



A STRUCTURAL EQUATION MODELLING APPROACH TO VALIDATE THE DIMENSIONS OF SERVPERF IN AIRLINE INDUSTRY OF MALAYSIA

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ABSTRACT

Purpose – This research paper aims to validate the model of performance of the airline services from the perspectives of Malaysian passengers by replicating the factors used in an earlier study by Cronin and Taylor and to address the implication of culture on their choice.

Design/methodology/approach – The selection criteria examined in this study were the items included in the SERVPERF measurement and the relative importance of the dimensions of reliability, assurance, tangibility, empathy and responsiveness were examined along with other preferences. Apparently, data was collected through convenience sampling from 500 passengers departing from Kuala Lumpur International Airport.

Findings – The results confirmed that the model of performance criteria is multi-dimensional; tangibles, reliability, responsiveness, assurance, and empathy. We also found significant positive interrelationships among the constructs of the proposed framework. In this study, five-common factor measurement model was found to be valid and reliable to be used in determining performance of the airline providers. Out of these five factors, three factors (tangibility, reliability, assurance) resulted in strong significance.

Originality/value – This paper attempted to validate a model based on the perception of Malaysian passengers pertaining to the performance of the airline services which will give an insight towards better understanding their attitudes. Further, it will also help the airline industries in designing marketing strategies according to their consumers' preferences in a different cultural background. Finally, the use of SEM in validating the model is also a valuable contribution

KEYWORDS: SERVPERF, service quality, airline industry, passengers, structural equation modelling, Malaysia

INTRODUCTION

Since 1990's there have been many literatures on the service quality, especially on the factors which affect customer satisfaction and loyalty in various industries, and developing recommendations to increase service performance (Parasuraman *et al.*, 1988; Carman 1990; Cronin & Taylor, 1992; Asubonteng *et al.*, 1996; Davis 1999; Lee & Cunningham 2001; Jones *et al.*, 2002; Santos, 2003). There has also been studies done on the airline industry, however, there is a paucity of research on the performance of the airline, especially with regards to the effect of cultural background on the choice of airlines.

Several studies done on the selection criteria on services focused on the retail banking services (Haron, *et al.*, 1994; Zineldin, 1996; Levesque & McDougall, 1996; Almossawi, 2001; Babakus *et al.*, 2004), besides airlines (Chin, 2002), and hotels (Pei *et al.*, 2006). This study intends to replicate the SERVPERF measures designed by Cronin and Taylor (1992), and apply it on Malaysian airline passengers.

The basis of the scale measurement used for this study follows that of Cronin's and Taylor's (1992) study that used SERVQUAL items. The five dimensions of SERVQUAL scale (Parasuraman *et al.*, 1988) include the physical facilities, equipment and the appearance of the staff

(Tangibles); the dependability and accuracy of the service provider (Reliability); the ability to know and willingness to cater to customer needs (Responsiveness); the ability of staff to instil confidence and trust in the company (Assurance); and finally, the ability of the staff in providing a caring service to customers (Empathy).

However, it has been empirically demonstrated that the measures of the service performance (SERVPERF) constitute more effective measure than SERVQUAL (Cronin & Taylor, 1992, 1994). SERVPERF explained more of the variation in the global measure of service quality in all of the four service industries Cronin and Taylor (1994) examined: banks, pest control, dry cleaning, and fast food services. Further, Cunningham *et al.*, (2004) adopted SERVPERF in successfully measuring airline service quality. In the present study, therefore, we also intend to adopt the SERVPERF to measure the airline service quality in Malaysia.

LITERATURE REVIEW

Many researchers attempted to define and measure the concept of service quality (Carman, 1990; Cronin & Taylor, 1992; Parasuraman *et al.*, 1985, 1988, 1991). This has also been argued that the nature of SERVQUAL and the dimension it has may be industry specific and needs

refinement (Nadiri *et al.*, 2008). Scholars have replicated the dimensions proposed by SERVQUAL but the results differ. For example, Angur *et al.* (1999), Babakus and Mangold (1992), and Babakus and Boller (1992) found SERVQUAL to be uni-dimensional. Further, some researchers found SERVQUAL to have ten dimensions (see Carman, 1990) and with some others it emerged with two dimensions (Nadiri & Hussain, 2005; Karatepe & Avci, 2002; Ekinici *et al.*, 2003). It has also been argued that the performance-only measure proposed by Cronin and Taylor (1994), the SERVPERF, explains more variance in an overall measure of service quality than SERVQUAL instrument.

Moreover, passengers' criteria for selection of the airline of their choice are also based on many factors, such as the airline services, service quality, service value, service expectation, service delivery, and service performance. Other factors such as fares, booking and reservation facilities, convenience, the physical nature of the carriers, service expectation, service perception, service value, passenger satisfaction, airline image and frequent flyer programs (Park *et al.*, 2004; O'Connell & Williams, 2005; Lu and Tsai, 2004) service reliability, scheduling system, air fares, better connectivity, comfortability, safety reasons and company policy (O'Connell & Williams, 2005; Lu & Tsai, 2004) and types of aircraft (Lu & Tsai, 2004) were also cited by past researchers. For passengers selecting Low Cost Carriers (LCC), the main reasons were the fares, and flight schedule. A study on Malaysian passengers conducted by O'Connell and Williams (2005), found that one of the main reasons for selecting LCC is the convenience of booking via the internet and the attractive holiday packages offered by Air Asia. On the other hand, Chin (2002) indicated that the ability of airline to offer reduction in elapsed time which comprises of airport access time, flight time, waiting time and boarding time, safety records, airline experience, range of fleet available, in-flight services and whether airline is a national carrier of the travellers' country of origin – are the factors that will attract a passenger to a particular airline.

Based on a qualitative fieldwork in the UK, Edwards and Smythe's (2009) findings indicated that operational factors such as punctuality, price and boarding procedures as key influential factors in airline choice. It was further observed by the authors that other attributes also play an important role in forming choice such as; the purpose of travel, cultural background, buyer behaviour and spontaneity, decision-making, cost, speed and schedule, availability, advertising and brand loyalty as well as offers of value for money.

In relation to culture, Edwards and Smythe (2009) observed that culture and the society to which a person belongs to, will affect one's desires and human behaviour besides value systems. It was further asserted that, an individual from the collective cultures tend to refer to friends and family especially in the post-purchase satisfaction and evaluation. However, in an earlier article by Abdullah *et al.*, (2007) it was found that Malaysian passengers refer to impersonal sources (print, broadcast, and internet advertisements) than personal sources (friends and relatives). This could be due to the fact that most of

the respondents were highly educated (82.8%) and would trust the media more than personal sources.

PURPOSE AND RATIONALE

This study embarks on the following objectives: (1) to develop a model based on the selection criteria replicated from Cronin and Taylor (1992) and examine the relationship between the measurement variables, 2) to determine the important criteria deemed important by the respondents, 3) to determine the implications to the management of airline industry, and 4) to make recommendation based on the findings to the operators of these services and the proper authorities responsible for tapping into the Malaysian market.

RESEARCH METHODOLOGY

Research Instrument

The survey questionnaire for the present research was designed based on the SERVPERF items, adopted from Cronin and Taylor (1992). Cronin and Taylor (1992) used the performance-only measures of SERVQUAL originally designed by Parasuraman *et al.* (1988). In the present study, we also adopted 22 performance-only (SERVPERF) items and slightly changed the wording to suit the current research, as per the suggestion of Parasuraman *et al.* (1988). Respondents were asked to indicate how important the criteria items on a scale of '1' very unimportant to '7' very important. The last section of the questionnaire focuses on the background information of the respondents: gender, age, marital status, ethnic background, occupation, level of education and monthly income. Table 2 presented the valid items, their loading, mean, standard deviation, and Cronbach's alpha.

Data Collection

A total of 500 passengers waiting to board their respective flights were surveyed at the KLIA airport by enumerators, netting a completion yield of 78 percent. Survey questions elicited passengers' responses to 22-item list of criteria replicated from Cronin and Taylor's (1992) study. In depicting the sample respondent's characteristics, descriptive statistics of frequencies and percentages were calculated. Female respondents contributed slightly more than half of the sample (53.2 %) while male respondents make up the rest (46.8 %). Most of the respondents are young within the ages of 26 to 55 years (73.1 %); while the rest (26.9) are either young adults of between 19 to 25 years old or older people of 56 to 65 years and older. Working adults either in the public or private sector made up 71 percent of the sample, with 66.7 percent earning RM2000 and above per month. Nearly two-thirds of the respondents (60.3 %) were highly educated with a university education.

ANALYSIS AND RESULTS

First, the Cronbach's alpha reliability coefficient was calculated in order to assess the psychometric properties of the questionnaire. Sekaran (2003) recommended this step to ensure the stability of the consistency of the research instrument. Even though, we adopted a well established

instrument, this step was deemed necessary to see the consistency of the instrument in the settings of the present study. Cronbach's alpha value ranges from 0 to 1, with value closer to 1 indicating greater stability and consistency, however for basic research the cut-off value is 0.60 (Nunnally, 1978). The results of Cronbach's alpha are depicted in Table 1, which shows a value of 0.820, indicating an acceptable consistency and stability of the instrument.

Table 1 Reliability Statistics of the Questionnaire

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.820	0.826	22

Second, two-phase modelling procedure was adopted, as it is considered one of the best practices in the use of SEM. In

this procedure, the measurement model is fitted before fitting the full structural model. The rationale behind two-phase approach in structural equation modelling is the ease and accuracy of fitting the structural model (Byrne, 2011; Hair *et al.*, 2010). For this purpose, confirmatory factor analysis was first conducted on the hypothesized five-factor model using Amos version 18. The validity of the measurement was tested using the maximum likelihood estimation procedure of the confirmatory factor analysis.

Estimating the Hypothesised Model of Performance

The confirmatory factor analysis was adopted to validate the hypothesized measurement model of performance, which incorporates five-common factor, namely, tangibles (TANG), reliability (REL), responsiveness (RES), assurance (ASSU) and empathy (EMP) as shown in Figure 1. In this study, the initial confirmatory factor analysis was estimated with 22 items; each item was assumed to load only on its respective dimension. The majority of the items demonstrated a loading greater than 0.80, with the highest and the lowest being 0.89 and 0.40 respectively.

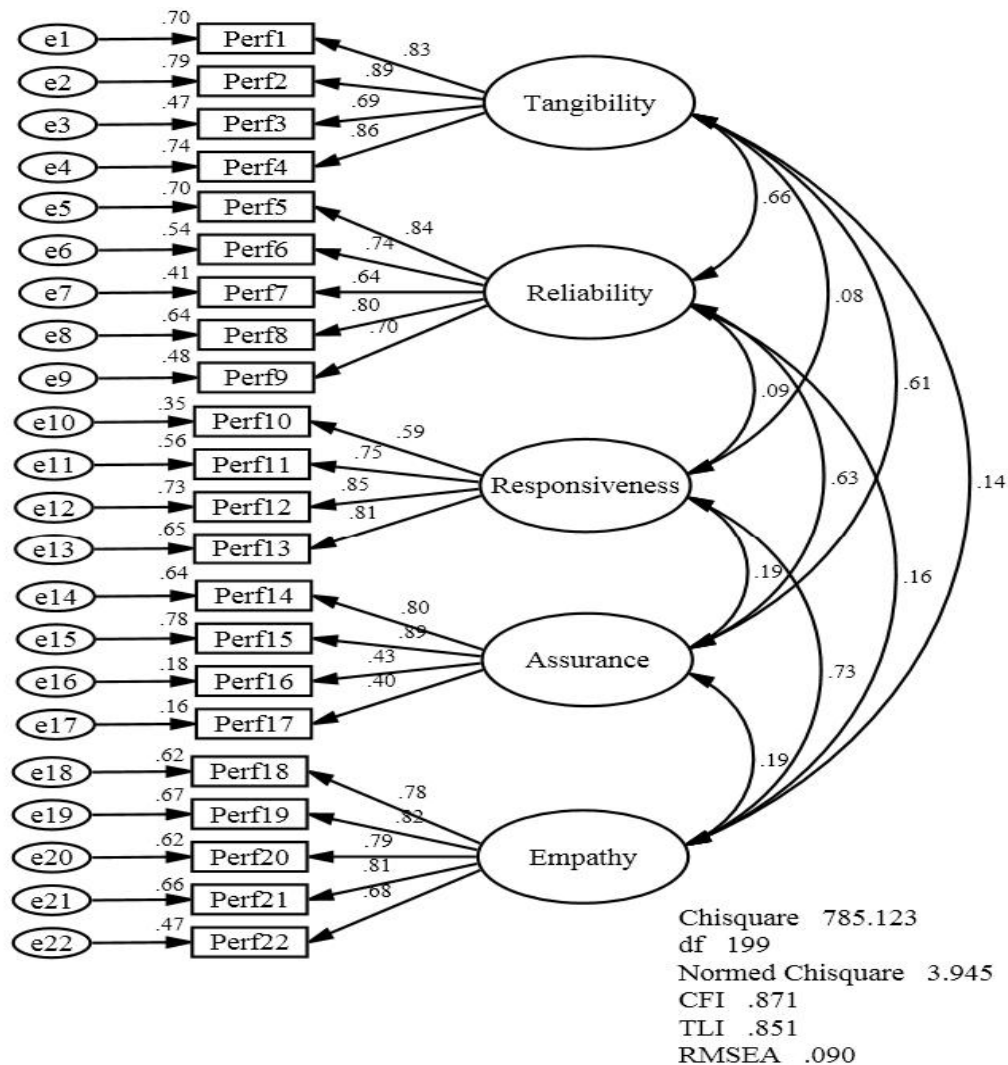


Figure 1: Hypothesized Measurement Model of Performance

The results indicated that the parameters were free from offending estimates. The inter-factor correlations, ranging between $r = .09$ and $r = .73$ substantiated the expectation that the five factors are distinct, yet positively interconnected aspects of performance of the airline services. Hence, the results showed that tangibility, reliability, responsiveness, assurance and empathy are positively related. However, the results of the analysis of the overall fit of the model are not as encouraging. The data revealed that the fit statistics for the measurement model fall short of the conventional standards, with the exception of the ratio model of the minimum discrepancy to its degree of freedom ($\text{cmin}/df = 3.945$) as illustrated in Figure 1. Besides, none of the fit indices, CFI and TLI exceeded the threshold values of 0.90, the standard deemed important model fit. Furthermore, the root mean square error of approximation ($\text{RMSEA} = 0.09$, $p = 0.01$), indicating a non-trivial misfit of the hypothesized model. Therefore, the model requires revision due to lack of fit indices and the presence of statistically significant discrepancies between the observed covariance and implied matrices.

The Revised Model of Performance

The hypothesized model was revised and estimated in order to assess its overall adequacy. The squared multiple correlation was examined and it was found that indicators including Perf3, Perf7, Perf10, Perf16, Perf17 and Perf22 were excluded since the factor extracted by them were having low variance in the indicator, thereby affecting its reliability as illustrated in Figure 2.

The Cronbach's alphas for the sub-constructs were .894 (tangibility), .85 (reliability), .842 (responsiveness), .842 (assurance) and .880 (empathy). The results indicated that the revised sixteen-item measurement model was consistent with the data. The overall goodness-of-fit of the model was adequate, the $\text{cmin}/df = 3.265$; $\text{RMSEA} = 0.079$; $\text{CFI} = 0.938$; $\text{TLI} = 0.921$. Further, the measurement model of criteria did produce the observed covariance matrix; there was no evidence that the measurement model is incorrect. Moreover, the direction and magnitude of factor loadings were substantial and statistically significant, and the model was free from offending estimates. The interrelationships among the constructs were statistically significant, as shown in Figure 2. The data also supported the measurement adequacy in terms of their divergent and convergent validity.

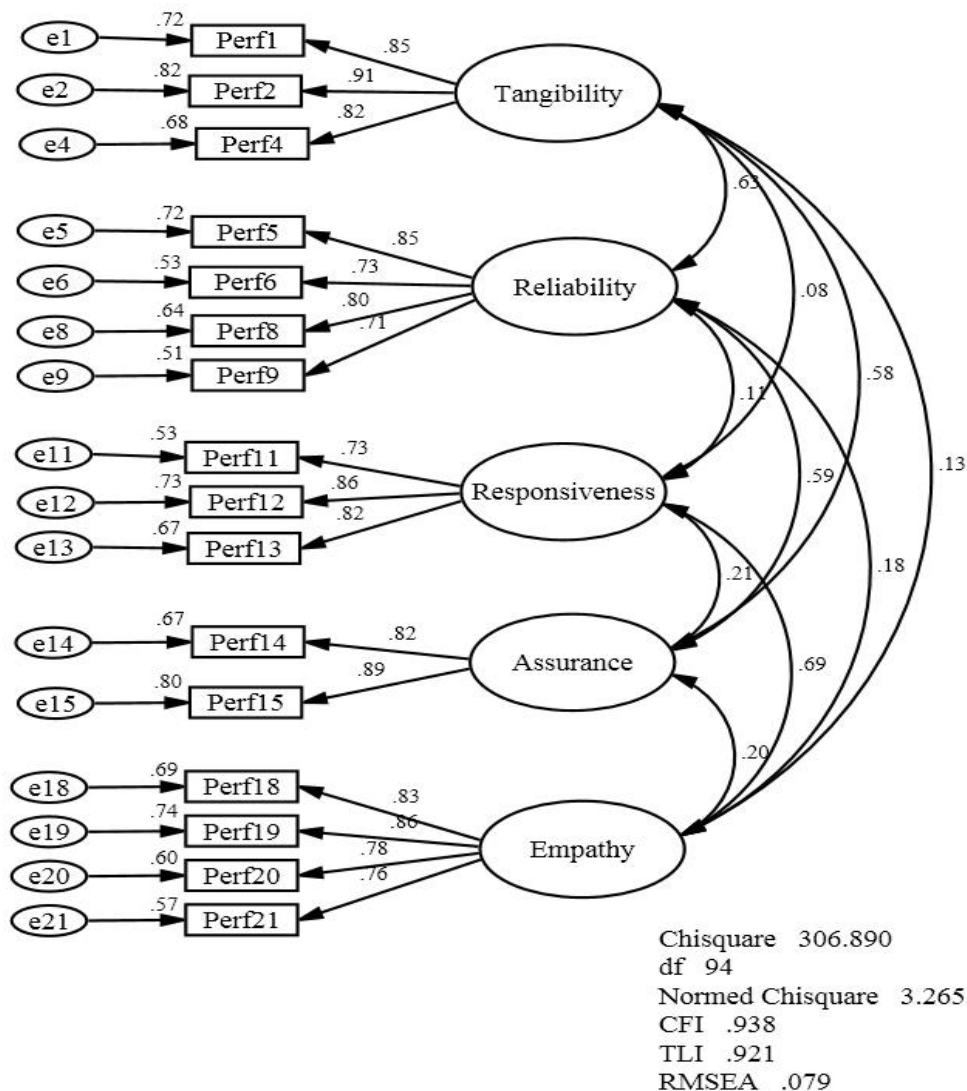


Figure 2: Revised Models of Performance

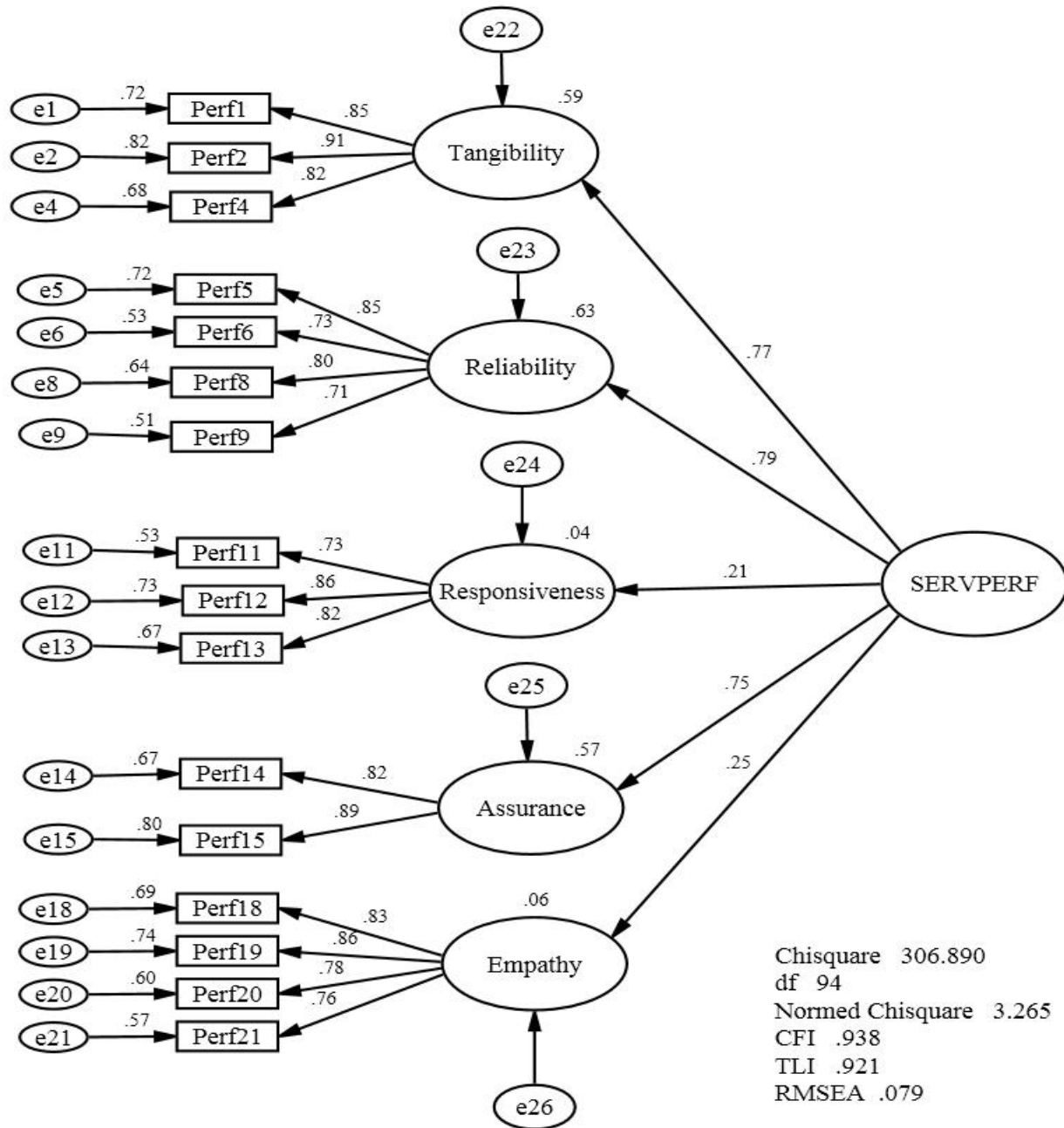
Table 2: Measurement of the variables of the revised model

Constructs	Items	Item Measure	Loadings	<i>M</i>	<i>SD</i>	<i>α</i>
Tangibles (TANG)	PERF1	This airline has up-to-date equipment & technology	0.85	5.72	1.198	0.894
	PERF2	Physical facilities are visually appealing	0.91	5.62	1.155	
	PERF4	The appearance of the physical facilities of this airline is in keeping with the type of services provided	0.82	5.61	1.158	
Reliability (REL)	PERF5	When this airline promise to do something by a certain time, it does so	0.85	5.39	1.257	0.850
	PERF6	When there is a problem, the employees are sympathetic and reassuring	0.73	5.38	1.269	
	PERF8	This airline provides its services at the time it promises to do so.	0.80	5.49	1.156	
	PERF9	This airline keeps its records accurately.	0.71	5.55	1.314	
Responsiveness (RES)	PERF11	You do not receive prompt service from this airline's employees.	0.73	3.59	1.592	0.842
	PERF12	Employees of this airline are not always willing to help customers/passengers	0.86	3.41	1.684	
	PERF13	Employees of this airline are too busy to respond to customers' / passengers' requests promptly.	0.82	3.50	1.562	
Assurance (ASSU)	PERF14	You can trust employees of this airline.	0.82	5.42	1.283	0.842
	PERF15	You can feel safe with the airline's employees.	0.89	5.69	1.125	
Empathy (EMP)	PERF18	This airline does not give you individual attention.	0.88	4.01	1.673	0.880
	PERF19	Employees of this airline do not give you personal attention.	0.86	3.85	1.617	
	PERF20	Employees of this airline do not know what your needs are.	0.78	3.85	1.571	
	PERF21	This airline does not have your best interest at heart.	0.76	4.35	1.61	

Next, in order to determine the most significant path in the model, a second-order model was suggested. Surprisingly, the most important criteria in terms of performance for the Malaysian passengers are reliability, followed by tangibility and assurance (see Figure 3). Further the model was assessed based on the following indices: the chi-square test, the comparative fit index (CFI), and the root mean square of approximation (RMSEA), as per the suggestions of many scholars (Byrne, 2010; Hair *et al.*, 2010; Kline, 2011).

The results of the model in Figure 3 yielded acceptably high goodness-of-fit indices. This indicated that the model fits the observed data well. The normed chi-square value (χ^2/df) for the current model was 3.265 which is below the threshold value of 5.0. Similarly, other GOF indices also resulted in acceptable range. In this case, the CFI value of 0.938 and TLI value of 0.921 is above the cut-off value of 0.90. Another important index of model fit, the RMSEA, also yielded a value of 0.79, which also below the cut-off value, indicating a good fit of the present model.

Figure 3: SERVPERF Model



DISCUSSION AND CONCLUSION

The findings of the present study are very interesting in a sense that it validated the SERVPERF measurements in the airlines industry, which to our knowledge has never been validated, especially in Malaysian context. Further, the replication of Cronin's and Taylor's (1992) SERVPERF in airline industry will open doors for further research to extend the present model using validated items from the present study along with the inclusion of some other important constructs.

The results of the present study also revealed that tangibility, reliability, and assurance were the main

dimensions measuring service quality. This finding should be of import to the airline industry when designing their strategies. Based on the findings of our research, we recommend to airlines, particularly Malaysian airlines, that focus should be given to improving the ability to perform the promised service accurately. Similarly, importance should also be given to physical facilities, equipment, and appearance of personnel. Finally, we recommend to the airlines to build their trust and confidence in the eyes of customers through courtesy of employees and enhancement of their knowledge.

LIMITATIONS

With every study there are some limitations, as is the case in the present research. First, the generalisability of the findings; that is, this study was conducted with the data collected from airlines customers which may not possibly result the same way in other sectors, like; hotels, banks, and hospitals, etc. So, it is suggested to replicate the same study using other service sectors. Second, the present study only validated SERVPERF measures without investigating its impact on any other construct. A very promising research would be to investigate the impact of SERVPERF on customer satisfaction and customer loyalty in the airline industry. Finally, much appreciable research would be to validate AIRQUAL (Ekiz *et al.*, 2006; Nadiri *et al.*, 2008) in Malaysian context, and compare its results with the present research.

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