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Piraeus and Thessaloniki ports: performance and development

Abstract

The study first makes a comparison between two major Greek ports; Piraeus and Thessaloniki with regard to their functionality, performance, development and their national or international roles. Secondly, the study determines the factors that are the most influential on the performance and development of the two ports. The former constitutes the most important node in the route connecting the Far East with Europe via the Suez Canal which makes it significant both to the national economy and to the economies and trade of the Eastern Mediterranean region (Psaraftis, 2007). The latter serves a wider international contestable hinterland which consists of the FYROM, southern Bulgaria, southern Serbia and the Black Sea countries. Further, Thessaloniki is the only port in Greece which is directly connected with the national rail network, it is a node in the Pan-European Corridors IV and X (Vaggelas, 2012) and it is more closely integrated into the TEN-T than the port of Piraeus. Hence the research conducts a comparative study between the ports in terms of their performance and development paths.

**Keywords:** Port performance, port development, Piraeus, Thessaloniki

1. Introduction

In recent years, seaport-specific research has become a dominant theme in the area of maritime economics studies. It comprises various themes, such as port policy, port governance and reform, competition between ports, performance of ports, management and strategy, planning and

development of ports, spatial analysis, etc., while new themes constantly emerge over time, reflecting the evolution of the port industry such as the changing role of seaports in supply chains and logistics. A schematic representation of the areas of study is illustrated in Figure 1 below:

Figure 1: Port-related research themes
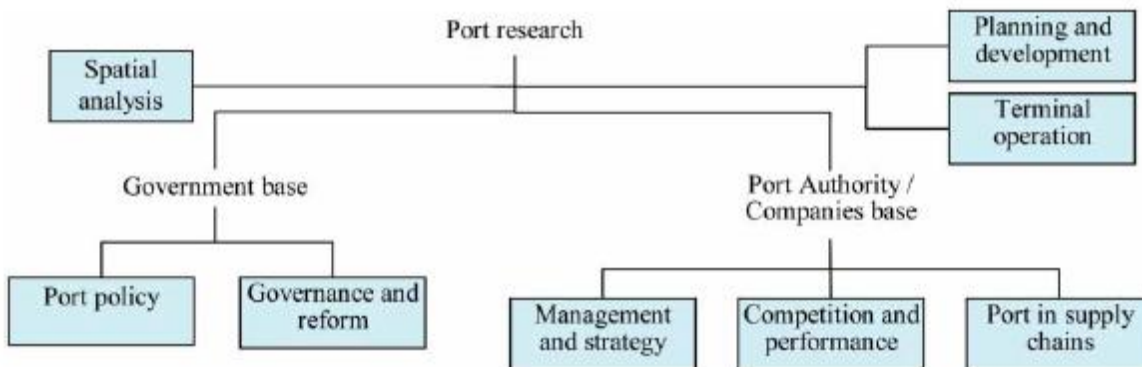
Source: Woo *et al.* (2012)

Relevant research on seaports (Woo, *et al.,* 2012) indicates that in the 1980s 'planning and development', 'management and strategy' and 'spatial analysis' studies were very popular, representing 32%, 19% and 18% respectively of the total research focus compared to 15% of 'competition and performance' issues. In the 1990s, 'governance and reform' studies were more prominent compared to the 1980s and the 2000s, representing a 20% of the total research focus while 'competition and performance' issues represented only 11% of the total research focus. But, in the 2000s, 'competition and performance' issues reached 24% of the total research focus, achieving the highest proportion of all the research themes.

In the 1980s the research themes were essentially development-focused, in the 1990s they were policy-focused, whilst in the 2000s they have been management-focused (Woo *et al,* 2012). Given the fact that the changes that take place in industry have a significant impact on research, the post-2000s trend may be attributed to the new port environment that has emerged, with the

physical transport modes becoming all the more closely integrated, the existence of fierce inter-port competition and the increasing private sector involvement in port operations due to port privatisation. Thus, in the 2000s, researchers focused on port management, which includes port performance, in terms of efficiency and effectiveness, as well as port competitiveness *inter alia*.

Regarding port performance, early studies on this topic primarily were discussing how to measure port performance (Talley, 1994). Later, existing measures were re-evaluated and new approaches accompanied with the introduction of new measures took place in the 2000s (Marlow and Paixao-Casaca, 2003; Bichou and Gray, 2004). What should be noted is that port performance surveys evolved in the 2000s in two ways. The first was to conduct comparison studies in terms of technical efficiency with the use of analytical methods (Barros, 2003; Wang and Cullinane, 2006) while the second way was to evaluate the competitiveness of a port (Pantouvakis, Chlomoudis and Dimas, 2008; Wang and Cullinane, 2008).

The difference in the respective roles of Piraeus and Thessaloniki ports has been widely acknowledged but rarely studied in specific terms. This paper aims to highlight the contrasting roles of the two ports by isolating their primary functions as expressed by tonnage handled and comparing these data with professional opinion derived from senior management, port users and public sector representatives.

In light of the above, the following research was carried out:

1. An exploration of the different characteristics of the ports of Piraeus and Thessaloniki as perceived by Port Authority of Piraeus (PPA) and the Port Authority of Thessaloniki (ThPA), port operators, and senior managerial personnel of the Ministry of Mercantile Marine and the Aegean (MMMA).

2. An identification and evaluation of which factors, extracted by means of interviews during an exploratory survey, a literature review of the ports and WORKPORT model, are the most influential to the performance and development of the ports.

3. A comparison of the relative significance of each decisive factor with regard to each port.

4. An examination of whether any determinant factors differ significantly in terms of their relative significance between the two ports.

Data were collected by means of a postal questionnaire (twenty responses) and 28 subsequent interviews with managerial personnel of the MMMA, executives of shipping companies, the PPA and ThPA.

2. Top tier ports of Greece: Competition and performance issues

Pallis (2007) argued that, with reference to the operations and geographical location, there are 12 top-tier ports in Greece: Piraeus due its strategic location and proximity to Athens, Patras, Igoumenitsa and Corfu as the main gateways to the EU via the Adriatic, Thessaloniki, Kavala, and Alexandroupoli as gateways to the Balkan countries, Volos as a potential alternative to Thessaloniki, Rafina, and Lavrio as passenger ports to the Aegean islands, Elefsina as a cargo port complementary to Piraeus, and Iraklion as the largest port of the island of Crete. The port of Piraeus holds a strategic position as a gateway port connecting the Far East with Europe and the port of Thessaloniki is a node in the Pan-European Corridors IV and X (Vaggelas, 2012; Pallis, 2008; Pardali and Michalopoulos, 2008; Psaraftis, 2007). The main activities of the ports are listed in Table 1.

With specific reference to Piraeus and Thessaloniki, in terms of **general cargo** a shrinkage in the flows of general cargo throughput in 2008-2009 was observed (Table 2). This is attributed primarily to the port labour issues that the two ports experienced and secondarily to the economic crisis (Vaggelas, 2012; Psaraftis and Pallis, 2012). Nevertheless, it is clear that the port of Piraeus is dominant over the port of Thessaloniki. With regard to **liquid bulk cargo** (Table 2), there is an observed absence of the port of Piraeus in the sector, post 2008. On the
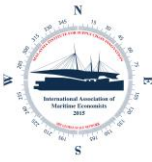
other hand, it is assumed that the port of Thessaloniki handles primarily liquid bulk cargo, having a competitive advantage against Piraeus port in the sector.

Table 1: Port Facilities of the 12 top tier ports in Greece

	Liquid Bulk Cargo	Dry Bulk Cargo	General Cargo	Containers	Ro-Ro	Cruise
Piraeus	*	*	*	*	*	*
Elefsina	*	*	*			
Thessaloniki	*	*	*	*	*	
Volos		*	*	*	*	
Patras	*	*	*	*	*	
Iraklion	*	*	*	*	*	*
Igoumenitsa		*	*		*	
Kavala	*	*	*		*	
Lavrio	*	*	*			
Corfu	*	*	*		*	
Alexandroupoli		*	*		*	
Rafina	*	*	*		*	

Source: Lloyd's (2014)

Table 2. Cargo by Type (tonnes) Piraeus and Thessaloniki Ports

	General cargo		Liquid bulk	
Year	Piraeus	Thessaloniki	Piraeus	Thessaloniki
2007	19,515,462	5,721,561	23,693	8,540,913
2008	10,046,246	3,597,054	10,309	8,137,043
2009	11,286,451	3,529,717	0	8,006,344
2010	11,128,013	3,792,882	0	8,289,724
2011	12,175,733	4,020,035	0	6,095,321

Source: PPA & ThPA Annual reports

In terms of **dry bulk traffic** (Table 3), the port of Thessaloniki is considerably more important than the port of Piraeus. The recession, which began in 2008-9, caused port labour protests which led to the temporary closure of the ports, and the loss of significant cargo throughput
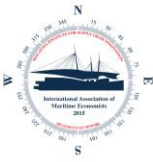
affecting both of the ports very significantly. With reference to **Ro-Ro traffic (**Table 3), the port of Thessaloniki lags behind the port of Piraeus. Again, labour unrest in 2008/2009 and afterwards, negatively affected the throughput in both ports and particularly the port of Piraeus. Nevertheless, that the latter is regaining its lost market share.

Table 3. Cargo by Type (tonnes) Piraeus and Thessaloniki Ports

	Dry bulk		Ro-Ro	
Year	**Piraeus**	**Thessaloniki**	**Piraeus**	**Thessaloniki**
2007	582,761	4,565,177	1,108,928	114,070
2008	420,878	4,307,745	1,055,258	111,060
2009	653,534	3,427,153	598,066	77,760
2010	587,192	4,044,618	682,667	80,220
2011	408,003	3,592,957	625,700	61,804

Source: PPA & ThPA Annual reports

Finally, concerning **containerised cargo** (Table 4), the port of Thessaloniki again lags behind the port of Piraeus. The port of Piraeus was affected by the economic downturn to a greater extent than the port of Thessaloniki. In particular, Psaraftis and Pallis (2012) claim that the downturn that the port of Piraeus experienced is due to the diversion of a large share of its transhipment traffic to competing transhipment hubs in the East Mediterranean, the principal reason being important labour unrest at the port of Piraeus. Piraeus port to a large extent then retrieved its lost market share, but it has benefited even more due to the privatisation process, notably the concession of Pier II of the its container terminal. The latter affected positively the competitive position of the port *vis-a-vis* its rivals (Psaraftis and Pallis, 2012). Container traffic almost quadrupled at Piraeus during the period 2008 to 2011 with an increase of 94% in 2010 to 2011 and a 287% increase from 2008 to 2011, whilst in the case of the port of Thessaloniki the increase was only 8% and 24% during 2008 to 2009 and 2010 to 2011 respectively. This can be attributed to the presence of private sector in the port of Piraeus, encouraging emerging intra-port

competition. Unlike at Piraeus, in the port of Thessaloniki, intra-port competition is totally absent; this implies monopolistic features leading to an absence of innovation, over-specialization and inflexibility (World Bank, 2006).

Table 4. Containers (TEUs) Piraeus and Thessaloniki Ports

Year	Piraeus	Thessaloniki
2007	1,373,138	447,211
2008	433,582	238,940
2009	664,895	270,181
2010	863,808	273,282
2011	1,680,133	295,870

Source: PPA & ThPA Annual reports

In the light of the lack of serious domestic competition at the port of Thessaloniki it is suggested that this is the main reason for it lagging behind the port of Piraeus in the majority of sectors. Barros and Athanassiou (2004) highlight that Thessaloniki is inefficient compared to other Mediterranean ports including Piraeus, suggesting that this is due to the absence of private sector involvement and the lack of economies of scale. This leads to the conclusion that the port of Piraeus also competes with foreign ports, primarily in the area of container transhipment. Piraeus' major competitor is Gioia Tauro in Italy and secondary competition comes from other ports in the Mediterranean Sea such as Malta, Damietta, Port Said and Limassol (Psaraftis, 2007; Pallis, 2007; Pardali and Michalopoulos, 2008; Psaraftis and Pallis, 2012)

The only sector in which the port of Thessaloniki dominates is in **liquid bulk**. Thessaloniki competes with Agioi Theodoroi, Elefsina and Megara, whilst regarding the dry bulk sector, it competes with Volos and Larymna. In the non-containerised general cargo sector, it competes with Kavala and Elefsina. Hence, Vaggelas (2012) asserts that the port of Thessaloniki encounters its main competition from neighbouring ports in the Balkans such as Durres in Albania, Bar in Montenegro and Burgas in Bulgaria serving the same hinterland.
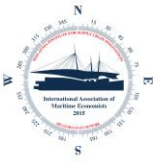
The first conclusion, shown in Table 5, is that Piraeus port handles mostly transhipment cargo and that transhipment trade in 2011 almost tripled compared to that of 2007. It is suggested that this is due to the undertaking by the Piraeus Container Terminal (PCT) S.A. of the exclusive operation of Pier II of the container terminal of Piraeus under concession a contract with PPA SA since 01/06/2010. Given the low percentage of the imports/exports destined for the port's hinterland, the absence of transit trade and the large percentage of transhipment cargo flows, the real role of the port of Piraeus can only be revealed when the direction (origin as well as destination) of these transhipment flows is elucidated.

Table 5. Piraeus port container traffic (TEUs)

Years	Imports/Exports	Transhipment	Empties
	Containers (TEUs)		
2007	544,110	460,152	368,876
2008	256,182	29,928	147,472
2009	377,946	83,491	203,458
2010	229,457	523,448	110,903
2011	223,797	1,165,425	290,911

Source: PPA Annual reports (See PPA, 2013)

According to Psaraftis and Pallis (2012), Piraeus' transhipment trade is approximately 98% of transhipment containers handled through Greek ports, while transit traffic is estimated to account for only 1% of Piraeus' total gateway traffic, which represents about 10% of the transit traffic handled through Greek ports. The remaining 90% of transit traffic is handled by the port of Thessaloniki (ibid, 2012). This implies that the prevalent role for the Piraeus is a national one; hence, this research does not confirm or refute their findings.

In the case of the port of Thessaloniki, what is evident from Table 6 is that, given the large percentage of imports/exports destined for/derived from its hinterland, the small percentage of transit traffic to foreign countries by road/rail and the absence of transhipment trade, it also mainly serves a national purpose. The port's role will be clarified later in this paper.

Table 6. Thessaloniki port container traffic (TEUs)

	Containers (TEUs)		
Years	Imports/Exports	Transit	Transhipment
2000	127,927	44,740	3,116
2001	131,789	40,421	4,668
2002	140,566	40,500	1,715
2003	154,792	46,622	6,183
2004	175,044	50,954	24,643
2005	193,742	56,230	23,534
2006	193,772	57,101	8,232
2007	229,561	79,933	4,336
2008	151,349	34,505	44
2009	171,809	23,858	674
2010	183,383	25,869	302
2011	188,610	31,681	134

Source: ThPA Annual reports (see ThPA, 2013)

3. Factors influencing performance and development in Piraeus and Thessaloniki

Interpreting responses to the questionnaire, interviews and the WORKPORT model (Beresford *et al.,* 2004), enabled the authors to suggest relationships between a total of 12 factors influencing port performance and port development. Of these 12 factors, 3 were common to all three approaches: Port's role in supply chains, port ownership and hinterland connections. The use of interview responses and a Likert scale were used to identify which of the twelve factors are the most influential factors to the performance and development of the ports of Piraeus and Thessaloniki. The rank order of factors was estimated in two ways; first, based on the numeric values attributed by the respondents, as illustrated in Table 7; second, based on the mean measure of their significance, as indicated in Table 8. The median measure for each factor was 3.00. In each one of the ports, the median measure was exceeded in 8 factors.

Table 7: Determinant factors influencing performance and development based on the numeric values attributed by respondents

Factors	PIRAEUS PORT							THESSALONIKI PORT								
	N.V.*	R**	N.V.	R	N.V.	R	SUM	N.V.	R	N.V.	R	N.V.	R	N.V.	R	SUM
Location	5	28					**140**	3	9	2	11	1	8			**57**
Strategic Alliances	5	26	4	2			**138**	4	28							**112**
Port's role in supply chains	5	19	4	7	3	2	**129**	5	17	4	11					**129**
Ownership	5	20	4	6	3	2	**126**	5	15	4	10	3	3			**124**
Competitive pricing policy	5	16	4	8	3	4	**124**	5	12	4	12	3	4			**120**
Quality of port services	5	5	4	20	3	3	**114**	5	1	4	20	3	5	2	2	**104**
Hinterland connections	4	25	2	2	1	1	**105**	5	20	4	7	3	1			**131**
Infrastructure and Cargo-handling equipment	4	20	3	6	2	2	**102**	5	5	4	20	3	3			**114**
Cargo support systems	4	4	3	20	2	4	**84**	4	1	3	20	2	7			**78**
Environment & safety issues	3	8	2	18	1	2	**62**	4	1	3	18	2	3	1	6	**70**
Working culture	3	11	2	9	1	8	**59**	4	18	3	8	2	2			**100**
Cooperation/ coordination with port users	3	3	2	10	1	15	**44**	3	5	2	9	1	14			**47**

Source: Authors

*N.V.: numeric value attributed by the respondent; ****R:** number of respondents; **Scale:** 1: less important, 5: extremely important
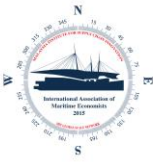
In the case of Piraeus port, 'location' (including geographical location and marine approach) was ranked first, 'strategic alliances' were ranked second, 'port's role in supply chains' was ranked third, 'ownership' was ranked fourth, while 'competitive pricing policy' was ranked fifth. With regard to the port of Thessaloniki, 'hinterland connections' were ranked first, 'port's role in supply chains' was ranked second, 'ownership' was ranked third, 'competitive pricing policy' was ranked fourth, whilst 'infrastructure and cargo-handling equipment' was ranked fifth.

Table 8: Determinant factors influencing performance and development

Factor	Piraeus Port			Thessaloniki Port		
	Rank	Mean	S.D.	Rank	Mean	S.D.
Location	1	5.00	0.00	11	2.04	0.78
Strategic Alliances	2	4.93	0.26	6	4.00	0.00
Port's role in supply chains	3	4.61	0.62	2	4.61	0.49
Ownership	4	4.64	0.61	3	4.43	0.68
Competitive pricing policy	5	4.43	0.73	4	4.29	0.70
Quality of port services	6	4.07	0.53	7	3.71	0.65
Hinterland connections	7	3.75	0.74	1	4.68	0.54
Infrastructure & Cargo-handling EQ	8	3.64	0.61	5	4.07	0.53
Cargo support systems & information provision	9	3.00	0.53	9	2.79	0.49
Environment & safety issues	10	2.21	0.56	10	2.50	0.87
Working culture	11	2.11	0.82	8	3.57	0.62
Cooperation/ coordination with port users	12	1.57	0.68	12	1.68	0.76

(ranked in order of importance based on the mean measure of their significance)
Source: Author
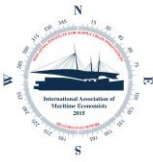
An absolute coefficient value of more than 0.6 can be interpreted as a very strong correlation, 0.5 could be considered a strong one, 0.4 could be regarded as a weak correlation and less than 0.2 indicates no correlation or a correlation that can be ignored. Correlation between the order of factors' importance in the ports of Piraeus and Thessaloniki was found to be strong. The non parametric correlation coefficient between the two ports according to the ranked order of each factor was +0.52. The 95% significance level is 0.83, which means that at the 95% level the correlation is not significant; but at the 90% level it is significant.

Most of the factors except location indicate a correlation between the two ports. The three factors 'Port's role in supply chains', 'Ownership' and 'Competitive pricing policy' were found to be very important. Four factors including 'Hinterland connections', 'Infrastructure and cargo-handling equipment', 'quality of port services' and 'strategic alliances' were found to be important. Three factors: 'working culture', 'environment and safety issues' and 'cargo support systems and information provision' were found to be less important. Finally, 'cooperation/coordination with port users' was found to be neutral while 'Location' was found to be an unpredictable decisive factor (sometimes very important whilst other times neutral or less important).

Given the fact that the port of Thessaloniki operates as a national facility and as a gateway for the Balkans, and taking into account the existing literature where location is considered to be a key element, this was an unexpected outcome. In the authors' opinion this can be attributed to the fact that the factor 'location' comprises both the land-oriented geographical location and the marine approach. Piraeus port has an advantageous geographical location and an excellent marine approach. Thessaloniki also has an advantageous geographical location but a non-advantageous marine approach since it is too far away from the main seaway. Furthermore, some of the interviewees replied that the relative importance of each parameter depends on the port and the current situation, while theory may sometimes be different from practice. They also claimed that results may change when macro-economic factors are compared to micro-economic ones. Others stated that the choice of the decisive factors depends on the cargo, actor and type of service.

Finally, in order to establish the statistical significance of the results, SPSS was employed and a t-test was applied. The examined variables were 'LOC': location, 'STA': Strategic Alliances, 'PRSC': Port's role in supply chains, 'OWN': Ownership, 'CPP': Competitive pricing policy, 'HC': Hinterland connections and 'ICHE': Infrastructure and cargo-handling equipment and the results are illustrated in Table 9. Although the relationships are not statistically strong or significant, the closest link is between location and strategic alliances where the relationship is significant at the 90% level and almost significant at the 95% level, implying a relatively strong relationship between the presence of alliances and Piraeus port's location with the measure of productivity being key.

Table 9: Statistical significance between the determinants factors

| <Piraeus Port>			
1. LOC-STA	One-tailed test	p = 0.8	Not statistically significant
2. PRSC-OWN	One-tailed test	p = 0.42	Not statistically significant
3. OWN-CPP	One-tailed test	p = 0.12	Not statistically significant
<Thessaloniki Port>			
1. HC-PRSC	One-tailed test	p = 0.30	Not statistically significant
2. OWN-CPP	One-tailed test	p = 0.22	Not statistically significant
3. ICHE-STA	One-tailed test	p = 0.24	Not statistically significant

Source: Authors

4. Findings and Synopsis

Seaports play a dominant and central role in a country's economic growth by providing an economic multiplier for the region involved. Hence, in order for a country's economic progress at an accelerated pace to be achieved, the establishment of efficient ports and up-to-date port facilities is necessitated (Paul, 1987; Alderton, 2006). Among the key elements that a port must have in order to become attractive for the big shipping lines are its geographical location, marine approach, infrastructure and equipment, hinterland connections, ownership, integration into the
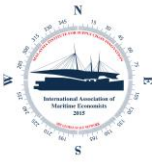
supply chains, quality and costs of port and value-added services, good reputation for environmental and safety issues, working culture, good organizational structure as well as technical and management know-how (Beresford et al, 2004).

Greece constitutes a country traditionally engaged in shipping. It has approximately 1250 peripheral ports, including marinas and fishing harbours and 45 large ports. Among them, Piraeus and Thessaloniki are of particular interest in the sense that they are regarded as 'large trans-European' ports. The former, located at the crossroads of three continents, constitutes the most important node in the route connecting the Far East with Europe via the Suez Canal which makes it significant both to the national economy and to the economies and the trades of the Eastern Mediterranean regions (Psaraftis, 2007). The latter serves the domestic market, and a wider and internationally contestable hinterland which consists of the FYROM, southern Bulgaria, southern Serbia and the Black Sea countries. What is worth mentioning is that it is the only port in Greece which is directly connected with the national rail network whilst it is also a node in the Pan-European Corridors IV and X (Vaggelas, 2012). Furthermore both ports are seen as part of the EU policy, being engaged in TEN-T projects. Greek ports have traditionally been regarded as national assets; hence, in order for deficiencies of the earlier port structures to be overcome, to facilitate adjustment to a complex economic context, and further enhance port competitiveness, Greece embarked on a port governance reform programme in Piraeus and to a lesser one in Thessaloniki. This reform has significantly affected their performance, competitiveness and pattern of future development.

Both primary data (interviews, questionnaire) and secondary data (online journals, books, reports, published literature), enabled the authors to undertake a comparative study between Piraeus and Thessaloniki ports with regard to their functionality, performance and development. In particular the study focused on the ports' roles, whether national or international, and on the factors that are the most influential on their performance and development. Robinson (2002) asserts that within the competitive environment to which they belong, ports do not only compete with regard to their location and the effectiveness of their operations, but also due to the fact that
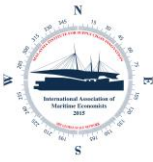
they are included in the supply chains of shippers (Robinson, 2002). According to the findings, the location of the port of Thessaloniki is not regarded as a privileged one due to Thessaloniki's unfavourable marine approach, located too far away from the main seaway between northern Europe and the Far East. The port is also not as effective as Piraeus port and is certainly not yet integrated in supply chains. This means that Piraeus' dominant position is unchallenged domestically.

This argument is further enhanced by the greater presence of the private sector during recent years in Piraeus, which has led to the emergence of intra-port competition and a rapid increase in traffic flows. On the other hand, Thessaloniki port still possesses monopolistic features which, according to the World Bank (2006), further lead to the absence of competition, innovation, specialization and flexibility. Consequently, the policy implications for Thessaloniki's port development should be to primarily encourage privatisation and secondarily discouraged government control. This implies that the Greek government policy has had a rather interventionist approach, influencing to a great extent the port authorities as well as port operators in formulating strategies to improve their competitiveness vis-a-vis rivals. In light of this it seems that privatisation and competition is the best route to follow for performance enhancement.

What was further inferred was the impact of globalization and containerisation. In the analysis of secondary data, over the years a reducing number of vessels entering the ports of Piraeus and Thessaloniki was observed, in contrast to increases in the volumes of containerised cargo and total seaborne traffic. This implies average vessel size through the two ports has been increasing. Moreover, increasing use of IT as well as increasing private sector involvement were derived from the interviews as well as from the questionnaires. These patterns are in line with the first, second and fourth threads of the WORKPORT model (Beresford *et al.* 2004).

Furthermore, the findings indicated that in general, Piraeus and Thessaloniki ports' inbound and outbound flows of cargo have different origins and different destinations. In other words Piraeus

and Thessaloniki ports have different captive and contestable hinterlands. It also seems that the ports have different commercial features and they serve different customers and destinations, although they have the same basic organizational structure and a similar tariff policy. In light of this the conclusion can be drawn that Piraeus and Thessaloniki ports do not, on the whole, compete. Hence, when the rail connection project oriented to expand Piraeus' hinterland to northern Greece and the Balkan states is completed, the real challenge, in the sense of competition, will emerge, since Piraeus and Thessaloniki ports will contest the same hinterland.

With regard to the factors that are the most influential to the performance and development of the two ports the findings indicated that 'port's role in supply chains', 'ownership' and 'competitive pricing policy' were found to be very important for both ports. The most influential factor for the port of Piraeus was found to be 'location', whilst 'hinterland connections' was most influential for the port of Thessaloniki.

Finally, given the fact that the hinterland of the port of Thessaloniki is primarily the Balkans and central Europe, and secondarily northern Greece, Thessaloniki appears to have a more international role. In the case of Piraeus, it is suggested that its hinterland is primarily central and northern Greece and secondarily the south eastern Mediterranean; this implies Piraeus fulfils a rather more national role mainly with regard to the imports/exports, since Piraeus port handles mostly transhipment cargo. Consequently, the real role of Piraeus is not elucidated. Psaraftis and Pallis (2012), suggest that Piraeus' transhipment trade is approximately 98% of transhipment containers handled through Greek ports, while transit traffic is estimated to account for 1% of Piraeus' total gateway which represents about 10% of the transit traffic handled through Greek ports. This implies that the prevalent role for Piraeus is the national one; hence, this research does not confirm or refute their findings.

5. Conclusion
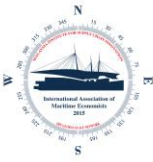
In conclusion, the key aspects identified from the research for each port are:

The port of Piraeus has many strengths, particularly as it operates in a more international context than Thessaloniki. These include the fact that it has an advantageous geographical position at the crossroads of Asia-Africa-Europe sea routes and can enhance this position with a large number of feeder services to/from most of the main ports in the Mediterranean. Piraeus has been able to develop adequate infrastructure facilities due to the granting of EU funds and private sector involvement. The port is able to accept vessels with a draught up to 18 metres and can thus service the largest container ships and car carriers on a 24-hour, 365 days per annum basis. Other strengths include a certain level of inter-port competition domestically, intra-port competition, competitive tariffs and the ability to provide quality logistics services. Weaknesses, which were highlighted during the research, include: poor hinterland connections and the continued role of the government in both control and tariff policy. This results in bureaucratic procedures and a complex institutional framework which hinders the implementation of EU legislation.

There are substantial opportunities for Piraeus including the exploitation of its strategic location for future development of transhipment trade to south eastern Europe as well as the Balkan countries. The development of TEN-T projects, including the motorway axis linking Piraeus to the heart of EU and the railway axis linking Piraeus to central Europe, will be important as is the rail connection project expanding Piraeus' hinterland to Northern Greece, south eastern Europe and the Balkan states. Threats include strong competition from other ports in the Mediterranean Sea, the impact of the global economic downturn and the continuing Greek financial crisis and an over-reliance on a single shipping line, MSC.

For Thessaloniki, its strengths, are its advantageous geographical position due to its proximity to south eastern Europe, the Balkans and the Black Sea countries. While its does not have the depth of water that Piraeus has, it is still capable of taking vessels with draughts up to 12 metres and the port has been able to specialise in the handling of both dry and liquid bulk cargoes. It has
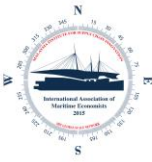
also been able to develop infrastructure facilities due to the granting of EU funds, and is able to operate the container terminal on a 24-hour, 365 days per annum basis. Weaknesses include the control of all port functions by the government and the setting of tariffs also by the government. This has led to bureaucratic procedures, a complex institutional framework which has hindered the implementation of EU legislation, and full dependence on public funds for infrastructural developments. The lack of provision of logistics services and the absence of an inland customs depot (ICD) also hinders the development of multimodal transport opportunities.

However, opportunities do exist for Thessaloniki's development as it is a gateway to south eastern Europe, to the Balkans and to the Black Sea countries. The port benefits from TEN-T projects including a motorway axis linking Thessaloniki to the heart of the EU and a railway axis linking Thessaloniki to central Europe; these will help it to exploit the growing economies of the Balkan and south eastern European countries. It is, however, likely to face fierce competition from other ports in the Balkans as well as the Black Sea countries and the global economic downturn and the continuing Greek financial crisis will remain threats in the near future.

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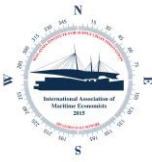
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