

Erasmus University Rotterdam

**MSc in Maritime Economics & Logistics**

*2015/2016*

The impact of Piraeus' port privatization on port  
performance and port competition in the  
Mediterranean Sea.

by

Apostolos Dedousis

## **ACKNOWLEDGEMENTS**

First of all, I would like to thank all those people who contributed to this thesis, and especially all the port's experts that, despite their scarce free time and their job responsibilities, they gave meaning to this paper. But more specifically, I would like to thank my dear friend Vicky and my uncle Nick, not only for their valuable inputs, but for their patience, consideration and time they spent on aiding me to this quest.

Furthermore, I would like to thank my supervisor Mrs. Elvira, for her invaluable guidance through the whole semester on this project. This thesis has been a personal challenge for me, and I would not have made it through without her support and advice. Moreover, I should never forget that whenever I was in need of her help, she was always there to provide me with her opinion and recommendation.

My roommate and fellow 'traveler' in this journey on our Maritime studies in Rotterdam, Alexandros, could not be missing from this part of gratitude. We spent endless nights together, stressed with exams, tired of assignments, but he was always there to encourage me and I appreciate it.

My beloved friend Aiki, who has always been there for me throughout the year, although miles away from Rotterdam. Her faith on my capabilities, her continuous encouragement, even during periods that anxiety and anger occupied me, her trust and her unceasing affection have been priceless during the whole year.

Concluding this chapter of gratitude, I would like to thank my parents Dimitris and Dafni and my sister Natassa. There are no words that could possibly express the feelings I have for you. I have been fortunate enough to be brought up by people who love me, care for me and have given their full support, financial and emotional, to make me who I am. The morals that they have transmitted to me, the endless love they have given me, their constant belief in my ambitions and the sacrifices they have made to support me are only very few of the words that I could write about my role models-my family.

## **ABSTRACT**

Over the last decades, the logistics chain has gained increased attention from all industries, identifying its importance and the potential added value it can offer. Ports are significant nodes of transport and the pressure has been transferred to their authorities for increased efficiency and consummation of the operations. In this context, private terminal operators have emerged, who -motivated by the incentive of achieving financial profit- are dedicated on providing the most advanced services. Consequently, the rise of these private entities have replaced the classic service model of ports with the currently prevailing landlord model, and the port of Piraeus has been no exception to this trend, with the Greek government coming to an agreement with the Chinese carrier 'COSCO' for the concession of the busiest Greek port. The dynamic process of privatization is always followed by radical changes in the managerial, operational and commercial tactics of the port. This paper aims to contribute on the continuous discussion about how privatization affects port performance and the positioning of a port in the area of competition, focusing on the latest change of ownership of the Greek port. In order to achieve this, an extensive review of the existing literature on port performance indicators and port privatization has been conducted, complemented by a Strategic Positioning Analysis (SPA) of the most important ports in the Mediterranean Sea. Furthermore, the opinions of port experts were recorded in an effort to evaluate the most important variables for Piraeus' port and the impact of port liberalisation. The findings indicate that indeed the Chinese have reestablished Piraeus as a credible and modern port, minimizing administrative procedures, eliminating labour union's power, attracting -the much needed for the Greek economy- foreign investments and improving infrastructure and facilities. However, further privatization is favorable based on the interviewees' point of view, for the utilization and expansion of the port, the creation of more port-related jobs and the enhancement of its competitive positioning in the Mediterranean Sea. It is suggested, though, that privatization is correlated with ever-changing variables that need to be constantly reviewed and monitored, in order to achieve a long-term plan that ensures the viability and profitability of the port.

## Table of Contents

<b>Acknowledgements</b> .....	<b>i</b>
<b>Abstract</b> .....	<b>ii</b>
<b>Table of Contents</b> .....	<b>iii</b>
<b>List of Tables, Figures and Appendices</b> .....	<b>v</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1 Problem Statement.....	2
1.2 Research Objectives .....	2
1.3 Structure.....	4
<b>2. Literature Review</b> .....	<b>6</b>
2.1 Port Performance .....	6
2.1.1 <i>Annual Throughput</i> .....	6
2.1.2 <i>Market Share</i> .....	7
2.1.3 <i>Overall Time in Port</i> .....	7
2.1.4 <i>Infrastructure Efficiency</i> .....	8
2.1.5 <i>Unexpected Delays</i> .....	8
2.1.6 <i>Hinterland Connectivity</i> .....	8
2.1.7 <i>Overseas Connectivity</i> .....	9
2.1.8 <i>Warehouse &amp; Storage</i> .....	10
2.1.9 <i>Yard utilization</i> .....	10
2.1.10 <i>Ease of Transactions</i> .....	10
2.1.11 <i>Employee Efficiency</i> .....	11
2.1.12 <i>Existence of Other Businesses</i> .....	11
2.1.13 <i>Information Technology Systems</i> .....	11
2.1.14 <i>Reliability &amp; Adaptability</i> .....	12
2.1.15 <i>Return on Investment</i> .....	12
2.2 Port Privatization .....	14
2.2.1 <i>Reasons for Privatization</i> .....	15
2.2.2 <i>Privatization Impact</i> .....	17
2.3 Port Privatization in Greece.....	22
<b>3. Strategic Positioning Analysis</b> .....	<b>26</b>
3.1 Relevance and Limitations of Model.....	26
3.2 Piraeus' Port Evolution and Selection of Competing Ports .....	27

3.3 Data Collection .....	27
3.4 Results of Portfolio Analysis and Visualization .....	28
<b>4. Qualitative Analysis.....</b>	<b>26</b>
4.1 Interview as a Method to Conduct Research.....	33
4.2 Sample Choice .....	34
4.3 Formulation of Interview Questionnaire.....	35
4.4 Interviews Results & Interpretation.....	36
4.4.1 <i>Port Performance</i> .....	36
4.4.2 <i>Reasons for Privatization</i> .....	38
4.4.3 <i>Privatization Impact</i> .....	39
4.5 Recommendations for Future Development.....	43
<b>5. Conclusion .....</b>	<b>45</b>
<b>Bibliography .....</b>	<b>48</b>
<b>Appendix.....</b>	<b>53</b>

## **List of Tables, Figures and Appendices**

### ***List of Tables***

Table 1: Distribution of Responsibilities at Different Port Models .....	15
Table 2: Summary of Product Portfolio Analysis 2009-2015 .....	28
Table 3: Interviews Sample .....	34

### ***List of Figures***

Figure 1: Research Questions.....	3
Figure 2: Schematic View of Thesis .....	5
Figure 3: Port Performance Indicators .....	13
Figure 4: Reasons for Port Privatization.....	17
Figure 5: Fields of Port Privatization Impact.....	20
Figure 6: Linkage Between Privatization & Port Performance Indicators .....	21
Figure 7: Potential Relationship of Privatization & Port Performance Indicators .....	22
Figure 8: Stimulation for Piraeus' Port Privatization .....	24
Figure 9: BCG Market Share-Growth Rate Matrix.....	29
Figure 10: Strategic Positioning Analysis Matrix .....	30
Figure 11: Port Portfolio Analysis 2009-2012.....	31
Figure 12: Port Portfolio Analysis 2013-2015.....	32
Figure 13: Summary of Qualitative Analysis.....	42

### ***Appendix***

Interview Questionnaire .....	53
-------------------------------	----

## CHAPTER 1 INTRODUCTION

The radical changes in the shipping industry over the last twenty years have entailed to great reforms in the sector of ports. Globalisation and international economic growth have led to booming containerization, which resulted into fierce competition between ports for traffic flows, and their related creation of added value. Furthermore, these important nodes of transport not only have to deal with the technological advancements in the maritime industry, but also have to keep up with the hinterland foot of the supply chain, since they serve both sides. In this respect, port authorities have to constantly adapt to the needs of the new era, provide with low-cost but at the same time efficient services and always relate to the desires of their customers, since the port's efficiency has a great impact on the decision of all parties involved in the logistics chain. As (Lovell, 1993) has mentioned, it is of utmost importance to measure the efficiency of each production unit in order to evaluate the wealth of a country, and ports have become all the more significant for a country's competitiveness since they are indispensable elements of the logistics chain.

The importance and the increased responsibilities of the ports in the logistics chain is even more pronounced due to the needs of door-to-door logistics, which result into ports having to invest on their infrastructure both on waterside and on landside, implement innovative IT systems and offer tailor-made solutions to all parties (World Bank, 2007). Especially over the last few years, despite the fact that growth rates undergo severe diminution, the average vessel size in the global fleet has substantially increased, creating even more barriers and challenges for the port authorities, which not only have to coordinate all parts of the supply chain, but also have to adapt and provide with the adequate infrastructure to serve the contemporary vessels. And port productivity is so closely correlated with the economics of containership (World Bank, 2007) that in order to survive in the ever-competitive environment, port authorities have to meet these needs of the customers to monitor and influence their decisions.

In the global freight streams, the role of ports in the Mediterranean Sea has substantially evolved over the last decade, and port authorities have been seeking for ways to increase their market share and compete with the largest ports of the world. Nowadays, there are about sixty services between East Asia-Mediterranean and East Asia-North Europe – ports of the Mediterranean usually serve as transshipment hubs for these long routes and this is why they are also taken into account- that enable goods to move around (Drewry Shipping Consultants Ltd, 2013).

Along with the aforesaid, the external forces of technology and competition, the trend of liberalisation, the potential positive impact of private investors on the reform of a port and the new managerial and operations tactics that private entities bring with (World Bank, 2007), have created a positive environment for cooperation between authorities and specialized private companies over the world. The global recession of 2008 gave one more reason to the public port authorities to shift the financial burden of engaging in a risky and unstable international economic environment, to privates. This could be no exclusion to the area of the Mediterranean Sea, where major terminal operators have acquired parts of ports, or even sometimes the whole of them, like the cases of CMA-CGM on the port of Malta and APM-Terminals on the port of Algeciras.

## **1.1 Problem Statement**

Although shipping has always been a field of national heritage for Greece, due to the plethora of Greek shipowners, the situation has been entirely different in the ports' sector. Greece has never really taken advantage of its strategic geopolitical location and the natural geomorphology of the country and has failed to provide with a port that could serve as a benchmark in the EU-East Asia trade route. This incapability can be partially attributed to inefficient management tactics, indifference from the competent authorities and political reasons, like the continuous policy of each and every government, to serve the interests of unions for the sake of canvass.

However, the international economic crisis of 2008 has greatly affected Greece, which has been seeking for ways to relieve the financial burden that the global recession has put on its shoulders. Following the imminent need for reform on the field of ports and the international trend of liberalisation in all aspects of economy, the Greek government decided to cooperate with the Chinese carrier COSCO, by signing a thirty-five-year concession for the operation of the largest and most important port of Greece, the port of Piraeus. The exploitation of the port by the Chinese behemoth seems to be related with some interesting results on the port's TEU handling and overall efficiency and the Chinese are confident on further investing on the port in an effort to boost its performance and capture the largest possible share in the Mediterranean market. Although there is still a long way to go for the full engagement of the Chinese in the port, and there is still room for improvement in the collaboration with the Greek authorities, the new era of transformation and revolution of the port is already apparent.

This paper aims to analyze all the effects that the privatization of the Piraeus' port has had so far both on its individual performance and on the competition in the Mediterranean Sea, identify the reasons behind the decision for privatization and predict the next potential steps on the development of this invaluable for the Greek economy port.

## **1.2 Research Objectives**

As every thesis is structured, this one too has a main research topic, which is then divided into some sub-research questions. As it has already been mentioned, the goal of the research is to examine how the recent developments of the container terminals of Piraeus' port after the partnership of the Greek Port Authorities with the Chinese carrier COSCO have affected key port performance indicators and the potential game changer this could be in the port competition in the Mediterranean Sea. Thus, on this paper we have identified our *main research topic* as:

***“What is the impact of Piraeus' port privatization on port performance and on port competition in the Mediterranean Sea?”***

Following a deductive reasoning, the answering of each one of the *sub-research questions* will guide us to the resolution of our main research topic. Therefore, we have come up with four questions, each with a specific objective, whose sum will lead us to the answer of the aforementioned topic:

- 1. “What is the expected impact of privatization on port performance?”***
- 2. “What is the positioning of Piraeus' port for containers in the Mediterranean Sea and how has port competition in terms of***



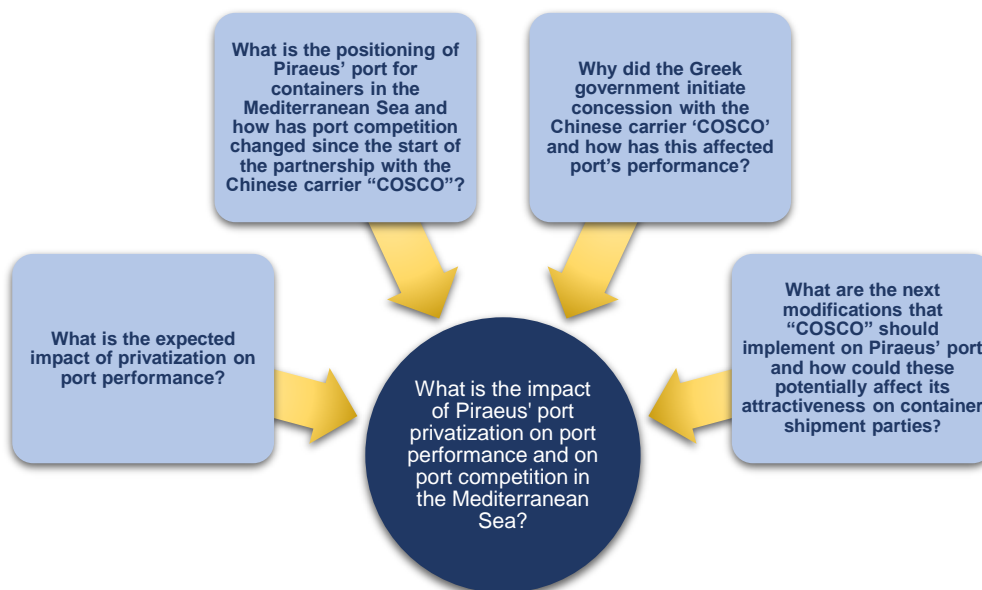
***throughput changed since the start of the partnership with the Chinese carrier 'COSCO'?"***

- 3. "Why did the Greek government initiate the concession with the Chinese carrier 'COSCO' and how has this affected port's performance?"***
- 4. "What are the next modifications that 'COSCO' should implement on Piraeus' port and how could these potentially affect its attractiveness on container shipment parties?"***

All four sub-research questions have distinct objectives, scope and serve a very specific reason; investigate and come to conclusions which answer the main research topic.

1. The first question leads us to an understanding of how governmental transformation of a port affects its key performance indicators and variables, according to existing literature. Port performance and port privatization literature are analyzed thoroughly, along with the background of the concession between the Greek government and the Chinese carrier 'COSCO'.
2. The evolving role of Piraeus' port in port competition in the Mediterranean Sea over the last years, and the comparison with the competing ports of the region in terms of throughput will be examined meticulously in this section on a more quantitative basis.
3. The objective of this segment is to identify the key performance indicators specifically for the Greek port and explain the reasons behind privatization, as well as its impact, according to the views of Piraeus' port experts.
4. Light will be shed on the future developments that 'COSCO' needs to implement on the port, in its effort to enhance its competitive position in the Mediterranean Sea, based on the opinions of experts.

More schematically as presented below, our research question is the center of the thesis, divided and answered by the four aforementioned sub-research questions



**Figure 1: Research Questions**

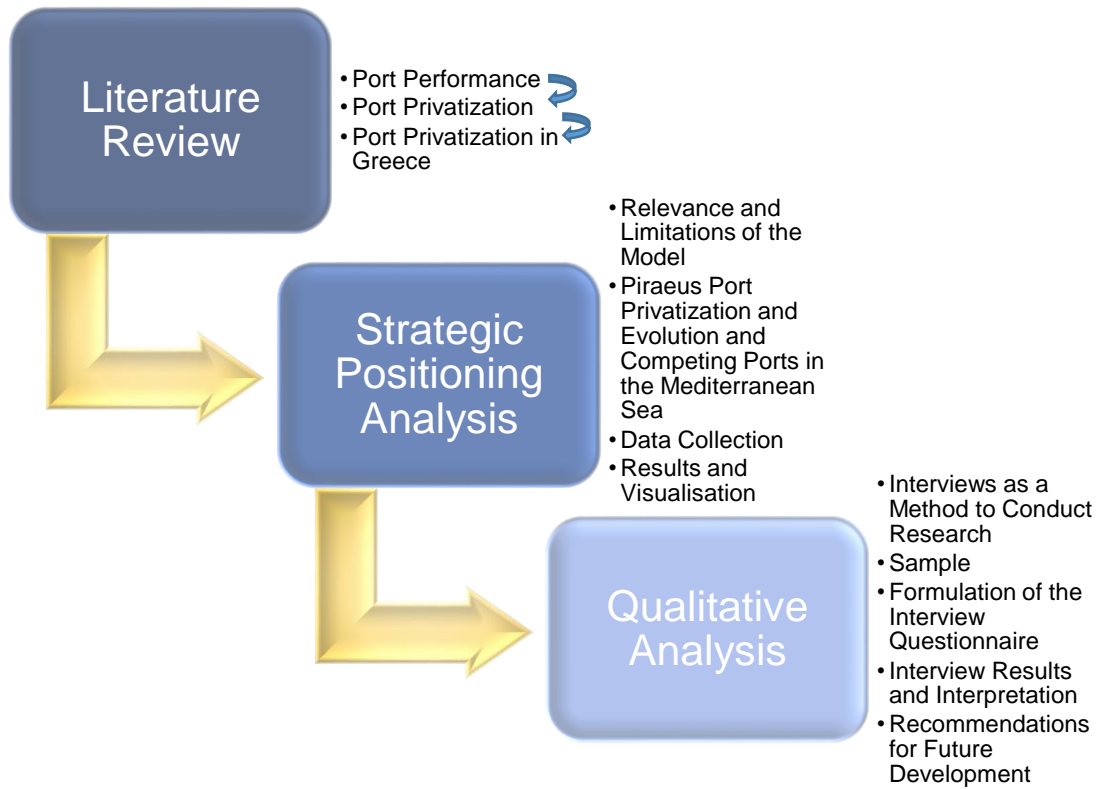
Source: Author.

### 1.3. Structure

The following paper uses plenty of methods to assiduously research in depth its questions, like extensive literature review, quantitative methods and interviews. Therefore, a clear and understandable structure is of utmost importance for the reader, in order to follow the reasoning and the resolution of each question;

- Chapter 2-Literature Review. It is the most crucial part of the thesis, since the main topic will be analyzed in depth, all the different opinions from authors that have worked on similar researches, and the drawn results will later be translated in the formulation of the interview questionnaire. Therefore, this part not only examines and answers the *first sub-research question*, but also *sets the groundwork for the third and fourth sub-research questions*. This chapter will be divided in three sub-chapters, that deal with port performance indicators worldwide, different forms of port privatization and their results, and the process of privatization in the Greek port, respectively. After the end of the literature review, the main aim is to fully understand what affects port performance, how this is changed after the privatization of a port, what are the drivers for this process, and the situation in Piraeus after the initiation of the privatization six years ago. This chapter is a prerequisite for conducting the qualitative analysis, and the success of the interviews is bound to this section of the research.
- Chapter 3- Strategic Positioning Analysis. On this chapter we will apply a Strategic Positioning Analysis (SPA), for the port of Piraeus and its six most important competitors in the Mediterranean Sea, over the years 2009-2015, i.e. since the start of privatization of the port of Piraeus. The product portfolio analysis will be used from the SPA model, in a vivid visualized way of a BCG Group's matrix of market share-growth rate, to show the situation in the Mediterranean Sea among the most significant ports, leading to the answering of the *second sub-research question*.
- Chapter 4- Qualitative Analysis. The main focus of the research will be based on the qualitative analysis of the impact of privatization on Piraeus' port. By assessing all the aforementioned and especially the literature review on chapter 2, the next step draws attention on the interviews of Piraeus' port experts for their views on the performance of the port and its evolution since the start of the privatization, as well as how this may have altered their sector of business. The interviewees also give their point of view on what the next steps of this cooperation between the Chinese and the Greeks should be, in the attempt to improve the positioning of the port in the Mediterranean Sea and the quest for Piraeus to become one of the busiest and most modern ports of Europe. These opinions of experts are complemented by existing literature on strategy making by these hybrid forms of organizations by academics (van der Lugt, et al., 2013).
- Chapter 5- Conclusion. The thesis will end with a conclusion that summarizes all the main results of the research, the most important points that should be highlighted and the fields for further research.

Diagrammatically, the main body of the thesis looks like the following figure:



**Figure 2: Schematic view of Thesis**  
Source: Author

## **CHAPTER 2 LITERATURE REVIEW**

This chapter focuses on the evaluation of all the different opinions from the existing literature on what variables affect port performance, why port authorities have moved towards the corporatization or privatization of ports and what implications this has on their performance and. Since this thesis concentrates on the case of Piraeus' port privatization, the aforementioned would be to no avail without the complementary examination of the change of ownership process of the port since its beginning in 2009 until now.

### **2.1 Port Performance**

The increased importance of the ports is visible on the existing literature, since over the last twenty years all the more papers are published that investigate the variables that affect the performance of this node of transport, either by conducting surveys to all interested parties or by quantitative methods. There are various models that have been used to quantify port's performance, like Data Envelopment Analysis by (Cullinane , et al., 2004) and the stochastic frontier model by (Cullinane, et al., 2002), while other authors have preferred a more qualitative way of investigating the relationship between port variables and the expected performance of the ports, like (Ghosh & De, 2000) and (Pettit & Beresford, 2008) in regional situations. However, the majority of the academics, like (de Langen, et al., 2007) and (Woo, et al., 2011) have used mixed ways to come up with valid performance indicators. These indicators not only provide with the necessary sort of information to the management team of a port authority, but are also used to communicate with all stakeholders to compare performance between competing ports (de Langen, et al., 2007).

According to (Cullinane , et al., 2004), it is of great significance to note down and evaluate as many indicators as possible, since only by this way one would have a clear and concise opinion of whether the port is actually efficient or not. For example, especially after the continuous growth of vessels' sizes, port authorities have put emphasis on investing on waterside infrastructure to increase berth and crane productivity, but at the same time hinterland connectivity may be deprived of development, which would result to severe consequences in the whole supply chain. And although the use of port performance indicators is ever-increasing, disarray of clear standards and methods exists as well in their recording (de Langen & Sharypova, 2013), that would allow benchmarking between different ports and between different dates for a single port. Thus, the next chapter is trying to sum up the majority of the important extant literature on the most significant port performance indicators, that will later be used to assess Piraeus' performance. Last, but not least, the latest PPRISM project – the result of the cooperation among many universities (University of Antwerp, Vrije Universiteit Brussel, Cardiff University, University of the Aegean and Technical University of Eindhoven), contributes to this quest.

#### **2.1.1 Annual Throughput**

“Ports are maximizing throughput seekers” (Marlow & Paixao Casaca, 2003). Indeed, port authorities are heavily dependent on the port dues paid by shipping lines for their survival. According to (de Knegt, 2016), almost half of the financial income for a port authority comes from the shipping lines that use the berth for their activities. The traditional way of measuring the efficiency of a port has always been to evaluate the actual throughput to the optimum throughput- a rather economic to engineering kind of measurement (Talley, 2007). However, measuring optimum throughput is not as

easy as one may think, since it is a function of various “sub-indicators”, like the location of the port, the frequency of the ship calls, the port charges, the economic activity in the region, etc. (Tongzon, 1994). Especially when port authorities want to concentrate on the financial appraisal of the port, the annual throughput is an indicator that should not be omitted (Talley, 1994). Annual throughput is also an indicator of efficient operation, and except for the financial implications, it also has an impact on the internal operational structure of a port (Woo, et al., 2011).

However, there are various academics that have warned for a myopic view on the throughput as an indicator. If it is not complemented by the value added it provides, the market share in the region and the investment level on the port, then annual throughput may not serve as a valuable indicator (de Langen, et al., 2007).

### **2.1.2 Market Share**

As it has already been observed, annual throughput serves as an indicator, but is closely related to the market share it secures for a port in the competing region. Multi-port approach is suggested by (Talley, 2007) when looking at the economics perspective of a port, where the market share secured by a port in a well-defined area is taken into account. Market share also serves as a tool for the management team for the interpretation of the performance of a port. The importance of the captured market share by a port has been recognized by (Haezendonck, et al., 2006), who have created a tool- namely the Strategic Positioning Analysis- that provides the board with an overall view about the evolution of a port and facilitates the decision-making for strategic matters. Furthermore, its importance is also stressed by (World Bank, 2007) because the annual throughput does not say much by itself, since the economic activity in the region plays a significant role especially on the sector of containerships.

### **2.1.3 Overall Time in Port**

Port's efficiency has a serious impact on the decision making for the selection of a port from the side of shipping lines (World Bank, 2007), which try to minimize their operational expenditures. Port dues represent a considerable piece of them, and most of the port authorities charge their customers based on the time the ships occupy a berth. Therefore, it is apparent that the overall time a ship spends in the port is a critical indicator for the performance of a port. “Port charges” and “time-related costs” are recorded by (Talley, 2007) as “important determinants in port selection by shippers and carriers”. Furthermore, (Talley, 1994) refers to the ship's time in port as the most deciding operational indicator, that could also differentiate the service of a port. When researching the performance of various ports in India, (Ghosh & De, 2000) found too, that the ship turn-around time, along with the pre-berthing waiting time and the idle time at berth are important for the operational performance of a port, and their utilization can greatly enhance its position. The ship turn-around time becomes even more crucial for the ports that serve as transshipment hubs (World Bank, 2007). (Marlow & Paixao Casaca, 2003) take it one step further, as they suggest that the overall time of a ship in a port, and more specifically the waiting time to be berthed and the time spent there, have an ever-increasing impact on the effectiveness of a port in this changing logistics environment. The same view is also shared by (Woo, et al., 2011) and (de Langen, et al., 2007).

#### **2.1.4 Infrastructure Efficiency**

The aforementioned indicator heavily relies on infrastructure efficiency of a port, and more specifically on crane productivity. Containerization has changed forever the way the shipping industry operates, and has lifted the expectations for utilized services by the ports. The performance of container terminals is dependent on the regular and punctual calls of ships which is a result of high-performing cranes (World Bank, 2007). Although crane productivity measurement is a rather controversial issue (Cullinane, et al., 2004), all authors do mention its importance and include it as a major indicator of port performance. (Tongzon, 1994) includes it as a determinant of efficiency and an indicator for working time, while (Marlow & Paixao Casaca, 2003) divides this important operational criterion in even more sub-categories for the improvement of its measurement. Infrastructure service was used as a customer perspective criterion in the Analytic Hierarchy Process used by (Su, et al., 2003). Its significance has also been stressed out by the (World Bank, 2007) that includes it as a technical indicator of the performance of a port and mentions that potential unproductive moves limit the productivity of a terminal. The expansion of automation, which could prove to be a limiting factor of the handling cycle and even affect the overall time of a ship in a port (World Bank, 2007) has upgraded this indicator to a great extent during the last decades, but shipping lines continue to put pressure on terminal operators for more intensive crane work- up to 250 berth moves per hour when the best-performing terminal in 2014 achieved 157 berth moves (Drewry Shipping Consultants Ltd, 2016).

#### **2.1.5 Unexpected Delays**

An important indicator of port productivity is the potential unexpected delays that shipping lines have to suffer, like equipment breakdown, stevedoring problems, labour strikes, etc. As it has been mentioned before, shipping lines consider the overall time their ships spend in each port, and although crane productivity is more or less known, the unforeseen setbacks in their schedules can alter their decision on port selection. The more often these delays occur in a port, the fewer the chances a carrier or a shipper chooses the certain port (World Bank, 2007). And in this dynamic logistics environment, that each part of the supply chains counts on the timeliness of the rest, time barriers can result to high expenses. The cargo waiting time between nodes is described as the major connectivity indicator of a port by (Woo, et al., 2011), and timeliness of terminal operations are referred as effectiveness measure by (Marlow & Paixao Casaca, 2003). The latest results of "Port Performance Indicators Selection and Measurement" (PPRISM) have a dedicated index on the importance of "on-time performance", highlighting the significance of avoiding delays (European Sea Ports Organization, 2012). The handling capability and the prevention of stevedoring setbacks, equipment maintenance and the constant service of vessels is a main indicator for internal business according to (Su, et al., 2003), and the avoidance of delays due to strikes and equipment breakdown by (Tongzon & Heng, 2005), too.

#### **2.1.6 Hinterland Connectivity**

The introduction of container in the shipping industry marked the genesis of a new era in the international trade. The relative convenience it offers has not only come with the advantage of bringing transportation costs down, but has also created the need for all parts of the supply chain to adapt. Although operational efficiency and handling capacity have been viewed as matters of great importance for container terminals (Gharehgozli, et al., 2014), vital is also the role of the hinterland connectivity and the door-to-door service the container provides with. It is actually found by (Zhang, 2008)

that when ports compete in quantities, an increase in corridor capacity will increase own port's output, reduce the rival ports' output, and increase own port's profit. (Bichou & Gray, 2004) were one of the first to recognize that the whole supply chain has to be integrated in the measurement of port performance measurement. This opinion was largely supported by (de Langen, et al., 2007), who supported that one of the three major port products is the logistics product it offers. Hinterland connectivity, time to major consumer(de Langen, et al., 2007), inland carrier service rate and value of time for inland carrier (Talley, 1994), and cargo waiting/working time between transport nodes (Woo, et al., 2011) are all consistent with the time-related costs (Talley, 2007) in the multi-port performance evaluation. (Marlow & Paixao Casaca, 2003) have placed even greater emphasis on the importance of the hinterland connectivity of a port, since they include a bunch of indicators to highlight its significance, such as "overall transport cost", "lead-time to service delivery", "time waiting for cargo to be transferred between transport nodes", "time spent in carrying out logistics activities", etc. If a port authority wants to improve its positioning in the market share of its geographic region of competence, one of the most effective ways to achieve it is by enhancing its intermodal connectivity (de Langen & Sharypova, 2013). Port authorities have to manage this complex aspect of port performance, since as soon as waterside operations are complete, containers need to be brought to the consumers with the utmost care and diligence in the shortest period of time – and this is not done by a single node of transport but in most cases split by trains, trucks and barges all together. And although there is plethora of data available for the efficiency of a port in the waterside of the terminal (berth occupancy, dwelling time of ships, etc.), the landward operations are challenging to evaluate due to the lack of statistical information (World Bank, 2007) and contractual relationships between terminal operators and inland carriers (van der Horst & de Langen , 2008). All the aforementioned have been confirmed by the PPRISM project (European Sea Ports Organization, 2012), and have been complemented with the introduction of new indicators measuring the quality of road and railroad infrastructure along with the quality of port infrastructure, for the appraisal of hinterland connectivity.

### **2.1.7 Overseas Connectivity**

Improving hinterland connectivity infrastructure and creating contractual relationships with inland carriers is closely related with the overseas connectivity of a port. Regardless of the quality of road and railroad infrastructure, the potential of the industrial area and the presence of free trade zones, shipping lines may not prefer to choose a port if they are to deviate from their main routes. The number of liner shipping companies and the number of vessels they deploy in each port are major indicators of shipping connectivity (European Sea Ports Organization, 2012), which in combination with hinterland link indicators make up for one of the most important factors for the survival and expansion of a port-connectivity. It is also mentioned by (de Langen, et al., 2007) that an 'upgrading' indicator for the cargo transfer product of a port is the number of first-calls in a port, which is defined both by physical constraints such as depth and dredging backlog, but also by the location of the port and how well it is connected to the major maritime trade routes (van Schuylenburg, 2016). The importance of overseas connectivity is even more evident on ports that serve as transshipment hubs (World Bank, 2007). These findings comply with the first conclusion of (Tongzon, 1994) who identified location, and more specifically the avoidance of isolated ports both to industrial areas and big seas and the presence of free trade zones, as a determinant of throughput for a port. Furthermore, the

frequency of ship calls which is related to overseas connectivity can attract both importers and exporters and improve the competitiveness of a port (Tongzon, 1994).

### **2.1.8 Warehouse & Storage**

The structure of the world economy has transformed over the last decades, as a result of the booming globalization of production. This trend has created the need for ports to become 'value-adders', since it acts as the interface between production/consumption areas and intercontinental transport of goods (World Bank, 2007). In between the waterside operations and the hinterland transportation of goods, terminals may need to act as places of storage for the goods. Thus, the provisioning of adequate warehouse and storage areas for the safety of the goods has gained the attention of port authorities. (Marlow & Paixao Casaca, 2003) have included warehouses as the best option to diminish the level of damages in the shipment- which is a proposed measure for evaluating port performance- and (Su, et al., 2003) have incorporated warehousing as an indicator of handling capability that affects the internal business of a port. Modern storage facilities may also attract the biggest players of liner shipping that operate larger ships with high volumes of cargo capacity (World Bank, 2007), and therefore act to the benefit of the overall connectivity of a port. The warehouse area has also been recognized as an indicator that both shows the output of a port and also gives information about other factors that have an impact on the long term advancement of a port (de Langen, et al., 2007). A deficient and congested warehouse can be a major cause of potential poor performance of a port (World Bank, 2007) and since it is a vital element of the whole logistics services it could negatively affect the logistics performance indicators as identified by the PPRISM project (European Sea Ports Organization, 2012).

### **2.1.9 Yard Utilization**

Yard utilization has also been in the centre of attention from terminal operators since it is a major determinant of operations efficiency. Although one may think that it is not too complicated, there are many factors that affect it, such as number of ground slots available, stacking height, TEU ratio (20' or 40' containers) and peak factor (related to seasonality of international trade) as identified by (Bottema, 2016), senior commercial executive of European Container Terminals. Consequently, all the more academics have noted down the importance of this factor and have identified it as an indicator for port performance. Utilization rates of the yard are barometers for internal business indicators (Su, et al., 2003) and efficient operations (Woo, et al., 2011). (de Langen, et al., 2007) define throughput per square meter/hectare as a factor that could contribute to the enhancement of the cargo transfer product of a port. The sufficient existence of yard, and its ability to utilize the mix of 20'/40'/45' containers are even more essential for transshipment hubs, since they enable quick ship turnarounds (World Bank, 2007).

### **2.1.10 Ease of Transactions**

Crucial for the efficiency of a port and its selection from both importers and exporters is the ease of transactions – administrative procedures, customs, logistics services, etc. (World Bank, 2007) includes documentation delays, lengthy customs and corruption as significant organizational causes of poor performing ports and emphasizes on the importance of the absence of administrative impediments especially for ports that serve as transshipment hubs. Customs and certification operations are included in time-related costs by (Talley, 1994) and (Talley, 2007),



while (Marlow & Paixao Casaca, 2003) incorporate the calmness of transactions and the low levels of conflicts between logistics activities as measures of efficiency and effectiveness. This indicator has been especially stressed by European Union that wants to promote the free movement of human and financial capital, goods and services. Thus, based on PPRISM project (European Sea Ports Organization, 2012), “ease of transactions” is one of the three major port performance indicators. This is comprised of efficiency of clearance procedures, number of documents and time-costs required to export and import.

#### **2.1.11 Employee Efficiency**

Despite of the high levels of automation in container terminals worldwide, the human factor continues to play an important role in the overall efficiency of a port, and the potential poor performance of a port is sometimes attributed to the lack of trained work force (World Bank, 2007). Both when it comes to technical matters, like performance of each gang/crane, and communication-interaction with customers, employee efficiency is critical for the port according to (Marlow & Paixao Casaca, 2003). Special reference is drawn on the ‘balance scorecard’ by (Su, et al., 2003) not only on the training and efficiency of the human resources of a port, but also on the organizational system of a port authority; structure and policy matters, maintenance of employment record, constant evaluation and motivation with (financial) incentives are regarded essential for the balance between financial and non-financial measures. Furthermore, the education level of employees and their adequate financial remuneration is considered by (de Langen, et al., 2007) as a factor that could upgrade the port as a whole.

#### **2.1.12 Existence of Other Businesses**

Ports are not isolated places that are disconnected with the rest of the economy. On the contrary, all the more industries decide to use the port region for their commercial activities, since it provides both with security and the proximity to the physical flow of the goods. Demand for transportation is a derived demand (Friedlaender & Spady, 1980) and thus the more companies are established in a port, the greater the demand for goods, and consequently the demand for transport. This led (Tongzon, 1994) to identify that economic activity both in the greater region and the port area is an important factor that affects port performance. The same view is also shared by (Su, et al., 2003) who believe that the acquisition of new businesses in the port area increase cargo movement and ship calls, which itself affects the customers’ perspective and strengthens the competitive positioning of a port. In addition, according to (de Langen, et al., 2007), when evaluating the port performance, the existence of other businesses, and especially the chemical industry, as well as the investment level of other companies in the manufacturing site of a port, are output indicators of the performance of a port. Moreover, the number of new establishments, both in the form of start-ups and new patents, are indicators that show the long term development of the port (de Langen, et al., 2007).

#### **2.1.13 Information Technology Systems**

The value of communication between businesses in the 21<sup>st</sup> century cannot be sufficiently highlighted in a few lines; the global internet network supplemented by contemporary information technology systems facilitate the flow of communication, bring new educational and business opportunities, low-priced goods and abundance in the choice of services (Chandra, 2003). The port industry is no exception to this

trend, where cooperation between all interested parties in the trade of goods is of utmost importance. Information technology systems that provide accurate information to the whole supply chain is a service quality indicator according to (Woo, et al., 2011), while (Su, et al., 2003) note that providing the right information service to the customer entails to increased satisfaction, which itself results into amplifying the position of a port. (Marlow & Paixao Casaca, 2003) put even more emphasis on the significance of these systems, since they include at least three indicators which are inseparably connected to them; accuracy of information of shipment status, accuracy of information processing and timely notification of modifications in the multimodal process. The intermodal nature of the specific freight transportation in the whole supply chain has created the need for each container to be easily tracked, along with all the necessary documentation and information (European Sea Ports Organization, 2012). Furthermore, first rate computer systems enable quick ship turnarounds (World Bank, 2007) and can contribute to coordination and cooperation not only between different nodes of transport, but also between ports themselves (Woo, et al., 2011). Last, but not least, one of the key determinants of port performance according to (Tongzon & Heng, 2005) is the ability to differentiate; and the easiest but at the same time most effective way to do so, is by introducing state-of-the-art information technology systems.

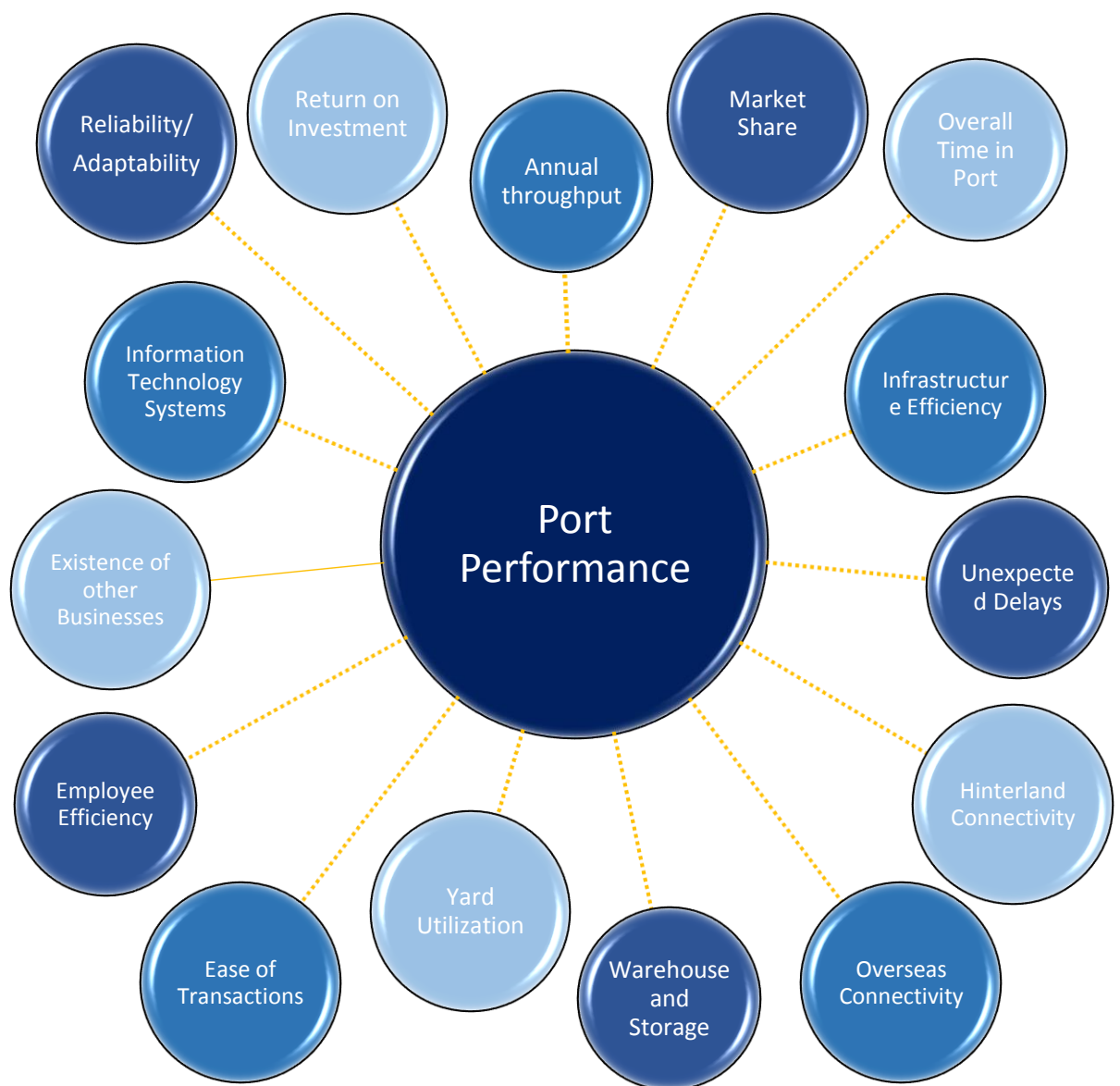
#### **2.1.14 Reliability & Adaptability**

It should not be omitted that ports are lively parts of international trade and that although port authorities always try to improve their quantifiable indicators, there are some other virtues that affect decision making from their customers. (Tongzon & Heng, 2005) mention that many shippers and shipping lines select their port of business not only according to reports, but also according to feelings. What is crucial for a port authority to ensure is that it has a “steady and predictable performance” (Tongzon & Heng, 2005) in order to create positive feelings to the interested parties. This is in line with (World Bank, 2007), which reports that shipowners and shippers have additional requirements to the technical matters, such as reliability and adaptability. The service quality of a port is defined by the values of trustworthiness and flexibility according to (Woo, et al., 2011) and (Marlow & Paixao Casaca, 2003) devote a special part of their research on proposing measures for the evaluation of port performance, such as responsiveness to the customers’ needs, adaptability of operations and reliability of transit time.

#### **2.1.15 Return on Investment**

Return on investment as a performance indicator has been quite controversial among academics, since different forms of port authorities come with different objectives and constraints (Talley, 2007), and therefore different indicators that should be used. Public port authorities tend to target to maximize container throughput (Talley, 1994) while privatized entities are mostly concerned with creating financial value. Therefore, return on investment should not be neglected as an indicator since it is crucial on how capital is allocated for the improvement of the port (Ghosh & De, 2000). One of the criteria that have impact on port performance according to (Su, et al., 2003) is the financial efficiency - return on investment, profitability and solvency. However, (Bichou, 2007) states that although many port authorities use financial metrics such as return on investment and return on assets, this profitability/loss may not be a result of higher efficiency, but may be attributed to other variables, such as inflation, and that focus on financial ration “is inconsistent with long term objectives”.

Summing up, port performance is a very complicated issue, affected by surfeit of factors and there is plethora of indicators to measure and evaluate it. The above chapter tried to concisely summarize the most important of them according to the existing literature. It is not suggested though that port authorities should take into account only the aforementioned indices, but their meticulous assessment can give a detailed insight to the strengths of a port, their problems and the potential solutions. Each port has its own idiosyncrasy, operates under different circumstances and is affected by different external factors and may need to constantly adapt its performance indicators. The above analysis, though, serves as the basis for the formulation of the questionnaires that will be used in the final part of this research, the qualitative analysis for the port of Piraeus. However, most of the authors seem to converge that, as shown schematically in the below graph, port performance can be evaluated by the following indicators:



**Figure 3: Port Performance Indicators**  
Source: Author

## 2.2 Port Privatization

Privatization is not a trend that emerged during the 21<sup>st</sup> century. Many state-owned enterprises, such as telecommunications, electricity and gas companies, have been objects of ownership transformation for more than thirty years now (Dieter, 1991). The port sector, although viewed in the past as people's property, since it is important for country's competitiveness in logistics and its overall wealth (Lovell, 1993), has not been left out of this global ongoing trend. The technological advancement and the ever-increasing requirements from the side of shippers and shipping lines have resulted to increased port competition worldwide and the imminent need not only for operational excellence but also for institutional shift to specialized terminal operators that can manage the increased expectations in the shipping industry (Martin & Brian, 2001). As (Haarmeyer & Yorke, 1993) have stated "the need for operational and commercial flexibility has dictated an increasing participation of the private sector who often now set the pace for a port's progress".

Cooperation between states and private entities can take a lot of forms; from purely public to hybrid partnerships and entirely private authorities. Although these different organizational structures are controversial between authors and their findings, the most important forms in accordance with (Brooks & Cullinane, 2007) and (World Bank, 2007) are - briefly - the following:

- *Service Port Model:* Public authorities own the land and the infrastructure and also perform all administrative functions and operations, from price setting to stevedoring and vessel handling. The executive board is comprised of civil servants and the labour is directly employed by the government. However, the monopolistic nature of this structure creates a lot of inefficiencies, both at management level - because of the lack of incentives - and at infrastructure and superstructure level - due to limited investment. Therefore, the number of ports that use this model is declining.
- *Tool Port Model:* According to this model, the public authorities still possess the infrastructure and superstructure of the port, but private companies perform cargo-handling and quay operations. Yet, there exists a considerable problem with this model; the division of responsibilities. Since government owns the infrastructure but private entities operate them, a possible equipment breakdown causes conflicts between parties, creating excessive delays in ship turnaround time and inefficient performance.
- *Landlord Port Model:* Under this model, which is the most dominant worldwide nowadays, public port authorities retain ownership of the port area and act as regulators, but lease the infrastructure and superstructure to a private terminal operator for a specific timeframe. After the expiration of the agreement, all investments on infrastructure are taken over in the public authorities' possession. Furthermore, private companies perform all vessel and cargo handling operations, but access roads and berths remain at the possession of government.
- *Private Sector Port Model:* The famous and extreme case of United Kingdom's ports, where government has sold all port areas, infrastructure and superstructure to private entities that now have full ownership of them and also perform all port-related operations. Government no longer has any interest in the port sector, and therefore cannot execute long-term economic development policy.

Schematically, the responsibilities of each model are delegated as following:

**Table 1: Distribution of Responsibilities at Different Port Models**

Responsibilities	Service	Tool	Landlord	Private
Infrastructure	Public	Public	Public	Private
Superstructure	Public	Public	Private	Private
Port Labour	Public	Private	Private	Private
Other functions	Mostly Public	Public- Private	Public- Private	Private

Source: Author's Creation, adapted from World Bank Port Reform Toolkit, Module 3, p. 21. (World Bank, 2007) and Devolution, Port Governance and Port Performance, Chapter 18, p.410 (Brooks & Cullinane, 2007)

Although port privatization is an established issue, there is no “clear cut theoretical relationship” between privatization and efficiency results, since there are other events that may affect port’s performance that take place simultaneously with the privatization procedure (Cullinane, et al., 2005). Furthermore, the difficulties in the evaluation of port performance before and after privatization lie upon other reasons, such as the unwillingness of privatized entities to provide with confidential information, and even when they do so, they should be taken into consideration with the utmost of attention, since the results may be dubious and serve different interests (Everett & Robinson, 2007). The next sub-chapter analyzes all the potential reasons behind the decision of a government to proceed into lease or sale of part or the whole of a port, and the potential impact the privatization may have on port performance indicators.

### **2.2.1 Reasons for Privatization**

Port reform and change of any structural ownership should take place only after thorough and careful assessment of the objectives that public authorities set (World Bank, 2007). These targets are the ones that form the reasons for the formulation of partnerships between governments and private terminal operators.

One of the most common intention of public authorities, when leasing or even selling part or the whole of a port to a private company is the *shift of economic burden of operating the port*. In the United Kingdom, after the prevalence of Margaret Thatcher, the majority of the port sector was sold to private operators. According to (Bassett, 1993) the economic cost of providing subsidies to the port authorities was rising year by year while at the same time profits were decreasing, resulting to each taxpayer having to reimburse with thirty additional pounds on their annual tax in 1979, only for the port sector. This is also supported in the working paper of (United Nations, 1997) which concludes that one of the most important long term objectives of a government that arises out of the agreement with the private sector for the port is to reduce the need for investments in infrastructure and superstructure and diminish the financial and administrative burden of operating the port. The shift of economic constraints of port expansion and development to the private sector is also included by (World Bank, 2007) in the port reform toolkit as one of the main reasons of port privatization.

Complementary to the aforementioned reason is also the potential desire of the government for the *generation of financial profit* in the shortest possible timeframe. Coming to a concession with a private entity or selling the port brings a considerable amount of money and can act as a ‘financial injection’ especially for governments with a poor fiscal condition (Haarmeyer & Yorke, 1993), and the method was supported by the author for the case of ports in the United States. Other countries that have faced economic recessions have decided to follow the same path, like the case of the Italian

ports, where although the public authorities still have a lot of interference in the port sector, the agreements with private operators boosted the economy and the industry (Valleri, et al., 2007). These also come in agreement with the (World Bank, 2007), that one of the positive impacts of privatization is the quick revenue streams for the governments.

Continuing the analysis of the existing literature, the attraction of investments, and mainly foreign ones, is an underlying reason behind the privatization of a port. The elimination of bureaucratic procedures, the avoidance of monopolies and the new managerial and administrative methods brought by a private company improve the external trade competitiveness (World Bank, 2007). These higher incentives by the managerial board, the continuous monitoring of the performance, the delegation of responsibilities and accountability for each operation along with the “fuller set of market disciplines” help attract investments according to (Haarmeyer & Yorke, 1993). And as explained by Marcelo Giugale, senior economic advisor at the World Bank, when a multinational company sets for a new project, especially in developing countries, governments benefit in two ways; directly, with the creation of jobs and the increase in the tax streams, and indirectly, with the allure of other behemoths (Giugale, 2014). These also come in agreement with (United Nations, 1997), which state that one of the long term aims of the governments by privatizing ports is to promote the private sector involvement in the whole economy.

In addition to the above reasons, many governments proceed to the privatization of the port sector in an effort to utilize its potential. Optimizing the existing facilities, and enhancing port capacity improve the productivity of a port, and private companies accomplish these objectives (Khalid, 2014). Also, these entities develop other industries, closely related to the port sector, such as feeder, bunkering, multimodal transportation and create contemporary logistics services (Khalid, 2014). The experience of these private terminal operators in the world of global trade can improve the competitive positioning of a port (United Nations, 1997). The privatization of operations contributes to the improvement of port efficiency and port expansion, and this is something governments expect from the reform (World Bank, 2007).

Although port management is not usually affected by the cyclicity of the shipping industry, there is always the danger of getting influenced by negative conditions in the shipping business. Sharing the risks connected to this industry could be one of the long-term ambitions of port privatization according to (United Nations, 1997). It is also reported by (Notteboom, 2007) that the public port authorities may not be able to keep up with the recent trends in market development, such as vertical and horizontal integration, and may prefer not to take place into this hypercompetitive industry. Market risk includes both negative financial situations, like global recession, but also not being able to keep up with the opposite situation, where international economic growth takes place. That was one of the main policy objectives of the Malaysian government for the privatization of the port sector. The public authorities were not able to handle “the tremendous growth in cargo throughput and in commercial shipping activities” as stated by (Khalid, 2014), whereas privatized entities not only could meet the increasing requirements of the industry, but it is implied that this was the critical success factor of privatization.

Last, but certainly not least, regarding the government’s policy, is the potential demand on behalf of the society. All governments want to retain their position at the reins of administration of the country, thus they need to follow society’s desires. This has been one of the most important reasons for the privatization of many ports,

especially in Asia. According to (United Nations, 1997) the heavy privatization of the port sector in Malaysia happened owing to an effort of the government to “move marginal communities closer to the middle of the economic mainstream”. The same situation also took place in India, where the benefits of port liberalisation were apparent in the state of Guajarat, that experienced high growth rates (10,14%), becoming the fastest growing state in the country between 2001-2006 (Aiyar, 2008). And although legislation and bureaucracy impeded the procedure, after the demand from the society of Guajarat, the industrial licensing was abolished, and many businesses have chosen this state for their operations, which entailed to economic growth and heavy investments (Aiyar, 2008).

Summarizing, there may be a lot of reasons that push public authorities proceed to cooperation with private terminal operators for ports, and most of the times it is not solely one reason responsible, but there may be many conditions simultaneously that force the port reform. The following diagram outlines the main reasons behind privatization:



**Figure 4: Reasons for Port Privatization**  
Source: Author

### **2.2.2 Privatization Impact**

It is well established that, due to divergence of interests, objectives, incentives and tactics, state-owned enterprises operate utterly differently than private companies (Dewenter & Malatesta, 2001). This paper does not elaborate on whether private firms are superior than public owned. However, while examining the existent literature on port privatization, it is discernible that the privatization is a procedure characterized by radical modifications in certain aspects of the port's performance, and the next paragraphs are trying to note down the most significant of them.

One of the first changes a privatized entity brings to a port is the facilities' modernization. This is essential both for increasing efficiency rates, and also for improving the 'marketing status' of the firm. This acts as an advertisement for the 'new era of change' that the firm has brought, and it is crucial for the success of the privatization (United Nations, 1997). It is also reported by (World Bank, 2007) that the reshape of facilities and equipment is correlated with the privatization of a port, and that private parties have greater experience in developing modern facilities tailored to the needs of the world of trade (United Nations, 1997). Many authors seem to have found the same results, as (Haarmeyer & Yorke, 1993) mentioned that in United States' ports that have been privatized, the upgrade of the facilities is apparent on their efficiency, and (Khalid, 2014) reported that the first actions of the privatized entities in Malaysia were to supply the port with adequate facilities to ample the capacity in order to mitigate congestion and accommodate larger vessels. Similar are the findings of (Newman, 2013) that reports the modernization of facilities, not only in the quays and berths, but also on the landside.

Profit seekers privatized entities' primary aim is to improve operational efficiency and tackle to minimize costs and provide enhanced services (United Nations, 1997). This is accomplished by establishing quantifiable targets, constant assessments of costs and operations along with innovative new technologies for the improvement of the performance of the port (United Nations, 1997). After all, unlike public authorities that can always resort to governmental subsidies, these private entities cannot afford to experience financial losses (Everett & Robinson, 2007) and always seek to improve infrastructure efficiency. And this is supported by the majority of authors, who have found that indeed privatization and infrastructure have a positive correlation (Tongzon & Heng, 2005), like in Australia where infrastructure productivity was greatly improved after privatization (Everett & Robinson, 2007), or Hong Kong, where privatization resulted in such high levels of infrastructure and operational efficiency that the ports handled throughput higher than anticipated (Song & Cullinane, 2007). The advancement of infrastructure, the installment of new efficient equipment and the introduction of cargo handling techniques (Fernandez, et al., 1999) are most of the times the way for the privatized authorities to achieve economies of scale and meet the increased requirements of the competitive shipping industry.

What is also contributed by the private terminal operators is the upgrade in the hinterland connectivity of the port. It is reported by (Newman, 2013) that management boards of port authorities have emphasized on the importance of intermodal transport and private companies pair their expertise and planning with heavy investments on the landside in their effort to mitigate congestion and attract cargo. According to (United Nations, 1997), next to the goal of profit and the spread of investment risk, private parties follow the trend of vertical integration and have been trying to expand their operations in all parts of the supply chain for the improvement of their strategic marketing positioning.

What public authorities lack in is the arrangement and management of agreements with main carriers and the promotion of the port as an area of entrepreneurship, innovation and industrial evolution (Privatization Barometer, 2014). This derives from two main reasons; initially, the monopolistic nature of port management under public authorities, the government regulations and processes do not always support business development and an 'investment-friendly' environment (United Nations, 1997). The abolishment of protective laws to certain parties and the increase of competition in all aspects of the port promotes a more commercial environment (Baird & Valentine, 2007) that could turn a port into an entrepreneurial cluster. Furthermore,



the elimination of barriers on diversification leads to the attraction of investments in the whole port area according to (Haarmeyer & Yorke, 1993). Cases that support the above argument are the Malaysian ports, where the privatization of them led the creation of a commercially competitive environment, with value-added logistics services and the development of many industries in the ports' areas (Khalid, 2014), and the state of Gujarat that experienced astounding growth rates, after the re-establishment of businesses on the area, following the liberalisation of the port (Aiyar, 2008).

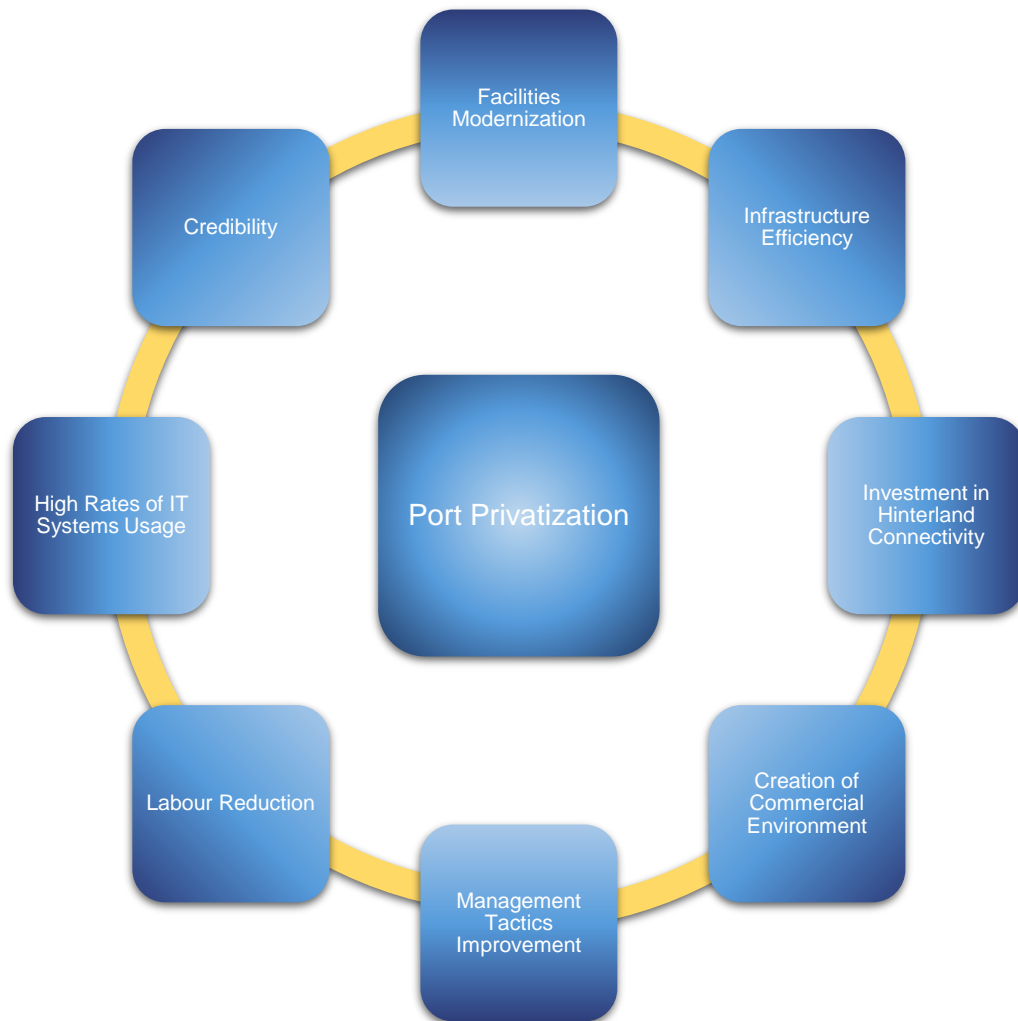
There is no doubt that what radically alters after the change of ownership of a port, is the management tactics followed by the new board. Private terminal operators perform under a 'fuller set of market disciplines' and introduce clear control methods and concepts such as accountability and liability (Haarmeyer & Yorke, 1993). Their constant incentive for profitability paired with the operational and administrative experience which is transferred by previous affiliation with other ports fundamentally reforms the port's activities (World Bank, 2007). Private ports seem to be more conscious of the market they operate in, promote innovation and are more responsive to the customer's requirements (Everett & Robinson, 2007). In addition, they react more quickly to potential changes in the market and can adapt to technology advancements that change the world of trade (Tongzon & Heng, 2005). These new management methods are also supported by (Fernandez, et al., 1999) and (United Nations, 1997) as essential part of the reform, especially in developing countries or poor performing ports.

Closely related to the modification of management methods, is the introduction of information technologies. Cooperation among all nodes of transport is of great significance for the utilization of the supply chain, and the diffusion of timely and accurate information can greatly affect operational efficiency (World Bank, 2007). Especially in ports that act as transshipment hubs, state-of-the-art information technology systems ensure their growth (World Bank, 2007). This was recognized by the private operators of the Malaysian ports that promoted cooperation through these systems, enhanced automation in their effort to provide value-added logistics services and invested on information for the creation of added value (Khalid, 2014).

However, controversial is among the authors the matter of labour management. (Haarmeyer & Yorke, 1993) has found that after the initiation of privatization of a port, labour productivity seems to increase, but through downsizing the force, like the elimination of the surplus of dock workers (United Nations, 1997). Furthermore, labour unions perceive a potential privatization of a port as means of worsening their working conditions, elimination of their (financial) benefits and deterioration of the working hours; however, this is not supported by accompanied studies (World Bank, 2007). This element of the privatization process has caused great disputes between governments and private terminal operators, especially in countries with high levels of labour protection and political interference as in the Mediterranean (Psaraftis & Pallis, 2012), due to contradicting interests of the parties.

It should not be omitted that there are many reported cases, in which ports' potentials were impeded due to mistrustfulness from the side of carriers to public port authorities (Valleri, et al., 2007). Global, well respected terminal operators have a serious impact on the port's credibility and stability, both in administrative and operational levels, and has acted as a sign of change that attracts main line operators, as reported by (Khalid, 2014) in the case of Malaysian ports, where the restoration of the reliability of the ports acted as an engine of growth for the sector.

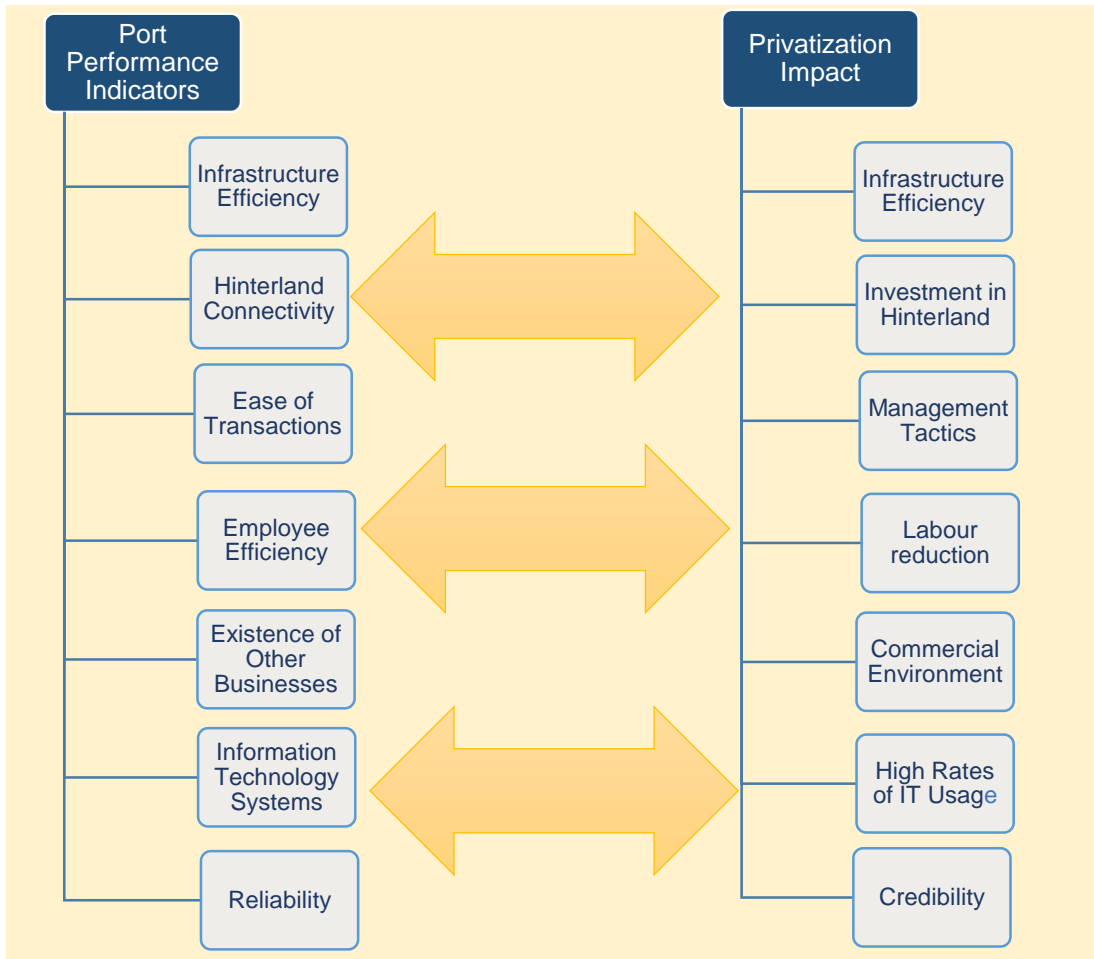
Epitomizing this issue of delicate balances, although privatization's result is controversial and should not be treated as panacea to the potential predicament a public authority may face, it is indeed a dynamic procedure, followed by radical changes in a plethora of aspects a port operates. "Although development success is not guaranteed by private management", it does activate hibernated resources and bring new original methods that alter the competitive position of a port (Privatization Barometer, 2014).



**Figure 5: Fields of Port Privatization Impact**  
Source: Author

Summing up the literature review, there is an apparent relationship between the impact of privatization and some of the most important port performance indicators. The *investments on the infrastructure and on all the facilities and the intermodal transportation* are some of the first actions of most terminal operators when they engage in a former service-model port. Furthermore, the *new management tactics* and their long-term aim of creating the necessary conditions for *upgrading the port into an entrepreneurial cluster* are closely correlated with the *ease of transactions-as*

for example the simplification of customs and administrative procedures- and the *attraction of port-related businesses*. In addition, the significance of *Information Technology Systems* is highlighted by the private entities, which also enhance the positioning of a port when it comes to *credibility* and *adaptability*.



**Figure 6: Linkage Between Privatization & Port Performance Indicators**  
Source: Author

Furthermore, it is of utmost importance to note down that the indicators of annual throughput and market share are of special value for this research, and therefore are examined thoroughly in the next chapter of Strategic Positioning Analysis, in a more quantitative aspect. The return on investment and the unexpected delays could be attributed up to some level to the management tactics the new port authorities follow and their credibility, whereas no clear-cut relationship has been found in this research between yard utilization or overseas connectivity and port privatization.



**Figure 7: Potential relationship Between Port Performance Indicators & Privatization**  
Source: Author

The above analysis of *port performance indicators*, *reasons for port reform* and *the accompanied impact of privatization* facilitates the evaluation of the concession between the Greek authorities of Piraeus' port and the Chinese carrier "COSCO". Based on the aforementioned findings the formulation of the questionnaires - for the interviews of Piraeus' port experts on their views of the recent privatization of the port - will be conducted.

### **2.3 Port Privatization in Greece**

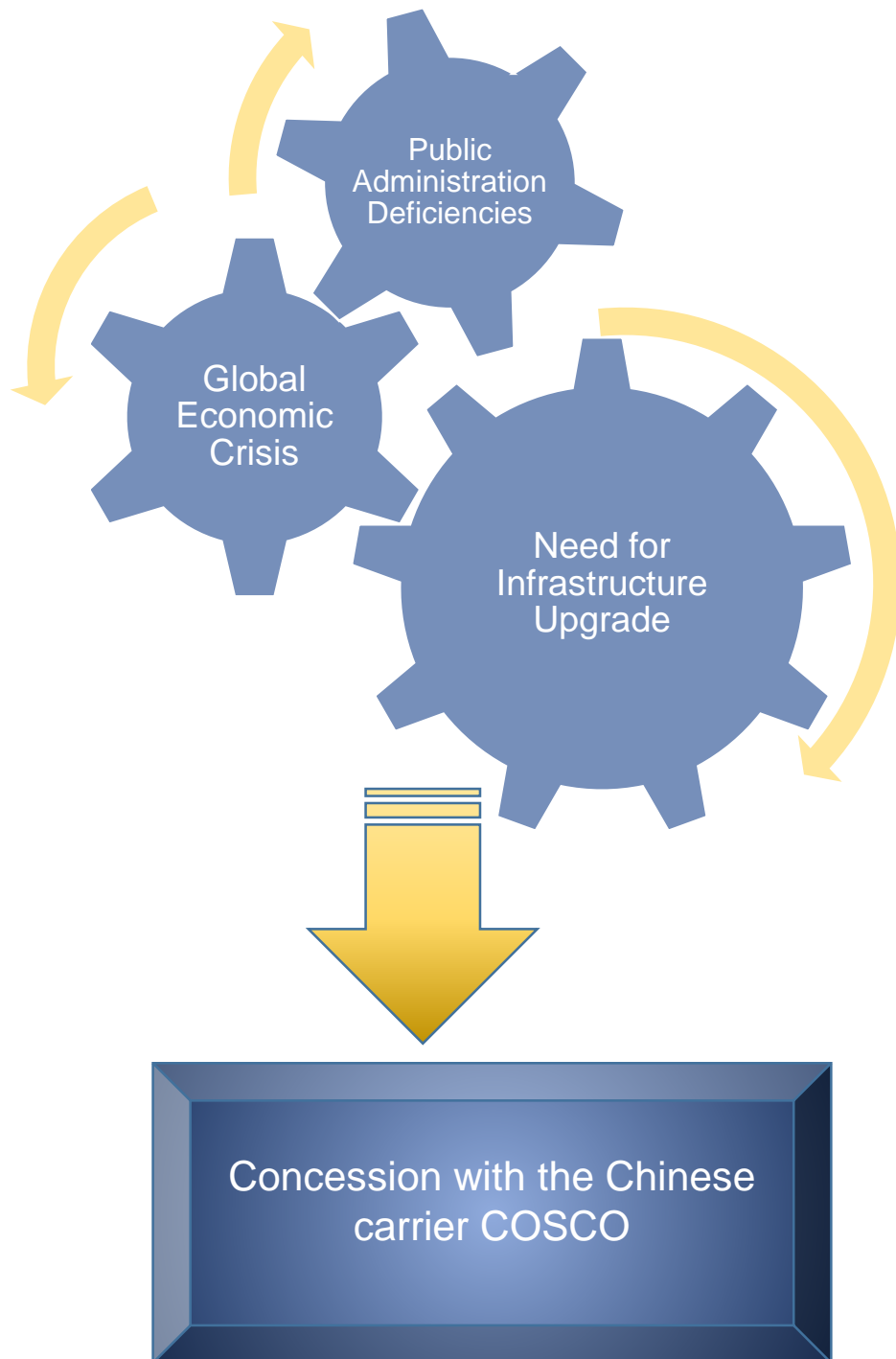
Before continuing with the research on the quantifiable impact of COSCO's involvement in Piraeus' port and the opinions gained from the experts' interviews, it is useful to shortly describe the privatization process at the Greek ports, with a focus on Piraeus.

To begin with, although the agreement between the Greek government and the Chinese behemoth COSCO was sealed in December 2009, the initiatives for structural change at the Greek ports date back in 1999. The two biggest ports of the country, namely the port of Piraeus (OLP) and the port of Thessaloniki (OLTh), were in the center of political conflicts, due to the effort of the government to corporatize them (Psarftis & Pallis, 2012). It is of great significance here to mention that the port authorities were managed by a government-appointed board, which was under the complete control of the Ministry of Mercantile Marine. In addition to the administrative board, the existence of a strong and influential labour union overburdened any potential organizational reform (Psarftis & Pallis, 2012). What worsened the situation was the change in the government leadership in 2004. It is therefore apparent that the political interference has always played a significant role in the organizational structure and the performance of the port sector in Greece.

The first failed attempts were followed by the open express of interest for both ports of Piraeus and Thessaloniki, by the Chinese carrier and terminal operator COSCO (Psaraftis & Pallis, 2012). Its plan included the exploitation of the whole of the ports with the form of concession between them and the Greek government, and the creation of all the necessary pre-requirements for the development of the ports as transshipment hubs in the Mediterranean Sea. However, once again, the influence of the union forced the Greek government to postpone the privatization process (Psaraftis & Pallis, 2012).

It was not until 2007, and the third effort of the government to reform the port sector, that a realistic plan for the change of ownership took shape. The constant growth of the Mediterranean ports, which have improved their competitive positioning, especially compared to the ports of Northern Europe, and the fact that Greece stands as a crossroad between three continents and the potential of the ports to serve as transshipment hubs, made two important international terminal operators bid for the two biggest ports (Mylonas, 2013). “COSCO Pacific” and “Hutchison Port Holding” won Piraeus’ port and Thessaloniki’s port respectively, but the latter withdraw its interest due to the global economic recession (Psaraftis & Pallis, 2012).

After a series of consultations and negotiations between the stakeholders, the port authorities of Piraeus announced in 2009 the concession with the Chinese company ‘COSCO’, for the lease of Pier II - the largest one - and Pier III, for thirty-five years. The imminent need for heavy investments in the infrastructure, both on the waterside and the hinterland connectivity for intermodal transport, the continuous mismanagement of the public authorities that entailed to deficiencies, and the international economic downturn gave motivation to the Greek government to proceed with the privatization of the port (Psaraftis & Pallis, 2012). Although controversy and political conflicts still existed, it had been high time that the environment and the groundwork for the reform of the port sector that was shaped for years, made the concession real.



**Figure 8: Stimulation for Piraeus' Port Privatization**  
Source: Author

It is of special value to mention the basic rationale of the concession between a public authority and a private entity for the reform of a state-owned enterprise. According to (Notteboom, 2007), concession is “a grant by a government or a port authority to a private operator for providing specific services” for the exchange of a lease payment. The element that characterizes this agreement is that the public authorities still retain the property rights of the area, the infrastructure and the facilities, but the operational

procedures are done by the private terminal operator and in exchange, the authorities receive a fixed payment, usually based on the area provided (Notteboom, 2007). The selection of the private entity is done after a bidding process, where all offers are evaluated based on financial (balance sheets, auditor's notes, etc.) and technical criteria along with the experience of the operators on other ports (Notteboom, 2007). Equally important is the design of concession that defines the rights and the obligations of the stakeholders for the avoidance of frictions (Notteboom, 2007), as it has been noted in the case of Piraeus port, where the Ministry of Mercantile Marine tried to ratify a legislation in favor of the labour unions, which almost resulted in the withdrawal of the Chinese company (Tsimplakis & Hatzikonstantinou, 2016).

The privatization of Piraeus' port is viewed as one of the most important development projects in Greece. Only during the first two years of exploitation by the Chinese operator, the Greek ports' market global share rose to 0,5% from a record-low of 0,15% in 2008, mainly during to the upgrade of Piraeus port, which counts for 90% of the total cargo handled in Greek ports (Mylonas, 2013). The creation of more than 125,000 jobs and the long-term benefit of 5.1 billion euros by 2020 (Mylonas, 2013), along with the promotion of Piraeus as the 4<sup>th</sup> top European port, only after Rotterdam, Antwerp and Hamburg (Tsimplakis, 2016), are the aims of both the Greek government and the Chinese company. Therefore, the reasons for the selection of Piraeus' port for the research of the impact of privatization on port performance and competition become apparent.

## **CHAPTER 3 STRATEGIC POSITIONING ANALYSIS**

After reviewing and elaborating on the literature on indicators that give insight about the performance of a port, the reasons and the results of port reform, and the process of structural change at the busiest Greek port, this chapter indulges into the consequences of the privatization of Piraeus' port in the port competition in the Mediterranean Sea in terms of throughput. This is accomplished using the Strategic Positioning Analysis, developed by (Haezendonck, et al., 2006), and constitutes a useful tool that shows quantitatively, yet simply, the positioning of a port in the area of competition, and can provide the management board with invaluable information for strategic decision-making on port development.

### ***3.1 Relevance and Limitations of the Model***

Before analyzing the results of the model, the reasoning for its selection should be clarified. Firstly, as also stated by (Haezendonck, et al., 2006), the relative strength of the model is that it presents quantifiable information on the development of port competition in a specific area, assists the management board to identify the future of the port and prepare alternatives in its strategic management. The model has a very specific hierarchical approach; the first part consists of a product portfolio analysis (PPA) that describes the performance of the competing ports, the second is a shift-share analysis (SSA), complementary to PPA, that analyzes the overall progression of all the elements of the port, and ends with a product diversification analysis (PDA), which evaluates the impact of each traffic category.

In this research, only the first part of the model is used, namely the product portfolio analysis. This enables the description of the performance of multiple ports, based only on the annual amounts of TEUs handled in each port. The dynamics of each port are translated into the growth rate - market share matrix as created by the Boston Consulting Group.

The relative advantage of this method is the simplicity of the representation of statistical information. The creation of the visualization makes it easily readable for anyone interested, and even more simple for the management board to get a quick insight of the competitive position of the port. Furthermore, since the model is based only on cargo handling, the data is publicly available and effortlessly accessible on the websites of each port authority. For more information, see (Haezendonck, et al., 2006).

However, it is of utmost importance to note that the Strategic Positioning Analysis "should not be used as a substitute for managerial judgement" (Haezendonck, et al., 2006). Every port has its own unique characteristics, operates under ever-changing conditions and is affected by lots of variables, and using solely this model creates the risk of oversimplifying the reality. Thus, under no circumstance is it implied that the model itself provides with all the necessary data for strategic decision making. It should be used, though, as a complementary tool by the management board of a port authority for the evaluation of the competitive position of the port in the area of interest.



### **3.2 Piraeus' Port Evolution and Selection of Competing Ports**

A quick research on the statistics of the Greek port authorities and on academics' and journalists' articles reveals the importance of the participation of the private party in the port's performance. The annual traffic of containers experienced more than 200% increase between 2010-2012, mainly due to the significant investment from the Chinese operator for the upgrade of port's infrastructure (Mylonas, 2013). The annual cargo handling retains a steady growth, reaching almost 4 million of TEUs in 2015, with the expected handling to reach the levels of 5,6 million TEUs in 2020 according to (Tsimplakis, 2016). And although the concession agreement amounted to investments of 4,3 billion euros for the 35-year lease of the port, the Chinese behemoth invested more than 230 million euros, in excess of the agreed sum, between 2013-2015 to increase the capacity of the terminal (European Union Academic Programme, 2015), and is rumored to invest more than 400 million euros until 2020 for the upgrade of the terminals, in order to achieve the target of making Piraeus the fourth busiest port of Europe (Tsimplakis, 2016). It is obvious that the new era the Chinese company has brought at the port of Piraeus is worth investigating.

Regarding the ports that have been selected for the Strategic Position Analysis, these met the following criteria:

- Adequate container traffic to compete with the port of Piraeus.
- Service of the same market with the port of Piraeus.
- Operation -mostly- like transshipment hubs, as the port of Piraeus.

Therefore, the choice of ports of Algeciras, Gioia Tauro, Malta, Barcelona, and Mersin was made, as competitive ports to Piraeus. In addition, the selection of the port of Valencia could not have been omitted, because, although it does not fulfill the third requirement since it mostly serves as gateway to the Iberian Peninsula, its importance in the Mediterranean Sea cannot be ignored. However, the port of Genoa is not included, since it serves as a gateway to the Central and North Europe, the port of Ambarli serves the great market of Istanbul and also receives a great deal of traffic from the Black Sea and Port Said, although a major transshipment hub in the Mediterranean Sea, especially due to its position of strategic importance, benefits from the fact that it is the major port that leads to Africa, therefore it is questionable if it is indeed a competitor to the Greek port.

### **3.3 Data Collection**

As it has already been mentioned, one of the greatest advantages of the Strategic Positioning Analysis is the accessibility of the data. The model is built upon the annual TEU handling of each port. For transparency reasons, port authorities, either by national or supranational (as in the European Union) legislation, are forced to publish their results, at least on an annual basis. Therefore, after the selection of the ports of Piraeus, Valencia, Algeciras, Malta, Barcelona and Mersin, the extraction of the data have been made through the annual statistical reports of each port authority, found at

the sites of OLP<sup>1</sup>, PAV<sup>2</sup>, APBA<sup>3</sup>, MFC Ltd.<sup>4</sup>, POB<sup>5</sup> and MIP<sup>6</sup> respectively. For the verification of the data, the cross-checking with the “World Port Rankings” of the American Association of Port Authorities<sup>7</sup>, as well as the publications of “PortEconomics”<sup>8</sup>, a site created by academics specialized on port management, has been made.

### 3.4 Results of the Portfolio Analysis and Visualisation

As is has already been remarked, the product portfolio analysis will be used in this chapter, which is visualized in growth rate-market share matrix. The periods of 2009-2012 and 2012-2015 are examined, since the start of the Chinese participation in the port of Piraeus was apparent from the beginning of 2010. Furthermore, the existence of two periods enables the evaluation of the gradual change in port competition in the Mediterranean Sea. The next table summarizes the necessary data for the analysis: Annual throughput in terms of TEU for the years of reference, the average market share each port captured for the examined periods, as well as the growth rates each one achieved.

**Table 2: Summary of Product Portfolio Analysis 2009-2015**

Port	Annual TEU	Annual TEU	Average Market Share	Growth Rate	Annual TEU	Average Market Share	Growth Rate
	2009	2012	2012	2009-2012	2015	2012-2015	2012-2015
Piraeus	667135	2108090	8,30%	216%	3977781	16,55%	57,85%
Valencia	3653890	4469754	24,45%	22,33%	4615195	20,64%	3,25%
Algeciras	3043268	4070791	19,87%	33,76%	4515768	20%	10,93%
Gioia Tauro	2857438	3049875	16,18%	6,73%	2550000	13,87%	16,39%
Malta Freeport	2261034	2538080	13,97%	12,25%	3064005	13,38%	20,72%
Barcelona	1800213	1756429	11,06%	2,43% <sup>9</sup>	1965240	8,56%	11,89%
Mersin	843917	1204820	6,17%	42,77%	1470000	6,66%	22,01%
<b>Total/Average*</b>	<b>15126895</b>	<b>19197839</b>	<b>100%</b>	<b>47,34%*</b>	<b>21507989</b>	<b>100%</b>	<b>15,75%*</b>

Source: Author's Calculations, adapted from Statistical Data of Port Authorities<sup>10</sup>

<sup>1</sup> <http://olp.gr/en/stats>

<sup>2</sup> <http://www.valenciaport.com/en/VALENCIAPORT/Trafico/Paginas/Presentacion.aspx>

<sup>3</sup> <http://www.apba.es/en/stats>

<sup>4</sup> <http://www.transport.gov.mt/admin/uploads/media-library/files/Cargo%20Throughput%202015.pdf>

<sup>5</sup> <http://www.portdebarcelona.cat/en/web/autoritat-portuaria/estadisticas%3Bjsessionid=444A44E220139A823139129918DFCEDE.lifepro1.port.apb.es>

<sup>6</sup> <http://en.mersinport.com.tr/port-services/detail/Container-Services/404/632/0>

<sup>7</sup> <http://www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048>





<sup>8</sup> <http://www.porteconomics.eu/2016/02/23/portgraphic-top-15-european-container-ports-in-2015/>

<sup>9</sup> The numbers in red colour indicate negative growth rates, in the case of Barcelona for the period 2009-2012, and Gioia Tauro for the period 2013-2015.

<sup>10</sup> See above footnotes for the sources.

From the above table there are some interesting facts that should be discussed:

- ✓ Before the initiation of privatization, Piraeus' port had been performing quite poorly, capturing a rather frictional market share compared to its actual potential.
- ✓ The port of Piraeus experienced tremendous growth rates during the period 2009-2012, in which it managed to more than triple its container traffic, and significantly increase its market share.
- ✓ Even after the first heavy investments of 'COSCO', Piraeus still managed to retain its growth rates (57,85%), way above the average of the competing ports (15,75%).
- ✓ The above figures validate the "success story" of the participation of COSCO at the Piraeus port (Fotinos, 2013).
- ✓ The port of Valencia managed to hold on the first position as the busiest port of the Mediterranean, but its market share has been declining since 2009.
- ✓ The above fact is correlated with the steep increase of the traffic in the port of Algeciras, which has achieved growth rates of double figures since 2009.
- ✓ The ever-increasing importance of the Mediterranean ports is also apparent at the ports of Malta and Mersin, which have grown at a significant level in the past few years.
- ✓ There are cases, like the port of Barcelona, where the international economic crisis of 2009 resulted in negative growth rates for the period 2009-2012, and the port of Gioia Tauro, where the lack on investment and the upgrade of Piraeus entailed to its decline in annual traffic, market share and negative growth rates for the period 2012-2015.
- ✓ Ports that have been operated by private entities, like the ports of Piraeus (COSCO), Algeciras (APM Terminals) and Malta (CMA-CGM), have enhanced their competitive position, securing considerable market shares.

<b>Growth Rate</b>	<b>Question Marks</b>  Low Market Share & High Growth Rate	<b>Stars</b>  High Market Share & High Growth Rate
	<b>Dogs</b>  Low Market Share & Low Growth Rate	<b>Cash Cows</b>  High Market Share & Low Growth Rate
	<b>Market Share</b>	

**Figure 9: Boston Consulting Group's Market Share-Growth Rate Matrix**  
 Source: Author, assembled by Boston Consulting Group

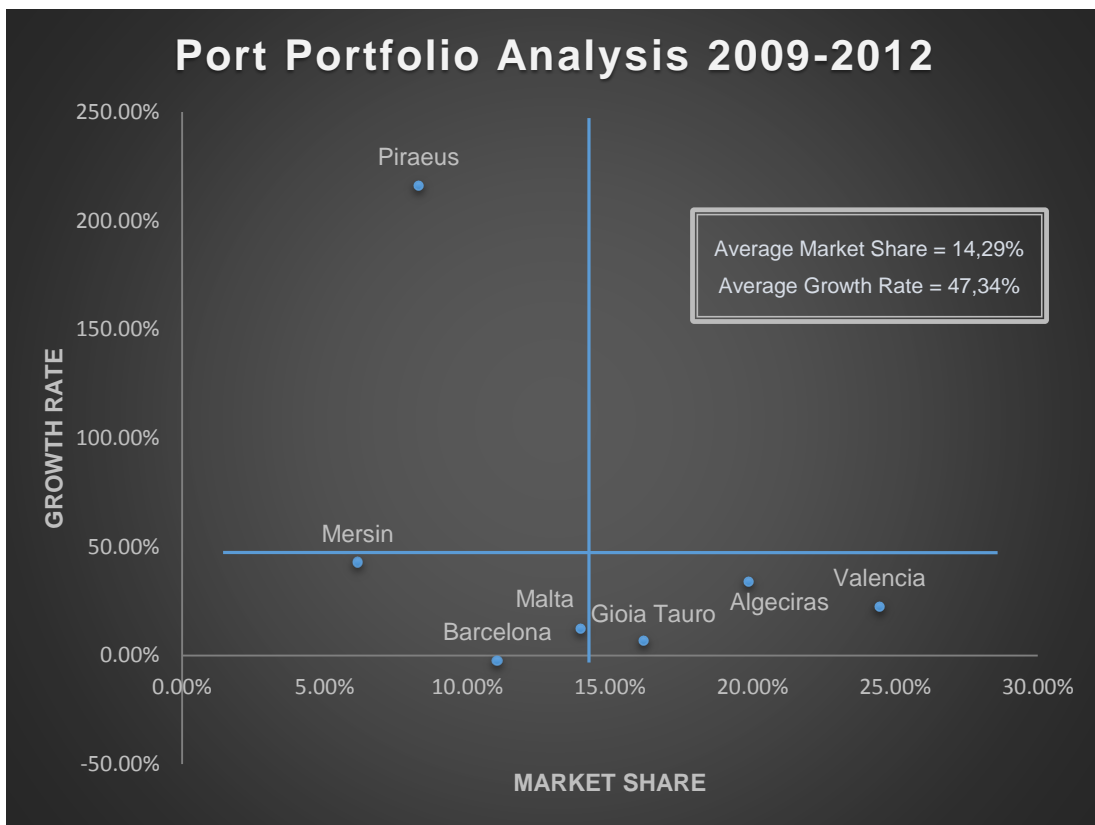
In the next figures, the port range is considered the portfolio of the ports: each port is placed on the growth rate-market share matrix based on the market share and the growth rates it achieved during each period. Then each quadrant is divided, according to the average market share of the seven ports and the average growth rates they achieved during each period. Of course the above table and the next figures represent only the container traffic of the ports, since the participation of 'COSCO' regards only this category. The analysis of each port is done based on the above matrix created by the Boston Consulting Group. However, since ports are not 'business units', the description of each quadrant should slightly alter. "Stars" are adjusted to "Star Performers" to highlight the importance of continuous investment for the future, while "cash cows" need to be renamed to "Mature Leaders" since ports have distinct differences than a business unit, which when obtaining a high market share even with a low growth rate, it generates high revenue. "Dogs" have no longer place as a concept, but rather "Minor Performers" are used to show that a port has low container traffic, and "Question Marks" are modified to "High Potential" ports, in the sense that if they keep their growth rates, they can enhance their competitive position (Haezendonck, et al., 2006). The next two figures show the transformation of the Boston Consulting Group's matrix, to the Strategic Positioning Analysis matrix.

<b>Growth Rate</b>	<b>High Potential</b> Need for maintaining its growth rate	<b>Star Performer</b> Investments to guarantee long-term sustainability
	<b>Minor Performer</b> Low traffic in comparison with competing ports	<b>Mature Leader</b> High market share in a traffic category
	<b>Market Share</b>	

**Figure 10: Strategic Positioning Analysis Matrix**  
 Source: Author, based on (Haezendonck, et al., 2006)

When considering the portfolio analysis of 2012, Piraeus port is the only one that achieved higher growth rates than the average among the competitive ports. However, the tremendous growth that this port experienced between 2009-2012 is one of the reasons that the period 2009-2015 has been split in two sub-periods. This way the gradual evolution of competition is examined more thoroughly, and the results are more subjective. Although Piraeus managed to improve its position, its previous poor performance impeded the capturing of a market share higher than the average. Thus, Piraeus' port is placed in the quadrant of "High Potential". At this stage, port authorities have to be very careful, as there exist plenty of opportunities for further

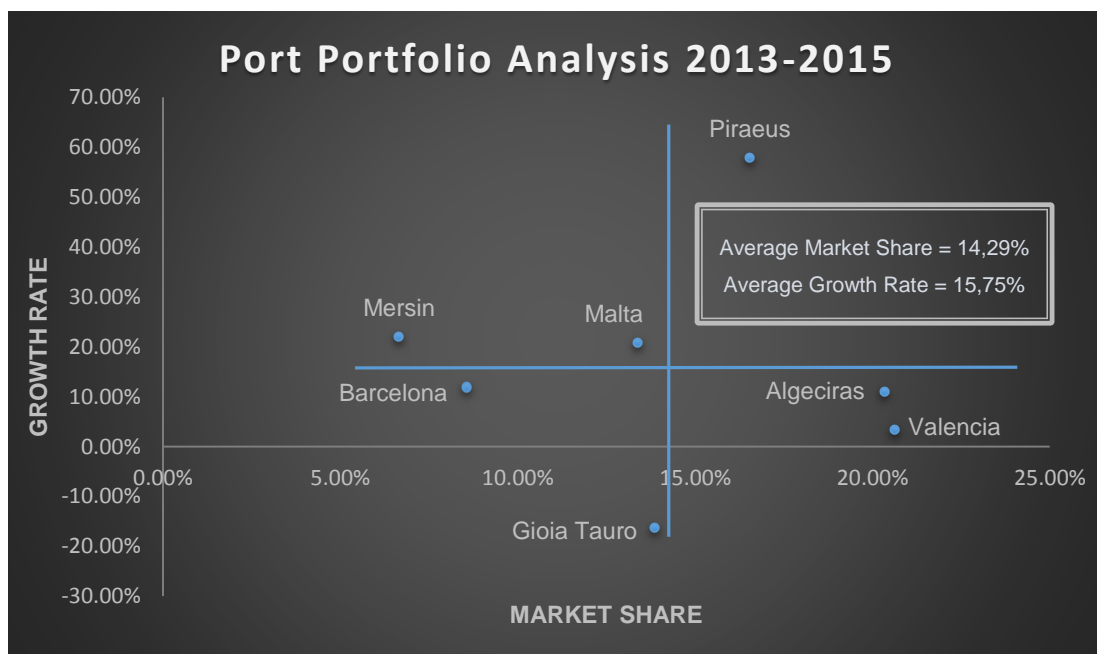
development, but a careful analysis of where the investments should be placed is crucial for the survival and growth of the port. This graph may be a little unjust for the ports of Algeciras and Mersin, which accomplished vast growth rates, but due to the steep growth of Piraeus' port, they are placed as "Mature Leader" and "Minor Performer" instead of "Star Performers" and "High Potential", respectively. The importance of the port of Valencia is also apparent, as the considerable market share it has, placed the port as a "Mature Leader". Furthermore, according to the figure, hazardous is the situation for the port of Gioia Tauro, which although is considered a "Mature Leader", its market share is quite close to the area's average while at the same time its growth rate is rather low and could entail to deterioration of its position. The ports of Malta and Barcelona can be pronounced as "Minor Performers", since they neither have considerable market shares, nor have they achieved growth- especially Barcelona's rate is negative.



**Figure 11: Port Portfolio Analysis 2009-2012**  
Source: Author

Moving on to the analysis of the competition during 2013-2015, the most important change for the research is the position of Piraeus. The continuation of the investment by the Chinese resulted into the port moving from a "High Potential" to a "Star Performer". This means not only has it captured a significant market share in the area, higher than average, but it has also grown in a rate far higher than the average, making it the only port to feel that it operates not only in a market full of opportunities, but it has also yield its investments, confirming the findings of the above chapters. However, although it generates a lot of income for the terminal operators, in order to

maintain its position in that quadrant, Piraeus' port needs to invest and not become complacent. Interesting is also the course of the ports of Malta and Mersin, whose growth rates are above average, turning them from "Minor Performers" to "High Potential" ports. These ports achieved rapid growth rates and can now be more optimistic and confident for their future. Furthermore, Algeciras and Valencia remain "Mature Leaders", dominant when it comes to market share, but with quite low growth rates. On the other hand, the ports of Barcelona and Gioia Tauro face great challenges, as they are placed in the "Minor Performers" quadrant. And if for Barcelona the situation has not altered a lot, maintaining more or less its market share and attaining some growth, this figure comes to verify the aforementioned concerns about the port Gioia Tauro. During the period 2012-2015, the negative growth rates it experienced, has resulted into moving from a "Cash Cow" to a "Dog", becoming one of the poorest performance-wise players of the Mediterranean Sea.



**Figure 10: Port Portfolio Analysis 2013-2015**  
Source: Author

Summing up Piraeus' position in its area of competition, it can be obviously inferred from the above graphs that the situation has radically changed since 2009, and one of the poorest performing ports of the Mediterranean Sea is now a market leader, achieving rapid growth rates and ensuring considerable market shares. Therefore, the above analysis encourages the continuation of the research, in a more qualitative method, in order to understand and elaborate on the actual impact of privatization of Piraeus' port on each indicator.

## **CHAPTER 4 QUALITATIVE ANALYSIS**

As presented and described in the first chapter of the research, after the analysis of the secondary data, which have created an excellent background of information, the main focus of the research is on the qualitative analysis of the impact of privatization on Piraeus' port. More specifically, this chapter's target is to contribute to the findings of the literature review and the quantitative model results, by conducting in-depth interviews for the resolution of the last two sub-research questions. However, before analyzing and interpreting the results of the interviews, it is critical to point out the reasons for selection of the interview as the method to conduct this research, its advantages and drawbacks, the sample selection and the formulation of the questionnaires. At the end of the chapter, the outcome of the interviews is complemented by recommendations for the future development of the port.

### ***4.1 Interview as a Method to Conduct Research***

It is crucial for every researcher to be aware of what the research problem is and what is hoped to be answered and measured. This provides with the right guidance for selecting either a quantitative or a qualitative analysis. This part of the thesis investigates the effect of privatization on Piraeus' port performance indicators, which some can be quantified-as the annual throughput and market share which have been analyzed in the former chapter-and some need to be investigated in a more qualitative way. For this reason, the method of personal interviews has been selected, since it is "useful to detect meaning to a phenomenon" (Blumberg, et al., 2011). Indeed, we do have a phenomenon, namely the privatization process of the port, which is followed by a series of changes on performance indicators, and it is aimed to decipher the correlation between port performance and privatization. Personal interviews are effective tools that provide with versatility and depth of information, and especially for abstract concepts that cannot be obtained in any other way. What makes this method unique, is that, except for the completion of the standard questionnaire, it also enables the interviewer to deepen in the issue with follow-up questions that can unveil aspects of the research problem that were previously unknown (Blumberg, et al., 2011). This exploratory investigation may reveal dimensions of the issue examined that the researcher may not have thought of. Furthermore, the careful choice of uniquely qualified interviewees, and the cooperation with them, can prove to be of special value for the research, since the successful consummation of this qualitative method leaves no space for potential dispute for the results.

However, it is also accompanied by certain drawbacks. Firstly, almost everything depends on the sample. Many of the potential interviewees are unwilling to cooperate or even participate because they do not want to disclose potentially confidential data. This research was no exception to this obstacle, as some of the stakeholders were reluctant to take part. Furthermore, personal interviews are time and energy consuming processes that may create time and budget constraints, which hinders the research and may affect the results.

Last, the interpretation of the results is to no avail if there has not preceded a careful and thorough assessment of the sample, the knowledge and qualifications standards of the participants and their motivation for each answer. Therefore, it is apparent that

the sample choice is invaluable for the research and thus the next sub-chapter is dedicated on this.

## 4.2 Sample Choice

As it has already been highlighted, the sample design is of utmost importance since it enables the researcher to derive the appropriate information that will lead to value-added results. According to (Blumberg, et al., 2011), the two most important elements of a sample are accuracy and precision; or in other terms the level of bias and the precision of estimate.

Port privatization is a dynamic procedure that affects a lot of interested parties; from port authorities and shipping companies, to agents and researchers. The purpose of the *selected sample* – a random sample would be to no avail for this paper, due to the complexity of the investigated issue- is both to gather diverse opinions from as many stakeholders as possible, and to eliminate any potential tendentious views. However, it has to be mentioned once again that despite the initial hopes of a larger and more representative sample, there were many parties (especially from the side of the two entities related to the concession) that were not willing to participate, based on the belief that they would disclose classified data that could prove beneficial for competitors.

One more element that should not be omitted is that conducive to the extraction of the most accurate possible results is the clause of confidentiality that has been included in the interview procedures and the names of the interviewees cannot be published. Yet, below a table is provided with the title of each participant, the date and the method of the interview, in order to show the incorporation of diverse opinions.

**Table 3: Interviews Sample**

<b>Title</b>	<b>Date</b>	<b>Method</b>
Customs Broker	13/07/2016	Personal Interview
CEO-Shipping Company	14/07/2016	Personal Interview
General Manager-Marine Consultancy Group	14/07/2016	Personal Interview
Vice President of Hellenic Shortsea Shipowners Association	15/07/2016	Personal Interview
General Admiral, Former President of Coast Guard	15/07/2016	Personal Interview
Former Master Captain-Consultant	18/07/2016	Personal Interview
Marine Consultant	18/07/2016	Personal Interview
Second Officer	18/07/2016	Mail Interview
COO-Shipping Company	19/07/2016	Personal Interview
Crew member	19/07/2016	Personal Interview
Master Captain	28/07/2016	Mail Interview
Master Captain	01/08/2016	Mail Interview
Chief Engineer	01/8/2016	Mail Interview
Master Captain	01/08/2016	Mail Interview
Shipping Agent	11/08/2016	Mail Interview
Director at Ports & Shipping Advisory-Researcher	13/08/2016	Mail Interview

Source: Author



### **4.3 Formulation of the Interview Questionnaire**

Many researchers that use a qualitative analysis, due to impatience and excitement to resolve their main research topic, tend to draft the interview questionnaire during the initiation of the research. However, there are certain preliminary steps that should be followed, which ensure the success of the analysis. Before continuing with the interviews' results analysis, this sub-chapter is dedicated on explaining the background behind the formulation of the interview questionnaire.

Each research is based on a central topic, a central idea under which the sub-research questions are built, whose deductive reasoning entails to the resolution of the main research question. The progress of the research is heavily dependent on following step by step, examining and coming to a conclusion for each investigative question. As soon as these questions are formulated, the next step is to make an analysis plan of the potential methods of resolution (Blumberg, et al., 2011). Thereafter, if the interview is selected as a method, the measurement questions that constitute the questionnaire need to be formulated, as well as the type of questions. There are structured questions, suitable for gradations of preference or agreement and unstructured questions that promote cooperation and discussion between researcher and interviewee and can unveil aspects of the issue that may have been omitted (Blumberg, et al., 2011). However, both types also come with drawbacks, such as the possible exclusion of a graded answer from the list or the potential unwillingness of the participant to elaborate on open-ended questions (Blumberg, et al., 2011).

As it has already been discussed on the introductory chapter of this thesis, the qualitative analysis has been chosen for the examination of these sub-research questions:

- ✓ *“Why did the Greek government initiate the concession with the Chinese carrier ‘COSCO’ and how has this affected port’s performance?”* (sub-research question 3).
- ✓ *“What are the next modifications that ‘COSCO’ should implement on Piraeus’ port and how could this potentially affect its attractiveness on container shipment parties?”* (sub-research question 4).

The first question emphasizes on the reasons behind the privatization of the port, and its consequences on port performance indicators that are important for Piraeus. It is obvious that the extensive literature review has proved to be an indispensable element of the thesis and has served as the basis for the formulation of the interview questionnaire. The examined port performance indicators, reasons for privatization and potential fields of privatization impact are asked to be addressed by the experts, in both structured and unstructured questions. The second question focuses on future and aims to give an insight of the policies that should be followed in the forthcoming years for the enhancement of the competitive position of the Piraeus’ port. This is answered by an open-ended question that lets each expert elaborate on its views about the future steps of the port. Consequently, the interview questionnaire includes:

- i. List of the key performance indicators and their relative importance on Piraeus’ port, in form of graded questions.

- ii. List of the potential reasons for privatization of a port, and their weighted role on Greek government's decision for the concession of Piraeus' port, in form of graded questions.
- iii. List of the potential fields under the sphere of influence of privatization and their weighted alteration after the exploitation of the port by 'COSCO', in form of graded questions.
- iv. Open-ended question that requires the description of the impact of privatization on Piraeus' port, with a special focus on each interviewee's sector of expertise.
- v. Open-ended question about the opinion of each expert on the future of Piraeus' port, potential modifications and governance policies that could enhance its competitive position.

An effort to minimize each question form's disadvantages has been made too; although the lists provided for the port performance indicators and privatization reasons and consequences are rather extensive, the choice of adding a variable deemed important by each expert has been given, along with the necessary space in the questionnaire for the justification of the argument. Furthermore, both during personal interviews and communication through mail, the participants have been encouraged and motivated to elaborate on the two last questions, in order to obtain the most accurate results, that in combination with the existing literature can give a fair insight of Piraeus' port future. The complete interview questionnaire can be found in the appendix part, at the end of this paper.

#### **4.4 Interview Results & Interpretation**

This chapter aims not only to provide all the results from the interviews of Piraeus' port experts, but also try to interpret the results from the questionnaires gathered. The comparison of the interview questionnaires has revealed some interesting facts; since the sample has been rather diverse, many different opinions have been noticed, and although interviewees generally share similar opinions about the privatization of the port, there are some fields of divergence that have to be highlighted. The next pages follow the same structure as in the literature review; thus, the sub-chapter initiates the analysis with the most important performance indicators for the port, followed by the reasons behind the decision of the Greek government to come to a concession with the Chinese carrier 'COSCO', and finally concludes with the impact of this ongoing procedure. The thoughts and points of view of the experts on the future of the port are analyzed in the next sub-chapter.

##### **4.4.1 Port Performance**

*Results:* The importance of maximizing the *annual traffic and throughput* for Piraeus' port and obtaining the largest possible *market share* in the Mediterranean Sea has been the focal point of the majority of the interviewees, confirming the importance of the Strategic Positioning Analysis. Piraeus used to be a rather poor performing port, not utilizing its assets and potentials, despite its location of strategic importance for the Europe-East Asia trade. This *overseas connectivity* is considered of great importance and this factor that could prove to be the comparative advantage for Piraeus, in its quest for enhancing its positioning in the fierce competition of the ports. What is also of great significance for the proper functioning of the port is the

*infrastructure efficiency*. The terminal operator needs to leverage on the physical structure of the port and its advantages (sufficient depth and navigation channels to attract large vessels) by optimizing the infrastructure and superstructure assets, in order to increase its throughput.

Furthermore, there are plenty of indicators, viewed as crucial for the port that have turned out to be Achilles' heel for Piraeus. The high degree of administrative problems and bureaucracy and the complexity of customs have created a hostile environment for *transactions*, and have also acted as deterrents for the attraction of *other businesses*, either port-related services or industries that could benefit from the physical flow of the goods in the port. In combination with the low levels of *employee efficiency* and the high likelihood of equipment breakdown, unforeseen strikes or stevedoring problems-in other words *unexpected delays*- have acted adversely in the *credibility* and the prestige of the port to shipping companies, logistics providers and maritime service companies.

On the other hand, experts seem to agree that *hinterland connectivity* is important, but only up to some extent, since the port mostly serves as a transshipment hub. However, all of them have indicated the need for further investment on the landside, if Piraeus aims to get a place among the most important European ports. The existence of *information technologies* is not yet an indicator that port authorities have focused on, but experts do believe that it will attract more attention in the future.

Divergence on interviewees' opinions are noted on the importance of *yard utilization* or *storage areas*, between people on board the vessels and the rest. Therefore, no result can be derived for these indicators.

What has also been added by many of the experts is that *security* of the port area is important for the port and should be included as a port performance indicator. Furthermore, the *physical structure* of the port should complement the *overseas connectivity* indicator, since it provides with a thorough view of the significance this indicator has for Piraeus.

*Interpretation:* The general outcome of the questionnaires and the interviews is that Piraeus' port performance is affected by a plethora of variables. Yet, many of them have been neglected by port authorities for years, creating adverse conditions. Major concern is the limited ease of transactions, which is "mainly result of the constitution of Greece that favors the existence of many administrative procedures for political reasons". This prevailing bureaucracy is also evident in the port sector, and has discouraged many multinational companies to invest in the port area. It is believed that if these obstacles are not overcome, it is unlikely that the necessary commercial environment, which would lead to industries moving to the port area and creating a port cluster, will be created. It is also apparent that as any port, special focus is placed on the annual throughput and the obtained market share, confirming the results of the quantitative analysis earlier in this thesis.

However, controversial is the issue of the hinterland connectivity of the port. Although according to the interviews, prominent is the need for further expansion of the intermodal transportation and creation of the basis for Piraeus to become a gateway to the growing Eastern Europe, this indicator is still considered as of mediocre

importance, due to the current transshipment status of the port. Surprising is also the fact that employee efficiency is of utmost importance for the port. The existence of strong influential unions, with increased demands and claims have created inefficiencies in different port's aspects, e.g. unexpected delays due to strikes, that have a negative impact on the credibility of the port, creating an image of an unreliable place to do business with.

#### **4.4.2 Reasons for Privatization**

*Results:* Regarding the reasons that led to the concession between the Greek government and the Chinese behemoth 'COSCO', the picture seems to be clear. The economic recession at the end of the last decade deteriorated the financial situation in Greece, which has resorted to the aid of the IMF and its launch of three bailout programmes since 2010. Consequently, one of the clauses, which has had a prevailing position in all loan structures, has been the decentralisation of a series of state-owned enterprises. The port sector has been no exception to the demanded reform of the Greek economy. It has *generated considerable amounts of profit* for the Greek economy, in these turbulent times that raising capital in order to meet the lenders' demands has been vital for the survival of the country. Furthermore, it is common view that the exploitation of the port by 'COSCO', one of the most recognizable and reliable carriers and terminal operators, will have a beneficial impact on the *attraction of foreign investments*. Nobody disagrees with the belief that the only sustainable way for the ravaged Greek economy to 'resurrect' is by bringing direct foreign investments to the country, and the interviewees support that this cooperation with the Chinese will not only upgrade the credibility levels of the country, but will also promote the *expansion and utilization of the port sector in Greece*. Many of the experts hope that "this privatization will initiate a 'domino' of concessions in other important ports of the country, as the port of Thessaloniki, where interest has already been shown by the biggest terminal operators of the world and this liberalisation of the ports will *bring the sector to the international levels of efficiency and competence*, which may result into a new era for the Greek economy". *The transfer of the risk related to this market* has been excluded by the majority of the experts as a potential reason for the privatization of the port, since "even though freight rates are low and shipping industry has been hurt like never before, the importance of ports in the whole supply chain always makes the situation more stable for the terminal operators rather than the shipping companies".

In addition to the aforementioned, one more reason has been highlighted behind the privatization of the port; *the relief of political obstacles*. As it has already been analyzed, the power of unions and their influence on each and every government has hindered the situation of the port. However, since the terminal has been operated by the private entity, this has radically changed; unions "no longer benefit from the privilege of threatening the port authorities with strikes", unexpected delays for the vessels or the inland carriers have been decreased, restoring the reliability of the port to its clients.

One field of controversy though has been the demand from society. There are some who believe that many supporters of the current socialist government have openly opposed to the "clearance sale of this important public good", while others support

that this is only a minority, and most of the Greek people wanted this change in the ownership status of the port, hoping that this would optimize its operations, increase its traffic and create more jobs.

*Interpretation:* Summarizing, despite the discrepancy of opinions regarding the potential demand from society for port privatization, which can be attributed to diverse political beliefs of each interviewee, it is apparent that the economic condition of the country is the underlying factor under the concession with the Chinese carrier 'COSCO'. The economic agenda dominates the attention of the whole government, and the inability of the public authorities to raise capital from other sources or persuade investors to inaugurate their business in the country are the key factors that led to the decision for privatization. By leasing the busiest and most important port to a foreign, respectable and well-established terminal operator of the world, the Greek government has tried to make a statement of credibility and attraction of foreign investments. This reform is viewed as the first major effort of the Greek government, both to utilize the potential of the maritime sector of Greece -which is considered to be the strongest aspect of the economy along with tourism- and to build the background for the engagement of the private behemoths in the Greek economy. This view is common among all the interviewees, who have also pointed out that even if there was no clause in the programmes, the Greek government should have proceeded to the privatization of the port in order to find an alternative source of income rather than increasing tax rates or cutting horizontally pension schemes

#### **4.4.3 Privatization Impact**

*Results:* The most interesting part of the interviews though was the experts' opinions and their critique on the effects of the port's privatization. All of them agreed that the aftermath of this dynamic procedure is evident on many variables, resulting to the rapid *increase of annual throughput*. "Numbers talk for themselves" commented many of them, verifying the importance of the quantitative analysis of the preceding chapter.

Although the *modernization of the facilities* and the *increase of infrastructure efficiency* receive high scores of impact, the experts did not emphasize on these two variables, because as it has been explained, "these were the first targets included in the business plan of the Chinese". What has been highlighted by the interviewees is the effect of the involvement of the private entity is apparent on other aspects of the port, such *new management tactics* transferred to the operations of terminal; increased accountability, safeguard for the port area that guarantees stability and security for the facilities and the goods, flexibility, responsiveness to customers' needs and promotion of the port as a reliable transshipment have greatly affected the *credibility* status of the port. This has entailed not only to attraction of shipping lines, but has created a *commercial environment* that incorporates all the necessary requirements for *foreign investments allure*. "More ships mean more ship-and-port-related jobs, as for instance more freight forwarders, more companies that provide supplies for the ships, more inspection companies, etc."

On the other hand, experts point out that the investment in the *hinterland connectivity* of the port has been limited so far, and this is a major drawback for Piraeus, since "it now serves mostly as a transshipment hub and does not utilize its potential to become a gateway to the Eastern Europe". Similar is the case of the *information technology*,

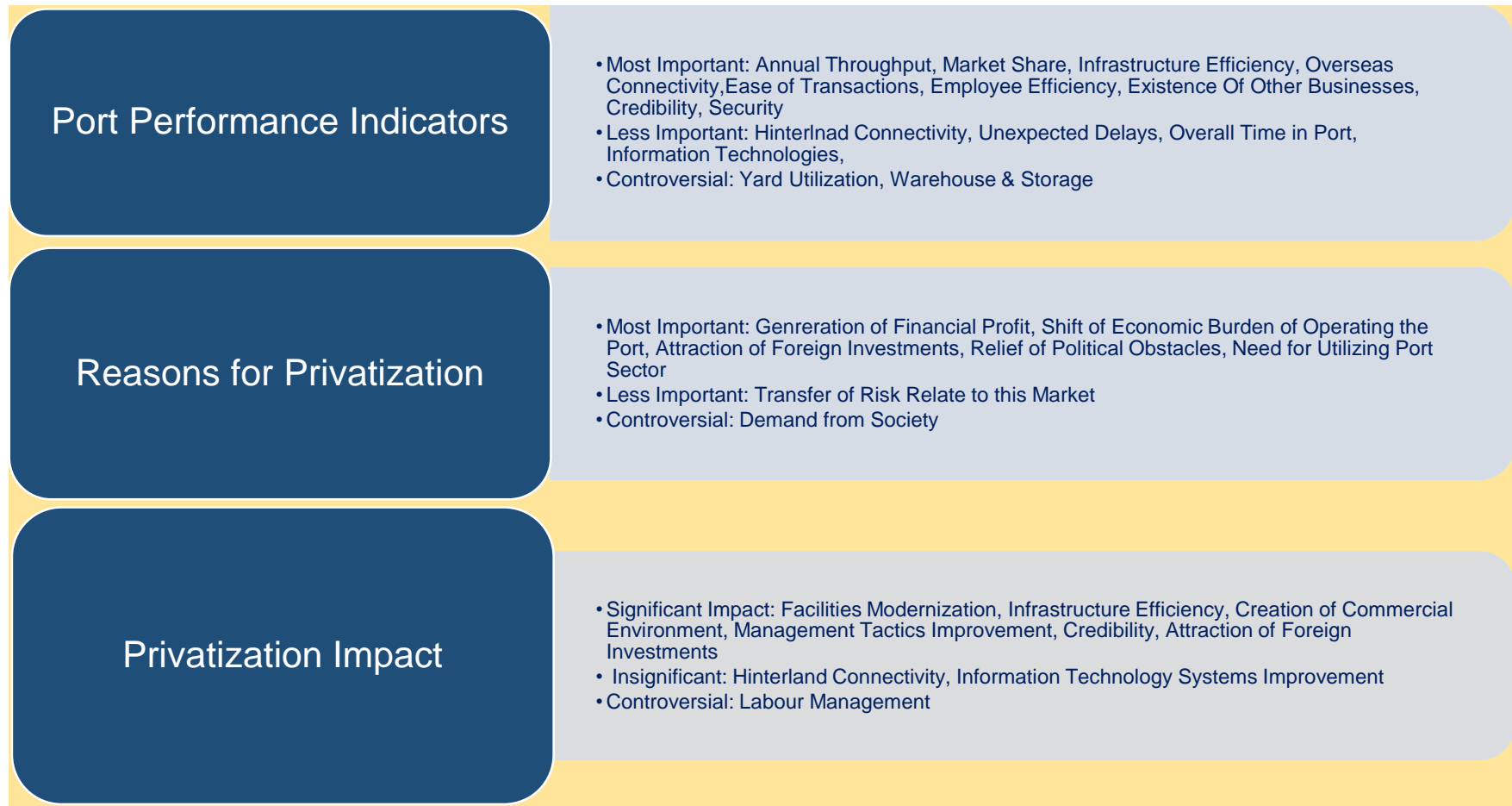
which although some systems have been introduced, the level of their usage is not as high as in other modern European ports.

Once again, different opinions are noted when it comes to *labour management*. There are some who believe that privatization resulted to many lay-offs, reducing considerably the number of employees in the port, while others support that this labour force cutback was much needed since it exceeded the (financial) capabilities of the port. Furthermore, the weakening of the union's power and the elimination of the strikes are correlated with the privatization of the port.

It has been added that the Chinese operator has put great pressure on the Greek government to simplify all the administrative processes and minimize bureaucracy. "One of the greatest advantages of Port of Rotterdam has been the ease of procedures and the minimum amount of paperwork", noted by an expert, who explained that customs processes and bureaucracy act as significant deterrents for the attraction of many shipping lines, which know that not only is it not efficient to come to Piraeus in respect of time, but they also have to pay "brokers, experts and public servants to get their work done".

*Interpretation:* Analyzing the opinions of the experts, it is apparent that privatization has brought a new era to the port, modifying a great deal of variables and this could not have been more evident in the steep increase of the traffic and market share of the port. And although the development of the facilities and the upturn of infrastructure efficiency are considered significant drivers behind this increase of throughput, more emphasis has been put on other indicators, since this has been 'taken for granted' by the experts. On the other hand, it is common belief that both the Greek economy and the port sector in the country are under the imminent need of foreign investments in order to revitalize. The environment, however, has been very hostile for multinational companies to establish their businesses in Greece, obstructed by the exhaustive administrative procedures and the high levels of bureaucracy. As discussed in the preceding chapters, these are variables that affect especially transshipment hubs, and the much needed troubleshooting in these areas have restored port's credibility in the international trade. The clauses of the Chinese behemoth for the concession of the port may have included the alteration of these complications for the optimization of the procedures for the terminal operator, but have also had a positive impact on the whole economy. And although "foreign investments, especially in goods considered public, have been viewed as taboo fields of conversation", this has been very welcome by the Greek community, since it has created job opportunities and has fought unemployment. Last, but certainly not least, it should not be omitted, that the incentives of the new private entity for profit and operational excellence, something that the public authorities in Greece lack of, has transformed the port financially, commercially and operationally, creating and applying all the necessary requirements for Piraeus to become one of the busiest and most modern ports in Europe. Summing up concisely the above qualitative analysis, there are some interesting facts that should be mentioned once more in the next bullets and figure;

- The port of Piraeus has experienced some radical changes since the initiation of privatization, and the majority of the performance indicators have been improved on a great level.
- As every port has its own idiosyncrasy, Piraeus is affected by other variables that have not been included in the performance indicators of literature review, such as *security of the port area* and *natural morphology of the port*.
- The economic recession of the country and the need for foreign investments have been the main drivers behind the decision of concession of the port with the Chinese behemoth 'COSCO'.
- The impact of privatization is generally characterized as positive, with the new management tactics and the restoration of the credibility of the port to its clients, through a series of actions by the private entity, to be the most noteworthy.
- The need to overcome the obstacles of bureaucracy and long administrative procedures has been noticed, if the port wants to enhance its competitive position.
- Hinterland Connectivity and Information Technology Systems are viewed as of fields that need further investments, should 'COSCO' want to use Piraeus' port not only for transshipment in the Mediterranean Sea, but also as a gateway to the Eastern Europe.
- Controversies do exist among the experts, especially on the issue of labour management.



**Figure 13: Summary of Qualitative Analysis**

Source: Author



#### **4.5 Recommendations for Future Development**

Each port consists of unique components and has its own characteristics, operates under different conditions and the variables that affect it are not easy to predict. However, based on the interviews with Piraeus' port experts combined with the works of (Dooms, et al., 2013) and (van der Lugt, et al., 2013), the next sub-chapter is trying to give a brief insight of the future of the port and recommend a few steps that will upgrade Piraeus.

It has been found earlier in this thesis that the much needed investments on infrastructure and facilities have increased the efficiency of the port, which resulted into the rapid growth in terms of throughput. It is also true that these investments are crucial for capturing a larger market share and achieving the financial objectives set by each port authority (Dooms, et al., 2013). However, should Piraeus try to expand and amplify its traffic, there are other fields that need to be considered:

- ✚ The landside of the port is in imminent need of investment. The hinterland connectivity of the port is nowhere near the European standards. Although Piraeus and Athens are equipped with a great network of roads, this is not the case for railway. Most experts still hope for the vertical integration of 'COSCO' in this field, because they see great potential in Eastern Europe. It is believed that alongside with the investment in the infrastructure and superstructure assets of the port, improving the rail connection to other countries will contribute substantially to the improvement of the competitive positioning of the port. This view is also shared by (Dooms, et al., 2013) who believe that multinational companies that want to develop port authorities should aim for state-of-the-art logistics service alongside the industrial expansion in the port area.
- ✚ In addition to the investment in the hinterland connectivity of the port, the creation of a 'freight village', with modern storage areas and warehouses, especially for vulnerable goods, and the increased security measures of this area should be a target for the operators. This would not only improve efficiency of the port but would also create a strong "brand name" for Piraeus and would attract more cargo.
- ✚ It is the fierce belief of the majority of the experts that the investment in the shipbuilding zone, the cruise and the Ro-Ro terminals will upgrade the whole port. When it comes to shipbuilding, Piraeus used to rely on this industry, especially since Greek shipowners own the largest fleet of the world, but once again poor management has turned it into an obscure business, and its future is still unknown. On the other hand, optimistic have been the experts for the development of the cruise and the Ro-Ro terminal, two areas that have been reportedly marked by 'COSCO' as of high potential and the Chinese company aims to invest on them (Naftemporiki, 2016).
- ✚ Although formalities and bureaucracy have been in the center of attention by the private operator, having achieved respectable progress, 'COSCO' still needs to put pressure on the Greek government for the elimination of administrative problems. Governments always need to take initiatives and

support port authorities, either public or private, in all ways, should they wish to enhance their competitive positioning (Dooms, et al., 2013). And in the case of Piraeus, this is even more important according to the experts, since a potential elimination of the aforementioned obstacles will have such a positive impact on the credibility status of the port, that both the global business network may expand and all performance indicators may experience an improvement.

- ✚ The private terminal operator's capabilities and the technical, operational and managerial know-how from previous engagement in other ports need to be transferred and transmitted (Dooms, et al., 2013) to the labour force of the Piraeus in an effort to modernize the way this port works.
- ✚ It is of utmost importance to include all stakeholders and factors that affect the port in the risk management plan, and constantly monitor their satisfaction (Dooms, et al., 2013). As noted by the interviewees, Greece is a country of "special idiosyncrasy", where labour unions and environmental groups have both the power and the ability to influence governmental decisions. Thus, making sure to 'enlarge the pie' and control all interested parties is of utmost importance for the uneventful cooperation between the Greek authorities and the private entity. The constant control is also essential to ensure the social benefit (van der Lugt, et al., 2013), which should be the ultimate goal of the government. After all and "the Greek state must somehow safeguard the provision of this 'public good'".
- ✚ Finally, although this will not take place in the near future, as the concession agreed is for 35-year exploitation of the port by the Chinese, most experts have indicated the need for a smooth transaction of the port back in the Greek port authorities, and that by this time the public authority's old tactics of limited incentives, request for considerable subsidiaries and ineffectual business plans (van der Lugt, et al., 2013) will have been replaced by the management strategy of the private terminal operator.

Summarizing the experts' opinions, they do believe that privatization has had a positive impact on the port so far, and most of them hope for further privatization in the future, in the pursuit of attracting even more foreign investments and boost the port's competitive position. Of course there are plenty of variables and factors that should be taken into careful consideration, but as quoted by one of the interviewees; "the combination of Greeks' deep knowledge of maritime affairs and Chinese excellence in organizational matters will transform Piraeus' port into a modern key transit hub, important for the global international trade".

## CHAPTER 5 CONCLUSION

This thesis was directed by the main research question of how the process of privatization has affected the performance of Piraeus' port, and consequently its competitive positioning in the Mediterranean Sea. The main driver has been the fact that privatization is indeed a dynamic procedure, accompanied by radical changes in the operational, commercial and managerial tactics of a port. And the current environment which is characterized by the prolonged international economic recession, the increased responsibilities of the terminal operators and the continuous technological advancements in the logistics industry, have boosted the need for cooperation between the public authorities and private terminal operators. In this context, the Greek government agreed on a thirty-five-year concession of the busiest port of the country with the Chinese behemoth 'COSCO'.

In an effort to investigate the change of ownership of Piraeus' port and its implications as thoroughly as possible, the main research question was divided into four sub-research questions that cover the examined issue from all perspectives. Accordingly, an extensive literature review, quantitative as well as qualitative analysis have been applied in order to delve into all parameters.

Firstly, it was of great significance to meticulously study the existing literature on the basis of three very important aspects; the most influential port performance indicators, the strongest reasons for a government to decide the concession of a port to a private terminal operator, and the fields of high impact by the private entity. Although the examination of a series of journals, books and reports revealed that each port has its own different characteristics and variables, it has also led to the creation of a list of the fifteen most important performance indicators, varying from technical features like infrastructure efficiency and yard utilization, to commercial aspects like the ease of transactions and the existence of port-related businesses and industries in the port area and many more. The review continued with the identification of the potential rationale of public authorities behind the leasing of a port to private companies. The results have shown that the implying factors behind privatization are mostly related to financial reasons, such as the generation of profit or the shift of the financial burden of operating a port to the private sector, especially for countries facing economic downturn. However, other reasons were included too, such as attracting foreign investments or satisfying needs of the society. The analysis ended with recording the spheres of influence of privatization on a port. It has been found that the liberalisation process is accompanied with profound modifications on facilities and infrastructure, the transfer of new management tactics from the engagement of the operator in other ports, and the creation of a stable, credible and commercial environment for industries. All the aforementioned theoretical background, served two purposes; the resolution of the first sub-research question about the expected influence of privatization on port performance and the basis for the formulation of the questionnaires that are assessed by Piraeus' port experts in the succeeding qualitative analysis.

Subsequently, through the Strategic Positioning Analysis, applied in the third chapter, it has been shown quantitatively the change in the competitive positioning of Piraeus' port in the Mediterranean Sea in terms of throughput, covering the second sub-

research question. This simplified, yet useful tool, transforms statistical data by port authorities about the annual traffic of containers into a management tool showing the performance of a port compared to its competitors. After the collection of the data from the port authorities of the seven most important ports in the Mediterranean Sea, the annual amounts of TEU handling from each port in the area of competition are translated into a growth rate-market share matrix, which is divided into four quadrants, and based on Boston Consulting Group's matrix, each port is characterized as a "Minor Performer", "High Potential", "Star Performer" or "Mature Leader" based on its performance. The analysis revealed a growth rate higher than 200% for Piraeus' port in the first three years of exploitation by 'COSCO', placing the port as of "High Potential", due to its former poor performance. However, between the years 2012-2015, the analysis confirmed the continuous growth of the port, which enhanced its competitive position and can now be described as 'Star Performer', capturing a market share higher than the average of the competing ports, and achieving the highest growth rate. The implications of the analysis' results are of utmost importance; not only do they show quantitatively the change of competition in the Mediterranean Sea, but they also verify the value behind this thesis, since they show that indeed privatization has greatly affected the performance of Piraeus' port.

Last, but definitely not least, the remaining part of the paper has focused exclusively on the port of Piraeus. A diverse group of port experts were interviewed based on the questionnaire that was formed according to the findings of the literature review. Therefore, interviewees had to weight the relative importance of each port performance indicator, reason for privatization, and field of impact – all focusing on the busiest Greek port. They also gave their general opinion on the alterations that resulted after the initiation of the concession of the port with 'COSCO' and on the potential fields of development for the future, in the effort of the port to become one of the top ports of Europe. This way the objectives of the last two sub-research questions were met, filling the gap in the evaluation of the findings in the chapter of literature review, regarding the port of Piraeus, and giving an insight about the future development of the port. The outcome of the interviews showed that many indicators are significant for the performance of Piraeus, but the port has not given the proper attention to all of them. Despite the fact that the port lies in a place of strategic importance that offers great overseas connectivity, and that its infrastructure efficiency has resulted to the increase of its annual throughput, there are other variables that have been neglected; the severe administrative procedures, the high levels of bureaucracy, the lack of credibility, the limited hinterland connectivity and the unions' power answered for the inefficiencies of the port and its former poor performance. It was also found that mostly economic reasons forced the Greek authorities to lease its busiest port to a terminal operator, along with the hope for relief of political obstacles. And according to the experts, the decision for privatization has been successful so far, having a positive impact on the ease of transactions and the elimination of bureaucracy, the modernization and security of the facilities and increase of the infrastructure efficiency. The new management tactics that were introduced by the private entity have not only created a stable commercial environment, attractive for businesses, but have also restored the reliability and the "brand name" of the port. However, it is also mentioned that the port still lacks in hinterland connectivity, information technology systems, and investments in port-

related industries, like shipbuilding, cruise and Ro-Ro terminal development, and experts hope that the private investor will put emphasis on these fields, for the further upgrade of the port. It should not be omitted though that the interviewees' opinions do not converge on labour management, where some criticize the reduction in the labor force and weakening of the union, while others support the necessity for the actions taken by the private operator. Finally, it has been pointed out that the Greek state has to safeguard the port as a 'public good', and although most of them believe that a further privatization during this thirty-five-year concession would benefit the port, this will be to no avail if there is no careful and smooth return of the management at the public authorities after the end of the agreement.

However, although this thesis came to useful and value-added results, there have been a few limitations that need to be kept in mind. First of all, both port performance and port privatization are complicated concepts, and their variables are ever-changing. The lists provided above by no means imply that these are the only indicators that should be used by port authorities, but they do cover a wide range of the matter. Furthermore, the Strategic Positioning Analysis, although useful to identify changes in the competition of ports, basically covers the alterations in terms of throughput. Of course there are many factors that need to be taken into account when examining the competition of ports in a selected area, but this analysis shows in a simple way their positioning in terms of market shares and growth rates. In addition, though it has been stressed before in the qualitative analysis of the paper, it should not be omitted that time and budget constraints led to a limited number of interviews. The opinions of the experts have been priceless for the results of the thesis, but it is advised that a larger sample would have even more important results. Therefore, taking into consideration the aforementioned, there are profound fields of further research, either quantitatively or qualitatively, for the continuous verification and expansion of the results.

Summarizing, the investigation of the effect of privatization on Piraeus' port has proven to be beneficial, since the changes after the initiation of the concession have been radical, bringing a new era to the busiest Greek port. It is advised though that since the privatization is a dynamic procedure that constantly affects a plethora of variables, the constant evaluation and monitoring of the situation in Piraeus' port is of utmost importance in order to ensure the growth and the enhancement of its competitive position, in the effort to become one of the most modern ports in Europe.

## Bibliography

- Aiyar, S. A., (2008). *The Benefits of Port Liberalization*. Washington: CATO Institute - Center for Global Liberty & Prosperity.
- Baird, A. & Valentine, V., (2007). 'Port Privatisation in the United Kingdom'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd., pp. 55-84.
- Bassett, K., (1993). 'British Port Privatization and its Impact on the Port of Bristol'. *Journal of Transport Geography*, vol.1 No.4, pp. 255-267.
- Bichou, K., (2007). 'Review of Port Performance Approaches and a Supply Chain Framework to Port Performance Benchmarking'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd, pp. 567-598.
- Bichou, K. & Gray, R., (2004). 'A Logistics and Supply Chain Management Approach to Port Performance Measurement'. *Maritime Policy & Management*, vol. 1 No. 1.
- Blumberg, B., Cooper, D. & Schindler, P., (2011). *Business Research Methods*. Third European Edition, Berkshire: McGraw-Hill Education.
- Bottema, U., (2016). 'A Strategic Framework'. *Maritime Logistics 2*. Handout. Erasmus University Rotterdam, Rotterdam, The Netherlands.
- Brooks, M. & Cullinane, K., (2007). 'Governance Models Defined'. *Devolution. Port Governance and Port Performance*. London: Elsevier Ltd, pp. 405-435.
- Chandra, R., (2003). *Information Technology in 21st Century*. Vol. 9, New Delhi: Kalpaz Publications.
- Cullinane, K., Song, D.-W., Ping, J. & Wang, T.-F., (2004). 'An Application of DEA Windows Analysis to Container Port Production Efficiency'. *Review of Network Economics*, vol. 3 No. 2, June.
- Cullinane, K., Ji, P. & Wang, T.-f., (2005). 'The Relationship Between Privatization and DEA Estimates of Efficiency in the Container Port Industry'. *Journal of Economics and Business*, vol. 57, pp. 433-462.
- Cullinane, K., Song, D.-W. & Gray, R., (2002). 'A stochastic frontier model of the efficiency of major container terminals in Asia: Assessing the Influence of Administrative and Ownership Structures'. *Transportation Research Part A: Policy and Practice*, vol.36 No. 8, October, pp. 743-762.
- De Knegt, T., (2016). 'Corporate Strategy 2016-2020', *Port Management 1*, Handout. Erasmus University Rotterdam, Rotterdam, The Netherlands.
- De Langen, P. & Sharypova, K., (2013). 'Intermodal Connectivity as a Port Performance Indicator'. *Research in Transportation Business & Management*, vol. 8, pp. 97-102.

De Langen, P., van der Horst, M. & Nijdam, M., (2007). 'New Indicators to Measure Port Performance'. *Journal of Maritime Research*, vol. 4, No.1, pp. 23-36.

Dewenter, K. & Malatesta, P., (2001). 'State-Owned and Privately Owned Firms: An Empirical Analysis of Profitability, Leverage, and Labor Intensity'. *The American Economic Review*, vol. 91, No. 1, pp. 320-334.

Dieter, B., (1991). *Privatization: A Theoretical Treatment*. Oxford: OUP Catalogue.

Dooms, M., van der Lugt, L. & de Langen, P., (2013). 'International strategies of Port Authorities: The case of the Port of Rotterdam Authority'. *Research in Transportation Business & Management*, vol. 8, pp. 148-157.

Drewry Shipping Consultants Ltd, (2013). *Drewry Container Forecaster Q1 & Q2 2013, (Container Forecaster)*, London: Drewry.

European Sea Ports Organization, (2012). *Port Performance Indicators Selection and Measurement*, Brussels: European Commission.

European Union Academic Programme, (2015). 'Chinese investment in Europe – the case of Piraeus Port'. [Online]

Available at:

<http://euap.hkbu.edu.hk/main/chinese-investment-in-europe-the-case-of-piraeus-port/>

[Accessed 08 August 2016].

Everett, S. & Robinson, R., (2007). 'Port Reform: The Australia Experience'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd, pp. 259-284.

Fernandez, J., De Cea, J. & Fernandez, J., (1999). 'Port Privatization in Developing Countries'. *International Journal of Transport Economics/ Rivista internazionale di economia dei trasporti*, vol. 26, No. 2, pp. 293-314.

Fotinos, F., (2013). 'COSCO's success story'. [Online]

Available at:

<http://www.enet.gr/?i=news.el.article&id=369279>

[Accessed 08 August 2016].

Friedlaender, A. & Spady, R., (1980). 'A Derived Demand Function for Freight Transportation'. *The Review of Economics and Statistics*, vol. 62, No. 3, pp. 432-441.

Gharehgozli, A., Roy, D. & de Koster, R., (2014). 'Sea Container Terminals: New Technologies, OR Models, and Emerging Research Areas'. *ERIM Report Series Research in Management*, vol 18, No. 2, pp. 103-140.

Ghosh, B. & De, P., (2000). 'Impact of Performance Indicators and Labour Endowment on Traffic: Empirical Evidence from ports'. *International Journal of Maritime Economics*, vol. 2, No. 4, pp. 259-281.

- Giugale, M., (2014). 'What Can Foreign Investment Really Do For Your Country?'. [Online]  
Available at:  
[http://www.huffingtonpost.com/marcelo-giugale/what-can-foreign-investme\\_b\\_5069624.html](http://www.huffingtonpost.com/marcelo-giugale/what-can-foreign-investme_b_5069624.html)  
[Accessed 04 August 2016].
- Haarmeyer, D. & Yorke, P., (1993). *Port Privatization: An International Perspective*, Los Angeles: Reason Foundation.
- Haezendonck, E., Verbeke, A. & Coeck, C., (2006). 'Strategic Positioning Analysis for Seaports'. *Research in Transport Economics*, vol. 16, pp. 141-169.
- Khalid, N., (2014). *Port Privatization in the Context of a Developing Nation: The Malaysian Experience*, Kuala Lumpur: Maritime Institute of Malaysia.
- Lovell, C., (1993). 'Production frontiers and productive efficiency'. *The measurement of productive efficiency: Techniques and applications*, pp. 3-67.
- Marlow, P. & Paixao Casaca, A., (2003). 'Measuring Lean Ports Performance'. *International Journal of Transport Management*, vol. 1, pp. 189-202.
- Martin, J. & Brian, T., (2001). 'The Container Terminal Community'. *Maritime Policy & Management*, vol. 28, No. 3, pp. 279-292.
- Mylonas, P., (2013). *Container Ports: An Engine of Growth*, Athens: National Bank of Greece.
- Naftemporiki, (2016). 'Investments of 293 million euros in Piraeus' Port by COSCO'. [Online]  
Available at:  
<http://www.naftemporiki.gr/finance/story/1136299/ependuseis-293-ekat-euro-ston-peiraia-apo-tin-cosco>  
[Accessed 15 August 2016].
- Neil Davidson, (2016). 'Container Ports, Liner Shipping and Drewry', *Distinguished Lecture Series*, Erasmus University Rotterdam, Rotterdam, The Netherlands.
- Newman, A. E., (2013). *Privatization of Port's*, MSc Thesis. Pretoria, South Africa: University of South Africa .
- Notteboom, T., (2007). 'Concession Agreements as Port Governance Tools'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd., pp. 437-455.
- Pettit, S. & Beresford, A. K. C., (2008). 'An Assessment of long-term United Kingdom Port Performance: A Regional Perspective', *Maritime Economics & Logistics*, vol. 10, No. 1, pp. 53-74.
- Privatization Barometer, (2014). *The Privatization Barometer 2013/2014*, Milan: Privatization Barometer.



- Psaraftis, H. & Pallis, A., (2012). 'Concession of the Piraeus Container Terminal: Turbulent Times and the Quest for Competitiveness'. *Maritime Policy & Management*, vol. 39, No.1, pp. 27-43.
- Song, D.-W. & Cullinane, K., (2007). 'Port Governance in Hong-Kong'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd, pp. 311-329.
- Su, Y., Liang, G.-S., Liu, C.-F. & Chou, T.-Y., (2003). 'A Study on Integrated Port Performance Comparison Based on the Concept of Balanced Scorecard'. *Journal of the Eastern Asia Society for Transport Studies*, vol. 5, pp. 609-624.
- Talley, W., (1994). 'Performance Indicators and Port Performance Evaluation'. *Logistics and Transportation Review*, vol. 30, No. 4, pp. 339-353.
- Talley, W., (2007). 'Port Performance: An Economics Perspective'. *Devolution, Port Governance and Port Competition*. London: Elsevier Ltd., pp. 499-516.
- Tongzon, J., (1994). 'Determinants of Port Performance and Efficiency'. *Transportation Research*, 14 June, vol. 29A, No. 3, pp. 245-252.
- Tongzon, J. & Heng, W., (2005). 'Port Privatization, Efficiency and Competitiveness: Some Empirical Evidence from Container Ports (Terminals)'. *Transportation Research Part A*, vol.39, pp. 405-424.
- Tsimplakis, A., (2016). 'COSCO Targets the 4<sup>th</sup> Place in Europe for OLP'. [Online] Available at: <http://www.naftemporiki.gr/finance/story/1070395/tin-tetarti-thesi-stin-europi-stoxeuei-i-cosco-gia-ton-olp> [Accessed 07 August 2016].
- Tsimplakis, A. & Hatzikonstantinou, M., (2016). 'Embroidment with COSCO for the Sale of OLP Creates the Ratification Law'. [Online] Available at: <http://www.naftemporiki.gr/finance/story/1122351/emploki-me-cosco-gia-tin-polisi-tou-olp-prokalei-o-kurotikos-nomos> [Accessed 07 August 2016].
- United Nations, (1997). 'Guidelines for Private Sector Participation in Ports', New York: United Nations.
- Valleri, M., Lamonarca, M. & Papa, P., (2007). 'Port Governance in Italy'. *Devolution, Port Governance and Port Performance*. London: Elsevier Ltd, pp. 139-153.
- Van der Horst, M. & de Langen, P., (2008). 'Coordination in Hinterland Transport Chains: A Major Challenge for the Seaport Community'. *Maritime Economics & Logistics*, vol. 10, pp. 108-129.
- Van der Lugt, L., Dooms, M. & Parola, F., (2013). 'Strategy making by hybrid organizations: The case of the port authority'. *Research in Transportation Business & Management*, vol. 8, pp. 103-113.

Van Schuylenburg, M., (2016). 'The Container Market: Trends and Developments', *Port Management 1*. Handout. Erasmus University Rotterdam: Rotterdam, The Netherlands.

Woo, S.-H., Pettit, S. & Beresford, A. K. C., (2011). 'Port evolution and performance in changing logistics environment'. *Maritime Economics & Logistics*, vol. 13, No. 3, pp. 250-277.

World Bank, (2007). *Port Reform Toolkit*, Washington: The International Bank for Reconstruction and Development / The World Bank.

Zhang, A., (2008). 'The Impact of Hinterland Access Conditions on Rivalry between Ports'. *OECD/ITF Joint Transport Research Centre Discussion Papers*, Discussion Paper 2008-8, Vancouver.

## APPENDIX



The purpose of this questionnaire is to get an insight from all the stakeholders involved in the privatization of Piraeus' port, regarding the effects of privatization on port performance, port competition in the Mediterranean Sea and the future of the most important port in Greece.

### Confidentiality

Please be assured that all answers and information collected by the following questionnaire will be treated with the utmost of confidentiality and under no circumstances will any of the data be revealed to third parties.

### Part I: Port Performance

Below you will find a list of port performance indicators. Please evaluate their relative importance. (Mark your preferred answer with an **X**.)

	Not important				Highly important
Annual throughput					
Market Share (in the geographical area of competition)					
Overall Time in Port					
Infrastructure Efficiency (crane efficiency, berth occupancy, etc.)					
Unexpected Delays (stevedoring problems, equipment breakdown)					
Hinterland Connectivity					
Overseas Connectivity					
Warehouse and Storage					
Yard Utilization					
Ease of Transactions (customs, logistics hub)					
Employee Efficiency/Adequate Training					
Existence of Other Businesses					
Information Technology Systems					
Reliability/Adaptability					
Return on Investment					
Other*					

*\*Please indicate which indicator and why :*

---



---



---



---

**Part II: Reasons for Privatization**

Below you will find a list of possible reasons behind the privatization of a port. Please indicate which ones have played a stronger role for the decision of the concession of Piraeus' port with the Chinese carrier Cosco. (Mark your preferred answer with an **X**.)

	Not important				Highly important
Shift of Economic Burden of Operating the Port					
Generation of Financial Profit					
Attraction of Foreign Investments					
Need for Utilizing/Expanding the Port Sector in Greece					
Transfer of Risk Related to this Market					
Demand from Society					
Other*					

*\*Please indicate which reason and why :*

---



---



---



---

**Part III: Privatization impact on Piraeus' Port**

Below you will find a list of possible areas that privatization may have an impact on. Please indicate the relative effect each one has on Piraeus' port. (*Mark your preferred answer with an X.*)

	Low impact				High impact
Facilities Modernization					
Infrastructure Efficiency					
Investment in Hinterland Connectivity					
Creation of Commercial Environment (port becomes an entrepreneurial cluster)					
Management Tactics Improvement					
Labor Reduction					
High Rates of IT Systems Usage					
Credibility/Adaptability					
Other*					

*\*Please indicate which area and why :*

---



---



---



---

**Part IV: Piraeus' port privatization results**

Shortly describe the impact of privatization on Piraeus' port, with a special focus on your sector of expertise.

---

---

---

---

---

---

---

---

---

---

**Part V: Future steps of Piraeus' port**

Shortly describe what should the next steps in governance policy of Piraeus' port, and how the port can enhance its competitive position.

---

---

---

---

---

---

---

---

---

---

**Thank you for your time!**