,000 km road transport can usually deliver the goods faster than other transport modes. The smaller carrying capacity of trucks is another advantage of road

transport. The benefits are lower inventory levels and inventory carrying costs and more frequent services. The road transport sector is highly flexible in scheduling which is another advantage. The road transport sector is far more customer- and market-oriented, resulting in responsiveness to customer equipment and service needs. Finally, the road transport sector is reliable, relatively cheap, and has less damages and losses. Less damage results in lower packaging requirements and thus lower costs. The road transport sector is far more involved and interested in the improvement of performance of trucks, roads and unimodal road transport in general than are other transport modes in the improvement of their transport mode. Disadvantages of the road transport sector are: rising congestion, rising costs due to the incorporation of external effects, rising fuel costs, time restrictions on both transport and (un)loading, environmental regulations, and safety regulations.

Short sea shipping is defined as all water transport inside the EU via sea where the origin and destination are inside the EU. Short sea shipping is an important transport mode on specific origin destination combinations. Transport between countries such as the UK, Ireland, Norway, Denmark, Sweden, Greece, and Turkey can be very suitable for short sea transport. An overview of the main competitors in the transport market (rail, road, barge, and short sea) of the EU is given in Table 3.

### 3.2 Competitive forces in the transport market

In the European transport service market we see many relatively small competitors originating from EU countries and high industry growth (see also Table 3). Most competitors do serve one transport mode including the logistics component. The largest competitors in the transport market stem from road transport, rail transport, and express services. In the European road transport market segment almost all competitors operate their own fleet of trucks in order to be able to deliver express services. In this market segment we see large global competitors from the USA and Japan that may be expected to increase their presence in the European transport market. In the near future, we may see the emergence of more global express delivery companies and the disappearance of the traditional road transport companies into the logistics service providers market. In the European rail transport market segment we see competitors that are all former national state monopolies. The three largest rail freight transport companies come from Germany, the UK, and France. In the near future, liberalisation will further increase and we may expect more mergers and acquisitions.

Table 3 Actors on the European transport service providers market (1995–1999)

Company name	Sales (billion Euro's)					Growth 98-99	Other activities	Main transport mode
	99	98	97	96	95			
UPS (USA)	25.8	20.7	18.7	–	–	24.6%	National and international package	Road
FedEx (USA)	16.0	13.2	11.9	–	–	21.2%	Transportation, logistics, and e-commerce	Road
Nippon Express (JP)								Road
Kühne en Nagel (CH)	4.2	4.2	4.0	3.3	3.2	0.0%	Worldwide transport and logistics management	Road
Deutsche Bahn (D)	3.5	3.6	3.6	3.7	–	–/– 2.8%	Passengers, tourism, stations	Rail
Panalpina (CH)	3.5	3.3	–	–	–	6.1%	Airfreight, seafreight, logistics	Road
ABX Logistics (B)	2.4	–	–	–	–			Road
EWS (UK)	2.1	2.2	2.1	–	–	–/– 3.6%	International rail transport	Rail
SNCF (Fr)		1.9	1.9	–	–	–/–0.1%	Passengers	Rail
Rail Cargo Austria (AT)		0.93	0.95	0.9	–	–/– 1.7%	Passengers	Road
Christian Salvesen (UK)	0.9	1.0	1.1	1.1	–	–/– 10.0%	Transport and logistics	Road
FS Cargo (It)	–	0.75	0.69	–	–	–/– 4.6%	Passengers, regional and metropolitan transport	Rail
SBB Cargo (CH)	0.64	0.62	–	–	–	–	Passengers	Rail
SJ Cargo Group (S)		0.76	0.70	–	–	8.6%	Passengers	Rail
Gebr. Weiss (A)	0.5	–	–	–	–	–	Transport, logistics, air- and seacargo, parcel service	Road
NMBS (Be)	0.44	0.45	0.38	–	–	–/– 2.2%	Passengers, logistics	Rail
VR Cargo (F)	0.32	0.34	–	–	–	–/– 5.9%	Passengers	Rail
NS Cargo (NL)	0.13	0.14	0.14	0.14	0.15	–/– 7.1%	Passengers	Rail
Glodex							Transport, logistics, and aircargo	Road
CCS (D)	–	–	–	–	–	–	450,000 TEU	Barge
SRN (S)	–	0.15	–	–	–	–	Logistics, terminals	Barge
DSB (DK)		0.15	0.15	–	–	0.0%	Passengers	Rail
Haniel Reederei (D)	0.21	0.21	–	–	–	0.0%	Steel, pharmaceuticals	Barge
RENFE (Sp)	–	0.12	0.11	0.10	0.09	9.1%	Terminals, logistics	Rail
Danser Container Line BV							100,000 TEU	Barge
Total						–	–	

\* In this Table, rail, road, barge, and short sea are included and analysed as far as possible  
Source: annual reports, 1998, 1999<sup>16,17,18,19</sup>

So far, the Deutsche Bahn has taken over NS Cargo and we have seen the tie-up between the Swiss and Italian rail freight transport companies. In the table above there are only a few representatives from the transport modes, barge and short sea. This is caused both by a lack of data and the relatively small companies in these sectors.

#### **Buyers of transport services**

The strength of the competitive force depends on the number of buyers and the relative sales volume the buyer represents to the transport service provider. As there are just a few express delivery transport companies, their market power is considerable to buyers. In the road and rail transport market segments the filling up of the capac-

ity is very important. This reduces the market power of these transport companies with respect to the buyers of the transport services. As most barge companies are relatively small companies, this automatically means that buyers do have considerable power vis-à-vis the barge operators. The two main groups of buyers of transport are shippers and logistics service providers. Global producers and global logistics service providers purchase transport services for the continental part of the marketing channel. In general, maritime and continental terminals are not acting as buyers of transport services. However, maritime terminals are sometimes organising pre- and end-haulage, which means that in such cases the terminal operator is a buyer of transport services (mainly road and barge).

**Suppliers of transport facilities**

The suppliers of inputs for transport service providers are quite heterogeneous. They include producers of transport means (e.g., barge), warehouse, office, rail track, electricity, transshipment terminals, and ICT equipment suppliers. Depending on the sales volume the transport companies may represent considerable economic power with respect to the suppliers. As most rail transport companies are relatively large, their competitive power towards their suppliers will be considerable. The scale of most barge transport companies is small, and their competitive power towards suppliers tends to be relatively weak. Maritime and continental terminals supply transport companies with transshipment services. Maritime terminals represent large volumes to transport companies, and their competitive power is therefore considerable. Continental terminals are smaller than maritime terminals and depend more on transport companies for transshipment volume.

**Potential entrants into the transport market**

Potential entrants to the European transport market are existing companies from the USA and Japan that are eager to increase their presence in Europe. This third competitive force imposes a serious threat to current transport companies. Entry barriers for potential entrants to the transport market are not high. The potential entrants will probably ensure better efficiency and an improved utilisation of transport networks through a better combination of road, rail, short sea, and barge transport. Most continental terminals operate their own barging services to a selected number of destinations. Maritime terminals may be expected to enter the transport market to increase the efficiency of the total combined transport marketing channel. Another threat may come from rail transport service providers that decide to start operating their own rail transport company. A third group of potential entrants comes from global production companies that are interested to operate their own rail transport service (e.g. chemicals).

**Substitutes for transport**

There are no substitutes for transport. Transport can be varied in space or time, but transport is an activity that has to be performed to reach the final consumer or to produce a product.

**Transport regulations**

External effects are increasingly charged to infrastructure users. The barging service market is very competitive and not directly regulated (barges transport freight

in rotation). This has ensured the emergence of good and competitive services. The rail transport market is not very competitive and still mostly oriented towards the domestic market. This has led to low service quality and few services provided. The road transport market is quite heavily regulated. Maximum loads, licenses per country and many other regulations apply to this transport sector. Environmental pressure is also mounting and will likely result in more regulation in the medium term. In the near future, regulation may be expected to be in favour of the more environmentally friendly perceived transport market segments of rail, barge, and short sea transport. Probably this will further strengthen the competitive position of continental terminals.

**3.3 Competitor analysis of transport service providers**

In this section the goal was to compare industry competitors on their historical sales volume. Due to a lack of data we have selected the rail transport service providers and compared them on productivity numbers for 1998 (second best solution).

Both figures show the competitive position of rail transport service providers in Europe. The first figure consists of the total sales in 1998, the total transported tonnes, and the total tonkm. These numbers are used for composing the second figure, where two productivity numbers for 1998 are compared: sales per ton and sales per tonkm. In both figures total sales are the leading number for ranking the companies. Figure 8 shows that rail transport companies originating from big national markets play an important role in Europe. According to both figures it is also possible to pick the leaders, nichers, followers, and challengers according to the above mentioned productiv-

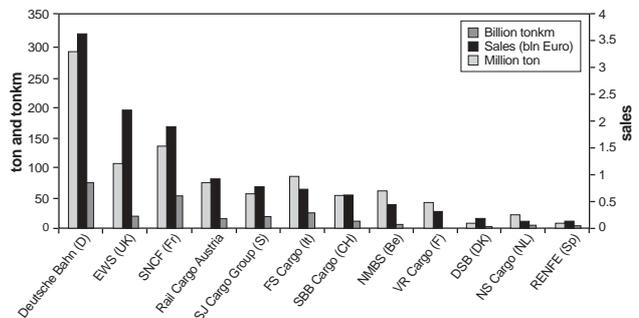


Fig. 8 Sales volume in billion Euro, million ton, and billion tonkm for the ten biggest rail transport service providers

Source: Annual reports, 2000

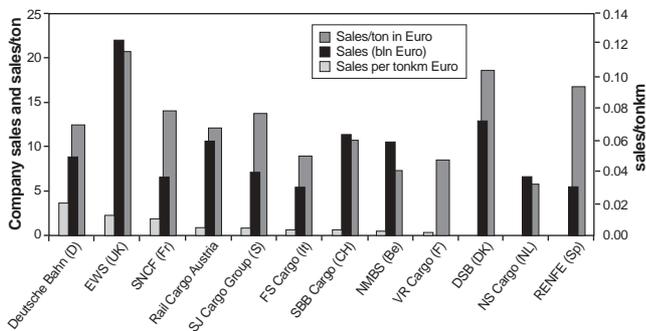


Fig. 9 Sales volume in billion Euro, sales per ton in Euro, and sales/tonkm for the ten biggest rail transport service providers

Source: Annual reports, 2000

ity measures. *Leaders* in this respect are big companies (in terms of sales volume) that are capable of realising high productivity rates at the same time. The obvious leader is *EWS* from England. *Nichers* are companies that manage to realise high productivity rates but still have relatively low market shares in terms of sales volume. Companies aim for a few related businesses (focusing), realise high growth rates and have relatively good profits. *Nichers* are then *DSB* from Denmark and *RENFE* from Spain. *Followers* have low productivity numbers and low sales volumes compared with their competitors in the rail transport market. Clear followers seem to be *NS*, *VR Cargo*, and *NMBS*.

Finally, *challengers* are companies with a relatively high market share (sales volume), but with a relatively low productivity rate compared with its competitors. Challengers are *Deutsche Bahn*, *SNCF*, *Rail Cargo Austria*, *VR Cargo Group*, *FS Cargo*, and *SBB*. The figures are the result of the operations of companies and show only a temporary overview of a small part of the transport market, namely rail transport.

### 3.4 Conclusions on transport

Maritime container terminals and continental container terminals do not have a great influence in the transport service market. In general, maritime container terminals are engaged in the transshipment of containers, but continental terminals offer pre- and end-haulage and barge transshipment as well. Maritime container terminals are increasingly serving the logistics market of containerised freight. Maritime terminals are not serving barge transport markets with barging services in their service portfolio, but continental terminals are.

Usually, continental terminals operate their own

barge transport services to a selected number of destinations, while also pre-and end-haulage is offered. Continental terminals are not offering rail transport as part of their service portfolio. The only connection with rail they have is the transshipment of containers to and from arriving and departing trains. Most continental rail terminals that exist form part of the 'still existing' national railway monopolies. Continental terminals with their own barging services compete with barge transport companies. Most barge transport companies operate their own continental container terminals or are continental container terminals that operate their own barge transport services. Road transport is generally offered through pre- and end-haulage of containers. Usually, shortsea transport is not offered by continental container terminals. A short sea service is introduced if the volume is high enough. Critical Success Factors for continental container terminals are favourable pre- and end-haulage to and from the terminal, good connections by barge and if possible by rail, and sufficient local based container volume.

Maritime container terminals are concentrating on their core business of transshipping containers. Most maritime terminals are not offering transport services, but they are increasingly offering logistics services to their customers, mainly deep sea shipping and global producers. In this respect the maritime container terminals are challenging the traditional logistics service providers for control of the marketing channel. The maritime container terminals do have the advantage to be the first part of the continental marketing channel. Critical Success Factors for maritime container terminals are good transshipment services, engagement in information management, and backing from deep sea shipping companies.

In conclusion, we see that continental terminals are competing with unimodal road transport, with neighbouring continental terminals and with barge transport companies. The position of continental terminals vis-à-vis rail transport and continental rail terminals is somewhat different. Usually the rail terminals form part of the national rail monopolies and are only there to facilitate the rail transport. Besides transshipment, continental terminals are serving the barge transport market and the market of pre-and end-haulage. Maritime terminals are competing with other maritime terminals for transshipment volume. With logistics service providers they are competing for other marketing channel flow elements. Overall, they are serving the transshipment market and increasingly also the logistics market.

## 4. CONCLUSIONS

The central theme in this paper addressed the assessment of the competitive position of intermodal container terminals with respect to logistics and transport markets. Three economic theories have been used in order to structure this task. The central question of this paper has been: *Which markets are served by intermodal container terminals and with whom are they competing?*

The *management of marketing channel flows (logistics)* has traditionally been a task of logistics service providers that concentrate on the management of freight. We observe a growing number of maritime terminals that are offering the management of marketing channel flows. Besides the transshipment of containers they provide logistics services to deep sea container carriers and on the other hand they provide logistics services to global producers. Until recently, maritime container terminals were not offering transport services themselves. Maritime container terminals are offering transshipment and marketing channel management services. They are competing with other maritime container terminals and with traditional logistics service providers for control over the marketing channel flows. Currently, continental container terminals are not present in these markets. Critical Success Factors (CSF) for maritime container terminals active in these markets are then engagement in information management and big logistics contracts with global producers. Another CSF is market definition (transshipment/transport/logistics) and corresponding business units. At the moment both maritime container terminals and continental container terminals do not have a great influence in the logistics service market. They concentrate on the physical movement of containers (transshipment). Maritime container terminals, however, are increasingly serving the logistics market of containerised freight. In this respect the maritime container terminals are challenging the traditional logistics service providers for control of the marketing channel. The maritime container terminals do have the advantage to be the first part of the continental marketing channel. Critical Success Factors for maritime container terminals are good transshipment services, engagement in information management, and backing from deep sea shipping companies.

Both maritime container terminals and continental container terminals do not have great influence in the *transport service market*. In general, maritime container terminals are mainly active in the transshipment of con-

tainers, but continental terminals offer pre- and end-haulage and barge transshipment as well. Maritime terminals are not serving barge transport markets with their own barging services, but continental terminals do. Continental terminals are thus serving the road and barge transport markets and also providing transshipment services. In this respect they are competing with unimodal road transport companies and with neighbouring container terminals. Usually, continental terminals operate their own barge transport services to a selected number of destinations while also pre- and end-haulage is offered. Continental terminals are not offering rail transport as part of their service portfolio. Most existing continental rail terminals form part of the national railway monopolies.

Continental terminals with their own barging services compete with barge transport companies. Most barge transport companies operate their own continental container terminals or are continental container terminals that operate their own barge transport services. Critical Success Factors for continental container terminals are: favourable pre- and end-haulage to and from the terminal, good connections by barge and if possible by rail, and sufficient locally based container volume. Overall we see that continental terminals are competing with unimodal road transport, with neighbouring continental terminals and with barge transport companies. Besides transshipment, continental terminals are serving the barge transport market and the market of pre- and end-haulage.

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