

## **The Effect of Airline Service Quality on Passengers' Behavioural Intentions Using SERVQUAL Scores: A TAIWAN Case Study**

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### **Abstract:**

This paper seeks to improve our understanding of air passengers' decision-making processes by testing a conceptual model that considers service value, airline service quality, satisfaction, perceived sacrifice, and behavioural intentions. In this study, a linear structural equations modeling system is applied to incorporate the service quality of airline companies into the passengers' airline choice models to enhance the models' performance and the forecasting ability. Two modeling approaches are applied in this research: the structural equation modeling (SEM) and the importance-performance analysis (IPA). The SEM results of this study show that the service value is the major factor that can influence the behavioural intention. IPA results indicate that responsiveness is the most important airline service quality attribute in passengers. Finally, implications of these results for practice and research are provided.

**Key Words:** *airline, service quality, SERVQUAL, SEM, IPA*

### **1. INTRODUCTION**

In a highly competitive environment the provision of high quality services passengers is the core competitive advantage for an airline's profitability and sustained growth (Chen, 2008). In the past decade, as the air transportation market has become even more challenging, many airlines have turned to focus on airline service quality to increase service satisfaction. Service quality conditions influences a firm's competitive advantage by retaining customer patronage, and with this comes market share (Park *et al.*, 2004; Morash and Ozment, 1994). Delivering high-quality service to passengers is essential for airline survival, so airlines need to understand what passengers expect from their services.

Studies in other sectors suggest that customer satisfaction and service quality judgments involve consumers comparing their prior expectations to actual service performance. Where customer satisfaction and loyalty has been examined in the air transport context, factors such as service value tend to be ignored.

Based on the above-mentioned research background, the purpose of this study is to investigate the decision making factors affecting airline service quality, the main purposes of the study are: (1) to explore the relationships among the airline service quality factors (ASQ), satisfaction and service value and behavioral intention within the framework of structural equation modeling, (2) using Importance-Performance Analysis to discuss the relationship between the of level of customers' expected airline service quality and level of customers'

perceived airline service quality. Finally, we discuss the findings from an academic and managerial perspective and provide directions for future research.

## **2. LITERATURE REVIEW**

Understanding and maintaining quality are the main concerns of business today. Providing quality is not a concern of manufacturing companies alone. The delivery of high-quality service becomes a marketing requirement among air carriers as a result of competitive pressure (Ostrowski *et al.*, 1993). Chang and Yeh (2002) argue that quality in airline service is difficult to describe and measure due to its heterogeneity, intangibility, and inseparability, and only the customer can truly define service quality in the airline industry (Butler and Keller, 1992).

### **2.1 SERVQUAL IN AIRLINE SERVICE**

Service quality can be defined as a consumer's overall impression of the relative efficiency of the organization and its services. Understanding exactly what customers expect is the most crucial step in defining and delivering high-quality service (Zeithaml *et al.*, 1996). SERVQUAL is one of the best models for evaluating customers' expectations and perceptions (Pakdil and Aydm, 2007; Chen, 2008). Despite criticism from other research, SERVQUAL remains the most commonly used diagnostic model for evaluating service quality. SERVQUAL has five main dimensions to measure service quality: tangibles, reliability, responsiveness, assurance, and empathy (Zeithaml *et al.*, 1996). In addition to SERVQUAL related studies, many scholars have measured airline service quality through various quality dimensions. Gourdin (1988) categorized airline service quality in terms of three items: safety, timelines and price. Elliott and Roach (1993) proposed food and beverage, timely luggage transport, seat comfort, the check in process, and in-flight service dimensions. Haynes (1994) used the processing of luggage, seat cleanliness, and the check-in process, the convenience of transit, timeliness, and handling of customer complaints as the standards of service quality.

### **2.2 Behavior intention**

Consumer behavior is an integrate science; it includes economics, marketing, psychology and sociology. American Marketing Association (AMA) defined consumer behavior as a dynamic relationship between interaction of emotion, cognition and behavior. That also means that consumer behavior includes the feelings and thoughts experienced by consumers and the behavior during their buying process. At the same time, it also includes environment which affect consumers' emotion, cognition and behavior, like other consumers comment, advertisement marketing, product price information, package, product appearance ...etc. As compared with the service quality or customer satisfaction variables, intended behavior are more closely related to actual behaviors and reflect richer diagnostic value. Engel, Blackwell, and Miniard (1995) introduce that behavioral intention is related to attitude. The traditional view reflects that attitude consists of three key components: (1) cognitive, a person's knowledge and beliefs with respect to the attitude object; (2) affective, a person's feelings about the attitude object; (3) cognitive, a person's action or behavior tendencies toward the attitude object. Cronin, Brady, and Hult (2000) in accordance with recent advances in services marketing theory and built on the efforts to conceptualize the effects of quality, satisfaction, and value on consumers' behavioral intentions across multiple service industries. It stated three competing models based on different research objectives from the literatures; those are value model, satisfaction model, and indirect model. And then, the authors developed the

forth model called “Research Model” to depict the relationship amongst the primary service evaluation constructs of sacrifice, service quality, service value, satisfaction, and behavioral intentions.

### **2.3 Satisfaction**

The performance of a company leads to customer satisfaction with a product or service (Huang and Feng, 2009). Customer satisfaction is fundamental to the practice of consumer sovereignty. In recent research, customer satisfaction (or dissatisfaction) has become an important issue for marketing practitioners because of the rapid business environment. Customer satisfaction can be defined as a judgment made on the basis of a specific service encounter. Satisfaction and loyalty are not surrogates for each other (Bloemer and Kasper, 1995; Oliver, 1999). It is possible for customers to be loyal without being highly satisfied (e.g., when they are few other choices) and to be highly satisfied and yet not loyal (e.g., when many alternatives are available). Firms are needed to gain a better understanding of the relationship between satisfaction and behavioural intention in the online environment and to allocate the online marketing efforts between satisfaction initiatives and behavioural intention program.

### **2.4 Service value**

The issue of value creation or value added has been widely discussed in consumer and industrial marketing articles and is often treated as the main part of organization’s mission statements and objectives. Service value has been defined as an important variable of customer satisfaction and behavioral intentions (McDougall and Kevesque, 2000). Zeithaml (1988) described perceived value conceptually as the consumer’s overall assessment of the utility of a product based on perceived of what is received and what is given. She also identified four unique definitions of the value construct by an exploratory investigation: (1) Value is low price, (2) Value is whatever I want in a product, (3) Value is equality I get for the price I pay, (4) Value is what I get for what I give. Overall, value is a trade-off between get (benefits) and give up (sacrifices). The value of what is given and what is received vary across consumers.

### **2.5 Perceived sacrifice**

Sacrifice is defined as what is given up or sacrificed to acquire a service/product (Zeithaml, 1988). The measured scale of the sacrifice can be described as the consumers’ perceptions of the monetary and the non-monetary price when they acquire a service/product. Monetary price is evaluated by a direct measure of the dollar price of the service, and non-monetary price is evaluated by direct measures of time and effort of the service (Cronin, Bredy, and Hult, 2000). Because risk is an inherent part of the cost of the acquisition and use of any service/product, sacrifice is described as a composite of perceived monetary price, perceived non-monetary price, and perceived risk (Cronon et al., 1997).

### **2.6 Modeling air passengers’ behavior intention**

The importance of the relationships between airline service quality, satisfaction, and behavioural intentions have been examined by Ostrowski et al. (1993), Sultan and Simpson (2000) and Cronin (2000). Although the direction of airline service quality and satisfaction has been studied empirically, the relationships between airline service quality, satisfaction,

service value and behavioural intentions, is still a matter of debate because the direction may vary depending on context. Zeithaml et al. (1996) explore the relationship between service quality and customer retention and suggest that customers' behavioral responses play a mediating role in that link. In other words, behavior intentions are conceptualized as consequences of service quality and will affect customers' actual behavior, and in turn, firms' financial outcomes.

To improve our understanding of air passengers' decision-making process, a model that considers airline service quality, service value, satisfaction and behavioural intentions is established. Based on the literatures review (Christo, 2007; Flavian, Guinaliu and Gurra, 2006; Steven et al., 2006; Shankar, Smith and Rangaswamy, 2003; Srinivasan, Anderson and Ponnnavolu, 2002; Mara and Barbara, 2002; John et al., 2001; John et al., 1999), the hypothesis and measurement model are formulated for the exogenous variable and the endogenous variables as shown in Figure 1 to explain the relationships among perceived sacrifice, service value, behavioural intention, satisfaction and airline service quality.

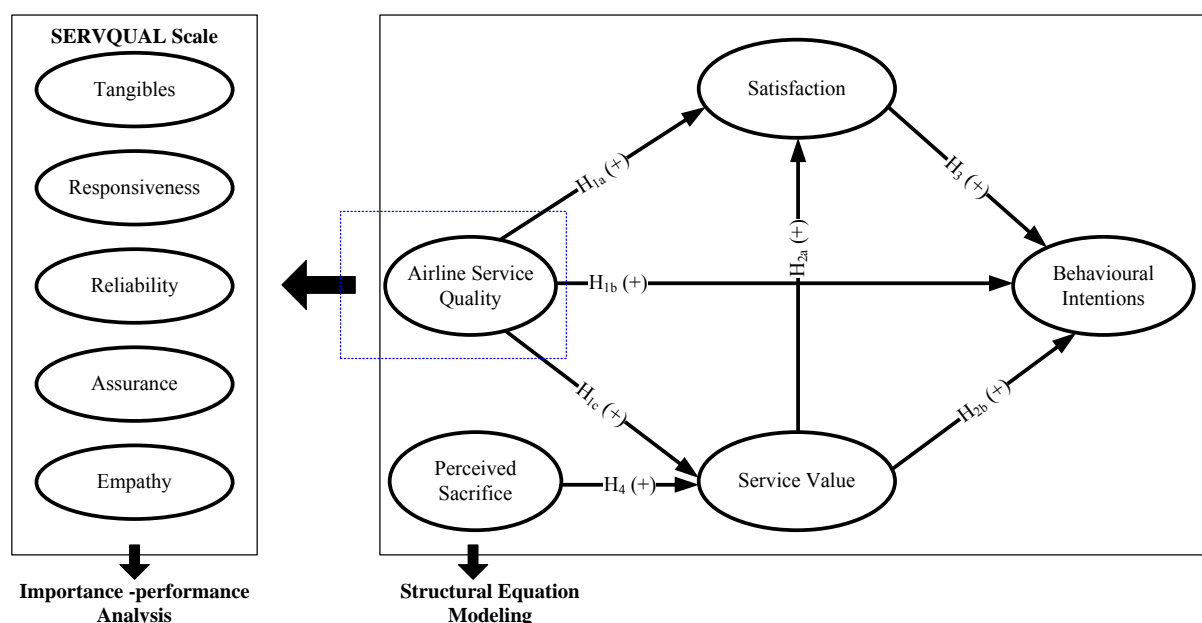


Figure 1 The proposed conceptual model

### 3. METHODOLOGY

#### 3.1 Structural equation modeling

The conceptual model is used and shown in Figure 1 to explain the relationships among behavioural intention, satisfaction, service value, and airline service quality. To analyze the relation between these factors, a structural equation modeling approach to the analysis of collected data was proposed. Confirmatory factor analysis (CFA) is employed to develop a measurement model that achieved an acceptable fit to the data. Reliability is assessed at first, and then convergent validity is analyzed. Reliability may be understood as the internal consistency of the items that are used to measure a latent construct.

SEM is a multivariate technique which combines confirmatory factor analysis modeling from psychometric theory and structural equations modeling. The primary aim of SEM is to explain the pattern of a series of inter-related dependence relationships simultaneously between a set

of latent (unobserved) constructs, each measured by one or more manifest (observed) variables. By using LISREL, the simultaneous estimation of: (1) a measurement model can be obtained that items in each scale to the construct represented, giving factor loadings for each item; (2) a structural model that related constructs to one another, providing parameter value. The LISREL model represents a series of hypothesis, and how the variables are related.

### 3.2 Questionnaire design and data select

The questionnaire is consists of several parts in light of the previous literature. Firstly, we determined the important control variables as gender, age, marital status, occupation, and purpose of last trip. Next, the SERVQUAL and airline service quality dimensions were taken into consideration under the inspiration of previous studies. Airline service quality is measured by 18 airline service quality measurements primarily based on the SERVQUAL scale developed by Parasuramen *et al.* (1988), Park *et al.* (2004), and Padil *et al.* (2007), together with insights gained from in-depth interview of airline managers and focus group responses.

The design of the survey questionnaire is based on multiple-item measurement scales. The measurement items are adapted for an airline setting and all of the measurement items are based on a 5-point Likert scale related from 1 = strongly disagree/unimportant to 5 = strongly agree/important.

An airline passenger survey was conducted in Taiwan. Face-to-face interviews of passengers waiting for their flights were conducted in Taoyuan international airport between June and July 2007. A total of 700 questionnaires were distributed to Taiwanese who had undertaken at least one international flight in the previous 18 months. 602 completed questionnaires were collected. In terms of the respondent's purpose for the current trip, 43.1% are business and 37.93% are holiday. Among the sample data, more than half of the respondents are unmarried, 76.25% are males, 85.38% are in the 19-40 age groups, and 62.4% of the respondents indicate that 7-11.com is their main pick-up point. A demographic analysis is presented in Table 1.

Table 1 Passenger profiles

Attributes	Sample number	Frequency (%)
Gender		
Male	459	76.25%
Female	143	23.75%
Marital status		
Married	439	72.9%
Single	163	27.1%
Age		
Less than 18	28	4.65%
19~22	146	24.25%
23~29	187	31.06%
30~40	181	30.07%
41~50	48	7.97%
51 and over	12	1.99%
Occupation		
Employee of company	186	30.90%
Professional	28	4.65%

Student	30	4.98%
Management	34	5.65%
Housewife	26	4.32%
Freelancer	16	2.66%
Private business	128	21.26%
Government employee	22	3.65%
Others	132	21.93%
Purpose of last trip		
Business	259	43.10%
Holiday	228	37.93%
Visit	61	10.10%
Other	53	8.87%

## 4. RESULTS

### 4.1 Reliability and validity

Reliability analysis was performed on the basis of both internal consistency and interrater agreement methods. Firstly, the internal consistency reliability of all questions was assessed by the Cronbach's alpha coefficients of measurement items for each construct are presented in Table 2. Hair *et al.* (2006) suggested that Cronbach's alpha coefficient over 0.6 is adequate for basic research. The reliability of each construct was assessed by using Cronbach's alpha measure which is in the experiment ranging from 0.89 to 0.93, indicating that the scale are internally consistent and reasonably free of measurement error.

As a second, confirmatory factor analysis (CFA) was used to test the adequacy of the measurement model using LISREL 8.52. The results indicated a good fit between the model and the observed data. The large  $\chi^2$ -value was not surprising because the  $\chi^2$  statistic in LISREL has been shown to be directly related to sample size. Goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI) and comparative-of-fit index (CFI) all exceeded the recommended 0.9 threshold level. In addition, root mean square residual (RMSR) and root mean square error of approximation (REMEA) were lower than .05 (Hair, *et al.*, 2006).

We assessed the latent factors' reliability by calculating a composite reliability for each construct (Boyer and Hult, 2006). To be thorough, we calculated reliabilities for each scale in our sample. The composite reliability was calculated as:

$$CR_{\eta} = \frac{(\sum \lambda_{\gamma i})^2}{(\sum \lambda_{\gamma i})^2 + (\sum \varepsilon_i)^2} \quad (1)$$

where  $CR_{\eta}$  = composite reliability for scale  $\eta$ ;  $\lambda_{\gamma i}$  = standardized loading for scale item  $\gamma i$ , and  $\varepsilon_i$  = measurement error for scale item  $\gamma i$ . Along with the reliability calculations, we also examined the parameter estimates and their associated  $t$ -values as well as the average variances extracted. Again, we report the average variances extracted for each scale in the sample. Average variance extracted was calculated as:

$$V_{\eta} = \frac{(\sum \lambda_{\gamma i}^2)}{(\sum \lambda_{\gamma i})^2 + (\sum \varepsilon_i)^2} \quad (2)$$

where  $V_{\eta}$  = average variance extracted for  $\eta$ ;  $\lambda_{\gamma i}$  = standardized loading for scale item  $\gamma i$ , and  $\varepsilon_i$  = measurement error for scale item  $\gamma i$ .

We examined the convergent validity of the measurements items by factor loadings, composite reliability, and the variance-extracted measure. Standardized loading and t-value were estimated to display the convergent validity of the constructs comprising more than two factors. The results of the test of convergent validity are shown in Table 2. Convergent validity was supported because all standardized loadings were highly significant ( $p$ -value less than 0.05). In addition, the average variance extracted for each construct was greater than 0.5, thus providing support for the convergent validity of the measure for each construct. Composite reliability was estimated to evaluate the internal consistency of the measurement model. All of the composite reliability measures were above the suggested level of 0.5. As a result, all construct were reliable.

Table 2 Measurement model results

Construct	Items	SL	CR	AVE
Tangibles (0.93) <sup>a</sup> (Gourdin, 1988; Pakdil et al., 2007)	X <sub>1</sub> : In-flight newspaper, books, etc X <sub>2</sub> : Quality of food and beverage X <sub>3</sub> : In-flight entertainment facilities	0.92 0.93 0.86	0.93	0.81
Responsiveness (0.89) <sup>a</sup> (Pakdil et al., 2007; Gourdin, 1988; Elliott and Roach, 1993; Haynes, 1994)	X <sub>4</sub> : Handling of delayed, etc X <sub>5</sub> : Efficient check-in/baggage handling service X <sub>6</sub> : Employees' speed handling request/complaints X <sub>7</sub> : Quality of the reservation services X <sub>8</sub> : Employees' willingness to help	0.88 0.86 0.75 0.71 0.69	0.89	0.61
Reliability (0.82) <sup>a</sup> (Haynes, 1994; Gourdin, 1988)	X <sub>9</sub> : Safety X <sub>10</sub> : On-time departure and arrival X <sub>11</sub> : Clean and comfortable interior/seat	0.81 0.77 0.74	0.82	0.60
Assurance (0.87) <sup>a</sup> (Elliott and Roach, 1993; Haynes, 1994)	X <sub>12</sub> : Image of the airline company X <sub>13</sub> : External appearance of the airplane X <sub>14</sub> : Employees' foreign language level	0.87 0.93 0.72	0.88	0.71
Empathy (0.82) <sup>a</sup> (Park et al., 2004; Zeithaml, 1988)	X <sub>15</sub> : Employees' behaviour to delayed passenger X <sub>16</sub> : Individual attention to passenger X <sub>17</sub> : Advertising of the airline company X <sub>18</sub> : Availability of air/accommodation packages	0.51 0.93 0.87 0.68	0.84	0.59
Service value (0.90) <sup>a</sup> (Gourdin, 1988; Park et al., 2004; Zeithaml, 1988)	SV: I have always had a good impression of this airline. SV <sub>2</sub> : The ticket price of this airline is reasonable. SV <sub>3</sub> : Considering the ticket price I pay for the airline, I believe that the airline offers	0.81 0.88 0.91	0.90	0.75

	sufficient services.			
Perceived sacrifice (0.84) <sup>a</sup> (Cronin <i>et al.</i> , 2005)	PSC <sub>1</sub> : I think that the price charge to use this airline is low.	0.90	0.85	0.66
	PSC <sub>2</sub> : The time required to use this facility is low.	0.85		
	PSC <sub>3</sub> : The effort that I must make to receive the services offered is low.	0.68		
Satisfaction (0.92) <sup>a</sup> (Park <i>et al.</i> , 2004; Fornell, 1999)	SAT <sub>1</sub> : think that I did the right thing when I decided to use this airline.	0.91	0.92	0.79
	SAT <sub>2</sub> : My choice to use this airline was wise one.	0.94		
	SAT <sub>3</sub> : I feel satisfied with the airline's service quality	0.81		
Behavioural intentions (0.90) <sup>a</sup> (Park <i>et al.</i> , 2004)	BI <sub>1</sub> : would like to use this airline again in the future	0.81	0.90	0.74
	BI <sub>2</sub> : I would recommend their organization to a friend	0.91		
	BI <sub>3</sub> : If asked, I would say good things about this airline	0.86		

Notes: ( )<sup>a</sup> express Cronbach's alpha; SL: Standardized Loading; CR: Composite Reliability; AVE: Average Variance Extracted

#### 4.2 Structural equation model

Because of the proposed measurement model was consistent with the data, the hypothesis were tested with LISREL 8.54, using the covariance matrix. The LISREL analysis produced a significant  $\chi^2$  statistic. The other fit measures were indicative of adequate fit to the sample data. The standardized parameter estimates and *t*-values are reported in Fig. 2. Figure 2 portrays the hypotheses test results and the completely standardized parameters in the proposed structural model. All of our hypothesized associations were significant at  $p=0.01$  (except H<sub>1b</sub>). The summary of the overall fit indices of our research model is shown in Table 3. In general, NFI, NNFI (Non-Normed Fit Index), CFI (Comparative Fit Index) and GFI (Goodness-of-fit index) greater than 0.9 are indicative of good model fit; the RMSR value of 0.062, PGFI value of 0.62 and most other value surpass the recommended level while PNFI value of 0.75 is at a marginal acceptance level.

As predicted in H<sub>2b</sub> and H<sub>3</sub>, (see Fig. 1) service value and satisfaction had positive and significant influences on behavioural intention. Contrary to H<sub>1b</sub>, the influence of airline service quality on behavioural intention was not significant. As expected in H<sub>1a</sub> and H<sub>2a</sub>, airline service quality and service value had positive and significant influences on satisfaction. Airline service quality had a significant positive influence on service value. The results also indicated that perceived sacrifice had positive influences on service value. Finally, the model explained 47%, 83% and 82%, respectively, of the variance in the endogenous constructs: service value, satisfaction and behavioural intention.



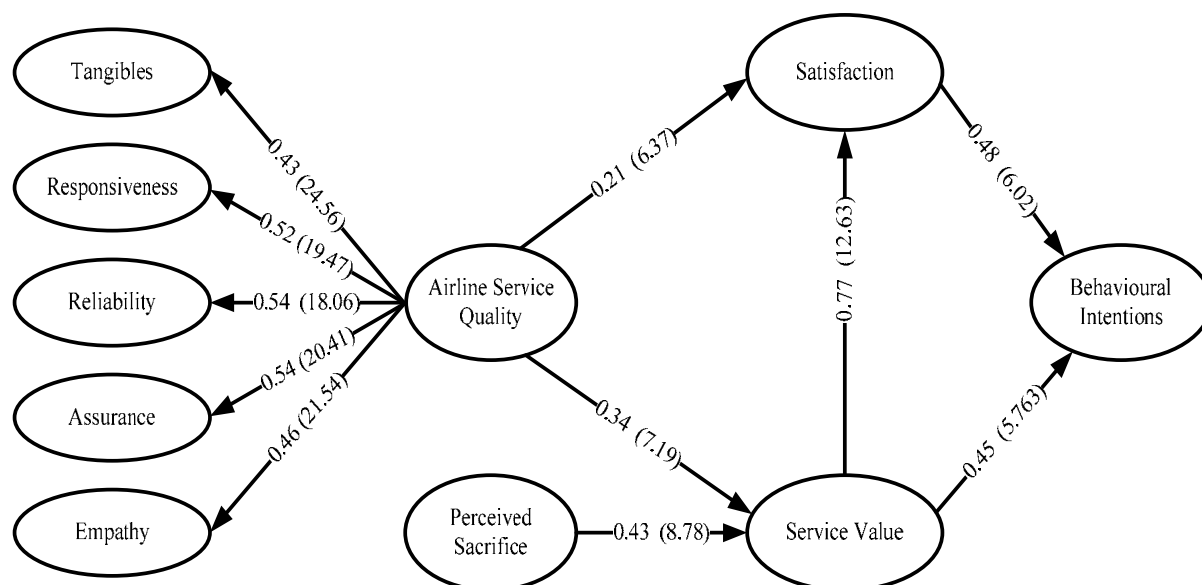


Figure 2 Choice tree of inter-regional transport modal choice, ( ) express the *t*-value

Table 3 Results of reliability and convergent validity test

Fit index	Value	Suggested value
Goodness-of-fit index (GFI)	0.91	Greater than 0.9
Comparative Fit Index (CFI)	0.95	Greater than 0.9
Normed Fit Index (NFI)	0.94	Greater than 0.9
Non-Normed Fit Index (NNFI)	0.94	Greater than 0.9
Parsimony Normed Fit Index (PNFI)	0.78	Greater than 0.5
Root Mean Square Residual (RMSR)	0.03	Below 0.08
Parsimonious goodness of fit index (PGFI)	0.67	Greater than 0.5

Comparing the direct, indirect, and total effects among the study variables (Table 4) show satisfaction have the strongest direct on behavioural intention and service value was the great total effects (Total effects are simply the sum of direct and indirect effects.) on behavioural intention. The other direct and indirect effect behavioural intention is the following:

Table 4 Direct, indirect and total effects of independent variables on behavior intention

Independent variable	Direct effects	Indirect effects	Total effects
Airline service quality (ASQ)			0.38
ASQ → SV → BI		0.15 (0.34*0.45)	
ASQ → SAT → BI		0.10 (0.21*0.48)	
ASQ → SV → SAT → BI		0.13 (0.34*0.77*0.48)	
Satisfaction (SAT)	0.48		0.48
Service Value (SV)	0.45		0.82
SV → SAT → BI		0.37 (0.77*0.48)	
Perceived sacrifice (PSC)			
PSC → SV → BI		0.19 (0.43*0.45)	0.35
PSC → SV → SAT → BI		0.16 (0.43*0.77*0.48)	

● Direct effects

As presented in Figure 2, satisfaction and service value are all direct effect on the behavioural intention.

- Indirect effects

The airline service quality, service value, and perceived sacrifice are all had indirect effect on the behavioural intention. The indirect path from airline service quality to behavioural intention is the following:  $0.15 (0.34*0.45) + (0.21*0.48) + (0.34*0.77*0.48) = 0.38$  because it is mediated through service value and satisfaction. The direct effect of perceived sacrifice on behavioural intention is mediated through service value and satisfaction. As for the service value, the indirect effect on the behavioural intention is mediated through satisfaction.

### 4.3 Importance-performance analysis

One technique available to the protected area professional is Importance-Performance Analysis (IPA). Importance-Performance Analysis is a simple and useful technique for identifying those attributes of a product or service that are most in need of improvement or that are candidates for possible cost-saving conditions without significant detriment to overall quality. The application of IPA, introduced by Martilla and James (1977) is well documented, and has shown the capability to provide service managers with valuable information for both satisfaction measurement and the efficient allocation of resources, all in an easily applicable format.

To complete the Importance-Performance analysis, a series of paired-samples t-tests were conducted to evaluate whether the mean performance scores differ significantly from the mean importance scores. Table 5 illustrates results the mean importance and performance ratings of the 18 items of ASQ.

Table 5 Importance-performance analysis for airline service quality

Attribute	Mean Imp.	Mean Per.	Gap (I-P)	t-value	Significance (two-tailed)
Tangibles (X <sub>1</sub> )	3.716	3.493	0.223	-8.146	0.000
Tangibles (X <sub>2</sub> )	3.146	3.508	-0.362	9.382	0.000
Tangibles (X <sub>3</sub> )	3.216	3.462	-0.246	6.913	0.000
Responsiveness (X <sub>4</sub> )	3.628	3.281	0.347	-10.434	0.000
Responsiveness (X <sub>5</sub> )	3.593	3.153	0.440	-8.015	0.000
Responsiveness (X <sub>6</sub> )	3.583	3.370	0.213	-6.453	0.000
Responsiveness (X <sub>7</sub> )	3.807	3.239	0.568	-15.270	0.000
Responsiveness (X <sub>8</sub> )	3.877	3.296	0.581	-18.698	0.000
Reliability (X <sub>9</sub> )	3.387	3.306	0.081	-2.322	0.021
Reliability (X <sub>10</sub> )	3.734	3.316	0.419	-14.924	0.000
Reliability (X <sub>11</sub> )	3.100	3.156	-0.056	3.738	0.000
Assurance (X <sub>12</sub> )	3.033	3.465	-0.432	5.269	0.000
Assurance (X <sub>13</sub> )	3.424	3.021	0.403	-4.646	0.001
Assurance (X <sub>14</sub> )	3.513	2.940	0.573	-2.315	0.021
Empathy (X <sub>15</sub> )	3.558	3.075	0.483	-2.830	0.005
Empathy (X <sub>16</sub> )	3.301	3.277	0.023	-8.936	0.000
Empathy (X <sub>17</sub> )	3.090	3.510	-0.420	3.710	0.000
Empathy (X <sub>18</sub> )	3.588	3.480	0.108	-12.816	0.000

Table 5 also shows the gaps (importance minus performance) and t-test statistic. As seen, there is a significant difference between the importance and performance scores, and the top five largest negative gaps are: X<sub>12</sub>, X<sub>17</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>11</sub>. The analysis then examined the relationship to the overall mean performance and importance for operators. One of the advantages of using a weighted performance measure is that attributes can be plotted graphically on a matrix, and this can facilitate faster and more efficient interpretation of the results. Based on Table 5, the overall mean importance rating is 3.46, and the performance rating is 3.30.

Figure 3 highlights the relative positions of attributes in matrix format, with the importance values on the vertical axis and performance values on the horizontal axis. Airline service quality original question items are classified into quadrants as shown in the graph: quadrant I (maintenance reinforcement area), quadrant II (improvement reinforcement area), quadrant III (secondary improvement area) and quadrant IV (over-emphasized area)

As shown in Figure 3, most of the items fall in quadrants I, II and IV, with just a few in quadrants III. On one hand, home delivery service provider should maintain the advantage of quadrants I (X<sub>1</sub>, X<sub>6</sub>, X<sub>10</sub>, and X<sub>18</sub>), their resource allocation should be changed from quadrants IV (X<sub>2</sub>, X<sub>3</sub>, X<sub>9</sub>, X<sub>12</sub>, and X<sub>17</sub>) to quadrants II (X<sub>4</sub>, X<sub>5</sub>, X<sub>7</sub>, X<sub>8</sub>, and X<sub>15</sub>) on the other hand. The IPA results indicate that responsiveness (X<sub>8</sub>), responsiveness (X<sub>7</sub>) and reliability (X<sub>10</sub>) are the top three important airline service quality attributes in passengers. Fig.4 describes the airline service gap by different attribute.

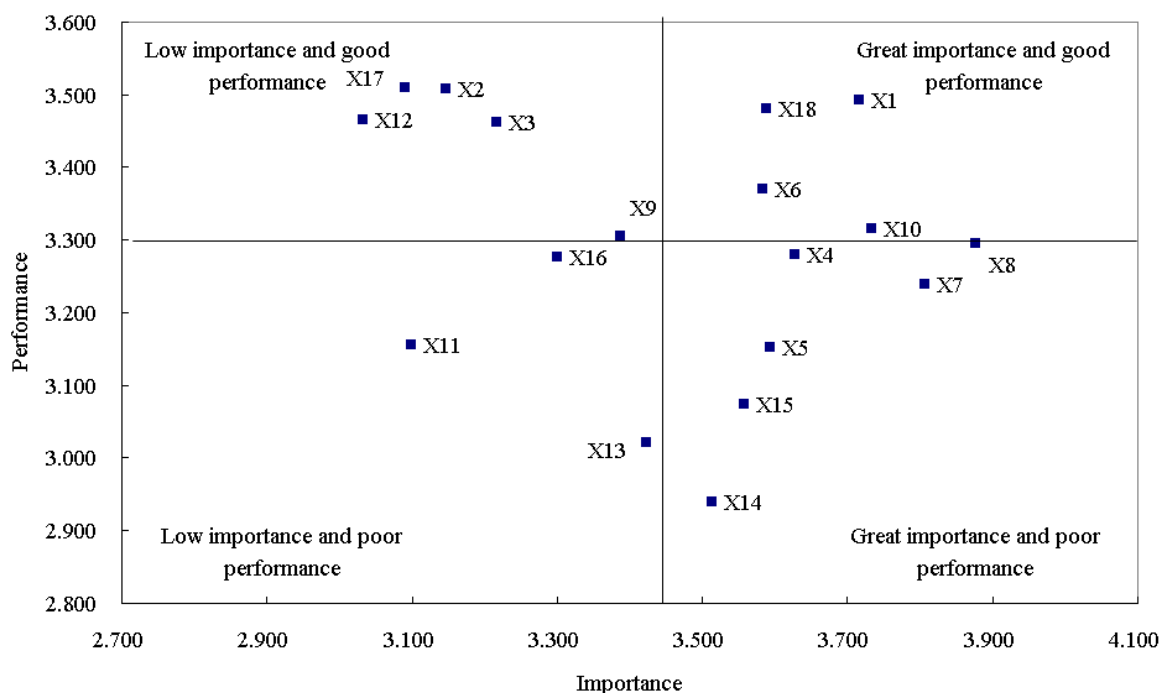


Figure 3 Importance-Performance matrix of individual service attributes

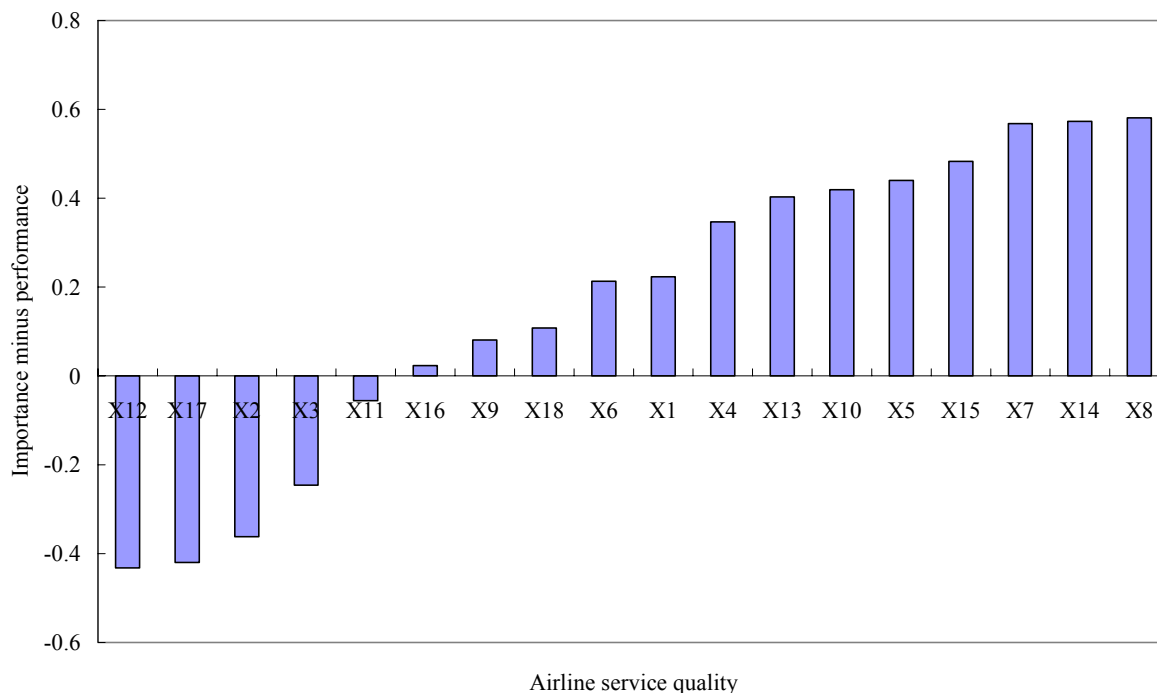


Figure 4 Airline service gap by different attribute

## 5. CONCLUSIONS

The goal of this study was to identify potential components of airline service quality for Taiwan airline. We have presented a relationship model between airline service quality, service value, satisfaction, perceived sacrifice, and behavioral intention for international airline. We measured service quality based on data collected at a Taiwan airline using SERVQUAL score. Based on the confirmatory factor analysis, the ASQ scale developed in this study adequately fit the data. According to SEM analysis, the service value, satisfaction, and perceived sacrifice have positive effects on behavioral intention. Furthermore, service value not only has direct effect on behavioral intention, but also indirect effect on behavioral intention by satisfaction. Furthermore, SEM analysis provided support that airline service quality and perceived sacrifice dimensions are indirectly affected behavioral intention by satisfaction.

The findings have both managerial and research implication. For managers of the airline, how to offer the consumer satisfied quality becomes the essential running methods of the service industry businessmen. Due to the invisible, heterogeneous, non-divisible, and easy-passing quality of the service industry, it is easy for the customers to have the sense of uncertainty and insecurity. Maintaining a great quality relationship with the customers will usually lower the customers' uncertainty and increase their sense of security. Therefore, establishing great relationship with customers has become the urgent business of enterprises. Moreover, how to maintain a great relationship with customers also becomes an important issue for the service industry businessmen. Additionally, importance-performance analysis indicates that an airline should maintain the advantage of ASQ (e.g. in-flight newspaper, books, etc; availability of air/accommodation; employees' speed handling; on-time departure and arrival), and focus to improve the following attributes: handling of delays, etc; efficient check-in/baggage handling service; quality of the reservation services; employees' willingness to help; employees' behavior to delayed passengers (the first four attributes are all in the ASQ concept of

responsiveness).

Past research indicates that the link between customer satisfaction and loyalty is not straightforward. Oliver *et al.* (1997) demonstrated that extremely satisfied customers are much more likely to remain loyal to firm than those who are merely satisfied. According to Oliva *et al.* (1992) and Huang (2008), the relationship between satisfaction and loyalty is both linear and nonlinear. Investigation of the system with respect to transitional, discontinuous behavior and the catastrophe theory is a powerful mathematical tool to analyze the nonlinear system. We suggest that other researchers could consider the catastrophe theory and other nonlinear techniques, especially when standard approaches do not adequately capture the underlying dynamics.

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