

## **Strategic positioning – instrument of port system competitiveness analysis**

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### **Abstract**

The effects of distance and location of the port regarding the place in the hinterland cause different space and economic relationships between the port and the hinterland. The issue of absolute level of transport costs is included in this interdependence without interest. Decisive for the situation of ports is the height of additional transportation costs (caused by the difference between the optimal and the minimal transport distances) which are compared or opposed to cargo handling costs at ports. The range of additional transportation costs is exclusively dependent on the minimal and optimal distances, which can be influenced either by getting the companies nearer to the port or by shortening the optimal distances.

The mechanism of factors that act on the location of seaports, acts in the same way also on the ports. Only the problem of congestion of cargo flows shows certain deviations, i.e. in ports a significant role lies in the competitiveness of land transport.

Past research of the hinterland of a port system have mainly referred to the research of the geo-traffic position of the port. Therefore, the authors wish to contribute with this work to defining and studying the competitiveness of the port system, i.e. strategic positioning as an instrument in the competition analysis, defining the relation between competitiveness and competition of a port system.

## **1 Introduction**

The majority of European seaports are included in strong competition battle, not only for the tonnage, but also for the ship lines, investments into infrastructure and industry, and future flows of goods.

The main problem in any managerial decision of the ports is the demand for the turnover capacity. This requires insight into the variables that determine the competition position of the port. The answers to the following three questions give insight into the nature of the port competitiveness:

- Which factors determine the port selection?
- Why and how do users select a certain port, port services located within the port, and/or a certain domestic transport method and routes?
- What legal aspects influence the competitiveness of a port?

Before analysing the phenomenon of competition and competitiveness of ports, first the term of inequality needs to be defined, which marks the seaports. The following definition may be adopted – seaport is a logistic and industrial centre which has an active role in the global transport system and this is characterised by slow and functional agglomeration of activities that are directly or indirectly included in the logistic chain.

Based on this definition different levels of port competition may be distinguished as follows:

- competitiveness at one port (e.g. competitiveness within the port),
- competitiveness between ventures for different ports (e.g. competition within the port at operative level),
- competitiveness between port authorisations (e.g. competitiveness at state level).

## **2 Competition and port competitiveness**

Ports are considered today as links in the complex logistic chain. Ports that contribute to the lowest cost within the chain are most often well known. The fact that the understanding of integral logistic chain is becoming more and more important, implies that the success of the port does not depend any more exclusively on its performance on the market, but is rather determined by other aspects as well, such as the network connection of the port with the external and internal environment. These new circumstances require dynamic and proactive management and port policy.

Before analysing the phenomenon of port competition and competitiveness, first the inequalities in port characteristics need to be distinguished. The following definition may be adopted – the port is a logistic and industrial centre which plays an active role in the global traffic system marked by functionally defined activities that are directly or indirectly included in the transport of cargo and information.

Competition requires competitiveness, which means that in the conditions in which competition exists on the market one has to be competitive. In case of port

competitiveness, an important question is who (which port) is competitive towards whom (which port).

Figure 1 shows the relation of terms of competition and competitiveness of ports, which are linked by the requirements for improvement, strengthening and stimulation of strengthening and improvement of quality of the port service and the position on the market.

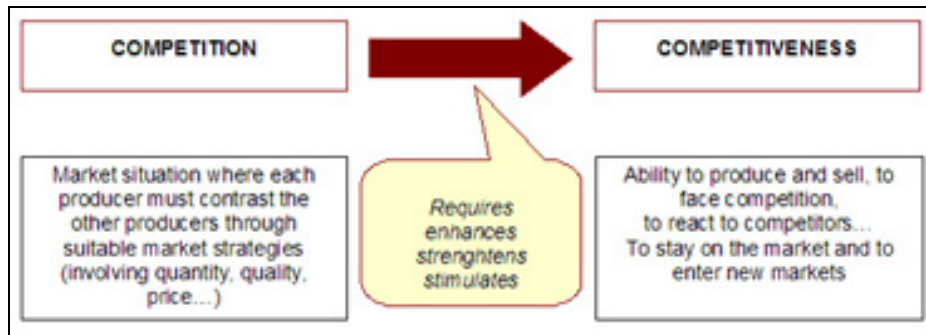


Figure 1. Relation of competition and competitiveness of ports

Source: E. Musso: Ports: competition and competitiveness, Course in Advanced Port Economics, Antwerp, 2005.

Competition and competitiveness understand the research of:

- **port economies:**
  - changes in economy,
  - changes in transport industry,
  - demand of port services and demand consequences,
  - supply of port services and consequences of supply,
  - structure of port industry market: new threats and opportunities.
- **port selection criteria:**
  - position with respect to the hinterland,
  - characteristics of geotrafic position,
  - frequency of bottlenecks in the port.
- **characteristics of competitiveness:**
  - is there an optimal size of ports and terminals?
  - vertical integration: specialised port terminals,
  - horizontal integration: linking,
  - level of computerisation / robotisation of the port.
- **micro and macro economic influence of changes on the market**
- **roles of ports and port politics.**

The decision-making process in the selection of a certain port by the port user is not based only on the integration of the production or transportation chain, but has to take into consideration various market factors. Therefore, scientific methods are

necessary for correct evaluation of the policy of measures and external influences on the port activity, i.e. study of the complex model of port competitiveness.

An extremely important segment of port competitiveness is related to the state and its influence on (“interference with”) the port competitiveness expressed through the level of intervention of the state in the chain of port activities. From the national aspect, there are different levels of interconnected port operations. The shipping agencies, forwarders and traders or port operators have to keep close connections in order to optimise the goods flows and the port capacity. Empirical research have shown that their position varies in dependence with the activities or position of the company within the port, regarding the role of the state and the government investments programme, and the port operators and big ship companies are especially worried because of the government interference.

### **3 Analysis of strategic positioning**

The structure of water traffic, especially the port system can be analysed in different ways. The often applied method is the **analysis of strategic positioning** which enables comparison of constitutive components of the port traffic and the comparison of single port with other ports in the competitive environment. The main drawback of the analysis is the neglecting of the level at which a certain traffic category expressed by the type of cargo participates in the creation of added value of the port service. The main advantage of the analysis is the universal methodology for objective determination of the competitive position of the port in relation to the competitors. Significant additional advantage of the analysis is that it is completely based on the realised throughput of traffic in the ports, and not on the difficult-to-realise financial and confidential marketing data. The result of analysis is influenced by determining which port has to be included in the analysis and the selection of the traffic throughput and the respective period of study.

The analysis of strategic positioning includes three interconnected methods of analysis for determining the competitive position of the port in relation to the competitive ports, which are: [5]

1. analysis of port service portfolios,
2. analysis of share, and
3. analysis of diversification.

By means of combination (of results) of these three analyses, a relevant conclusion may be made based on the performances and potentials of the ports in the competitive environment.

### **3.1 Analysis of service portfolio**

Analysis of services portfolio is the method originally designed in 1968 by the Boston Consulting Group (BCG) for the purpose of strategic planning. The method enables interpretation of business results and business units using only two variables: market share–profit and relative growth, its basic characteristic in the context of port competitiveness is to enable positioning and determining the potentials of a certain port in order to improve its market share and growth percentage. The analysis of port service portfolio checks the connection between the growth in the relative market share of ports in a certain competitive environment and observed growth of traffic during a certain period. These factors are connected with relative port potential. By using these methods, the port authorities and port service users obtain relevant insight into the competitive position of the port.

The selection of the analysis of the service portfolio and usage of the growth of the market share as optimal method of competitive port positioning is motivated by the following considerations: [5]

- the instrument includes visual technique where all the necessary data are easy to collect,
- universal method which ensures credibility (which from the aspect of management may be significant in relation to the estimate of the infrastructure required at the port)
- method can be taken into consideration as an efficient evaluation tools in developing a long-term strategic plan, when applied in the selection and evaluation of objectivity and alternatives.

### **3.2 Share analysis**

Another tool is the analysis of the share which means the analysis of the structure and the share on the market of particular ports in the context of international port competition. The method allows determination of the extent to which the desired specific cargo or specialisation in the growth or dropping of traffic influences the port performances. Although the analysis of share does not allow momentary explanation of the changes in the circumstances in competitive environment of ports, it allows characterisation of the growth or fall of variables, i.e. traffic volume, in three effects:

1. effect of share,
2. effect of services,
3. competition effect.

It may be generally said that negative results for any effect are the indication of unfavourable position, whereas positive results are the indication of favourable position. The result of the analysis of share can have decisive influence on the selection of the port, basic year of study and the period of study.

The effect of share indicates the hypothetical growth of a certain type of traffic at a particular port, assuming that the market share remains constant. As such it describes the changes in the traffic volume assuming that the transport of all the types of cargo (increase, decrease) develop in the same direction like the average traffic development. The difference between the actually observed growth and the calculated growth is reflected on the growth or decrease of the market share, and is represented by variable effect. The variable effect can be further divided into the effect of services and the competition effect. The effect of services indicates the level of specialisation of the port in the traffic category it performs most successfully. Consequently, this effect takes into consideration the influence of diversity of conditions of the traffic structure in every port. Positive effect of services is indicative for the ports specialised for the fastest growing traffic categories, i.e. leads to the conclusion that the port has developed favourable traffic structure. The negative effect of services indicates that the traffic structure is unfavourable. Although the calculation of the effect of services assumes that all the traffic categories realise their individual market shares, the variability towards the fastest growing traffic category will lead to the crucial market share in the overall port traffic: overall market share changes as the result of a different growth level of different traffic categories. Whereas the port has individual (favourable and unfavourable) traffic structure, the competition effect is reflected in the efforts toward larger market share in the traffic category which realises the highest growth percentage. The competition effect is reflected in the strengthening or weakening of the overall market share of the port due to the growth or decrease in the share in different traffic categories.

### **3.3 Diversification analysis**

The third and final component of strategic positioning analysis is the analysis of diversification which studies the diversity of port traffic over a certain period of study. The traffic diversity index determines the relative importance of different traffic categories in the overall port traffic and estimates the traffic structure.

Until now the Hirshman-Herfindahl index was used to determine the level of diversity in the ports and consequently the relative importance of different traffic categories in the total port traffic structure. The index shows the level of concentration between different traffic categories in the port. If the index is 1, it means that the total traffic structure of a port is dominated by one traffic category. The equal part of the traffic volume of the considered traffic categories will result in index  $1/n$  where  $n$  is the number of traffic categories. The consequently high index of diversity indicates high level of disproportion (which may be indicative for the existence of a specialised market), whereas lower diversity index value indicates proportional distribution of traffic categories. The lowest possible index  $1/n$  indicates that there is perfect proportionality in the port traffic structure.

#### **4 Evaluation of competitiveness**

As already conceptually shown, port competition develops at different levels [8]. For instance, there is competition between private companies of a port that are included in similar activities, e.g. port operators (operators at specialised terminal) that tend towards maximal possible growth in the volume of handled cargo or directly connected realised profit. The difference between competition at operative level and at state level is the consequence of different means that had been used, first, by the private companies and, second, by public institutions. Private companies tend towards maximal turnover or profit and minimal costs, whereas the purpose of public companies is to realise the basic functions of the port system, better integration into the traffic system, better connection with road and railway traffic – all of which may be indicated with the term – public benefit. The mission of public benefit of seaports has been recognised at the European Union level (legal conclusions), therefore the European Commission has intensified further deregulation and prohibition of any misuse of dominant position.

Vertical and horizontal integration in the port system influences the throughput of cargo in the port, with vertical integration ensuring higher level of safety, shortening of the activities, faster ship turnover, and horizontal integration i.e. specialization of particular ports into specialised port terminals facilitates work for the concessionaires and operators and cooperation with other operators by merging port concessions in order to ensure sufficient capacities for receiving and handling cargo.

The result of vertical and horizontal integration of port activities is the increase in port competitiveness (Figure 2.).

The evaluation of port system competitiveness based on the strategic positioning represents a complex process that requires a systems approach. The analysis of services portfolio directly determines the port service parameters and induces the definition of the concept of port service quality. The basic factor of port service quality is the customer satisfaction i.e. satisfaction of all the stakeholders. The level of port users' satisfaction is especially important.

The defined port system services represent a portfolio; the so defined set has a large potential in planning the future development of the port system and planning of realisation of competitiveness. The analysis of share provides a significant level of conceptual aspect by explaining changes that occur in relation to the competition position during the period of observation/study. Although this method of analysis does not allow immediate performance of optimal competitive strategy, in combination with the analysis of services portfolio it represents an instrument that ensures information on changes in the competitive potential of the port – competitive power of the port as well as any traffic growth or decrease that can occur. The diversification analysis that studies the diversity of port traffic over a certain period of observation directly influences the level of port system competitiveness, i.e. way of catching up with the competition.

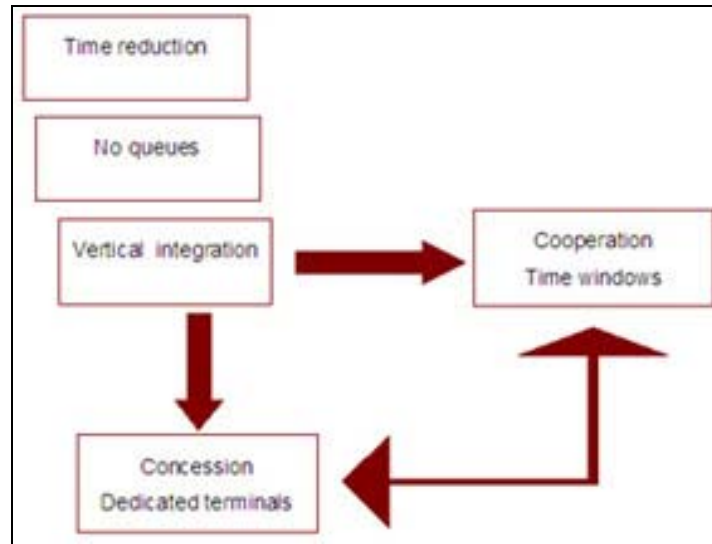


Figure 2. Vertical and horizontal integration of port activities

The methodology of evaluating the competitiveness of the port system as the traffic system subsystem can serve as methodology of evaluating the competitiveness and other traffic system subsystems, since they have common characteristics of stochastic and dynamic system and in their vertical and horizontal integrity they combine technical means according to organizational structure and functional dependences.

The basic strategic objectives of the Croatian port system development regarding contents rely on the objectives of the economic and transport development of Croatia, since these cannot possibly be considered in isolation from the existing and possible economic and transport development orientations. Thus, in Pre-accession the Croatian maritime strategy [9] the following has been listed as the basic strategic objectives of the port system development:

- development of actual technology of transport and information unification of all the traffic participants;
- completion of the transition and privatisation process, and the process of granting concessions in ports, in order to attract foreign capital necessary to allow longer terms of concession contracts;
- modernization of technologically obsolete capacities by attracting foreign capital, and enabling the port terminals, first of all by various concession contracts for a more competitive performance on the market of maritime services;
- establishment of coordinated approach of all the participants in the realisation of the traffic service on the traffic routes with the aim of improving the service quality and achieving competitive price on the transport market;



- determining the priority investments in the traffic infrastructure and improvement of the traffic connection of the ports with the hinterland;
- stimulate introduction of advanced technologies of transport and information technologies of unifying all the port system participants;
- stimulate and develop the feeder service between the Croatian and the Mediterranean ports, and establishing ship line connections between the Croatian and Mediterranean ports.

## 5 Conclusion

When speaking of the parameters of port and corridors competitiveness, important changes have to be kept in mind, which initiated the changes in the port industry and caused a number of consequences that are reflected on the port system, traffic system and economy system of a country.

These changes include:

- **changes in port operations:**
  - have become capitally very intensive,
  - informatisation and robotisation decrease the need for labour,
  - have become operatively complex with the requirements for a larger execution space.
- **changes on the port market:**
  - greater competition among ports,
  - decrease of port tariffs (direct connection with competitiveness),
  - shortening of ship turnover time,
  - risk due to overcapacity of ports,
  - increased flexibility of port services.
- **changes in port economy:**
  - relocation of industries which had been port-oriented before,
  - the concept of intermodality.

The consequences of the mentioned changes are the following:

- reduction in the transport costs, increase in demand,
- increased requirements for space and increase in external costs, as results of containerisation, overcapacity of port caused by port competition, substantial increase in cargo throughput through the port [7]
- positive effect of port expands from the level of local economy to the level of national global economy, directly including the crucial impact on the hinterland.

Based on the results obtained in this preliminary research, it is recommended to carry out an analysis of the competitiveness of the Croatian ports using the method of strategic positioning analysis. In further research good results are expected that will serve as the guidelines of the future development.

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## **Strateško pozicioniranje - instrument analize konkurentnosti lučkog sustava**

### **Sažetak**

Djelovanje efekata udaljenosti i položaja luke u odnosu na mjesto u zaleđu izazivaju različite prostorno-privredne odnose između luke i zaleđa. Pitanje apsolutne visine transportnih troškova u toj je međuzavisnosti bez interesa. Odlučujuće za situaciju luka je visina dodatnih transportnih troškova (nastalih uslijed razlike optimalnih i minimalnih transportnih udaljenosti) koji se uspoređuju ili suprotstavljaju prekrajnim troškovima nastalim u luci. Raspon dodatnih transportnih troškova isključivo je zavisan od minimalnih i optimalnih udaljenosti, na koji se može djelovati ili privlačenjem poduzeća u blizini luke ili skraćanjem optimalnih udaljenosti.

Mehanizam faktora koji djeluje na lokaciju morskih luka djeluje na isti način i na pristaništa. Jedino problem zgušnjavanja robnih tokova pokazuje stanovita odstupanja, tj. kod pristaništa značajnu ulogu ima i konkurencija kopnenog transporta.

Dosadašnja istraživanja zaleđa lučkog sustava uglavnom su se odnosila na istraživanje geoprometnog položaja luke i veličine gravitacijskog područja. Stoga, autori ovim radom žele doprinijeti definiranju i istraživanju konkurentnosti lučkog sustava odnosno strateškom pozicioniranju kao instrumentu analize konkurentnosti, definirajući odnos konkurentnosti i konkurencije lučkog sustava.