
The role of corporate agility and perceived price on the service quality – customer satisfaction link: some preliminary evidence from the port industry

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Abstract: The purpose of this study is to confirm the applicability of SERVQUAL scale in the shipping corporate sector and explore the relationship between service quality, customer satisfaction, corporate agility and perceived price. The hypotheses introduced were tested using EFA and multiple linear regression models. Findings were in support to a more parsimonious 3-dimensional one-measurement model arguing thus against the 5-dimensional nature of the SERVQUAL instrument. Moreover, corporate agility fully mediates assurance/empathy and tangibles' dimensions of SERVQUAL and perceived price on customer satisfaction. It has been further supported that agility partially mediates the reliability/responsiveness dimension. The major contribution of this study is that it is the first attempt to investigate the impact of corporate agility on service quality and customer satisfaction relationship in the port industry.

Keywords: service quality; business customer; ports; corporate agility; perceived price; shipping.

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1 Introduction

In today's highly competitive business environment, companies' success and survival are becoming more and more difficult to ensure. A prevailing topic in industrial and academic environment is how organisations can successfully deal with unpredictable and constantly changing business settings. Proposed competitive means in the literature, initially include price, moved forward to include product or service quality and delivery time, whereas nowadays it also incorporates customer choice and customer satisfaction. Among the recent proposals of how organisations may successfully deal with an unpredictable environment, the notions of 'agility' or 'flexible organisations' are the most predominant and popular (Sherehiy et al., 2007). Agility and flexibility, terms to be used interchangeably in this work, despite certain definition considerations, describe in general the ability of a firm to quickly and efficiently respond to *changing* customer needs. It further enables firms to proactively and timely satisfy customer demand rather than just forecast sales and react to future orders.

Particularly in the services sector and especially under turbulent economic and financial conditions, there is a distinct need for more efficient, high quality and flexible services. Quality of services is attributed a critical role in the marketing literature in enabling firms to achieve a differential advantage over their competitors (Gronroos, 2001) and greatly contributes to customer satisfaction and loyalty (Caruana et al., 2000; Baker and Crompton, 2000) and profitability and productivity of the firms (Vuorinen et al., 1998). The relationship between service quality and customer satisfaction has gained increased attention and stimulated considerable debate during the past decade (Parasuraman et al., 1985; Zeithaml et al., 1990; Brady and Cronin, 2001). It is widely accepted today that service quality has a direct effect on customer satisfaction. Besides, a customer with positive perceptions about service quality is likely to report high levels of satisfaction (Caruana, 2002; Cronin and Taylor, 1992; Spreng and Chiou, 2002; Spreng

and McKoy, 1996; Woodside et al., 1989). The ways service quality is assessed and measured is critical and SERVQUAL model is widely accepted despite certain and serious considerations on its generic use (Pantouvakis, 2010) and dimensionality. On the other hand, the role of the *perceived price* or what “.. is given up or sacrificed to obtain the product...” (Zeithaml, 1988) by customers has been rarely examined or empirically supported in the literature (Ryu and Han, 2009), even though it is a fundamental antecedent of customer satisfaction. This may happen as the terms *perceived value*, *perceived price* or *sacrifice* are sometimes used interchangeably (Kashyap and Bojanic, 2000). This work, in line with Kashyap and Bojanic (2000), defines overall perceived price as a combination of monetary price and nonmonetary price, including other factors such as convenience, time, search costs, etc... Customers’ satisfaction, quality products or services are not by themselves enough and sufficient for firms to create a competitive advantage especially in today’s increasingly uncertain service environment. Nowadays firms must not only react to stated customer needs but they have also to respond promptly to their time changing requirements in order to gain the competitive lead. Competitive strategies of the past, emphasising initially cost efficiency through economies of scale, and later on quality and speed of delivery (Vokurka and Fliedner, 1998) have been extended to include *corporate agility* (Swafford et al., 2006b; Sherehiy et al., 2007; Kasarda and Rondinelli, 1998; Goldman et al., 1995; Vokurka and Fliedner, 1998) which has become a necessary component in an organisation’s competitive strategy (Yusuf et al., 1999) and a fundamental aspect for addressing market uncertainty (Van Hoek et al., 2001). Agility differs from conventional strategies as it enables firms to satisfy customers’ demands as they occur rather than just forecast sales and react to estimated orders (Zhang et al., 2005). Although the concept and the importance of corporate agility is generally acknowledged, there is no obvious evidence in the literature, to the best of authors’ knowledge, linking and relating the concept of corporate agility with those of service quality and customer satisfaction.

Accordingly, the purpose of this study is twofold. First, it aims at exploring the relationship between service quality and customer satisfaction in a business-to-business service setting of the shipping industry. Secondly, it attempts to estimate customer satisfaction through service quality, corporate agility and perceived price.

2 Literature review and research hypotheses

During the last few decades, the rapid growth in the world’s population and the increasing economic prosperity caused a remarkable growth in the demand for goods and a rapid change in the international trade movement. The significant role of ports and their production capabilities in the international transportation cannot be ignored (Larroque, 1995). Beyond the traditional functions of handling cargos, ports are considered to function as integrated logistics centres. Ports have experienced great transformations in their efforts to support the innovations and developments in the maritime industrial sectors by putting in place the necessary infrastructures and services. More than 1,000 ports managing about 3.5 billion tons of cargo every year, about 90% of goods, while 350 million passengers pass through European ports annually, almost 70% of the total European population (Eurostat, 2007).

Much of the research in the port sector has tended to focus on infrastructure conditions, productivity and efficiency levels, pricing aspects and costs, while giving

little attention to the issue of port service quality. Recently, since factors such as productivity/efficiency or infrastructure have become identical through the standardisation of cargo handling facilities, operational and managerial processes, service quality is recognised as a main factor influencing the competitive position and selection of ports in the container port industry (Pantouvakis, 2006, 2007; Pantouvakis et al., 2008; 2010; Lee and Ducruet, 2009).

2.1 Service quality and customer satisfaction relationships

The service quality issue has become a pivotal marketing concern in the past two decades (Frankel, 1993; Parasuraman et al., 1985, 1988). In the literature, there are numerous definitions, dimensions and models of service quality (Parasuraman et al., 1985, 1988, 1994; Dabholkar et al., 2000; Bitner et al., 1990). Among them, the SERVQUAL scale is designed to measure service quality as not a singular but a multi-dimensional phenomenon (Vandamme and Leunis, 1993). SERVQUAL, a 22-item instrument developed by Parasuraman et al. (1988), is used widely as a generic instrument for measuring service quality. The instrument represents five dimensions by which consumers evaluate service quality: tangibility, reliability, responsiveness, assurance, and empathy.

SERVQUAL has become an accepted tool for researchers in order to measure service quality (Bolton and Drew, 1991; Brown and Swartz, 1989; Carman, 1990; Cronin and Taylor, 1992, 1994; Zeithaml et al., 1996) and several attempts to integrate or replicate it to several industries are evident in the literature (Dean and White, 1999; Kang and James, 2004; Olorunniwo and Hsu, 2006) besides some strong criticism (Gronroos, 1990; Mangold and Babakus, 1991; Richard and Allaway, 1993). Many researchers have argued that given the nature of the SERVQUAL model (especially with respect to the number of dimensions), it is highly likely that dimensions may vary and might be industry-specific and thus, the universality of SERVQUAL's five dimensions has been questioned (Buttle, 1996; Carman, 1990; Cronin and Taylor, 1992). Finally, it has also been argued that other more parsimonious models (see for an example Pantouvakis, 2010) or models including performance-only measures, such as SERVPERF, explain and describe better service quality than does SERVQUAL (Cronin and Taylor, 1994).

2.2 SERVQUAL and the maritime industry

Despite the global concern about service quality the SERVQUAL model has been rarely mentioned in the maritime literature and just a handful of studies examine its application in the shipping sector. In the shipping industry, SERVQUAL has been tested by Pantouvakis et al. (2008) in the passenger port sector, in ocean freight operations by Durvasula et al. (1999, 2000) and by Ugboma and Ugboma (2004, 2007) in commercial ports. Most of the studies support that the SERVQUAL instrument presents certain and severe drawbacks when applied to the shipping sector either regarding its dimensionality, or fit or explanatory power.

Durvasula et al. (1999, 2000) applied the SERVQUAL model to 114 shipping managers of ocean freight shipping companies in Singapore who regularly use the service for exporting. They found that the three- or two- dimensional structure instead of the original five-dimensional fits the data reasonably well. The suggested two dimensions of

service quality, according to Durvasula et al. (1999), are the tangibles and a combination of the other four dimensions to one. This was supported by the tests that the authors conducted on their data, indicating that none of the five dimensions presented discriminant validity. They also argued there is a need for further studies to determine whether the dimensionality of the SERVQUAL scale may be reduced to fewer dimensions. Ugboma and Ugboma (2004, 2007) have tested the SERVQUAL instrument in 40 registered licensed clearing agents who use the port services of Nigerian ports of Lagos and Harcourt Nigeria. The authors found that the SERVQUAL model could be applied in ports and greatly assisted them in their marketing strategies. Responsiveness and tangibles dimensions received high ratings and the lower ratings were received by the last dimension of SERVQUAL empathy. Pantouvakis et al. (2008) applied the SERVQUAL model to 434 passengers travelling from Piraeus port and stated that although the fit of the five-dimensional model data is better than other parsimonious 1-, 2-, 3-, 4-dimensional alternatives when applying multinomial logistic regression, the three out of five dimensions are statistically insignificant. Also the authors identified that tangible dimensions are of major important in predicting customer satisfaction. In line with the above, Pantouvakis (2010) questioned the ability of the instrument to fully and adequately explain service quality and has introduced a model with two dimensions describing the tangible and the intangible nature of the shipping offering in ports. Given the ambiguity of results and the arguments in favour and against the applicability of SERVQUAL in shipping the first hypothesis is therefore evident:

H1 Does the SERVQUAL scale exhibit the five-dimensional structure in a business-to-business shipping environment?

Moreover, according to Zeithaml and Bitner (2003), “satisfaction is the consumer fulfilment response. It is a judgment that a product or service feature, or the product or service itself, provides a pleasurable level of consumption-related fulfilment” (p.86). It has been suggested that satisfaction is a broader concept than service quality as satisfaction includes both cognitive and affective evaluations, while service quality evaluations are mainly a cognitive procedure (Oliver, 1997; Tian-Cole and Crompton, 2003). A number of studies in the services marketing literature have reported that these two constructs are strongly related (Alexandris et al., 2001; Caruana, 2002; Cronin and Taylor, 1992; Spreng and Chiou, 2002; Spreng and McKoy, 1996; Woodside et al., 1989) and other mentioned the positive relationship between service quality and customer satisfaction (Anderson and Sullivan, 1993; Parasuraman et al., 1988). Also past studies support that perceptions of service quality affect insights of satisfaction, which then affect loyalty (Cronin and Taylor, 1992; Petrick and Backman, 2002; Choi and Chu, 2001).

Accordingly, the second hypothesis could be formed as follows:

H2 There is a positive relationship between service quality dimensions and customer satisfaction in shipping business environments.

2.3 *The role of perceived price*

The concept of perceived price in the marketing literature has been rarely examined due to its relationship with perceived value. According to Kashyap and Bojanic (2000, p.46) “...All definitions of perceived value refer to some form between what the consumer gives

up (price, sacrifice) and what the consumer receives (benefits, utility, quality)...”. In the literature, the concept of perceived price is unclear while there is not a reliable construct measuring consumers’ perceptions about the perceived price. Chen et al. (1994) consider perceived price as the customer’s judgement about a service’s average price in comparison to its competitors. In their study they calculate perceived price as the average gap between a particular type of service firm and its competitors. Also, Chang and Wildt (1994) measured perceived price on a single nine-point scale assessing the degree to which subjects judged price to be high or low and proved that perceived price is positively associated with objective price and negatively associated with reference price. In another study, Iglesias and Guillen (2004) mention that perceived price is a cost for the customer and this cost can be monetary and non-monetary. These two types of costs make up the total perceived price, which is negatively associated to customer satisfaction in the restaurant industry.

This study adopts Zeithaml’s definition of perceived price, which is an antecedent of perceived value and includes monetary and non-monetary prices. Due to the fact that a customer has difficulty in remembering the exact price paid for a service, he encodes prices in ways that are meaningful to him (Zeithaml, 1988). Hence, cost and effort (sacrifice) to obtain the service should also be considered from customers which points to the concept of perceived price.

Consumers post-purchase behaviour greatly depends on their satisfaction experience. Customer satisfaction is a complete evaluation of the accumulated purchase and consumption experience, which reflects a comparison between the sacrifice and the perceived reward. Therefore, when satisfaction from a service offered is being measured, the perceived cost, sacrifice and effort should also being considered.

Hence the third hypothesis is as follows:

H3 Perceived price forms and presides customer satisfaction of shipping corporate customers.

2.4 Corporate agility

Agility can be defined as “the rapid and proactive adaptation of enterprise elements to unexpected and unpredicted changes” (Kidd, 1994) or as “the ability of surviving and prospering in competitive environment of continuous and unpredictable change by reacting quickly and effectively to changing markets, driven by customer-defined products and services” (Gunasekaran, 1999, p.87).

As mentioned in the introduction, *agility* is regarded as the contemporary competitive priority for firms (Sherehiy et al., 2007; Vokurka and Fliener, 1998). The competition basis, which used to be the price, has moved to quality, delivery time and finally customer choice or differently customer satisfaction. Existing strategies for economies of scale have been transformed to economies of scope, having the firms to apply new methods of competition such as flexible manufacturing, responding to change, taking advantage of the opportunities (Sharifi and Zhang, 1999). These changes necessitate a basic agility that is sensing, perceiving and awaiting changes in the business environment.

According to Jackson and Johansson (2003), agility is not a goal in itself but a necessary means to maintain the competitiveness in the market characterised by uncertainty and change. They also divide agility into four main dimensions: knowledge

and creativity, change competency within operations, product-related change capabilities, internal and external co-operation, and people. Yusuf et al. (1999) identified competitive foundations of agility as follows: speed, flexibility, innovation, proactivity, quality and profitability. Sharifi and Zhang (1999) support that the agility drivers would force a company to revise the current company's strategy, admit the need to become agile, and adopt an agility strategy. Strategic abilities such as responsiveness, competency, quickness, and flexibility are considered as main attributes of the agile organisation that allow to successfully deal with changes.

In this model, responsiveness is considered as the ability to identify and respond quickly, reactively or proactively to changes. Competency is defined as an extensive set of abilities that provide a basis for productivity, efficiency, and effectiveness of a company's activities. Flexibility is an ability to process different products and achieve different objectives with the same facilities. Quickness is the ability to carry out tasks and operations in the shortest possible time.

A review of the literature revealed that the development of an agility framework is by itself a serious challenge for researchers. As mentioned by Sherehiy et al. (2007) the agility concepts are not yet clearly defined and conceptualised, as its main attributes are applied to large and complex corporate structures. Hence a large number of opinions concerning the meaning of agility are found in the literature. Sherehiy et al. (2007) distinguished seven main attributes, based on an extensive review in the literature. According to their study, an agile corporation has seven main characteristics which should be reflected as the most important aspects in a firm and these are:

- 1 flexibility and adaptability
- 2 speed
- 3 mobilisation of core competence
- 4 high quality and customised products
- 5 responsiveness
- 6 integration and low complexity
- 7 culture of change.

Providing exceptional service to the customers reaps the benefits of customer satisfaction and loyalty as mentioned in Emerson and Grimm (1998). Enhancing customer service requires flexible and fast response, which depends on firms' effectiveness and agility (Damen, 2001). Performing services quickly and effectively can deepen the relation with customers and improve satisfaction (Zhang et al., 2005).

Although there is a profound relationship between corporate agility and customer satisfaction there is no empirical evidence in the literature that explores and examines this relationship. Hence, the fourth hypothesis formed as follows:

- H4 There is a direct relationship between corporate agility and customer satisfaction in B2B environments.

Agility is a new manufacturing paradigm, which has been proposed as a strategy to enable manufacturing enterprises to maintain their competitive advantages in this new era (Zhang and Sharifi, 2000). The term corporate agility encompasses also service level improvements and quality improvements, which are recognised as requirements to succeed in the competitive international marketplace. As Beamon and Ware (1998) mentioned, in the supply chain process an improvement in quality results in resource utilisation improvements and in process efficiency improvements and also meet customer needs and specifications. For the first time in the relevant literature this study will examine the type and kind of relationship between service quality and corporate agility, and thus, proposes that:

H5 Corporate agility mediates the service quality dimensions to form corporate customer satisfaction.

3 Methodology

3.1 The sample

Data for the survey were collected from 34 shipping companies-customers who are registered with Piraeus Port Authority. The sample of 34 companies includes shipping companies (Safmarine, etc), line operators (Maersk, Cosco, Damko) and agents. The sampling frame was gathered through questionnaires and was performed by trained interviewers. Personal interviews with the companies' managers were conducted in a week and a final sample of all the registered companies-customers (34) gathered. It should be noted that the number of companies collected represents almost the entire population of relevant companies operating at this port.

3.2 The questionnaire

Data for this survey were collected through the use of questionnaires. To confirm the 1st Hypothesis, regarding the applicability and dimensionality of SERVQUAL scale, the SERVQUAL instrument wording was modified to reflect on-shore activities. Only perceptions from port services were asked, following similar suggestions in the literature (Cronin and Taylor, 1992; Durvasula et al., 1999; Pantouvakis et al., 2008). Having validated the measurement instrument and its scales, customers of Piraeus Port Authority were asked to indicate the level of their agreement with regard to the service they perceived from the port authority. All items were measured using seven-point scale of agreement anchored 1 = 'strongly disagree' to 7 = 'strongly agree'. The mean responses to the 22 SERVQUAL items are presented in Table 1.

In order to measure perceived price, a four-item construct was developed due to the lack of a reliable instrument in the literature. The respondents were asked about the price paid and the perceived effort to obtain the service. All items were measured using a seven-point scale of agreement anchored 1 = 'not at all' to seven = 'absolutely'. The items are presented in Table 1.

Table 1 Mean and Std. deviation of the 22-SERVQUAL items

		<i>Mean</i>	<i>Std. deviation</i>
Tangibles			
Port has modern looking equipment	1	3,21	1,250
Port's storage places are adequate	2	3.17	1.487
Port facilities are up to date	3	3.27	1.539
Materials associated with the service are visually appealing	4	3.23	1.461
Connection to other transportation means is adequate	5	3.86	1.490
Reliability			
All functions are performed according to specifications	6	3.12	1.595
Port personnel are willing to solve my problems	7	3.45	1.531
Port provides high quality services to the customers	8	3.75	1.386
Port provides reliable services	9	3.77	1.388
Port insist on error-free records	10	3.40	1.402
Responsiveness			
Personnel in the port tell me exactly when services are to be performed	11	3.69	1.585
Personnel in the port give me prompt service and solves any problem	12	3.59	1.426
Personnel in the port always be willing to help me	13	3.90	1.525
Personnel in the port never be too busy to respond to my requests	14	3.86	1.655
Assurance			
Personnel in the port is consistently courteous to me	15	4.14	1.504
I feel secure for my cargo in the port	16	3.96	1.581
The behaviour of personnel in the port will instil confidence to me	17	3.74	1.587
Personnel in the port have the knowledge to answer my questions	18	3.90	1.531
Empathy			
Personnel I the port give me individual attention	19	3.44	1.567
The port facilities operating hours are convenient to passengers	20	3.92	1.557
The port understands my specific needs and requirements	21	3.29	1.454
Personnel in the port understand every customer individuality	22	2.96	1.581
Perceived price			
How satisfied are you from the total operation costs	1	3.53	1.285
How satisfied are you from the total storage costs	2	3.35	1.433
How satisfied are you from the services offered to you in the commercial port	3	3.71	1.447
How satisfied are you from the willingness to handle your requests	4	3.82	1.381

Table 1 Mean and Std. deviation of the 22-SERVQUAL items (continued)

		Mean	Std. deviation
Corporate agility			
Piraeus Port Authority (PPA) immediately react to changes in b2b environment	1	3.79	1.553
PPA sensing, perceiving and anticipating changes	2	3.71	1.567
PPA has the strategic vision to respond to the market needs	3	3.65	1.070
PPA has the sufficient technological ability	4	3.62	1.129
PPA provide quality services	5	3.26	1.442
The cooperation with PPA comes up to my expectations	6	4.47	1.463
PPA has the flexibility to brought off all my requirements	7	3.29	1.292
PPA has the flexibility to respond to my special needs	8	3.69	1.199
PPA keep service delivery quickness and timeliness	9	3.06	1.516
PPA keep fast operation time	10	3.56	1.541
Customer satisfaction			
In general, my company is very satisfied with the services offered by PPA.	1	3.71	1.219
Overall, my company is very satisfied with its relationship with PPA.	2	3.65	1.203
Overall, PPA is a good company to do business with.	3	3.88	1.274
Overall, PPA treats my company very fairly.	4	4.38	1.670
Overall, the service of PPA comes up to my expectations.	5	3.97	1.566

A major challenge for this research is the concept of corporate agility. In the literature review section, the lack of a commonly accepted definition of corporate agility was mentioned. Hence, there is not a widely accepted construct measuring corporate agility. Moreover all studies related to agility are applied in the manufacturing environment, and concern specific strategies, techniques and management practices, which are described as part of an agile organisation. As Sherehiy et al. (2007) cited, most agility related publications focus in the theoretical description of agility and on ‘production’ aspects of an organisation whereas only few empirically investigate the real environment. Hence, this study adopts Sharifi’s and Zhang’s (1999) proposal in order to measure agility as this model is based on capabilities that a company must use to achieve and maintain agility. A ten-item instrument was developed based on four major agility capabilities (responsiveness, competency, flexibility and quickness). Business customers asked in a seven-point scale to express their perceptions from 1 = ‘strongly disagree’ to 7 = ‘strongly agree’ about the corporation agility. The items are presented in Table 1.

Finally, customer satisfaction was measured by a five-item instrument based on Lam’s et al. (2004) study on business-to-business customers. The items are presented in Table 1.

3.3 Analysis

To test the hypotheses, means, standard deviations, kurtosis and skewness were first reviewed; no normal distribution violations were present. Moreover, the correlation coefficients show that all variables are highly associated. Then the SERVQUAL instrument was analysed, using exploratory factor analysis (EFA) and a principal component analysis was performed, rotated by a Varimax algorithm. Reliability tests when applied to all 22 items provide an excellent overall Cronbach's alpha coefficient (0.969) which indicates the very good scaling of the instruments. The results are presented in Table 2.

Table 2 Results from the factor analysis

	<i>Components</i>		
	<i>Assurance- empathy</i>	<i>Reliability responsiveness</i>	<i>Tangibles</i>
The behaviour of personnel in the port will instil confidence to me	0.999		
Personnel in the port give me individual attention	0.989		
The port understands my specific needs and requirements	0.926		
Personnel in the port understand every customer individuality	0.910		
Personnel in the port is consistently courteous to me	0.825		
The port facilities operating hours are convenient	0.721		
Personnel in the port have the knowledge to answer my questions	0.708		
Personnel in the port always be willing to help me	0.569		
Personnel in the port never be too busy to respond to my requests	0.507		
All functions are performed according to specifications		0.980	
Port insist on error-free records		0.843	
Port provides reliable services		0.833	
Personnel in the port give me prompt service and solves any problem		0.823	
Port provides high quality services to the customers		0.797	
Personnel in the port tell me exactly when services are to be performed		0.747	
Port personnel are willing to solve my problems		0.550	
Port's storage places are adequate			0.867
Connection to other transportation means is adequate			0.835
Port facilities are up to date			0.831
Materials associated with the service are visually appealing			0.749
Port has modern looking equipment			0.720

Table 2 presents the factor loadings as extracted. Loadings lower than 0.45 in absolute value were suppressed to sharpen the clarity of the relationships. The Kaiser-Meyer-Olkin statistics was very good (i.e., 0.890), indicating good relationships among items. Therefore patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors (Fields, 2005). Finally three factors, explaining 78.6% of the total variance were identified. ‘Reliability’ and ‘responsiveness’ were collapsed in one factor as ‘assurance’ and ‘empathy’ in another. The third factor is the ‘tangibles’ dimension.

Finally only one factor was identified explaining 69% of the total variance, named ‘corporate agility’. The Kaiser-Meyer-Olkin statistics was very good (0.905), indicating very good relationships among items.

3.3.1 Measurement model

A multiple linear regression model was performed to test the hypothesised relationships:

$$Y_1 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e$$

where

Y_1 = customer satisfaction

X_1 = assurance/empathy

X_2 = reliability/responsiveness

X_3 = tangibles

X_4 = perceived price

X_5 = corporate agility

b_1, b_2, b_3, b_4, b_5 = coefficients

e = error term.

Overall satisfaction perceived by the commercial customers was used as dependent variable. Independent variables included the factor scores of the three extracted factors from the SERVQUAL, the perceived price and the corporate agility. The results are presented in Tables 3 and 4.

Table 3 R square and adjusted R square: model summary

R	R square	Adjusted R square	Std. error of the estimate	Change statistics				
				R square change	F change	df1	df2	Sig. F change
.933	.871	.848	2.78329	.871	37.865	5	28	.000

Table 4 Coefficients(a)

Model	Unstandardised coefficients		Standardised coefficients	t	Sig.	Collinearity statistics	
	B	Std. error	Beta			Tolerance	VIF
(Constant)	22.794	0.477		47.753	.000		
Assurance–empathy	.923	0.936	0.129	0.985	0.333	0.268	3.734
Reliability–responsiveness	2.201	0.873	0.308	2.521	0.018	0.308	3.249
Tangibles	1.030	0.720	0.144	1.429	0.164	0.452	2.210
Perceived price	0.643	0.946	0.090	0.679	0.503	0.462	3.814
Corporate agility	3.758	1.431	0.526	2.627	0.014	0.515	3.071

Table 3 shows that the variables account for 84.8% of total sample variance (adjusted R square = 0.848). No multicollinearity problems are evident, since the values of tolerance and VIF are at a good level (tolerance > 0.01 and VIF < 10). Results from Table 4 show that three out of the five independent variables are not statistically significant. Only the factors reliability/responsiveness and corporate agility seem to affect customer satisfaction. The results indicate that corporate agility and reliability/responsiveness factors could affect as mediator the service quality and customer satisfaction relationship.

A mediator variable is one that explains the relationship between the other variables. More accurately, mediation implies a causal hypothesis whereby an independent variable causes a mediator, which causes a dependent variable. A given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion variables. While moderator variables specify when certain effects will hold, mediators indicate how or why such effects occur (Baron and Kenny, 1986, p.1176).

A series of regression models suggested by Baron and Kenny (1986) were used to test the mediating role of corporate agility in the relationship of service quality factors, perceived price and customer satisfaction. First, the independent variables [service quality factors (assurance/empathy, reliability/responsiveness, tangibles) and perceived price] were regressed on corporate agility (Test 1), to determine that there is an effect that may be mediated. Second, the independent variables [service quality factors (assurance/empathy, reliability/responsiveness, tangibles) and perceived price] were regressed on the dependent variable (customer satisfaction) (Test 2). Third, the dependent variable (customer satisfaction) was regressed on both the independent and the mediator variables (Test 3), hence providing control to the regression model, as the initial variable must be controlled to establish the effect of the mediator on the outcome variable. The three tests can be expressed as follows:

$$M = a_1 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e_1 \quad (\text{Test 1})$$

$$Y = a_2 + b_5X_1 + b_6X_2 + b_6X_3 + b_8X_4 + e_2 \quad (\text{Test 2})$$

$$Y = a_3 + b_9X_1 + b_{10}X_2 + b_{11}X_3 + b_{12}X_4 + b_{13}M + e_3 \quad (\text{Test 3})$$

where

Y = customer satisfaction

X_2 = reliability/responsiveness

M = corporate agility (mediator variable)

X_3 = tangibles

X_1 = assurance/empathy

X_4 = perceived price

a_1, a_2, a_3 = intercepts

$b_1, b_2, b_3, \dots, b_{12}, b_{13}$ = coefficients

e_1, e_2, e_3 = error term.

Test 3 has been tested in the first multiple linear regression (Tables 3–4. The other two tests were performed next. Firstly, the independent variables [service quality factors (assurance/empathy, reliability/responsiveness, tangibles) and perceived price] were regressed on corporate agility. The results are presented in Tables 5 and 6:

Table 5 R square and adjusted R square: model summary

<i>R</i>	<i>R square</i>	<i>Adjusted R square</i>	<i>Std. error of the estimate</i>	<i>Change statistics</i>				
				<i>R square change</i>	<i>F change</i>	<i>df1</i>	<i>df2</i>	<i>Sig. F change</i>
.939	.881	.865	4.18884	.881	53.927	4	29	.000

Table 6 Coefficients(a)

<i>Model</i>	<i>Unstandardised coefficients</i>		<i>Standardised coefficients</i>	<i>t</i>	<i>Sig.</i>	<i>Collinearity statistics</i>	
	<i>B</i>	<i>Std. error</i>	<i>Beta</i>			<i>Tolerance</i>	<i>VIF</i>
(Constant)	36.353	0.718		50.604	0.000		
Assurance–empathy	5.853	0.876	0.513	6.684	0.000	0.693	1.443
Reliability–responsiveness	4.690	0.975	0.411	4.811	0.000	0.559	1.788
Tangibles	2.625	0.974	0.230	2.695	0.012	0.561	1.784
Perceived price	3.364	1.266	0.295	2.658	0.013	0.332	3.014

Secondly, the independent variables [service quality factors (assurance/empathy, reliability/responsiveness, tangibles) and perceived price] were regressed on the dependent variable (customer satisfaction). The results are presented in Tables 7 and 8:

Table 7 R square and adjusted R square: model summary

R	R square	Adjusted R square	Std. error of the estimate	Change statistics				
				R square change	F change	df1	df2	Sig. F change
.916	.839	.817	3.05335	.839	37.896	4	29	.000

Table 8 Coefficients(a)

Model	Unstandardised coefficients		Standardised coefficients	t	Sig.	Collinearity statistics	
	B	Std. error	Beta			Tolerance	VIF
(Constant)	22.794	0.524		43.530	0.000		
Assurance–empathy	2.849	0.638	0.399	4.463	0.000	0.693	1.443
Reliability–responsiveness	3.740	0.711	0.524	5.263	0.000	0.559	1.788
Tangibles	1.861	0.710	0.260	2.621	0.014	0.561	1.784
Perceived price	1.781	0.923	0.295	1.931	0.063	0.332	3.014

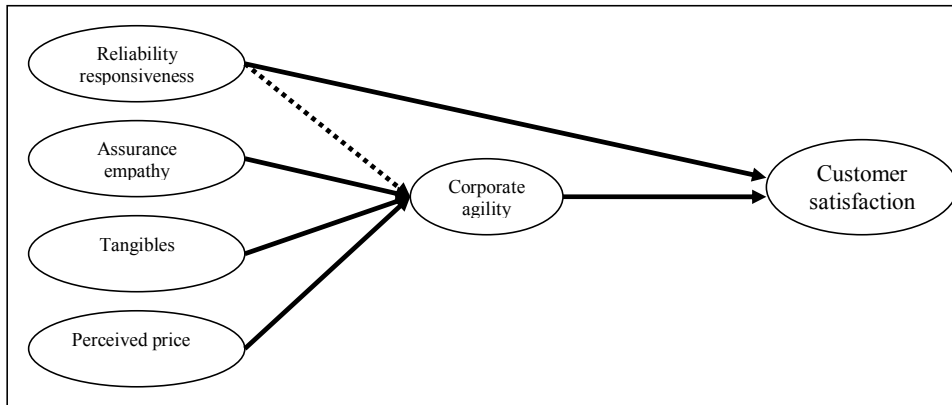
4 Discussion

The results of this study are in line with other researches (Durvasula et al., 1999; Ugboma and Ugboma, 2004, 2007; Pantouvakis et al., 2008) in maritime literature, as the five-dimensional nature of the SERVQUAL was not verified. Despite the similarities with previous studies (three-dimensions solution of the SERVQUAL instrument) there are differences in the final findings. The current study identified three service quality dimensions perceived by the PPA commercial customers (tangibles, reliability-responsiveness, assurance-empathy). The study of Durvasulas et al. (1999) extracts three factors where responsiveness, assurance, and empathy are combined into a single dimension. Also the study by Pantouvakis' et al. (2008) on the passenger port sector extracts two factors where tangibles and reliability are combined into a single dimension and the other three into another. Empirical findings also indicate the importance of the reliability-responsiveness dimension in forming customer satisfaction. The tangible dimension seems less important in forming customer satisfaction and is in line with Durvasulla et al. (1999) and Ugboma and Ugboma (2004).

Furthermore, the new concept of corporate agility fully mediates assurance/empathy, tangibles and perceived price dimensions on customer satisfaction and partially mediates the reliability/responsiveness dimension. As mentioned by Baron and Kenny (1986, p.1177) "*Perfect mediation holds if the independent variable has no effect when the mediator is controlled*". Tangibles, assurance/empathy and perceived price dimensions are not statistically significant and do not affect customer satisfaction in the first test when the mediator corporate agility is controlled. Moreover, corporate agility partially mediates the reliability/responsiveness and customer satisfaction dimensions relationship, as the effect of the independent variables is less in the 3rd test [adjusted $R^2 = 0.848$] (Table 3) than in the 2nd test [adjusted $R^2 = 0.817$] (Table 7) on the dependent variable (Baron and Kenny, 1986).

Finally, an important result in this research is the insignificance of the perceived price dimension. In the 2nd test (Table 8) perceived price is not statistically significant ($\text{sig} = 0.063 > 0.05$). The final proposed model is presented in Figure 1.

Figure 1 Proposed model



5 Conclusions and managerial implications

Ports as traditional transit points play an emerging role in the new global era. Maritime transportation literature emphasises this particular role of ports as logistic nodes. Moreover, the technological improvements and rapidly growing Eastern markets have intensified competition impacting on port activities. New port infrastructures have been planned, improvements in port services have been designed and new maritime transport technologies have been applied, so that ports improve their efficiency and their services in order to compete with national and international competitors. These circumstances postulate the adoption of new marketing strategies, more competitive and targeted to the improvement in port financial state.

Corporate agility, the introduced concept in this research seems as the most important factor in forming customer satisfaction. Building agility is important for ports as it allows the management to react more quickly than in the past. An agile port proactively anticipates business customer requirements and leads to the emergence of new markets. This study adopted Sharifi's and Zhang's (1999) proposal in order to measure agility as this model based on capabilities that a company must use to achieve and maintain agility. Hence, flexibility, competency, responsiveness and quickness are important port capabilities in forming business customer satisfaction. These capabilities should be considered from PPA managers as of major importance for their commercial customers. Although the level of service quality seems as the most important factor for a port rather than traditional factors such as the price and facilities, the ability of an organisation to respond to changes takes the upper hand. In order for a port manager to attract new customers and to secure the existing customers, it is necessary to understand the fundamental capabilities of corporate agility, and then to utilise these to develop appropriate marketing strategies.

Corporate agility is a vital ability in the ports business atmosphere as the highly competitive and the constantly changing environment requires capabilities to detect the changes and respond to them. Strategic intention to become agile and leveraging the core competencies of the company towards achieving the competitive advantage are essential.

Finally, it is important to mention the role of perceived price. The results indicate that perceived price, although positively associated with customer satisfaction, is not statistically significant. This is an important finding as the personal costs business customers perceived from the operations of storage facilities of the port is not essential when a port provides full of service quality facilities. As service quality of commercial ports means efficiency, security, punctuality, speed, safety and reliability (Lopez and Poole, 1998; Lopez, 1996) the total customer costs continuously decrease. Hence, an important finding of this research is the insignificance of perceived price in forming customer satisfaction in a port offering a high service quality.

Every port manager should understand the circumstances it deals with, the threats it receives and the opportunities that would bring the prosperity and success in this company.

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