PERFORMANCE INDICATORS IN THE FREIGHT TRANSPORTATION SECTOR- THE CASE OF THE GREEK MARKET

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ABSTRACT

The concept of supply chain management embraces the activities of transportation and logistics that are generally provided by carriers (ocean, air, railway carriers, truckers), freight forwarding companies, and/or third party logistics providers that intermediate in the movement of goods from shipper to consignee. There are some critical milestones throughout the transportation process that have to be successfully managed, so that the intermediaries provide leveraged performance to the services users. The aim of this study is to identify the critical transportation performance measures and indicators, and to rate their significance in the Greek market through a survey, according to the members of the Association of International Freight Forwarders and Logistics Enterprises of Greece (IFFAG&L), an association member of FIATA (International Federation of Freight Forwarders Associations).

Keywords: Freight Forwarder, Third Party Logistics Provider, Performance Measurement, Performance Indicators, Transportation, Logistics

INTRODUCTION

The concept of supply chain management embraces the activities of transportation and logistics that are generally provided by carriers (ocean, air, railway carriers, truckers) that possess the transportation means, and/or transport intermediaries that intermediate in the movement of goods from shipper to consignee.

The study presented in this paper examines the key performance indicators that are taken into consideration in order to cooperate with a transport provider, as perceived by the Greek Transport Providers that are registered in the Association of International Freight Forwarders

and Logistics Enterprises of Greece (IFFAG&L), an association member of FIATA (International Federation of Freight Forwarders Associations), through a survey.

Greece is expecting to leverage its role in the Transportation Industry. The European Union Transport Policy in the Balkan Peninsula includes Greece among other countries as a neuralgic part of the Pan-European Transport Axes (Papadaskalopoulos et al., 2005). Additionally, interest for Greece has been shown by COSCO Pacific Limited through the agreement with Piraeus Port Authority SA for the concession of Piers 2 and 3 for a period of 35 years (COSCO, 2010), as well as by Qatari investors, so that Qatari liquefied natural gas will be exported to Greece along with the establishment of LNG terminals (Gulf Times, 2010). Besides the strategic position of Greece in the Balkan Peninsula, the country faces a severe economic crisis, as a consequence of the global financial recession, with a significant percentage of firms terminating their operation. Therefore, it would be interesting to investigate the perception of entrepreneurs, such as Transport Providers, regarding their conception of the most significant performance indicators.

The study begins with an extensive literature review on performance indicators. In the next section, the research methodology is presented, as well as, the data analysis that resulted from the statistical processing of the questionnaires. Further to the factors identification, the results are discussed and conclusions are presented.

LITERATURE REVIEW

Freight transportation is considered a complex area, taking into consideration the pluralism of the participating agents (Wycisk et al., 2008), including Carriers (ocean carriers, airfreight carriers, truckers, railway carriers), Freight Forwarders, Non Vessel Owning Common Carriers (NVOCCs) and Third Party Logistics Providers. Since there are multiple entities operating in the field of freight transportation, it is imperative to specify the performance indicators according to which the selection of the suitable transportation intermediary is realised.

Performance Indicators

The viability of the freight transportation firms depends on their capability to respond to customers' expectations and needs. The dynamic nature of transportation may affect the performance of the entire supply chain. Therefore, the measurement of the transportation system constitutes an important logistics process.

A plethora of studies have been conducted worldwide, stressing the importance of quality service in the logistics field, using different methodologies for the categorization of indicators. Bienstock et al. (1997) conducted factor analysis aiming at understanding the criteria used to assess the quality of physical distribution. The survey resulted in three factors, namely Timeliness, Availability and Condition.

Franceschini and Rafele (2000) identified the "traditional" logistics indicators and compared them with the service dimensions.

Lai and Cheng (2003) supported that the Supply Chain Performance in Transport Logistics incorporates the aspects of services effectiveness of shippers, the operational efficiency for

transport logistics service providers and service effectiveness of consignees. They proposed a self-assessment tool for the assessment of the Supply Chain Performance in transport logistics, and viewed the perspective of the Hong Kong transportation firms regarding the importance they attach to the Supply Chain Performance.

Lai et al. (2004) conducted one of the first studies that evaluated Supply Chain Performance in the transport logistics sector. They managed to gather information from three sectors of the transport logistics industry regarding their perceived Supply Chain Performance in terms of both Cost and Service effectiveness.

Lai (2004) examined the existance of different types of Logistics Service Providers and whether they differ in terms of service performance. Twenty-four logistics services are included in the survey, against which, the perceived capability of each Logistics Service Provider is rated. The factors extracted through exploratory factor analysis are Value-added logistics services, Technology-enabled logistics services and Freight Forwarding service. The results revealed significant differences among the LSPs in terms of service performance. The research of Lai and Cheng (2004) was conducted among the Freight Forwarding companies in Hong Kong, aiming to register their demographic characteristics, along with the services they provided, and also to assess their performance and provide periodical reports.

In the study of Pearlman, et al. (2009), the considerations of the Israeli business executives, during the Freight Forwarder selection process, were examined. The statistical analysis resulted in four factors, namely Reliability, Service Prices, Information Management and International Freight Forwarding Business Environment.

METHODOLOGY

The performance criteria that have been identified during the literature review process were used as a basis for the construction of the questionnaire that was mailed to the 94 active IFFAG&L (Association of International Freight Forwarders and Logistics Enterprises of Greece) members. Before sending the questionnaire to the member companies, the researchers submitted it to the Board of the Association (IFFAG&L) for validation. Along with the Board's approval, the researchers received through e-mail the relevant members list. Due to the small number of contacts, the researchers tried to contact the transport providers by phone and introduce the scope of the study. Apart from the first contact, each member received an initial e-mail, consisting of a covering letter, explaining officially the aim of the research, accompanied by the questionnaire. Within 30 days after the first contact, two reminders were forwarded to the non-respondents.

In total, 48 viable responses were received, resulting in 51% response rate. The amount of missing values was regarded as insignificant, and thus was replaced by the mean. In the first part of the questionnaire, the respondents were asked to rank the significance of each criterion for the cooperation with a transport provider, on behalf of shippers/ consignees, on a 1-5 scale (1=completely insignificant, 5= completely significant). A total of 42 criteria affecting the selection of a transportation provider, which are mentioned in literature (except for that of the company location) (see Table 1) were identified. The criterion of Company Location was included aiming to measure the significance of the transportation company's proximity to

customs offices, port, airport, etc. In the second part of the questionnaire, the respondents' demographic characteristics are denoted.

The majority of the companies (93,8%) operate for more than 10 years, with the 43,8% occupying 11-30 employees. Additionally, in most cases (60,4%), the questionnaires were handled by the General Managers.

The majority of the respondents (48%) are considered to operate solely as Freight Forwarders, whereas a 12,5% declares to be solely 3PL providers. However, in some cases (23%), the freight forwarding and 3PL services, are regarded as supplementary for specific companies that try to operate as "one-stop-shop" providers. This trend is also obvious through the fact that the 37,5% belongs to more that one category of logistics service providers.

Data Analysis

Forty two performance measures were included in this study. Table I presents the relevant measures based on literature review, and the respective means and standard deviations for the significance ratings as stated by the respondents and processed through statistical package SPSS. All scores ranged between 1 and 5.

The three most significant measures are Freight Rate (M=4,729; SD=0,4942), Payment Terms (M=4,667; SD=0,5955) and Company- Customer Partnership Level (M=4,489; SD=0,7683).

The findings are congruent with similar studies that outline "On-time Delivery" and "Total Support of Customer Needs" as the most important factors stated by logistics companies (Rahman and Laosirihongthrong, 2008; Rahman, 2006; Sohal, et al., 1999).

The study findings indicate that the ratings on Freight Rate, Payment Terms, Crisis Handling Ability, Willingness to Negotiate Freight Rates and Claim Handling Ability tend to be high (> 3.0 on the five point scale), indicating the transport providers' perception that these criteria mostly affect the attitude of the services users.

The internal consistency of the questionnaire was assessed according to Cronbach's alpha measure, resulting in 0,947 (>0,70), indicating significant questionnaire reliability.

The researchers further tested whether factor analysis is suitable, based on the results of the KMO and Bartlett's Test of Sphericity. In this case, the KMO is at 0.531 (>0.50) and Bartlett's Test is significant [χ^2 (861)= 1.676^{E}3, p<0.001], denoting that factor analysis is suitable for this data set. Additionally, the communalities are tested, in order to check the existence of high correlations among the variables. All communalities are higher than 0.60, indicating a high degree of shared variance among the variables.

Table I - Significance of Transport Provider Performance Variables (*n*=48)

Performance Measurement Criteria	References	Mean	SD	Min	Max
Freight Rate	Liang et al. (2006); Kahraman et al. (2003); Bergantino and Bolis (2008); Gunasekaran et al. (2001)	4,729	0,4942	3,0	5,0
Payment Terms	Burkovskis (2008)	4,667	0,5955	3,0	5,0
Company - Customer Partnership Level	Gunasekaran et al. (2001)	4,489	0,7683	1,0	5,0
Convenience in pick up/ delivery time	Nir et al. (2003)	4,396	0,8184	1,0	5,0
Crisis Handling Ability	Liang et al. (2006); Lai and Cheng (2004)	4,319	0,6875	3,0	5,0
Logistics Costs	Liang et al. (2006); Burkovskis (2008); Memedovic et al. (2008); Gunasekaran et al. (2001); Lai et al. (2004)	4,234	0,7498	2,0	5,0
Willingness to Negotiate Freight Rates	Liang et al. (2006)	4,229	0,7506	3,0	5,0
Correct Documentation	Liang et al. (2006); Gunasekaran et al. (2001); Chen and Lee (2008)	4,213	0,7701	2,0	5,0
Claim Handling Ability	Nir et al. (2003); Liang et al. (2006)	4,149	0,6835	3,0	5,0
Response Time to User Needs	Tongzon (2009); Lai and Cheng (2004); Liang et al. (2006); Gunasekaran et al. (2001)	4,146	0,7987	2,0	5,0
Provision of Accurate Information	Youngdahl and Loomba (2000); Agarwal et al. (2006); Arvis et al. (2007);	4,128	0,8152	2,0	5,0
On time Pre-alert Notices	Lai and Cheng (2004)	4,083	0,7672	2,0	5,0
Accurate Departure/Arrival Schedules	Tongzon (2009); Liang et al. (2006); Memedovic et al. (2008); Gunasekaran et al. (2001); Youngdahl and Loomba (2000)	4,000	0,8505	2,0	5,0
Transit Time	Liang et al. (2006); Kahraman et al. (2003); Bergantino and Bolis (2008);	3,979	0,7290	2,0	5,0
Company Reputation	Liang et al. (2006)	3,979	1,0816	1,0	5,0
Frequency of Sailings	Tongzon (2009); Liang et al. (2006); Bergantino and Bolis (2008); Nir et al. (2003)	3,958	0,9216	2,0	5,0
Quality of External Partners	Wong et al. (2008)	3,958	1,0097	1,0	5,0
Complaint Handling Process	Lai and Cheng (2004)	3,957	0,9884	2,0	5,0
Provision of Correct Offers	Chen and Lee (2008)	3,891	0,8562	2,0	5,0
Level of Intra-firm Collaboration	Chen and Lee (2008)	3,851	0,9448	1,0	5,0
Accurate Track and Trace process	Nir et al. (2003); Memedovic et al. (2008); Chen and Lee (2008)	3,745	1,0410	1,0	5,0
Geographical Coverage	Tongzon (2009); Robinson (2002); Gunasekaran et al. (2001); Memedovic et al.	3,587	0,9357	1,0	5,0

	(2008); Wong et al. (2008); Perlman et al. (2009)				
The Company Experience	Perlman et al. (2009)	3,521	0,9223	1,0	5,0
Range of Services	Burkovskis (2008); Arvis et al. (2007); Liang et al. (2006)	3,479	0,8749	2,0	5,0
Consultancy Services	Liang et al. (2006); Lai and Cheng (2004)	3,458	1,0711	1,0	5,0
Equipment and Space Availability	Liang et al. (2006); Nir et al. (2003); Chen and Lee (2008)	3,326	1,0730	1,0	5,0
Existance of Advanced IT/IS	Arvis et al (2007); Memedovic et al (2008); Christopher (2000); Perlman et al. (2009)	3,319	1,1129	1,0	5,0
Proximity to Service Centers (e.g. Port)		3,283	1,0450	1,0	5,0
Accurate and Detailed Customer Records	Lai et al. (2004), Chen and Lee (2008)	3,261	1,0197	1,0	5,0
Provision of customs clearing services	Arvis et al. (2007); Memedovic et al. (2008); Wong et al. (2008)	3,250	0,9565	1,0	5,0
Quality Certification (ISO, IATA, FIATA etc)	Perlman et al. (2009)	3,167	1,1730	1,0	5,0
Transit Cargo Handling	Arvis et al. (2007); Memedovic et al (2008)	3,130	0,9365	1,0	5,0
Handling of Specialized Cargo	Nir et al. (2003); Perlman et al. (2009); Chen and Lee (2008)	3,130	1,0233	1,0	5,0
The Company Size	Perlman et al. (2009)	3,042	0,8982	1,0	5,0
IS Integration with Clients	Christopher (2000)	2,936	1,1186	1,0	5,0
Online Booking Process	Gunasekaran et al. (2001)	2,894	1,0765	1,0	5,0
Online Pricing	Perlman et al. (2009)	2,875	1,1783	1,0	5,0
Routing Options	Nir et al. (2003); Gunasekaran et al. (2001)	2,833	1,2604	1,0	5,0
Provision of on-line Statistical Reports to Clients	Perlman et al. (2009); Lai and Cheng (2004)	2,792	1,1291	1,0	5,0
Investment Realization	Burkovskis (2008)	2,708	0,9884	1,0	5,0
Paperless Cargo Handling Procedures	Wong et al. (2008)	2,702	1,0088	1,0	5,0
Company Profitability	Burkovskis (2008)	2,562	1,1281	1,0	5,0

An exploratory factor analysis was conducted, using principal component extraction with varimax rotation. Based on the Eigenvalue criterion (keep all factors with an eigenvalue larger than one), eleven dimensions emerged. As the Eigenvalue criterion has a tendency to overestimate the number of factors extracted (Ford et al., 1986), the interpretability (Lai, 2004) and reliability of factors were additionally employed to determine the number of meaningful components. Five factors were finally derived and identified: Company Reputation and Capabilities, Service Level, Voyage Characteristics, Business Environment, and Information Technology. The ranking of their importance is displayed in Table II.

Table II – Significance of Transport Provider Performance Factors

Factors	Mean Rating	Cronbach's Alpha	Eigenvalues
Company Reputation and Capabilities (CRC)	4,108	0,872	3,206
Service Level (SERL)	3,695	0,809	2,521
Voyage Characteristics (VC)	3,693	0,770	1,976
Business Environment (BE)	3,253	0,858	2,817
Information Technology Applications (INTA)	3,037	0,910	13,995

DISCUSSION

In this section, an interpretation of the ratings that correspond to each indicator is discussed. Figure 1 presents the performance indicators in the freight transportation sector along with their corresponding measures, means (M) and loading factors (LF), according to the results of the exploratory factor analysis.

Performance Indicators in the Freight Transportation Sector

Company Reputation and Capabilities
- Convenience in pick-up/delivery time (M=4,396) (LF=0,582)
- Crisis management (M=4,319) (LF=0,564)
- Claim handling ability (M=4,149) (LF=0,578)
- Company reputation (M=3,979) (LF=0,610)
- Complaint handling ability (M= 3,957) (LF=0,779)
- Level of intra-firm collaboration (M=3,851) (LF=0,760)

Service Level
- Company-customer partnership level (M=4,489) (LF= 0,507)
- Response time to user needs (M=4,146) (LF= 0,622)
- Consultancy (M=3,458) (LF=0,573)
- Customs clearing services (M=3,250) (LF=0,805)
- Handling of transit cargo (3,130) (LF=0,602)

Voyage Characteristics
- Accurate departure/arrival schedules (M=4,000) (LF=0,703)
- Transit time (M=3,979) (LF=0,792)
- Frequency of sailings (M=3,958) (LF=0,670)
- Routing options (M=2,833) (LF=0,590)

Business Environment
- Company experience (M=3,521) (LF=0,780)
- Company's proximity to service centers (M=3,283) (LF=0,694)
- Quality certification (M=3,167) (LF=0,826)
- Company size (M=3,042) (LF= 0,816)

Information Technology Applications
- Cargo tracking and tracing system (M=3,745) (LF=0,699)
- Existence of advanced IT/IS (M=3,319) (LF=0,610)
- IS integration with clients (M=2,936) (LF=0,890)
- Online booking order (M=2,894) (LF=0,584)
- Online pricing (M=2,875) (LF=0,822)
- Provision of statistical reports to clients (M=2,792) (LF=0,827)
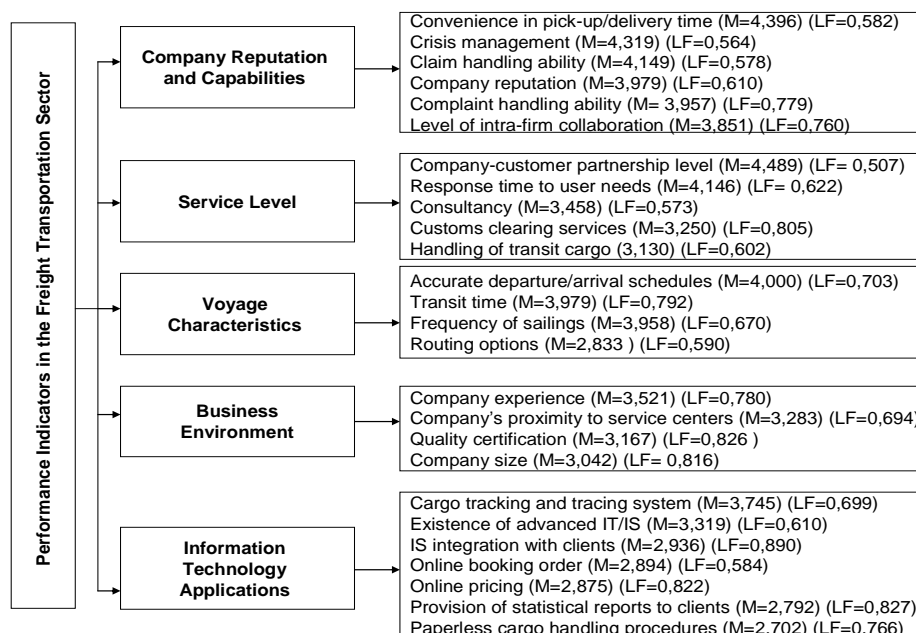- Paperless cargo handling procedures (M=2,702) (LF=0,766)

Figure 1 – Performance Indicators in the Freight Transportation Sector and the corresponding Performance Measures and Loading Factors

According to the respondents' mean ratings, the CRC (Company Reputation and Capabilities) indicator is considered as the most significant one. The measures that explain the particular indicator are critical for the cooperation with a transport provider. Cargo pick-up and delivery process is important for the prompt flow of cargo through the entire supply chain, and must be executed within the timeframes set by the customer (Dumas et al., 2001). Complaints and claims to the transport providers arise when cargo is at risk (Iakovou, et al.,2009). The ability of the Logistics Service Providers to apply a crisis management policy is highly rated by the survey respondents; as such risks may have a damaging impact on the customers' business processes. The transport provider's capabilities are leveraged through the existence of a high level of intra-firm collaboration, allowing prompt flow of information among the company departments. Furthermore, the company's capabilities are assessed by its customers and the relevant ratings are embedded into its reputation, also being a significant factor for contracting business.

The SERL (Services Level) indicator is regarded as the second most important, with the Company - Customer Partnership Level as the most significant measure, as organizations have realized that the meaning of collaboration has to be applied at both tactical and strategic levels, both vertically and horizontally (Barratt, 2004) in order to create a strategic advantage for the involved organizations. The response time to customers' needs is also central, as it either fosters or inhibits the prompt cargo and information flow. Furthermore, the recent trend in the field of logistics is the evolution of transportation intermediaries into "one-stop-shop" logistics service providers, through the provision of supplementary value added services (i.e. customs clearance, consultancy, transit cargo handling, etc) (Berglund et al., 1999; Murphy and Daley, 2001). According to this research, the respondents consider the provision of the aforementioned supplementary services, as somewhat significant for the decision to cooperate with a transport provider.

The measures of the VC (Voyage Characteristics) indicator are also significant except for the measure of routing option, which scores below 3 (<3), whereas the remaining ones are very close to 4. Transit time and frequency of sailings, represent important parameters to the organization of the supply chain, and more specifically to the production and final distribution. Time variability in departure and/or delivery time is considered more significant, as it affects the customer's inventory practices. Even if the average lead time is short, high variability in transit time may prove to be more damaging for the customer, than a predictable, though, long transit time (Nordas et al., 2006).

The BE (Business Environment) indicator is explained through the measures of Company Experience, which is ranked first by the respondents among the Company's Proximity to Service Centers, Quality Certification and Company Size. The Company Experience measured in years of existence may be synonymous to accumulated expertise. The second measure may have not appeared in literature so far, but it proves to be significant to the customers, or the customers' representatives, such as customs brokers, who would be enabled by the LSP's establishment at a central area, close to the logistics facilities (i.e. customs office), thus facilitating the accomplishment of their transactions. Furthermore, the fact that the transport provider may influence the customer's inventory management, production planning or even product quality fosters the acquisition of quality certification regarding the provided services, verifying the construction of accurate processes (Perlman et al., 2009).

The significance of the INTA (Information technology Applications) indicator is marginally above 3 (>3), and this is due to the high rating on the existence of a Cargo Tracking and Tracing System. In combination with the Existence of Advanced Information Technology/ Information Systems, the use of EDI facilitates the deployment of a cargo tracking system, thus enhancing shipment security, and accuracy of information. Although Information Technology provides its users with the opportunity to constantly monitor the areas of their interest, the research respondents do not consider the possibility of Information Systems integration with the clients, the possibility for online pricing, online booking and provision of statistical reports to clients, along with the application of paperless cargo handling processes, as significant issues in the cooperation with the transport providers.

CONCLUSIONS

The complexity of the transportation process signifies an important issue, and thus proper attention must be drawn to the selection and evaluation process of Logistics Service Providers. The aim of this study is to identify the key performance measures and indicators that Transport Users take into consideration, in order to assess the performance of a Transport Provider, and then investigate their applicabitlity and significance in the Greek market, by processing the collected data.

The most significant factors, resulted from the research are considered to be in the following order the Company Reputation and Capabilities, the Service Level, the Voyage Characteristics, the Business Environment and Information Technology Applications.

We have to keep in mind that this study analyses the perceptions of transport logistics service providers on behalf of shippers/consignees. The results could differ if the perceptions of shippers/consignees were collected and processed.

Another limitation is that the study's Descriptives can only be partially compared to previous studies, due to THE lack of synchronized research. The authors investigated the significance level assigned by the Greek Transport Providers to specific performance indicators on behalf of the service users, whereas previous similar studies investigated the quality concept of Australian, Thai, Hong Kong, American etc companies. Thus, no comparison can be realized, unless an international research is conducted over the same time-period, especially if this period is characterized by a global financial recession. Greek entrepreneurs make extensive efforts in order to maintain their business, through strict cost cutting policies. These financial conditions may explain the fact that among the most significant issues for the cooperation with a transport provider are considered the Freight Rate, the Payment Terms and the Willingness to Negotiate the Freight Rates, whereas in literature "On Time Delivery" is presented as the most important affair, as already mentioned.

The outcomes of this study will be disseminated to the members of the Association of International Freight Forwarders and Logistics Enterprises of Greece, to represent a benchmark across the Greek industry perceptions. The results could be used by the transport providers to compare their own perceptions with those of their customers, helping them to identify the possible gaps that will help them improve their performance accordingly.

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REFERENCES

Arvis, J.F., M.A. Mustra, J. Panzer, L. Ojala and T. Naula, (2007). Connecting to Compete: Trade Logistics in the Global Economy. The Global Enabling Trade Report 2008, 2008 World Economic Forum.

Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. Supply Chain Management: an International Journal. 9, 30-42.

Bergantino, A.S. and S. Bolis (2008). Monetary values of transport service attributes: land versus maritime ro-ro transport. An application using adaptive stated preferences, Marit. Pol. Mgmt, 35, 159–174.

Berglund, M., P. Van Laarhoven, G. Sharman and S. Wandel (1999). Third-party logistics: is there a future? Int J Logist Manag,10, 59–70.

Bienstock, C.C., J.T. Mentzer and M.M. Bird (1997). Measuring Physical Distribution Service Quality, J. Acad. Market. Sci., 25, 31-44.

Burkovskis, R. (2008). Efficiency of freight forwarder's participation, in the process of transportation. Transport. 23, 208–213.

Chen, C.H. and H.Y. Lee (2008). Empirical Analysis of the Customer Loyalty Problem in the International Logistics Market, WSEAS Transactions on Business and Economics, 5, 113-123.

Christopher, M. (2000). The agile supply chain, competing in volatile markets. Ind. Market. Manag., 29, 37–44.

Dumas, Y., J. Desrosiers and F. Soumis (1991). The pickup and delivery problem with time windows. Eur. J. Oper. Res., 54, 7-22.

Ford, J.K., R.C. MacCallum and M. Tait (1986). The application of exploratory factor analysis in applied psychology: a critical review and analysis. Pers. Psychol., 39, 291–314.

Franceschini, F. and C. Rafele (2000). Quality evaluation in logistic services, Int. J. Agile Manag. Systems, 2, 49-53.

Gunasekaran, A., C. Patel and E. Tirtiroglu (2001). Performance measures and metrics in a supply chain environment, Int. J. Oper. Prod. Man., 21, 71-87.

Iakovou, E., D. Vlachos, and A. Xanthopoulos (2009). Risk and Security Management for Logistics Service Providers: Trends, Challenges and Opportunities.In: Managing Risk and Security. The Safeguard of Long-term Success for Logistics Service Providers (S.M. Wagner and C. Bode, ed), pp. 59-81, Haupt Velag, AG, Switzerland.

Kahraman, C., U. Cebeci and Z. Ulikan (2003). Multi-criteria supplier using fuzzy AHP, Logist. Info. Manag., 16, 382-395.

Lai, K.H. and T.C.E. Cheng, (2003). Supply Chain Performance in Transport Logistics: An Assessment by Service Providers. Int. J. Logist. Res. Appl., 6,151-164.

Lai, K.H. and T.C.E. Cheng (2004). A Study of the Freight Forwarding Industry in Hong Kong. Int. J. Logist. Res. Appl., 7, 71-84

Lai, K.H. (2004). Service Capability and performance of logistics service providers, Transp. Res. Part E. 40, 385–399.

Lai, K.H., E.W.T. Ngai and T.C.E. Cheng (2004). An empirical study ofsupply chain performance in transport logistics. Int. J. Production Economics. 87, 321–331.

Liang, G.S., T.Y. Chou, and S.F. Kan (2006). Applying Fuzzy Quality Function Deployment to Identify Service Management Requirements for an Ocean Freight Forwarder. Total Qual. Manage., 17, 539–554.

Memedovic, O., L. Ojala, J.P. Rodrigue and T. Naula (2008). Fuelling the global value chains: what role for logistics capabilities?, Int. J. Technological Learning, Innovation and Development, 1, 353-374.

Murphy, P.R. and J.M. Daley (2001). Profiling international freight forwarders: an update. Int. J. Physic. Distr. Logist. Manag., 31, 152-168.

Nir, A.S., K. Lin, and G.S. Liang (2003). Port choice behaviour--from the perspective of the shipper. Marit. Pol. Mgmt., 30, 165–173.

Nordas, H. K., E. Pinali and M.G. Grosso (2006). Logistics and Time as a Trade Barrier., OECD Trade Policy Working Papers, No. 35.

Papadaskalopoulos, A., A. Karaganis and M. Christofakis (2005). The spatial impact of EU Pan-European transport axes: City clusters formation in the Balkan area and developmental perspectives Transport Policy, 12, 488–499.

Perlman, Y., T. Raz, and L. Moshka, (2009). Key Factors in Selecting an International Freight Forwarding Company, Open Transportation J., 3, 29-34.

Rahman S. and T. Laosirihongthrong (2008). Quality management practices in logistics services in Thailand. Int. J. Integrated Supply Management. 4, 49-59

Rahman, S. (2006). Quality management in logistics: an examination of industry practices. Supply Chain Management: An International Journal. 11, 233–240.

Robinson, R. (2002). Ports as elements in value-driven chain systems: the new paradigm, Marit. Pol. Mgmt., 29, 241-255.

Sohal, A.S., R. Millen, M. Maggard, and S. Moss (1999). Quality in logistics: a comparison of practices between Australian and North American/European firms. Int. J. Physic. Distr. Logist. Manag., 29, 267-280.

Tongzon, J. L. (2009). Port choice and freight forwarders, Transp. Res. Part E., 45, 86–195.

Wong, P.C., H. Yan, and C. Bamford (2008). Evaluation of factors for carrier selection in the China Pearl River delta. Marit. Pol. Mgmt., 35, 27-52.

Wycisk, C., B. McKelvey and M. Huelsmann (2008). Smart parts supply networks as complex adaptive systems: analysis and implications, Int. J. Physic. Distr. Logist. Manag., 38, 108-125.

COSCO Pacific Limited (2010). 2009 Final Results Announcement [WWW]. Available from: http://www.coscopac.com.hk/admin/upload/ir/announcements_circular/e20100330.pdf [Accessed 5/5/10].

Youngdahl, W. E. and A. P.S. Loomba (2000). Service-driven global supply chains. Int. J. Serv. Ind. Manag., 11, 329-347.

Gulf Times (2010). Qatar govt eyes $5bn investment in Greece [WWW]. Available from: http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=359323&version=1&template_id=57&parent_id=56 [Accessed 5/5/10].