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Globalisation in Maritime Transportation:

Competition, uncertainty and implications for port development strategy

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1. Introduction

In 1998, a newly formed consortium of container shipping companies, SeaLand-Maersk, announced its intention to consolidate its services on the East Coast of North America at one port, and invited bids from interested parties. Because the business represents a traffic volume in excess of 600,000 TEUs per year, many responded, eager to attract this trade. Six ports were retained in the evaluation process and their submissions included major concessions. The process was very much a contest, in which separate port authorities felt obligated to enter into a competitive bidding war without any guarantee that the concessions made would be successful. This contest is instructive and important, being an early indicator of a trend that is likely to be repeated elsewhere in the years ahead. Ports are being confronted by forces of change and uncertainty that are reducing their abilities to control their own destinies. Other actors in the transportation industry; the shipping lines in particular, are shaping port development more than ever before.

In this paper I examine the reasons for the changing status of seaports. The central thesis is that as intermediate points in transport chains, linking shipping with road and rail modes, ports are vulnerable to developments on both land and water. In the last decade these developments have been particularly significant, and have brought about uncertainty and change that has made port planning extremely difficult. Inter-port competition has been heightened in unanticipated ways. In the latter part of the paper I examine some options for ports to confront the challenges that are facing the industry.

2. Ports in a changing operational environment

The port industry has always been competitive. Every port has a history of rivalry with competitors near and far. Venice and Genoa were rivals for the trade of the Mediterranean during the Renaissance, and through the years other closer ports to Venice have been seen as competitors. Each port sought to secure a competitive advantage, and this usually involved

improving infrastructure - a new dock here, more storage facilities there, and extending links with the hinterland. These were improvements out of which the port authority could have a reasonable expectation that they would yield traffic improvement. Any cost advantage or service efficiency improvement could be translated into a greater market share. Under these conditions, ports could control their destinies. Today this is no longer true. A number of external developments are creating conditions of great uncertainty and change, which are making obsolete traditional port planning approaches.

2.1 Containerisation

Containerisation brought about a revolution in the transport industry. Giving rise to significant economies throughout the transport chain, containers permit freight to be transported more cheaply and further than ever before. This is what geographers refer to as *transferability* and it has given shipping lines much greater freedom to serve markets from a wider choice of ports.[1] Markets that were once seen to be in the exclusive hinterland of a particular port can now be served by many gateways. Individual ports no longer have exclusive control over inland markets, and they can no longer be sure that trade even in their own local areas is secure.

For ports, the impact of containerisation has been something of a paradox. Many of the investments required to make containerisation successful have been made by the ports industry. Ports have had to purchase the gantry cranes, develop ever-larger terminal sites, and invest in a wide range of mechanised yard equipment to speed dockside and yard operations. The result has been a significant reduction in terminal costs and improvements in efficiency, benefits that have been shared throughout the transportation chain. Thus, the ports industry has borne a large share of the investment burden of containerisation without a proportionate share of the benefits. Yet ports around the world have felt obliged to enter the container industry by investing in expensive superstructure and infrastructure, only to find these new facilities are underutilised or even

[1] Fleming, D.K and Hayuth, Y. (1994) 'Spatial Characteristics of Transportation Hubs: centrality and intermediacy'. *Journal of Transport Geography* 2, pp. 4-5.

bypassed. In an earlier paper I likened containerisation to a lottery.[2] Only those with tickets have a chance of winning, however small the odds may be. For a port authority, investing in a container terminal is the only way it can hope participate in the container business, but the presence of the terminal is no guarantor of use.

2.2 **Globalisation**

Globalisation has extended and deepened the effects of containerisation. Production systems are increasingly global, as firms depend upon the door-to-door services and just-in-time deliveries that containers have made possible. Logistics is the means by which trade is being organised, and ports, which used to be gateways (or bottlenecks) through which trade flowed, are now but one of many links in chains that are global in scope. The shipping lines have emerged as the most important players in these logistics chains, widening their maritime services and extending their control over landward movements. The choice of a port by an ocean carrier may be made based upon considerations that reflect the economies and conditions of the entire chain, rather than the specific merits of a particular port. There are examples from many parts of the world. In North America, the establishment of mini-bridge rail services from West Coast ports for the burgeoning trans-Pacific trades resulted in significant diversions from East Coast ports, as the shipping lines sought to avoid Panama Canal crossings. More recently, services in the Mediterranean have been transformed by many carriers establishing services at entirely new pivot ports in the southern basin, such as Gioia Tauro and Algeciras, bypassing direct services with established Northern Mediterranean ports such as Livorno and Marseille.[3] Here the choices are influenced by the total transport picture, as much as the merits of an individual port.

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[2] Slack, B. (1993) 'Pawns in the Game: ports in a global transport system'. *Growth and Change* 24, p. 582.

[3] Ridolfi, G. (1999) 'Containerisation in the Mediterranean: between global ocean routeways and feeder services.' *Geojournal* 48, p. 31.

The shipping lines have themselves responded to globalisation in ways that impact directly on ports. Over the last five years the container shipping industry has been restructuring itself in a revolutionary fashion. Several firms have come together through equity mergers, such as NOL-APL, P&O-Nedlloyd, and SeaLand-Maersk. Involving some of the largest carriers in the world, the new corporations yield enormous influence. Parallel to the mergers are strategic alliances that have been formed between major shipping lines. Today, most of the top companies belong to one of five global groupings (see Table 1). These reorganisations have come about because of the pressures of globalisation, including the need for lines to have a presence in all the major markets of the world. New service configurations are being forged, and the once separate services of members are being integrated. This is creating a great deal of turmoil and uncertainty in the industry, and ports simply cannot predict what the outcomes will be. The emergence of new ports is the Mediterranean is but one manifestation of this trend. The SeaLand-Maersk decision to concentrate its business at one port on the East Coast of North America is another.

Table 1 Shipping Alliances, 1999

Alliance	Grand	New World	United	SeaLand/Maersk
Members	H-L,MISC, NYK, OOCL, P&ON	APL, HMM, MOL	CY, DSR, Hanjin, UASC	SeaLand, Maersk
# ships	79	75	61	199
# TEUs	299,224	289,399	190,235	483,000

Accompanying the changes being wrought by globalisation are continued technological developments. Vessel size is increasing at an accelerated rate. The progress of vessel dimensions was relatively slow during the first thirty years of containerisation, but the 1990's ushered in a wave of vessel size increases that seem to have no limit. While the largest ships of today have

capacities in excess of 6,000 TEUs, naval architects suggest that vessels of up to 15,000 TEUs are possible.[4] Some economists, however, suggest that dis-economies of scale will be reached when vessel size reaches 8-9,000 TEUs.[5] The uncertainty over vessel size is another challenge for the ports. To build facilities in anticipation of new size dimensions is a risky undertaking, yet ports that wish to be at the forefront of world trends have to make these choices. What is known is that the newer vessels will be broader of beam than before, requiring a new generation of dock gantry cranes; will draw more water than before, requiring extensive dredging; and, being of greater capacity, will require much more dockside space and handling capacity. All will involve a new round of capital expenditures.

2.3 Landward developments

The distribution of containers to and from inland markets has assumed an ever more critical role in the emergence of logistics systems. Controlling the shipments from door to door has become an important feature of contemporary transportation. This has meant a greater integration between the modes and requires the establishment of organisational structures to manage the flows. Here, too, the shipping lines are playing are playing an ever increasing role, either directly by operating their own services, as in the United States and Canada, or in association with intermediaries and railway companies, as in Europe. The result is the establishment of multi-modal logistics providers that control the routing of the flows in conjunction with the ocean services of the consortia, and in which individual ports are seen as incidental to the entire network structure.

[4] Seok-Min, L. (1998) 'Economies of Scale in Liner Shipping.' *Maritime Policy and Management* 25, 361-373.

[5] Gilman, S. (1999) 'Size Economies and Network Efficiency of Large Container Ships.' *International Journal Of Maritime Economics* 1, p. 51.

The alliances that are restructuring the ocean industry are being repeated on land. The railway industry is being re-shaped by equity mergers and alliances in much the same way as the container shipping industry. In North America the former 10 major railroads have been reduced to five, and in the increasingly deregulated environment of Europe, comparable trends are emerging. This is adding further uncertainty to the ports industry. There exists a potential for differential access to ports based upon a rationalisation of rail services.

3. Port- specific challenges

As reviewed above, ports have seen their ability to control developments shrink at the same time as the costs of competing have increased. These externally-induced pressures, particularly from the shipping lines, have been accompanied by a set of internal forces that compound an already difficult situation.

3.1 Declining economic benefits

Ports used to be major employment generators. The large crews required to work the ships that spent most of their time in port, the dockers that were needed to load and off-load cargoes, the firms that supplied the ships with supplies and provisions, and the large sector of intermediaries, including ship brokers, freight forwarders and warehousing firms, all contributed to the local economy.[6] Port cities were often major centres of population and industry. Containerisation has diminished these benefits. Today, ships crews are small and spend little time in port, and dock labour has been reduced drastically, so that in this context containerisation can be seen to have reduced the economic impact of ports on cities.

[6] Vigarié, A. (1999) 'From Break-bulk to Containers: the transformation of general cargo handling and trade.' *Geojournal*, 48, p. 5.

These circumstances must be seen in light of the increasing costs of containerisation that are being borne by the ports themselves. How can port authorities justify increased expenditures for an activity whose local benefits are declining?

3.2 Restructuring in the ports industry

Around the world ports are being privatised and liberalised. Central governments, by intent or directive, are increasingly reducing their financial commitments to ports. While privatisation has tended to invigorate management and operations, questions remain about the funding of infrastructure developments, such as dredging, and the preparation of new sites, including the provision of land transport access. The European Commission appears to be working towards the elimination of subsidies, and in Canada the principle of user pay is government policy. But how ports will be able to cover such expenditures out of their own resources remains an unanswered question.

3.3 Environmental issues

Ports occupy sites in zones that are inevitably ecologically sensitive. The coastal zone is one of the most precious environments both for aquatic and terrestrial life forms. Competing pressures for use and/or preservation of these zones has become an issue that occupies a central place in political arenas around the world. Yet ports require sites that are increasingly extensive, with access to water depths that frequently require dredging, requirements that places them in conflict with legislation, environmentalists, and the general public. It is significant that environmental considerations are now among the most important constraints on port development.[7]

[7] Vandermeulen, J.H. (1996) 'Environmental trends of ports and harbours: implications for planning and management.' *Maritime Policy and Management* 23, 55-66.

4. Ports in the 21ST Century

As we enter the new millennium, it is clear that seaports are facing exceptional challenges at a global scale. Their position in the new logistical chains that literally span the world has been weakened, and they feel at the mercy of the shipping alliances that dominate world trade on land and water. Many of these issues were illustrated in the SeaLand-Maersk contest on the East Coast of North America. From the original six ports that were considered, the consortium narrowed the selection down to three ports, Baltimore, Halifax and New York. The first two were retained because they had offered major concessions to the shipping lines. Baltimore, for example, made available a 150ha-equipped terminal, and the State of Maryland offered to dredge the ship channel to an acceptable water depth at no charge. Halifax obtained financing from various levels of government and the railroad amounting to C$500 million to provide a new facility to meet the needs of SeaLand-Maersk. These inducements reveal the extent to which these two ports felt it necessary to attract the business. For Baltimore it represented an opportunity to reverse a decade of traffic decline, and for Halifax it was an opportunity to draw some economic growth in a very disadvantaged peripheral region of Canada.

New York, the third contender, was unable to offer as many inducements. Part of the problem was the unusual composition of the port authority, comprising two states, whose governors saw the situation very differently. For New Jersey the retention of the carriers represented economic benefits, and its Governor was anxious to offer favourable lease terms on the Port Elizabeth site. For the Governor of New York, the situation was not as appealing, since the jobs were not in his State, and he saw no need to meet the demands of the consortium to maintain the lease on the Port Elizabeth site at the old rate that had been in effect since 1970. Of central importance to the consortium was a commitment to secure dredging to 45 feet, which was beyond the direct control of the port authority, since that is a federal government responsibility. Pointedly Maersk sent its

largest ship, the *Regina Maersk*, to New York only partially loaded, to demonstrate the need for deeper water access.

While New York was ultimately selected by the consortium in 1999, having secured a commitment to deepen the channel to 40ft at least, and favourable terms on the lease of the Port Elizabeth, the process revealed the weak position of ports against the demands of shipping lines. What will other consortia now demand of both winner AND loser ports? They have witnessed how far ports have gone to attract the services of the consortium; will they now go to Halifax to obtain comparable terms, even though they may not be offering the same volume of business? Will the alliances pursue similar strategies in other parts of the world?

Arising out of the changes that have been discussed in this paper emerge a number of critical issues that confront the port industry around the world:

-how to plan in a climate of great market uncertainty
-how to confront the power of the shipping lines
-how to justify continued investments
-how to plan development and satisfy environmental concerns
-how to manage effectively in a climate of regulatory change

In the following section possible responses to these challenges will be discussed.

5. Strategies for survival

It is significant that ports large and small face the challenges outlined above. None are exempt. However, as daunting as the problems may be, they are surmountable.

Most port authorities seeking to address the competitive pressures have adopted one of two strategies. The first has been to try to keep pace with market demands. Realising that shipping lines have been investing in larger vessels, many ports have embarked on ambitious expansion projects, ordering post-panamax gantry cranes and deepening and extending berths. Many times these investments have not been made without specific market goals in mind, nor have they been subjected to rigorous financial evaluation. As speculative responses, intended to keep the port in the containerisation game, it is the lottery ticket analogy again. The second approach has been to pursue customer-driven strategies, where superstructure and infrastructure facilities have been provided in response to demands from shipping line clients. In other words the client is given what he wants, regardless of the financial, commercial or ecological consequences. Both approaches have contributed to the duplication and overcapacity of container facilities in most parts of the world, and given the fickleness of the shipping lines, are solutions that not economically nor environmentally sustainable. There is no evidence to suggest that by throwing money at the problem will ports be able to re-gain control over their futures.

Borrowing from the work of Porter[8] and Robinson[9], a third approach appears appropriate. It is centred around the notion of market-focussed strategies, in which business actions are oriented to providing superior value-delivery to targeted customers at a cost that provides acceptable profit levels. This approach requires a searching and realistic appraisal of how the port fits into local, regional and global markets. Ports must be willing to undertake drastic adjustments in their functions. For example, the notion that to remain as a main line container port may no longer is a viable solution. For some ports it may be better to get out of the container business altogether, and focus on other market opportunities in the bulk, neo-bulk, break-bulk or passenger business. For others, it may be advisable to focus on a role as a container feeder port. For example, with

[8] Porter, M. E. (1998). *On Competition*. Harvard Business School, Boston.

[9] Robinson, R. (1992) "Competitive Efficiency and competitive advantage: the basis for Australian port reform." Paper presented at Maritime Technology 21st Century Conference, 1992, University of Melbourne.

the realignment of services of the major consortia there has been an explosion of services to secondary ports. These may be important (and less expensive) niches to cultivate.

These reappraisals must also take into account the alternate use of port sites. Some land under the jurisdiction of the port authority may be more valuable in a non-port use. In the recent past some redundant port land has been turned over for urban redevelopment, usually at very low prices. Waterfront land is immensely valuable, and port authorities must take advantage of this opportunity if sites can be shown to be of no further use for port operations. Several authorities in North America, such as Boston and Montreal, have woken up to these possibilities, having already 'lost' millions of dollars in earlier transfers and sales. In this way the port authority may become a land developer as well as a port operator. The potential profitability of such site conversions may be one of the reasons that there has been such an interest by private companies in purchasing ports and terminals from public control.

An important step for ports to achieve greater control is to expand their stakeholder base. Functionally, ports are links in intermodal and logistical chains, and they must strive to insert themselves more fully within these networks. This means working closely with the traditional port community (dock labour, terminal operators) but also with logistics providers, railroads and truckers to establish partnerships that will improve and extend efficient services beyond the port. This may require some equity involvement in the services. A pro-active port authority, working with other actors in the logistics chain, can enhance the service attractiveness of the port, raising the probabilities that shipping lines will wish to establish service calls.

Included in strategies to expand the stakeholder base are attempts to integrate shipping lines more fully in port development. Partnerships to exploit and develop berths, taking the form of long-term leases and linking performance with rates are a way of attaching the lines more completely to the port. This involves the allocation of berths to a single user in exchange for a long-term commitment. Many ports are already pursuing this strategy.

One of the challenges confronting ports is the need to enhance the economic benefits from port operations. The transfer function alone is producing diminishing returns for the regional economy because of growing automation. Once again port authorities have to become more deeply involved in logistics: in inventory control, data management, packing and processing. These are the new value-added elements of physical distribution. They can be located anywhere along the transport chain. It is up to port authorities working with other stakeholder to work towards ensuring that these functions take place as near to the port as possible. By acting as catalysts they can coordinate the planning and policy development to bring the various parties together. The Port of Rotterdam's "distriparks" are an example of the possibilities of bringing together logistics firms to sites on port-owned land, in collaboration with road and rail industries.

The solutions suggested so far have been based upon a single port authority taking steps to assess its future directions. In the global environment, some would suggest that ports have to go further. Just as the shipping lines have come together in alliances, so ports should come together to form a united front against the overriding power of the alliances. The difficulty with this concept is that ports are separate entities operating under different jurisdictional regimes, some private, others public. On many ranges there are different national interests at stake, which makes effective coordination very difficult. On the North European range there is already a grouping of ports that meets occasionally to discuss planning issues of common concern. More recently, a similar grouping on the East Coast of the US has been formed with the intention of serving as a clearinghouse of information, in which such sensitive information such as rates and leases would be exchanged. Whether these groupings can dilute the power of the lines in dealing with ports separately to secure the best concessions remains to be seen, but the fact that they form part of serious discussions among port authorities, suggests that this will be a future development to monitor.

Related to the issue of port alliances are the growing trend of port privatisation, and the emergence of grouping of terminal owner/operators. The emergence of a handful of multiple port terminal operators is a recent phenomenon (see Table 2), and is particularly evident in the recently reformed port industry of Italy. It is still too early to measure if the groupings have served to counterbalance the power of the shipping lines. Nevertheless, it is unlikely that the individual ports would be weaker in dealing with the carriers through their ownership by a consortium.

Table 2 Emerging Port/Terminal Groupings

	Hutchison	**P&O**	**PSA**	**GATE**
Asia				
	Hong Kong	Manilla	Singapore	
	Shanghai	Shekou	Dalian	
	Yantian	Bangkok	Fuzhou	
	Gaolin	L. Chabang	Cigading	
	Jiuzhou	Batangas		
	Nanhai			
	Jiangmen			
	Shatou			
	Xiamen			
	Yangon			
	Bojonegara			
Europe				
	Felixstowe	Southampton	Genoa	Hamburg
	Thamesport	TilburyVenice	Bremen	
	Rotterdam	Larne	Rome	G. Tauro
	Trieste	Naples		La Spezia
		Cagliari		Lisbon
Americas				
	Freeport	Buenos Aires		
	Cristobal			
	Balboa			
Other				
	Mombassa	Colombo	Aden	
		SydneyTuticorin		
		Brisbane		

Fremantle
Melbourne

6. Conclusions

Ports are operating in an environment that has changed substantially over the last few years. Not only do they have to face the continued vagaries of market cycles and economic fluctuations, but also they are being buffeted by unprecedented changes in the structure and organisation of the broader transport industry. It is from the latter that most of the most difficult challenges are being presented. The physical integration of transport chains, the organisation of multi-modal transport groupings, a growing awareness of ecological constraints, and the restructuring of regulatory relationships are all interacting to present an environment that is difficult to manage and predict. This paper suggests that the successful ports will be those that respond in a pro-active manner to the challenges. There are no simple solutions. Each port must develop and apply its own responses. It is clear, however, that ports must try to anticipate trends and position themselves to exploit the opportunities that are presented. They must establish realistically where they wish to be in the new global networks, and they must work to integrate the other stakeholders in the logistics chains in their planning. It is only through partnerships that ports will be able to succeed in providing superior value-delivery to their customers. These represent difficult choices to port authorities, who in the past have tended to be reactive in their management, standing apart from the other segments of the transport industry.

References

Fleming, D.K and Hayuth, Y. (1994) "Spatial Characteristics of Transportation Hubs: centrality and intermediacy." *Journal of Transport Geography* 2, 3-18.

Gilman, S. (1999) "Size Economies and Network Efficiency of Large Container Ships."*International Journal Of Maritime Economics*.1, 39-59.

Porter, M. E. (1998) *On Competition*. Harvard Business School, Boston.

Ridolfi, G. (1999) "Containerisation in the Mediterranean: between global ocean routeways and feeder services." *Geojournal* 48, 29-34.

Robinson, R. (1992) “Competitive Efficiency and competitive advantage: the basis for Australian port reform.” Paper presented at Maritime Technology 21st Century Conference, 1992, University of Melbourne.

Seok-Min, L. (1998) “Economies of Scale in Liner Shipping”. *Maritime Policy and Management* 25, 361-373.

Slack, B. (1993) “Pawns in the Game: ports in a global transport system.” *Growth and Change* 24, 579-588.

Vandermeulen, J.H. (1996) “Environmental trends of ports and harbours: implications for planning and management.” *Maritime Policy and Management* 23, 55-66.

Vigarié, A. (1999) “From Break-bulk to Containers: the transformation of general cargo handling and trade.” *Geojournal*, 48, 3-7.