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# TRENDS IN INVESTMENTS IN PORT INFRASTRUCTURE IN THE MEDITERRANEAN COUNTRIES: CONVERGENCE OR DIVERGENCE TO EU POLICIES?

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**Abstract**

As Mediterranean ports and the state of their infrastructure turn to critical parts of the European transportation networks, this paper analyses the trends in Investments in Port Infrastructure (IPI) in four Mediterranean EU member states: Portugal, Spain, Italy and Greece. To remain competitive, ports need to integrate to multimodal networks. The improvement of their infrastructure consists a decisive factor of this process. A selective modal allocation of the investments devoted in transport infrastructure can also advance the use of environmentally friendly transport modes through. As these demands have became EU policy targets, the paper focuses on the national IPI policies followed in the Mediterranean countries assessing whether they converge to EU policies. The findings suggest that, contrasting the policy targets that have been set in the Common Transport Policy (CTP), the level of the investments devoted to projects aiming to improve port infrastructure follows a negative trend in all the cases under examination. (JEL: L91, **R41)**

## 1. Introduction

Mediterranean ports have the potential to advance the development of the Southern peripheral EU coastal areas and islands. They also offer access to the European Union, including connection of the EU with many non-European countries and contribute to sustainable mobility by connecting the most environmental friendly parts of the network in a multimodal prospective. The development of European short-sea shipping to limit the congested inland traffic and decrease significantly the private, social, and environmental costs of transport, has turn to a major transport policy target at European level.

Although many factors affect the volume of transport demand, the important links between Investments in Transport Infrastructure (ITI) and the modal split of this demand are widely acknowledged. A measure to redistribute the modal pie and advance seagoing transport is the improvement of port infrastructure. Directing investments to port modernisation upgrades the competitive position of shipping, forwards the expansion of the sector, and facilitates its integration to the trans-European transport networks. Still, the modal allocation of such investments in the European countries has differed.

This paper analyses the investment policies in port infrastructure that have been developed since the 1980s in four Mediterranean European countries: Portugal, Spain, Italy and Greece. These investments are compared with variables like the evolution of the total investments in transport infrastructure and the trend of the national GDP. The paper also focuses on the financial intervention of the supranational EU institutions - as all these countries are listed among the lagging regions of the EU and cover their infrastructure needs using financial resources of respective Cohesion Funds.

Before these, the paper examines the vital role of port infrastructure for the improvement of Mediterranean ports' competitiveness. Then analysis turns to the relationship between investments in a mode's infrastructure and the modal split of transport demand, emphasising the importance of this relationship when sustainable mobility becomes part of transport policies. Presenting the extent that these issues have transformed to parts of common EU policies, the paper assesses the IPI policies that have been followed in the cases under examination. This provides a better understanding on the extent that the policies applied in each of these Mediterranean countries have integrated the EU target to promote maritime transport or neglected the importance of port modernisation.

## 2. Investments in Infrastructure and the Competitiveness of Mediterranean Ports

The expansion and structural modification of seaborne trade have several implications for ports. There is a growth in traffic and for ports coping with this growth poses an enormous challenge. A main reason for this growth is the increasingly widespread use of unitised cargoes, which means that the problem for ports is no longer how to attract vessels but how to

attract containerships. Then, the much larger size of vessels has made necessary to upgrade port infrastructure to cater for high volume flows. The arrival of unitisation lead to the incorporation of further criteria in deciding the route of a cargo as well as in modal choice.

Ports need to transform to areas were highly sophisticated logistic activities are concentrated. In this respect it is possible to talk in terms of logistics polarisation, a transformation realised in the early 1990s (Pesquera & De La Hoz, 1992). All types of seagoing trade are increasingly integrated into logistics chains. The recent, of forthcoming in the case of Greece (2004), cabotage liberalisation in the Mediterranean EU member states, create the challenge to overcome existing lengthy procedures in ports and provide state-of-the-art intermodal connections and other infrastructure facilities. The expanding feedering traffic cannot be developed unless it is properly integrated into the individual links of the inland transport chain. Freight corridors should go further and ports need to develop the conditions for setting up networks dedicated to intermodal transport.

There is also a fierce competition between ports to attract traffic and transportation activities. This competition has intensified even between ports that are not located in the same geographical area in Europe. This is because the efficiency of cargo handling and of ocean and inland transportation services has increased so greatly that the geographical monopoly power has eroded (Heaver, 1995). The market powers of ports are affected by technological developments associated with the provision of more specialised facilities. Capital-intensive terminals that serve few logistic systems, and the strategies of port authorities - in terms of their ability to provide value added services based on both economies of scale and scope, become more important than previously to the selection of port routings. As the reliability and damage rates of different services are converging the 'infrastructure related' transit time gains importance as a source of competitive advantage as it reduces generalised transport costs and lowers the size of stocks (de Langen, 1998).

The intensification of competition between transport modes for the same consignments strengthens the importance of the infrastractural adjustments. The expanding cargo figures, particularly their most profitable unitised part, are exposed to sharp modal competition. Road and air are two modes already involved in business logistics. Rail also competes strongly for intra-European traffic, including traditional international seaborne trade. The

feeder market provides an illustrative example. On certain routes road operators now compete effectively, an example being the Benelux - Spain service where the feeder traffic has frequently developed without using sea feeders (MDS Transmodal, 1994).

Therefore, adequate infrastructure (along with variables like organisational restructuring, know-how and expertise, the efficient use and administration of port infrastructure - Chlomoudis & Pallis, 1998) helps to attract cargoes when competition is strongest. The cargo generating capacity of a port remains a powerful element but other factors - i.e. electronic data information linking port authorities, shippers, stevedores, shipowners - come into play. In their absence, ports cannot meet the demand for commodities to be delivered (or transhipped) quickly and predictably, and the user considers the employment of the mode as a disadvantage of the production function (cf. Kallstrom & Warnecke, 1998). Whether a port will manage to introduce and improve these factors is largely dependent on the available funds for investment.

Infrastructure might not be the main determining factor of competition, more than ever when ports are well equipped in that respect. However, Mediterranean is a region where port infrastructure shortcomings are not rare - i.e. second generation container terminals and roll on/roll off facilities, transhipment installations, electromechanical equipment, skilled personnel, and inland transport infrastructure inside the ports (cf. MST *et al*, 1996). Over the course of the 1990s there have appeared problems arising from infrastructure congestion (ECMT, 1998). Moreover, irrespective from capacity requirements, even the most successful ports need further infrastructure modernisation though for different reasons: large ports to integrate into logistical systems, small and medium ports to overcome less efficient and less specialised facilities and offset their weaknesses regarding economies of scale. In short, there is a need to proceed for funding mechanisms to catch up.

Along with other adjustments, Mediterranean ports need to adopt a proactive approach to the improvement of accessibility infrastructure. In particular, they should provide demand-oriented infrastructure that links the different transport modes, and integrate into logistics. They also need to match the technological changes otherwise they may stagnate. By developing to a 'service oriented' economic activity, ports have entered in a post-industrial era: along with conventional services, the provision of modern logistics and

distribution services become essential conditions for rapid and efficient cargo flows in all types of trade. Infrastructure developments assist the compilation of shipping with the just-in-time requirements and stimulus the competitiveness of a port.

## 3. Sustainable Mobility: The Importance of Investing in Port Infrastructure

All these happen when the transport sector contributes to a wide range of environmental problems because of its nature, steady growth, and large share of fossil fuel and energy consumption. In economic terms, air pollution due to transport traffic costs 0.4% of the EU GDP, sound pollution 0.2% and congestion 2%. In total, an annual cost of approximately EUC 510 per person is the product of transport activities. However, each mode results in different environmental effects. When the energy annually consumed by the transport sector increased by 10,6% within the first half of the 1990s, road transport is responsible for 73,5% of the total consumption. The consumption in the case of both sea and rail modes equals 17% of the energy that would be consumed if the same exacty freight would be transported the same distance by road. As regards the modal split of $CO_2$ emissions, road freight emissions are 190gr/tonne Km, those of railway and inland navigation are 30 gr/tonne Km, and those of sea (intra-EU) 20 gr/tonne Km (Eurostat, 2000).

This issue involves fundamental political decisions as well as valuations about priorities, and distributional issues about who gains and who loses in the transport modal pie. The achievement of sustainable mobility insists upon the rational exansion of those modes whose operation combines the lowest demands in energy and produces the less possible negative effects to the environment. Investments in infrastructure generate new traffic and induce modal choices. At the strategic level the main effect is to influence the pace at which the demand for, and the congestion of, a particular transport mode and environmental damage from transportation activities gets worse or improves.

The amount of extra traffic varies according to specific circumstances, i.e. existing traffic distribution, geographical and economic conditions, the availability of alternatives. Overall, the infrastructure-induced traffic - the additional traffic which an enhanced transport supply (or the extension of upgrading of infrastructure) makes possible and which, as a result, is caused

by transport participants who partly or fully realise this potential - in long term can range from zero to 40 per cent (ECMT, 1997). This is due to various factors; i.e. to take advantage of the new infrastructure firms may modify routes, mode and, not least, the production-distribution process. Necessary responses might evolve over time. Nonetheless, the assumption that all modal growth is exogenous may cause appreciable planning, or policy mistakes (cf. Jansson, 1993).

As regards Mediterranean ports, cargo gains can be expected as the limitation of the time spent in ports makes short-sea shipping more attractive for fast cargoes and expands the range of the potential freights. In the more competitive ports of North Europe there is the potential of unloading more than 30 containers per hour because developments in their infrastructure - and organisational developments that result in the efficient operation of the existing infrastructure - have contributed to meeting the innovations in transhipment methods. On the other hand, in some ports in South Europe the productivity is up to 40% lower. The upgrade of infrastructure results in savings due to new possibilities to use specialised vessels that could not be accommodated before. Reduction of other costs related to the port interface - stevedoring costs, harbour and conservancy dues, pilotage - could also be achieved. This is of great significance since the transportation cost of a product varies from 7% to 35% of its final price and the shorter the distance the higher is the port cost as a proportion (Everard, 1995).

In addition, modernising port infrastructure offers advantages in terms of reliability. By creating the conditions under which the use of different transportation modes is simplified and transit times are reduced, infrastructure promote the compatibility of short-sea shipping with the inland legs of the transportation, and meet the demands of the users for unbroken chains of door-to-door services, and just-in-time delivery. These are important benefits, as the general perception is that short-sea shipping is slow when compared to its competitors on European trade corridors, not competitive in terms of price, and risks delays and disruption for reasons related to port modernisation. Devoting significant investments in port infrastructure can reduce inefficiencies and reverse this perception (Chlomoudis &Pallis, 1996).

It is frequently argued that the competitive disadvantage of short-sea shipping is mainly a consequence of the fact that the road transportation sector does nof fully pay the social and environmental costs it generates. Undoubtedly, the internalisation of these external costs in necessary. Still,

emphasis should be put on measures to improve the competitive position of the mode. It is the modernisation of the system itself that facilitates the regularity and the reliability of the shipping services at a reasonable cost that provides the main competition to alternative modes. Ports remain the nodes that facilitate the realisation of a continuous freight and passenger flow, and the critical transboarding points of a chain that involves modal interchanges.

## 4. EU Policy Developments

The state of transport infrastructure became a subject of attention at EU level in the early 1990s, when limitations of the public sector income and high public deficits in the 1980s had lead the aggregate European investments in transport infrastructure to a stagnation at the relatively low 1% of the DGP (ECMT, 1991). Attempting to overcome this situation the EU institutions have been involved in granting financial assistance. The European Investment Bank (EIB) and the European Regional Development Fund (ERDF) have been the major EU institutions forwarding investments in infrastructure. The Cohesion Fund covers the infrastructure needs of the lagging EU regions. Complementary projects are financed in the context of other European programmes, which target inter-state cooperation and the financial support of the geographical isolated islands of the EU periphery respectively. Apart from direct co-finance of the projects, these attempts implicate the interests subsidisation, budget guarantees, improvements of the fiscal environment, and means to promote self-finance of these projects. Since the entry into force of the Maastricht Treaty, the key strategy has been the further increase of this financial contribution through the progressive development of a multimodal Trans-European transport Network (TEN). In this perspective, improvements of ports, the poor relations in the trans-European networks, contemplated as essential.

It was also in the early 1990s that the growing concern about the environmental impact of transport resulted in a number of EU policy initiatives aiming to promote sustainable transport through the rational planning and modal allocation of the available funds. The 1992 European Environmental Action Programme recognised that transport policy could no longer be demand-led due to environmental constraint. The 1992 Green Paper on Sustainable Mobility presented a common strategy, which should enable transport to fulfil the sustainable mobility scenario (CEU, 1992a). The 1992 White Paper outlined a new policy for European transport

recognising that transport policy needs to have an environmental dimension (CEU, 1992b); apart from regulatory and technological measures to reduce the environmental impact of transport, the redistribution of the modal split was integrated to the targets of the EU policy. In this vein, the selective development and upgrade of transport infrastructure were declared as principal means to achieve this redistribution and promote the sustainability scenario.

A modification of the initial TEN guidelines in order to include and integrate ports has taken place. This is because when the priorities of the EU policy where setled did not include ports, although a great part of the EU port policy had already emphasised the problem of the inadequate port infrastructure - especially as regards the advancement of short-sea shipping (CEU, 1995). Acknowledging that the improvement of transport networks at both national and trans-European scale are meaningful otherwise, it was emphasised that ports are important nodes of the integrated systems and were included in the TENs project. The Green Paper on Ports and Maritime Infrastructure (CEU, 1997) suggested that the adequacy of the infrastructure in all EU ports, the connection of these loading and reloading centres with the other inland modes, and the modernisation of port zones are preconditions to maximise the participation of the sea mode in transport chains of door-to-door services. Priority was given in the contribution of substantial funds in port infrastructure, especially in the development of EDI systems and combined transport.

Still, the EU policy does not confine itself in a policy of rigid lines of port infrastructure that should be constructed in a certain time. The adopted view is that a network related action could discriminate against ports that are not part of it (for details: Pallis, 1997). Instead all the EU initiatives focus on port, or port related, infrastructure projects of common interests that facilitate trade; help to relieve congested land corridors and reducing the external costs of European transport; and improve the accessibility and strengthening economic and social cohesion in the EU. Not least because the EU does not have sufficient financial resources, the mobilisation of complementary private or public capital remains a significant requirement to accomplish the objectives of a modern and competitive port industry.

## 5. National Port Infrastructure Policies in the Mediterranean Countries

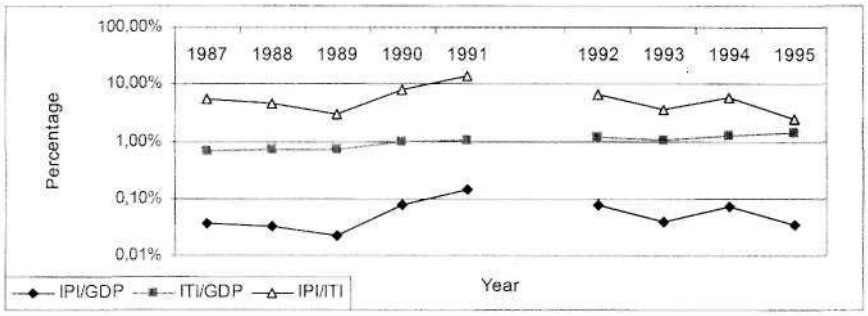
The perspective of the EU actions is not to replace the national governments, or the private sector, as the main sources of funding the

improvement of port infrastructure. The goal is the co-ordination of the local, national, and regional policies in line with the principles of subsidiarity and within a multimodal and sustainable prospective. The port infrastructure needs are being addressed but only partly funded at EU level. National governments need to implement these strategies as they continue to develop and maintain their own policies. They have a significantly larger role with respect to national planning and design, distribution of capital resources, financing of IPI, and the monitoring of such funding.

In order to conclude on whether the national policies followed in Portugal, Spain, Italy, and Greece converge or not to the aforementioned EU policy targets, the analysis turns to the exercised investment policies in port infrastructure. The focus is on the evolution of the IPI, the relationship of this evolution with that of the total investments in transport infrastructure (ITI), and the comparison of IPI growth with the economic growth of each country. As the accession of Portugal and Spain to the EU took place in 1986, and the most recent data that are available are those of 1995 (ECMT, 1999), this examination looks upon the period 1987-95. The latter is further divided in two sub-periods. As the preceded analysis highlighted a shift of the Common EU Transport Policy targets occurred in the early 1990s, hence 1991 is taken as the beginning of the second sub-period.

**Portugal**

A notable declining trend of the evolution of IPI in Portugal is evident (Figure 1). Expressed as a percentage of the GDP, the period 1987-91 IPI equalled 0,063%. This percentage was remarkably lower during the period 1992-95, leading to an average of 0,056% of the GDP. In absolute numbers, 37,6 millions ECU were devoted annually to the upgrade of port infrastructure in Portugal throughout the period 1992-95, comparing to 39,7 millions ECU the period 1987-91. On the other hand, the level of the GDP devoted to ITI increased significantly, from 0,827% of the GDP the first period to 1,218% in the second period. Whilst the applied national policies have taken advantage of the institutional framework and directed substantial higher levels of investments in transport infrastructure, ports were neglected: the IPI diminished remarkably from 7,64% of the total investments in transport the period 1987-91 to 4,57% of ITI the period 1992-95.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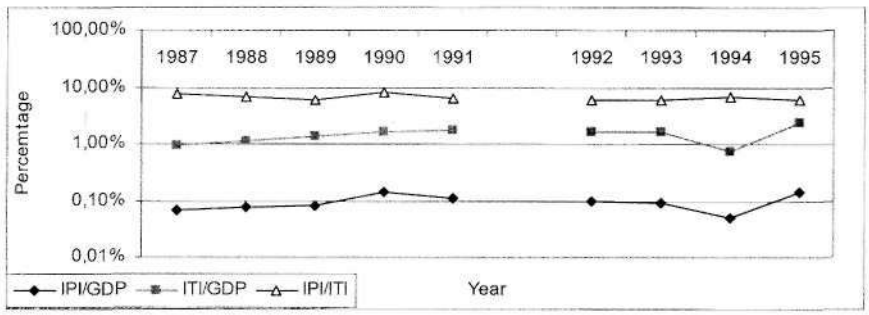
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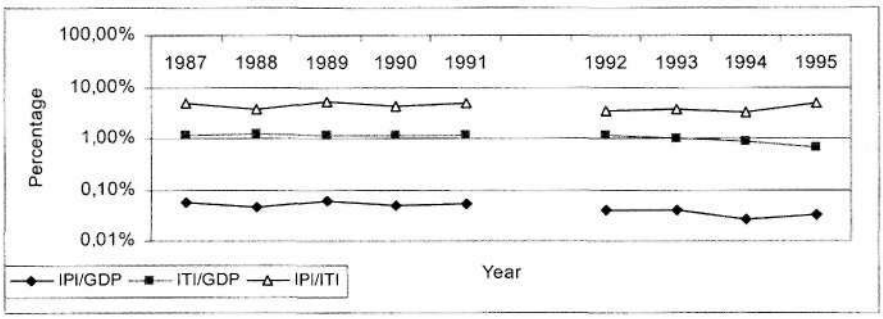
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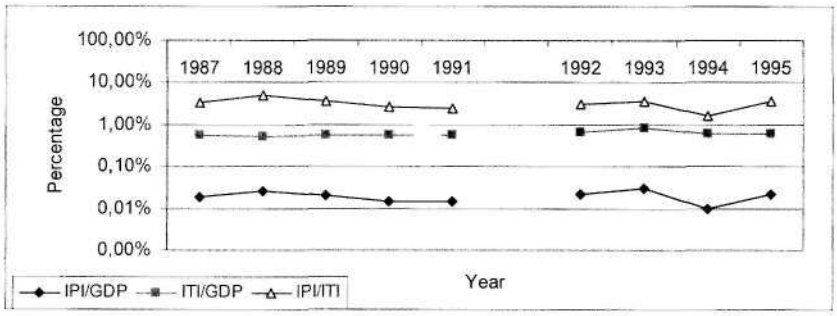
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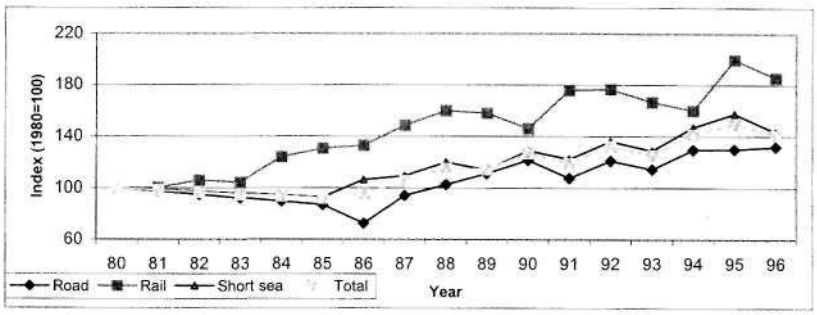
| | | IPI as % of the GDP (x1000) | ITI as % of the GDP (x1000) | IPI as % of ITI |
|---|---|---|---|---|
| Portugal | 1992-95 | 0,56 | 12,18 | 4,57% |
| | 1987-91 | 0,63 | 8,27 | 7,64% |
| Spain | 1992-95 | 0,47 | 7,76 | 6,12% |
| | 1987-91 | 0,96 | 13,87 | 6,90% |
| Italy | 1992-95 | 0,34 | 9,19 | 3,70% |
| | 1987-91 | 0,53 | 11,69 | 4,51% |
| Greece | 1992-95 | 0,20 | 5,09 | 4,01% |
| | 1987-91 | 0,19 | 5,50 | 3,41% |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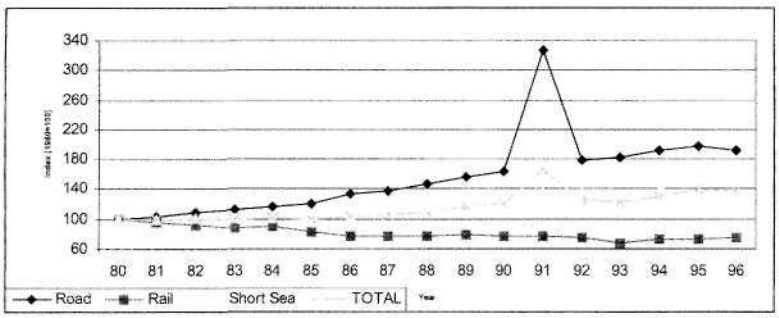
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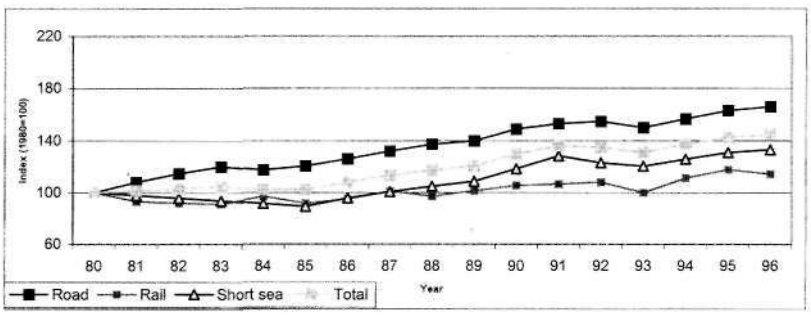
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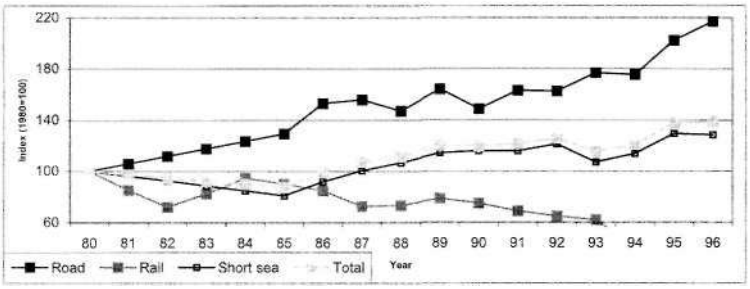
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paper. The period 1980-1990 the growth of total transport traffic was 21%. The same period the goods transported by sea increased only by 18,1%. As a result, since 1989 seagoing trade is not anymore the principle mode of goods transportation in the EU. The higher annual growth of road traffic than the growth of the total goods transport (tkm) that was observed in the 1980s (2,6% comparing to 1,6%) continued in the 1990s. Throughout the period 1990-97, road transportation increased by 29% when the goods distributed by sea (intra-EU) increased by 22% (CEU, 1999).

## 6. Conclusions

Substantial investments in Mediterranean ports infrastructure are essential in order to achieve their adjustment to competitive nodes of multimodal operations. Moreover, the redistribution of the investments in transport infrastructure in favour of the environmentally friendly sea mode can advance the creation of a Trans-European transport network in line with the sustainability principle; investments in a mode's infrastructure can generate traffic and induce modal choices.

However, in Portugal, Spain, Italy and Greece, national level choices contradict the supranational level policy design - even though public investments in transport infrastructure have been boosted by EU financial initiatives and support frameworks. Contrasting the policy targets that have been set in the context of the Common Transport Policy since the beginning of the 1990s, the level of the investments devoted to projects aiming to improve the infrastructure of ports in all these EU member states follows a negative trend. In live with the conclusions of an earlier study of the Greek case alone (Chlomoudis & Pallis, 1996), these findings suggest that the problematic tendency of national level choices regarding the balanced integration of ports in the transport network is a generalised phenomenon.

Notwithstanding that the EU approach is to implement a bottom-up decision making approach, in line with the subsidiarity principle, it would be a mistake to attribute the road-addicted investment strategy solely to deficiencies of the initiatives undertaken by national institutions. This study enhances suggestions that, despite the rhetoric, the EU perception of transport network's development is dominated by its role in making the single liberalised market work (Masser *et al*, 1992; Whitelegg, 1993). Ignoring in practice infrastructural and environmental necessities, and aiming not to distort competition, the EU has avoided a defined plan of a strategic priority port infrastructure that should be constructed in a certain time - a decision

highly appreciated by considerable parts of the industry. Community Support Frameworks increase the funds allocated to transport infrastructure development without indicating a potential redistribution of their modal split. The EU initiatives lack a transport dimension, which would offer alternative scenarios for the achievement of its objectives.

In the short term these policy patterns harm the modal distribution of the traffic volume and the competitive position of Mediterranean ports. Infrastructure in these ports lags behind, with substantial negative consequences on their capacities to accept vessels (for both technical and economic reasons), in turn for their potential participation in the absorption of the increasing demand for transport services. As a result the share of the seagoing transportation declines. In the long-term the negative trends of IPI contradict the necessities of the transport networks interoperability and undermines the concept of sustainable mobility.

Investment policies applied in the Mediterranean EU member states need to overcome these problems and converge to the EU policy targets. As goods and passengers transport continues to grow at a higher level than the GDP, the required fundamental change lies in the re-thinking that public and private decisions involving expenditure should progressively concentrate more in the advancement of maritime transport. National administrations need to increase the funds allocated to the improvement of port infrastructure if they are to succeed in integrating the ports in a multimodal perspective.

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