

# Scale economies, intermodality and the evolution of competition in maritime markets

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## 1 Economies of Scale of the Ship

Ships intended for intermodal transport are generally characterized by complex technology and strong investment per unit of capacity. As such, they give rise to significant economies of scale, having relatively high speeds given the traffic connections to be served. As in all other cases relative to the economic theory of optimum ship size - apart from draught limits for international waterways, the continental shelf and harbour depths, as well as limits in relation to the size and type of market (the magnitude of the flows of traffic to be served) - the economies of scale of ships intended for intermodal transport could also not to find any limitation within the context of the intrinsic productive process of the ship itself. (This is with the obvious exception of large bulk carriers for liquid and dry cargoes, especially in relation to the costs linked to insuring against possible ecological disasters.)

Leaving aside the above factors, the potential for growth of the capacity of the ship, with the consequent benefits of economies of scale, is limited by the other element in the productive equation in shipping transport service - the port. Here, the rate of throughput of pier operations - i.e. of cargo unit handling - dictates the period of stay of the ship in port and reduces the possibility of exploiting the economies of scale of the ship itself.

The higher the rate of throughput - and, consequently, the more efficient, economic and well-organized the port - the greater the possibility of exploiting the economies of scale and, ceteris paribus, the lower the voyage costs per cargo unit.

*L'articolo si propone di delineare il discorso logico che, partendo dalle economie di scala della nave e dall'intermodalità, giunge sino agli aspetti fondamentali della competizione economica globale così come questa si manifesta nei trasporti marittimi e nei traffici via mare. Tale percorso passa attraverso un'estesa serie di fattori che comincia con il considerare il ritmo di imbarco-sbarco a livello di banchina fino ad arrivare all'analisi delle strutture dell'organizzazione del sistema degli operatori marittimi. A questa che è la principale conclusione dell'esame delle grandi trasformazioni in corso è collegato un breve esame dell'evoluzione e della profonda trasformazione del sistema delle Conferenze marittime, e una breve esplorazione delle ipotesi che si possono formulare circa l'evoluzione ulteriore di tali cambiamenti.*

This article is derived from an "invited paper" written by the author for the International Conference NAV 97 - H.S.M.V. (High Speed Marine Vessels) held in Sorrento, Italy, from March 18 to March 21, organized by ATENA (Associazione di Tecnica Navale), CETENA (Centro Studi Tecnica Navale) and the Dipartimento di Ingegneria Navale, University of Naples. Obviously the original text has been entirely revised and modified in some parts.

See, for example: H.J. Molennars - E. Van de Voorde (eds.), *Competition Policy in Liner Shipping*, Antwerp (International Association of Maritime Economists - IAME), 1994; see in particular S. Gilman, *Contestability and Public Policy in Liner and Short Sea Shipping*, as far as concerns items b) and d) in the text.

But where the rate of throughput is high and increasing, this creates considerable and increasing requirements for space in the port area adjacent for the immediate stay of cargo units. In actual fact, such port areas normally tend to be scarce, due to the pressures for multifarious uses, so that they are only available at increasing cost per unit of space; and, in the case of intermodal transport, they are specialized, i.e. not (as a rule) employable for other uses, with the risk of the possible effects of "rationing" by the Port Authority.

The increase in space requirements in question may be reduced only where it is possible to regulate and accelerate the inflow and outflow of cargo units in port, and where the operations concerned (ranging from consolidation to deconsolidation, to the stay, to the repair of containers, to their maintenance, etc.) are decentralized to the greatest possible extent away from the immediate port area.

The Ro-Ro system, which has the highest investments per unit of

capacity of transport (decks, access ramps, volume lost on board, etc.), manages to offset this due to the possibility of rapid loading-unloading of cargo units in port and immediate decentralization of operations, which obviates the problem of lack of space and increasing costs (as it, for instance, since long-time, is the case with oil and pipes). The greater the frequency of stays in port, the greater this possibility becomes. As is common knowledge, these are the reasons for the comparative advantage of Ro-Ro on short and medium haul routes.

The generational quantitative-qualitative leaps of container ships, for their part are generally correlated with