Greek Ports: Structural Challenges and Forms of Adjustment

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ABSTRACT

The Greek port industry is characterized by the dominance of the public sector in port activities. The ownership of port assets, corporate port governance and services provision develop under strict, direct or indirect state (ministerial) control. As a result Greece stands among the few countries in which the port industry is fully controlled by the public sector.

Yet, the context, in which contemporary ports operate impels for greater flexibility in port operations. Several countries worldwide have responded implementing port devolution programs. The latter have been accompanied by an increasing participation of the private sector in port operations. In several EU countries several port reforms devolved the port industry, allowing for the participation of private companies.

In Greece the port reform process which is underway since 1999 (corporatization of public ports – has been incomplete, and the terms of potential private sector participation remain under discussion. Despite the fact that the vast majority of ports worldwide have introduced ownership and managerial models which allows the participation of private entities as a mean to develop intra-port competition, in Greece this issue remains under examination. Based on the highly competitive context of the contemporary port industry the activation of the private sector in Greek ports seems to be essential. Recent empirical research (published by Pallis & Vaggelas in Maritime Economics and Logistics in 2005a) concluded that this view is endorsed by port authorities but the ways of adjustment are still to be determined.

As private involvement in the port industry stands now as a ‘global’ rule the examination of the optimum public private relations in Greek ports is an emerging challenge – frequently the theme of the relevant policy agenda. Yet, issues like the liability undertaking and the distribution of port services production costs between the two sectors, have not yet been resolved in a concerted way. Identifying this optimum is a major challenge not only for the Greek public port authorities but for the Greek government as well, as successive administrations have expressed the will to proceed to reforms allowing the participation of private companies in the port industry. A framework that will encounter these issues in a fair and dynamic base is essential.

Aiming to contribute to this debate and the essential adjustments, this paper presents a conceptual framework that when implemented can be a valuable tool in the process of defining the interface of the two sectors. Being part of a research in progress that is implemented in the case of the passenger port of Piraeus, this framework is based on the benefits that are obtained by each sector from port services production. It also analyses a methodological framework for its implementation.

Keywords: Greece, Port adjustment, Public/Private interface in port services
1. INTRODUCTION

The port industry is under an ongoing reform. Radical transformation of the world economy, through globalization, in conjunction with changes in the port industry environment, such as containerization and technological progress had substantial effects in ports, worldwide. As a result ports moved towards the post fordist model (Notteboom and Winkelmans, 2001) and new ‘world of production’ (Chlomoudis et al, 2003). Moreover they transformed from a labour intensive to a capital intensive industry (Trujillo and Nombela, 1999).

These changes resulted in a new port environment, which is characterised by competition which in turn impels ports towards effectiveness. To increase their effectiveness ports are investing huge capitals for the modernization of their infrastructures and superstructures. But due to restrictions in public financing, ports are turned to the private capital in order to finance their investments (ESPO, 2004a). As a result public ports are in a difficult position in this competitive environment (Slack, 1993).

This new environment has created the appropriate conditions for the participation of private companies in the port services provision market. The capital adequacy and some other advantages of the private sector (i.e. effective operation, know-how etc) made their participation in the port industry more attractive. The shipping companies, especially the liner ones, exploit the opportunity and they are participating in the port services provision market in order to accomplish the vertical integration of their production process. Thus in many cases, the port users are also port services providers (ESPO, 2004b). On the other hand there are multinational port services providers (i.e. PSA, HPH etc.), who are trying to achieve the horizontal integration of their production process. Thus they operate multiple terminals in many major ports worldwide.

As Juhel (1998; §7, pp.4) noted “The most considerable characteristic of the port reform is the increasing participation of private companies in the provision and management of the port services”. The increasing private participation in the port industry is in line with the reform processes in many public sectors. The main characteristic of these reforms is that the public sector is trying to adopt management techniques, implemented by the private sector. This process is known as New Public Management (Pollitt and Bouckaert, 2000) and its implementation aims to increase efficiency, effectiveness, and relevant economic results.

As a result there is an international trend for a decreasing participation of the public sector in ports (UNCTAD, 1996) and the increasing participation of the private sector. Despite its declining participation, the public sector is involved in the port services management and operation in order to protect the production of public goods in ports (see Langen and Nijdam, 2006) and to avoid market distortions such as monopolistic situations (Goss, 1990) although this might not be the case (see Brooks and Cullinane, 2007; pp. 434).

So what a port represents? Is it a public infrastructure or it is a commercial entity? The worldwide trend is to consider a port as a commercial entity, which must cover its expenses from the port users who benefited from its existence. Moreover, based on the above analysis a conclusion is that in the majority of the ports there is a coexistence of the public and private sector and that the contemporary port product is a mixture of public and private goods.

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In an effort to reflect the various organizational and ownership structures of the contemporary ports, several organizational/ownership/governance models have been developed [see World Bank (1999); Stevens, (1999); Bowden and De Jong, (2006); Brooks and Cullinane (2007)]. From the examination of these models major conclusions can be extracted:

1. The modern models are recognizing the coexistence of the public and private sector in every port, even in those ports which are fully private (i.e. Felixstowe).

2. The existence of so many models shows that there is an absence of a concerted framework for categorizing ports. Thus these models can’t define a final boundary between the two sectors in the port industry (Bichou and Gray, 2005).

Despite their weaknesses, these models (especially the World Bank model) have been widely used, in an effort to categorize every port according to the extent of the private sector participation.

Given that the coexistence of the two sectors in the port industry is the rule, rather than the exception, the paper (Section 2) analyses the ownership and organisational structure of the European port industry. Based on these findings the paper examines (Section 3) the reform of the Greek port sector, which exhibits different ownership structures, compared with the rest of EU countries. The port market analysis certifies the necessity for a further reform towards the participation of the private sector, which is the intention of the Greek government. The farther participation of the private sector raises the question of the optimum interface and the fair distribution of the port services production cost between the two sectors. A methodological framework based on the benefits obtained from each sector is presented (section 4) as a potential answer to these questions. Finally, section 5 concludes and it post proposals for further research.

2. **THE EUROPEAN PORT INDUSTRY**

Ports are vital for the EU economy. Almost 90% of its external and the 40% of its internal trade is seaborne trade. A total throughput of 3.5 billion tones and 350 million passengers are passing through EU ports every year, creating an added value of 20€ billion. European ports must be efficient and competitive in order to facilitate the EU trade.

In many European countries, ports are exploiting the advantages of the private sector participation in services provision, infrastructure-superstructure investments, and management of the Port Authority. Table 1 presents the extent of private participation in port operation in the countries which are members and observers of the European Sea Ports Organization (ESPO). The categorisation of the countries is based on the features of their major (international) ports, because in the small ports (of national or topical interest), the public sector is almost exclusively responsible for their financing and operation. This is mainly because the small ports have small cargo throughput and accordingly small revenues, thus there aren’t attractive to the private initiative.
Table 1.
Extent of private sector participation in the member-observer countries of ESPO

<table>
<thead>
<tr>
<th>Extent of participation</th>
<th>Port Services provision</th>
<th>Investments in superstructure and port services provision</th>
<th>Fully private ports</th>
<th>Absence of private sector involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries</td>
<td>• Croatia</td>
<td>• Belgium</td>
<td>• U.K.</td>
<td>• Denmark</td>
</tr>
<tr>
<td></td>
<td>• Bulgaria</td>
<td>• Estonia</td>
<td></td>
<td>• Greece</td>
</tr>
<tr>
<td></td>
<td>• Cyprus</td>
<td>• Germany</td>
<td></td>
<td>• Iceland</td>
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<tr>
<td></td>
<td>• Finland</td>
<td>• Latvia</td>
<td></td>
<td>• Portugal</td>
</tr>
<tr>
<td></td>
<td>• France</td>
<td>• Lithuania</td>
<td></td>
<td>• Sweden</td>
</tr>
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<td></td>
<td>• Ireland</td>
<td>• The Netherlands</td>
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<tr>
<td></td>
<td>• Italy</td>
<td>• Norway</td>
<td></td>
<td></td>
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<td></td>
<td>• Malta</td>
<td>• Poland</td>
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<td></td>
<td></td>
<td>• Spain</td>
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</tr>
</tbody>
</table>

Source: Author (based on data process from ESPO (2004b) and ESPO (2006)).

The conclusion from Table 1 is that the private sector has a direct involvement in the European port industry. In nine countries the private sector is financing the superstructures and it provides the port services. This is the well known (i.e. the World Bank models), landlord port, where the Port Authority owns the land, rents it through concessions to private companies) and supervise the port operations. In 8 countries the private sector participates in the provision of port services, while in one country (U.K.) the private sector is responsible for almost the entire port operations (cf. Baird and Valentine, 2007). The final category is the absence of private sector participation in which there are 5 countries, one being Greece.

The landlord model is the prevailing one among the ESPO members and this outcome is in line with the ESPO (2004b) conclusion that there is a worldwide trend for ports to operate as landlords. This trend is mainly due to the characteristics of this port organizational model, as it combines the benefits from the private management and the safeguarding of public goods (Saundry and Turnbull, 1997).

Evidently, there is a coexistence of public and private sector in the port industry of many European countries. The private participation will inevitably increase in the near future, taking into account the decision of the EU to minimize the financial support of the member states governments to the public transport systems. This decision aims at eliminating market distortion from the public subsidies. Thus, port authorities are turning to the private capital in order to finance their investments. The EU realised that the private sector is an important player in the port industry in the early 1990s. Having in mind the elimination of market distortions decided (CEU, 1997) the European Commission put forward the
proposal that every user should pay for the use of maritime and port infrastructures, excluding only those which are perceived to be as public goods.

The contemporary EU port industry is characterised by fierce competition, the inability of the public sector to finance the necessary investments (due to budget restrictions or due to EU legislative framework) and the increasing participation of private companies in the port services provision market. This environment requires appropriate measures as a response to the new challenges, aiming at the survival of their port industry. Many European countries (i.e. Italy, Spain) have already moved towards the reform of their port systems in order to allow the participation of the private sector. The North European countries had already endorsed similar models, by allowing private participation in the port industry for many years. The adaptation to the new environment is more difficult for those countries where the port industry is under the exclusive control of the public sector. This was the case for Spain and Italy which nevertheless, have managed to successfully reform their port industry.

From the five countries in the table 1, Iceland doesn’t have a sufficient hinterland in order to preserve high trade volumes. Portugal is facing the competition from the French (i.e. Le Havre), Spanish (i.e. Barcelona) and U.K. (i.e. Felixstowe) ports which we are the pioneer ports in this area. Sweden and Denmark are also facing competition from German (i.e. Hambourg) and the Netherlands (i.e. Rotterdam) ports and the geographical location of their ports does not enable them to become major transhipment ports. For these reasons these four countries might not want to apply a port reform program in order to increase their competitiveness and effectiveness. What about the Greek port industry and its potential in the new port environment?

3. THE GREEK PORT INDUSTRY

The Greek port sector has been characterised by the direct intervention of the state in their development, management and operation. This seems to be the result of the national ideology which represented that the industries which produce some kind of public goods (i.e. telecommunications, transport and electricity market) must be under the direct control of the public sector. This scene changed at the middle of 90’s when several public corporations was privatized or went public. The same was the scene for the port industry.

A first attempt for the reform of the Greek port industry occurred in 1999, with Law 2688/1999. According to this law, the two major Greek ports, Piraeus and Thessaloniki, transformed in limited companies and went public and currently are listed in the Athens Stock Exchange. A second step towards port reform was the law 2932 of 2001. This law transformed 10 ports of national interest \(^2\) in limited companies. Moreover a special secretariat was created in order to coordinate the entire national port system.

What was the result of these initial attempts for the reform of the Greek port system? The two ports of international interest went public but the public sector still maintains the 75% of their shares and exercises the management of these ports. The 10 ports of national interest transformed to limited companies with 1 share owned by the state and of course it has their management. This is a type of port reform known as corporatization (see World Bank, 1999), when the public sector maintains the ownership of the port and moreover it

\(^2\) These ports are: Lavrio, Elefsina, Corfu, Kavala, Alexandroupolis, Heraklion, Igoumenitsa, Patra, Rafina and Volos.
introduces professional management structures (based on the structures of private companies), through the creation of autonomous entities.

The current operational framework of Greek ports is characterised by the dominant role of the public sector. State authorities are responsible for the enforcement of the port regulatory framework, the development of port infrastructures and superstructures and finally for the provision of port services. The private sector is involved in the provision of port services only in cases when the public port authorities can’t provide them due to lack of the appropriate equipment.

Has this operational framework being successful for the Greek ports or there is a need for a further reform? A first answer to this question is coming from the data of table 2, which shows the TEU traffic at the major Mediterranean ports for the years 2000-2005. The container traffic is illustrative, as it is the most profitable cargo for ports and is by far the most developing cargo sector of the world trade.

Table 2.

<table>
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<th></th>
<th></th>
</tr>
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<td>Gioia Tauro</td>
<td>Italy</td>
<td>3.261</td>
<td>3.149</td>
<td>2.955</td>
<td>2.488</td>
<td>2.653</td>
<td>22,92</td>
</tr>
<tr>
<td>Algeciras</td>
<td>Spain</td>
<td>2.937</td>
<td>2.516</td>
<td>2.229</td>
<td>2.152</td>
<td>2.009</td>
<td>46,19</td>
</tr>
<tr>
<td>Valencia</td>
<td>Spain</td>
<td>1.949</td>
<td>1.992</td>
<td>1.821</td>
<td>1.507</td>
<td>1.308</td>
<td>49,01</td>
</tr>
<tr>
<td>Barcelona</td>
<td>Spain</td>
<td>1.890</td>
<td>1.652</td>
<td>1.461</td>
<td>1.411</td>
<td>1.370</td>
<td>37,96</td>
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<td>Italy</td>
<td>1.686</td>
<td>1.605</td>
<td>1.531</td>
<td>1.527</td>
<td>1.501</td>
<td>12,33</td>
</tr>
<tr>
<td>Piraeus</td>
<td>Greece</td>
<td>1.500</td>
<td>1.595</td>
<td>1.405</td>
<td>1.168</td>
<td>1.173</td>
<td>27,88</td>
</tr>
<tr>
<td>Malta Freeport</td>
<td>Malta</td>
<td>1.461</td>
<td>1.305</td>
<td>1.244</td>
<td>1.155</td>
<td>1.033</td>
<td>41,43</td>
</tr>
<tr>
<td>Damietta</td>
<td>Egypt</td>
<td>1.263</td>
<td>0.955</td>
<td>0.750</td>
<td>0.639</td>
<td>0.617</td>
<td>104,70</td>
</tr>
<tr>
<td>Haifa</td>
<td>Israel</td>
<td>1.043</td>
<td>1.068</td>
<td>0.906</td>
<td>0.901</td>
<td>0.871</td>
<td>19,75</td>
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<tr>
<td>La Spezia</td>
<td>Italy</td>
<td>1.040</td>
<td>1.007</td>
<td>0.975</td>
<td>0.975</td>
<td>0.910</td>
<td>14,29</td>
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<tr>
<td>Marseilles</td>
<td>France</td>
<td>916</td>
<td>833</td>
<td>813</td>
<td>742</td>
<td>725</td>
<td>26,34</td>
</tr>
<tr>
<td>Taranto</td>
<td>Italy</td>
<td>770</td>
<td>659</td>
<td>472</td>
<td>186</td>
<td>5</td>
<td>15300,00</td>
</tr>
<tr>
<td>Istanbul/Ambarti</td>
<td>Turkey</td>
<td>770</td>
<td>815</td>
<td>574</td>
<td>386</td>
<td>395</td>
<td>94,94</td>
</tr>
<tr>
<td>Port Said</td>
<td>Egypt</td>
<td>700</td>
<td>640</td>
<td>587</td>
<td>589</td>
<td>504</td>
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</tr>
<tr>
<td>Leghorn</td>
<td>Italy</td>
<td>653</td>
<td>593</td>
<td>547</td>
<td>553</td>
<td>501</td>
<td>30,34</td>
</tr>
<tr>
<td>Ashdod</td>
<td>Israel</td>
<td>560</td>
<td>514</td>
<td>536</td>
<td>512</td>
<td>480</td>
<td>16,67</td>
</tr>
<tr>
<td>Cagliari</td>
<td>Italy</td>
<td>496</td>
<td>303</td>
<td>46</td>
<td>29</td>
<td>25</td>
<td>1884,00</td>
</tr>
<tr>
<td>Salerno</td>
<td>Italy</td>
<td>400</td>
<td>417</td>
<td>375</td>
<td>321</td>
<td>277</td>
<td>44,40</td>
</tr>
<tr>
<td>Constanta</td>
<td>Rumania</td>
<td>386</td>
<td>206</td>
<td>135</td>
<td>119</td>
<td>106</td>
<td>264,15</td>
</tr>
<tr>
<td>Naples</td>
<td>Italy</td>
<td>348</td>
<td>433</td>
<td>446</td>
<td>430</td>
<td>397</td>
<td>-12,34</td>
</tr>
<tr>
<td>Thessaloniki</td>
<td>Greece</td>
<td>336</td>
<td>270</td>
<td>240</td>
<td>234</td>
<td>230</td>
<td>46,09</td>
</tr>
<tr>
<td>Trieste</td>
<td>Italy/Adriatic</td>
<td>190</td>
<td>117</td>
<td>185</td>
<td>196</td>
<td>206</td>
<td>-7,77</td>
</tr>
<tr>
<td>Malaga</td>
<td>Spain</td>
<td>97</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>n.a</td>
</tr>
<tr>
<td>Tangier</td>
<td>Marocco</td>
<td>30</td>
<td>23</td>
<td>21</td>
<td>19</td>
<td>17</td>
<td>76,47</td>
</tr>
<tr>
<td>Derince</td>
<td>Turkey</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>100,00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>24.684</td>
<td>22.671</td>
<td>20.255</td>
<td>18.240</td>
<td>17.314</td>
<td>42,57</td>
</tr>
</tbody>
</table>

n.a. = not available
Source: European CommunityCommission: Transport in Figures, various issues
According to these data the reform of the Greek port industry cannot be characterised as a successful one. For the port of Thessaloniki there was a positive outcome as the container traffic increased about 4% more than the average increase in the Mediterranean area. Piraeus achieved an increase rate of about 28%, far below the average rate of increase. In the case of the Port of Piraeus developments have been worse as in 2005 he had a throughput of 1,394 million TEU’s which is a decrease of 7.07% in container traffic compared with the year 2004. Moreover Piraeus dropped from the 41st position in 1998 to the 60th position in 2005 in the list of the top container ports in the world (Psaraftis, 2007).

These data might not mean anything for the potentiality of a port. Yet they are signs for the future. First of all, the container traffic in Mediterranean increased by 7.35 million TEUs in a period of 4 years. From this volume, the two major Greek ports earned just 0.46 million TEU. The number seems to be significant but other ports in the region, like Algeciras, Valencia, Barcelona, Malta and Gioia Tauro, enjoyed considerable higher growth level in their container traffic. This means that these ports offers port services in such a way that are attract port users, i.e. the shipping companies.

The Greek ports, despite that they have a strategic geographical location in the crossroads of Far East-West Europe and West Europe-Black Sea routes, did not manage to take the advantage of traffic increase in the Mediterranean. This was caused mainly by the way in which Greek ports are operating, under the strict control of the public sector. As earlier noted, there is a fierce competition between ports in the Mediterranean region. Other countries (i.e. Italy), moved on a more liberalized port industry which included the development of specialized terminals (i.e. Voltri container terminal, Gioia Tauro). The first stage of port reform despite some positive regulations, didn’t offered a dynamic change of the port industry as the public sector still has the fully control and ownership.

Should Greece proceed to a new reform of the port industry? Based on the above conclusions the answer is, rather positive. Pallis and Syriopoulos (2007), evaluated the Greek port reform, by analyzing the financial condition of the 12 ports which are limited companies. They concluded that despite some positive sign, there is an imminent need for further reforms. Psaraftis (2007) also agreed with this conclusion as he pointed out that the benefits from the port reform for the Greek ports are insignificant.

Thus, the Greek port industry needs to move towards a new reform. But before proceeding to the development of a new framework it must be decided which is the appropriate structure for the Greek port industry, that it will contribute in enhancing the role of the Greek ports in the Mediterranean. Based on a research in the 12 biggest Greek ports regarding the potential effects of the rejected EU directive on market access to port services, Pallis and Vaggelas (2005a) concluded that the vast majority of the ports CEO, was in favor of directive’s proposals and they was seeking for private companies participation in the provision of port services. They maintained that the participation of private companies could increase the quality of the port services and at the same time could decrease the tariffs.

So in a future port reform, the government must take into account the potential of private participation in the port industry and it seems that is in favour of this proposal. Few months ago the government announced its intention to proceed to a public tender in order to grant the container terminals of Thessaloniki and Piraeus through concession contracts. Interest has been expressed by many private shipping companies (i.e. COSCO, ZIM, MSC) and by private port operators (i.e. Hutchinson Port Holdings, Dubai Ports). Port labor employees opposed to this decision and went in a two months strike (December 2006-January 2007). The loss for the two port authorities and especially for Piraeus was huge and the
government decided to withdraw its intention at the moment in order to discuss the whole project with the port labours.

This first attempt (the participation of private companies) it’s in the right direction but several issues have to be re-examined. The government aimed at granting each terminal into only one private port services provider. The result will be the transformation of the public monopoly into a private one and the consequences might be worst comparing with the present situation. Nevertheless the new attempt for reforming the Greek port industry should move on as the port market in the Mediterranean is rapidly changing. Few months ago the reform of the Turkish port industry was completed (i.e. including the concessioning of the port of Izmir). Many terminals are now operated by private companies through concessions and the new players in the region include the Port of Singapore Authority (PSA), a worldwide known and efficient port operator. Greece needs to follow these trends and open the port market to private sector involvement— not least because entry barriers restrict the desired development of intra-port competition (De Langen and Pallis, 2006). Based on the recent developments, the concession process will start sooner or later; hence the optimum public/private interface need to be identified.

### 3.1 What about the port services production costs?

Is the beginning of a concession process enough? The participation of the private sector helps in solving some problems of contemporary ports (i.e. efficiency, increasing quality etc.). At the same time concessioning might create other problems. These are the outcome of the coexistence of public and private entities in a port and are questions mainly regardign the fair distribution of the costs of port services production. The European Commission (CEU, 1997) has noticed the new trend of the increasing participation of private entities in transport systems and decided to introduce the “user pays principle” as the best mean to distribute the cost of infrastructure use among the various stakeholders.

This intention was the beginning of a long discussion regarding the appropriate application of this principle. Haralambides (2002) proposed the long-run marginal cost as an efficient tool in order for a port authority to cover the full cost of the port services production. Apart from some other deficiencies (see: Walters, 1974; Talley, 1994) this proposal, cannot be a solution to the cost distribution problem. This is because it focuses to the ex post cost distribution without taking into account the ex ante cost distribution (for example when there is a construction of a new port complex).

Moreover, the user pays principle has another major deficiency. Which is the variable according to which someone will estimate the distribution of the cost? It might be the time or the amount of infrastructure usage. However this variable can be problematic, because different inputs (amount or time of infrastructure usage) can lead to different outputs for every user. This is either due to differences in technological equipment, or because of the achievement of economies of scale. Thus, the appropriate variable can be the output of the production process which is the benefits that each user obtains from the use of port infrastructure. A common characteristic of the majority of economic systems is that the interaction between the factors of production, transaction or both creates some benefits between the participants (Castrillo and Wettstein, 2006). According to these the appropriate principle for the fair distribution of the port services production costs should be the “beneficiary pays”. Of course the benefits obtained by a port user are not only the revenues.
There are also some other “hidden” benefits (including economic externalities) which are not perceivable from the participants in the port industry.

A first conclusion is that a fair distribution of port costs should be based on the benefits that each participant obtains. The second one is that the benefits must take into account the whole benefits that can be produced from the port services production process and not only the revenues. Thus the cost distribution should be based on the distribution of benefits. A methodological framework for the distribution of the benefits coming from the port services provision, between the public and the private sector is essential.

4. A METHODOLOGICAL FRAMEWORK FOR THE DISTRIBUTION OF BENEFITS FROM PORT SERVICES PRODUCTION

To develop the aforementioned methodological framework, this research focuses on passenger ports. This part of the port industry has been neglected in the international literature (Pallis et al., 2007), as it is not as profitable as the container ports, but is important for the well-being of a society and especially for countries like Greece. The large number of islands in the Greek territory requires the provision of reliable and effective coastal shipping services as well as passenger port services in order to maintain the social cohesion.

As previous said the ultimate goal of the methodological framework is the fair distribution of the port services production costs according to the distribution of the benefits produced. A first step is to define where these costs and benefits are coming from. The first stage of the research focuses on the identification of the services provided in the port. This task has some difficulties as every port is unique regarding the socio-economic environment in which it operates, the services that produce, its target-market etc.

The second stage is to locate the potential benefits that are produced by the production of port services. Cities are historically benefited from the existence of a port complex in their territory (Helling and Poister, 2000). A port can produce several benefits like employment, economic development, trade facilitation, etc. In the international literature there are several researches regarding the economic impact of a port in its surrounding region, but they take into account only some benefits (mostly employment, revenues, and taxes). Thus it is necessary to identify the whole benefits that can be produced by a port (in the case of this research, a passenger port).

The final stage is the selection of an appropriate method for the quantification and the distribution of the benefits between the public and the private sector. Pallis and Vaggelas (2005b) examined three potential methods, namely Economic Impact Studies (EIS), Stakeholder Theory (ST) and Cost Benefit Analysis (CBA). These methods might be appropriate (especially the EIS) for the quantification of the benefits but they can be used for the benefits distribution. A follow up research (Vaggelas, 2006) examined two more methods, the Analytic Hierarchy Process (AHP) and the Game Theory with the Shapley Value solution. This study concluded that the AHP is an appropriate method for the quantification and the distribution of the benefits coming from the port services provision.

Thus the third stage of the proposed methodological framework is based on AHP. The prospective outcome of the application of the proposed framework in a forthcoming research will be the percentile participation of the private and the public sector in the toatal benefits. As a result, the two sectors might participate in the total port costs by the same percentage. The proposed framework is shown on figure 1.
4.1. **Port Services produced in a passenger port**

As passenger ports are neglected in the international literature there is not any scientific study regarding the services that might be, or are produced in a passenger port. An exception is a study from Chlomoudis et al. (2004) in which the authors provide a limited number of port services. Based on Pallis and Vaggelas (2006a) who conducted a field research in 20 of the bigger passenger European ports, a list of potential services in passenger port can be extracted. According to these studies, which are based on the theory of intermediate and final port product, there are 53 different port services that might be produced in a passenger port.

From these services, 17 are characterised as core services because they produced in every passenger port of the sample either because are necessary for the port existence or because they are mandatory under EU legislation. The core services are divided in 6 categories according to the scope of each service (i.e. services to ship, services to passengers, services to vehicles, safety and security services, navigation services and environmental management services). The framework to be proposed is based only in the core services for two major reasons: a) these services are vital for the existence of a passenger port and (b) they are the most costly services as they related to the infrastructures of a passenger port. Table 3, presents these 17 core services.

**Table 3. Core services in a passenger port**

<table>
<thead>
<tr>
<th>Category</th>
<th>Core services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services to vessels</td>
<td>Anchorage, Mooring-Unmooring, Pier</td>
</tr>
<tr>
<td>Environmental management services</td>
<td>Ship waste management, Anti-pollution equipment</td>
</tr>
<tr>
<td>Services to vehicles</td>
<td>Connection with road network, Port road network, Port area infrastructures for vehicles</td>
</tr>
<tr>
<td>Security and Safety services</td>
<td>Security, Safety</td>
</tr>
<tr>
<td>Services to passengers</td>
<td>Embarkation-Disembarkation, Connection infrastructures with transport network, Passenger terminal station</td>
</tr>
<tr>
<td>Navigation services</td>
<td>Breakwaters, Navigation Channel, Port basin, Port signalling</td>
</tr>
</tbody>
</table>


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3 According to this theory the intermediate port product are the port services that are used as inputs for the production of the final port product (for a thorough review see Chlomoudis et al, 2004)
4.2 Benefits resulting from the port services production process

The second stage of the proposed framework is to trace the benefits that can be produced from the provision of port services in a passenger port. Baird (2004) agrees that the existence of a port is of vital importance for the transportation of passengers and cargoes helping in trade facilitation and thus contributing in a country’s economic development.

Pallis and Vaggelas (2006b) through an analytic examination of the benefits that can be produced by a passenger port, conclude in a list of 19 unique benefits. These benefits are categorised either as direct or as indirect. The former group refers to the benefits enjoyed by those directly involved in port operations (i.e. shipping companies, passengers, employees etc), while the latter group refers to the induced benefits that are enjoyed by the external port environment (i.e. society). Table 4 presents the 19 direct and indirect benefits.

Table 4. Direct and indirect benefits coming from port services production process

<table>
<thead>
<tr>
<th>Direct Benefits</th>
<th>Indirect Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employment</td>
<td>1. Employment (induced)</td>
</tr>
<tr>
<td>2. Direct taxes</td>
<td>2. National Security</td>
</tr>
<tr>
<td>3. Contribution to GDP</td>
<td>3. Indirect taxes</td>
</tr>
<tr>
<td>4. Trade Facilitation</td>
<td>4. Land value increase</td>
</tr>
<tr>
<td>6. Income generation</td>
<td></td>
</tr>
<tr>
<td>7. Investments augmentation</td>
<td></td>
</tr>
<tr>
<td>8. Urban Planning</td>
<td></td>
</tr>
<tr>
<td>9. Local &amp; Regional Development</td>
<td></td>
</tr>
<tr>
<td>10. Value Added</td>
<td></td>
</tr>
<tr>
<td>11. Lower transport costs</td>
<td></td>
</tr>
<tr>
<td>12. Potential development</td>
<td></td>
</tr>
<tr>
<td>13. Access to a wide range of port-related services</td>
<td></td>
</tr>
<tr>
<td>14. Free Trade Zones</td>
<td></td>
</tr>
</tbody>
</table>

Source: Pallis and Vaggelas (2006b)

Having identified the port services and the benefits coming from their production the final step toward the definition of a relevant framework is the application of the AHP for distributing the benefits between the public and private sector.

4.3 The application of AHP for benefits distribution

AHP is mainly a multi-criteria method for decision process. It requires the development of a hierarchical model which contains several criteria. Based on such a model, a number of pair comparisons are extracted in order to form a questionnaire. This is distributed to experts on port industry issues who make estimations in every pair comparison. The estimations are then processed and the result is the percentile participation of the public and the private sector in the total benefits produced from a passenger port.

The main advantage of AHP is that can be applied in order to estimate the specific gravity of qualitative and quantitative criteria (Badri, 1999). This advantage is very important in the current research as some benefits resulting from port services provision are quantitative while others are qualitative. Moreover, according to Bodin
and Gas (2003) AHP is in position to estimate with great accuracy the specific gravity of every criterion, as the experts will estimate the unknown to them specific gravity, when they compares it with the other criteria.

Regarding the disadvantages of the AHP, a major one is the use of experts. Despite the fact that the use of expert’s opinion is a well recognized research method, it doesn’t mean that these opinions are expressing the actual situation. This is because the expert’s opinions represent mostly estimations and moreover there is the issue of subjectiveness in their estimations. Thus at this point it must be clarified that the results from the application of the proposed framework will be an estimation of the actual situation.

The application if AHP requires the completion of three steps (Wedley et al, 2001):

A) The development of the hierarchy model
B) The pair comparisons
C) Data process and extraction of the specific gravity of every criterion.

The development of the hierarchy model will base on the catholic services and their categories only. Except from the reasons mentioned in section 4.1 the use of the total number of port services (53) will cause problems regarding the capability of applying the AHP. Milet and Harker (1990) concluded that if the number of the criteria (in the case of this research the number of port services) increase, then the number of pair comparisons will also increase. This can easily result in experts constraints which might decrease the model efficiency. Moreover, according to Saaty (1994), every criterion must have the same importance with the other criteria in a given level of the hierarchy model. Thus by using only the core services in the proposed model this study enhances its reliability; these services are of equal importance because they provided in every passenger port. Figure 2 provides a brief description of the constructed hierarchy model.

Figure 2. The levels of the hierarchy model

Based on the hierarchical model the research can extract the number of the pair comparisons. In the major criteria level there are 6 elements (the categories of the catholic services) so the pair comparisons will be $5+4+3+2+1 = 15$. At the criteria level there are 17 pair comparisons. The same is true in the sub-criteria level. Thus the total number of the pair comparisons is 49.
The next step in the research is the development of a questionnaire that contains the 49 pair comparisons. Moreover to the research might progress by designating a case study, i.e., the passenger port that (a) will contribute in the selection of the appropriate experts who will participate in the research and (b) will contribute in the testing of the methodological framework.

Based on Sirikrai and Tang (2006) the sample of experts shall represent a holistic approach of the port industry, thus the research will choose experts from different sectors (i.e., shipping industry, port industry, regulatory authorities and academics). Of course, all of them must have a confirmed knowledge and experience on port industry issues. The experts will be asked to make judgments in the pair comparisons on a nine point scale based on which element produces more benefits and how many times more comparing with the other.

The final stage of the research will be the data process with relevant PC software. The results will be in the form of a percentile representing the share of the total benefits produced from the port services production process in a specific passenger port that are enjoyed by the public and by the private sector respectively. It needs to be stressed that the final results are the synthesis of the experts’ estimations in the pair comparisons, rather than the actual conditions. Taking into account that until now there is not any method that can determine the interface between the two sectors in the port industry and not least to distribute the benefits or the cost between these sectors, the proposed framework is a first step towards this direction. Besides, the final results can provide the base for further developments or cooperation between the two sectors, for example in a case of a Public Private Partnership.

5. CONCLUSIONS

The port industry has rapidly changed the last two decades. The formation of global players and the new world of productions had significant effects. Nowadays ports are operates in a highly competitive environment, trying to be effective in order to survive.

Many European countries moved towards the liberalization of their port industry in order to attract private companies hopping that with their capitals and know-how will help in increasing the competitiveness and effectiveness of their ports. A brief examination of the European port industry reveals that the participation of private companies in the port services production process is the rule rather than the exception. On the contrary there are some European countries, including Greece, which didn’t followed this rend and their port industry is characterized by the highly intervention of the public sector.

Few months ago, Greece started a new reform process aiming at granting the two major ports of Piraeus and Thessaloniki to private companies. This initiative caused the intense reaction of the port labour unions which resulted in standstill. But soon or later Greece should liberalize the port industry in order to gain a competitive position in the Mediterranean region. If we take into account that rival countries such as Spain, Italy and more recently Turkey, managed to reform their port industries in a successful way, then Greece should move faster towards a new port reform.
The forthcoming reform it might result in the participation of private companies in the port services provision market. The private participation will contribute in solving some current problems (i.e. effectiveness) but it will cause other problems. The most important is the fair distribution of the port services production cost, something that is also desirable for the EU, between the private and the public sector.

The paper proposes a methodological framework that will contribute in the fair cost distribution based on the principle “beneficiary pays”, i.e. on the benefits obtained by each sector. Based on previous studies the services and the benefits that can be produced by a passenger port have been defined. Based on these, a hierarchical model has been developed which concluded in the construction of the questionnaire.

The final step of the proposed framework which is also a proposal for further research is the selection of a case study passenger port (i.e. Piraeus) in order to test the reliability and the performance of the framework.

The framework can be a useful tool for defining the rules governing the Greek port system. The relevant regulatory authorities might also use it both prior and after the implementation of the projected reform. The intention of the Greek government is to initiate a concession process at least in the case of the two major container ports of the country. As in any case of “privatisation”, liberalization, or other form of a market opening, attention should be on avoiding inequities which might wrongly discriminate against some of the contracted parties. Thus in the case of Greece, the public sector shall not accept a concession fee lower than the real value of the port infrastructures and superstructures. The same also applies for the private sector, i.e. it shall not pay a concession fee higher than the actual market value of the container terminals.

The proposed framework can be a background to facilitate reaching an optimum ending (when each sector will, normally, try to gain the more from the concession agreement). The benefits that each sector obtains from the port services production could be the base for an analogous and fair distribution of the port costs associated with the operation of a competitive port. Thus the results from the forthcoming application of the proposed framework could provide valuable signs as regards the present conditions and the benefits that each sector obtains from port services provision.

ACKNOWLEDGMENTS

Financial support of the research by the General Secretariat of Research and Technology (Greece) under the program “Port Services Production Organization and Effective Management and Administration of Passenger Terminals (2003-2007), is gratefully acknowledged. The author would also like to thank Pr. Athanasios A. Pallis for his valuable contribution in the research and his insightful comments.

6.  BIBLIOGRAPHY


