Coping with port competition in Europe: a state of the art

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Abstract

This paper considers certain aspects of port competition in Europe. There is clearly a trend towards greater control over the logistics chain through strategic alliances, mergers and cartelisation. It is quite noticeable that shipping companies in particular have so far been taking the initiative in this development. One of the crucial questions is how port authorities should adapt their strategic behaviour to this new evolution in port competition.

1 Introduction

In the not so distant past, certain port authorities tended to present their port as a 'main port', both to other ports and to the market as a whole. And within each individual port, there used to be fierce competition between different transhipment companies. Furthermore, the various hinterland transport modes used to aim at maximising their market share.

Presently, there is clearly a new trend to be discerned. The competitive struggle is no longer taking place in separate areas of the transport market, but is increasingly unfolding at the level of logistics chains. All the above-mentioned players (shipping companies, port authorities, transhipment companies, hinterland modes) are regarded as links in that chain. The

player able to contribute to attaining the lowest generalised costs for the transport chain as a whole has the greatest chance of actually being included.

In this paper, we shall take a closer look at certain aspects of port competition in Europe. There is clearly a trend towards greater control over the logistics chain through strategic alliances, mergers or cartelisation. It is quite noticeable that, so far, shipping companies in particular have been taking the initiative in this regard. One of the crucial questions is how port authorities should adapt their strategic behaviour to this new development in port competition.

2 Port throughput: the figures

Any meaningful discussion on port competition requires a certain amount of background information. We shall limit ourselves to some major indicators.

Table 1: Throughput in some major European ports (1000 tons)

YEAR / PORT	1990	1996	Nature of traffic in % share of total (1996)		
			general cargo	dry & liq. bulk	Oil / oil prod.
Hamburg - Le Havre range					
Antwerp	102.009	106.526	49.0	51.0	21.3
Rotterdam	287.692	284.358	25.0	75.0	5.6
Hamburg	61.098	70.919	52.5	47.5	--
Bremen	30.502	31.501	68.3	31.7	7.5
Le Havre	54.019	56.152	24.2	75.8	63.9
Baltic range					
Gdansk	18.283	16.491	11.7	88.3	30.5
Mediterranean					
Genoa	43.633	45.864	27.8	72.2	51.8
Barcelona	18.030	22.851	42.8	57.2	30.4
Marseille	90.323	90.712	12.9	87.1	72.0
Algeciras	24.538	36.836	52.1	47.9	38.1

Source : ISL, Bremen

Table 1 provides an overview of the tonnage handled in the principal ports of each of the three European ranges. The difference between such ports as Rotterdam and Gdansk, for example, is enormous. Growth figures for the period 1990-1997 vary for each of the ports considered. In terms of port competition, the difference in the nature of traffic is striking: a high general cargo share for Antwerp, for example, while Marseille depends for more than 70% upon oil products.

Table 2 provides further information concerning container throughput.

Table 2: Number/TEU of total containers handled

YEAR / PORT	1991	1996
Rotterdam	3.721.351	4.905.459
Hamburg	2.196.223	3.060.192
Antwerp	1.761.422	2.653.909
Bremen	1.276.948	1.531.907
Algeciras	761.795	1.306.825
Le Havre	918.528	1.020.040
La Spezia	464.470	871.100
Genoa	344.353	825.752

Source : ISL, Bremen

Clearly, container transport is a growth market. Within the Hamburg-Le Havre range, container throughput increased fivefold between 1975 and 1996 (e.g. Meersman, Steenssens & Van de Voorde (1997)). It is striking how in some ports (e.g. Rotterdam, Bremen) the general upward trend in throughput in absolute terms coincides with a drop in their market share. However, it is clear that we need additional information concerning, among other things, capacity, capacity utilisation and containerisation rates

3 Port management objectives and competition

Any development in port competition can be linked to changes in terms of port management objectives. These objectives are no longer restricted to stimulating transhipment of goods, increasing the value added, boosting

local employment, and maximising operating profit. Reality, indeed, is more complex and more dynamic than that.

Up until now, these goals have mostly been short term objectives, while in the long run a strategy aiming at cost minimisation or profit maximisation might in fact be preferable. In this context it may be useful to consider a number of key issues (e.g. Suykens & Van de Voorde (1998)).

- The port product may be regarded as a chain of interlinking functions, while the port as a whole is in turn a link in the overall logistics chain. However, within the port itself, the respective significance of the constituting links has clearly changed in the course of time. This is due to, among other things, important technological developments (e.g. the increasing degree of containerisation, the growing dimensions of ships,...) that have improved efficiency.

- The total port-related cost constitutes only a fraction of the total cost associated with the logistics chain. Therefore, one may expect overall demand for port services to be inelastic. But there is fierce competition between goods handlers, ports and even countries. The possibilities for substituting one port for another are so great that elasticity of demand for a specific port may, on the other hand, be quite considerable.

- The derived character of transport has been ignored in recent analyses of the impact of additional investment in throughput capacity. This has resulted in significant surplus capacity or even over-capacity in some ports, among other things because the systematic build-up of surplus capacity was not, or insufficiently, penalised.

- Often a compromise needs to be sought between the priorities of the various players involved. It is clear that the relative strength of the various players changes in the course of time. An interesting example of this are a number of strategic alliances that were established in a relatively short space of time (e.g. Meersman & Van de Voorde(1997)). Two observations can be made in this respect. Firstly, it is clear that a number of market players are trying to get a tighter grip on the overall logistics chain by establishing forms of vertical integration, often supported by horizontal mergers. Secondly,

one notices that the initiative for such action is taken by shipping companies.

One of the crucial questions is to what extent the increasing involvement of the European Union in port issues will affect the impact of national and regional authorities. What will the consequences be for the commercial activities of ports and their mutual commercial relationships? Furthermore, a debate is looming on whether port infrastructure, especially maritime access to ports, should be regarded as a 'public good'.

4 Issue of port competition

The European Commission is taking a keen interest in the sometimes quite fierce competition between seaports, which appears to go hand in hand with mutual accusations of distortion of competition, often through allegedly untransparant public investments and transfers (cf. Green Paper).

Simons (5) (1997) distinguishes four elements which the Commission finds important:

1. with regards to access to the market, i.e. access to the port, positions of power must not be abused, for example, to exclude any third parties;
2. any direct or indirect restrictions on competition between ports, e.g. in the form of railway rates or conferences who concentrate their activities in certain ports, must be prevented;
3. as regards port services, inferior quality must be avoided, and so too must excessively high or discriminatory tariffs for stevedores, harbour pilots or towing services;
4. with regard to state aid, one must distinguish between two types of infrastructure: firstly, there is infrastructure that is available to all port users: no discrimination, and no preferential treatment; in addition, there is infrastructure that is intended for specific types of enterprises, i.e. port superstructure and terminals.

A new dimension has been added to the issue of port competition. It concerns competition not so much between individual ports but between entire logistics chains (e.g. Meersman, Steenssens & Van de Voorde (1997)). A port is either part of (and thus contributor to) a successful logistics chain, or it is not. As such ports have an incentive to continuously try to improve their 'product'.

The increasing importance of logistics chains in the debate on competition also implies that the success of a port is not exclusively dependent upon its own performance, but also upon other factors such as its connections with the hinterland. Inadequate connections may, for example, provide port management with an incentive to reduce port dues or offer financial compensations in an effort to maintain or increase the port's market share. This often leads to insufficient use of already available port capacity or even the creation of additional (idle?) capacity. Sometimes this coincides with extensive service packages being offered to clients, which is only possible if political approval has been obtained and adequate funds are available for investment in over-dimensioned infrastructures, oversized superstructures and large numbers of equipment (e.g. De Monie, 1997, p. 273).

It is clear that the issue of port competition will continue to dominate debates in the future. This is mainly due to three elements (e.g. Suykens & Van de Voorde (1998)): a lack of sound theoretical research; a number of expectations that have either not come true of insufficiently so; certain unexpected problems that threaten to complicate matters.

5 Market players, strategic alliances and instruments

Within the logistics chains, a number of strategic alliances have recently emerged: there are examples of shipping companies taking over stevedores (e.g. CMB and Hessenatie), of joint ventures between stevedores and railway companies in container terminal operations etc. The question is, therefore, to what extent is or may a port authority be a desirable participant in such a logistics chain. Is it in port authorities' interest to encourage certain alliances? Other market players, such as shipping companies, are adjusting to changing circumstances all the time, developing new operational strategies, introducing new technologies, in order to survive in the new global economy. To what extent will this make port authorities more dependent upon other market players?

In order to be able to answer this kind of question one needs to create and efficiently apply a set of tools that can, for example, provide insight into a port's individual cost structure as well as that of the logistics chain as a whole.

To illustrate the type of scientific tool that is required, we refer to recent research concerning the competitiveness of seaports (e.g. Steenssens, Meersman & Van de Voorde, 1997). We shall limit ourselves to

containerised throughput. The two central questions for any port that has sufficient room for growth in container throughput are how to realise this growth and which strategy to adopt with regard to the positioning of the port on the market. This requires insight into the factors that determine the choice of port for specific container traffic. Who is the most important port user? Who decides which port to call at and by which elements is this choice affected?

It is clear that the port users constitute quite a heterogeneous group: shipping agents, consignors, owners, handlers,... Moreover, port activity is a dynamic process, as is apparent from the various strategic alliances. This makes it much more difficult to acquire a genuine insight into why a certain port is chosen, via which companies established in that port the goods flows pass, and by means of which hinterland transport modes and routes.

As we have already mentioned, seaports (and port industries) constitute a link in the logistics chain from origin to destination. One must pay due account to the total cost of that chain and all its cost centres: costs related to shipping (e.g. time factor, possible delays), port related costs (port dues, pilotage,...), cargo handling costs, cargo storage costs, feeder costs. Furthermore, industrial and commercial functions (including storage and distribution of goods) and hinterland transport are important besides throughput.

Minimising the overall cost of the transport chain must be the ultimate goal of port management. Clearly, minimising costs associated with goods-handling and delay of sea ships fits into this general objective. This means that mutual trade-offs between links in the transport chain must be made, e.g. servicing of inland ports result in a higher cost per tonne transported by sea (because of longer distance to port, limited draught,...), but this is compensated for by reduced costs for hinterland transport.

The port that constitutes a link in the cheapest transport chain will, in theory, stand the best chance of actually being called at. Consequently, the following questions are important: Does the port in question offer the same advantages as other ports serving the same hinterland? Does the port offer enough advantages as an additional port of call within an existing regular service or for the setting up of a new service or feeder service? One must realise that, in making a choice, the port user will take explicit account of market factors (e.g. the potential customers, competition from other shipping companies and consignors,...).

What is important for the choice of port is not only who makes this decision, but to what extent the above-mentioned battery of relevant variables is kept under control. Therefore, the question of which variables are most significant to the decision process is crucial. One must, for

instance, take into account that the cost structure is probably affected to a greater extent by exogeneous factors (e.g. scale increases in world trade, or the rapid developments in the field of cargo handling equipment) than by factors related directly to the port.

Up to now, it has often been the case that the reasoning behind container throughput forecasts was rather mechanical in nature. After all, it appears that many so-called "models" are no more than simple trend extrapolations. The assumption behind these models is that trends from the past will also manifest themselves in the future. However, as a result of this approach one still lacks an instrument for analysis which is able to deal with effects due to changes to relevant factors. Reality is far more complex than suggested by any of the models used so far, which usually do not allow elaborate testing of strategic decisions.

If one introduces the notion of the 'logistics chain', one needs to make a distinction between 'sailing areas' (e.g. North Atlantic etc.) on the basis of origin-destination matrices. Indeed, economic developments in each of these areas may vary, which in turn may have an effect on the types of vessels that are in operation, the type of cranes used, the time factor etc. There is a second indicator that points towards possible volatility, i.e. the varying degrees of containerisation of ports, which profoundly affects ports' growth potential for container traffic on top of growth linked to economic development. Furthermore, there is the issue of port competition and the struggle for market share. This competition may be affected by multifarious variables.

Therefore we propose a methodology that tries to take into account the above-mentioned considerations by incorporating as many decision variables and market players as possible. Our approach is based upon a combination of disaggregated demand models on the one hand and a number of cost models on the other. It is our intention to arrive at a sequence of sub-models that encompasses the entire logistics chain, while also making a distinction between, among other things, sailing areas, ship size, crane type, hinterland transport mode, etc. In this manner, due account can also be given to the strategic behaviour of the market players. A further advantage of this modular make-up is that, for each of the constituting elements, one can make use of the output of models developed elsewhere.

Ultimately, two main groups of models may be distinguished in the initial phase. Firstly, there are those relating to the (spatially disaggregated) economic activities, which form the basis for the (derived) demand for transport. A second group encompasses models relating to the generalised costs, incorporating the make-up of the logistics chain per sailing area, and the specification/estimation of a number of sub-models per type of activity

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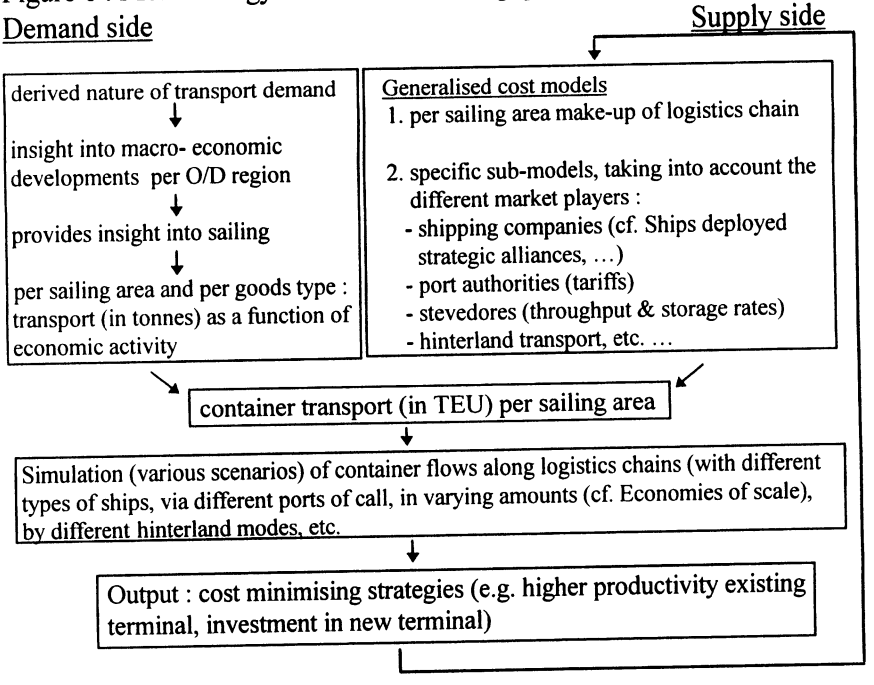
(shipping companies, ports, stevedores, hinterland,...). With regard to hinterland transport, one will need to work with modal split models.

Figure 1 : Methodology for container throughput demand forecasts



The combination of the (partial) output of the two groups should allow one to work out different scenarios for container flows along logistics chains in which ports perform a pivotal function. In the subsequent phase, the output of these simulations will serve as the input for developing cost minimising strategies.

It is clear that this methodological framework must enable one to forecast the impact of a new container terminal in a port, with a given capacity and cost structure, as well as its impact on capacity use at other terminals. In addition, however, it must take account of any interaction between changing strategic behaviour on the part of the other market players.

6 Conclusion

The nature of competition between seaports has changed completely. It has gone far beyond competition between port ranges, port clusters, ports or stevedores. The force of attraction of a port must be seen as a link in the

logistics chain. It is to a port's benefit to be part of a 'favourable' chain, otherwise extra (compensatory) efforts to attract goods flows will be necessary.

Both from a scientific and a policy point of view, the positioning of a port requires insight into the complexity and interaction between the links in the transport chain. Extrapolation of trends clearly ignores the dynamics which are so typical of the transport industry. Therefore we have established in this paper a theoretical framework that is broad enough to incorporate all relevant factors, and that, in addition, can quantify the issue in order to allow the development of scenarios and strategies on the one hand and empirical testing on the other.

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