



SUPPLY CHAIN MANAGEMENT: THE CASE OF CRUISE SECTOR IN GREECE AND ITALY

Mihail Diakomihalis and Nikolaos-Marios Diakomichalis

Accounting and Finance Department, University of Ioannina, Psathaki, Preveza, 48100, Greece
University of the Aegean (MSc) Business Consultant, Thessaloniki, Greece

Corresponding author: Mihail Diakomihalis

Abstract: *The paper investigates the factors that affect and influence the choice for own supply chain or outsourcing of a cruise company, within the frame of the different cruise ship size and the operation in dissimilar geographic area, considering also the factors of differentiated Cruise Product, the Characteristics of the cruise company and of the passengers, the cost and the supply strategy of the company, as to their participation in the final alternative supply decision of a cruise itinerary. For the purposes of this research, a small deluxe cruise company, offering specialized programs and a larger mass cruise company, headquartered in Greece and operating East- Mediterranean, are compared between them, as well as with another couple of these types of companies headquartered in Italy, and operating Central Mediterranean were selected for a comparison study. The methodology applied is the Analytic Hierarchy Process (AHP) which is a flexible multi-criteria method for decision making and priorities ranking. "Passenger characteristics" is the most significant Criterion for the Italian SCC and LCC, while "Cost" and "Supply strategy" are the most significant Criteria for the Greek SCC and LCC respectively. "Characteristics of cruise company" seems to be the least important Criterion for the Italian SCC and for the LCC of both countries. "Supply strategy" depicts the greatest difference between the Greek LCC (1st) and SCC (6th) but also between the Italian SCC (2nd) and the LCC (3rd).*

Keywords: *cruise company; supply chain management; outsourcing decision*

JEL: *D220, L 830, M 110*

1. Introduction

A Traditional industrial supply chain could be considered the process of transforming raw materials acquired by wholesale or retail suppliers into final products offered to the final customers (Mabert & Venkataramanan, 1998). Supply chain of services refers to a stream of incoming and outgoing services offered by businesses to their customers (Miles & Snow, 2007). A typical tourism supply chain includes suppliers of goods and services, tour operators, travel agents, and tourists as final consumers. In other words, since Tourism is considered a

coordination- and information-intensive industry, Tourism Supply Chain is a network of businesses and organizations of both public and private ownership, involved in activities of transportation and accommodation to the delivery and disposal of the final tourist products to the final consumers- tourists at a specific destination (Zhang et al.2009). It contains all suppliers of goods and services, such as accommodation, transportation, excursion, shopping, and dining, irrespectively if are directly contracted by tour operators or by retail agents or direct suppliers such as accommodation services providers (Wongsurawat &

Logistics and Tourism International Research Journal

An official Publication of Center for International Research Development

Double Blind Peer and Editorial Review International Referred Journal; Globally index

Available ww.cirdjournal.com/LTIRJ/; E-mail: LTRJ@cirdjournals.com



Shrestha, 2018). Furthermore, manufacturers of food, equipment, and crafts are included to the tourism supply chain, as well as the basic utilities of a society, such as electric power, water, garbage collection, etc., which are considered vital or infrastructural supplies.

Supply chain is the mechanism that coordinates and synchronizes Demand with Supply in the real market. Supply chain management is a crucial operation for the cruise company and a determinant of the quality and diligence of each cruise product. Logistics players are recently making best use of the free time available in seaports terminals and inland terminals, thereby optimizing the terminal buffer function (Rodrigue & Notteboom 2009:165). Supply chain selection or plan reconfiguration affects the performance of the business. Ivanof et al (2016) found an explicit connection of performance impact assessment and supply chain plan reconfiguration.

Since tourism is an activity based on demand, not allowing tourism services to be stored and forcing producers to depend on forecasted demand, a tourism supply chain is characterized by a forward flow of services from suppliers to customers grounded on a customers to suppliers flow of information. Effective inventory management is vital for every sector such a hotel or transportation, with high fixed costs and perishable products.

The crucial difference of the Cruise in terms of supply is that unlike any commercial and industrial enterprise that uses the supply chain or the alternative of outsourcing to promote and deliver to the market its products, the Cruise Ship moves in different seas and approaches specific ports, where the cruise customers expect to be satisfied for catering and inventories supplied.

Passenger satisfaction is the key to success for the cruise sector (Vaggelas & Lagoudis 2010). Lekakou et al (2009) believe that contemporary cruise sector provides (a) a wide variety of cruise ships, (b) a variety of potential

itineraries (c) alternative cruise durations and (d) a vast of activities onboard the vessel, as well as on the offshore visited destinations. Since all four characteristics are provided in the global market, the cruise supply chain might be an added value to the cruise program quality and to efficiency of the cruise company, as it could be reflected in passengers' satisfaction.

Cruise product is differentiated to their clientele feedback as well to competition while they have showed high degree of flexibility to the general economic conditions (such as crisis) by repositioning and altering their products, so as to make it affordable and ensure high completeness (Diakomihalis & Stefanidaki 2011). Marti (2003) noted that cruise passengers' profile has been modified in recent years and this is the reason why different economic status passengers may participate in the same theme, type and cost of cruise. The goal of outsourcing is to make the company more flexible and adaptable to new environmental conditions, by focusing on its core activity, entrusting part of the tasks, activities or functions to other companies (Florea, cited by Hila & Dumitrascu, 2014).

The present study is mainly concerned with the economic dimension of designing a tourism supply chain for a special tourism product, that of the cruises, which creates and ensures the availability of tourist products at the best possible quality and at the lowest possible price. This study concentrates in the Mediterranean market where simultaneously operate different companies offering different cruises, addressing to different consumer profile. At the time when more and bigger ships enter the market, smaller ships offering thematic cruises and specified products and destinations are emerged in the same market. Among the differences which alternate cruise products obviously is the size of the cruise ship. Destination development, seasonality, redeployment, itinerary complexity and international sourcing of passengers are some of the major considerations for the development of the supply chain of



a cruise company (Diakomihalis & Stefanidaki, 2011). The size of the cruise vessel is not just about the number of visitors, nor the types of ports that can attract small ships to the larger ones, but also the factor of supply of all necessary goods and supplies.

The research question is whether and to what extent the choice for own supply chain or outsourcing is affected by the specific criteria. Besides, if and to what extent these criteria differ due to the size of the ship and especially the different product it offers. Finally, whether there is another differentiation that may be due to the place of the ship operation, is the geographical area where the cruises are performed.

A complete answer to the above questions steers the research simultaneously towards the following three targets: 1) analyzing how a cruise company decides whether to develop an in-house supply chain department and which activities select to run in-house and which to outsource, 2) if and how this decision differentiates between cruise companies operating in producing Greek cruises and those operating and offering cruises in the Italian territory and, 3) which are the main factors by significance and by ranking that determine the decision of creating an own supply chain or outsourcing for a cruise vessel.

The research was concluded by the end of 2019. Therefore, any impacts of the Covid-19 outbreak on March of 2020, are out of the scope of the research.

The paper is structured as following. The Introduction is followed by Section 2 in which the cruise

ship supply chain management is presented. Section 3 explains the methodology of Analytical Hierarchical Process (AHP) which is applied to this research. The results are described in Section 4, and finally the last section demonstrates the conclusion of the paper.

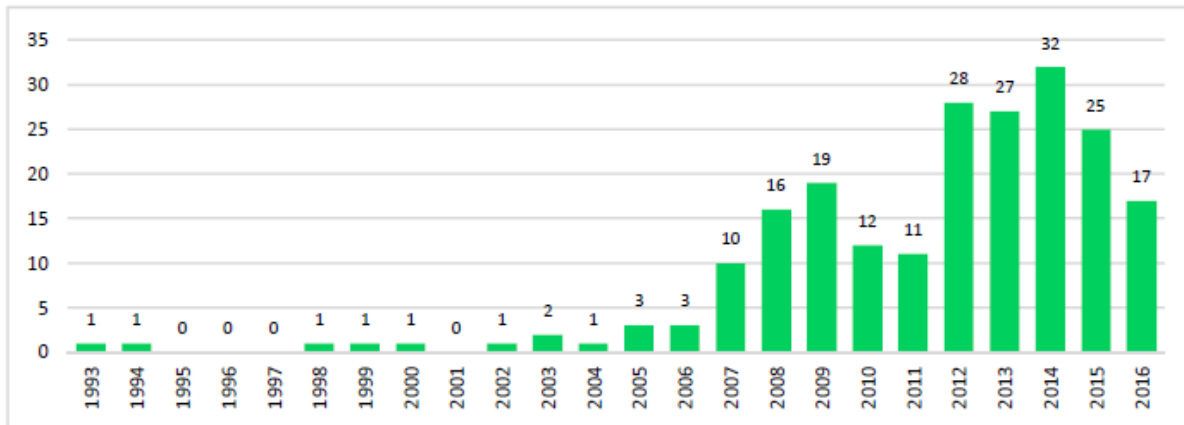
2. Literature review

Scientific interest in the subject supply chain has increased significantly over the last years, beginning in 1960 with the first publications in this field. This issue attracted a high number of researchers, as evidenced by the growing number of published scientific work in the subject of the supply chain since 2000.

The picture though is not the same for the tourism supply chain issue. The first published research in this field appeared just in 1993. A significant increase in the interest of studying the tourism supply chain field has showed up in 2007. Nevertheless, the number of publications in the field tourism supply chain is low which indicates the initial stage of the issue research, despite the high growing contribution of tourism to the local and national economies and the issue of tourism supply chain management (Fig. 1), proving though the growing interest of the international scientific literature henceforth.



Figure 1. Number of “tourism supply chain” publications indexed in the Web Science.



Source: Danuta Szpilko, 2017, pp. 690

Regarding the geographical area of researchers dealing with tourism supply chain issues derivation, most of them come from China, UK, USA, Spain, Taiwan, Italy and Australia. The majority of the studies in the field of tourism supply chain can be classified into business economics and social sciences areas. Among the few publications related to research areas as, public administration, agriculture, geography, transportation science library information science, psychology, sociology, automation control systems, energy fuels, food science technology, and urban studies, are the very few related to the cruise industry and specifically those by Papatheodorou (2006); Veronneau & Roy (2009); Vaggelas & Lagoudis (2010); Diakomihalis & Stefanidaki (2011) and Di Vaio & Diakomihalis (2018). The international literature on the viability of cruise tourism has been growing in recent years and is based on an assessment of the environmental, economic and social impact of cruise ships and passengers on different destinations (Dawson et al., 2016).

Cruise ship supply chain management

The tourism supply chain is a comprehensive set of activities that include the allocation of resources, cost reduction, optimal possible quality, while evaluating customers in all tourism activities, taking into account the products offered, cost, time, safety and quality that affect tourism products and tourism experiences (Chen & Yi, 2010).

Cruise sector is one of the most characteristic globalized business due to its variety of customers and the vast pluralism of itineraries offered worldwide. In the last decades, competition among cruise companies has concentrated mainly not only in terms of quality but also in terms of variety and offerings (Papatheodorou, 2006). In other words, the ship, the time of the cruise, the itinerary and the booking process could be the factors of cruise market competition (Papatheodorou, 2006). This global deployment and the increasing worldwide competition bring a set of challenges regarding the supply chain (Veronneau & Roy, 2009) as a new dimension of competition.



The supply chain within the cruise sector is more complicated than that of cargo shipping supply or of hotel supply. This is expected and obvious since the cruise ships, as mentioned earlier, combines the needs supplied by a vessel and at the same time requires all the supplies of a high-quality hotel. Besides, cruise vessels operate within different geographic locations each of which has its own laws and regulations (O’Bull, 1990), accommodating different nationalities of passengers with different alimentation preferences. It is a common feature on the sector the passenger’s profile which is expected to be substantially different, effecting the different needs which must be satisfied. On top, it is crucial to synchronize all the necessary components for the delivery of a cruise product, independent of the size of ship, the time for re-supply remains the same and the quality alike. According to Mentzer et al. (2001) supply chain may be defined as “*a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream of products, services, finances and/or information from a source to a customer*”. Any organization and not only a shipping or a cruise company, may provide an effective management of supply chain as a vital component for its successful operation (Ketchen & Hult, 2007). The characteristic highlighted the competition based on supply chain management in Mentzer et al. (2001) study is that “*companies and supply chains compete more today on the basis of time and quality*”. Eventually, contemporary competition even in cruise sector has been shifted from company management level to supply chain management level (Christopher, 2000).

Even though Zhang et al (2009) interpreter supply chain management as a new research field, it inevitably has been applied all along by the cruise companies and consequently has been under-examined by the academia. Its importance has spiraled nowadays, so much so the competition in the cruise sector is focused on the cruise supply chain. The appearance and the

subsistence of a supply chain is owed to the development of synergies among the involved parties of the supply chain, which ultimately aims to a competitive advantage achievement (De Martino & Morrillo, 2008). Inevitably, these synergies should be developed in the cruise industries, even after modifications based on the evolutions observed in the cruise industry as well as in other sectors of the cruise supply chains (for example, ports) in order for the right supply chain strategies to be applied (Vaggelas and Iagoudis, 2010).

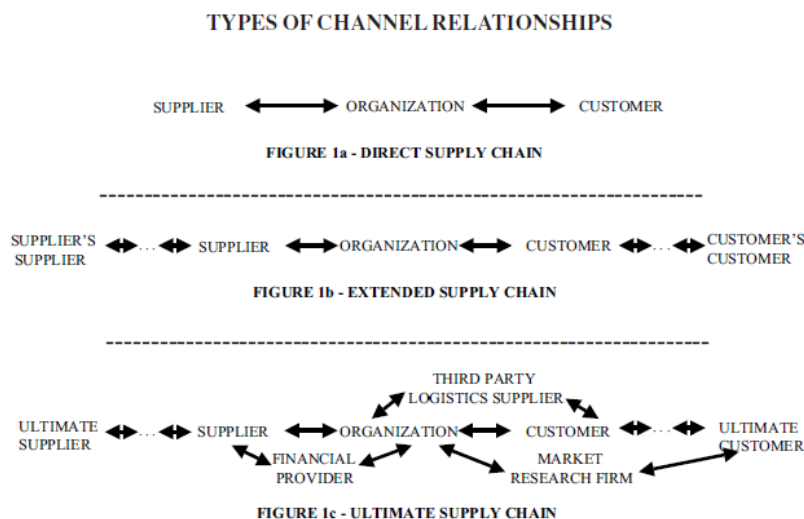
Supply chain management is an operation aiming among other targets to maximize value and quality under the condition of reducing overall cost. Business environment changes rapidly, creating conditions of uncertainty for companies, which try to compete in terms of cost and quality. Companies need to divert their resources, keeping focused on doing the best they can and alternatively outsource operations which are not important to the overall objective of the company. Outsourcing is the “the process whereby activities traditionally carried out internally are contracted out to external providers” (Domberger 1998). As early as in 1999, Lankford and Parsa (1999) postulated that outsourcing operations is the trend of the future, since companies that were already involved with outsourcing have been satisfied. There are numerous advantages from outsourcing (Beaumont & Khan, 2005) such as access to specialized suppliers, reduction of investments in assets and reduction and better control of costs (Pirkatis & Nikitakos, 2006). The most significant widely referred advantage for selecting outsourcing is cost (Domberger,1998; Lankford-Parsa, 1999). While it is generally accepted that cost reduction is the most widely referred advantage from outsourcing (Domberger,1998; Lankford-Parsa, 1999), Quinn (1999) emphasizes that outsourcing should not be intertwined with the cost decrease but rather with the strategic benefits from its selection, such as innovation, quality and the value added, while Zhu (2016), believes that “cost, quality and time to



market are three main factors for outsourcing management”. Even though the literature on the broad area of supply chain management is immense, the literature on the specific topic of cruise ship supply chain management is so limited that it is referred as “poverty of cruise theory”. This is not peculiar at all, according to Papathanassis and Beckmann (2011), since cruise research is subject to fragmentation, managerialism and lack of unifying theoretical perspectives to characterize empirical research (Diakomihalis & Stefanidaki, 2011). One of the recent studies within the field of cruise supply chain is by Veronneau and Roy (2009), aiming at the complexity of global cruise ship supply management, presenting a field study of a large Florida-based cruise company. The outcome of this research is that the main processes of supply chain for consumable products are divided into three levels: strategic (long term), tactical (for short and medium term) and operational (for day-to-day operations). The significance of this study is that the supply chain starts with the suppliers of the company and is extended to the ship as the ultimate consumer. The on-

board the cruise ship consumption is not being considered at all. Vaggelas and Lagoudis (2010) analysed the supply chain strategy of a small cruise company operating in the East Mediterranean region. The theoretical approach of the supply chain strategy is based on a generic supply chain management system for tourism sector, pursuant to Zhang et al. (2009). The study combines three supply chain methodologies that deal with the “Logistic Type”, the “Level of Flexibility” and the “Level of Complexity” that have been tested according to the authors in other fields, such as transport and manufacturing. Finally, they have approached the supply chain starting from the suppliers and end to the cruise passenger as the final consumer, in contrast with Veronneau and Roy (2009). The three different structures of a generic supply chain based on Metzger et al. (2001) are presented in the following Figure 1. According to our research, Small Cruise Companies in the cruise industry follow the structure presented in Figure 1b; whereas larger ones follow the ultimate supply chain, see Fig. 2.

Figure 2. Supply Chain Structures (Source: Metzger et al., 2001)





According to the same authors the complexity of a supply chain can be classified in three main categories: “direct supply chain”, “extended supply chain” and “ultimate supply chain”.

3. Methodology

The Analytic Hierarchy Process (AHP) has wide application in multi-criteria decision making. It is based on a double-entry table, which records the relative importance of the variables in a mathematically consistent way. The power of preference for each variable is measured on a scale of 1-9 and the value entered in each cell corresponds to the ratio of the relative importance of the variable-row to the variable-column. The relative importance is expressed in the form of a fraction per pairs, so the primary evaluations that need to be done are $n(n-1)/2$.

The Analytic Hierarchy Process (AHP), developed by Saaty in the early 1970s, approaches the complexity of decisions with simplicity, which makes the conceptually simple approach of the method extremely powerful (Saaty 1977, 1980b and 1999).

The Analytical Hierarchical Process, through the hierarchical structure of the problem and the relevant comparisons between the problem factors, tends to simplify substantially complex problems, helping the decision maker to single out the important points of the problem in order to be led by the method to the final goal, choosing the right alternative for him (Saaty, 1980a). That is accomplished by the combine of the multiple criteria analysis in a hierarchical structure, deriving the relative importance of the criteria, comparing alternatives for each criterion and determining the overall score of the alternatives.

The AHP has a successful track record regarding applications in the wider transport area and ports (Lirn et al, 2004) as a Multiple Criteria Decision Making (MCDM) methodology in the late 1970s (Saaty, 1977). In the port industry the AHP has been used mostly for assessing port selection criteria (Lirn et al., 2004; Guy &

Urli, 2006; Ugboma et al, 2006), carrier selection criteria (Wong et al., 2008) and benefits distribution from port services (Vaggelas and Lagoudis, 2010).

In each multi-criteria analysis problem, the researchers who make use of AHP fully and carefully define the situation by structuring the decision-making process in four stages:

1. Hierarchical structure of the problem
2. Data entry
3. Estimation of the relative gravities of the decision criteria
4. Combination of the relative weights of the criteria in order to carry out the evaluation of alternatives.

1: The first step in the application of AHP is probably the most important and determines the quality of the results of the method. In this first stage, the ultimate goal pursued (the research’s aim) in the decision problem under study is analyzed in individual sub-objectives, which are then more and more analyzed in the models of a hierarchical structure. At the top of this hierarchical structure (tree structure) is the ultimate goal, which is as general as the requirement and the decision to be made to be the best possible. This method leads to the classification of Criteria or classification of alternatives or Sub-Criteria, depending on the needs of the problem under study.

2: The decision maker enters the data of the problem, expressing his preferences through bilateral comparisons. Bilateral comparisons concern all or Sub-Criteria of each hierarchy level, in relation to their Criteria contribution as well as all Criteria to the Goal of the immediately preceding hierarchy level. To express the preferences of the decision maker, when conducting bilateral comparisons, the parameters are quantified by giving them values from a scale from 1 to 9, indicating the strength with which one element dominates another with respect to a higher-level element. This scaling process can then be translated into priority weights – scores,



according to the gravity selection in between the pair of Criteria or Sub-Criteria, as shown below.

Criterion	Gravity of relative significance																Criterion	
A	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	B

3: A table is formed that contains the actual relative weights that the decision maker assigns to each element of the specific level of the hierarchy. In the last stage, the relative weights of the data of all levels are combined, in order to evaluate the alternative decisions of the last level of the hierarchy in relation to the first level that includes the goal of the problem. This evaluation gives a score to each of them and allows the decision maker to make a decision.

It is obvious that the alternatives to a decision problem cannot be compared to such a general objective - criterion. Thus, the ultimate goal is analyzed (specialized) in a number of more specific targets (decision elements). This analysis is done in such a way that the satisfaction of the individual objectives has as a result the service of the general objective.

This gives a hierarchical structure to the decision problem, in which the upper levels refer to general objectives-criteria and as one goes down, the criteria

become more and more specialized, to the point that they can be used effectively to compare alternatives.

4: In the fourth and last stage, the individual weights of the Sub-Criteria are synthesized, as they result from the comparison tables, and their export to general priorities of the branches of the tree structure, ie the Criteria to the ultimate goal, as they result from the tables of pairwise comparisons. The calculation of the final evaluation score of the various alternatives is as follows:

$$\sum_{j=1}^n (G_j R_{ij})$$

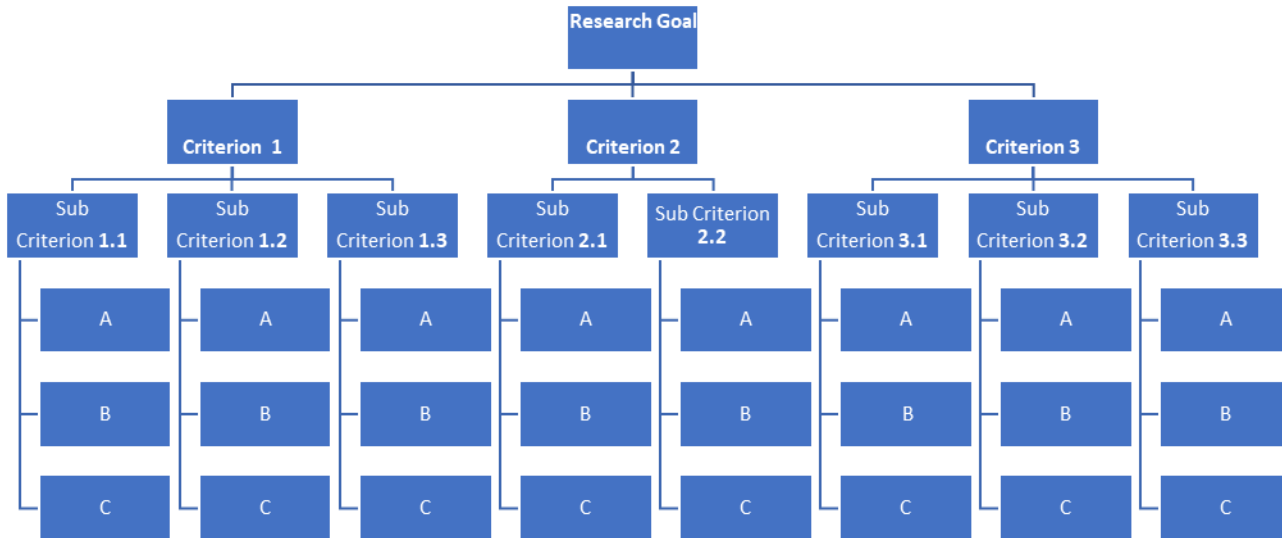
Where

G_j , the table of specific gravity of the Criteria.

R_{ij} , the scoreboard of Sub-Criteria



Figure 3: Hierarchical structure of decision-making process via AHP



The ultimate objective which is the Research Goal is broken down into three sub-objectives called Criteria that determine the Goal: (Cr 1, Cr 2, Cr 3).

Each of them is further analyzed in a number of more detailed decision elements which are called Sub-Criteria (the Sub-Criteria of Cr 1 are Sub. 1.1, 1.2 and 1.3, etc.). At the last level of the hierarchy are the alternative solutions A, B and C in Global values.

Table 1: Table of Relative Gravities:

Research Goal	Criterion 1	Criterion 2	Criterion 3	Gravity
Criterion 1	gr1 / gr1	gr1 / gr2	gr1 / gr3	GR1
Criterion 2	gr2 / gr1	gr2 / gr2	gr2 / gr3	GR2
Criterion 3	gr3 / gr1	gr3 / gr2	gr3 / gr3	GR3

Identification of Critical Decision Factors and Questionnaire Development

Given the limited research in this area brainstorming was firstly used to identify first the broad area of factors that may influence and ultimately shape the decision for outsourcing. As James et al (2020) argue, the development stage of the cruise destination and the

relative importance of tourism in the region, shape the perceptions of those interested in how they perceive the viability of cruise tourism. The opinion of local shipping agents, local suppliers and business executives of the cruise industry contributed to reduce the initial list of the key factors to a set of 6 major criteria categories each of which has been further broken down into its sub-criteria.



Based on the existing literature as well as according to the brainstorming among the cruise sector experts, the main cost categories of a cruise company are the following:

- **Cruise product:** includes all the characteristics of the itinerary such as the *home port*, the *number of ports of call* and *time of eve at each*.
- **Characteristics of cruise company** refers to the *specialization of the cruise company* as well as if it an *affiliated or parent company* since the latter may affect the supply chain strategy and whether cruise is the *main activity* of the company.
- **Geographic area of activity:** location of the *headquarters*, proximity to the *distribution centers* and concentration of fleet activity to specific areas in terms of *number of ships*.
- **Passengers characteristics:** includes the major demographic characteristics of the passengers, such as *age*, *income*, *nationality* and their *nutritional habits*
- **Cost:** includes all factors that determine the total cost of the cruise, which are, *trip*, *supplies*, *port fees*, *transport* and *storage*.
- **Supply strategy:** factors that influence the formulation of the supply chain orientation like *quality*, *packaging*, *trust to local suppliers*, *special supplies*, *payment arrangement*, *regulations* and *experience*.

According to the above analysis and criteria and sub-criteria selection, we developed a questionnaire consisting of a total number of 61 questions (comparisons per couples). The questionnaire requires only a pairwise comparison of the 'sub-criteria' for the 6 major criteria categories which is the major input of the AHP analysis. The structure of the questionnaire is made in a way that the respondents must compare each sub-criterion with the remaining sub-criteria included in each Criterion. Therefore, there is no comparison between the sub-criteria of different Criteria. The application of the Expert

Choice™ software allows the evaluation and the gravity of each sub-criterion to the research goal, without the need of such a comparison.

3.2 Field Research and Data analysis

The field research includes a double comparison analysis, firstly between two cruise companies with different market profile, regarding the size of the companies and the cruise programs offered, and secondly between two different countries, operating both in the Mediterranean Cruise Market; specifically, in the Greek and the Italian cruise market.

Data regarding the Greek Cruise Companies are retrieved from the research "Cruise Ship Supply Chain: A field study on outsourcing decisions, published in *International Journal of Decision Sciences, Risk and Management*, Vol.3 Nos 3/ 4, pp.369-383. <http://inderscience.metapress.com/content/h1v0436940364g81/> (Diakomihalis and Stefanidaki, 2011).

The distinguish difference is the cruise program specialization which is reflected on the type of tourist-passengers they attract. The small cruise company mostly offers specialized programs and it rather belongs to thematic cruise market, while the large cruise company is considered a major "player" in the cruise industry in the central Mediterranean market (Italy) and the east Mediterranean market (Greece). The questionnaires were completed by the heads various departments of both companies, in both countries, such as the finance, the management, the marketing, the accounts and purchasing, and finally the operations department. The final respondents were the heads of general management dept of the selected companies. Instead of receiving separated responses from each executive, participants-companies return to us only one collective questionnaire per company.

The questionnaires have been registered in the Expert Choice software in order to reveal the results of the significance each Criterion and Sub-criterion that was given by the experts according to their opinion.



Therefore, the impact of each Criterion to the main question, which is the goal of the research, has been estimated and at the same time the gravity of each Sub-criterion on the value of the Criterion it belongs has also been evaluated.

4. Results

The results are revealing the degree of participation of each criterion to the goal of the study and, simultaneously the degree of participation of each sub-criterion to the criterion where it belongs (Table 1). The local (L) and global (G) priorities based on our goal for both SCC and LCC companies operated in the Greek Cruise Market and in the Italian Cruise Market are displayed in Table 1. Global priorities (G) are obtained

for nodes by applying each node's local priority (L) and its parent's global priority (G). The global priorities for each alternative are then summed to yield overall or synthesized priorities. The most preferred alternative is the one with the highest priority towards our goal for both SCC and LCC companies operated in the Italian and the Greek Cruise Market.

The values of participation determine the gravity of the criteria for the achievement of the objective, with their differences and ranking on the decision factors been revealed. The results derived by the Expert Choice™ software application.



Table 2. CRITERIA and SUB-CRITERIA FOR A SMALL & LARGE CRUISE COMPANY SUPPLY CHAIN IN GREECE and ITALY

Criteria and Sub-criteria	SCC in GREECE		SCC in ITALY		LCC in GREECE		LCC in ITALY	
	Local	Global	Local	Global	Local	Global	Local	Global
1. Cruise product	0.203	0.203	0.091	0.091	0.054	0.054	0.103	0.103
1. Cruise program characteristics	0.622	0.126	0.196	0.018	0.196	0.011	0.169	0.017
2. Home ports	0.247	0.050	0.493	0.045	0.493	0.027	0.388	0.040
3. Port of calls and time of eve	0.131	0.027	0.311	0.028	0.311	0.016	0.443	0.046
2. Characteristics of cruise company	0.112	0.112	0.047	0.047	0.045	0.045	0.039	0.039
1. Main activity	0.349	0.039	0.297	0.014	0.079	0.004	0.327	0.013
2. Parent company or affiliated company	0.167	0.019	0.163	0.008	0.125	0.006	0.260	0.010
3. Specialization	0.484	0.054	0.540	0.025	0.796	0.035	0.413	0.016
3. Geographic area of activity	0.209	0.209	0.064	0.064	0.118	0.118	0.041	0.041
1. Company's headquarter	0.139	0.029	0.113	0.007	0.122	0.014	0.125	0.005
2. Location of distribution centers	0.333	0.069	0.235	0.015	0.648	0.076	0.125	0.005
3. Company's size (number of ships)	0.528	0.111	0.652	0.042	0.230	0.028	0.750	0.031
4. Passengers characteristics	0.132	0.132	0.301	0.301	0.119	0.119	0.427	0.427
1. Nutritional habits	0.145	0.019	0.338	0.102	0.226	0.027	0.354	0.151
2. Income	0.298	0.040	0.324	0.097	0.088	0.010	0.388	0.166
3. Age- Health	0.264	0.035	0.213	0.064	0.468	0.056	0.153	0.065
4. Nationality	0.293	0.038	0.125	0.038	0.218	0.026	0.105	0.045
5. Cost	0.247	0.247	0.241	0.241	0.330	0.330	0.261	0.261
1. Trip	0.253	0.063	0.156	0.038	0.362	0.119	0.374	0.098
2. Supplies	0.253	0.063	0.195	0.047	0.245	0.081	0.302	0.079
3. Port Fees	0.129	0.032	0.391	0.094	0.125	0.042	0.090	0.024
4. Transport	0.195	0.048	0.103	0.025	0.134	0.044	0.109	0.028
5. Storage	0.170	0.041	0.155	0.037	0.134	0.044	0.125	0.032
6. Supply strategy	0.097	0.097	0.256	0.256	0.334	0.334	0.129	0.129
1. Quality	0.252	0.025	0.193	0.049	0.204	0.068	0.119	0.015
2. Packaging	0.086	0.008	0.037	0.009	0.035	0.012	0.060	0.008
3. Trust to local suppliers	0.163	0.016	0.156	0.040	0.117	0.039	0.157	0.020
4. Special supplies (bunkering, watering)	0.082	0.008	0.186	0.048	0.201	0.067	0.140	0.018
5. Payment arrangement	0.158	0.015	0.200	0.051	0.08	0.027	0.199	0.026
6. Regulatory framework (sanitary regulations)	0.111	0.011	0.108	0.028	0.216	0.072	0.092	0.012
7. Know-how and experience	0.148	0.014	0.120	0.031	0.147	0.049	0.233	0.030

Table 3 and Figure 5 display the evaluation of the Criteria considered by experts with their significance in the selection of supply chain management or the alternative of outsourcing for the Small Cruise Company (SCC) in Greece and Italy. Table 3 presents the Criteria for the selection of the Small Cruise Company supply chain or outsourcing, their gravity per mil (‰), and their ranking. Also, the difference in significance is displayed in the same table.

The results are quite different for the same type of cruise company, between the two countries. Cost is the most

significant Criterion for the Greek SCC but in third place for the Italian SCC, with not noteworthy difference in evaluation. Passengers characteristics is evaluated as the first Criterion for the Italian SCC. The greatest differences appear in Passengers characteristics with 0.169 and Supply strategy with 0.159, both, higher for Italian SCC. Geographic area of activity evaluated with greater difference of 0.145 for the Greek SCC.



Table 3. EVALUATION AND RANKING OF CRITERIA FOR SCC in GREECE & ITALY

	SCC Greece	Ranking	SCC Italy	Ranking	Differences SCC Greece-Italy
Cruise product	0.203	3	0.091	4	0.112
Characteristics of cruise company	0.112	5	0.047	6	0.065
Geographic area of activity	0.209	2	0.064	5	0.145
Passengers characteristics	0.132	4	0.301	1	-0.169
Cost	0.247	1	0.241	3	0.006
Supply strategy	0.097	6	0.256	2	-0.159

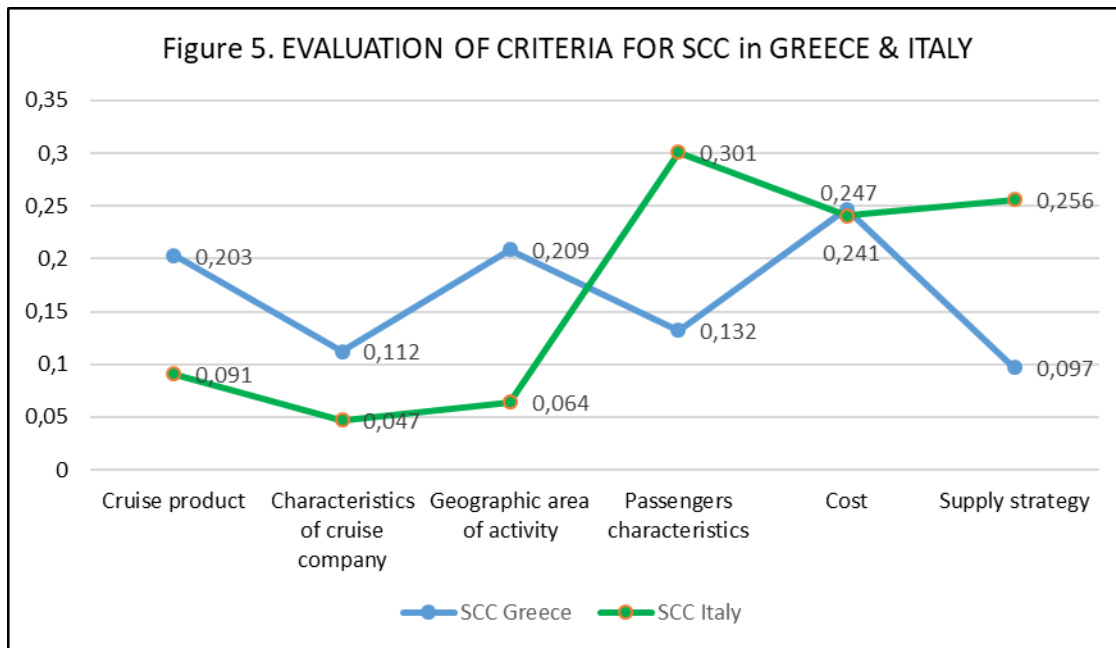


Table 4 and Figure 6 display the evaluation of the Criteria considered by experts with their significance in the selection of supply chain management or the alternative of outsourcing for the Large Cruise Company (LCC) in Greece and Italy. Table 4 presents the Criteria for the selection of the Large Cruise Company supply chain or outsourcing, their gravity per mil (%), and their ranking.

Also, the difference in significance is displayed in the same table.

The results for the Large cruise company between the two countries are also quite different. Supply strategy is the most significant Criterion for the Greek LCC but in third place for the Italian LCC, with the noteworthy difference in evaluation of 0.205 for the Greek LCC. Passengers characteristics is evaluated as the first Criterion for the

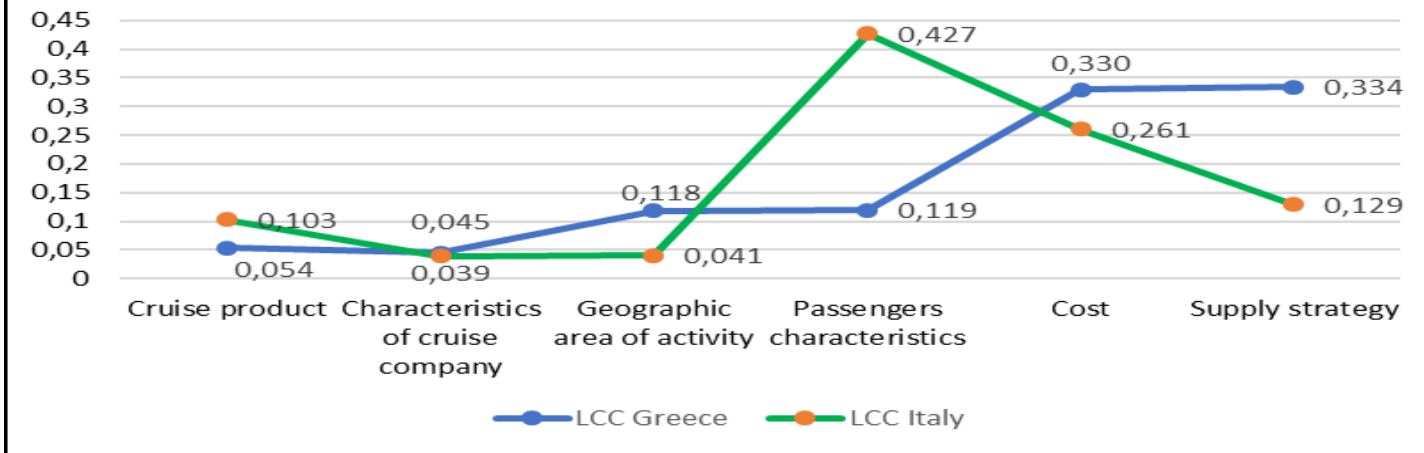


Italian LCC. The greatest differences for the Italian LCC appear in Passengers characteristics with 0.308.

Table 4. EVALUATION AND RANKING OF CRITERIA FOR LCC in GREECE & ITALY

	LCC Greece	Ranking	LCC Italy	Ranking	Differences LCC Greece-Italy
Cruise product	0.054	5	0.103	4	-0.049
Characteristics of cruise company	0.045	6	0.039	6	0.006
Geographic area of activity	0.118	4	0.041	5	0.077
Passengers characteristics	0.119	3	0.427	1	-0.308
Cost	0.330	2	0.261	2	0.069
Supply strategy	0.334	1	0.129	3	0.205

Figure 6. EVALUATION OF CRITERIA FOR LCC in GREECE & ITALY



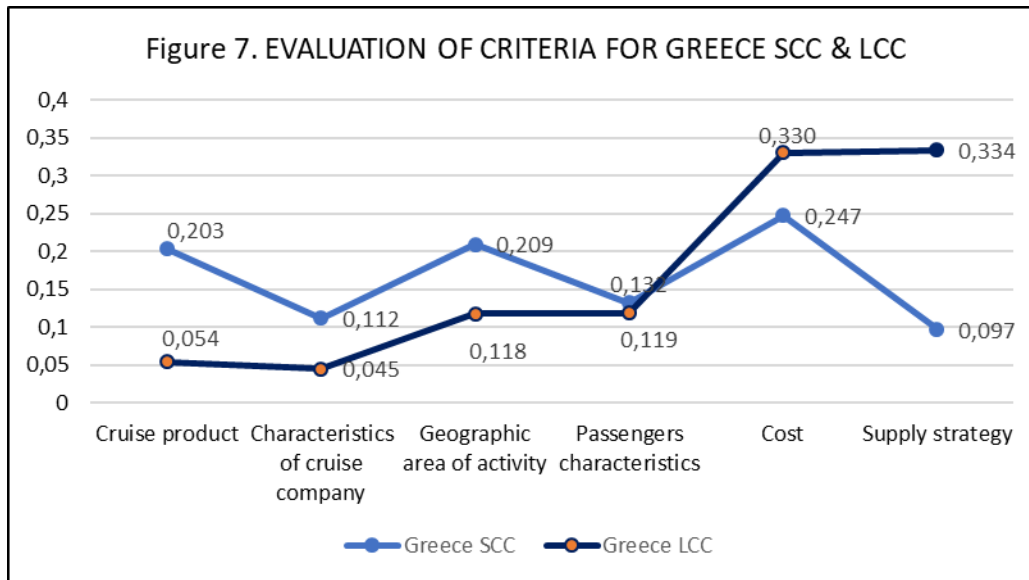
Another comparison of the results regarding the evaluation of the Criteria determining the supply chain management or the outsourcing alternative, will be between the different kinds of cruise companies in the same country. According to table 5, and Figure 7, it seems a very high difference in the evaluation of the most

significant Criterion, which is Cost, ranking first for SCC and second for LCC with a rather small difference (0.083), but the first Criterion for LCC, Supply strategy, ranks in 6th place for SCC, displaying the highest difference in significance (0.237) in favor of LCC.



Table 5. EVALUATION AND RANKING OF CRITERIA FOR GREECE SCC & LCC

	SCC Greece	Ranking	LCC Greece	Ranking	Differences SCC-LCC Greece
Cruise product	0.203	3	0.054	5	0.149
Characteristics of cruise company	0.112	5	0.045	6	0.067
Geographic area of activity	0.209	2	0.118	4	0.091
Passengers characteristics	0.132	4	0.119	3	0.013
Cost	0.247	1	0.330	2	-0.083
Supply strategy	0.097	6	0.334	1	-0.237



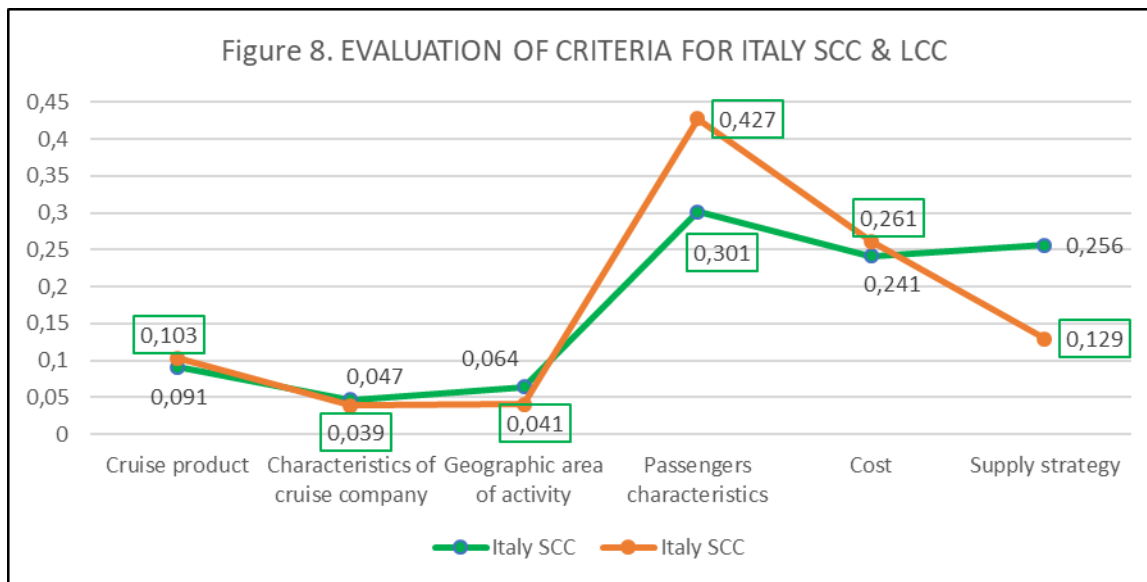
The results for the comparison between the Italian Small cruise company and Large cruise company reveal a rather parallel course of the Criteria significance and no extreme differences in their ranking. Passengers characteristics is the first important Criterion for both SCC and LCC, despite the difference in significance of 0.126 in favor of

LCC. Supply strategy ranks 3rd for SCC and 2nd for LCC, but their difference is the highest among all evaluations (0.127). The evaluation of the remaining Criteria is without noteworthy difference and their ranking is the same.



Table 6. EVALUATION AND RANKING OF CRITERIA FOR ITALY SCC & LCC

	SCC Italy	Ranking	LCC Italy	Ranking	Differences SCC-LCC Italy
Cruise product	0.091	4	0.103	4	-0.012
Characteristics of cruise company	0.047	6	0.039	6	0.008
Geographic area of activity	0.064	5	0.041	5	0.023
Passengers characteristics	0.301	1	0.427	1	-0.126
Cost	0.241	3	0.261	2	-0.020
Supply strategy	0.256	2	0.129	3	0.127



In the following Table 6 and subsequently Figures 9, 10, 11 and 12 all Sub-Criteria are displaced with their evaluation of significance.

Comparing the evaluation of the Sub-Criteria between the Small Cruise Company of Greece and Italy, it is shown that Cruise program characteristics (0.126), Company's size (0.111) and Location of distribution centers (0.069) are the Sub-Criteria considered of highest importance, while Packaging (0.008), Special supplies

(0.008) and Regulatory framework (0.011) are the three of the least significance for the Greek SCC.

Respectively the Sub-Criteria of highest significance for the Italian SCC are Nutritional habits (0.102), Income (0.097) and Port fees (0.094). On the other hand, the least important Sub-Criteria for the Italian SCC are Company's headquarter (0.007), Parent company or affiliated (0.008) and Packaging (0.009).

Regarding the Sub-Criteria evaluation of the Large Cruise Company of Greece it is shown that Trip



(0.119) is the most significant Sub-Criterion, Supplies (0.081) followed by Location of distribution centers (0.076), while main activity (0.004), Parent company or affiliated (0.006) and Cruise program characteristics (0.011) are the least significant for the decision to outsourcing or managing an own supply chain.

The most important Sub-Criteria for the Italian LCC are Income (0.166), National habits (0.0151) and Trip (0.098), and the least significant are Company’s headquarter (0.005), Location of distribution centers (0.005) and Packaging (0.008).

Table 7. SUB-CRITERIA FOR A SMALL & LARGE CRUISE COMPANY SUPPLY CHAIN in GREECE and ITALY

Sub-criteria	SCC in GREECE		SCC in ITALY		LCC in GREECE		LCC in ITALY	
	Local	Global	Local	Global	Local	Global	Local	Global
1. Cruise program characteristics	0.622	0.126	0.196	0.018	0.196	0.011	0.169	0.017
2. Home ports	0.247	0.050	0.493	0.045	0.493	0.027	0.388	0.040
3. Port of calls and time of eve	0.131	0.027	0.311	0.028	0.311	0.016	0.443	0.046
4.Main activity	0.349	0.039	0.297	0.014	0.079	0.004	0.327	0.013
5. Parent company or affiliated company	0.167	0.019	0.163	0.008	0.125	0.006	0.260	0.010
6. Specialization	0.484	0.054	0.540	0.025	0.796	0.035	0.413	0.016
7. Company’s headquarter	0.139	0.029	0.113	0.007	0.122	0.014	0.125	0.005
8. Location of distribution centers	0.333	0.069	0.235	0.015	0.648	0.076	0.125	0.005
9. Company’s size (number of ships)	0.528	0.111	0.652	0.042	0.230	0.028	0.750	0.031
10. Nutritional habits	0.145	0.019	0.338	0.102	0.226	0.027	0.354	0.151
11. Income	0.298	0.040	0.324	0.097	0.088	0.010	0.388	0.166
12. Age- Health	0.264	0.035	0.213	0.064	0.468	0.056	0.153	0.065
13. Nationality	0.293	0.038	0.125	0.038	0.218	0.026	0.105	0.045
14. Trip	0.253	0.063	0.156	0.038	0.362	0.119	0.374	0.098
15. Supplies	0.253	0.063	0.195	0.047	0.245	0.081	0.302	0.079
16. Port Fees	0.129	0.032	0.391	0.094	0.125	0.042	0.090	0.024
17.Transport	0.195	0.048	0.103	0.025	0.134	0.044	0.109	0.028
18. Storage	0.170	0.041	0.155	0.037	0.134	0.044	0.125	0.032
19.Quality	0.252	0.025	0.193	0.049	0.204	0.068	0.119	0.015
20.Packaging	0.086	0.008	0.037	0.009	0.035	0.012	0.060	0.008
21. Trust to local suppliers	0.163	0.016	0.156	0.040	0.117	0.039	0.157	0.020
22.Special supplies (bunkering, watering)	0.082	0.008	0.186	0.048	0.201	0.067	0.140	0.018
23.Payment arrangement	0.158	0.015	0.200	0.051	0.080	0.027	0.199	0.026
24. Regulatory framework (sanitary regulations)	0.111	0.011	0.108	0.028	0.216	0.072	0.092	0.012
25. Know-how and experience	0.148	0.014	0.120	0.031	0.147	0.049	0.233	0.030



Figure 9. EVALUATION OF SUB-CRITERIA FOR SCC in GREECE & ITALY

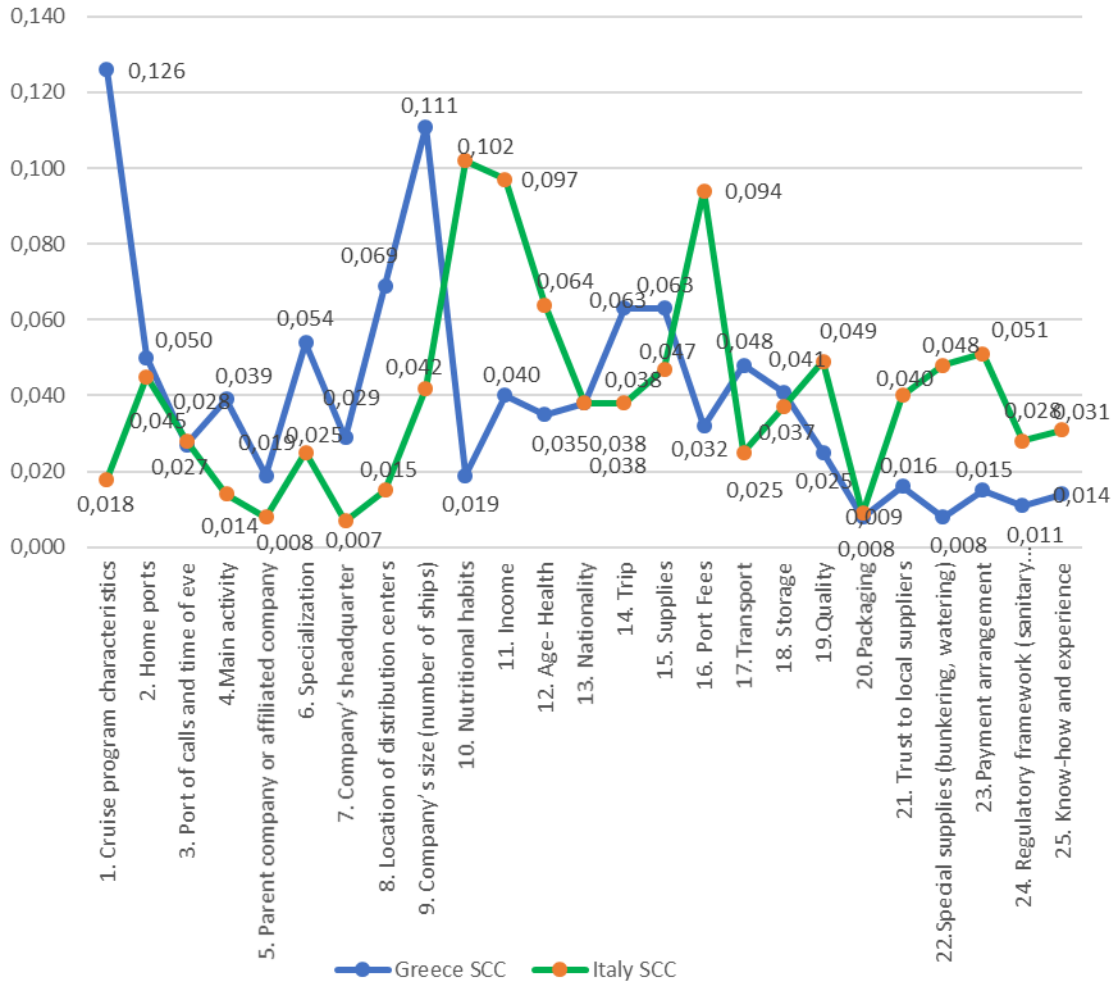
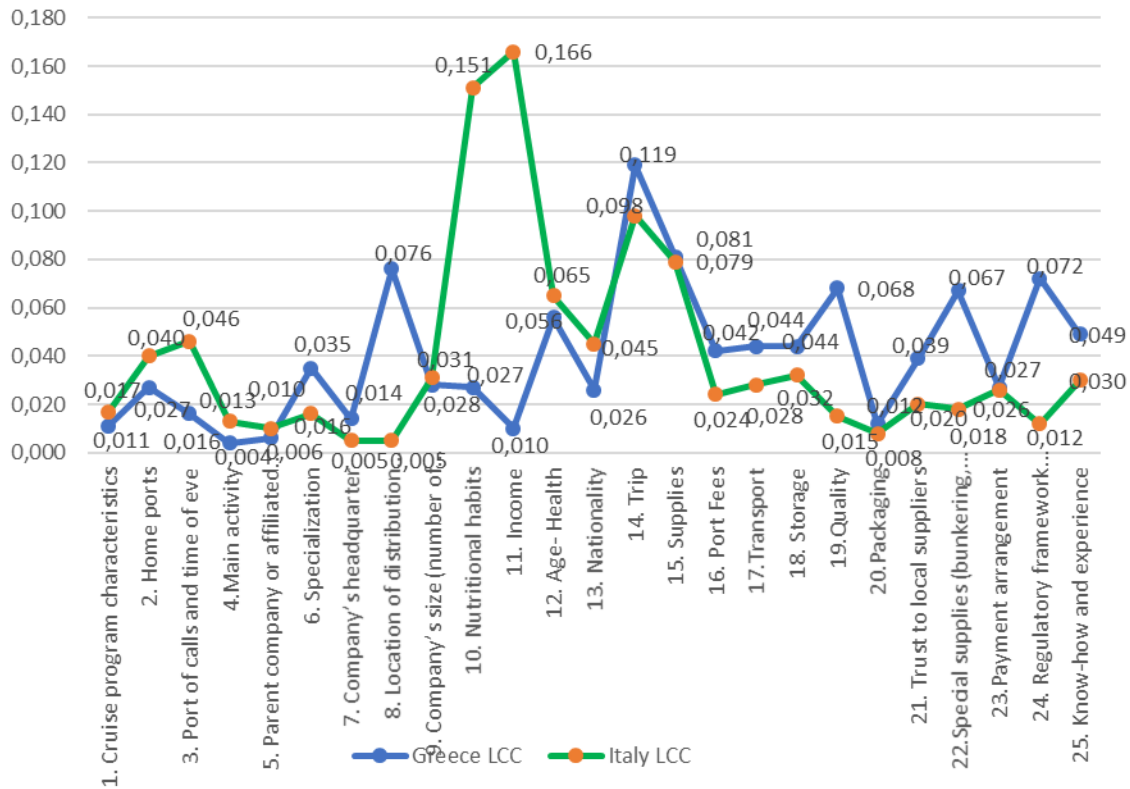
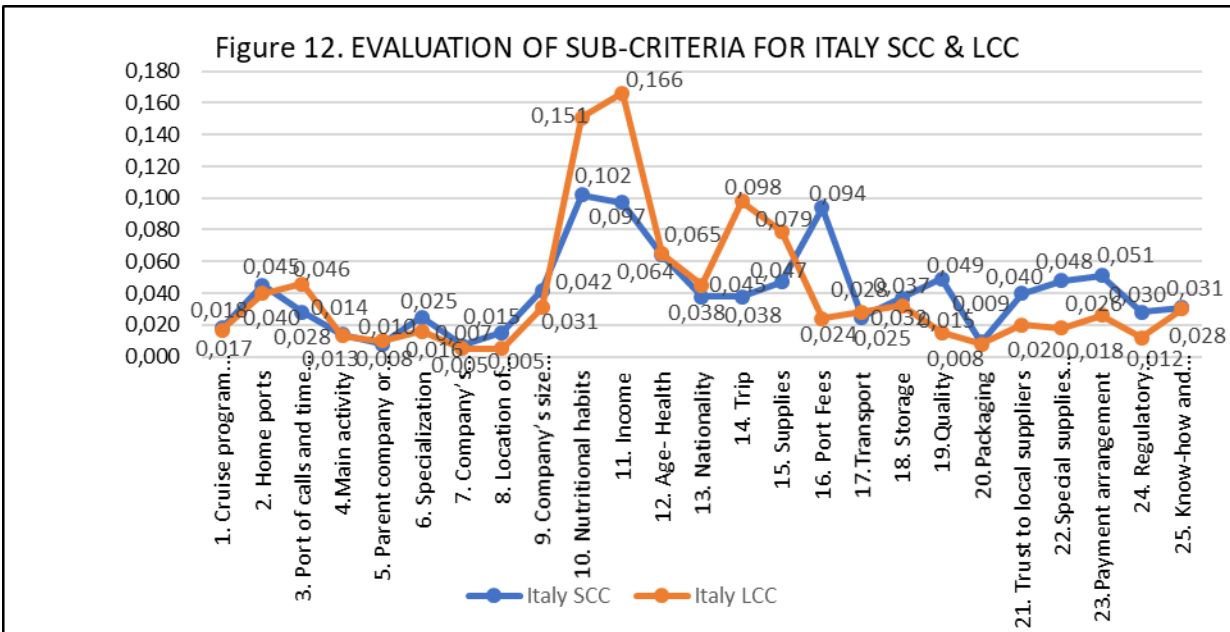
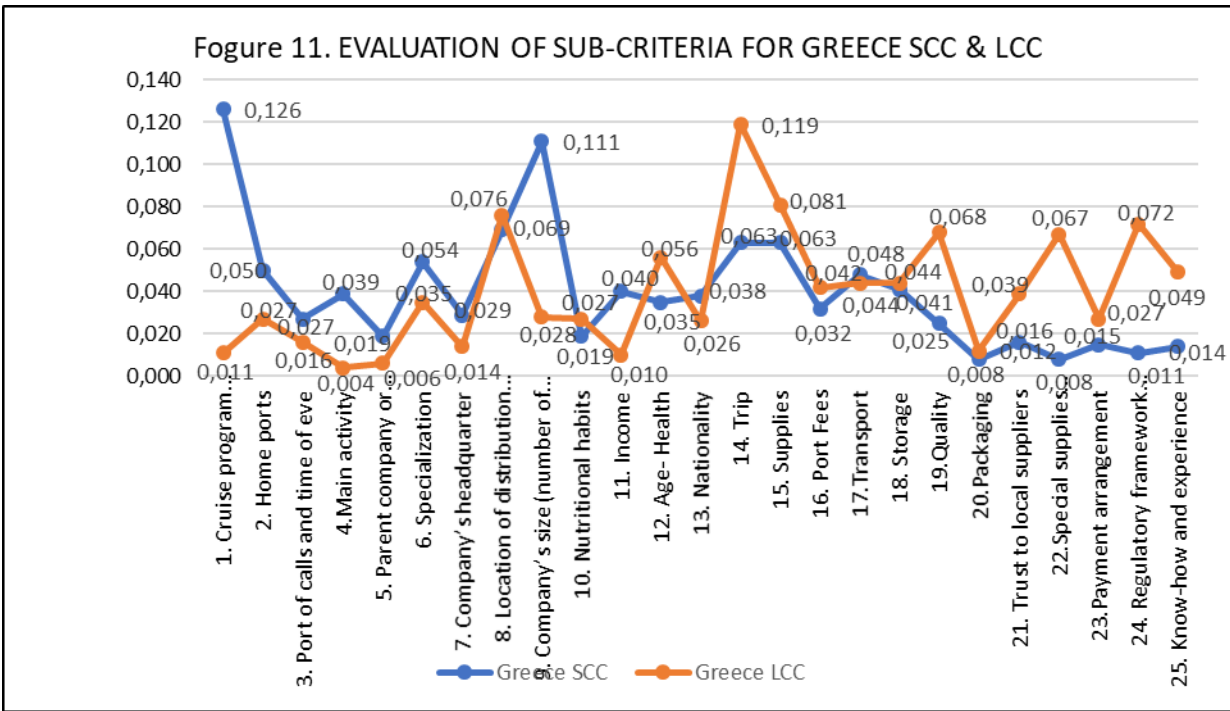




Figure 10. EVALUATION OF SUB-CRITERIA FOR LCC in GREECE & ITALY





5. Discussion and Conclusions

This study focuses on the complex issue of cruise supply chain management and, specifically, the factors



that determine outsourcing decisions for two different types of cruise companies and in two different Mediterranean countries with developed cruise tourism. Cruise supply chain is characterized by high complexity. This is because of the characteristics of the cruise customers who expect high quality, products' variety, lower prices, quick delivery and excellent customer service. Literature review reflects the opinion of cruise experts, who believe that cruise industry requires low operating costs, while at the same time preserving high levels of quality is very challenging for the management of the supply chain.

Outsourcing is a widely applied alternative that gains a lot of attention lately. The decision for outsourcing is affected by several different factors with primary the size of the company and the country where the cruise is developed. This work tries to identify and rank the key decision parameters for small and large cruise companies operated in two different countries of the Mediterranean, Greece and Italy.

The methodology of Analytic Hierarchy Process was applied, with the use of a professional questionnaire developed and addressed to different types of cruise companies operating in Greek and Italian territorial waters and the wider area of the Mediterranean. The first cruise company is a small company operating in the premium market while the second one is a large company operating in the mass market. The same types of cruise companies were used in the Greek market and (different companies but of the same type) in the Italian market. The set of key factors was identified based on literature review and brainstorming with business experts of both countries.

The responses were analyzed using specialized software Expert Choice to determine the key decision factors regarding the outsourcing. The AHP method, which is analyzed in Section 3, is very widely used multi criteria decision making (MCDM) method.

The results for the Criteria that affect the decision on outsourcing or developing own supply chain on the Supply Chain revealed **Cost**, **Passenger characteristics**, and **Supply strategy**, as the top drive Criteria of the cruise companies of both sizes, SCC and LCC, operated in both countries, Greece and Italy. In contrast, **Characteristics of cruise company** is considered by far the least important Criterion for the above-mentioned dilemma.

Regarding the relation of the Criteria significance between the two countries for the supply chain of the SCC, it is obvious that the difference in the evaluation is so that there is not any match in the ranking of these two categories (Table 3 and Figure 5). Except **Passenger characteristics**, and **Supply strategy** which are evaluated of higher significance for the Italian SCC, the evaluation of the other four Criteria is higher by the Greek SCC.

As for the evaluation of the Criteria significance between the two countries for the supply chain decision of the LCC, it is obvious that high differences occur in the evaluation of **Passenger characteristics**, (the 1st in significance for the Italian LCC) and **Supply strategy** (the first in significance for the Greek LCC) (Table 4 and Figure 6), while the remaining Criteria are evaluated similarly with differences less than 0.100 between the two countries.

Comparing the Criteria significance in the same country for both types of cruise companies, it seems that "**Supply Strategy**" is the top factor for the large company in Greece, although it has the least importance for the Greek SCC. For the latter, "**Cost**" seems to be of extreme importance (Table 4, Figure 7.) Generally, the Greek SCC seems to have less fluctuations in the evaluation among the Criteria comparing to the LCC.

Regarding the Criteria for the two different cruise companies operated in the Italian market, the analysis revealed that "**Passenger characteristics**" is indeed the top drive for outsourcing for both types of companies. In



addition, while the “**Supply Strategy**” is 2nd top factor for the SCC company, it ranks 3rd in importance for the LCC. “**Cost**” is also of extremely high importance as it is ranked in second place in significance for the LCC and in third for the SCC. Not any significance difference is noteworthy for the rest of the criteria between the two companies (Table 6, Figure 8).

Discussing the evaluation of the Sub-Criteria significance for the supply decision of the SCC in Greece and Italy, we may admit that picture of the relation between the two different assessments is very mixed. That is because of the appearance of parallel fluctuation in some Sub-Criteria, like Parent company or affiliated, Specialization, Company’s headquarter, Packaging, etc., but also the most extreme evaluation differences, such as for the Cruise program characteristics, Company’s size, Nutritional habits, Port fees, etc. Obviously, the differences in the Sub-Criteria evaluation for the same type of cruise companies in two different countries is related to the differences in the Criteria assessment and undoubtedly to the specificities related to the geographic areas of cruise activity in the two countries (Figure 9).

The relevant evaluation of the Sub-Criteria significance for the supply decision of the LCC in Greece and Italy, reveals a similar picture with that of the SCC, even though the extreme differences appear in fewer Sub-Criteria, like Nutritional habits and Income, while the convergence and even the coincide of evaluations appears in many Sub-Criteria, like Cruise program characteristics, Parent company or affiliated, Company’s size, Supplies, Packaging, payment arrangement, etc. This outcome is attributed evidently to the size of the company and to the programs scheduled for mass passengers and of longer period (Figure 10).

An evident difference revealed regarding the sub-criteria between the two different companies operated in Greece. The characteristics of the cruise program, the size of the company as well as the location of the distribution centers are of extreme importance for the SCC, while trip,

supplies and, again, the location of distribution centers are the major decision determinants for the LCC (Figure 11).

Fewer differences appear between the two companies regarding the sub-criteria evaluation in the Italian SCC and LCC. With a few exceptions of high differences, the assessment of the most Sub-Criteria is very close and even coincides for the two types of cruise companies. This is clear in the Figure 12, where Nutritional habits, Income, Trip and Supplies are the only noteworthy Sub-Criteria with higher importance for the LCC against the LCC. On the other hand, Port fees, Quality, “Special Supplies”, “Regulatory framework”, “Trust to local suppliers” and “Payment agreement” are of higher importance for the Italian SCC compared to LCC.

Besides the variation of the Criteria and Sub-Criteria between the SCC and the LCC operated in the Greek and the Italian cruise markets, the comparison of the Criteria and Sub-Criteria between the cruises offered in Greece and Italy between the SCC and the LCC, also revealed extremely interesting results and remarkable differences in their values. The differences in the evaluation by the experts of the cruise industry are justified by the difference of the programs offered by the SCC and LCC as well as by the geographical area of activity, which differentiates the contribution of each Criterion and Sub-Criterion to the final decision for the development of supply chain management or the alternative of outsourcing.

Supply chain management and outsourcing have both been given increasing interest by organizations worldwide, especially due to intensifying competition at both national and global level. Managers must act proactively and creatively in finding the best strategy for their organization to survive and excel in their market (Raja & Kherun, 2006). As the consequence, each strategy should be examined individually for every



different kind of cruise ship and for every area of activity and cruise operation.

Concluding this paper, we should point out that the selection between supply chain management and outsourcing for the cruise industry of Greece -and eastern Mediterranean- depends upon the Cost mainly and not at all upon the Supply strategy, regarding a Small and thematic cruise company, but for a Large and massive cruise company, Supply strategy will mainly determine the decision, which will not be affected by the Characteristics of the cruise company or the cruise product. Besides, an outcome contributing to the existing literature is the differentiation of the criteria affecting the outsourcing or Supply Chain Management selection, for the cruise industry in Italy -and central Mediterranean- where the Passengers Characteristics will be the main factor for both Small and thematic as for Large and massive cruise company. Neither the Geographic area of activity nor the Characteristics of cruise company will affect significantly this decision. These factors are proved to ensure for cruise companies, efficiency, cost effectiveness, high quality and service for the prompt satisfaction of their passengers.

The results of this study could be useful within the area of cruise ship supply chain management, an area that has not been addressed much in the literature (Papathanassis and Beckmann, 2011), and therefore of high contribution to existing literature. The outcome though, cannot be generalised because of the small number of participants in our research as well because of the geographical limitations (only Med region). Besides, factors that could influence the final decision of the cruise company, such as risk orientation, strategic risk management measures and the risk exposure leading to a high implementation level of prevention activities (Bendul & Skorna, 2016), have not been considered in this study and are included in its limitations. Future research could include more companies and be extended to different geographic areas (e.g Caribbean, Alaska,

North Europe) and market segments (e.g premium, luxury and mass).

References

- 1) Beaumont. N. and Khan. Z. (2005). A Taxonomy of Refereed Outsourcing Literature, *Working paper*. Monash University Business and Economics.
- 2) Bendul J. C., Skorna A. C.H (2016) Exploring impact factors of shippers' risk prevention activities: A European survey in transportation. *Transportation Research Part E: Logistics and Transportation Review*. Vol. 90, pp. 206-223
- 3) Chen, D. and Yi, P. 2010. Mode selection of tourism supply chain and its management innovation. Proceedings of the *international conference on ebusiness and e-government*, May 7-9, 2010, Guangzhou, china, pp. 3388-3391.
- 4) Christopher M. (1992). *Logistics and supply chain management*. Pitman Publishing Essex.
- 5) Danuta Szpilko (2017) Tourism Supply Chain – Overview of Selected Literature, *7th International Conference on Engineering, Project, and Production Management*. Procedia Engineering 182, pp. 687 – 693
- 6) Dawson, J., Stewart, E. J., Johnston, M. E., & Lemieux, C. J. (2016). Identifying and evaluating adaptation strategies for cruise tourism in Arctic Canada. *Journal of Sustainable Tourism*, 24(10), 1425–1441.
- 7) De Martino, M. and Morrillo A., (2008). Activities, resources and inter-organizational relationships: Key factors in port competitiveness. *Maritime Policy and Management*, 35 (6), pp.571-589.
- 8) Diakomihalis Mihail, Stefanidaki Evagelia. (2011). Cruise Ship Supply Chain: A field study on outsourcing decisions. *International Journal of Decision Sciences, Risk and Management*,



- Vol.3 (3/ 4), pp.369-383.
<http://inderscience.metapress.com/content/h1v0436940364g81/>
- 9) Di Vaio A., Diakomihalis M., (2018), Cruise ship supply chain: a field study on outsourcing decisions in Italy, *4th Olympus Conference ICSC*, Katerini, Greece, 14-15 September 2018, International Conference on Supply Chains.
- 10) Domberger. S. (1998). *The Contracting Organisation: A Strategic Guide to Outsourcing*. Oxford: Oxford University Press.
- 11) Guy. E., Urli. B. (2006). Port selection and Multicriteria Analysis: An application to the Montreal-New York alternative. *Maritime Economics and Logistics*. 8 (2). 169-186
- 12) Hila Constantin Manuel, Dumitrascu Oana (2014) Outsourcing Within a Supply Chain Management Framework. *Proceedings of the 8th international management conference "management challenges for sustainable development"*, November 6th-7th, 2014, Bucharest, Romania
- 13) James Laura, Olsen Lise Smed & Karlsdóttir Anna (2020) Sustainability and cruise tourism in the arctic: stakeholder perspectives from Ísafjörður, Iceland and Qaqortoq, Greenland, *Journal of Sustainable Tourism*, 28:9, 1425-1441, DOI: 10.1080/09669582.2020.1745213
- 14) Ivanov D., Pavlov A., Dolgui A., Pavlov D. and Sokolov B. (2016) Disruption-driven supply chain (re)-planning and performance impact assessment with consideration of pro-active and recovery policies. *Transportation Research Part E: Logistics and Transportation Review*, Vol. 90, pp. 7-24
- 15) Ketchen D.J. and Hult G.T.M. (2007). Bridging theory and supply chain management: The case of best value supply chains. *Journal of Operations Management*. Vol. 25 (2). pp. 573-580.
- 16) Lankford. W.M. and Parsa. F. (1999) Outsourcing: A Primer. *Management Decision*. 37(4). pp 310 – 316.
- 17) Lekakou, M., B., Pallis, A., A., Vaggelas, G., K., (2009). "Is this a home-port? An analysis of cruise industry's selection criteria". Proceedings of the *International Association of Maritime Economists Conference*, 24-26 June 2009, Copenhagen, Denmark.
- 18) Lirn. T. C., Thanopoulou. H. A., Beynon. M. J., Beresford. A. K. C. (2004). An application of AHP on transshipment port selection: A global perspective. *Maritime Economics and Logistics*. 6(1). 70-91.
- 19) Mader, P. (2015). Mechanisms of a microfinance crisis. In P. Mader (Ed.), *The political economy of microfinance* (pp. 160–194). London: Palgrave Macmillan.
- 20) Marti E.B. (1990). Geography and the cruise ship port selection process. *Maritime Policy and Management*. Vol. 17 (3). pp. 157-164.
- 21) Marti B. (2003). Trends in world and extended-length cruising: 1985-2002. *Marine Policy*. Vol. 28. pp.199-211.
- 22) Mentzer T.J., De Witt W., Keebler S.J., Nix W.N., Zacharia G.Z. (2001). Defining Supply Chain Management. *Journal of Business Logistics*. Vol. 22 (2).
- 23) Papathanassis A. and Beckmann I. (2011). Assessing the "poverty of cruise theory" hypothesis. *Annals of Tourism Research*. Vol. 38 (1) pp. 153-174.
- 24) Papatheodorou, A., (2006). The cruise industry – An industrial organization perspective. In: Dowling, R.K., (Ed.), *Cruise ship tourism*. pp. 34-43, CABI: Oxfordshire, UK.



- 25) Quinn. J.B. (1999). Strategic outsourcing: leveraging knowledge capabilities. *Sloan Management Review* 40(4). 9–22.
- 26) Rodrigue Jean-Paul & Notteboom Theo (2009) The terminalization of supply chains: reassessing the role of terminals in port/hinterland logistical relationships, *Maritime Policy & Management*, Vol. 36 (2), 165-183, DOI: [10.1080/03088830902861086](https://doi.org/10.1080/03088830902861086)
- 27) Roy Biplab, Mamun Al and Kuri Bapon Chandra (2015) Sustainable Tourism Supply Chain Management for Tourism Industry in Bangladesh. *Global Journal of Management and Business Research: F. Real Estate, Event & Tourism Management* Volume 15 (2) Version 1.0, pp.18-26
- 28) Saaty. T.L. (1977). A scaling method for priorities in hierarchical structures. *Journal of Mathematical Psychology*. Vol. 15, pp. 234-281.
- 29) Saaty. T. (1980a). *Multicriteria decision making: the analytic hierarchy process*. Mc Graw-Hill. New York.
- 30) Saaty. T. L. (1980b). *The Analytic Hierarchy Process*. McGraw-Hill Co. New York
- 31) Saaty T.L. (1999). *The Seven Pillars of the Analytic Hierarchy Process*, ISAHP, Kobe Japan
- 32) Ugboma. C., Ugboma. O., Ogwude. I. C. (2006). An Analytic Hierarchy Process (AHP) approach to port selection. Decisions-empirical evidence from Nigerian ports. *Maritime Economics and Logistics*. 8 (3), pp. 251-266.
- 33) UNWTO. (n.d.). *Sustainable Development of Tourism: Definition*. Retrieved from <http://sdt.unwto.org/content/about-us-5> .
- 34) UNWTO. (2016). Tourism highlights 2016. Retrieved from the World Tourism Organization website: <http://www.e-unwto.org/doi/pdf/10.18111/9789284418145> .
- 35) Vaggelas G.K. and Lagoudis I.N. (2010). Analysing the Supply Chain Strategy of the Cruise Industry: The case of a small cruise company' Paper presented at the *International Association of Maritime Economists Conference*. Lisboa. Portugal. July 2010.
- 36) Veronneau S. and Roy J. (2009). Global service supply chains: An empirical study of current practices and challenges of a cruise line corporation. *Tourism Management*. Vol.30. pp.128-139.
- 37) Wong. P.C., Yan. H. and Bamford. C. (2008) Evaluation of factors for carrier selection in the China Pearl River delta. *Maritime Policy and Management*. 35(1). pp. 27-52
- 38) Wongsurawat W., Shrestha V. (2018) Designing a Sustainable Tourism Supply Chain: A Case Study from Asia In. H. Qudrat-Ullah (ed.), *Innovative Solutions for Sustainable Supply Chains, Understanding Complex Systems*, Springer International Publishing AG, https://doi.org/10.1007/978-3-319-94322-0_10
- 39) Zhang X. Song H and Huang Q.G. (2009). Tourism supply chain management: A new research agenda. *Tourism Management*, Vol. 30 (3), pp. 345–358
- 40) Zhu Xiaowei. (2016) Managing the risks of outsourcing: Time, quality and correlated costs. *Transportation Research Part E: Logistics and Transportation Review*, Vol. 90, pp. 121-133