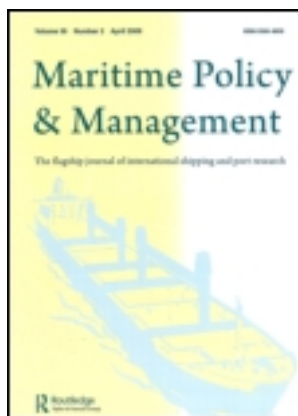


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Who pays the ferryman? An analysis of the ferry passenger's selection dilemma

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Purpose: based on the known in the literature difference between expected and perceived quality, this study examines the factors and the ways that influence the passenger to select a ferry operator.

Methodology/approach: the research attempts to shed some light on the importance of every selection determinant by employing multinomial logistics analysis which identify that the convenience determinant is pivotal when selecting a service.

Findings: the main findings of the study indicate that among six different combinations of factors—models—perceived service quality together with price and convenience (satisfaction determinants) best describe the choice procedure followed by the passenger. The evidence is drawn from a survey performed in the Greek coastal shipping sector.

Originality/value of the paper: to survive in a competitive market, organizations must continuously strive to understand their customers' wants and needs. Although this is a highly recognized issue in the marketing agenda little or no research has been done on passenger satisfaction and the subsequent selection of a ferry operator.

Practical implications: by using the findings of this work, ferry operators may deeply and timely understand their customers' purchasing behaviour and adapt their marketing policies especially in a competitive and fast-changing environment.

1. Introduction

Firms in the European Union (EU) are currently facing strong competition; they must offer better or differentiated services in order to gain the kind of competitive advantage that is difficult for competitors to imitate and, thus, be sustainable. Understanding customers and delivering products and services that satisfy their needs is central to the marketing agenda. How a customer selects a product or service and what drives him or her to purchase has been widely discussed in the marketing and economics literature. Some authors have argued for the violation of the principles of economic rationale in purchasing, and using instead a combination of conscious and unconscious processes. Others (e.g. [1, 2]) observed the behavioural concepts of motivation, cognition and learning for product selection. Finally, some scholars (e.g. [3, 4]) conceptualize the purchase procedure from a composite perspective, combining attitudinal and behavioural definitions.

Many attributes have been delineated as important antecedent factors to customers' purchasing intentions. These include word-of-mouth intention and complaint intention (e.g. [5]), price and brand name (e.g. [6]), store image (e.g. [7])

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and quality of service, which has been identified as one of the most important (e.g. [8–13]). Academic research has been done on airline passengers' quality determinants and selection criteria (e.g. [14–16]) and on the relationship of quality to the selection of a commercial carrier in shipping (e.g. [11, 12, 17, 18]). However, little or no evidence exists on the ways that the passenger customer selects a carrier in the shipping industry (ferry, coastal or short sea, which will be used interchangeably throughout this work). This may be because the very nature of the shipping industry, which seeks profit maximization through mass movements of freight and gives little attention to the individual passenger, viewing him or her as more of an annoyance or interference to the system than a viable revenue source. This viewpoint results, in passengers' minds, in an old-fashioned, slow and complex mode of transport designed only for bulk operations and providing no particular care for passengers' needs. The lack of research in this area may also be due to the intense competition from other means of transport for the traditional sea transport passenger, and the very low fares offered. Road and/or rail transport are perceived as meeting, more or less, users' requirements such as transit time, cost, reliability, flexibility, frequency and safety.

The recent debate in the EU of the so-called 'port package' (e.g. [19]) stresses the need for a more comprehensive approach to the role ports and sea transportation will have to play in the coming years. This is especially the case for the Greek coastal shipping environment, where a few major competitors share the market and serve the hundreds of islands of the Greek archipelagos. New domestic and foreign competitors (e.g. Carnival and Garibaldi) have shown eager interest in entering the market, since cabotage ended in 2004 and price de-regulation is expected in mid-2006.

The goal of this paper is to expand knowledge in the area of ferry passenger customers that is almost a virgin territory in the literature of services marketing and management by: (1) examining the main criteria under which the passengers select ferry services; (2) exploring different ways on how to describe the passenger customers' selection/purchase procedure through examination and assessment of how well passengers' satisfaction, expected and perceived service quality, price and route explain and predict purchasing behaviour; and (3) by calculating for the best model the importance of each determinant in an attempt to provide a prediction instrument to be used by academics and by managers of ferry services. Evidence is drawn from the Greek coastal shipping sector with data from passengers travelling through three large Greek ports: Piraeus, Heraclion and Patras.

The remainder of the paper is structured as follows: the second section reviews the existing literature on the selection and quality literature. The third section reviews literature related to the shipping industry and presents the research model and hypotheses that describe the purchasing procedure, taking evidence from the Greek coastal shipping sector. The fourth section presents the analysis and the six different models that were tested for fit, explanation and predictive ability of ferry passengers' behavioural patterns. The fifth section concludes the paper.

2. Background theory

2.1. Service quality and customer satisfaction

Service quality has been a frequently studied topic in the marketing literature, particularly in the last fifteen years (e.g. [20–28]). The principal focus of the service

quality literature has been to identify the service quality dimensions (e.g. [29, 30]) and to develop an instrument for measuring service quality (e.g. [21, 29–32]).

In a competitive market, the need for better service or higher levels of quality is clearly defined. To gain a competitive edge, firms must know exactly what the consumer sees as important, especially in services where the consumption and the production of the service are simultaneous. Over the last decade, service firms have identified service quality as a driving force in their success (e.g. [33]), as a consumer's judgement about an entity's overall excellence (e.g. [34]), as an outcome of satisfaction (e.g. [31, 35]), and as a condition precedent of the customers' selection procedure (e.g. [8, 9, 36, 37]). Other researchers (e.g. [20, 21, 38–41]) argued that satisfaction is a function of product or service performance relative to consumer expectations; an emotional reaction by the consumer in response to an experience with a product or service (e.g. [42]); or a more general attitude and, therefore, a direct result of the quality efforts made by a company (e.g. [43–47]) identified customer satisfaction as a very important precursor of the selection process, and also observed that satisfaction may be further decomposed to its quality, convenience and price characteristics. These theories support the concept of customer satisfaction as the primary, direct antecedent of customer selection, as they conceive satisfaction as an overall evaluation of the service based on all experiences over time.

Quality and satisfaction are both assessments made by the customer regarding the service experienced; hence the confusion vis-à-vis these constructs has attracted a good deal of discussion (e.g. [21, 39, 48]). Oliver [49, 50] assumed that the two, quality and satisfaction, are different in that quality is specific and cognitive, based on comparisons with the ideal or the excellent, whereas satisfaction is generic and emotional, based on comparisons with the fair and good. In the case of intangible and inseparable services, however, it is difficult to define objective standards for the service provided. Hence, both satisfaction and quality are usually described as the difference between service perceived and service expected (e.g. [51, 52]), generally following the disconfirmation paradigm. Parasuraman *et al.* [29] employed these disconfirmation principles in developing their Gap theory of the difference between pre-purchase customer expectation and perceived service and output quality, and in constructing their SERVQUAL model.

The SERVQUAL model and Grönroos' [53] contentions are two of the most widely accepted perspectives on the conceptualization and measurement of service quality. SERVQUAL includes two 22-item sections that measure customer expectations of service quality and customer perceptions of the service they receive, and identifies five dimensions of service quality: tangibles, reliability responsiveness, assurance and empathy (e.g. [29–31, 54–57]). The other widely accepted perspective on measurement of service quality, Grönroos' [53, 58], Nordic perspective, identifies two service quality dimensions: functional and technical. Several studies have proposed modified versions of SERVQUAL (e.g. [21, 59]) and Grönroos' model (e.g. [60]).

2.2. *Links and relationships between customers' selection criteria, customer satisfaction and service quality*

In an attempt to differentiate themselves from competition, some firms provide a huge variety of products or services to customers, which make the decision process even more difficult (e.g. [61]). Given this variety of products, services and offerings, how does the customer select? Bettman *et al.* [62], argued that customers have

clear preferences when making routine purchases, which they have learned and evaluated over time; however, in more complex or unusual situations, customers need guidance from the retailer. Foreman [63] suggested that companies must help customers understand the distinct characteristics of their product or service—such as price, quality and variety—to ensure that the customer selects their product.

Dimensions of quality and satisfaction as determinants of selection are also well debated in the literature, with the number of dimensions ranging from two to ten. Stafford's [64] review of US customer perceptions of service quality found that customers want courtesy, friendliness and convenience but also view 'fair prices, concerned management and institutional stability as integral components of the service process'. Elliot *et al.* [8] and Reaves and Bednar [65] identified that customer service, price, speed and access were choice criteria that customers usually used in choosing a bank. Keaveney's [9] exploratory research on the factors with which customers choose or switch banks provided five major causal factors: price, convenience, quality of service, employee–customer relationships and ability to solve problems.

Researchers questioned the traditional economic notion of the price and cost dominance over the customer's selection procedure, suggesting that other factors such as quality (e.g. [66–68]) or convenience (e.g. [69]) are more important than price increases or decreases and that customers are willing to pay more to enjoy these 'soft' benefits. Jones *et al.* [70] claimed that convenience and satisfaction are the two main factors influencing customer repurchase intention, while Butcher *et al.* [71] showed that customer convenience and value are positively associated with repurchase intentions and the selection procedure. Finally, Driscoll [72], drawing evidence from the financial services selection procedure, postulated that convenience, cost, service and customers' experiences are factors influencing the customers' selection criteria.

3. Quality, satisfaction and other selection determinants in shipping

Gifford and Stalebrink [73] stated that a key issue for transportation organizations is to create and develop mechanisms that allow them to pay attention to customers and focus on results and performance. Much research work has been done on this topic, identifying carrier selection criteria as well as the relevant antecedents or determinants of selection. Studies vary in terms of industry explored, range, classification and importance of factors identified.

A significant portion of the early research (e.g. [74, 75]) or specific paradigms in the shipping literature (Pedersen and Gray [11] work on a Norway shippers' survey) found price to be the most important factor in the commercial carriers' selection procedure. However, the majority of recent studies question this belief. For example, McGinnis [10], after 11 empirical studies, contradicts the then existing literature's prevalence of the cost factor superiority and identified certain service attributes—specifically, timing, security, and service, as well as price—as important. Whyte [76] emphasized the carriers' ability to meet requirements as imperative to single-transport reliability and cost factors. Dunn [77] reported that service variables should be considered before cost considerations in the carrier selection criteria. Burd and Daley [78] introduced the importance of service requirements and cost and found shippers gave greater weight to service, while carriers placed more importance on cost. Morash and Calantone [79] found that service criteria

(on-time delivery, reliability and safe delivery) were all ranked well above cost factors in selecting carriers. In their work on ocean freight services for corporate customers, Durvasula *et al.* [17], tested the SERVQUAL's five-dimensional scale (tangibles, reliability, assurance, responsiveness and empathy) and found that a three-dimensional structure in which responsiveness, assurance and empathy are combined into a single factor may better describe the phenomenon of service quality. Bardi *et al.* [80] named membership, transition time reliability, transportation rates and transit time as the most important characteristics in carrier selection. In their analysis of the Irish Sea freight market, Matear and Grey [81], acknowledged carriers' fast response to problems as the most important service quality determinant.

Sambrakos [36], asserted that customer selection criteria for carriers in Greece derive from the demand for the goods or services that transport helps to produce; demand for transport services in Greece is driven by quality of the offered transport product, price of the ticket, preferences of the consumers, population of the region, income level of the population, existence of substitute means of transport, and seasonal character of the Greek coastal shipping. Georgadopoulos and Vlachos [82], listed price, location, previous experience, reputation of the shipping company, safety on board, regularity of service, sufficiency and efficiency, speed and facilities on board as factors influencing buying behaviours (demand) in shipping. In the same authors' 2003 study, price, substitutes, alternatives, population size, seasonality, tax policies and passengers' requirements were acknowledged as determinants of transport demand. In another study, Mylonakis and Vlachos [83] suggested destination, travel time, departure arrival time and number of persons travelling, type of accommodation available and the total cost as possible factors for selecting a ship. Finally, reliability, timeliness, responsiveness, problem-solving ability, accuracy, customer service and flexibility are used by Panayides and So [18] to conceptualize logistics service quality.

3.1. *The passengers' selection dilemma*

At time of writing, 2006, little or no attention was given to empirically examining the carrier selection criteria for the ferry passenger. A great deal more has been written about passenger selection criteria, and quality and satisfaction issues in other transportation sectors, such as the airline industry (e.g. [14, 15, 84]). No empirically tested study on the subject exists in ferry, short sea and coastal shipping to the best of the author's knowledge. While academic research is continuously engaged in refining various conceptualizations for commercial carriers' selection criteria and their antecedents, much less attention has been devoted to the ways that ferry passengers select and evaluate a carrier as a coastal shipping line. In analysing the issue, two main reasons may induce the customer to opt for a specific carrier: the lack of transportation alternatives or the selection criteria employed by everyone. The first case, lack of alternatives, although pivotal will not be thoroughly examined since, in a free market, direct competitors and substitutes may enter the market at any time. The latter reason will be the basic field for our research.

3.2. *Search model and questions*

Our examination of the literature revealed certain selection criteria which have been recognized, although the literature differs in which criteria are employed and on their

level of importance. The criteria that have been identified are similar to the plethora of findings for the purchasing function in almost every quality and economics handbook. The first profound question to be examined may be:

Which are the dimensions (criteria) most suitable for use in the ferry passengers' selection case?

This study recognizes that service quality and satisfaction are distinct constructs (e.g. [85, 86]) and that service quality, to an extent, leads to satisfaction (e.g. [29, 45, 87]) which, in turn, is the primary antecedent of customer selection. So, if selection is partially determined by service quality, what might be the other determinants of selection? Since no empirical evidence exists to define the ferry passengers' selection criteria, a good starting point may be to explore whether the dimensions from other industries or other commercial carrier's structure are applicable.

One of the simplest and well acknowledged structures in commercial shipping has been introduced by D'Este and Meyrick [37], who listed three factors that influenced the commercial carrier selection procedure:

1. Freight cost
2. Route (convenience, frequency, capacity, flexibility, availability)
3. Service factors (reliability, fast response to any problems, damage avoidance, loss and theft, co-operation with carrier).

This approach is very close to the prevailing approach of the marketing literature, which breaks *customer satisfaction* into three components: service quality, convenience and price (e.g. [21, 22, 47, 88]). Existing research has also demonstrated that satisfaction is strongly associated with purchase (selection) or repurchase intention (e.g. [35, 21, 89]).

Also of interest is the ideal combination of these elements, since service quality, convenience and price may not be all useful in the analysis. The ideal relationship among the three needs to be examined and the question may now take the form of:

Are all the three elements equally essential when the ferry passenger selects service or in other words quality or satisfaction better explains the selection process?

Selection (real purchase) is the customers' attitude realized and is usually based on past experiences or present expectations with respect to the required service, company or brand under consideration (e.g. [90]). But which prevails when a customer chooses a service, past or perceived experiences or pre-purchase expectations? One approach in the literature argues for using the difference between the expected and perceived quality by customers to measure quality (e.g. [29, 30] Gap theory), following the disconfirmation paradigm. Another approach, based upon certain drawbacks of the Gap theory, questions the relevance of the expectations-performance gap as the basis for measuring quality because, by measuring expectations only, where the time of measurement is usually simultaneous to the consumption time, the Gap theory leads in increased or altered expectations. Instead, this approach argues for the superiority of simple performance-based measures of service quality (e.g. [21, 22, 48, 55, 91]). Evidence from many industrial sectors provides varying results on the question of whether expected or perceived service quality better describes the phenomenon (e.g. [30, 31, 49, 50]), while some researchers contend that expected and perceived difference may be used together

in order to diagnose service shortfalls (e.g. [92]). To shed light on this disputation a logical question may be:

Are perceived and expected service quality valued differently by the customer **and** which one better explains the selection problem for the ferry passengers?

From the previous analysis, we formed four hypotheses:

Hypothesis 1: Expected service quality and perceived service quality are distinct constructs in the minds of coastal shipping's passengers.

Hypothesis 2: Perceived service quality explains the selection procedure process followed by the ferries' passengers better than does expected service quality.

Hypothesis 3: Passengers' satisfaction is a multidimensional construct that includes dimensions of quality, price and convenience (route).

Hypothesis 4: Coastal shipping passengers' purchasing behaviour is better explained when convenience and price considerations complement the service quality criterion; in other words, customer satisfaction rationale is a better predictor of selection process than service quality alone.

4. Market overview

Greek coastal sector and domestic ferry services was until 2004 a fully regulated industry where the state defined the prices and provide the required licences for the carriers (cabotage) operating in Greece. While some steps towards the liberalization of the industry were made recently, the Greek government continues to impose price ceilings on fares and price controls on food and beverage sold on board, and to control manning conditions and scheduling procedures. This heavy regulation was deemed necessary because of the complex nature of the Greek archipelagos, where more than 100 islands, almost 200 ports, more than 1200 direct port-to-port connections, and 25 million passengers' expectations must be managed efficiently. The expressed intention of the government to deregulate the market fully in mid-2006 encourages the antagonism between domestic and EU ferry companies who want to operate in Greece.

At present, five large ferry passenger firms directly or indirectly control the market:

1. Attica Enterprises, through its two subsidiaries Super Fast Ferries and Blue Star Ferries has a fleet of 16 newly built cruise and passenger vessels which serve mainly Greek-Italian routes and certain Aegean routes. The company is also serving Belgium–Scotland routes as well as Germany–Baltic routes and has been granted several awards for its service:
 - 4-star grading by VisitScotland as an exceptional example within Scotland's tourism industry in July 2005
 - 'Best ferry company' in the 2005 19th Guardian and Observer Unlimited Travel Awards
 - 'Best Ferry Operator' by the Scottish Passenger Agents' Association, for two consecutive years.
2. Minoan Lines serves mainly Crete and Italy destinations with a fleet of seven newly built vessels. It also has a contract for four new vessels, costing

- up to 800 million USD. Minoan has been awarded the ‘Best Ferry passenger award’ from the Lloyd’s List and, together with Attica, serves more than 60% of total passenger flow from Italy to Greece.
3. Hellenic Sea Ways has a fleet of 34 vessels, 18 of which are newly built catamarans and 16 of which are older, conventional ones. Hellenic is a leader in the internal coastal shipping lines, serving almost 35 ports throughout the Aegean islands, Sporades and Saronikos. After the wreck of the *Samina* in 2000, with more than 80 casualties, Hellenic undertook an extensive re-organization programme.
 4. Cretan Shipping plc (ANEK) has an intense presence in Greek–Italian routes, Cretan routes, in the Dodecanese islands. It has a total fleet of ten vessels, a third of which are newly built, while the rest are very old.
 5. NEL has an intense presence in the Aegean and Adriatic Sea routes. The company’s fleet numbers six vessels, three of which are new passenger-car-ferry boats and three of which are old ships.

4.1. *The survey*

4.1.1. *Method.* This empirical study focuses on identifying the selection procedures and selection criteria followed by coastal shipping passengers. The target group, passengers, has been investigated regardless of class travelled (business or economy). Because the work aims, among other issues, at revealing the differences between expected and perceived perceptions of customers, it was necessary to set up a two-stage onboard survey. Stage I was performed inside the vessel and just before departure, when it was assumed that the respondent would not yet have had enough time to evaluate the service. Stage II took place at least an hour after departure, when it was assumed that the same respondent would be able to assess the offering and rate his or her overall perception on quality.

4.1.2. *The sample.* The data were collected from passengers travelling from the three Greek ports of Piraeus, Patras and Heraclion. These ports were selected for their size and location and because more than 25 million Greek and foreign passengers use these ports each year to travel to Greek islands and to Italy and Europe. The sample of passengers was randomly selected by the trained interviewers on the ships. A number of respondents was excluded as biased and extreme outliers were later rejected from subsequent analysis. The final usable sample consisted of 213 ferry passengers, a profile of which is presented in table 1.

4.1.3. *The questionnaire.* To measure the variables, data were obtained through the use of a specially developed questionnaire, which consisted of four sets of questions, the first two and the fourth sets of which were asked just before departure, and the third set of which was asked at least an hour after departure. The first set asked passengers to indicate who—the passenger or someone else—selected the service and to name of the company they were travelling with. The next 14 questions, which were based on existing research on commercial carrier selection criteria, explored passengers’ selection criteria—including service, route/convenience, cost and availability—in order to identify customer expectations for ‘usual’ (not ideal) service. Items were measured in a 5-point Likert scale from 1 (never) to 5 (always). Because of questionnaire restrictions imposed by both the shipping companies and

Table 1. Socio-demographic characteristics.

Demographic	Percent
Age	
15–25	32.4%
26–35	14.4%
36–45	16.7%
46–55	16.2%
56–65	11.1%
66+	9.3%
Gender	
Male	59.7%
Female	40.3%
Education	
Primary	14.9%
Secondary	39.1%
University	41.4%
Post-graduate	4.7%
Occupation	
Wage earners	29.9%
Freelancer/ businessman	16.8%
Farmer	3.7%
Worker	10.7%
Workers	8.9%
Pensioners	15%
Unemployed/ student	14%
	0.9%

the selected survey method, the third set contained only one question and investigates the overall perceived service quality from the vessel. The question asks 'How have you perceived the overall vessel's service quality?' This question aims in capturing the quality that the customer perceives after he or she has experience the service provided.

The author recognizes that the perceived service quality may be measured more completely by using the exact set of 14 questions applied previously, but this was not possible. This approach is not without precedent: Cronin and Taylor [21] used a single item to measure customers' overall feelings toward service. The fourth set of questions was related to socio-demographic characteristics of the respondents. Interviews were conducted in two stages: Stage 1, includes sets 1, 2 and 4, while Stage 2 contains step 3 and answers were requested from the same respondents. The mean responses to the interview questions are presented in table 2.

4.2. Data analysis

4.2.1. *Reliability.* To assess the 'usually' expected service quality dimensions of the passengers, we had to first calculate the reliability of the introduced instrument. The reliability estimate (Cronbach's alpha measures) for the expected set of questions (expected, 14 items) was high (0.869), verifying the very good scaling of the instrument.

The high value in alpha coefficients demonstrates the good internal consistency of the model and that it has acceptable reliability value in its original form. Because the removal of none of the items led to a significant improvement of the alphas, all the items were kept in the analysis.

Table 2. Descriptive statistics table.

The coastal shipping company I usually want to travel with ...	Mean	Std deviation
gives confidence to me ('CONFIDENCE')	3.57	1.228
provides assistance if a problem appears ('EMPATHY')	3.22	1.322
is financially viable ('VIABILITY')	3.70	1.133
has polite employees ('POLITENESS')	3.54	1.205
has safe vessels ('SAFETY')	3.91	1.111
is local ('LOCAL')	2.35	1.569
has a fast and modern fleet ('SPEED')	3.78	1.224
has suitable hour of departure ('DEPARTURE')	3.58	1.347
has suitable hour of arrival ('ARRIVAL')	3.53	1.285
is the only available for my trip ('UNIQUENESS')	1.82	1.370
has polite ship agents ('SHIP AGENTS')	2.40	1.427
offers me good value for money ('VALUE')	2.21	1.521
offers cheap tickets ('CHEAP')	2.19	1.833
is fully booked and I have to travel with another ('AVAILABILITY')	1.35	0.835

Table 3. Descriptive statistics—perceived quality.

	N	Mean	Std deviation	Variance
How have you perceived the overall vessel's service quality?	216	4.06	0.923	0.852

4.2.2. *Validity.* The face and content validity of the construct was ensured because of the literature survey and analysis and the resulting items chosen for the instrument. Further, when the factor analysis was conducted, almost all items load to the factors as expected, thereby demonstrating a strong convergent validity. In addition, the variance of all items' extracted scores exceeded the cut-off point of 0.5, providing support for convergent validity of the construct [93].

4.2.3. *Dimensions of passengers' satisfaction.* In order to find the interrelationships between items and to verify Hypothesis 3 for the different aspects (dimensions) of satisfaction (and, thus, selection) we performed an exploratory factor analysis (EFA) using the first set of questions. EFA was used because the exact relationships between observed and latent (factors) variables are unknown in the quality shipping literature and due to the absence of a sufficiently detailed theory. The purpose is to come out with the minimum number of factors that explain the covariation among observed variables.

Factor analysis was run using the method of Principal Components Analysis (PCA) to extract the factors and a Varimax rotation to improve the interpretation. Running the first set of questions—4 items—we extract four (4) factors which explains the 65.21% of the total variance. The Kaiser–Meyer–Olkin statistic was very high (0.747) indicating the existence of strong relationships among items.

Table 4. Initial four factors rotated solution.

ITEMS	Components			
	Service quality	Route	Cost	Availability
'CONFIDENCE'	0.858			
'EMPATHY'	0.764			
'VIABILITY'	0.811			
'POLITENESS'	0.620			
'SAFETY'	0.715			
'LOCAL'	0.604			
'SPEED'	0.536			
'DEPARTURE'		0.905		
'ARRIVAL'		0.849		
'CHEAP'			0.790	
'VALUE'			0.738	
'UNIQUENESS'				0.782
'SHIP AGENT'				0.697
'AVAILABILITY'				0.426
Eigenvalues	3.975	2.435	1.542	1.178
Variance explained	28.394%	17.391%	11.015%	8.415%

Notes: All the items were measured in a five-point scale, 1 = very bad, 5 = very good.

The PCA revealed that a four factors structure explains the 65.21% of the total variation within the data set and confirms the multidimensionality of the passenger's satisfaction. The observed four factors include:

- *Quality of service* with items such as confidence, empathy, viability, politeness, safety, local and speed evolve consensus on the fact that these attributes play an important role in the overall satisfaction process.
- *Convenience* contains the two items expected, namely departure and arrival time which are essential factors when selecting service. Shipping routes are not only characterized as connecting port A to port B and elements such as frequency and time contribute to overall passengers' assessments.
- *Price* is addressed by the two components of value and cheapness, which conceptualize the passengers' trade-off between economic sacrifice and required level of service. The investigation of sacrifices other than monetary (e.g. psychological, physical) and their link to value estimations remains outside the scope of this research.
- The existence of *alternatives* or *availability* goes beyond the convenience factor and indicates whether the customer has a set of alternatives to choose from. Lack of alternatives is highly relevant in the coastal shipping environment, especially in regulated industries, like that in Greece.

Prompted by the announced decision of the Greek government to release all restrictions imposed to coastal shipping by end of 2006, the associated full liberalization of coastal shipping services and the subsequent entry of major domestic and foreign competitors into the market the 4th dimension of satisfaction has been decided to be eliminated from subsequent analysis. This decision is further

excused from the small increase in suggested models' predictability observed later in this work. This way the study will focus at the next stage of development and it will be more comparable to other industries. It has been decided to perform again EFA but obliging the PCA to extract only three factors. The new factor analysis identifies three factors which explain the 56.79% of the total variance but keeps all observed variables in the analysis. The Kaiser–Meyer–Olkin statistic was very high (0.747) indicating the existence of strong relationships among items (Table 5).

It has been shown that variables in the new structure load in the same manner as previously. Hence, in the first factor, which retains its name as *service quality*, the same variables are present. In the second factor, which is labelled as *convenience* or *route*, uniqueness and ship agent appeared, a logical outcome, given that both characterize the convenience of getting the service. Availability of service was added to the third factor, which was previously identified as *Price*, inducing the trade-off logic between what one expects before purchase (value) according to whether or not one has a choice (availability).

We can conclude from this analysis that satisfaction is a multidimensional construct in the case of the coastal shipping industry and that, like other industries, it includes the characteristics of quality, convenience and price. This confirms the validity of Hypothesis 3. In addition, the 'alternatives' factor should not be considered when no barriers to market entry exist and, as a result, uniqueness of the service stands to be only temporary. Of course, this argument is not supported when the passenger has alternatives to sea travel—like rail, road or air—and is not committed to any particular means of transportation.

4.2.4. *Are expected service quality and perceived service quality different?* The concept of perceived versus expected quality is well founded in the quality and services marketing literature, as has been discussed. Expectancy models (e.g. Gap

Table 5. Initial three factors rotated solution.

ITEMS	Components		
	Service quality	Convenience	Price
'CONFIDENCE'	0.844		
'EMPATHY'	0.807		
'VIABILITY'	0.773		
'POLITENESS'	0.651		
'SAFETY'	0.651		
'LOCAL'	0.614		
'SPEED'	0.458		
'DEPARTURE'		0.794	
'ARRIVAL'		0.784	
'UNIQUENESS'		0.600	
'SHIP AGENT'		0.583	
'VALUE'			0.695
'CHEAP'			0.684
'AVAILABILITY'			0.480
Eigenvalues	3.975	2.435	1.542
Variance explained	28.394%	17.391%	11.015%

Notes: All the items were measured in a five-point scale, 1 = very bad, 5 = very good.

theory [31]) are extensively criticized mainly because it is now assumed that expected quality negligibly contributes to the overall evaluation of the service, not because it is considered unimportant (e.g. [14, 94]). The approach of this study will be to highlight the different roles expected and perceived service quality play in the formation of the overall evaluation of the service. In order to test our third hypothesis, which contends that perceived and expected quality are different, correlations between expected and perceived quality were computed first and are tabulated in table 6, which shows statistical significance at the 0.01 level. In fact, there is a relatively high correlation between the two, but they are clearly different.

A Wilcoxon Signed-rank test based on the differences between scores in the two conditions was applied next, but in order to retain the categorical nature of the data, the factor scores of expected service quality were not used. Instead, a new variable score was developed from the sum of scores of all seven variables loading in the relevant factor (service quality) to express the expected service quality. The sum was then divided by 7, rounded and recoded in a 5-point Likert-type scale. This latent variable was named 'overall expected service quality'. The score of the original question of the 'overall perceived service quality' has been used, and the results are presented in table 7.

Table 7 results indicate that expected and perceived quality vary and this difference is statistically significant at .99 level ($p = 0,000$) and that expected quality is valued less in passengers' minds than the service quality offered to them by shipping companies. This underscores the fact that not only the two are distinguishable but also need to be further discussed since it confronts the rather dominant notion in the quality literature, that expected quality is ranked higher in customers' minds than perceived and this forms the gap or the dissatisfaction observed. In any case our first hypothesis seems to be confirmed.

Table 6. Correlation between expected and perceived quality.

		Perceived quality	Expected quality
Perceived Q.	Pearson correlation	1	0.556**
	Sig. (2-tailed)		0.000
	N	216	212
Expected Q.	Pearson correlation	0.556**	1
	Sig. (2-tailed)	0.000	
	N	212	212

**indicates significance at $p < 0.01$ level.

Table 7. Test statistics—Wilcoxon test.

			N
Perceived SQ–Expected SQ	Negative differences (Expected < Perceived)		135
	Positive differences (Expected > Perceived)		59
	Ties (Perceived = Expected)		19
	Total		213
Perceived SQ–Expected SQ			
Z		–5.373 (based on positive ranks)	
Asymp. sig. (2-tailed)		0.000	

4.2.5. *Selection procedure as a function of the factors.* In order to examine customers' selection procedures, the revealed approach (what the passenger really selects as revealed by the real choice of ferry operator), and not the stated approach (what the passenger states or declares that he or she will select), was adopted. By doing so, any selection bias or doubt will be diminished. Also, affiliated or similarly operating shipping companies were grouped together and recoded, so the five companies originally identified became three groups. Minoan Lines and Anek Lines remained in the analysis as Firm 1 and 2 respectively, while the rest were grouped together as Firm 3.

Further, the variable 'overall perceived service quality' (in a 5-point scale) has been, collapsed into a 3-point scale. Responses of 'unacceptable', 'poor' and 'just fair' were recoded into a new 'not satisfied' category, while the categories 'good' and 'very good' were retained and recoded as 'satisfied' and 'very satisfied' (Table 8). As a baseline, we used the second shipping firm (Anek). As covariates, we used the factors scores extracted from the previous analysis for expected service quality. In the case of perceived service quality, the score of the collapsed transformed variable was used.

Taking into account the categorical nature of the responses, the non-parametric method of multinomial logistic regression was selected and applied in order to examine whether the expected quality describes the selection procedure better than the perceived service quality, along with route and cost as factors that influence the selection procedure. In arithmetic terms, the relationship between selection procedure and expected or perceived quality, plus the route and cost, takes the form of:

$$Y = a + b_1X_1 + b_2X_2 + \dots + b_nX_n$$

where Y = firm selection, (dependent variable), a = exposure variable or constant, b_1, b_2, b_n = coefficients, and X_1, X_2, X_n represent the perceived or expected quality, cost and route (independent variables). Tung [95] and Kleinbaum [96] stated that multinomial logistic regression is highly recommended when the dependent and independent variables are a mixture of qualitative and quantitative variables. This and other similar techniques are used to describe the occurrence or non-occurrence of certain events and predict an outcome.

4.2.6. *Logistic statistics.* Although the link between the selection procedure followed by a customer and Service Quality, Price and Route elements is well

Table 8. Case processing summary of transformed data.

		<i>N</i>	Marginal percentage
Which is the ferry operator you are travelling with?	1	90	42.5%
	2	25	11.8%
	3	97	45.8%
How you evaluate the overall SQ you have received from ship?	Unsatisfied	43	20.3%
	Satisfied	94	44.3%
	V. satisfied	75	35.4%
VALID		212	100%
MISSING		4	

grounded in the literature (as previously presented) the potential for further clarification of this relationship needs to be considered. The objective is to increase the degree of conceptualization that the data capture and test different conceptual structures.

These structures were selected by taking into account all possible combinations of the available dimensions, much like a stepwise regression. In this way, every variable was added to expected or perceived service quality, relevant characteristics were examined, and six different models were produced. The significance of every model was assessed by using the chi-square test for the change in the -2LL value from the base model, which is comparable to the overall F test in multiple regression. In assessing overall model fit (goodness of fit), two of the available tests were used: Cox and Snell's and Nagelkerke's pseudo R^2 , which compare predicted to observed probabilities, with higher values indicating better fit. Model fitting information results are presented in table 9.

For every examined model the presented below in table 10 classification matrices showed high hit ratios of correctly classified cases for every model and a discrete improvement in ratios as factors were added to the analysis.

Results in combination provide support for acceptance of the model that includes perceived service quality, route and cost as a significant and of very good fit—better than any other model used in this case. This model also demonstrates the highest predicting ability of all and is, therefore, suitable for further examination.

4.2.7. *Validation of the results.* Validation of the results was accomplished through three methods. First, we tested whether including the 'availability' factor, instead of excluding it, would have produced better results and found that it increases the best model's R^2 (perceived service quality, route and cost) from 0.620

Table 9. Results from the overall model fits.

Variables in analysis	Cox & Snell	R^2 Nagelkerke	Change in 2LL	Sig.
Selection vs Perceived SQ	0.324	0.376	84.426	0.000
Selection vs Perceived SQ + Route	0.433	0.505	120.324	0.000
Selection vs Perceived SQ + Route + Cost	<u>0.532</u>	<u>0.620</u>	<u>160.820</u>	<u>0.000</u>
Selection vs Expected SQ	0.256	0.298	62.222	0.000
Selection vs Expected SQ + Route	0.370	0.432	98.040	0.000
Selection vs Expected SQ + Route + Cost	<u>0.526</u>	<u>0.614</u>	<u>158.354</u>	<u>0.000</u>

Table 10. Predicting ability of the models.

Variables in analysis	Overall prediction
Selection vs Perceived SQ	62.5%
Selection vs Perceived SQ + Route	67.9%
Selection vs Perceived SQ + Route + Cost	<u>74.5%</u>
Selection vs Expected SQ	68.4%
Selection vs Expected SQ + Route	68.9%
Selection vs Expected SQ + Route + Cost	<u>71.7%</u>

Table 11. Results from the multinomial regression analysis.

	B	Err.	Wald	Sig.	Exp (B)
Firm 1					
Intercept	5.905	1.423	17.229	0.000	
ROUTE/CONVENIENCE	1.298	0.527	6.060	0.014	3.661
COST	-1.772	0.489	13.143	0.000	0.170
SQ UNACCEPTABLE	-5.730	1.486	14.859	0.000	0.003
SQ FAIR	-3.052	1.363	5.017	0.047	0.047
SQ VERY GOOD	0*				
Firm3					
Intercept	4.660	1.458	10.210	.001	
ROUTE/CONVENIENCE	2.322	0.543	18.310	.000	10.191
COST	-2.273	0.489	21.576	.000	.103
SQ UNACCEPTABLE	-2.688	1.467	3.356	.067	.068
SQ FAIR	-1.547	1.402	1.217	.270	.213
SQ VERY GOOD	0*				

Notes: Reference category is firm 2; *the parameter is set to 0 because is redundant

to 0.666, with no increase in the best model's predictive ability (74.5%.) Second, we divided the original sample in two (holdout samples), repeated the analysis for both, and received results are almost identical for the two samples, leading to the conclusion that the results are robust and valid. Third, we identified misclassified observations and applied casewise diagnostics (Cook's distance). The rather small size of company 2's observations provided an inadequate basis for making any further analysis. We finally tested the best chosen model with a stepwise regression and we have received similar as previously results.

4.2.8. *Multinomial logistic regression coefficients.* Table 11 shows the estimated coefficients (B) and related statistics for the chosen 'best' model from the multinomial regression analysis, using firm selection as the dependent variable, recoded in three, as revealed by passengers' choice.

The regression model produced results that show that route had a positive association while cost and service quality had a negative association with the dependent variable (selection). Of course, it should be stressed that service quality is negatively associated to selection only because it is presented here in its negative status, as unacceptable service quality; therefore, unacceptable service quality may divert clients from selecting a certain shipping company. Route/convenience plays a very important role in selecting an operator, with varying results improving probabilities of occurrence from 3.661 to 10.191 times. Finally 'unacceptable' and 'just fair' service quality provided insignificant results for firm 3.

5. Conclusion

In this paper, issues relevant to ferry passengers' satisfaction criteria and method of ferry operator selection were examined, drawing evidence and data from the Greek coastal shipping sector. The hundreds of Greek islands which need to be served by sea transport will be affected when governmental protectionism ends in mid-2006. Extant research on customer satisfaction is extensive in every other transportation

industry except the passenger shipping sector and has identified the criteria related to customer satisfaction, as well as their relative levels of importance in passenger selection.

The research reported here attempts to answer three key questions. First it examines whether the satisfaction determinants identified in other sectors can be applied to assess ferry passengers' satisfaction criteria. Second, it tests the perspective that perceived service quality is different from the expected service quality and whether satisfaction describes the selection process better than service quality alone. Third it develops various models combining the previously recognized satisfaction determinants in an attempt to better capture the factors leading to passenger selection.

The results provide researchers and practitioners with several interesting findings. Much in line with other industries, ferry passengers form satisfaction perceptions on the basis of their evaluation of four primary dimensions: service quality, price, convenience and availability. We reduced these dimensions to three by merging the availability factor into the convenience factor; availability was deemed to have little impact because any existing exclusivity will likely change after the government deregulates the market. The first of the three primary dimensions, service quality, was then assessed in its perceived and expected status in order to illuminate the debate in the service quality literature that perceived quality better defines customers' will because it does not raise expectations. Our results support the fact that perceived and expected service quality in their categorical forms are distinct constructs and that expected service quality is ranked higher in customers' minds than the perceived value in case of the Greek coastal shipping industry. Finally, the research developed six different models of satisfaction by using the combinations of expected and perceived service quality together with price and convenience, and identified one as the most appropriate. This model links the perceived service quality, price and convenience to predict the likelihood of passenger selection of one operator or another. Through the multinomial logistic regression technique, the predictive ability of the model is almost as high as 75%, which provided evidence of importance for every determinant of satisfaction.

On the basis of these findings, it is clear that passengers differentiate firms according to their offerings and that a positive change in the convenience factor (arrival and departure times, etc.) may increase by 3 to 10 times the possibility of a passenger's selecting a specific firm. Useful results may also be obtained by comparing price or quality variations, from which one can argue, for example, that an increase or decrease in price will affect the likelihood of a passenger's selecting a firm only one-third as frequently as the convenience factor.

This study contributes to the discipline in two areas. First, it proves that the ferry passengers' selection dilemma can be described as a multidimensional construct by consolidating and adapting existing knowledge from other fields. Second, it introduces the best model scenario by using advanced techniques that allow for further prediction, simulation and analysis. This answers the call for an innovative direction in shipping and marketing literature that provides practical answers to questions usually raised by practitioners on what is the best policy or what and how much to do.

There are three primary practical implications of our study. From a competitive standpoint ferry operators should view their customers differently when evaluating their offerings. Policies on service quality, price or convenience issues may be

developed based on evaluations of passengers' likely purchasing behaviour, as management now has a useful tool for prediction and analysis. From a more generic standpoint, the difference between expected and perceived quality clearly indicates that there is room for better advertising techniques to increase expectations at least to a point equal to perceived levels of satisfaction. Finally, from a research or marketing standpoint, factors identified enable managers to use either quick technique to identify and reveal passengers' opinions or more comprehensive options by applying the full set of questions.

Concluding our work and as any other research study project certain limitations are acknowledged. A larger sample would allow more detailed and advanced techniques and would provide more definitive proof of reliability and validity. Moreover, an improved evaluation of perceived service quality could have been obtained if we had been able to use a duplicate of the 'expected' or 'usual' set of questions, instead of a univariate answer. Finally, we acknowledge that this approach may be difficult to apply across all service industries, although it would be interesting to test its applicability in the air transport industry or among ferry operators in countries other than Greece.

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