

THE ROLE FOR PORTS IN INTERMODAL TRANSPORTS AND GLOBAL COMPETITION: A SURVEY OF ITALIAN CONTAINER TERMINALS

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Abstract

Port competition concerns fares as well as quality of services, since rates of throughput are more and more important as ships' size increases; and port is increasingly integrated within other stages of intermodal transport. Besides, the growing importance of transshipment causes a segmentation into different markets of port services. The market of hub ports is marked out by a relatively low number of competitors, but also by a highly "footloose" demand, and little or no spatial protection of the market area. On the other hand, the market of feeder ports is characterized by a high number of competitors and a high degree of spatial protection; it is also strongly influenced by inland transport infrastructures.

INTRODUCTION

The most significant developments and trends in international maritime competition concern major companies, groups, alliances and joint ventures, on one hand, and a major intermodal (namely containerized) transoceanic or roundworld courses, on the other. In container transport, the enhancement of traffic flows between the Far East and the U.S. has led to major increases in via-Suez flows.

Increases in size and capacity of container ships - up to the present 6,000 TEUs and projected 8,000 ships - causes important changes in maritime transport competition, and brings about: concentration towards oligopolistic markets; agreements and alliances among major carriers and shippers; development of transshipment. These changes have major effects on ports, both at the level of port-related markets and inter-port competition. Ports play a key role in these changes. Productivity, efficiency and efficacy of ports not only affects the opportunities of exploiting the economies of scale of ships, but also strongly influence routes, above all in container transport. The following survey of Italian ports includes both data collection/processing and a direct survey of a sample of major ports.

Port competition concerns fares as well as quality of services, since (i) rates of throughput (and reduction of port times) are increasingly important as ships sizes increase; and (ii) the port is increasingly integrated within other stages of intermodal transport. Moreover, the growing importance of transshipment causes a segmentation into different markets of port services, with different roles, and for different ships. The market of (and competition among) hub ports is marked out by a relatively low number of competitors, but also by a highly "footloose" demand, and little or no spatial protection of the market area. On the other hand, the market of feeder ports is characterized by a higher number of competitors and a high degree of spatial protection, due to localization of demand; it is also strongly influenced by inland transport infrastructures. The emerging horizontal concentration among terminal operators, and the protracting and enhancing vertical concentration among land, maritime and intermodal transport firms also play a key role, so that different market forms, ranking from competitive oligopoly to collusive oligopoly and possibly quasi-monopoly can eventually result. On one hand, the generalized cost of port service should theoretically concern mainly hub ports (due to the footloose demand). On the other hand, the low number of potential competitors for calling of large ships cause high inelasticity of demand, while a relatively high competition is expected among feeder ports of the same region.

ECONOMIES OF SCALE OF THE SHIP

Ships intended for intermodal transport - with the sole (partial) exception of pallets - are characterized by complex technology and strong investment per unit of capacity giving rise to significant economies of scale. As in all other cases relative to the economic theory of optimum capacity - apart from draught limits for international waterways, the continental shelf and port depths, as well as limits in relation to the size and type of market - the economies of scale of ships intended for intermodal transport could also be unrestricted within the context of the intrinsic productive process of the ship itself.

Leaving aside these 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 ports. Here, the rate of throughput of pier operations 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. 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, these port areas normally tend to be lacking, due to the pressures for multifarious uses, so that they are only available at increasing cost; and, in the case of intermodal transport, they are specialized, i.e. not (as a rule) set aside for other uses, with the risk of the possible effects of "rationing" by the Port Authority.

The increase in space requirements 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 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 processing of cargo units in port and immediate decentralization of operations, which obviates the problem of lack of space and increasing costs (as is also the case with oil and pipes). The greater the frequency of stays in port, the greater this possibility becomes.

The generational qualitative leaps of container ships, for their part - together with the "transformations" and quantitative leaps in the market to be served, as occurred with Round-the-World services - are generally correlated with technical, organizational and territorial innovations enabling acceleration of the inflow and outflow of cargo units in port and decentralization of operations.

Probably the most recent and obvious example - apart from "Octopus" technology - is provided by the experience of Post-Panamax ships and by the fact that:

- i. the possibility of success of ships of up to 6,000 teus derives from a conspicuous precedent - that of the establishment of a railway landbridge from Los Angeles to New York for cargo originating in the South East Asia and the Pacific - which has enabled cargo to by-pass the Panama Canal and ships to exceed the breadth limits imposed by that passage;
- ii. the possibility of building broader ships has enabled the ships themselves to gain in terms of stability, thereby making less laborious and much faster the operations involved in placing containers on board and greatly increasing the speed of pier operations.

The above scenario has meant the development and gradual reinforcement of three needs on the part of the ship and the shipowners:

- a) to control by acquiring, and to manage as directly as possible, the port stage in the intermodal transport chain;
- b) to integrate with road transport and establish agreements with railway transport in order to ensure a rapid rate of inflow and outflow of cargoes;
- c) to establish inland terminal: inland goods depots, collecting and clearing stations, interports to decentralize port operations.

This leads intermodal transport to create a network with inland transport and terminals, even considerable distances from the sea. At the same time and via the same process, strategic "inroads" are made in relation to the promotion and acquisition of hinterland traffic.

In this way the investment requirements grow further, the (fixed) costs of the organization become more and more considerable and the economies of scale of both the means used and the organizational system increase in magnitude. In the meantime, the shipowners - particularly those in

container transports - tend increasingly to offer transport “(inland) junction to (inland) junction”, if not “door-to-door”, with associated unified responsibility and all-in tariffs.

THE ROLE FOR PORT COSTS

The port, as a factor offered in the production of shipping transport services, operates with increasing costs in the unit of time considered: overtime, night shifts and the like; increasing amounts of work needed for a ship, which can cause difficulties and slow down operations on other merchant ships (a sort of congestion cost); plant and technology which are more advanced but able to offer higher rates of throughput per unit of time only at costs per ton handled which are higher than those for plant and equipment which would be economically efficient for the volume of traffic normally handled by the port. In any event, the ship's interest in supporting the economic weight of these increasing costs per unit of traffic handled in the time given is directly proportional to the burden of investment, passive interest, crew, insurance, maintenance, organization and network which weighs on every day (or hour). As is precisely the case for ships involved in intermodal transport in general and container ship in particular.

Where an increase in the rate of throughput is not possible because the equipment or plant ashore is specialized, and therefore cannot be arranged for the ship considered beyond a given extent, the increasing cost per voyage occurs since the time spent in port - and hence the duration of the voyage - is lengthened, together with all the associated costs. This extension of time is reflected in the average costs of the voyage per ton of cargo transported.

The above-mentioned drawbacks can be avoided:

- a) by means of the expansion of the port complex, its space and its overall infrastructure. But this may lead to diseconomies of scale of the port complex due either to the territorial impact - which may be curbed only by careful arrangement of port systems in the planning of coastal areas - or to the bureaucratization of the activity of the port complex. As is well known, diseconomies of the latter type can only be neutralized through an advanced productive decentralization, starting with the complete and systematic separation of the moment, or function, of planning and control (Port Authority) from the productive moment, or function, of the service and industrial activities in the port itself (licensees and terminal operators). In any event, a substantial financial commitment is needed and can only be offset by means of the intervention - if not the actual initiative - of those requiring the new infrastructures, plant and equipment (licensees and terminal operators), or by recourse to the capital market when the latter is interested and willing to risk in the venture;
- b) together with the above, by means of massive investments in new technology and associated plant, equipment, infrastructural parts and/or inland terminals and any associated transport systems. Also in this case, however, the process requires either the financial intervention of licensees and terminal operators interested in such innovations or recourse to risk capital, where this is available.

OVERLAPPING OF OPERATIONAL AREAS. AGREEMENTS, CONSORTIA AND ALLIANCES

The overlapping of operational areas of the large shipping companies in container traffic, which is a consequence of the need to establish networks of inland terminals, the magnitude of investments and financial requirements and the high sunk cost of the setting up and organization of the major complexes in the sector lead to the establishment of agreements, joint ventures, consortia and global alliances between the complexes themselves. This lessens the rigidity of the investments as well as

the risks and is intended to rationalize - if not actually to optimize - the use of both the shipping fleet and the container fleet. In this kind of agreement, "slot arrangements" between the large companies and consortium groups constitute a particularly efficient instrument. They ultimately enable the reciprocal availability of the transport capacity of the shipping fleet and the container fleet.

The end result is the same as regards the move towards the concentration of traffic and the minimization of the number of ports of call for each ship and/or the fleet of each company. This move is due both to the need to reduce the idle time at ports of call and to the "economies (of scale) of density" arising from the concentration of traffic (organization, basic services and equipment, costs of promotion and acquisition, etc.).

In this way - and thanks to a careful operating plan for feeder services between ports which are "hub" or "transshipment" ports for some, and terminals or supply ports for others - the need to minimize the number of ports of call for each ship and for the ships of a company is reconciled with the need to retain and not to lose traffic. That which a company in a consortium, joint venture or alliance loses by renouncing a given port of call is compensated for by the traffic acquired by other enterprises in the consortium or alliance in such port, as well as by that which the company gains which would otherwise go to other enterprises in the consortia, joint ventures or alliances if they were present in that port. In this manner, the economies of density stemming from the concentration of traffic of one company or group manage to avoid the generation of the side-effects of congestion, and therefore to keep at bay most of the diseconomies of the concentration itself.

Other types of agreements are being established within the context of the above-mentioned tendencies currently characterizing intermodal transport, particularly in container transport: agreements between large companies, groups, consortia and alliances of carriers on the one hand, and "large shippers" on the other. The latter are shippers providing the company, group or consortium with substantial quantities of traffic, agreeing on prices, times and service procedures different from those of normal shippers.

This type of agreement is reminiscent of those used in the "captive transport" of the 1950s and 60s, for the transport of small and large goods in bulk, as well as for other products and cargoes, within the context of the requirements of industry (manufacturing industry, but also at times mining, electricity and gas). The so-called "captive transport" was, and is, based on special ships in technically integrated ship-shore equipment sequences modelled on the demands of the cargo transported and was defined using time charter contracts resembling (albeit inappropriate) forms of vertical integration of transport in industry.

It is easy to appreciate an important circumstance at this stage: namely, that as the range of services offered by the joint enterprises, consortia and alliances is upgraded and extended - in relation to geography, commodities, the composition of segments of intermodal cycles, and agreements between large shippers and large carriers - economies (of scale) based on diversification (economies of scope) are created. The additional services produced by the consortia and alliances can be offered at lower costs and prices than those which would be determined if there were not already, at an earlier stage in the process, a large quantity and variety of services produced; this is the principle of "sub additivity".

The networks of transport and inland terminals progressively established by the main companies, groups and alliances in intermodal transport, and in container traffic in particular, lead not only to the already cited overlapping of traffic areas of the shipping lines and enterprises. They also lead, in fact, to the overlapping of traffic areas (of jurisdiction) of the Shipping Conferences, resulting in a profound transformation of the general picture and range of operations of the latter, often accompanied by a loss of precision in their geographical delimitation.

Another contributory factor - again within the context of the evolution characterized by consortia, alliances, etc. in intermodal transport - is the establishment of networks of feeder shipping services

between transshipment ports and supply ports, also taking into account the possible change in the roles of the individual ports in the overall organization of the activity of consortia and alliances.

These factors, jointly operating to formulate supply prices for "inland junction to inland junction" (as opposed to "port to port") services, cast doubt and uncertainty on the meaning of tariffs limited solely to the shipping segment.

The effect of the evolution in intermodal transport - in particular, container transport (consortia, alliances, etc.) on the main international routes - is that there are fewer and fewer influential participants of significant dimensions with a determining role. And Conferences which were once charter agreements between ten, twelve or even twenty often medium-sized and sometimes medium-to-large sized participants, have turned into agreements between three or four very large complexes. Clearly, the procedures will also be different with respect to the past given the change in number and influence of the participants. The market is evolving towards forms of oligopoly, albeit with considerable differences in configuration.

INTERCONNECTIONS BETWEEN TRAFFIC AREAS, "ROUND-THE-WORLD" SERVICES, LANDBRIDGES

The interconnections between the areas of traffic of the large companies, consortia and alliances operating combined with the overlapping of traffic networks using systems of transport and inland terminals, opened the way for one of the great innovations of the 1980s - "Round-the-World" services. On the one hand this innovation has coincided with greatly increased market horizons and potential flows of traffic and, as already mentioned, it has created the conditions for a generational qualitative leap in the dimensions of container ships. While, on the other hand, it means being able to take advantage of the concept of global circumnavigation in both directions so as to exploit every possible "outward" voyage - in the direction of the greatest availability of cargoes - and alter the itinerary as necessary on those legs constituting the "inward" voyage - where there is less availability of cargoes - in order to increase such availability. Alternatively, there is also the possibility of including on inward voyages legs which, on other more limited local routes, would otherwise be considered "outward" (as sometimes occurs, for example, in the case of the "thin lines").

Moreover, there is the previously described need, on the part of the large shipping carriers involved in intermodal transport, especially containers, together with their consortia and alliances, to create a network. This establishes the preconditions for a further step forward in the evolution of the sector: the creation of landbridges (also referred to as "dry channels" or "link bridges"). The consequence is to reduce, through the introduction of land-based legs of considerable length, distances and time on international routes of great importance which would otherwise be covered entirely by sea. The most important example is the landbridge constituted by the direct railway link between Los Angeles and New York.

It is well known that in the last few decades the major international economic epicentres - and therefore the principal sources of world shipping traffic, particularly in container transport - have been moving towards South East Asia, the Far East and the Pacific (at any rate, east of Singapore). While the other terminus for this traffic connection - that centred in New York - represents the interconnection of several North-American metropolitan areas and continues to constitute the greatest concentration of economic activity in the world.

What has been said so far points to several key elements regarding the central argument:

1. the "internationalization" or "globalization" of shipping markets and the competition therein. (This global competition is distinct from the international nature which has always been attributed to shipping markets in that it takes place in real time);
2. in the context of this global competition, the acquisition of the control and direction of traffic and the logistical arrangement of the transport cycle become more and more important;

3. also in the shipping sector, global competition does not take place between individual productive units but between rival economic systems with a territorial basis. Therefore, in the specific case in question, the competition is between port areas and regions on the one hand, and "routes" of international importance on the other;
4. the solidity of shipping or port-based economic systems with a territorial basis is determined by the efficiency, cost effectiveness and organization of the port complexes and, in short, by the level of facilities offered by the shipping centres.

A SURVEY OF ITALIAN CONTAINER TERMINALS

The shift of world economy foci towards Asian Countries is demonstrated by the presence in that area of the biggest ports in container traffic, the largest companies and the major container builders. As a result, over the last few years, Europe-Far East routes have recorded the highest levels of growth.

This is why we consider especially interesting a survey of a sample of Mediterranean European ports, which have now the opportunity of reducing, if not cancelling, the gap from Northern European ports.

Within the Mediterranean Sea, the survey has been limited to Italian ports, in part for ease access to information and sites but principally for:

- the high number of ports, all obviously in a central location within the Mediterranean Sea;
- the recent (1994) reform of Italian regulations concerning ports, which transferred the running of port terminals to private companies (previously under complete public control until 1994) thus reintroducing market laws in port service production;
- the strong growth in throughput, largely due to the reform itself, which brought Italian ports to abt. 4,800,000 teus in 1997 (with an increase of 60% with respect to 1995);
- a growing leadership role within the Mediterranean Sea, since the total container throughput of Italian ports represents almost 40% of total Mediterranean throughput in 1996, with a rapidly growing trend; and since in 1997, for the first time, Italian ports achieved the supremacy among Mediterranean ports for both transshipment (Gioia Tauro) and for final destination (Genoa);
- the reduced gap between (at least) the bigger Italian ports and (at least) the smallest Northern Range ports (Genoa overcame Le Havre in 1997);
- the growing interest of major international companies - both in port terminals management (Eurokai, ECT, PSA) and in container traffic (P&O Nedlloyd, Evergreen) - for the direct control of major (Genoa-Voltri, Gioia Tauro, Trieste) or new (Taranto) Italian container terminals.

PORT AND TERMINALS UNDER CONSIDERATION

Italy's 4,500 Km of coastline boasts literally hundreds of ports. In order to select which should be included in the survey we analysed container throughput data over the last four years; three size categories clearly emerge: ports with over 400,000 teus per year (Gioia Tauro, Genoa, La Spezia and Leghorn); ports with annual throughput between 160,000 and 250,000 teus (Naples, Salerno, Ravenna, Venice and Trieste); small ports whose annual throughput is less than 50,000 teus (Cagliari, Palermo, Savona, Civitavecchia, Ancona, and others). It is easily observed that the gaps between "large" and "middle" ports, and namely between "middle" and "small" ports, are significant and constant over time. Thus the survey has been restricted to ports of the first two classes, namely the nine biggest Italian ports for container throughput.

It must also be stressed that, unlike the selected nine ports (except for Ravenna), "small" ports do not show significant growth trends (thus confirming the concentration of traffic in comparatively bigger ports).

Nevertheless, despite the focus on the nine main ports, some significant events concerning other ports have been considered as well, namely for the future: like, for example, the opening of the Cagliari container terminal and the planned construction and management of a container terminal in Taranto (by Evergreen).

Within the selected ports, we restricted the survey - also in order to compare terminals with homogeneous characteristics - to full container terminals, whose share of total throughput is outstanding. They are: VTE and SECH in Genoa; La Spezia Container Terminal (LSCT) and Cantieri del Golfo in La Spezia; Darsena Toscana and Sintermar in Leghorn; Molo Bausan, Flavio Gioia and Co.Na.Te.Co. in Naples; Molo Trapezio in Salerno; Sapir in Ravenna; Ve.Con in Venice; Molo VII in Trieste.

THE QUESTIONNAIRE

Besides throughput data and technical descriptions of the selected terminals, a questionnaire was submitted, by means of a direct interview, to chief executives of each port authority and of each terminal operator.

The questionnaire included four groups of questions, covering the following key items:

1. Macroeconomic features: the questionnaire investigates such aspects as the characteristics of the (potential) market area, the location of the port with respect to main traffic flows, the role for the port (or terminal) in the local economic context, especially as far as employment is concerned, as well as in the national and possibly international economic context;
2. Description of the terminal, with regard to: institutional, organizational and managerial framework of the port and the terminal; infrastructural system of the port and connections with inland transport networks; plans of investments and technological innovations;
3. Microeconomic features, business and management: the questionnaire includes estimates concerning business indexes, productivity, production and users' costs, economic performance;
4. Market structure and strategies of operators: emerging trends in market organization is investigated, and namely the role for horizontal and vertical concentrations.

SOME HEADLINE RESULTS

Macroeconomics aspects

All the persons interviewed, albeit in differing ways, consider their port as strategic or, at least, favourably sited with regard to the range of routes Europe-Far East and East-North America. A greater emphasis is set on the factor "proximity to the ideal route" by the Southern ports of Italy; while only Gioia Tauro retains to be a hub port.

The answers, which at first may appear conventional and standardized, actually reflect the strategic geographical position of Italy, set as it as a sort of "bridge" between Europe and Africa, almost perfectly interfacing the routes crossing the Mediterranean Sea. This comparative advantage, due to the geographical position of ports, is only partly exploited by Italian ports, as shown by their basin of users.

Apart from Gioia Tauro - whose core business is transhipment (the hinterland potential is estimated at only 40,000 teus per year) - all the other ports have a prevalently regional basin of users, i.e. it

extends to the areas with a high density of production but close to the port itself. In fact, north-western Italy addresses itself prevalently to the ports of Genoa and La Spezia (only 10% of the whole throughput of Genoa has its starting/ending point in central Italy), Tuscany and part of Lazio gravitate on Leghorn and Naples (beyond to Civitavecchia); Southern Italy prefers Salerno; Ravenna is the natural port for the flows of goods from/to central Italy and Emilia-Romagna (but the town of Parma gravitates on La Spezia); Venice and Trieste extend their basin of users towards the Northeast of Italy, Switzerland, Austria, Bavaria and the countries of Eastern Europe (Croatia, Slovenia, Hungary, Ceka Republic, Slovakia).

The limited extension of regions served by Italian ports, in spite of the potential users identified by using a physical or a geographical distance, stresses the fact that a major obstacle to their development was in road and rail infrastructures, usually outdated and congested, in a word incomparable with the infrastructural networks of other European Countries.

The answers relative to the role of ports regarding at the local economic context, mainly in terms of people employed, were less precise. Only for Gioia Tauro do we have figures concerning port related firms, estimated in about a thousand workers, while for all the other cases only general declarations about the crucial importance of ports for the cities, were obtained.

Description of ports and container terminals

As for the institutional, organizational and managerial rules concerned, it should be remembered that law n° 84 of 28/1/1994 establishes, for the largest 18 Italian ports, the Port Authority (from now on: P.A.), which is the body concerned with the planning of port development, the guide and propulsion in the realization of planning politics, the control on planning implementation and the carrying out of productive activities in the port (Goss, 1990 - Marchese, 1996), leaving the production of port services to the market.

In seven of the nine ports considered there is a P.A.; one does not exist in Gioia Tauro and Salerno. In the case of the last port, which has also reached all parameters (3 million tons for good or 200,000 teus per year) pointed out by the law for the creation of P.A., all the operators interviewed judged the present situation as optimal especially concerning managerial structure flexibility.

Differing feelings were those expressed by Ravenna towards the P.A., probably because here the P.A. is not the result, with problems of staff and a lack of entrepreneurial mentality, of a previous body. Moreover, in the port of Ravenna, operational areas are not public owning, but a twenty meters strip of land behind the shore. This situation allowed Ravenna to "anticipate" the process today in progress in other ports; in fact, Ravenna is known as the most *North-European* of Italian ports.

As far as the "deregulation" process is concerned, i.e. the separation of tasks between public (planning and control) and private (production of port services), - the most important innovation after the introduction of the law three years ago has been carried in Genoa, La Spezia, Salerno, Gioia Tauro, Ravenna; while it is still not complete in Leghorn, Naples, Venice and Trieste.

The functions of planning and controlling of private initiative attributed by the law to the P.A. are restricted to the single investment plan that private authorities have to present in order to obtain a concession. Furthermore what emerges from the survey is the lack of evaluation *in itinere* added to P.A. which is often viewed as an obstacle rather than enabling the division of tasks for an optimal management of port activities.

The services still managed by P.A. are those mentioned in the law - maintenance of the common areas, safety control, water taking - as well as some operational functions still maintained by the P.A. (as in Trieste, where it manages, for example, the railway service), which are being assigned.

The marketing and promotion functions are usually left by the private operators to the P.A., and sometimes these (as in the case of La Spezia and Naples) leave them to external bodies. However, private operators consider them quite unnecessary, since the maritime sector is made up of a small

number of operators and direct contacts are more profitable than, for instance, advertising; according to their annual budgets, in fact, investments destined for lectures and trips are greater than those for press advertisement and brochure distribution. In fact, an annual budget (of a private firm) of 30 million liras for promotion is considered a major investment.

Microeconomic aspects, running costs of terminals and costs for users

A first distinction to be made is between terminals aiming mostly at specialization or at global competition. Of all ports considered in the survey, only Gioia Tauro is strongly specialized in the container sector; all the others also include passenger and bulk terminals. Among terminals examined, some are specialized in container movements (SECH, VTE, Contship, Darsena Toscana) and some are multi-purpose (Co.Na.Te.Co., Flavio Gioia, Salerno, Sapir).

The level of standard tariff is similar in all the ports considered; but the actual tariff depends on the kind of service that clients ask. Of more importance is the fact that in a few years the level of tariffs has strongly decreased (around 1/3 below past figures) as the consequence of new entries on the market (VTE and Gioia Tauro), better equipped with reference to old competitors. Differences exist in the amount paid to the P.A. for concessions.

A common feature of all terminals considered is the irrelevance of the time spent by the ships waiting at the berth; only Leghorn records some problems due to the high number of ships, especially passenger ferries, congesting the port dock; while in Gioia Tauro delays rise when the scheduled time of feeder ships and mother ships (normally calling at the port on alternate days) are not respected.

Delays on the sea side are not so important as delays on the land side. In fact, in almost all terminals the arrival/forwarding of vehicles is not fluid and sometimes it gives rise to congestion costs that could be overcome with the development of telematic systems, currently on the agenda of all P.A. and terminal operators.

However, almost useless is the calculation of the profit or loss for handled container for the fact that many of the social bodies considered by the survey have been operating for only a few years (many closed their first budget in 1997). Generally, the first years of activity of a terminal are closed with high, albeit decreasing, losses caused by the size of the investments in terms of superstructures, software, hardware, personal training, etc. - which necessarily must be prepared in advance with regard to demand; it is the case, for instance, of VTE which closed the 1995 and 1996 budget with losses, respectively, of about 2.5 and 1 billion of liras. Different is the situation of those operating on the market for a longer period: SECH recorded a profit in 1996 corresponding to 800 millions of liras; Contship closed 1995 with almost three billion of profit (completely reinvested in the terminal of Gioia Tauro); Sapir had a profit of 5 billions of liras for 1996, expected to be lower in 1997.

The probable explanation of this course of the budget results, could lie in the fact that the cost born by a port terminal - and in particular by container terminals, specialized and highly capital intensive - behave as fixed costs, therefore with significant possibilities of exploiting economies of scale.

Competition and market forms

With the exception of the two bigger ports (Gioia Tauro and Genoa), all the terminal operators and the P.A. (or, by defect, the "Capitanerie di Porto") interviewed, consider as their main competitors the nearest ports/terminals. So that for La Spezia the principal competitor, the most feared, is Genoa; for Leghorn it is Genoa; for Naples it is Salerno; for Ravenna it is Venice; for Venice it is Trieste and, finally, Trieste's main rival is Venice.

Different is the situation for what concerns Gioia Tauro as a transshipment port operating in a different market where the principal actors are Malta, Pireo, Algeciras and Damietta. Within the Mediterranean transshipment market, Gioia Tauro has conquered in two years the supremacy; in fact,

according to provisional data, relative to 1997, in the Calabrian port over a million and 400,000 teus have been handled, around one hundred more than the most aggressive competitor: Algeciras.

This does not mean that the activities carried out by Gioia Tauro do not concern the other Italian ports and do not have repercussions on them. On the contrary. The beginning of operations in the Calabrian port has in fact determined two types of consequences. Negative ones for the principal Tirrenian national ports of destination (La Spezia and Genoa), which have seen their number of calls by Italian ships fall and replaced by feeders of minor dimensions. All the other national ports have had only positive effects, determined essentially by the creation of feeder services of connection between the small ports, above all on the Adriatic (but also from La Spezia, Leghorn and Civitavecchia) and the Calabrian hub call; a great number of the persons interviewed affirmed that the greatest worth of the Gioia Tauro is that of having "repopulated" the Italian seas.

Still it has to be underlined that the strong development of feeder services covering also relatively short distances is due to the particular situation of weakness of the Italian land infrastructural system, particularly railways. In fact, the interviewed terminal operators consider the railway connections one of the most critical elements for the development of the users of the Italian ports. From the interviews carried out, a problem of connection to the network does not emerge (all terminals evaluated have a direct connection, always considered to be of adequate dimensions, with the exception of the Genoa terminal operators); what does is the lack of reliability and ability in dispatching over the alpine passes. Concerning the port connections with the railway network, the terminal operators interviewed estimate them as insufficient to face the demand of railway transport that the different container terminals will express within the next ten years.

In ports defined as "middle" a further point of weakness is represented by the absence of spaces as a result of the increase of production: it is the case of the Neapolitan terminals and of that of Salerno, while Leghorn does not require additional spaces having started its activity in 1997, therefore still being far from the limits of operational ability. The space factor in the bigger ports does not represent a problem - with the only exception of the Genoa terminal of SECH -, VTE has planned to realize a Distripark of 75,000 square meters, La Spezia has presently some vacant space (since a major operator has just moved to Genoa) and Gioia Tauro still does not operate at full rhythm.

An interesting aspect concerning the form of market in which the Italian container terminals operate concerns competition. From the nine ports considered, in those of Genoa (SECH and VTE), Leghorn (Darsena Toscana and Sintermar), Naples (CoNaTeCo and Flavio Gioia) two terminals exist, and in Salerno four, that handle exclusively or prevalently containers, but only those in Genoa and Naples operate between them in competition. In the other ports, on the contrary, a form of collaboration exists: for instance, in Leghorn the job is separated in agreement between the terminals, while in Salerno the four terminals operate on a single dock without any division of the operational areas, each one using - upon agreement with the others - the approach adjusted to the demands of that particular moment.

THE ROLE FOR CONCENTRATION

The trend towards horizontal and vertical concentration, dominating maritime transport over the last few years, strongly affects port terminal operators.

The survey of Italian container terminals shows that the horizontal concentration has been taking place over recent years, and is likely to go on. The survey also points out some possible reasons for this trend:

- the lack of experience of Italian terminal operators (not only in container traffic) causes high economic risks;

- the reconversion of terminal operators implies the need for huge investments for the modernization of infrastructures and equipment, and this in turn implies the need for large amounts of capital and the consequent entry of new partners in the company;
- the opportunity to exploit the development of transshipment through the control over both hub and feeder ports.

Despite the present ferment of these horizontal concentrations, they are not seen by operators as strategic as vertical concentrations are, some of which begin to occur in major Italian container terminals (for example, Eurokai owns a significant share of Contship, which in turn controls terminals of La Spezia and Gioia Tauro, besides Savona and Salerno). The interest of port operators for vertical concentrations is due to the opportunity to increase their total market share and to increase their profits through economies of scale. Nevertheless, the well established trend towards horizontal concentration in intermodal transport and namely in maritime container traffic, with the constitution of several kinds of consortia, joint ventures and agreements, is meanwhile changing the market of port facilities in to a kind of oligopsony where the number of sellers is greater than the number of buyers. This seriously threaten to reduce the contractual power of port operators and eventually to reduce fares (all the operators interviewed agree that fares are at present very low and homogenous, as it is to be expected in an oligopsony) and profits.

It can thus be argued that the long-term trend might be well towards a strong vertical concentration, which is towards a growing number of intermodal companies and groups able to manage directly the entire door-to-door transport cycle, including the port node. So as to be able to fully exploit all the economies of scale of the intermodal chain. It must be stressed, as far as vertical concentrations are concerned, that the attitude of P.A. is one of absolutely impartiality towards the entry of foreign groups, since they are only interested in the total amount of planned investments, in throughput forecasts and in employment opportunities guaranteed by any potential newcomer.

SOME COMMENTS ON EMERGING TRENDS

The survey evidences some major trend emerging in the container terminal facilities market. Technological and management innovations in transport, and namely in inland transport, have induced increasing overlaps between potential market areas of ports, each of them is lesser and lesser protected by the geographical distance from competitors (since it no longer represents a cost, or this cost is now significantly reduced). This obviously increases the degree of competition between ports, and this loss of monopoly in turn causes such effects as:

- reduction and levelling of fares, reduction of profits and producer's surplus;
- increase in consumer's surplus; but since transport demand is a derived demand, this surplus is not necessarily transferred to the final consumer (the owner of goods) with goods, being possibly held by the forwarders or the shipowners or the intermodal operators, who have some degree of oligopoly in their own market;
- increase in service quality (in terms of throughput rates and reliability);
- global increase in quantity of service (i.e. global increase in traffic);
- increase in supplied capacity, and probable overcapacity.

From the point of view of throughput rates, it can be observed that:

- as far as handling times are concerned, technological innovations heavily reduced handling time and ship stops in ports; nevertheless, it should be considered that a reduced ratio between port times and handled quantity is made possible by highly capital intensive and land intensive

technologies: thus, a trade off is required between a capital factor (the ship) and other ones (port equipment and land) which are owned or managed by completely different economic actors, which consequently implies a shift in the global cost of port facilities;

- queuing times for ships have been dramatically reduced, if not cancelled, because of the above mentioned overcapacity due to the increase in competition between ports;
- inland transport queuing times are still critical in Italian ports, namely for road transport, mainly because of a poor level of connections of port terminals with inland transport networks, with frequent crossing of urban traffic, congestion of the node, etc., and a slow accomplishment of bureaucratic and custom procedures, usually not supported by information technologies.

The emerging trends that have been just summarized also have more general and long term effects, enhancing the push for the globalization of the world economy: this is the ultimate consequence of reduction in overall transport costs, and of consequent international specialization, increase in economies of scale, and in international trade. Nevertheless, it should not be forgotten that potential benefits of competition in port facilities market are possibly held back: by the defence of monopolies and/or privileges previously enjoyed by port labour or other categories of port operators, and by increases in profits of port facilities users, who normally face in their own market a lower degree of competition than port terminal operators do, so that a share of the surplus is not transferred to the final user. Furthermore, it should also be noted that most innovations having occurred in port operations have caused shifts in production costs from internal costs to externalities, and - within the internal costs - from labour costs to capital costs.

As far as the shift from internal to external costs is concerned, it is well known that - except for Ro-Ro - all technological innovation deriving from specialization in transport chains or in loading-unloading, obviously including containerization, have caused dramatic increases in rates of throughput but also a greater rigidity in land use. Containerization namely requires much wider spaces, which implies a much higher demand for a production factor which is usually particularly scarce in port areas and regions. Besides, the increased competition and the consequent overcapacity determine a further increase in the ratio space/throughput. Moreover, the enhancement of transshipment, while reducing the overall cost of maritime transport, has multiplied the phases of handling and stocking, thus the overall space requirement per cargo unit. It must be added that the space required by port activities is usually high-valued, because of its opportunity-cost, since it is normally an urban space and/or environmentally valuable. Congestion, pollution and noise enhance the set of external costs deriving from port to the socio-economic system (Musso, 1996).

The result is that in port facilities production a significant redistribution occurring from internal costs to external costs is born by the whole socio-economic community of port cities and regions. This trend should be taken into consideration for future port policies, namely through a higher attention to port planning, in order to minimize congestion for urban transport systems and pollution deriving from port related activities, and a greater or total autonomy of ports from central government, for both (a) finance and investment in port infrastructure and connection with inland networks, and (b) taxation on port activities, as well as in the appointment of P.A. presidents; in order that each local socio-economic system is made able to choose its level of involvement in port activities.

As far as the shift from labour to capital costs is concerned, it is well known that in all kinds of handling activities technological change has been strongly labour saving, more than in most other industries. For example, employment in the port of Genoa collapsed from 8,513 in 1983 (all employed in the public port company) to 2,179 in 1995 (half of which working in private companies). Technological innovation also require growing investments in specialized infrastructures, plants and equipment for cargo operations. The financial efforts and high risks connected to these investments have played a key role in the above mentioned concentration process. From the former public management of terminals, the 1994 Port Act led first to the private management of some major terminals, run by a few companies or even families already involved in other shipping businesses, and is presently leading to a quick evolution towards a situation where

most significant terminals are controlled by major international companies or groups, and control a number of smaller terminals in Italy. Moreover, growing investments and economies of scale required by the high degree of competition also give rise to a vertical concentration, and some major Italian container terminals are being controlled by international maritime or internodal operators. It might be observed that the war between port terminal operators and transport operators is being won by the latter, since the same technical and economic change pushed port facilities markets towards a growing degree of concentration: this means that transport operators are able to contest the surplus previously enjoyed by formerly monopolistic ports, and are eventually able to "buy" significant port nodes in order to absorb their revenues and to increase economies of scale and of scope.

SOME POSSIBLE FUTURE TRENDS

The survey also allow a few observations concerning some possible future trends for the container terminal industry. In recent years two major events have occurred in Italian ports: the Port Act (1994) and the opening of the port of Gioia Tauro. Both have had positive consequences on the total container throughput for Italian ports, also as a result of the increase in world container traffic.

So far, almost all ports (except for La Spezia) have taken advantage from these changes, also because the starting point was so low that things could hardly have got worse, but favourable consequences for all ports and terminals are unlikely to go on for a long time. For example, it is largely thought that a further growth of seaborne transport over the next few years might lead to a decline of transshipment, since every single route will easily approach the optimal size of ship, without grouping several final destination (origins), so that ships should come back to call ports closer to final destinations (origins). This might bring a decline mainly in transshipment ports not located on the continent, and a traffic increase for ports located near to great market areas and industrial areas. Competition should be based on the economic distance from these areas, which is on the efficacy of inland transport.

Another relevant topic is that horizontal concentration between terminals located in the same area, together with a higher degree of co-operation between P.A. (namely for functions with relevant economies of scale, such as marketing, telematics, staff training), could give new incentives for port systems, already projected by national General Transport Programme of 1980. While these should have been imposed (and were never set up), they might have more chances now, since they come straight from the rapidly changing requirements of port terminal operators.

ACKNOWLEDGEMENTS

The authors thank Miss Federica Flamminio for useful help in collecting data. 2nd, 3rd, 4th, 5th paragraphs should be attributed to Ugo Marchese, while 1st, 6th, 7th, 8th, 11th to Enrico Musso and 9th, 10th, 12th to Claudio Ferrari.

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