Service quality and customer satisfaction in liner shipping

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Service Quality and Customer Satisfaction in Liner Shipping

Abstract

Purpose – The objectives of this paper are to identify the dimensions of service quality in liner shipping and examine their effects on customer satisfaction.

Methodology – The indicators of service quality in liner shipping were identified from reviewing the literature and interviewing six qualified industry practitioners. An online survey was then administered to 183 liner shippers in Singapore. Subsequently, exploratory factor analysis and regression analysis were conducted.

Findings - Service quality in liner shipping can be represented by four key quality dimensions. In descending order of their impact on customer satisfaction, they are reliability, speed, responsiveness, and value. Service differentiation by time-related attributes results in greater customer satisfaction than practising cost leadership in liner shipping.

Implications – Allocation of resources to develop service quality in liner shipping should mirror the priorities established in this research. In addition, the developed measurement model for service quality can serve as a reference for liner shipping firms to assess the quality of their services.

Originality / Value – A parsimonious and updated set of variables can now be used to represent service quality in the liner shipping sector. The paper also identifies the key drivers of customer satisfaction in liner shipping.

Keywords Service Quality, Customer Satisfaction, Strategic Management, Shipping
Paper type Research paper

1. Introduction

In view of growing competition in the shipping industry, providing high level of customer satisfaction is critical to sustaining businesses (Midoro *et al.*, 2005). In general, a shipping firm can satisfy its customers by offering low-cost or differentiated services (Kotler and Armstrong, 2010). One way to differentiate a firm’s services from its competitors is by offering high quality services (Dadfar and Brege, 2012, Miles, 2013).

However, service quality (SQ) is an abstract construct and numerous models were proposed in the literature to operationalise SQ. The most prominent model is SERVQUAL which consists of five SQ dimensions. They are tangibles, empathy, assurance, reliability, and responsiveness (Parasuraman *et al.*, 1985). The model was claimed to be generic and can be applied invariantly across all contexts. However, there have been growing contentions that the interpretation of SQ differs across industries, customer groups, and cultures (Ladhari, 2009). In the context of shipping, Chen *et al.* (2009) found that SERVQUAL suffers from both discriminant and convergent validity when it was applied to samples consisting of shippers and freight forwarders.

Attributing to the aforementioned criticisms, a few SQ models that tailor to the shipping industry were subsequently proposed (Kang and Kim, 2009). Some of the models further accounted for sector differences. For example, SQ in tramp shipping was recently studied (Thai *et al.*, 2014). However, research on defining SQ in liner shipping is

scant despite its dominant role in transporting semi-processed components and finished products globally (Lobo, 2010). At present, a study that incorporates outcome-oriented indicators and new priorities in liner shipping such as firms' carbon footprint and involvement in corporate social responsibility is lacking (Lirn *et al.*, 2013). Furthermore, little is known with regards to the drivers of customer satisfaction in liner shipping. Therefore, this study aims to identify the dimensions of SQ in liner shipping and examine their impact on customer satisfaction.

The remaining parts of this paper are organised as follows. The next section reviews contemporary literature on SQ, SQ in shipping, as well as the causal relationship between SQ and customer satisfaction. Research methodology is presented next, followed by the analysis of results and discussion. Based on this, the paper concludes with some recommendations for future research.

2. Literature Review

2.1 Service Quality

The inherent characteristics of services relating to heterogeneity, intangibility, perishability, and inseparability equate to greater inconsistency in managing customers' experience (Ladhari, 2009). Unlike physical product whereby its quality can be specified and evaluated in advance, SQ was argued to be more elusive, difficult to replicate, and dependent on human attitudes and perceptions.

SQ was described as a composite of service attributes or dimensions that are desirable to customers (Zeithaml *et al.*, 1990). However, there is no clear indication of these dimensions as their interpretation differ across business contexts and individuals. Furthermore, some of the dimensions, which relate to sophisticated experiences and profound affections, are transcendent and cannot be directly observed or measured (Dahlgaard *et al.*, 2008).

The existing literature has developed frameworks to identify the dimensions of SQ. In one of the early studies on SQ, Grönroos and Shostack (1983) suggested that quality of a service can be experienced during a service (i.e. functional quality) and upon completion of a service (i.e. technical quality). The authors also suggested that customers' experience of both functional and technical quality should be contrasted with their expectations. Subsequently, this has resulted in the development of the GAP model where SQ is measured by the difference between expectation and perception scores (Parasuraman *et al.*, 1988). These scores are rated with reference to five SQ dimensions. They are tangibles, reliability, responsiveness, assurance, and empathy. Collectively, they represent the SERVQUAL instrument which was claimed to be generic and can be applied invariantly across different contexts.

Recently, the validity of SERVQUAL as an instrument to measure SQ in shipping has been challenged by Chen *et al.* (2009). A few plausible explanations are summarised. First, indicators of SERVQUAL are generic and may not account for the uniqueness of the shipping industry (Ramseook *et al.*, 2010). Second, SERVQUAL instrument was developed from the perspective of end-consumers. This is to be contrasted with shipping which is a predominantly business-to-business industry. As a result, managing SQ is

more complex, attributing to a larger group of customer representatives who interact with a service provider on a personal or functional level (Gounaris, 2005). Third, SERVQUAL was argued to be an instrument that chiefly focuses on service-delivery processes (Ladhari, 2009). Contrary to many service types, shippers are not physically present to experience the process of a transportation service (Frankel, 1993). It is thus conceivable that in the context of shipping, SQ is assessed with greater emphasis on technical quality. This conjecture is consistent with the findings of Thai *et al.* (2014) who found that the dimension on outcomes is the most important service attribute perceived by shippers.

The discussion above suggests weaknesses in the general application of SERVQUAL to the shipping industry. This implies that customised models should be developed to assess SQ in the shipping industry.

2.2 Service Quality in Shipping

The shipping industry is classified as a service sector wherein its demand is derived from trade (Branch and Stopford, 2013). It is characterised by high level of internationalisation and can be segmented into the tramp and liner sector (Talley, 2011). An implicit assumption in many SQ studies on shipping is that SQ models in both sectors can be used interchangeably. Although the underlying need for a tramp or liner shipping service is similar, the interpretation of SQ may differ considerably. The differences are presented in the subsequent paragraphs.

The tramp sector is characterised by non-fixed schedules where ships are employed on an ad-hoc basis. The price of transportation is often being negotiated and the transported commodities are generally raw materials such as crude oil, coal, grain, and iron. The tramp sector operates in a perfect competitive market which is characterised by high level of efficiency due to a large number of service providers (tramp shipping companies) and tramp shippers (MacConville, 1999). Since the commodities are often transported in bulk and are of low-value, the cost of the transportation service is perceived to be an important service attribute by tramp shippers (Lirn and Wong, 2013). Another service attribute that is important is safety (Goulielmos and Plomaritou, 2009). For example, in the event of a collision, pollution caused by an oil spill has dire consequences for shippers due to massive fines and clean-up cost. It will also have an adverse impact on their reputation and subsequently, their market shares.

On the contrary, the liner shipping sector operates on a regular schedule, with specific routes and port of destinations, and at published price. The cargoes that are transported by liners are generally finished products such as electronic appliances, devices, and apparels. Depending on the concentration of service providers in a particular trade route, liner shipping operates in an oligopoly or monopolistic market (Lun *et al.*, 2010). To some extent, liner shipping services can be differentiated (Notteboom, 2004). For example, the transit time, reliability, and frequency of a service can be differentiated by configuring the number of ports of call, the number of ships to deploy, and their speed. Unlike tramp shippers, liner shippers were reported to value these time-related service attributes over freight (Meixell and Norbis, 2008). Since the value of commodities transported by liners is generally higher than those transported by tramp operators, liner

shippers are less price-sensitive and their overall logistics cost can be minimised by improving these time-related service attributes.

As discussed above, there are differences in the interpretation of SQ between tramp and liner shipping. Although SQ in tramp shipping has been adequately addressed by the existing literature (Thai, 2008, Thai *et al.*, 2014), little research has been conducted on developing a SQ model for liner shipping. Existing models for liner shipping are direct adaption from the SERVQUAL instrument, which lacks outcome-quality and industry-specific indicators (Sakas and Marina, 2008, Lobo, 2010, Tuan, 2012). In addition, new priorities in liner shipping such as shippers' concerns for greenhouse gases emissions and corporate social responsibility have not been considered by existing SQ models. Therefore, this study aims to develop a SQ model that addresses these issues.

2.3 Service Quality and Customer Satisfaction

Customer satisfaction is a cognitive and affective reaction to a service incident (Oliver, 1980). It is regarded as a fulfilment response, from comparing a customer's experience with his or her expectation of a service encounter. Although customer satisfaction and SQ connote very similar meaning, it was argued that they are distinct constructs (Taylor and Baker, 1994). Iacobucci *et al.* (1995) concluded that the key difference between SQ and customer satisfaction is that quality relates to the core of the management service delivery whereas satisfaction reflects customers' experiences with that service. They argued that quality improvements that are not based on customer needs will not lead to customer satisfaction. As a result, SQ can be viewed as one of the antecedents of customer satisfaction.

Previous research has established that the relationship between SQ and customer satisfaction is generally positive (Liang and Zhang, 2009). In the marketing literature, customer satisfaction can result in positive customers' behavioural intentions (Qin and Prybutok, 2009). It was found that satisfied customers are more likely to exhibit loyalty to a service provider by repurchasing, or recommending the service to others (Senić and Marinković, 2014). Subsequently, this has a positive impact on a firm's market and financial performance (Lam *et al.*, 2011).

There is added complexity to satisfying customers in liner shipping. Although the ultimate customers are the shippers, other parties may act on behalf of the shippers and possess discretionary power to select a service (Frankel, 1993). For example, a freight forwarder which acts on behalf of a shipper, who can be an exporting manufacturer or an importing distributor, has decisions over the selection of routes, the combination of intermodal transport, and the selection of carriers and warehouse operators. This indicates that in addition to satisfying shippers, it is also important for shipping firms to satisfy the quality needs of their immediate customers who are the freight forwarders. Therefore, it is important that the study on customer satisfaction in liner shipping include the inputs from both shippers and freight forwarders.

To the authors' knowledge, the link between SQ and customer satisfaction in liner shipping has not been examined in the existing literature. At present, little is known with

regards to which SQ dimension has the strongest influence on customer satisfaction. As mentioned earlier, SQ only reflects the core attributes of a service delivery and do not necessarily result in customer satisfaction. Therefore, examining the relationship between SQ and customer satisfaction validates the identified SQ dimensions. In addition, studying the relationship can also offer detailed recommendations for liner shipping firms to manage and market their service deliveries.

3. Methodology

3.1 Overall Research Approach

To reiterate, the objectives of this research are to (1) identify the dimensions of SQ in liner shipping and (2) examine the effects of each SQ dimension on customer satisfaction. An integrated approach consisting of both qualitative and quantitative methodologies was adopted to meet the objectives.

This research first utilises the existing literature for the development of SQ indicators. Subsequently, structured face-to-face interviews were conducted on the users and servicer providers of liner shipping services. The purpose of the interviews is to ensure that the developed indicators genuinely reflect SQ in the liner shipping sector. In addition, the interviews also serve to ensure that all other relevant and yet omitted indicators were incorporated into the current research. Subsequently, a survey was administered to the users of container (liner) shipping services. Thereafter, the collected data were analysed using factor analysis to extract meaningful dimensions of SQ in liner shipping. Their effects on customer satisfaction were then estimated using multiple regression modelling. The procedures for each of these steps are elaborated in the subsequent sections.

3.2 Indicators of SQ and Customer Satisfaction

This paper adopts the suggestion by Sureshchandar *et al.* (2002) in developing SQ indicators for liner shipping. The authors suggested that indicators of SQ should reflect observable elements on the core service, human element of service delivery, systematisation of service delivery, tangibles of service, and social responsibility.

Based on the authors' recommendations, sixteen indicators were initially identified from the literature on carrier selection criteria and logistics performance studies, which reflect customers' requirements on shipping and shipping logistics services. Subsequently, the validity of these indicators was evaluated by interviewing senior managers from container shipping companies and their customers (i.e. freight forwarders and manufacturers) in Singapore. The interviewees were selected on a convenient basis. Three individuals from each group were interviewed. The interviewees were also asked to identify other indicators that are important in the assessment of SQ in liner shipping. Based on the general consensus shown by the interviewees, three additional indicators were included. All indicators are presented in Table 1.

A single-item measure was used to assess the customer's overall satisfaction with liner shipping services. This was reported to be the most common method adopted by researchers (Gronholdt *et al.*, 2000).

<Insert Table 1 here>

3.3 Targeted Sample Groups

The targeted sample groups for the survey are the users of container shipping services since they are the most suitable candidates to assess SQ as compared to their service providers. The users of container shipping services are the manufacturers and freight forwarders. In this study, the sampling frame for the manufacturers and freight forwarders consists of members listed in the Singapore Manufacturing Federation and Singapore Maritime Directory. Accordingly, 2018 contacts were obtained from both directories.

3.4 Survey Instrument and Procedure

An online survey questionnaire was administered to the targeted sample groups. The survey questionnaire comprises three sections. The first section provides information relating to the background, significance, and objectives of the research. The second section consists of the 19 indicators shown in Table 1. To assess the importance of each indicator in the evaluation of SQ in liner shipping, a categorical scale ranging from 1 (not important) to 5 (very important) was used. Respondents were also asked to rate their overall satisfaction with the services provided by liner shipping companies on a scale from 1 (very dissatisfied) to 5 (very satisfied). Lastly, the third section of the questionnaire captures information on the respondents' company, job title, department, and years of working experience in the company.

Data collection was performed during the period from January 2014 to June 2014. An invitation was first sent to the targeted sample groups via electronic mail to request for their participation in the survey. They were given an option to accept or decline the request. Those who accepted the invitation were immediately directed to a website for their completion. Subsequently, five monthly reminders were sent to the participants who had not completed the survey.

3.5 Statistical Method

After the survey responses were collated, exploratory factor analysis (EFA) was conducted to uncover the dimensions of SQ from the 19 SQ indicators. Thereafter, multiple linear regression analysis was performed to examine the linear effects of each SQ dimension on customer satisfaction. Prior to running the analysis, the data were formally tested for violations of multivariate normality, homoscedasticity, linearity, error independency, and multicollinearity. The results show that violations of these issues are insignificant.

4. Results and Discussion

4.1 Demographic profile of respondents

Out of 2018 questionnaires that were sent to the targeted sample groups, 183 completed questionnaires were received, and a response rate of approximately 9 percent was achieved. Table 2 provides a snapshot of the demographic characteristics of the respondents who are grouped into the following profiles: job title, department, years of tenure in the company, and types of firm.

As shown in Table 2, majority of the respondents hold managerial titles (80.3 percent), possess at least five years of working experience in their respective company (66.1 percent), and are involved in the operations of their respective companies (56.3 percent). These statistics indicate that the respondents are qualified and possess sufficient experience to answer the survey questions on behalf of their company.

<Insert Table 2 here>

4.2 Exploratory Factor Analysis

From analysing scree plots and comparing chi-square fit indices of a few alternative models (not shown in this paper), a four-factor solution was recommended to represent the 19 SQ indicators (Table 3). To facilitate factor interpretation, these indicators were grouped in accordance with their factor loadings. Indicators that have high loadings on Factor 1 were first listed, followed by those on Factor 2, 3, and 4. The four factors collectively account for approximately 76 percent of the total measurement variance.

Factor 1 which is reflected by the first five indicators in Table 3 is interpreted as “responsiveness”. Specifically, this factor relates to the supporting (non-core) elements of a liner shipping service. This includes attributes such as speed of claims, effectiveness of sales team, promptness of customer service, exhibition of socially responsible behaviour, involvement in green shipping practices, and availability of a large selection of service offerings.

Factor 2 which is collectively represented by the next five indicators relates to the core activity of the shipping service i.e. transportation. It primarily addresses the “speed” of the transportation service. Indicators including transit time of transportation services, frequency of transportation services, accuracy of cargo tracking systems, idle time of shipments, and availability of empty containers contribute to the speed of a shipment.

Factor 3 which represents the third group of indicators is interpreted as “value”. This factor involves maintaining the cost advantage of shippers by being sensitive to the pricing of shipping services and shippers’ total logistics cost. In addition, cost can also be reduced by maintaining the conditions of ships and equipment (e.g. containers), and enhancing the safety and security of shipments.

Factor 4 represents the last group of indicators and is interpreted as “reliability”. These indicators consist of core and non-core attributes which reflect the overall consistency in providing customer service, error-free documentation, and the transportation itself.

<Insert Table 3 here>

4.3 Unidimensionality and Reliability

To assess unidimensionality of each indicator, within-factor principal component analysis was performed on each SQ dimension. This is to ensure that each indicator is only representing a single concept. Based on kaiser criterion (eigenvalue > 1), the results from within-factor principal component analysis show that the indicators of each SQ dimension can be parsimoniously represented by a single factor, and thus lending support to unidimensionality.

The reliability of the indicators was examined using cronbach alpha values as a measure of internal consistency. As shown in Table 4, cronbach alpha for each factor is above 0.7, which suggests satisfactory level of reliability.

Based on the above analysis on unidimensionality and reliability, the results indicate that each dimension, or factor, is representative of its indicators. Therefore, the subsequent regression analysis can be conducted at dimensional level rather than at indicator level.

<Insert Table 4 here>

4.4 Regression Analysis

The four SQ dimensions were regressed on customer satisfaction using LISREL 9.1. Their standardised estimates are depicted in Figure 1. As shown in Figure 1, a squared multiple correlation of 0.765 was achieved. This indicates that SQ dimensions relating to reliability, speed, responsiveness, and value are sufficient to account for majority (> 75 percent) of the variances in customer satisfaction. This study attributes the remaining and unexplained variances to (1) plausible polynomial or interaction relationships among existing variables in the model, (2) observable variables that are omitted from the model, (3) transcendence aspect of quality that is not measurable and subjective to individual interpretation, and (4) satisfaction derived from previous transactions with a shipping company.

<Insert Figure 1 here>

All t-tests are significant which indicate a significant linear relationship between each SQ dimension and customer satisfaction. In descending order of importance, the service dimensions that are responsible for driving customer satisfaction in liner shipping are reliability, speed, responsiveness, and value. In general, the rankings of the service dimensions are fairly consistent with a recent study on liner carrier selection criteria by Meixell and Norbis (2008).

The results show that service attributes associated with the core activity of a shipping service are the main contributors to customer satisfaction. Aligned with the literature, reliability and speed are time-related competencies that can be adopted as strategies to differentiate shipping services (Notteboom, 2006). First, reliable transportation service results in substantial cost savings for shippers since it reduces supply uncertainty and safety stocks. Less variability in supply replenishment also allows

shippers to streamline their production, which results in better utilisation of assets and resources. Second, faster transportation service also reduces in-transit inventories in the transportation chain. Attributing to the time-sensitivity and value of the commodities that are shipped by liners, substantial cost-savings for the shippers can be realised from improving both SQ dimensions.

Following after reliability and speed is responsiveness. This factor addresses the aspect of customer satisfaction that is derived from the performance of supporting activities, which are usually provided before and after a transportation service. For example, satisfaction prior to a transportation service would occur from the interaction between shippers and frontline employees (i.e. sales and marketing team). It can also be attributed to the variety of service offerings that allows for greater degree of customisation. Satisfaction can also occur after the performance of a transportation service. In the event of cargo losses or late deliveries, the effectiveness of a firm's service recovery, which is determined by the promptness of customer service and the ease and speed of claims, has a positive impact on customer satisfaction.

Finally, value also positively contributes to customer satisfaction. This suggests that shippers expect freight to be competitive in addition to reliable, fast, and responsive services. The importance of value provides an explanation for the phenomenon of increasing ship sizes in the liner shipping industry to capitalise on economies of scale. It also accounts for the phenomenon of the increasing scope of shipping companies. They are expanding their ownership to the hinterland which includes both port operation and in-land distribution (Panayides *et al.*, 2012). Hinterland integration could enhance the price-competitiveness of shipping firms since landward distribution constitutes 77 percent of the total logistics cost for shippers (Branch and Stopford, 2013).

The rankings of the dimensions indicate that each dimension of SQ does not contain equal weight in driving customer satisfaction. As discussed earlier, core SQ dimensions are the main drivers of customer satisfaction in liner shipping. Therefore, it is recommended that the marketing of liner shipping services should focus on featuring the core attributes of a transportation service such as reliability, transit-time, and frequency to shippers. This study also captures the uniqueness of liner shipping where shippers prioritise time-related attributes (i.e. reliability and speed) over cost. For example, providing more reliable or faster transportation services can translate to greater customer satisfaction than offering low-cost services. This implies that differentiation strategy should take priority over applying cost leadership in the liner shipping sector.

5. Conclusion and Recommendation

In this study, the dimensions of SQ in liner shipping were identified. Their effects on customer satisfaction were also examined. Expert interviews, followed by a survey were conducted on the users of liner shipping services in Singapore. Statistical methods including factor analysis and regression analysis were adopted to analyse the data.

The most significant finding is that SQ in liner shipping can be parsimoniously represented by four SQ dimensions. In descending order of their effects on customer satisfaction, they are reliability, speed, responsiveness, and value. Reliability and speed

are the main predictors of customer satisfaction. They mainly comprise core indicators relating to the performance of a transportation service. Responsiveness consists of supporting indicators which assess shippers' perception and experience before and after the performance of a transportation service. For example, these indicators measure shippers' perception of a firm's image and their interaction with its employees and systems. Finally, value consists of indicators that determine the competitiveness of the freight charged by a shipping firm.

The results indicate that liner shippers prioritise time-related and responsive services (i.e. reliability and speed) over price (i.e. value). Therefore, it can be implied that differentiation based on time-related service attributes is a more effective strategy as compared to applying cost leadership. Most notably, this study contributes to the literature by developing a SQ model that is tailored to liner shipping. In addition, it addresses the deficiencies of previous studies by incorporating process, outcomes, and logistics indicators in its model. This is also one of few studies that have examined the effects of each SQ dimensions on customer satisfaction in shipping. The examination validates the SQ dimensions and provides clearer directions for liner shipping firms to evaluate the quality of their services, market their services, and maximise customer satisfaction.

However, a few limitations in this study are worth noting. First, this study has only examined the effect of each SQ dimension on customer satisfaction. Their subsequent impact on a firm's market and financial performance is not within the scope of this study. Second, the results may only be applicable to Singapore since culture may possibly influence the interpretation of SQ dimensions and their subsequent impact on customer satisfaction. Lastly, similar to most studies, this study has assumed linear relationship between SQ and customer satisfaction. There are indications in the literature that the functional relationship between SQ and customer satisfaction may vary with the industry that is studied (Ažman and Gomišček, 2014). Therefore, it is recommended that future studies should examine the functional relationship between SQ and customer satisfaction in shipping.

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For Review Only

Table 1. Indicators of Service Quality in Liner Shipping

ID	SQ attribute
01	Consistency of customer service
02	Error-free documentation
03	On-time pick-up and delivery of cargo
04	Transit-time of transportation services
05	Frequency of transportation services
06	Accuracy of cargo tracking system
07	Idle time of shipments
08	Availability of empty containers ^a
09	Speed and ease of claims
10	Effectiveness of sales team
11	Promptness of customer service
12	Corporate social responsibility and concerns for human safety
13	Green shipping practices
14	Variety of service offerings
15	Pricing of shipping services
16	Total logistics cost
17	Freight changes ^a
18	Conditions of ships and equipment
19	Safety and security of shipment ^a

Note: ^a The following indicators were contributed by the interviewees

Table 2. Demographic Characteristics of Respondents

Demographic Information	Number of respondents	Percentage (%)
Job title		
Vice-president and above	13	7.1
Director and assistant director	48	26.2
Manager and assistant manager	86	47.0
Non-management staff	36	19.7
Department		
Operations and Logistics	103	56.3
Procurement	32	17.5
Quality improvement	9	4.9
Sales	18	9.8
Others	21	11.5
Years of experience (current company)		
<5 years	62.0	33.9
6 – 10 years	49.0	26.8
11- 15 years	38.0	20.8
15 and above	34.0	18.6
Types of firm		
Manufacturers	117	63.9
Freight forwarders	66	36.1

Indicators of SQ	Factor 1	Factor 2	Factor 3	Factor 4
Speed and ease of claims	0.805	-	-	-
Effectiveness of sales team	0.710	-	-	-
Promptness of customer service	0.782	-	-	-
Socially responsible behaviour and concerns for human safety	0.880	-	-	-
Green shipping practices	0.813	-	-	-
Variety of service offerings	0.772	-	-	-
Transit-time of transportation services	-	0.712	-	-
Frequency of transportation services	-	0.843	-	-
Accuracy of cargo tracking systems	-	0.802	-	-
Idle time of shipments	-	0.701	-	-
Availability of empty containers	-	0.680	-	-
Pricing of shipping services	-	-	0.672	-
Total logistics cost	-	-	0.793	-
Freight changes	-	-	0.718	-
Conditions of ships and equipment	-	-	0.723	-
Safety and security of shipment	-	-	0.814	-
Consistency of customer service	-	-	-	0.883
Error-free documentation	-	-	-	0.713
On-time pick-up and delivery of cargo	-	-	-	0.772
Eigenvalue	4.19	3.19	2.86	1.93
Total variance explained (%)	26.20	19.97	17.86	12.07
Cumulative percentage variance (%)	26.20	46.17	64.03	76.10

SQ dimension	Factor mean	Standard deviation	Correlations			
			1	2	3	4
1. Responsiveness	3.49	0.91	(0.85)			
2. Speed	3.53	0.93	0.26	(0.89)		
3. Value	3.32	0.82	0.18	0.33	(0.92)	
4. Reliability	3.91	0.87	0.33	0.26	0.23	(0.91)

Note: Figures in parenthesis are cronbach alpha values

Figure 1. A Path Diagram on SQ Dimensions and Customer Satisfaction