DIFFERENCES AND SIMILARITIES BETWEEN THE SHORT SEA AND DEEP SEA SHIPPING MARKETS: THE LESSONS TO BE DRAWN FROM THE ECHO SURVEY

Elisabeth GOUVERNAL, Research Director, INRETS, The French Institute for Transport and Safety Research, SPLOT, Production Systems, freight and logistics. 
2 avenue Malleret Joinville 
94114 Arcueil 
Phone number : 33 1 47 40 72 22 
Fax number : 33 1 45 47 56 06 
E-mail: elisabeth.gouvernal@inrets.fr

Brian SLACK, Distinguished Professor Emeritus, Concordia University, Montreal Canada 
Phone number 1 514 848 2424, loc 2053 
E-mail: slack@alcor.concordia.ca

2 avenue Malleret Joinville 
94114 Arcueil 
phone number : 33 1 47 40 71 76 
fax number : 33 1 45 47 56 06 
E-mail: pierre.franc@inrets.fr

With thanks to Bertrand CANAL for his help in extracting data
Abstract

The globalization of trade has been accompanied in recent decades by a reorganization of the maritime and port systems. Deep-sea containerized traffic nowadays essentially passes through the largest ports, and it is this market which attracts the most attention.

The aim of this paper is to provide a better understanding of the physical and organizational characteristics of maritime consignments sent from France while attempting to compare those sent by DSS (Deep Sea Shipping) with those sent by SSS (Short Sea Shipping). The latter has not received much attention in the literature in comparison to DSS, but with growing interest on the part of governments in promoting short-sea shipping, it seems necessary to understand more fully the specific features of this market sector.

We used a survey completed in 2004 that was financed by the French Ministry of Transport. Unlike other transport censuses the ECHO survey identifies individual shipments, and contains information on routing, mode and organization. Using this survey we are able to reconstitute actual physical and organizational transport chains.

While the results of the ECHO survey have confirmed that the majority of deep-sea consignments pass through the major ports in particular for containerised goods, analysis of the SSS market has revealed a greater diversity with regard to the type of traffic (container, bulk, Ro Ro…). Furthermore, a link is apparent between the size of the hinterland and the type of trade. Finally, this study shows the importance of logistic service providers in SSS.

Key words: France, Short Sea Shipping, Deep Sea Shipping, Port, Hinterland, Transport organization.
DIFFERENCES AND SIMILARITIES BETWEEN THE SHORT SEA AND DEEP SEA SHIPPING MARKETS: THE LESSONS TO BE DRAWN FROM THE ECHO SURVEY

1. INTRODUCTION

The globalization of trade has been accompanied in recent decades by a reorganization of the maritime and port system which has resulted in the creation of a worldwide liner shipping network that makes use of a limited number of large ports. There has been a rapid increase in deep-sea container traffic. This development has rationalized and concentrated flows and at the same time produced a division between container ports and the others. Many ports have been unable to make the transition to containerization and are today, for either geographical or economic reasons, termed “secondary ports”. Consequently, their development must depend on markets other than those of the long-haul container liner services.

The Deep Sea Shipping (DSS) market is segmented, even though the container market has attracted most attention as a result of its growth over the last 40 years. Other markets include bulk products (for example oil, cereals and ore) which account for 2/3 of total tonnage, conventional transport which is in the process of dying out, and Roll-on Roll-off (Ro-Ro) transport which is also minor in scale. The same categories also apply to Short-Sea Shipping (SSS), but the distinction between them is generally much less clear than for DSS, both in the literature and in the statistics. This latter point is important because there are important deficiencies in the published statistics differentiating between DSS and SSS, and thus are of limited use in providing an understanding of the organization of maritime and port chains.

The ECHO survey, which stands for Envois-Chargeurs-Opérateurs de transport (Consignments–Shippers–Transport Operators) was conducted by INRETS in 2004 and involved 2,935 French shippers. The observation unit was the consignment, so for a given origin-destination pair the locations, time and object are unique. These are the units of measurement used in this paper. Each consignment was monitored by interviews with all those involved. Consequently, information about the transport and organizational services was obtained which can then be used to reconstruct transport chains, both physically and organizationally. A total of 9,742 transport chains, each relating to one consignment, have been reconstructed. Of these, 910 involved maritime transport.

A limitation of the ECHO survey is that it only included a limited range of bulk products. As a result solid mineral fuels and unrefined oil products were completely absent from the survey. Only 15% of the tonnage of all ore, minerals and aggregates were represented in the survey, while 40% of the tonnages of all agricultural products were covered. Throughout this paper, therefore, it is necessary to take account of the fact that bulk products are underrepresented in the surveyed population.

The aim of this paper is to provide an understanding of the physical and organizational characteristics of maritime consignments shipped from France, and in particular to compare those sent by DSS with those sent by SSS. Do the two markets tend to concentrate in the same ports? Or, on the contrary, do the specific features of SSS mean...
that it provides an opportunity for secondary ports to develop? Do the organizational characteristics differ from one market to the other? These questions will be addressed by referring to a literature survey and to the results of the ECHO survey.

The first section deals with DSS, particularly the containerized part of the market, which is highly represented in the survey. The ECHO survey confirms some of the intrinsic characteristics of DSS, while showing some particularities of the French context. The second part of the paper identifies the physical and organizational features of SSS on the basis of the results of the ECHO survey.

2. DEEP SEA CONTAINER SHIPPING: A CLEARLY IDENTIFIED MARKET

Containerization was first introduced in the 1950s in the United States and has had a radical impact on the organization of maritime transport (Muller, 1995). In conjunction with the increasing liberalization of trade in products and services and the movement of capital, it has contributed to the process of economic globalization. The emergence of new economic areas has stimulated a great deal of research aimed at achieving a better understanding of the organization of maritime transport (Grammatos 2002). Much of this research has been influenced by the increasingly international nature of production and distribution (Dicken, 2003). Consequently, the organization of DSS has received a considerable amount of attention in the literature (Slack, 2002; Heaver, 2002). We shall therefore give a brief account of some features of DSS which will provide us with a basis for comparisons in the course of a later analysis of the strategies of SSS. It will also be seen that the results of the ECHO survey confirm the major trends that have been identified.

2.1. The principal trade flows: the spectacular development of trade with Asia

Containerization developed rapidly along the major East-West trade routes, where it is still dominant. The transpacific route between Asia and North America accounts for the largest amount of traffic with 16.1 million TEUs\(^1\) in 2004; traffic between Europe and Asia accounts for 14 million TEUs\(^2\) and the transatlantic route, even though it was the first to be containerized, now only accounts for just 4.9 million TEUs. It is the trade with Asian countries, in particular China, that is responsible for much of the recent growth in the maritime trade of North America and Europe.

2.2. Organization of liner shipping and service of the principal trade flows

Growth in trade, in particular on East-West routes, the requirements of shippers and the need to be competitive has led maritime companies to develop various forms of liner shipping services. Three parameters which a liner shipping company must to combine have been identified by (Notteboom, 2006):
- service frequency;
- vessel size;
- number of ports served.

\(^1\) The TEU (Twenty Equivalent Unit) is the measurement unit used in ports and the liner shipping sector to count containers measuring 6X12X2,4 m. A forty foot container is counted as 2 TEUs.

\(^2\) Containerisation international
In order to cover their fixed costs, the shipping lines use their largest container vessels on the major routes (Lim, 1998) and limit their calls to major ports. This has led to the development of hub and spoke networks based on a small number of hubs with the requisite freight handling capacities. Feeder services are employed to complete the shipping line’s network and supply smaller ports. Feeder traffic has nevertheless remained marginal in France. The ECHO survey only includes seven cases where a feeder vessel was used to take consignments between French ports. Even if feeder line companies such as McAndrews, which has been purchased by CMA CGM, or Geest are growing, they are more involved in providing feeder services for exports from England rather than France.

The ECHO survey focus on the consignments sent from France through different loading ports as shown in the next map (Figure 1)

Figure 1: Map of major ports for ECHO survey consignments

![Map of major ports](image)

Today, the volume of containerized traffic in secondary ports is marginal, and this is confirmed by the findings of the ECHO survey. Table 1 shows that the major ports dominate the 566 consignments shipped by DSS from France, with 83% of DSS consignments from France passing through one of the three major ports (Le Havre, Marseille and Antwerp).
Table 1: Loading ports for deep-sea traffic (numbers of consignments)

<table>
<thead>
<tr>
<th></th>
<th>Le Havre</th>
<th>France, the rest of the Channel and Atlantic seaboards</th>
<th>Marseille-Fos</th>
<th>France, the rest of the Mediterranean seaboard</th>
<th>Antwerp</th>
<th>Rest of Belgium, the Netherlands and Germany</th>
<th>River ports and the rest of Europe</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Deep Sea Shipping</td>
<td>246</td>
<td>53</td>
<td>88</td>
<td>6</td>
<td>137</td>
<td>33</td>
<td>3</td>
<td>566</td>
</tr>
<tr>
<td>By Deep Sea Container Shipping</td>
<td>226</td>
<td>45</td>
<td>85</td>
<td>6</td>
<td>124</td>
<td>29</td>
<td>3</td>
<td>518</td>
</tr>
</tbody>
</table>

Table 1 also shows the extent to which consignments are containerized, with 518 out of 566 (92%) being containerized. This feature applies almost equally to the large ports as well as those of secondary status. Ninety-two per cent of DSS shipments passing through Le Havre, Marseille Fos and Antwerp are containerized, while the proportion for consignments passing through secondary ports grouped as “France, the rest of the Channel and Atlantic seaboards” is 85%. These results must be taken with caution because they are influenced by the under representation of bulk traffic in the sample.

The development of intermodality in shipments between ports and their hinterlands has been identified as a growing phenomenon (Notteboom and Winkelmans, 2001). In this process maritime companies are seen to be taking responsibility for inland transport using the railways and barges, a strategy that has been implemented to achieve better control of the movement of containers and meet demand from shippers for door-to-door services (Gouvernal, 2003; Gouvernal and al., 2005). However, analysis of the results of the ECHO survey does not confirm this trend. On the contrary, it highlights the market dominance of road transport and the lack of competitiveness of other modes. Table 2 shows that road haulage was used for 89% of the observed containerized consignments. It also shows that of the 43 non-container DSS consignments, only 5, i.e. 12%, used a mode other than the road. The results suggest therefore that type of traffic has little influence on the mode used to deliver consignments to the ports. This is in contrast to other countries of North West Europe where there has been a major increase in combined rail-road transport in the other ports in the Northern Range.

Table 2: Modes employed by French maritime consignments in Deep Sea Shipping and Deep Sea Container Shipping

<table>
<thead>
<tr>
<th>Type of pre-haulage</th>
<th>Number of consignments for Deep Sea Shipping</th>
<th>Number of consignments for container Deep Sea Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>517</td>
<td>474</td>
</tr>
<tr>
<td>Road + feeder</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Rail</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Combine rail-road</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>River</td>
<td>27</td>
<td>23</td>
</tr>
</tbody>
</table>
The low level of use of modes other than the road is essentially due to the poor quality of service provided by river and rail transport in France and the lack of volumes.

3. SSS: DIFFERENT STRATEGIES FROM DSS?

In this study we have used the European Commission’s definition of SSS, namely: “the movement of cargo and passengers by sea between ports situated in geographical Europe or between those ports and ports situated in non-European countries having a coastline on the enclosed seas bordering Europe. Short-range maritime transport covers national and international maritime transport, as well as feeder services, along the coast and from/towards the islands, rivers and lakes”.

3.1. SSS is not uniform

While in the case of DSS, the statistical results and their analyses clearly distinguish containerized traffic from bulk, conventional and Ro-Ro traffic, this segmentation is less clear for SSS and some confusion still exists between containerized traffic and other types. In order to achieve an understanding of the true nature of SSS, it is first necessary to clearly distinguish between the different types of SSS traffic. It will be seen below that there are several markets for SSS, and that the type of traffic plays a role in defining the categories.

Bulk is divided between liquid bulk (refined oil products as the oil import sector is not included in the surveyed sample of companies) and dry bulk which involves mineral products, cereals, etc.

With regard to general cargo, a distinction must be made between the following:
- conventional maritime transport which does not involve bulk products or containers but where the products are packed in bags, pallets, packets or boxes. At an international level, this mode is dying out, but it may still have a certain importance for regional traffic;
- container traffic: this includes the standard ISO boxes as well as the new type of Pallet -Wide Container that is capable of accommodating two 120cm x 80cm. European pallets;
- Ro-Ro is a system in which trailers are driven onto vessels. If the trailers are accompanied by drivers Ro-Ro transport is similar to ferry transport.

Because the containerized SSS market is not yet well developed, shippers do not yet have the service frequencies they would like as, in contrast with DSS, volumes are insufficient. Consequently, the maritime companies which provide short-sea services have not yet developed partnership strategies such as consortiums or alliances (Paixao and Marlow 2002). The market is not yet industrialized and, in Europe at least and in France in particular, has been less studied by the scientific community than DSS.
3.2. The place of SSS in Europe: the need for caution with regard to modal transfer statistics

According to European Union statistics\(^3\), SSS transported a total of 1.6 billion tonnes in 2003 in the 15 member EU, i.e. 63% of the Union’s maritime tonnage as opposed to 37% for DSS. 70% of the products transported by SSS are bulk products (divided between 52% of liquid bulk and 18% solid bulk), 13% are Ro-Ro, 10% are containers and 7% conventional.

This apparent healthy picture is in fact inflated by the EU definition of SSS, especially for container and RORO traffic. Most SSS container and RORO consignments are destined to island markets such as Iceland and Ireland, or North Africa where there is no direct road competition. Thus, we refer to these as captive markets. The case of the UK is special. It is now linked to the continent by the tunnel, so in one sense it provides an alternative to all-sea shipments. However, it does not divert traffic from the road, and as the current SSS policy of the European Commission is to favour SSS and produce a modal shift, even the UK market can be seen as captive.

Of the 346 SSS shipments contained in the Echo survey, 310 could be classified as non-substitutable from the road. Of the latter 116 consignments were identified as ferry traffic mainly to the British Isles, Corsica and North Africa, the remainder being made up of maritime shipments to these destinations. Only 36 consignments originating in France can be regarded as being in competition with the road. Twenty six of these involved shipments to Scandinavia from French and Belgian English Channel ports, and a further 5 involved shipments to Greece from Marseille. Consequently, that portion of SSS container or Ro-Ro traffic that is in direct competition with trucking is very small. This is the only non captive market in SSS.

Thus, while the EU boasts of a large SSS market, in fact the market is largely captive, and the traffic that is in direct competition with the road is very limited. This picture mirrors the situation in the US, where apart from containerised shipments to Puerto Rico and Hawaii (cabotage trade) coastal shipping for non-bulk goods is largely absent (Reeve Associates 2004).

3.3. SSS: a market where the type of traffic influences the choice of port

While the ECHO survey revealed that the majority of the observed deep sea containerized consignments passed mainly through the major ports, the SSS market is revealed to be more diverse. We have therefore examined the presence of a possible link between the type of SSS traffic and the loading port, excluding the ferry traffic where the driver accompanies the truck.

---

\(^3\) Data obtained from the Eurostat website:
Table 3: Cargo mix of loading ports for non-ferry SSS traffic (numbers of consignments)

<table>
<thead>
<tr>
<th>Cargo Type</th>
<th>Le Havre</th>
<th>Marseille-Fos</th>
<th>Antwerp</th>
<th>France, rest of Northern and Atlantic seaboards</th>
<th>Rest Belgium, the Netherlands and Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Conventional</td>
<td>1</td>
<td>14</td>
<td>11</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Containers</td>
<td>19</td>
<td>45</td>
<td>22</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Ro Ro</td>
<td>2</td>
<td>19</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>85</td>
<td>36</td>
<td>26</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 3, which is based on the results of the ECHO survey, shows the number of observations in loading ports as a function of the type of non-ferry traffic. It can be seen that SSS bulk traffic and conventional traffic are relatively well represented in the secondary ports of the French Northern and Atlantic seaboards (23% of observed bulk consignments). Container traffic is largely handled by the major ports (Antwerp, Marseille and Le Havre) with more 65% of the observed consignments being containers, compared with 39% (10 out of 26) for the ports on the French Northern and Atlantic seaboards. Other ports in Belgium, Germany and the Netherlands are also among the SSS loading ports for French origin traffic.

We have shown earlier that SSS traffic is made up of captive and non-captive components. In Figure 1 significant differences are indicated between different port groupings. The major French ports, Le Havre and Marseille, have extremely small non-captive traffic, since the majority of their SSS activity involves the British Isles and North Africa, respectively. A slightly less extreme balance is evident for Antwerp and the smaller French ports.

Figure 2: Captive and non-captive short sea traffic (number of shipments)
3.4. Port specialization and the size of the hinterland.

It might be expected that there is a link between the distance of pre-haulage and the length of the maritime leg, i.e. that SSS consignments would be more sensitive to the geographical proximity of the ports. If this hypothesis is correct the hinterlands of DSS traffic should be more extensive than those of SSS. Distances to the ports were calculated for both SSS and DSS shipments. A summary of the results are contained in Table 4 and are graphed in Figure 2.

**Table 4: Number of consignements by distance bands for non ferry traffic (in percentages)**

<table>
<thead>
<tr>
<th>Type of traffic</th>
<th>Distance bands</th>
<th>Le Havre</th>
<th>Marseille</th>
<th>Antwerp</th>
<th>Other French Atlantic and Channel ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Sea</td>
<td>unknown</td>
<td>9.5</td>
<td>2.7</td>
<td>7.7</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>&lt;100km</td>
<td>19.0</td>
<td>2.7</td>
<td>0.0</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>100-249</td>
<td>14.3</td>
<td>8.0</td>
<td>38.5</td>
<td>38.1</td>
</tr>
<tr>
<td></td>
<td>250-399</td>
<td>23.8</td>
<td>25.3</td>
<td>19.2</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>&gt;400</td>
<td>33.4</td>
<td>61.3</td>
<td>34.6</td>
<td>14.3</td>
</tr>
<tr>
<td>Deep Sea</td>
<td>unknown</td>
<td>2.0</td>
<td>11.3</td>
<td>3.9</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>&lt;100</td>
<td>7.5</td>
<td>4.2</td>
<td>0.0</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>100-249</td>
<td>19.1</td>
<td>18.3</td>
<td>20.2</td>
<td>30.4</td>
</tr>
<tr>
<td></td>
<td>250-399</td>
<td>23.1</td>
<td>26.8</td>
<td>6.7</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>&gt;400</td>
<td>48.3</td>
<td>39.4</td>
<td>69.2</td>
<td>17.4</td>
</tr>
</tbody>
</table>

**Figure 3: Distance profiles of port hinterlands**

- Le Havre
- Marseille
- Antwerp
- Other French Atlantic and Channel ports
The results show that as expected the hinterland of the port of Le Havre is smaller for consignments sent by SSS than for those sent by DSS. On third of SSS shipments involved trips in excess of 400kms from the points of origin to Le Havre, while the relative proportion for DSS is 50% more (48.3%). The results for Antwerp exhibit the same trend, that SSS shipments involve shorter distances, but the scale of the difference is significantly greater. Over two-thirds of the DSS shipments via Antwerp are drawn from suppliers more than 400kms away. This confirms the penetration of Antwerp into markets in Eastern and Central France for Asian and North American traffic.

Marseille-Fos is strikingly different, however. Marseille’s hinterland is significantly more extensive for SSS than DSS, with 61.3% of SSS shipments incurring trips in excess of 400kms. In contrast the more immediate market area (less than 399kms) generates half DSS traffic.

The ECHO survey provides an explanation of this disparity. The port of Marseille Fos is specialized in the captive market of North Africa which accounts for the majority of all SSS shipments. This North Africa trade draws traffic from all over France, with 55% of Marseille’s observed SSS consignments coming from Alsace Lorraine, the Paris Region, the Centre of France and the South-Western seaboard. This niche market function has given Marseille an extensive hinterland for SSS, as defined by the EC. Its DSS hinterland is more regionally-focussed because the large majority of exports to North America and Asia originating in southern France pass through the Northern ports.

For the lesser ports the hinterlands are much more local for both DSS and SSS. Table 4 reveals that a small part of their traffic originates more than 250kms from the ports (14.3%). Two thirds of their traffic originate from markets less than 250kms from the ports. These ports cannot compete at the moment with the larger ports for service frequencies for DSS destinations. Direct overseas services are very rare, one exception being MSC with its services to several smaller ports.

3.5 Decision-makers along the transport chain

DSS traffic, which is increasingly containerized, essentially passes through the major ports. The size and scale of the traffic has given rise to complex systems of organisation and integration. Shipping lines are seeking to extend their influence throughout the system, including the ports and inland transport links (Van Klinck, 1998). However, the SSS market has been described as one in which the maritime leg has few connections with the inland legs (Paixao et al., 2002, 2005). The transport chain is disconnected with many unrelated participants. This lack of integration is considered to be one of the weaknesses of SSS, which explains its low level of attractiveness when compared with road transport, a feature that is repeated in North America (Brooks and Frost 2004).

To understand this system, a knowledge of who controls transport decisions is essential and provides a means of ascertaining which players are the most able to influence these choices. The vast majority of companies who are included in the ECHO survey belong to a business group. Only the consignments of companies which belong to a group were selected. They represented 85% of the companies with SSS activity and 95% of those sending consignments by DSS. A face-to-face interview was conducted with the company sending the consignment in order to find out who was responsible for choosing the maritime mode, the port, the pre- and post-haulage and the maritime carrier. Figures 3
and 4 reveal which players are involved in the decision-making process for SSS and DSS respectively.

**Figure 4: Agencies making choices in SSS consignments**

In the case of SSS consignments, the choice of transport mode, in this case by sea, was selected by the company (shipper) in half of the cases. The company was rarely involved selecting the carrier, or being involved in choices affecting the other segments of the chain. However, the choice of maritime carrier, pre-haulage, post-haulage and loading port was made by a logistic service provider (LSP), defined as an intermediary such as a forwarder, in at least 50% of the cases.

**Figure 5: Agencies making choices in DSS consignments**

In the case of DSS, a very different picture is presented. The companies are mainly involved in choosing the inland pre-haulage and the loading port. The consignee is mainly involved in choosing the maritime mode, the maritime carrier and the post-haulage. The role of the LSP is much less marked than for SSS.

There appears to be a significant difference between DSS and SSS with regards to who makes the choices along the maritime transport chain. With regard to SSS, we suggest the importance of intermediaries is due to the nature of the traffic, which is irregular, in variable quantities and for which there is a lack of maritime services to choose from. Shippers here use the services of intermediaries because of the complexity of the system (Dubreuil, 2005). Responsibility for organising the service and filling the ships often falls on the shipping agent or the local freight forwarder which has been defined in this survey as an LSP. In contrast, DSS, which is largely containerised in the sample, has been massified in a small number of ports, where there are frequent sailings by liner services to
ports around the world. In this market the shipper himself or the consignees are able to play a much more important role.

These findings have an importance for the development of SSS in Europe. The EU is embarking on an ambitious program called the ‘Motorways of the Sea’. The goal is to establish frequent services between certain ports for non-bulk shipments that are presently carried by the road. The evidence presented here suggests that establishing Maritime Motorways or other alternatives to the road needs the active participation of LSPs. The fact that SSS is so poorly developed to non-captive markets can no doubt be explained in part and somewhat paradoxically by the latter’s lack of interest in SSS. The reason for this is that SSS may conflict with the main interests of the intermediaries. LSPs are heavily involved in road freight and frequently have their own fleets of trucks or their own subcontracting networks that use other road transport undertakings. This does not encourage them to adopt new SSS services since shifting traffic from the road would require them to overhaul their entire traffic organization. Furthermore, loading trailers onto vessels (Ro-Ro) ties up their equipment and makes it difficult to achieve profitability.

Regular shipping lines, who would be the most likely to be interested in the short-sea container market, are not involved in it at the present stage of development because traffic volumes are insufficient to allow the organization of end-to-end services with good frequencies, in contrast with DSS.

4. CONCLUSIONS

While approximately two-thirds of the tonnages transported by maritime transport consist of bulk, containerization which has developed for manufactured products during the last 40 years has brought about a profound reorganization of the maritime and port systems. The ECHO survey confirms that containerized consignments leaving France for overseas markets pass mainly through the largest ports such as Le Havre, Marseille or Antwerp. The secondary ports are less involved in this activity and are oriented proportionally more to bulk, conventional and Ro-Ro markets for DSS. Nevertheless even in these other markets the smaller ports remain marginal compared to the major ports.

SSS traffic is seen as a means of helping these secondary ports survive. However, there is a vicious circle: because the smaller ports do not have the cargo volumes to fill ships they cannot attract the carriers to provide a regular service; and because they cannot provide a regular service they cannot attract new customers. This problem has been reported in both Europe and North America (Brooks 2006; Cambridge Systems 2004; Packer 2004; Paixao and Marlow 2002, 2005). Here, we have identified the important role of LSPs in the small ports. In these ports a network of actors who are physically present facilitate the grouping of SSS consignments because the market has not yet reached maturity, and does not yet generate enough regular freight to fill vessels. Paradoxically, these intermediaries may be themselves part of the problem, since they are primarily oriented towards road transport and use SSS only when road transport is impossible, i.e. to island markets.

The SSS traffic is in most cases captive to maritime transport. Virtually none of this traffic has been diverted from the road. Containerized SSS or Ro-Ro services to non-captive markets, where there is a road transport alternative, encounter difficulties ensuring
their long term survival. Thus, the maritime motorways that are being promoted by the European Union in order to compete with the road are not a straightforward solution. While the forwarders have been identified as the central actors in SSS at present, other factors play a role in determining the success or failure of services of this type. As with combined transport services (Niérat, 1992), success is determined by many factors including the distance of the maritime leg, road pricing, the costs of competing road transport, traffic volumes, the balance of flows, the location of transhipment operations where modal transfers take place, all participate in ensuring the viability of a maritime motorway.

So far, this research has focused on France due to the nature of the database available to us. It would, however, be worthwhile to compare its main conclusions with the situation in American and Asian markets. A comparison with the work of other researchers involved in this area would therefore be particularly useful.
LIST OF TABLES AND FIGURES

Table 1: Loading ports for deep-sea traffic (numbers of consignments) ............................ 6
Table 2: Modes employed by French maritime consignments in Deep Sea Shipping and Deep Sea Container Shipping................................................................. 6
Table 3: Cargo mix of loading ports for non-ferry SSS traffic (numbers of consignments)9

Figure 1: Map of the major ports for ECHO survey consignments……………………………5
Figure 2: Captive and non-profit short sea traffic………………………………………………9
Figure 3: Distance profiles of port hinterlands…………………………………………………12
Figure 4: Agencies making choices in DSS consignments……………………………………12
Figure 5: Agencies making choices in DSS consignments……………………………………12
REFERENCES


