RESEARCH ARTICLE

THE IMPORTANCE OF FINANCIAL DIMENSIONS OF SEA PORTS

*Dr. Salem Alhrbi

King Abdul-Aziz University, Maritime Studies Faculty

ABSTRACT

The pricing of marine port infrastructure services is one of the most important aspects that occupy the mind of port administrations and port authorities and is one of the most controversial aspects of the global economy Discussions are currently focused on the extent to which mergers and homogeneity are created between the economic impacts of development and investment in infrastructure, cost recovery mechanisms and rules in developed countries and economic zones. In general and periodically, the mechanisms of public investment must be reviewed and the role assigned to them, Infrastructure services, especially in the area of seaports and the huge expenditures required to meet the requirements of the huge technological development of both port equipment and the technological development of ships on these ports, The present paper is based on the development of mechanisms on how to adopt the marginal cost of marine port infrastructure as a basis and reliable pricing rules to achieve the concept of marginal cost recovery and is introduced as a criterion for fair competition among private and single-seaport ports as a principle of competition in the quality of port services By means of its large infrastructure, as well as to ensure a greater range of transparency of the accounting systems in the operation of ports. It is therefore possible to rely on statistics from those ports and to maintain competition in port infrastructure investments .

INTRODUCTION

With the steady increase in maritime transport, ports have to develop from financial mechanisms, accounting standards and indicators in the field of performance measurement, which is the case for many other activities and industries where the fees of services and port infrastructure play an important role in the continuity and growth of the port or deterioration of results and exit from activity Appropriate prices that are developed on a variety of bases, to be included in the paper, can lead the port to prosperity and growth. Or lead to more government subsidies and thus inefficiency. High prices for port services could contribute to aversion to shipping lines, to the nearest competing ports in the region, as well as to the owners of goods, thereby reducing demand for port services , resources and its infrastructure will not be fully performed. In addition to the port style, which enjoys a balanced level of monopoly towards customers. The demand for port services in this case does not decrease significantly, but the fear will be due to the negative effects on the trade itself, which is supposed to serve the port and its output. On the other hand, low-cost ports may attract more customers to the port, but in this case may cause overcrowding. Long-term investment costs perhaps not be recovered. Competitors to the port may be lead to the pretext of unfair competition; in particular when low prices is the

result of support. In competitive industries and activities, the product may have no impact on the price that it sets for its products or services; it adjusts its costs to the externally priced price or it may disappear from competition (Coto-Millan, 1998). However, the port operates in the oligopolistic industry where pricing refers to "strategic pricing", that is, the ability of the producer to influence or set prices in order to achieve certain objectives. These include maximizing profits; maximizing productivity; generating employment and economic activity; regional development; reducing ship time in the port; in addition support the trade. However, there is a close combined between the port's pricing strategy and port financial , as well as the port ownership model, where the publicly and privately owned port must also be allowed to compete for the price with a privately owned port, An attempt to recover their investments, especially if those ports operate within the same geographically interdependent geographical area and the strategic pricing effects of the different ports have the same consumers or taxpayers. Which is unavoidable from it, such as container terminals, time is clearly declared and is funded by the ports and to be the main objective is to cover the full costs of the service performed by the port and the ports operate to recover infrastructure costs, depending on the economic pricing of the service rather than commercial pricing (Haralambides,, 2002a).

The concept of producing the port service: The economic concept of the port is to be established in a coastal area far from the sea currents and the cliff is closer to the transport networks and the main roads and not only a sea outlet," but includes the concept of navigation safety and includes large industrial complexes that host hundreds of companies, roads and railways and distribution centres and industrial activities and manufacturing industries and many refineries And refining centres. Regardless of the concepts of construction and how to develop and organize, the main task of the port is to enable the transport of goods from sea to shore and vice versa, in the hope that it will be done in a safe and cost-effective manner. The port is an interface between sea and land. A chain of transport chains is an important area where the destination of the goods and the mode of transport changes. Cargo handling is therefore a major work of the port. "So that to do this, the port must re organize a wide range of other services, all of which are equally important to facilitate the transport of goods (De Silva, 1991b)." they must provide sea channels and deep-water basins to enable ships to manoeuvre and provide navigational aids, And facilities, pavements, storage yards, warehouses, power supplies and fuel stations that allow ships to perform their duties as a maritime carrier at a standard time in anticipation of costs.
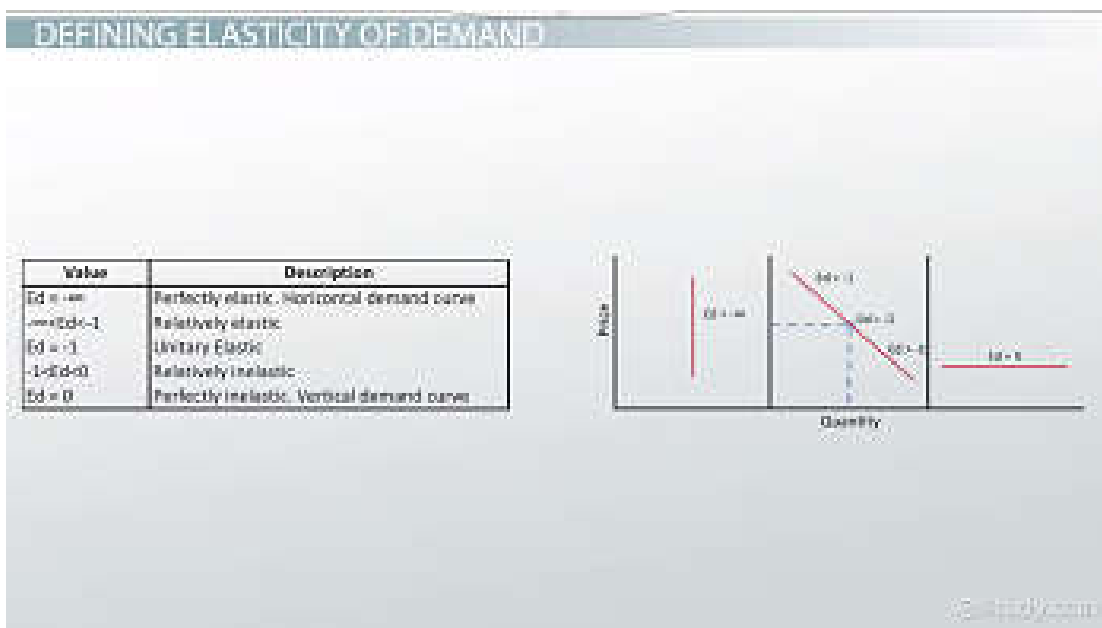
Land: Land is the most important thing that must be supplied to the port to perform the serious tasks that must be performed by the port. The port is a dense land industry. The land and its value are the main issues facing the port when pricing its services, since the land value of money and often-high value must be relied upon. And taking into account the cost of the alternative opportunity for the land itself and whether the value of land is taken when assigning the work of the port operators of stations and yards, storage and internal transport operators and dockers and what conditions must be included within the contract of operation between port authorities and subcontractors. In many of the world's seaports, land, particular land near the sea, is a rare commodity with a great opportunity. Cities can be used as residential spaces, administrative offices or universities, and since marine industries must be located close to the sea and beach places, the alternative to harbour land is the tourism and leisure industries as a privileged location while nature lovers tend to preserve it with its environmental system at all costs.

Port management is often in most types of port ownership, whether in the government model, private model or even the mixed model, which undertakes port operations to separate operators, and port authorities try to find a consensual mechanism among the interests of all port services. The value of the investments in terms of the value of the land itself and the value of the infrastructure that is built on them and make them ready to provide port services efficiently and in accordance with international standards in force in this area and the investments borne by the operations of land preparation and drilling moreover the establishment of contraindications. And the formation of berths to accommodate various types of ships and various types of submersibles of these ships, as well as innovations in the solution of congestion problems and accelerate the handling processes in accordance with the conditions of safety in operation and taking into account the environmental dimensions set forth in the international treaties and the land must be paved and paved and reinforced, and networks of roads and railways And the expansion of the port, a few hundred meters from the pier,

requires huge investments, and another important aspect is the way in which these investments are financed, in general or in particular, Ownership of any port, which is the most influential in the pricing method of port services. It is clear that the public-owned port infrastructure does not have to recover - through service prices - investment costs, and the competitiveness of the private port must restore investment costs."In terms of ports, the movement of goods in the past and according to the technology of the industry at the time was less containerized. The regional sea ports were less important than the present time and ports were characterized as labor intensive, resulting in great value added through direct and indirect activities." Therefore, have a positive impact on the national economy, including of course facilitating the international trade movement. They were therefore regarded by Governments as a growth driver for local and regional development and were often used as tools for regional planning. Governments around the world have been interested in developing the role of ports by injecting public investment through them to promote national development.

The cost of investment was therefore not to be recovered, and ports operated somewhat free of competitive forces, each serving its own region, due to trade barriers, national borders and insufficient infrastructure for road transport. Regardless of the level of inefficiency of the port, where it was inevitable that the ships go to these ports in spite of the poor condition of those ports and the distinction of irregularity and bureaucracy and the consequences of those negatives of increasing costs for ship-owners. At present, trade liberalization, which has led to significant and notable developments in transport, logistics and communication technologies, has led to a lack of linkages and linkages between manufacturing and production factor sites and has led to a significant shift and flow of manufacturing activities towards countries with comparative advantage. Developments in international transport have been instrumental in the formation of such operations, resulting in the transport of containers, integrated multimodal transport and major developments in the trading system, particularly in value-added goods, where they have relied on the processes of selection and control of "production, transport and communications". Plus the distribution chain. "Furthermore, the efficiency of the transportation of value-added goods should be increasingly developed during times of rapid transit from origin to the final destination in order to increase turnover and reduce storage costs, thereby achieving higher operating savings and achieving positive capital investment." Thus, the cost of inventory through the use of logistics concepts and methods and also by increasing the reliability and accuracy of international transport that allow manufacturing industries adopt flexible production technologies in a timely manner and custom-made manufacturing.

Elasticity levels in ports: Trade liberalisation, land infrastructure development, and new logistical concepts in the organisation of international transport of containers have had an equally profound effect on the port industry." Port hinterlands have ceased to be captive and have extended beyond national boundaries. Governments are increasingly realising that, from mere interface points between land and sea, ports have become the most dynamic link in international transport networks and, as a result, inefficient ports can easily wither gains from trade liberalisation and export performance." Convinced about this, governments have often taken drastic steps to improve the performance of their ports: new capacity and labour-saving cargo-handling equipment have replaced outdated facilities;

The Ed values differ Depending on the difference of the demand category

port workers training intensified; customs procedures simplified; information technology widely adopted; and management structures commercialised. In addition, the port industry is moving remarkably towards an industry in which public funds are often used to provide shared user facilities to a place where public and private capital is used to provide stations designed solely to serve logistical needs or designed for a specific range of users or Few or even one company (custom container terminals). At the same time, the limitations of economies of scale in liner shipping and the modernity and density of modern containers have affected the communication ports and have become a few transhipment ports or few loading centres. These very important ports (such as Rotterdam, Hong Kong and Singapore) have become the focus of international trade and goods are transported by road (roads, railways) and water (barge) from inland centres and feeding outlets to these world centres. The resulting system of access has made the passage of transboundary business more expensive.

Table 1. Price elasticities in selected container ports

Port	Elasticity
Hamburg	3.1
Bremen Ports	4.4
Rotterdam	1.5
Antwerp	4.1
Le Havre	1.1

Source: ATENCO

However, the "mobility" of the transhipment container, along with the transboundary land transport networks and the extended inland areas, has greatly increased the competition between container ports. Currently, there is little difference if a Hong Kong container bound for Paris passes through the port of Rotterdam or Antwerp or Hamburg because this container has little "loyalty" to any given port and switches between ports relatively easily. Thus, the elasticity of demand for container handling services is high. Demand elasticity of demand for port services is an economic component that contributes to price policy for port services and products. Demand elasticity (ED), also referred to as demand elasticity, is defined as the extent to which demand for port services responds to changes in the price of a given commodity.

It can play a vital role, for example, in the case of an increase in the price of the equivalent container in the container terminal, whether for loading or unloading, the standard and degree of flexibility for this service shall be guided. More precisely, it is the change in the percentage of quantity required for price change by 1 percent, keeping everything else constant (with other factors constant). "The demand for goods can be classified either flexible or inflexible or flexible to infinitely inflexible on the basis of elasticity of demand. This table shows the elasticity of the demand that corresponds to the different categories." The graph above shows the curves of the demand and the places along the demand curve that corresponds to the table. Where elasticity of demand changes as the demand curve moves along. This is an important concept to deal with demand elasticity with the status of good changes while evaluating them at different price points. Simply in the case of the container terminal, the different conditions of the elasticity of the demand and the scenarios of their evaluation at different price levels and assumed assumptions are shown for illustration purposes only. To determine whether demand is flexible at a given price, management and decision makers should evaluate these scenarios in the following ways. The demand elasticity formula can be formulated in two different ways depending on what is available to you at that time. To calculate the elasticity of the demand in both cases, you will need to curve the request for a good product. This can be in the form of graphs or equation. "Essentially, when determining the elasticity of the demand, you are trying to determine the curve of the demand curve at a certain point on the curve." The first method is called elasticity of demand:

The elasticity of demand formula is:

$$E_d = (P_1 + P_2)/(Q_{d1} + Q_{d2}) * \text{change in } Q_d/\text{change in } P,$$

where:

- P_1 is the original price point; P_2 is the new price point,
- Q_{d1} is the quantity demanded at the original price point
- Q_{d2} is the quantity demanded at the new price point

- Change in Q d is the change in quantity demanded: Q d2 Q d1
- Change in P is the change in price: P2 - P1
- The price-point elasticity of demand formula is:
- Ed = P/Q d * dQ/Dp, where:
- P is the price at which you are evaluating the elasticity of demand
- Q d is the quantity demanded at the point you are evaluating elasticity of demand
- dQ/dP is the first derivative of quantity demanded with respect to price

When calculating the elasticity of demand for all goods with a downward sloping demand curve, you should get a negative value. Remember this as a good reality check on your work. However, in some reports and texts, people will leave off the negative sign when reporting elasticity of demand because it is usually negative (Haralambides, 2002a). Follow these steps to determine the elasticity of demand via arc elasticity:

Determine an original and new price point - for this example: P 1 and P 2.

Evaluate the quantity demanded using the demand curve at points: P 1 and P 2; Q d1 and Q d2, respectively.

"Use this formula above and plug in the values for P 1 and P 2; Q d1 and Q d2.

Reality check and interpret your results - you should get a negative value assuming the good is a downward sloping line." So, assume this is the demand curve for lattes and you have to determine the elasticity of demand if prices increased from $4 per latte to $5 per latte. Since you do not have the exact formula, you have to use the arc elasticity of demand method. Following the four steps we just covered, you would get: As such, the decisions of both the port and development and pricing loans can have significant implications for regional ports at the national and international levels - at the global level, where this often creates strong trends for "market driven" investments and requires a more coordinated approach to infrastructure financing For ports as well as the emergence of a pricing policy dilemma that should allow full cost recovery.

"These are the most complex and often political issues and, as a result, did not allow for significant progress in port policy formulation in economically interconnected areas, which port officials did not question as they did not question the importance of "market-driven" investments and cost recovery rates." However, there was an implicit assumption of the seriousness of the recognition that cost recovery pricing would reflect previous (general) investment costs. In the past, investments were not always market driven. In the past, huge amounts of public funds have been pumped into port development, enabling many ports to establish such a strong market position, making it easier for them now to go to market-driven investments. This should be taken into consideration and not an argument Market-Driven Investments the policy of "limiting pricing" for existing ports hampers the entry of smaller ports and the same range of activity in markets that also aspire to develop their rapidly growing and self-sustaining regions.

The pricing of port infrastructure: The pricing strategy for port infrastructure can be followed by following several

objectives. The pricing orientation can take various forms such as marginal cost pricing (MCP), average cost of cost (ACP), and taking into account tariffs in all price directions, The methods of pricing, or even a combination of them, have become more pronounced between competing ports and among those who have financed them. Prices have to be cost-related; in the long run, cost recovery should be allowed, including costs of developing brown Infrastructure. There are cases of ports facing less competition or simple competition as they serve local industries and are important centres for regional development. Often, the port is the only major economic activity in the region." Such terminal ports can be considered a "public investment" without the need to recover infrastructure development costs. In this case, the public sector should include both cost-benefit analysis and social benefits, comparative advantages from the effects of regional development versus the costs and alternative uses of public resources required for the development and maintenance of the port. If the latter is exceeded, prices can be set without costs to promote regional development. The deficit can then be seen as the "cost of regional development".

First, this will result in poor allocation of resources and intensive competition among ports, together with labor-saving automated cargo handling systems, will reduce the domestic economic impacts of port investments and the added value of port activities. In such a case, the beneficial effects of low port prices would not be local but would be dispensed between the country concerned and the foreign consignee / consignee. This issue is of great concern to governments that are considering the continuation of their public investment programs, because they deny them the basic purpose of the establishment of these ports, as the port provides a public service for the benefit of the whole nation. Such fears have become remarkably "noisy" at the moment when governments have to reduce their size, cut spending and taxes and allow more private sector involvement in some "strategic" sectors that until recently have been seen as a government privilege. "Secondly, in economically interconnected areas such as the European Union, for example, such pricing may lead to complaints of unfair competition. Competition law in principle can be applied, especially since the deficit must be covered by public funds, Governmental organizations." However, the costs associated with costs and full cost recovery are easier said than done. The port is a multi-product company, and many of its services are often bundled at port charges. Common support is also common. For example, in order to attract trans-shipment cargo, the port may provide mutual support for feeding operations through main line shipments. Thus, the problem of common cost in economics is also present here, together with the difficulty, if not deficit, of allocating these costs to the various services of the port. "The difficulty of this problem is often compounded by the inability to accurately measure port costs, particularly marginal costs. And also because of the lack of reliable and comparable statistics in the port, where port accounting systems diverge and the financial flows between the port and its institutional owner (government or state) may not be known or transparent." However, many of the difficulties listed above, and often be overpriced." The following is an attempt to demonstrate how the consistent implementation of marginal cost pricing (MCP) in ports can eventually eliminate the deficit and the need for public funding, resulting in an efficient allocation of scarce or scarce resources and an equal level of competing ports." As a result of large surplus capacity, container ports are those that are low-cost or economically

viable. "They are industries with increasingly high returns (shipping shipments are another good example of such an industry familiar to marine economists). In these industries, short-term marginal cost pricing (SRMC) leads to a deficit, because marginal costs are always lower than the overall average cost. Excess capacity in competing container ports has a number of reasons. In fact, as Haralambides *et al.* (Haralambides, 2002a)., 2002a has shown, the higher the competition, the greater the need for excess capacity." First, as mentioned earlier, ports are often seen as axes of regional development, and therefore, infrastructure is built far more than demand to promote economic development. Secondly, the strengthening of administrative control may not often be innocent of its responsibilities to create excess capacity. However, the real causes of excess capacity should be found in the inadequacy of capital (investment conglomerate), economies of scale in port construction, and expectations of excessive demand for optimism. Moreover, in competing container ports, excess capacity is also considered an "operational necessity" as the only way to provide fast delivery times for ships, thereby maintaining or increasing current shares and can be easily demonstrated by the one-channel multi-channel theory .which assumes that once an outlet has a 70% utilization capacity, congestion arises in terms of unacceptable waiting periods for the most regulated shipping organization at the moment. "With this in mind, excess "operational" capacity should be viewed as an unavoidable cost rather than a reference to the use of inefficiency and waste of resources. However, port managers were not very convincing in clarifying this point, and as a result, governments were reluctant to see excess capacity through this concept (Haralambides, 2002a)." The problem of "operational" excess capacity is compounded by the larger number of containers.

In general, the cost of each TEU from vessel arrival time to port is an increasing function of vessel size. This is mainly due to the limited availability of cargo handling equipment (cranes) that can be operated on board a ship, and the problem of course increases in the higher levels of plant energy use." Where still, the average jacks have five standard lift operations for the day and that is in many major ports for Panamax vessels beyond. However, it can not be imagined or convinced that there are eight or ten cranes operating in a continuous synchronized operation on a vessel of 10,000 containers even in Hong Kong or Singapore or Los Angeles at any time in the near future (Haralambides, 2002a).

Thus, the use of larger vessels requires greater capacity in ports. Finally, the creation of excess energy can also be seen as a form of border pricing, which often explains the reluctance of governments and regulatory authorities to impose and implement ambitious port development plans that go beyond what are often considered "realistic" expectations for demand. Here, port strategies and investments in ports that encourage the construction of larger and higher vessels than the sunken costs of new niches increase the competitiveness of the port, Strengthen the current port market power on the one hand, and make the entry of new payloads unprofitable on the other. "The mixture between competition and excess capacity reflects prices towards marginal costs and does not allow full cost recovery in shipping. This problem can be solved through self-regulation and organization of transport companies at conferences and similar forms of cooperation (including shipping alliances)."

Short-term and long-term marginal costs: Let's try to explain how the MCP can have the positive effects listed above. In order to do so, it is necessary to briefly explain the concepts of short-term and long-term marginal costs; in particular the long-term concept of the most important (Haralambides, 1994). In the short term, the port size is fixed. Fixed capital assets, such as sidewalks, squares and other infrastructure, are fixed production capacity, and variable costs are mainly related to the costs of handling marine goods and services. In the short term, marginal costs (SRMC) consist of the increase in the variable costs required for the production of an additional port service, for example. Handle an additional container, when all other costs remain fixed. In the long run, all costs are considered variable. "The long-term marginal cost concept (LRMC) is the increase in total costs required to produce an additional port service unit. Through total costs, ie by including infrastructure costs as variable costs, where LRMC becomes a planning concept."

In principle, it gives the long-term balance of the port (LRE), capable of meeting a certain level of demand at the average of the total lower cost, without incurring a deficit or achieving economic rent (ie, an abnormal profit or a monopoly). In the absence of rapid technological change, we often assume that LRMC = LRAC = constant (Haralambides, 2002a). By increasing capacity revenues, the above matters can be better understood as the size, organizational structure and "operational" capacity of the port can be appropriately described by the short-term total cost curve. The port faces intense regional competition from neighbouring ports and finances its public investments. At present, the level of demand it has to meet assumes an increase in existing volume returns (Haralambides, 1994). As a result of competition and no need to recover infrastructure development costs (public-funded), the port will establish prices equal to marginal costs represented in the marginal cost curve of the port in the short term). Consequently, there is a deficit in the arrangement, and the port is not allowed to fully recover its costs. For the new level of productivity. Unless the demand goes well beyond the current amount, this situation can not be sustained in the long term without continued public support. We are in an unfair competition situation. "In the case of long-term equilibrium (LRE), this level of production must be produced by a much smaller port where pricing in this case allows full cost recovery." With this size, the port will show record fixed returns and will be able to produce its services at less than average cost.

Decreased volume returns: In this case, we assume that the port has faced an increasing demand for its services far beyond its potential. As the port can not be bothered by the increase in revenues, there will be some other major problems such as congestion and lack of standard returns (Coto-Millan, 1998). "There will be problems in standard times for ships In an unacceptable manner from the owners of the ships and accompanied by some problems resulting from accidents expected during the trading of goods and impose additional charges on the shippers and all this will damage the port in the long term In this case must adhere to the marginal cost criteria for the container, for example to be priced."The port's capacity and capacity to avoid the adverse operations of ships from leaving the port and reverse overexploitation, which is causing concern to the port and its management and the simplest solutions in this case resort to the price equal to the marginal cost and determine the average cost borne by the port to deal

with tons of goods (unit of measurement) (Carlton, 1994), "During the specified period of measurement. The port achieves an economic return and extraordinary profits, which means that the port will become an economic surplus after paying for all the factors of production, including entrepreneurship in the port, as well as the natural return on capital ,"Here too, the situation will be unsustainable in the long term. It is clear that the port is too small for this level of demand and will eventually have to move to a greater level of equilibrium in the long term and will face more competition in an attempt by others to take a growing share of the market through more investments for greater economic returns than the current situation of these Competitors.

Conclusion

Cost recovery and pricing of port services are complex and controversial, both technically and conceptually. Where the approach of developing infrastructure and preparing it for economic growth is handled according to complex conditions in terms of competition, especially in marine ports and in accordance with the general policy of the state for investment and the extent of the role of the state in economic activity, especially maritime transport and the direction witnessed in the current paper depends on the economic method followed by the state Production and feedback from the economic sectors of public policy makers and the pricing process of port services are always surrounded by a deliberate decision that includes all aspects that lead to correcting port tariffs.

In the short run, however, the long-term reversal of the term is a double-edged sword that should eventually lead to the restoration of public investment in the port and even go beyond it. This is to achieve returns commensurate with the value of these investments and can be an attractive element of private investment. The case of dependence, economic diversification, demand measurement and reliance on the principles of flexibility are among the most important criteria that must be taken into account, as competition becomes a frightening concern for port managers. It is no longer acceptable to take random decisions and compete for fair shares and shares in parallel with the value of Infrastructure and investments

REFERENCES

Carlton, D.W. and Perloff, J.M. 1994. Modern industrial organisation (2nd edition). New York: Harper and Collins.

Coto-Millan, P., Banos-Pino, J. and Villaverde, J. 1998. Maritime (General Cargo) import and export functions in the Spanish economy. In: P. Coto-Millan (ed.) Economic Inquiries in Maritime Transport. European Institute of Maritime Studies.

De Silva, H. 1991b. Applying cost axiomatic principles to Port of Melbourne data - an example. Paper presented to New thinking on port pricing Executive.

Haralambides, H.E., Cariou, P. and Benacchio, M. 2002a. Costs, benefits and pricing of dedicated container terminals. *International Journal of Maritime Economics*, 4: 21-34.

Haralambides, H.E., Westeneng, M. and Zou, S. 1994. GATT and its effect on shipping and ports. Proceedings of the KMI/IAME Conference on International Trade Relations and World Shipping, Seoul, June 1994.

****