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d	minimum percentage of the market area sales to be given to one truck carrier.
e	maximum percentage of the market area sales to be given to one truck carrier.
k	constant, whose value is bigger than the sum of destinations j is.
f_{nij}	minimum technical capacity for the truck carrier n to operate from source i to destination j.
g_{nij}	maximum technical capacity for the truck carrier n to operate from source i to destination j.
n	truck carriers, $n = 1, \dots, N$.
i	sources, $i = 1, \dots, I$.
j	destinations, $j = 1, \dots, J$.

Appendix 2

The overall performance of truck carrier n derived by the owner of the material flow

TRUCK CARRIER	DESTINATION				
	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
Carrier 1	0,52	0,47	0,51	0,43	0,50
Carrier 2	0,48	0,51	0,54	0,48	0,48
Carrier 3	0,51	0,42	0,44	0,47	0,42
Carrier 4	0,35	0,54	0,39	0,51	0,39
Carrier 5	0,55	0,36	0,48	0,39	0,52

Transportation costs \$ of truck carriers from plant 1 to market area j

TRUCK CARRIER	DESTINATION				
	Market Area 1	Market Area 2	Market Area 3	Market Area 4	Market Area 5
Carrier 1	740	430	650	380	540
Carrier 2	730	425	665	375	545
Carrier 3	710	400	600	360	535
Carrier 4	700	460	620	350	530
Carrier 5	705	470	615	365	525

Alliances in Liner Shipping: an Instrument to Gain Operational Efficiency or Supply Chain Integration?

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ABSTRACT This paper explores how shipping lines are responding to the changing environment, with particular reference to the diffusion of a supply chain management view, by using alliances. It reports the results of a survey conducted on a sample of alliances concluded by a number of firms in recent years. First, the implications for transportation providers with the adoption of the supply chain management approach by shippers are discussed. Then a literature review on the key driving forces effecting shipping line alliances is presented.

The findings of this indicate that most of the alliances examined are concentrated in the maritime transport phase rather than in inland transport and logistics services activities. They chiefly achieve objectives of internal efficiency and meet user logistical needs specifically in supplying higher service frequency and broader geographical coverage. Several implications for shipping line alliance strategies and supply chain management are suggested.

Introduction

In the last few years, the academic literature and business press has emphasised on several occasions that the increase in alliances formed by shipping lines is one of the most interesting phenomena characterising the containerised maritime transport sector during the 1990s.

Traditionally, co-operation in the container shipping sector had the chief objective of maintaining freight rates at a level able to guarantee investment profitability. Hence, for many years, co-operative relations among lines concerned the creation of consortia (Breitzmann, 1991). However, the recent trend in alliances involving shipping lines is characterised by the sharing of

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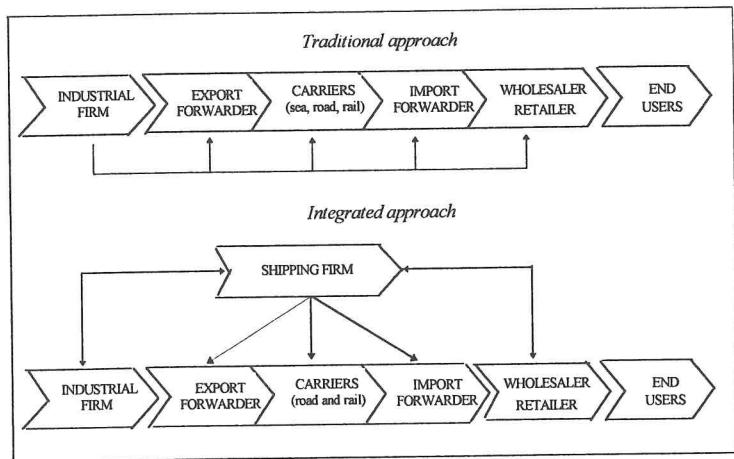


FIGURE 1. From Traditional to Integrated Approach of Shipping Lines in the Supply Chain.

an increasing number of activities, achieving faster market expansion, gaining access to supplementary expertise.

The diffusion of such alliances should be interpreted in relation to two main factors of change which are effecting the sector. First, the strategic choices of shipping lines has tended towards the limitation of economic and financial risk connected with the huge growth in investment. Secondly, there is a growing importance of logistics to shippers (manufacturers and retailers) which, together with the rise of the concept of outsourcing, underlies the diffusion of the supply chain management philosophy. Together, these factors impose on shipping lines a progressive extension of business from providing an undifferentiated port-to-port service, to providing more complex service packages.

It may be argued that such a process develops along a path of gradual integration of shipping lines in the supply chain, achieved by the creation of alliances which, compared with other strategic options (mergers, acquisitions and internal growth), allow shipping lines to acquire new capabilities without incurring high costs (see Figure 1).

The objective of this study is to ascertain to what extent the use of alliances on the part of shipping companies is designed to increase the degree of integration in the supply chain by providing ever greater customer-oriented logistics services or improving the efficiency of traditional services. In order to do this, a database was constructed which logged inter-firm agreements reported by the specialised press between 1990 and 1998.

The paper is structured as follows: the next section discusses some implications for transport service providers resulting from the widespread adoption of the supply chain management approach. Then a review of the literature on the driving forces resulting in container shipping alliances is discussed. Subsequently, the methodology and results of the survey are presented. Finally, the paper concludes with a discussion of the implications

of the survey results for shipping line alliance strategies and supply chain management.

Supply chain management and effects on transportation providers

According to Christopher (1992) "leading edge companies have realised that the real competition is not company against company, but rather supply chain against supply chain". Supply chain management has been defined as "an integrative philosophy to manage the total flow of a channel from earliest supplier of raw material to the ultimate customer, and beyond, including the disposal process" (Cooper, *et al.*, 1997) and it is based on the following three ideas: effective purchasing and distribution, a focus on long term relationships between trading partners and the operational integration of trading organisation (New, 1996). This means that firms are increasingly adopting a supply chain approach as a new way to integrate their own operations and to extend this integration to their supply chain partners. Co-ordination among the various actors in the supply chain is thus an important prerequisite in order to achieve competitive advantage (Womack *et al.*, 1990). Such co-ordination requires a high degree of organisational integration between the manufacturer and their network of product and service suppliers (Lamming, 1993; Hines, 1994).

Stevens (1989) has described a useful model for identifying the steps needed to attain a totally integrated supply chain. This model allows for the transition from an initial phase of complete functional autonomy within the firm (baseline organisation) to a final phase in which the firm extends the level of integration achieved with suppliers and customers (externally integrating company). In this phase, gaining competitive advantage no longer depends exclusively on the level of integration within the firm itself, but rather on exploiting the advantages derived from integrating suppliers (of goods and services) and continuous improvements in quality, cost and delivery.

Adoption of the supply chain management approach thus appears to have many implications for transportation providers. Firstly, integration processes started by shippers affect, at least in the initial phase, the re-engineering of physical and material flows with considerable consequences for logistics and transportation management. Secondly, for shippers the delivery system has become an integral part of the supplied product, to the point that transportation and logistics receive the same evaluation as the product itself (Kleinsorge *et al.*, 1991). Hence transportation providers play a more important role than in the past insofar as they are entrusted with the task of co-ordinating and accelerating physical and information flows along multiple levels of the supply chain and of making the whole logistical system more efficient and flexible in responding to swift market changes (Cooper *et al.*, 1998).

Thirdly, restructuring the supply system forces shippers to outsource significant parts of their logistical activities, as well as select and reduce the number of firms with which to establish long-term favoured relations for supplying "tailor-made" logistics and transportation services. Moreover, after the recent restructuring which has occurred in the transportation

market, "further transportation cost reductions cannot come from lowering carriers' prices but from better engineering of shippers' logistics systems" (Sheffi, 1990). This leads transportation providers to implement one-stop shopping strategies to extend their range of services in order to provide total transportation and logistics services (Semeijn, Vallenga, 1995). In this perspective, these companies are gradually transforming the scope and characteristics of their services. Service supply is no longer limited merely to transportation, handling, storage and warehousing, but also cover other services which are now perceived to be of critical importance such as less-than-truckload (LTL), packaging and unpackaging, payment and invoicing, delays, communications, documentation and inventory control.

Initially, transportation providers tend to consolidate their position within their own sector. In a subsequent phase, they seek to extend their control and co-ordination of physical and information flows along the whole transport chain through the creation of alliances with other transportation providers. This allows transportation companies to assume responsibility for the whole cycle of integrated door-to-door transport. Ultimately they are able to provide shippers with more complex logistics service packages under agreements concluded with specialised providers, finally taking on the role of global third-party logistics providers.

In the end, widespread adoption of the supply chain view has resulted in changes in relationships between transportation providers and other participants in the supply chain in two main directions. Firstly, these changes are reflected in the diffusion of alliances, partnerships, mergers and acquisitions. Secondly, the development and promotion of new types of third party providers is also clear evidence of these changing relationships (Thomchick *et al.*, 1998).

Alliances in liner shipping: a literature review

What are the driving forces affecting alliances in the liner market and what is their impact on the industry and its customers? The literature supplies no single answer but two main approaches may be distinguished.

The first is based on the transport literature and tends to explain the phenomenon of alliances by identifying a series of causes which chiefly originate within the sector itself. This body of literature views alliances as the strategic response of shipping lines to the intensification of intra-sectoral competition due to a series of factors such as freight rate, which is mainly exogenous and in constant decline, technology developments, exponential growth in investments, increasing deregulation, loss of power on the part of conferences, and the emergence of south-east Asian lines in the international competitive scenario (Ferrara, 1989; Slack *et al.*, 1996; Stopford, 1997; Gardiner, 1997).

These agreements may cover only the maritime-port phase or may tend towards inter-modality (agreements with road and/or rail transport firms and, less commonly, with airlines), leading shipping lines to integrate along the whole transport chain, that is the three main constituent parts of sea transport, transhipment and hinterland transport (Meersman, Van de Voorde, 1996).

In the first case, such agreements chiefly aim to optimise internal capacity and reduce service production costs by achieving significant economies of scale (Marchese, 1997). In the second case, the conclusion of agreements with port terminals and other transport service suppliers allows shipping lines to achieve significant advantages in terms of service differentiation (Graham, 1998) and at the same time represents a condition for achieving economies of scale in the shipping phase (Genco, 1995).

The increasing implementation of such non-competitive strategies thus appears to represent the most advanced stage of development of shipping lines within the context of an external growth pathway which often, albeit with entirely particular characteristics, may give rise to mergers (P&O-Nedlloyd) or acquisitions (NOL-APL). In the end, this process results in increasing sectoral concentration and the emergence of global mega-carriers which combine their respective assets and are thus able to compete effectively both in extending their geographical coverage, and by activating more frequent services with high-capacity ships whose high purchase price is often shared among the parties to the agreement. According to this approach, the diffusion of strategic alliances (as well as mergers and acquisitions) is an efficient way to reduce competitive pressure within the sector, allowing the firms in question both to concentrate their resources on internal company functions and to optimise the whole transport cycle, rationalising their own multi-modal transport chain.

The above interpretation of alliances among shipping lines implies an asymmetric view of the liner market in favour of the supply point of view. Sletmo and Holste (1994) questioned such an approach, pointing out that in the course of the last few years the role of shippers (manufacturers and retailers) has undergone profound changes due to the internationalisation which such firms have reached as well as the know-how that they have built up.

Furthermore, during the same period, due to a series of changes such as: the globalisation of business, the implementation of JIT strategies, time-based competition, the rise in importance of customer service, the industrial relocation and outsourcing of non-strategic activities, a growing number of manufacturers are adopting a supply chain management approach to guide business operations (Scott, Westbrook, 1991).

The emphasis on supply chain management underpins a series of recent contributions which, without refuting the transport approach, have highlighted the importance of alliances in explaining the development strategies of shipping lines. Among the driving forces which lead shipping lines to form strategic alliances, apart from industry regulatory factors, Brooks *et al.* (1993) have identified the increasing trend towards the globalisation of production and markets, as well as technological developments. Though chiefly describing alliances that take place within the container transport industry, the latter contribution recognises the importance of integration through alliances between shipping lines and other providers of logistical and transportation services in the delivery channel to provide an integrated door-to-door service.

Along the same lines, Heaver (1994) stressed that "... liner shipping has been moving from an operations oriented focus to a more market driven

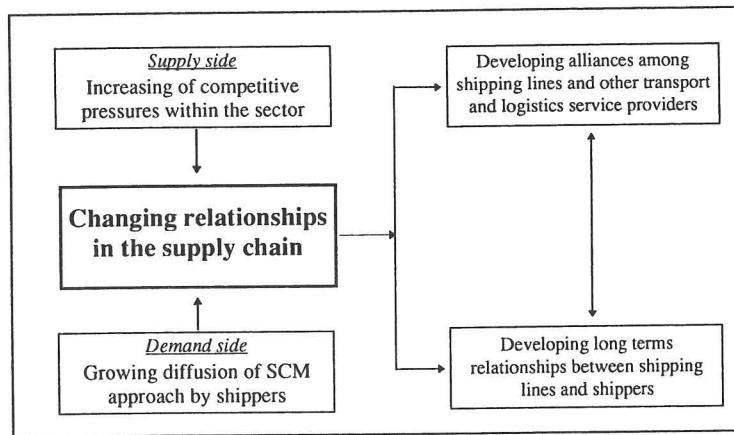


FIGURE 2. Driving Forces and Changing Relationships Among Shipping Lines and Other Participants in the Supply Chain.

focus". After examining the various types of alliances in shipping and in air transport, he analyses the implications of the shippers' needs for logistic services on conferences, consortia and other alliances in the sector. In a subsequent study Heaver (1996) showed that shipping lines was extending services beyond just shipping to provide door-to-door service. He argues that shipping lines may achieve this objective by means of direct control or by developing alliances with local suppliers. Moreover, referring to a series of case-studies the author underlined the greater efforts made by shipping lines compared with airlines, "to position themselves as logistics suppliers and supply-chain managers".

Other studies have shown that the development of strategic alliances on the part of shipping lines appears to represent one of the strategic options to achieve the status of true third party logistics provider (Drewry, 1991; Van Laarhoven, Sharman, 1994; Brown, 1996; Peters *et al.*, 1998;) or the so-called mega-carrier (Cooper *et al.*, 1994). Consequently, these firms may have engaged in alliances with other suppliers of transportation and logistical services operating in the supply chain to create vertically integrated logistics services which greatly simplifies the shipper's decision to use an outsourced logistics solution.

The driving forces analysed by the two lines of research considered above are summarised in Figure 2.

Due to the marked development of alliances in the containerised transport market in recent years, a series of investigations has been carried out in order to extend knowledge of non-competitive relations between firms operating in the sector. Nonetheless, the information available about these alliances is still scant and fragmented due to the lack of systematically conducted surveys. Investigations have chiefly been based upon case-studies concerning the operations and strategies of the main international shipping lines (Brooks *et al.*, 1993; Barrier, Gugenheim, 1990; Barrier, Gugenheim, 1992; Gardiner, 1997), the only ones for which comprehensive information has

been made widely available both from primary sources (the lines themselves) and from secondary sources (specialised press). In order to fill this gap and to provide a descriptive model of the various forms of alliances implemented by shipping lines, the authors (Evangelista and Morvillo, 1997) carried out a survey on a sample of alliances using the following methodology.

Alliances in the container shipping sector: results of the empirical survey

Methodology

The methodology used in this work consisted in creating a database that includes all formal alliances reported in the Lloyd's List Archive from 1990 to the first six months of 1998. Only alliances that were bound by some type of definitive agreements were considered in the survey, while preliminary agreements, letters of intent and informal understandings were not included.

For each of the agreement considered, the following information was recorded:

- the year in which the agreement was concluded (signed)
- the names and the locations of the firms involved;
- the sector(s) in which the firm(s) operate;
- the legal form of the agreement;
- the declared functional purpose of the agreement;
- the activities involved in the partnership.

With regards to the last point, four different agreement types were considered, reflecting increasing degrees of integration. The four profiles were defined according to whether the alliances were a) only maritime activities; b) port terminal activities; c) inland transport activities (road, rail, etc.); d) logistics services more extensive than just transport. In order to assign each of the sample alliances to these categories further secondary data was sought from information from specialised journals (such as *Lloyd's Shipping Economist*, *American Shipper*, *Containerisation International*, *Transportation and Distribution*, etc.) which allowed for a more precise definition of the objectives of the registered agreements.

In total 341 alliances were selected. From the legal viewpoint, the sample in question showed a polarisation of the operations around three main categories: joint ventures, minority stakes and contractual agreements. In all, 269 contractual agreements (78.9% of total operations) and 72 equity agreements (21.1% of the total) were found.

Table 1 gives the distribution of the alliances by nationality of the first two partners. Identification of the first or second partner does not reflect a particular role played within the partnership, but is merely random. Even with this constraint, it is nonetheless possible to highlight the following aspects of the sample:

- large number of operations carried out by EU (208) and Far Eastern (125) lines;
- significant number of partnerships between firms belonging to the same geo-economic area represented by the sum of the main diagonal (44% approx.), especially involving firms in the areas mentioned above;

TABLE 1. Alliances by Nationality of the First Two Partners.

FIRST PARTNER	SECOND PARTNER						Australia	Total
	EU*	EU*	Non EU	S.E. Asia [◊]	Rest of Asia	N. America		
EU*	81	10	24	1	13	6	9	148
Non EU	14	9	5	1	1	—	2	32
S.E. Asia [◊]	15	6	41	7	9	—	—	78
Rest of Asia	7	1	7	3	—	1	—	19
N. America	13	3	9	1	5	1	—	32
C.S.America	4	1	1	—	4	3	—	13
Africa	7	1	—	—	1	1	5	15
Australia	—	—	1	—	—	1	—	4
Total	141	31	88	13	33	13	16	341

* Euro 12; [◊] Japan, Philippines, S. Korea, China, Singapore, Hong Kong, Taiwan, Vietnam. Source: IRAT-CNR Database

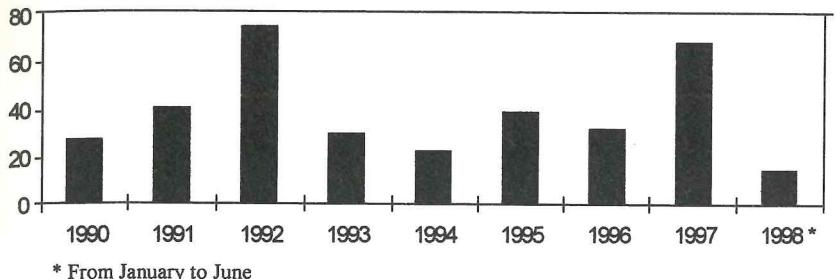


FIGURE 3. Trend in Alliances Source: IRAT-CNR database.

- high incidence of partnerships between firms of both geo-economic areas.

However, some limitations regarding the sample are worth mentioning. First, as there is no order of magnitude for the phenomenon in question, the sample may not be considered representative of all the operations conducted by firms operating in the container shipping industry. Secondly, the methodological approach adopted tends to favour the detection of operations carried out by medium-large firms rather than any operations set up by smaller firms. Lastly, the information search focused exclusively upon the conclusion of agreements since information failed agreements is not always reported by business publications.

Findings

The distribution of agreements between 1990 and 1998, illustrated in Figure 3, shows low variability, except for two peaks in 1992 (74 agreements) and 1997 (67 agreements). This may be partly explained by the fact that the sample is not statistically significant and also by two specific factors in the years in question. In particular, the peak recorded in 1992 appears linked to the completion of the liberalisation process for services within the European Union. In that year, the proportion of agreements concluded between EU lines compared with the total amounted to about 30%, a far higher percentage than that recorded in other years, especially from 1993 onwards. The figure in 1997 appears linked to the intensification of competition and the redefining of so-called "global partnerships" which will be discussed below.

Table 2 shows that the highest number of agreements (293, equal to 86% of the total) are made up of those exclusively between shipping lines involving shared arrangements within the maritime transport phase only (the column under the heading "Waterborne Transport"). With reference to the second group of agreements (the column under the heading "Port Terminal"), there are 14 agreements (4.1%) signed by lines which have begun to develop forms of co-operation to run port terminals. The third group of agreements (the "Inland Transport" column) includes 28 agreements (8.2%) regarding inland transport activities (road, rail, etc.). The last group examined (the "Logistics Service" column) reports 6 agreements which involve other wider logistical activities.

TABLE 2. Alliances by Legal Forms and Stages of Integration.

LEGAL FORM	STAGES OF INTEGRATION									
	Waterborne Transport		Port Terminal		Inland Transport		Logistics Services		Total	
	N.	%	N.	%	N.	%	N.	%	N.	%
Contr. Agreements	246	84.0	8	57.1	12	42.9	3	50.0	269	78.8
Joint Ventures	43	14.7	4	28.7	11	39.2	3	50.0	61	17.9
Minority Stakes	4	1.3	2	14.3	5	12.9	—	—	11	3.3
Total	293	85.9	14	4.1	28	8.2	6	1.8	341	100

Source: IRAT-CNR Database

From the legal standpoint, it emerges that the sample firms make use of contractual agreements particularly in relation to waterborne stage activities (84% of cases) while for other activities equity style agreements are employed either involving corporate joint-ventures or minority stakes, with a slight preference for the former. The characteristics of each of the profile will be analysed in the section below.

Alliances in the Waterborne Transport phase

Agreements between lines solely in the maritime phase vary considerably. They have been grouped into five categories, according to the increasing degree of complexity and reciprocal involvement required by the partners. As shown by Table 3, they are chiefly polarised around two types of agreements: "Space Agreements" (44.5%), involving mere space sharing on one or more ships, and "Joint Services" (48.9%), which imply a more significant commitment in terms of the intensity of relations between partners. It is also worth noting that a Joint Service Agreement is not incompatible with the other types considered, which often represent the approach used to bring it about.

Although all the Joint Service Agreements pursue the same basic objective—that is, the achievement of economies of scale by rationalising the utilisation of space on board and sharing of some assets—two different strategic behaviours, linked to different cultural and managerial approaches to co-operation, may be identified.

The first implies a traditional managerial attitude which leads to a low level of involvement in the partnership. This limited propensity to integration with the partner firm emerges clearly from the characteristics of such agreements, amongst which:

- the lines tend to develop co-operative relations with a single partner (one-to-one agreements) or with few partners for each shipping line in question;
- the geographical spread of such agreements is limited only to the shipping lane involved;

TABLE 3. Alliances in Waterborne Phase by Legal Form and Nature of Partnership

LEGAL FORM	NATURE OF PARTNERSHIP					
	Joint Scheduling	Space Agreements*	Joint Services	Cost and Investment Sharing [◊]	Joint Marketing Activities [◊]	Total
Contr. Agreements	4	126	110	3	3	246
Joint Ventures	3	5	31	—	4	43
Minority Stakes	—	—	2	—	2	4
Total	7	131	143	3	9	293

* includes: Slot Charter Agreement and Vessel Sharing Agreement;

[◊] includes: Joint Vessel Purchasing and Pooling Agreement or Cost Pooling;

[◊] includes: Agency Marketing Agreement and Marketing Network Sharing Agreement.

Source: IRAT-CNR Database

- the duration of such agreements is very short;
- this alliances does not cover either marketing or human resource management.

The latter more strategic behaviour has only recently become widespread, since the start of the 1990s. Although the number of agreements displaying such behavioural characteristics is appreciable, they may be attributed to four main "coalitions" which involve the world's leading shipping lines¹. They are characterised by a greater breadth of objectives. Besides aiming to achieve greater economies of scale and rationalising the use of investments, such agreements tend:

- to provide a higher level of service through wider port coverage, higher service frequency, shorter transit times;
- to cover increasingly huge financial resources which are required to provide a containerised trans-ocean liner service and off-set similarly increasing risks regarding profitability and the recovery of capital invested;
- to incur lower running costs and acquire stronger contractual power in purchasing services from terminal operators, container depot operators and inland transportation carriers when the latters' services are jointly purchased.

Despite recent modifications to the composition of some alliances, there are several distinctive features which do not appear to have been discussed. They may be summarised as follows:

- long duration (from 7 to 10 years);
- participation of several lines;
- broad geographical spread insofar as such agreements tend to cover the world's main trade lanes;
- cooperation between partners is no longer concerned with just the ship-

ping phase but increasingly tends to extend to a broader portfolio of activities.

Besides entailing a radical restructuring process of the sector characterised by growing concentration levels, this last trend is very notable due to its connection with the widespread integration of shipping in the supply chain. Although such coalitions currently tend to extend their range of action from the joint use of space to all non-vessel operations including inter-modal link operations with land transport (both road and rail), in a subsequent stage, the firms which take part in such agreements—as formally indicated in the signed agreements—could further extend their control over other strategic activities involving logistical value added services.

Alliances in Port/Terminal and Inland Transport Activities

Alliances in port/terminal and inland transport activities involve lines which have started integration processes along the transport chain. These processes respond to the two-fold objective of improving the internal efficiency of the shipping lines by *controlling the phases upstream and downstream* of the waterborne phase and, at the same time, responding to shippers' needs by providing JIT-transport services characterised by speed, reliability and tailor-made logistics, without being forced to provide other logistics services themselves. Pursuit of such objectives entails not only reducing costs, but also significantly effects flexibility in providing transport services.

Despite the frequent large size of the firms participating in such agreements—which would allow them to avail themselves of the necessary resources from a choice of *internal development*—the firms in question find it advantageous to develop co-operation strategies aiming to create integrated networks with different transportation links and nodes, at the same time reducing economic and financial risk. On the other hand, cooperative *external development* may be achieved through an equity stake, also of a considerable size.

As shown by Table 2, there are significantly more contractual agreements in operations covering port terminal activities (57.1%) than those recorded for operations focusing on inland and transport activities (approx. 43%). In the latter case, it is worth noting the weight of joint ventures, equivalent to about 40% of the total. The breakdown of the operations belonging to each of the two types into homogeneous groupings allows greater in-depth analysis.

In the context of port terminal agreements (Table 4), contractual agreements are preponderant (85% approx.) in relation to equipment sharing operations, while equity agreements are more commonly used in joint terminal investment operations (63% approx.). As regards inland transport operations (Table 5), equity agreements assume importance both in rail transport services (56%) and in services indicated as "others" (67%), while for road transport services the favoured form is the contractual agreement (75%).

It is interesting to note that, in the context of inland transport operations, rail transport services account for about 65%. This is explained by the

TABLE 4. Alliances in Port and Terminal Activities by Legal Form.

LEGAL FORM	PORT-TERMINAL ACTIVITIES					
	Equipment Sharing*		Joint Terminal Investments		Total	
	N.	%	N.	%	N.	%
Contr. Agreements	5	83.3	3	37.5	8	57.1
Joint Ventures	—	—	4	5.0	4	28.6
Minority Stakes	1	16.7	1	12.5	2	14.3
Total	6	43.0	8	57.0	14	100

* includes: Equipment Sharing Agreement, Chassis Sharing Agreement, Use of the Same Third Party Terminals, Use of the Partners' Terminals, Joint Terminal Processes and Terminal Lease Agreements.

Source: IRAT-CNR Database

TABLE 5. Alliances in Inland Transport Activities by Legal Form.

LEGAL FORM	INLAND TRANSPORT ACTIVITIES							
	Rail		Road		Other Services*		Total	
	N.	%	N.	%	N.	%	N.	%
Contr. Agreements	8	44.4	3	75.0	1	16.7	12	42.8
Joint Ventures	7	38.9	—	—	4	66.7	11	39.3
Minority Stakes	3	16.7	1	25.0	1	16.7	5	17.9
Total	18	64.3	4	14.3	6	21.4	28	100

* includes: Joint Container Yards, Equipment Interchange, Maintenance and Repair, Equipment Specification and Purchasing, Joint Operations Centres/Tracking Systems.

Source: IRAT-CNR Database

increasing tendency of shipping lines to organise their own dedicated rail services directly, so as to attract large traffic volumes into their own homeports. For example, consider the cases of the European Rail Shuttles (joint venture between Holland Rail Container, Sea-Land, Maersk, P&O and Nedlloyd) which organises dedicated trains exclusively to and from Rotterdam and NDX Inter-modal (joint venture between the German railways, Dutch railways and CSX Corp., holding company of the Sea-Land Service).

As indicated in Table 6, although the alliances in question are frequently between shipping lines (approx. 43%), firms belonging to other segments of the transport chain are being increasingly involved (about 57%). The occurrence of partnerships between shipping lines shows the same percentage (43%) both for terminal operations and for inland transport activities.

Examination of the disaggregated data also shows that the presence of non-liner partners is still more significant in cases of equipment sharing (about 67%), rail (61%) and road services (75%).

TABLE 6. Alliances for Terminal and Inland Transport Activities by Partner's Activity

2 ND PARTNER'S ACTIVITY	NATURE OF PARTNERSHIP						
	Port Terminal			Inland			
	Equipment Sharing*	Joint Term Investments	Total	Rail	Road	Other Services [†]	Total
Shipping Line	2	4	6	7	1	4	12
Other firms	4	4	8	11	3	2	16
Total	6	8	14	18	4	6	28

* includes: Equipment Sharing Agreement, Chassis Sharing Agreement, Use of the Same Third Party Terminals, Use of the Partners' Terminals, Joint Terminal Processes and Terminal Lease Agreements;

† includes: Joint Container Yards, Equipment Interchange, Maintenance and Repair, Equipment Specification and Purchasing, Joint Operations Centres/Tracking Systems.

Source: IRAT-CNR Database

Alliances in activities beyond the transportation phase

Analysis of such alliances, although few in number, shows several common features which are worth emphasising. More generally, the small number of alliances detected leads us to hypothesise a low propensity to use alliances as an instrument to overcome sectoral barriers and thus to initiate appreciable differentiation processes for services provided.

Detailed analysis of the alliances in question showed a certain homogeneity as regards the activities covered by the partnership, the geographical range and the type of partner involved. The activities in question mainly include those related to physical distribution, while the geographical range of all operations is strictly local. This also reflects on the choice of partner, which is generally a non-maritime operator with strong ties to the area in question. This allows the firm to enter the market rapidly, exploiting knowledge of the market itself and the local structure of the logistics and transport system.

Summary and Implications

This study aims to ascertain to what extent alliances are used to extend the range of services provided (door-to-door transportation and value added services) by increasing integration along the supply chain or to improve the efficiency of traditional waterborne transportation services. It is based on an empirical survey conducted on a sample of alliances formed by shipping lines in the last few years. An analysis was made of the activities covered by the alliances and their positioning in the transport chain and subsequently in the supply of specialised logistics services phase.

The most significant findings emerging from the survey regards the high concentration of alliances in the maritime phase as well as the extremely

limited occurrence of alliances oriented towards inter-modal integration and those concerning wider logistical services. The most common aim of alliances in the maritime phase is to rationalise the use of space on board, while alliances aiming to share marketing and human resources play a marginal role. The latter aspect may almost certainly be ascribed to the immediate perception of the benefits of sharing those activities which allow great economies of scale to be achieved.

The marginal role played by human and marketing in partnership choices can be explained in two ways. Firstly, sharing of such activities does not allow significant economies of scale; secondly, partnership in distribution networks could compromise immediate identification between the company name and the service.

As regards alliances involving land transport, those concerning rail transport are clearly predominant; this may be explained by the increasing trend on the part of shipping lines to organise directly their own dedicated rail services in order to attract large traffic volumes into their *homeports*.

Although there are extremely few alliances covering operations beyond the transport phase, we may hypothesise a low propensity towards using alliances as instruments to overcome sectoral boundaries and thus initiate appreciable differentiation processes in services provided.

On the basis of our survey findings, it appears clear that a great deal remains to be done if shipping lines intend to extend their services beyond transport and become global logistics suppliers. Analysis has shown that the shipping lines have a number of positions of strength along the chain. These include consolidation and ocean services and, to a lesser extent, truckload transport. However, there are still some critical weaknesses in some areas such as air and LTL transport, warehousing and distribution. Indeed, gains in efficiency and reductions in costs achieved in the sole shipping phase are becoming increasingly less important compared to those which may also be achieved within the other links in the supply chain, when managed in an integrated way.

The fact that these companies are firmly rooted in the ocean transport business may be considered a cultural factor which prevents such firms from divesting themselves away from their chiefly transportation hallmark and developing alliances to gain access to certain capabilities, and thereby allow them to compete effectively in the market for logistical services, characterised by different actors and competitive approaches. In this sense, the setting-up of partnerships could threaten key values such as decisional autonomy and corporate identity.

Therefore, with regard to integrated management of the supply chain such firms may choose between three basic strategic options:

1. To evolve towards the function of third-party logistics, or single first-level supplier of the complete logistical and transport services required by industrial and commercial firms. This option seems to be within the reach of large shipping lines, already integrated along the transport chain, who can form alliances with specialised suppliers operating both globally and locally and thus acquire the necessary logistical capabilities;

2. To opt for a niche strategy and supply a smaller market in terms of geographical spread or commodity range. This option may be soundly implemented by medium-size lines which have achieved an acceptable degree of inter-modal integration and are therefore more liable to become logistical service suppliers on a primarily local level, developing alliances with logistical and transport service suppliers. For such lines, inter-modal integration is an intermediate phase in their development strategies of lines shipping, which culminate in logistical integration.
3. To become a sub-supplier of second- or third-level transport services for the firm which takes on the management and coordination of logistics and transport. This is a reasonably likely prospect for small lines whose only strength is ocean transport. For such firms, the development of alliances in the land transport phase may prevent their exclusion from the market or acquisition on the part of a shipping firm or another logistical services supplier (Freight Forwarder, Distribution Company, NVOCC, etc.).

Finally, in all these options there is a clear role to be played by information technology, which is traditionally not very highly developed in the shipping sector. Particularly with reference to lines which seek to manage and co-ordinate the whole logistical and transport cycle, the use of information technology and those technologies which allow the electronic exchange of information (EDI) is of critical importance for stimulating and accelerating integration processes along the supply chain. Furthermore, these technologies can improve the benefits of alliances replacing control by ownership with control through information.

NOTES

- [1] For an analysis of the evolution and current make-up of such alliances, see Gardiner (1997).

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Supplier Relationship Map¹

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ABSTRACT Despite recognizing the strategic importance of their relationship with suppliers, most manufacturers maintained an arm's length relationship with their suppliers until the late 80s. This paper examines the underlying reasons for the dramatic changes in the supplier relationship during the late 80s and early 90s. In addition, we present a conceptual framework for mapping different types of supplier relationships for different business environments. This paper concludes with a discussion of some strategies for the buyers and the suppliers that will change the supplier relationship.

New Changes in Supplier Relationship

Virtually every company relies on their suppliers to provide parts, final products, or services. In the traditional sense, the buyer is the manufacturer while the supplier is a vendor that provides parts or services to the buyer. In this paper, we shall include the case where the buyer is a service provider (retailer) while the supplier is a manufacturer (Proctor & Gamble) or a freight service company (Federal Express). In general, suppliers play an important role in determining the competitiveness of the buyers because the cost of materials purchased by most manufacturing companies exceeds 50% of total sales, and the amount of goods purchased by most retailers is even higher (c.f., Raia (1990)).

Even though suppliers are critical for buyers' success, suppliers have historically been viewed merely as the entities that represent costs to the buyer. In order to keep the purchasing cost low, buyers often pressured their suppliers to lower their prices and threatened to switch to new suppliers if they did not comply with their requests. Consequently, the trust between the buyer and supplier has been weak and the relationship has been adversarial (c.f., Bravmen (1993)). Management experts reinforced this behavior. For example, Porter (1980) suggests that in order to maintain bargaining power, the buyer should source from many suppliers; commit short term contracts with the suppliers; share no information with suppliers regarding sales, cost, product design; and make (or receive) no improvement suggestions to (or from) suppliers.

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