

The Role of Mediterranean Short Sea Shipping in the EU Transport Chain:

The case of Greece

Abstract

The European Community has provided valuable support to short sea shipping through various programs and legislation. This paper analyses the situation while focusing on the Mediterranean Sea and suggests solutions for addressing the short sea shipping problems in this special region. The biggest challenge for all sides in the coming years will be the replacement of the existing fleet. The study presented herein gives an insightful and collective picture of the situation, while focusing on the Greek owned short sea vessels.

Key words: EU Short Sea Shipping, Mediterranean Fleet Renewal, Greek SSS fleet

1 Introduction

Since 1990 the European Community openly encourages a shift of shipments from road transport to other transport modes, and mainly short sea shipping. After more than 15 years, many issues have been dealt with successfully, but one major difficulty is clear. The European Short Sea fleet faces a serious ageing problem. A renewal scheme is of paramount importance for the survivability and competitiveness of short sea transport as well as for the protection of the marine and littoral environment. On the other hand, many ship-owners lack the funds to finance any ambitious large scale fleet replacement program or alternatively invest on modern second-hand vessels. At the same time they face severe competition and adverse market conditions.

In this context, this paper first outlines the various measures taken by EC on all hierarchical levels to attend complex bureaucratic procedures, infrastructural needs and multimodal transport issues. Additionally, a statistical analysis gives unique information on the actual number, age and flag of the Greek owned Mediterranean short sea fleet. This data are then compared with data available for the total European short sea fleet. The results show some of the problems in the ship replacement process for the Greek owners.

The rest of the paper is organized as follows. Section 2 describes the various measures and regulations that comprise the EC policy for transport and aim to deal with complicated bureaucratic procedures, infrastructure deficiencies and multi-modal transport issues. Section 3 presents a detailed statistical analysis for the existing Greek-owned European short sea fleet (vessels mostly operating the Mediterranean). The analysis results are further compared with those available in the literature for the other European countries. Section 4 closes with some qualitative data about the Mediterranean market, as well as the alternative options of a ship-owner there.

2 European Union Policy

The European Union (EU) is above and before everything else an economic union. It is only natural that its policies are based one way or another on economic and social criteria. In this context the European Commission (EC) has drafted long-term plans and has dedicated valuable resources to achieving sustainable development in the transport section within the period 1990-2010. One of the main targets of these policies is to improve the quality of services offered and at the same time reduce the cost of transport system as a whole.

The transport cost can be separated into a direct cost, payable by the shipper to the transport agency for its services, and a significant indirect cost, depicted as environmental pollution and decrease in the citizen's quality of life. An estimation of the latter from two separate studies is shown in the following table as a percentage of the EU gross domestic product (GDP).

Table 1. External cost of transport in EU (Source: Papadimitriou and Schinas, 2002)

Cause	Percentage of GDP	
	Study 1	Study 2
Air pollution	0.40%	1.95%
Noise	0.20%	0.54%
Accidents	1.50%	2.26%
Traffic	2.00%	0.5%
Climate changes	-	1.79%
Natural landscape degradation	-	0.23%
Rural areas fragmentation	-	0.08%

Table 2. Transport modes responsibility for the EU external transport cost (Source: Eurostat)

Transport Modes	Responsibility
Road transport	92%
Air transport	6%
Other transport modes	2%

Depending on the study, 4.1 to 7.35% of the EU GDP is spent annually to counter the impact of the various transport modes on the environment and the quality of life. The most costly elements in Table 1 are air pollution, accidents and traffic. In

Table 2 the modes responsible for these adverse results are identified. Road transport alone accounts for 92% of the total, while the combined sums of road transport with air transport are responsible for 98% of the total. All other transport modes, namely short sea shipping (SSS), inland waterways, railway and pipelines sum up to just 2%.

Therefore the EC is highly motivated in addressing this situation. One option would be to press for improvements in road transport, while at the same time enlarging the already extensive road network. To some extent, this is being done. But it has been estimated that the cost of such a policy will be much higher than promoting the other environmentally friendlier modes. Moreover it would just postpone the current issues associated with road transport to a later point in time, without actually addressing them.

Hence the EC has dedicated a great effort during the last 15 years in order to turn significant quantities of trade goods from road transport to other modes, such as railways, inland navigation, and, most preferably, SSS. The latter was selected due to a number of advantages over the other transport modes. It is by far the cheapest option available to shippers. As shown in Table 3, it can reduce the direct transport cost by as much as 33 times compared with road transport.

Table 3. Direct transport cost for various transport modes (Source: Muller, 1999).

	Cost (US cents - tonnemile)	Difference from SSS
Shipping	0.75	-
Railway	2.66	2,5 times

Road	25.43	33 times
Airplane	46.3	61 times
Pipeline	1.48	~1 time

Additionally, SSS is the only transport mode that has managed to follow the successful course of road transport during the recent years. As shown in Figure 1 for the decade 1995-2005, road transport use has increased with a rate of about 50%, while SSS has followed closely with 40%.

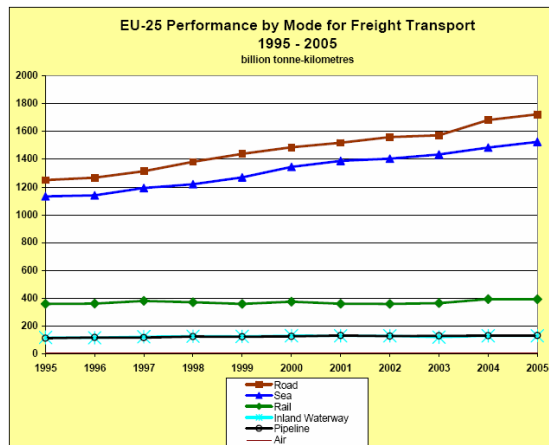


Figure 1: Tonne-kilometre increase by transport mode for years 1995-2005 (Source: Eurostat).

Total intra-EU trade is divided into internal and external trade, that is, trade within a member-state's borders and trade between different member-states respectively. Both road and SSS have almost equal shares of the total freight tonne-kilometres (the actual figures for year 2005 are Road: 44%, SSS: 42%, Source: EC). However in the external trade alone, SSS has a much higher percentage, namely 69% over 18% for road transport.

However, it seems that SSS cannot attract significant freight in the internal trade of the member-states. Actually only 6% of the total internal tonne-kilometres are moved by SSS, in comparison with 80% by road. The significance of internal trade for the EU is high, since it accumulates over 90% of the total tonnes and 50% of tonne-kilometres of the total transported cargo. The reason behind this imbalance in the two trade categories is the prevailing opinion that considers SSS to be worthy only in medium to long distance transport. For shorter distances, like the ones in most EU countries internal trade routes, road transport is highly preferred. This trend can be also identified in Figure 2.

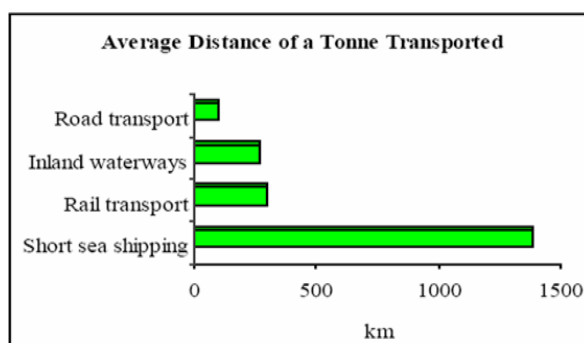


Figure 2: Average distance for a transported tonne of goods in EU (Source: Eurostat).

The aforementioned advantages of SSS do not seem to be reflected on shippers preferences. On the contrary, there seems to be confusion regarding the role that SSS should adopt in the EU transport chain. Road transport benefits from a valuable asset, flexibility. It is much easier for a shipper to

arrange his transport needs based on a road network rather than an intermodal one that involves passage through ports and customs. Improving existing port infrastructures and procedures, or building new ones as well as developing a denser network of transshipment stations can partially address this problem. Still, one cannot hope to achieve a level of service similar to the one available through the road mode. On the other hand, attention should be focused on the role that SSS can play in the multi-modal transport chain. Shippers opt for door-to-door services that require their personal smallest possible involvement. SSS has thus far failed to comply with this requirement and as a result has been replaced as a mode of choice by road transport.

The most important problems that hinder the adoption of SSS in the multi-modal logistical chains are the following:

- It is still considered to be an outdated industry;
- It includes complicated administrative and bureaucratic procedures;
- The rules and regulations regarding SSS are not consistent between the EU states (sometimes they vary even between neighbouring countries);
- Port operation is often inefficient;
- There are obsolete vessels, old port infrastructure, absence of advanced telematics, badly organized and imbalanced use of unitized transport.

The EC has acknowledged these obstacles and attempted to deal with them in various levels: EC, member state, regional, and local. The most notable EC measures towards a more competitive and efficient shipping are:

- Marco Polo I and II;
- Standardization of unitized transport;
- Environmental/Safety/Security Initiatives;
- Trans-European Networks and Motorways of the Sea;
- Guide for the access to port services and customs procedures;
- New customs transit system (NCTS);
- Common European Maritime Space and related developments;
- New Freight Logistics Action Plan
- National Centers for the Promotion of SSS;
- SSS Information Offices.
- R&D

3 SSS Vessels in Europe

The core of the European short sea trade is the EU short sea fleet itself. Figure 3 depicts the fleet according to the country of origin of the ship-owner. Greece holds the first position with 18% of the total number of ships. The Greek fleet is followed closely by the fleets of Germany, Holland and Italy.

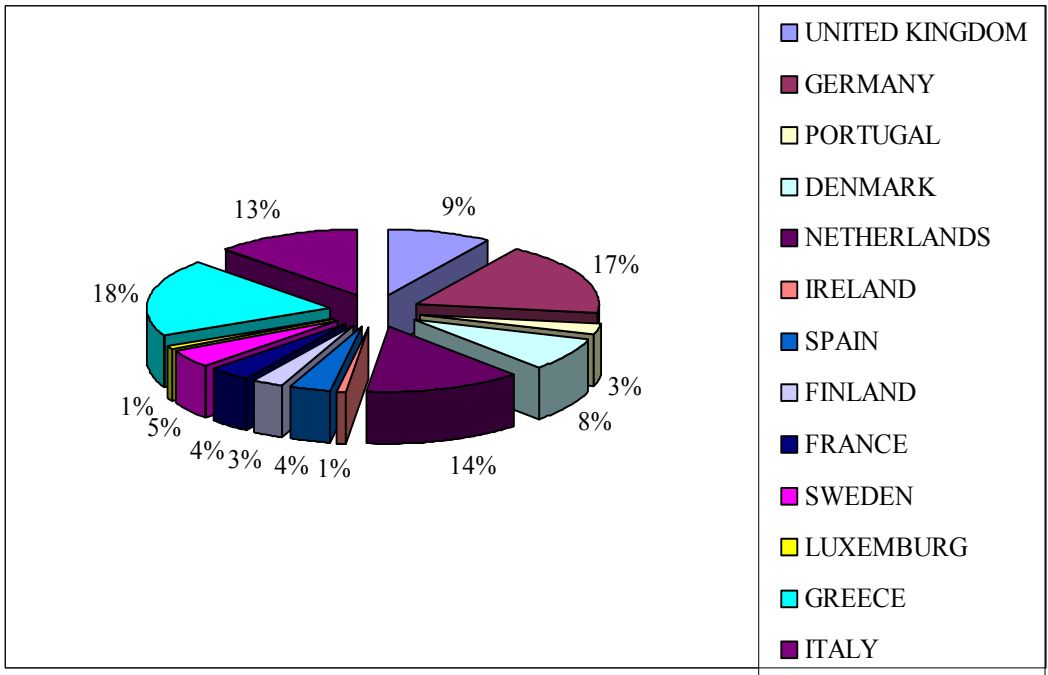


Figure 3: Analysis of the European Short Sea Fleet by country of origin of the ship-owner (Source: ISL Bremen).

Through a dedicated analysis of the Lloyd's Register of Shipping database regarding the Greek-owned fleet, many interesting results and figures came up and are summarized below. Some 607 ships were identified, with an average size of 2562 GT (Nitsopoulos, 2006). The dominant ship categories are tankers and bulk-carriers, while ships for the transport of unitized freight, such as containerships are fewer. The average fleet age is 30.4 years, while 78.7% of the vessels are older than 21 years. As far as the vessel flag is concerned, 31.2% of the Greek-owned fleet is under the Greek flag. The flags of Cyprus and Malta are identified as the main competitors of the Greek flag in the Greek-owned SSS fleet.

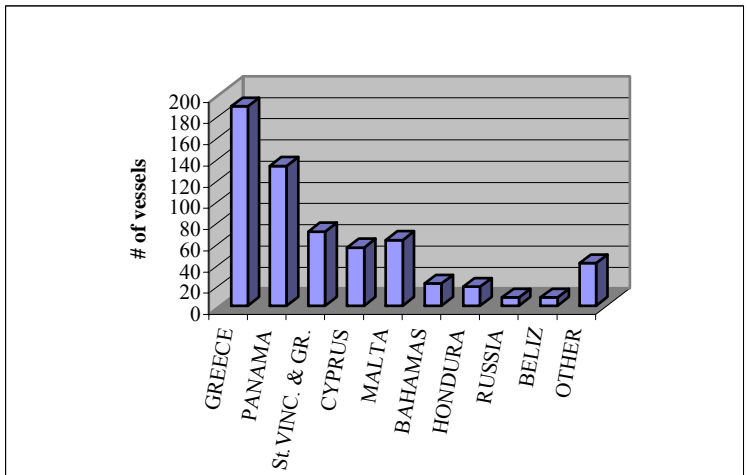


Figure 4: Greek-owned SSS ships by flag. (Source: Lloyd's Register of Shipping data).

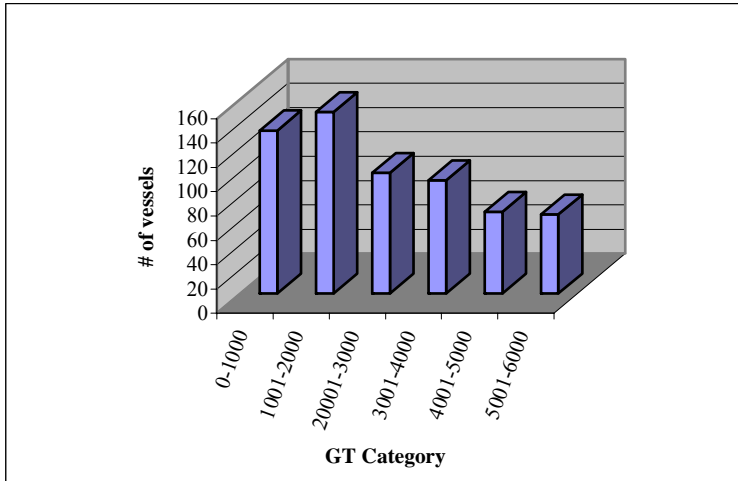


Figure 5: Greek-owned SSS ships by size category: (Source: Lloyd's Register of Shipping data).

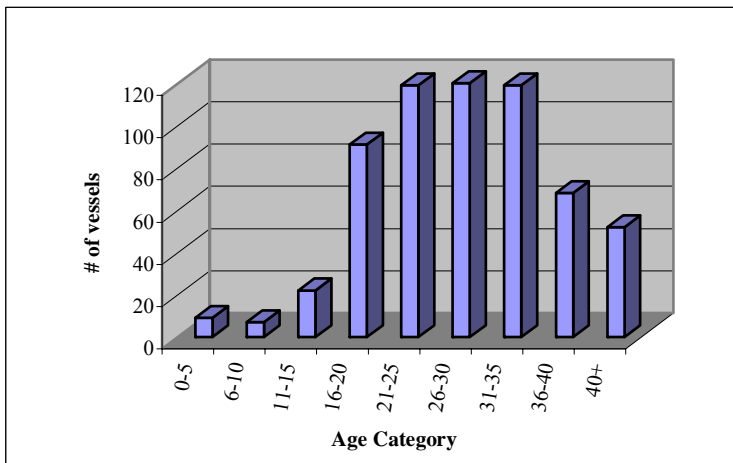


Figure 6: Greek-owned SSS ships by age category. (Source: Lloyd's Register of Shipping data).

A similar research was performed by Wijnolst and Waals (2005). The results included data for a wider range of vessels and included all European countries. With input from this study, the following Figures were created that can be directly compared with the ones presented for the Greek-owned fleet (Nitsopoulos, 2006). There appear to be notable differences in vessel size, type and age. The Greek-owned vessels are mostly in the size category 0-2000 GT, while the European fleet is denser around the 3000-4000 GT group. European ship-owners also favour dry cargo vessels, while Greek owners mostly operate tankers.

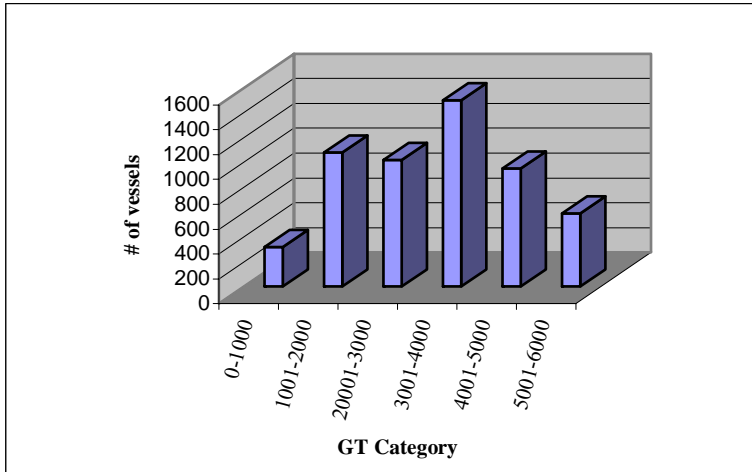


Figure 7: European SSS fleet by size category (Source: Data provided by. N.Wijnolst, F.A.J.Waals).

The reasons for these differences can be identified in the history of European SSS. It has been observed during the last decades that the maritime industry follows economies of scale, since they benefit both shippers and ship-owners. SSS was affected from this trend as well. During the late 70's an average short sea vessel's carrying capacity was 1600 DWT. By the late 80's the capacity increased to 3200 DWT and by 1998 it surpassed 6000 DWT (Corres and Psaraftis, 2005).

As shown in the following figures, the Greek-owned fleet was found on average about a decade older than the European fleet. Moreover, 52.0% of the GT/42.7% of the European vessels were found to be up to 20 years old, while the same figures for the Greek-owned fleet are 31.0% of the GT and 21.3% of the vessels respectively.

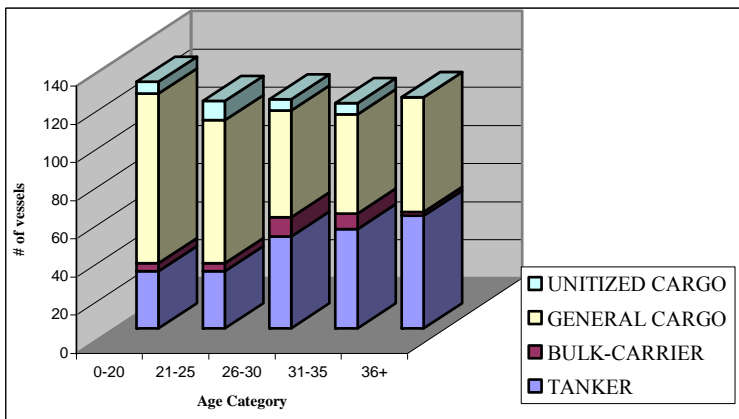


Figure 8: Greek-owned SSS fleet by type and age categories (Source: Lloyd's Register of Shipping).

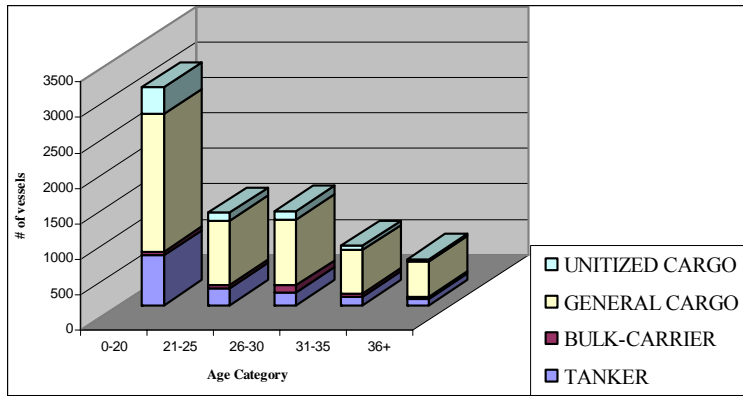


Figure 9: European SSS fleet by type and age categories (Source: Wijnolst and Waals (2005)).

Other interesting trends are the decreasing number of tanker vessels and the increasing number of general cargo vessels in the Greek-owned fleet. On the other hand, the numbers of vessels for all ship categories of the European fleet increase over the last three decades. We do know that Greek ship-owners depended heavily on tankers until the late 70's, when oil prices increased substantially. At the same period, new safety legislation was enforced on oil trades, after a series of oil-pollution accidents. These two factors are most probably responsible for the sudden change that appears during that period (see Figure 8) and the shift to general cargo ships. Obviously the reduction in the available tonnage was covered by other European ship-owners (see Figure 9).

4 Shipping Companies in the Mediterranean Sea

It should be evident by now that the Greek-owned Mediterranean short sea fleet faces a serious ageing issue. Two main reasons have led to this outcome: the characteristics of the market and the shipping companies' financial difficulties.

Most non-European countries of the southern and eastern Mediterranean Sea have developing economies. Their exports consist mostly of agricultural products, in relatively high and annually constant quantities. These products are highly affected by seasonal and weather conditions. While these goods provide a steady demand for Mediterranean short sea vessels, they allow for only marginal profits, due to their low specific value. At the same time it can be expected that vessels visiting these countries will often face problems like delays during loading/unloading operations, long storage or pier queuing due to old and limited port infrastructure, port personnel shortcomings and strikes.

Because of this negative environment, large notable Greek shipping companies employed in the tramp deep sea market avoid committing their ships to this geographical area. Hence the Greek-owned SSS companies are mostly small in size and solely operating in this market. It has been calculated that 76.5% of them possess one or two vessels only (Christou, 2003). This has partly to do with the fact that it is considered a closed market. It is much harder for newly established companies to obtain firm connections with shippers similar to what the older companies already have. In effect, the newcomers stay in the market only as long as they have to in order to move to the more profitable overseas market. If this is taken into account along with the existence of various protective state policies, like cabotage, it leads to the conclusion that competition amongst the remaining companies in the market is very low. This has led inadvertently to a total lack of motivation and capability for the companies to renew their fleet.

There have been many suggestions on how ship-owners can increase their profitability. Due to the nature of the market, the freights cannot be raised without risking losing cargoes. Therefore the only alternative is the reduction of the companies' operational cost, which is not an easy task. Fuel, diesel and lube oil consumptions of main and auxiliary engines or the boilers are practically a fixed function of the vessel speed. The latter can be reduced in some occasions, but even then the owner risks losing customers. On the other hand, the programmed maintenance operations are prescribed in detail by the

regulatory agencies and the vessel's registry. Any attempt to cut down on these expenses (e.g. by using cheap spares) will lead to higher non-programmed repair operations later on. Whenever some companies opted for cut back in safety-related expenses, the response of port authorities has been detailed onboard examinations and increased corresponding fines and detentions.

The renewal of the SSS fleet can provide increased income. Technological advances have led to engines with reduced fuel consumptions. Operating expenses are further reduced if the cost of the programmed maintenance (which increases with vessel age) and the non-programmed replacement/repair cost are taken into account. The latter almost doubles for vessels older than 15 years, according to Drewry Shipping Consultants. A vessel renewal will also allow for installation of new technology propulsion engines, designed for a higher operational speed and therefore answer the need for faster travels. This is a major requirement, if SSS is aiming to drain cargoes from road transport in the internal EU trade. It is commonly accepted that an average SSS vessel should travel with 16 knots on average (Corres and Psaraftis, 2005). This can be done with existing vessels by either increasing the fuel consumption or replacing the main engines. Both ways will incur a high direct cost. On the contrary, the construction of new faster vessels will lead to more journeys annually and consequently increased income.

Another practice used extensively in the past is the change of flag. Among the registries of the enlarged EU member-states that have a significant portion of the European SSS fleet due to their favourable terms to the ship-owners, one can see that Malta and Cyprus have a combined sum of 19.1% of the Greek-owned fleet sailing under their flag (see Figure 6).

The major reasons that make these registries more attractive to ship-owners are crew and taxation. In order to address taxation, many registries have introduced the so called "tonnage tax", specifying that tax will be a function of the ship-owners' total tonnage rather than their annual profit/losses. With these two factors mostly dealt with, the only point remaining is crew. This is more complicated, since it involves a number of stakeholders (seafarers unions, EC, governments, and ship-owners) and has to take into account issues like unemployment, working conditions and cost. The EC has taken some measures that will improve the seafarers' occupation and increase the availability of crew in European level. Additionally there are suggestions for EC funding some of the ship-owners' crew expenses, such as repatriation cost. Another suggested approach is the reduction of the minimum required crew onboard, since some previously obligatory posts are now obsolete through technological advances in ship construction and operation.

While a positive trend in cargo quantities in the Mediterranean area has been identified, it still does not allow for a systematic use of large vessels, benefiting from economies of size. An alternative option is organising the shipping companies after the example of the Euro-Asian liner companies. There are two key points where liner companies excel: organization and cooperation. This calls for incorporating a very effective operations department that can rapidly address the shippers' needs on capacity, frequency and destination. Moreover, it is of utmost importance for newly established small and average size companies to cooperate in such a competitive and fragmented market. In effect they can assist each other on a basis of a shared information network that provides common knowledge (e.g. problems of a certain harbour), or by covering a company's contractual obligations when that specific company fails to, instead of taking advantage of such occasions to claim exceptionally high freights as the common practice dictates. The benefits of sincere cooperation become even more if one considers the bank loan conditions that a single-ship company can achieve in comparison with that of a group of fifty such companies. Finally, ship-owners should take advantage of their close relationship with the shippers in the market to promote the use of time-chartering. In a market dominated by steady demand and supply of transport services, time-chartering will significantly reduce the ship-owners' risk, while also giving the shippers a more comfortable feel regarding their transport requirements and at the same time further reduce the transport cost.

At the moment no law enforces the renewal of the European short sea fleet. The small average size of the vessels involved is usually outside the margins of legislation, since most regulations are applicable to ships larger than 5000 DWT (e.g., requirement of double skin tankers). Vessels of this size appeared in the short sea market of Europe during the last decade.

Surprisingly, the pressure for renewal comes from the private sector itself. Competition between ship-owners is strengthened steadily over the last 30 years. It began with the oil trade after the oil companies abandoned their private fleets and turned towards the independent tanker owners for their transport needs. Since the required freight does not vary significantly, it is only natural for them to require the highest possible level of service, which in our case is new, safer and environmentally friendlier vessels. This competition has many times led to requirements much higher than those imposed by international legislation. The abolition of cabotage has only strengthened the competition, by enlarging the pool of available vessels.

On the other hand, port state controls operations (independent survey of the vessel safety equipment and crew working conditions) provide a steady pressure towards new vessels. This is done indirectly by showing preference for examination of older vessels, which are more prone to transgressions than new-buildings. For the same reason, older ships find it significantly harder to get insurance and pay increased premiums for it. Since these controls are relatively easy to lead to fines, or even worse detentions, they can incur a significant cost to the ship-owner.

5 Summary and conclusions

Short sea shipping can be a solution to many of the social and environmental problems created by the extended use of road transport. It is expected that by increased use of SSS, both the direct transport cost and the indirect transport cost (negative effects for the environment) will be highly decreased. Therefore the EC has provided many tools for shifting cargo from land to sea: i) by reducing the bureaucratic procedures involved in SSS, making them simpler and globally applicable, ii) by renewing the port infrastructures and the associated railway connections and iii) by giving additional motives to the shippers in order to change their main cargo transport choice.

However, there is one very important link missing from the chain. In order for SSS to remain the safest and most competitive transport mode in Europe and more specifically the Mediterranean Sea area where the problem is greater, a large percentage of the SSS fleet must be renewed. The Greek ship-owners who hold the top position in the Mediterranean market have one more reason to find the funding required for this task. After the abolition of the cabotage and the addition of new countries in the European Union, especially states with many Greek vessels under their flag, the balance has tipped. Most European ship-owners will take advantage of this unique opportunity to expand in new markets. Moreover the increasing port state inspections and the competition between important shippers gradually drive older ships out of the European waters.

The Mediterranean market allowed up to now for marginal but secure profits for the ship-owners, due to the existence of protection policies and adequate freight quantities. The necessary renewal of a large number of ships in a short time period entails high risk and access to adequate funding. The removal of protection policies further increases this risk and reduces expected profits. This means that many ship-owners who currently employ vessels in this area will be forced to withdraw. The elaboration of a project for the renewal of the fleet is more important than ever. Such a plan calls for pioneering ideas, cooperation among ship-owners and substantive action from the EC. Without such a plan, the situation in this sector will become worse before it becomes better.

6 References

1. Christou F., 2003, Analysis of the Greek-owned Shortsea Fleet and Proposal on a Greek Shortsea Fleet Renewal Scheme, London, Theses, Cass Business School.
2. Commission of the European Communities, 2001, *WHITE PAPER European transport policy for 2010: time to decide*, Brussels.
3. Corres A.J., Psaraftis H.N., 2005, *A Generic Ship for the Short Sea Trades of the EU*, Athens, Society of Naval Architects and Marine Engineers (SNAME) Greek Section International Symposium on Ship Operations, Management and Economics.

4. European Union, 2006, *Energy and Transport in Figures 2006*, Brussels.
5. Muller G., 1999, *Notes on Logistics and Intermodalism*, World Maritime University.
6. Nitsopoulos S. C., 2006, *The Renewal of the Mediterranean Short Sea Fleet as Strategy for the Support of Short Sea Shipping* , Athens, Thesis, National Technical University of Athens.
7. Papadimitriou S., Schinas O., 2002, *Introduction in Logistics*, Athens, Stamoulis Publications.
8. Wijnolst N., Waals F.A.J., 2005, *European Short Sea Fleet Renewal: Opportunities for shipowners and shipyards*, Athens, Society of Naval Architects and Marine Engineers (SNAME) Greek Section International Symposium on Ship Operations, Management and Economics.