The Effect of Airport Service Quality on Passenger Satisfaction in Airports

Yong Shih Ween[1], Ng Siew Imm[2], Yee Choy Leong[3]

ABSTRACT

The importance of passenger satisfaction in airports has received growing interest among airport managers. However, research on the influence of passenger-airport interaction on their satisfaction is still scarce. Therefore, this study examined the impact of airport service quality on passenger satisfaction in Malaysian airports based on the European Customer Satisfaction Index (ECSI) model. Survey data collected from 370 respondents was analysed using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The results demonstrate that perceived value has a positive impact on passenger satisfaction. Perceived value was also found to mediate the effect of airport service quality on passenger satisfaction. These findings offer important theoretical and managerial implications.

Keywords: European Customer Satisfaction Index (ECSI), Airport Service Quality, Passenger Satisfaction, PLS-SEM

INTRODUCTION

The airport industry has undergone significant changes over the past few decades. During this time, airport managers have been shifting their focus from seeing airports solely as large public facilities to viewing them as multi-service business organisations that can increase airport revenues (Shin & Roh, 2021). Besides that, airport competition in the region adds pressure to stay ahead by being adaptable and responsive to passengers' changing trends and preferences (Van Asch et al., 2019). As a result, airport managers are exploring different methods to improve airport business performance. Notably, as much as 81% of service managers use customer satisfaction as an indicator of their company's competitiveness and business continuity in the industry (Gartner, 2018). Moreover, customer satisfaction has been considered a predictor of customer behavioural intention, such as purchase intention (Han, Lee & Kim, 2018). Therefore, understanding passenger satisfaction in airports has become a priority and a crucial matter for airport management.

According to the literature, a satisfying experience at the airport can have positive outcomes for airport operations, such as passengers' intention to purchase in commercial areas (Sohn & Lee, 2017), enhanced reuse intention (Nesset & Helgesen, 2014), promotion of positive word-of-mouth (Wattanacharoensil, Schuckert & Graham, 2016), and better airport competitiveness (Graham, 2018; Wattanacharoensil, Schuckert, Graham & Dean, 2017). However, despite its relevance for airport management, literature on passenger satisfaction is scarce and tends to

[1]School of Business and Economics, University Putra Malaysia. shihween@hotmail.com
[2]School of Business and Economics, University Putra Malaysia.
[3]School of Business and Economics, University Putra Malaysia.

focus on a commercial and business viewpoint rather than a passenger-based one (Wattanacharoensil et al., 2016). Therefore, more research on passenger-airport interaction and passengers' behavioural attitudes towards the airport is needed to support airport planning and operational management efforts.

Accordingly, previous studies indicate that passengers' perceptions of airport service quality can affect their satisfaction (Ali, Kim & Ryu, 2016; Bezerra & Gomes, 2015). In other words, passengers who find themselves revelling in the various types of services and facilities offered in an airport have an elevated satisfaction with their experience. Additionally, a pleasant experience in the airport as a result of receiving high quality airport services has been shown to influence passenger satisfaction (Blichfeldt, Pumputis & Ebba, 2017). Consequently, airport service quality at all touchpoints is a primary indicator in devising the commercialisation strategies that airports seek (Pandey, 2016).

When determining passenger satisfaction, the perception of value remains a significant factor that should not be neglected. Specifically, the role of passengers' perceived value reflects their comparison of service performance against the price paid for that service at airports. As perceived value is represented by the perceived trade-off between benefits and sacrifices in a market exchange, it is vital to consider value to uncover the factors determining passenger satisfaction (Zauner, Koller & Hatak, 2015). Therefore, in the airport context, perceived value is believed to facilitate and influence passengers' satisfaction through service elements in the airport, whereby a higher perception of value can positively mediate the impact on passenger satisfaction.

In light of the discussion above, this study tested a comprehensive and reliable model of the relationships between passengers' experience and satisfaction. Using the European Customer Satisfaction Index (ECSI) as its foundational basis, the study assessed how six components of airport service quality (ambience, basic facilities, check-in, convenience, mobility, and security) affect perceived value and subsequently, passenger satisfaction. It also explored the mediating effect of perceived value on the relationship between airport service quality and passenger satisfaction. This framework offers new and interesting insights into the determinants of passenger satisfaction, especially from the passengers' own perspective, to enhance competitive dynamics in the airport industry.

LITERATURE REVIEW

The ECSI Model

The ECSI model is a well-known theoretical lens for determining passenger satisfaction and has been widely used to investigate the interrelationships among service quality, perceived value, and satisfaction in various contexts (Huang, Lee & Chen, 2019; ECSI, 1998). In the context of tourism and hospitality management, the ECSI model is one of the most common theoretical bases for investigating passenger satisfaction. For example, this model has been used to investigate the satisfaction of young tourists in youth hostels (Chitty, Ward & Chua, 2007) and passengers' satisfaction with public transportation (Ni, Zhang, Hu, Lu & Li, 2020). In the airport setting, satisfaction is regarded as the primary determinant of an airport's reputation and passengers' positive perceptions (i.e., behavioural intentions). The ECSI model describes the processes that support satisfaction and proposes that passenger satisfaction is

influenced by its antecedents (e.g., airport service quality and perceived value) before leading to desirable results (Bezerra & Gomes, 2020).

In conclusion, the ECSI model is significantly related to the current study, as airport service quality and perceived value are vital in forming satisfaction among passengers travelling in the airport. Therefore, this research proposed the ECSI model as its theoretical framework. Referring to the framework in Figure 1, passenger satisfaction is predicted to be influenced by perceived value and airport service quality (i.e., ambience, basic facilities, check-in, convenience, mobility, and security).

Airport Service Quality

The role of service quality is a crucial area of interest for airports and other stakeholders, as it reflects customers' perceptions and value judgments of a product or service (Bogicevic, Bujisic, Bilgihan, Yang & Cobanoglu, 2017). In the past, the SERVQUAL model was commonly used and adapted in various contexts of the tourism industry to measure consumer perceptions of service quality (Parasuraman, Zeithaml & Berry, 1988), such as in studies on wildlife tours (Akama & Kieti, 2003), airlines (Rezaei, Kothadiya, Tavasszy & Kroesen, 2018), hotels (Mey, Akbar & Fie, 2006), and trip agents (Urdang & Howey, 2001). However, the model was built upon a broader set of formative indicators and adopted attributes developed by other studies. Hence, airport-specific service quality attributes are needed to further understand service quality in airport studies.

In general, when benchmarking airport service quality, eight service attributes have been considered: access, check-in, personal identification control, security, wayfinding, airport facilities, airport environment, and services. Fodness and Murray's (2007) studies emphasised the importance of passengers' perspectives and demonstrated that airport service quality dimensions consist of function, effectiveness, efficiency, interaction, and diversion. However, Bezerra and Gomes (2015) extracted seven dimensions of airport service quality as perceived by passengers. They examined these dimensions using factor analysis to explore the effects on passengers' overall satisfaction and developed a six-factor model to measure airport service quality, which includes check-in, security, mobility, ambience, basic facilities, and convenience.

Overall, airport service quality research highlights the importance of providing passengers with simple yet comprehensive facilities and services that are functional and interactive (Saleem, Zahra & Yaseen, 2017). The construct distinguishes between process activities related to passenger flows and discretionary activities related to what passengers can do in their spare time. This study applied the airport service quality attributes of Bezerra and Gomes (2015), which represent the main elements of efficiency in airport service quality, including thorough check-in, security, mobility, ambience, basic facilities, and convenience.

HYPOTHESES DEVELOPMENT

Ambience

The airport's physical environment is the most critical component for passengers in evaluating airport service quality (Pike, Pontes & Kotsi, 2021). At an airport, ambience refers to the terminal's environmental surroundings, including thermal and acoustic comfort, lighting, and

the cleanliness of airport facilities (Prentice & Kadan, 2019). Previous studies have shown that passengers' overall contentment with the environment is influenced by how they perceive it, and this perception can affect passenger satisfaction (Prentice, Wang & Manhas, 2021). Accordingly, it was proposed that:

H1: *Ambience positively affects perceived value.*

Basic Facilities

Basic airport facilities refer to the elements associated with satisfaction that most passengers need during their stay at the airport (Fakfare, Wattanacharoensil & Graham, 2021). Components of basic facilities include the availability and cleanliness of washrooms and departure lounge facilities. These elements must be incorporated in airport design to add value to the transportation hub (Cao, Li & Zhang, 2023). Also, basic facilities are considered prerequisites for improving airport service performance and passenger satisfaction (Wattanacharoensil, Fakfare & Graham, 2022). Based on this explanation, it was hypothesised that:

H2: *Basic facilities positively affect perceived value.*

Check-In

Check-in at an airport is considered a typical service performance indicator for travelling passengers as it relates to passengers' perceptions of wait time, process efficiency, and the attitude of service staff (Rajapaksha & Jayasuriya, 2020). Studies have shown that passengers' opinions about check-in flow are crucial for understanding their overall perception of airport service quality, since this is the initial process they encounter when arriving at the airport (Bruno, Diglio, Genovese & Piccolo, 2019). Accordingly, the fundamental aspects that correspond to passengers' perceived value during check-in are efficiency, waiting time, and the availability of luggage carts in the airport (Thampan, Sinha, Gurjar &Rajasekar, 2020). As a result, when the check-in process is in place and in order, passengers perceive more substantial value. Hence, it was predicted that:

H3: *Check-in positively affects perceived value.*

Convenience

Convenience is an essential factor in airports, providing a seamless journey for passengers by ensuring the availability and quality of convenient facilities and services (Hong, Choi & Chae, 2020). Incorporating convenience has been shown to bring positive value to passengers as it enhances airports' ability to present their best offers, thereby putting passengers in control of their travel experience. Studies have found that passengers perceive higher value when provided with convenience in service-based hubs (Usman, Azis, Harsanto & Azis, 2022). Thus, it was hypothesised that:

H4: *Convenience positively affects perceived value.*

Mobility

Wayfinding, flight information, and walking distance inside the terminal are elements that form

mobility in airport service quality (Qing, Sun & Reneker, 2021). In particular, mobility is a significant concern for airport design and operations as it is the building block of an uninterrupted journey in the airport. Similarly, clear navigation in the airport influences passengers' overall journey. Findings have shown that a smooth transit trip through the airport can influence passengers' perception of value and services provided by the airport (Harding, 2019). Notably, a proper mobility solution may help minimise the time and uncertainty for passengers when moving within the terminal, allowing them to stay more relaxed during their interaction with the airport setting (Bezerra, De Souza & Correia, 2021). Therefore, it was proposed that:

H5: *Mobility positively affects perceived value.*

Security

Security is vital in an airport as it comprises clearance processing time and the attitude of service staff (Knol, Sharpanskykh & Janssen, 2019). It is also an indicator of the thoroughness of security screening and passengers' feelings of safety, which are aspects of a more comprehensive perception of airport service quality (Junior, Hollaender, Mazzanati & Bortoletto, 2021). Accordingly, this aspect assures passengers of feeling safe and secure in the airport. Previous studies have shown that the courtesy and helpfulness of security staff at airports and the meticulousness of security screening imply the dedication of the airport management in providing exceptional service and value to passengers (Kim & Park, 2019). Specifically, when passengers feel secure and safe while transiting in the airport, their perception of service value increases. Consequently, it was postulated that:

H6: *Security positively affects perceived value.*

Perceived Value

Perceived value is the overall assessment made by passengers regarding the utility of a product or service based on their perceptions of what is received and given (Chen, Li & Liu, 2019). The role of perceived value in the evaluation process of satisfaction has been extensively studied in various contexts (Li, Aw, Tan, Cham & Ooi, 2022; Lim, Cheng, Cham, Ng & Tan, 2019; Lim, Ngew, Cheah, Cham & Liu, 2022; Prebensen & Xie, 2017). In particular, perceived value has a significant impact on consumer satisfaction evaluation in the hospitality sector. Bezerra and Gomes (2019) also found empirical evidence of a significant relationship between perceived value and satisfaction. They found that passengers who paid reasonable airport taxes for the quality of services and facilities provided by airport management perceived a higher value. Accordingly, it was hypothesised that:

H7: *Perceived value positively affects passenger satisfaction.*

The Mediating Role of Perceived Value

Extended literature has posited perceived value as a determinant of customer satisfaction. In particular, the more passengers perceive that the quality of service exceeds the costs of obtaining the service, the higher their perceptions of the value of the service. Consequently, perceived value is an instrument for influencing satisfaction (Lin, 2022; Yuan et al., 2023). This is also supported by the fact that passengers often consider airport service quality as a proxy and a critical driver of their perceived value. Moreover, studies have shown that efficient

airport service quality is highly correlated with perceived value and results in passenger satisfaction (Liao, Cao, Liu & Huang, 2022).

In a similar vein, perceived value is proposed as the mechanism that connects airport service quality and passenger satisfaction. It is believed that passengers who experience efficient and comprehensive airport service quality are more likely to have high perceived value towards the airport, eventually influencing their satisfaction in the airport (Wattanacharoensil et al., 2022). Subsequently, it was hypothesised that:

H8: *Perceived value mediates the relationship between ambience and passenger satisfaction.*

H9: *Perceived value mediates the relationship between basic facilities and passenger satisfaction.*

H10: *Perceived value mediates the relationship between check-in and passenger satisfaction.*

H11: *Perceived value mediates the relationship between convenience and passenger satisfaction.*

H12: *Perceived value mediates the relationship between mobility and passenger satisfaction.*

H13: *Perceived value mediates the relationship between security and passenger satisfaction.*

Figure 1: Research Framework
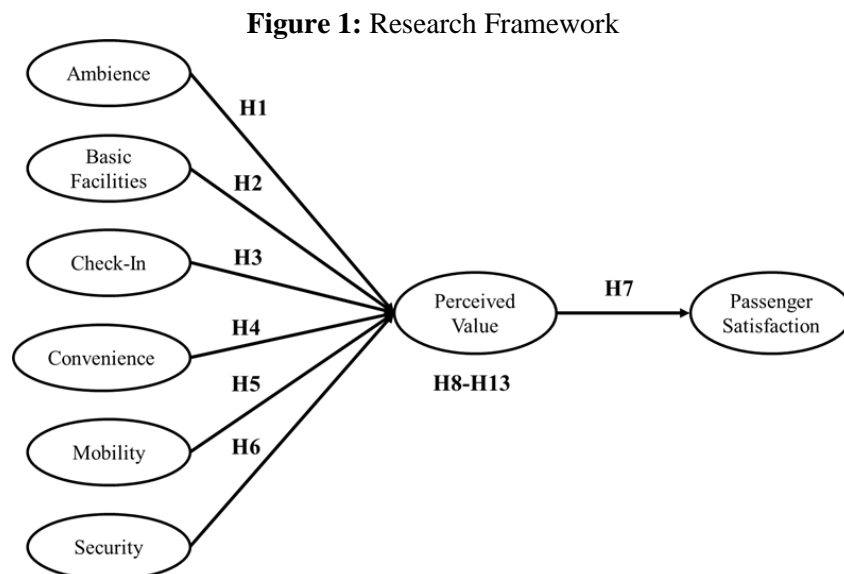
METHODOLOGY

Data Collection Method

Data for this research was collected at Kuala Lumpur International Airport (KLIA) from November to December 2022. Departing passengers for international flights were approached at the departure lounges to ensure they had experienced the full range of airport services, processes, and facilities. Participants were asked to scan a QR code and fill the questionnaire

online with their handheld devices. At the start of the questionnaire, passengers were required to answer a few questions about whether they were travelling to or from the airport and had arrived within an adequate time. Respondents who did not pass the screening questions were excluded.

A total of 370 responses were included in the data analysis after removing 110 straight-lining responses. The final sample size was satisfactory as per the guidelines of Saunders et al. (2016). The post hoc test using G*Power software revealed a minimum size of 118, with an effect size of 0.15 at a 95% power level (Faul, Erdfelder, Lang & Buchner, 2007). As listed in Table 1, the majority of the respondents were male (56.2%), married (51.1%), of Malaysian nationality (55.4%), aged between 30 to 39 years old (30.3%), and had completed an undergraduate degree (46.8%). On average, most of the respondents were managers in a company (40.3%) and were on a business trip (36.5%).

Table 1: Demographic Profile

Category	Characteristics	Frequency (n=370)	Percentage (%)
Gender	Male	208	56.2
	Female	162	43.8
Marital Status	Single	17	4.6
	Married	189	51.1
	Others	8	2.2
Nationality	Malaysian	205	55.4
	Others	165	44.6
Age	18 years old and below	2	0.5
	19 - 29 years old	102	27.6
	30 - 39 years old	112	30.3
	40 - 49 years old	109	29.5
	50 - 59 years old	33	8.9
	60 years old and above	12	3.2
Education Level	Diploma or below	77	20.8
	Undergraduate Degree	173	46.8
	Postgraduate Degree	103	27.8
	Professional Qualifications or equivalent	17	4.6
Occupation	Manager	149	40.3
	Non-Manager	90	24.3
	Self-Employed	64	17.3
	Housewife	17	4.6
	Student	42	11.4
	Others	8	2.2
Travel Purpose	Business	135	36.5
	Leisure	107	28.9
	Bleisure (Business & Leisure)	128	34.6

Measures

The instruments used in this study underwent testing in two phases. Firstly, a pre-test was conducted with a panel of academic and industry experts in the hospitality field. They were asked to review the appropriateness, relevance, and representativeness of the survey items to ensure there were no validity issues and that they fit well in the airport context. There were minor grammar and sentence structure changes based on their feedback, but no changes to the content. Next, thirty respondents participated in a pilot test of the revised questionnaire. Overall, the results indicated an acceptable level of reliability, as scores of 0.70 or higher indicated adequate convergence or internal consistency (Hair, Risher, Sarstedt & Ringle, 2019; Gefen, Straub & Boudreau, 2000).

All the scales used in this study were adapted from previous research. The scale for airport service quality, comprising six constructs (i.e., ambience, basic facilities, check-in, convenience, mobility, and security), was adapted from Bezerra and Gomes (2015). Perceived value's measure was adapted from Anderson and Fornell (2000), and passenger satisfaction was measured using Tse and Wilton's (1988) items. All constructs were measured using a 7-point Likert scale; ambience, basic facilities, check-in, convenience, mobility, and security used '7=very good' and '1=very poor' whereas perceived value and passenger satisfaction were rated as '7=strongly agree' and '1=strongly disagree'.

RESULTS

The proposed relationships of interest were examined using partial least squares structural equation modelling (PLS-SEM). The causal prediction approach used by PLS-SEM was appropriate for the current research's prediction-oriented objective as well as for assessing the mediation effects (Chin et al., 2020; Hair et al., 2019). SmartPLS 3.9.4 software was used to estimate the suggested model using PLS-SEM (Sarstedt & Cheah, 2019).

Common Method Variance (CMV)

When estimating the relationship between two or more constructs using a single data source, common method variance (CMV) remains a critical issue (Podsakoff, Podsakoff, MacKenzie & Klinger, 2013). Procedures and statistical remedies were used to address this issue and related concerns. For the procedural solution, the study included essential and vital information (e.g., contextual information, introductory messages, straightforward language, and detailed descriptions) to minimise uncertainty and define ambiguous terms in the instruction section to increase responses (Jordan & Troth, 2020). For the statistical solution, both Harman's single factor test (Podsakoff et al., 2013) and a full collinearity test (Kock & Lynn, 2012) were applied to assess the quality of the data. First, the principal component factor analysis illustrated that the variance explained by the first factor was 27.8% (<40%) (Babin, Griffin & Hair, 2016). The results of the full collinearity test exhibited that the variance inflation factor (VIF) of all constructs was between 1.692 and 2.885 (<3). This, again, suggested that CMV was not likely to be an issue (Kock & Lynn, 2012).

Reflective Measurement Model Assessment

Under the measurement model assessment, various approaches were used to evaluate the constructs' reliability and validity. First, the internal consistency of items was evaluated. Table

2 shows that all constructs had Cronbach's alpha (α), and composite reliability (CR) values exceeding the minimum rule of thumb of 0.70 (Hair et al., 2019). Next, convergent validity was checked using outer loadings and average variance extracted (AVE) scores. Table 2 indicates that most items met the suggested outer loading criteria (between 0.758 to 0.947) (Bagozzi, Yi & Phillips, 1991). The AVE scores for all the constructs exceeded the suggested 0.50 minimum value as well (between 0.687 and 0.789) (Bagozzi & Yi, 1988). Next, the Heterotrait-Monotrait (HTMT) ratio was used to check for discriminant validity (Henseler, Ringle & Sarstedt, 2015). As can be seen in Table 3, the constructs' HTMT values were all below the conservative threshold of 0.85 (Kline, 2011), confirming their discriminant validity.

Table 2: Reflective Measurement Model Results

Construct	Items	Loadings	Cronbach's Alpha	CR	AVE	Full Collinearity
Ambience			0.798	0.879	0.691	2.712
	AMB1	0.915				
	AMB2	0.883				
	AMB3	0.899				
Basic Facilities			0.807	0.911	0.789	2.542
	BSF1	0.905				
	BSF2	0.947				
	BSF3	0.931				
Convenience			0.861	0.843	0.706	2.043
	CON1	0.842				
	CON2	0.843				
	CON3	0.853				
	CON4	0.894				
	CON5	0.918				
Check-In			0.867	0.851	0.687	2.885
	CHI1	0.885				
	CHI2	0.758				
	CHI3	0.846				
Mobility			0.854	0.942	0.718	1.963
	MOB1	0.823				
	MOB2	0.808				
	MOB3	0.874				
Security			0.868	0.897	0.761	2.551
	SEC1	0.939				
	SEC2	0.816				
	SEC3	0.884				
Perceived Value			0.876	0.858	0.714	1.692
	PCV1	0.824				
	PCV2	0.845				
	PCV3	0.812				
	PCV4	0.854				

Passenger Satisfaction	PCV5	0.934				
			0.791	0.943	0.728	2.297
	PAS1	0.878				
	PAS2	0.853				
	PAS3	0.901				
	PAS4	0.875				

Note: CR = Composite Reliability; AVE = Average Variance Extracted

Table 3: Discriminant validity result using the Heterotrait-Monotrait (HTMT) ratio of correlation

Construct	1	2	3	4	5	6	7	8
Ambience								
Basic Facilities	0.314							
Convenience	0.245	0.573						
Check-In	0.421	0.398	0.579					
Mobility	0.449	0.223	0.621	0.576				
Security	0.325	0.362	0.646	0.654	0.265			
Perceived Value	0.679	0.239	0.268	0.574	0.474	0.433		
Passenger Satisfaction	0.556	0.492	0.639	0.452	0.208	0.206	0.322	

Note: HTMT<0.85 (Kline, 2011)

Structural Model Assessment

Table 4 presents the results of the analysis of the path coefficients and collinearity for the exogenous constructs. The VIF values for all exogenous constructs ranged from 1.042 to 1.688, indicating that collinearity was not an issue. The significance of the path coefficients was assessed using the bootstrapping technique with 5000 sub-samples (Streukens & Leroi-Werelds, 2016). The results indicated that ambience (H1: β=0.228; p<0.001), basic facilities (H2: β=0.412; p<0.001), convenience (H3: β=0.608; p<0.001), check-in (H4: β=0.631; p<0.000), mobility (H5: β=0.391; p<0.001), and security (H6: β=0.355; p<0.032) had a positive relationship with perceived value. Moreover, there was a positive relationship between perceived value (H7: β=0.254; p<0.000) and passenger satisfaction. Thus, H1 to H7 were supported. In addition, perceived value significantly mediated the paths linking ambience (H8: β=0.372; p<0.001), basic facilities (H9: β=0.305; p<0.000), convenience (H10: β=0.363; p<0.001), check-in (H11: β=0.367; p<0.000), mobility (H12: β=0.394; p<0.001), and security (H13: β=0.339; p<0.025) to passenger satisfaction, providing support for H8 to H13.

Based on the coefficient of determination (R^2), it was noted that 68% of the variance in perceived value was explained by ambience, basic facilities, check-in, convenience, mobility and security. In comparison, 79% of the variance in passenger satisfaction was explained by perceived value. Following Cohen's (1988) guidelines for effect size, mobility ($f^2 = 0.012$) had a small effect on perceived value, while ambience ($f^2 = 0.328$), convenience ($f^2 = 0.262$), check-in ($f^2 = 0.295$) and security ($f^2 = 0.329$) contributed medium effects on perceived value. Lastly, basic facilities ($f^2 = 0.387$) had a large effect on perceived value, as did perceived value ($f^2 = 0.374$) on passenger satisfaction. Regarding predictive relevance, the results were

assessed through Stone-Geisser's Q^2 statistics (Geisser, 1974; Stone, 1974). All the endogenous variables, namely perceived value ($Q^2 = 0.624$) and passenger satisfaction ($Q^2 = 0.751$), had values greater than zero. Thus, it can be concluded that the model had sufficient predictive relevance.

Table 4: Structural Model Results

Path Relationship	Direct Effect	IE	Std. Error	CI	t-value	VIF	f^2	R^2	Q^2
H1) AMB -> PCV	0.228		0.033	(0.503, 0.701)	9.393**	1.244	0.328 (M)	0.682	0.624
H2) BSF -> PCV	0.412		0.032	(0.438, 0.644)	15.047 **	1.093	0.387 (L)		
H3) CON -> PCV	0.608		0.054	(0.177, 0.319)	8.863**	1.272	0.262 (M)		
H4) CHI -> PCV	0.631		0.035	(0.299, 0.483)	12.247 **	1.302	0.295 (M)		
H5) MOB -> PCV	0.391		0.046	(0.653, 0.758)	3.811**	1.042	0.012 (S)		
H6) SEC -> PCV	0.355		0.038	(0.708, 0.912)	6.055*	1.247	0.329 (M)		
H7) PCV -> PAS	0.254		0.053	(0.239, 0.487)	4.399**	1.688	0.374 (L)	0.785	0.751
H8) AMB -> PCV -> PAS		0.372	0.049	(0.484, 0.613)	8.423**				
H9) BSF -> PCV -> PAS		0.305	0.045	(0.425, 0.621)	8.054**				
H10) CON -> PCV -> PAS		0.363	0.052	(0.454, 0.696)	8.195**				
H11) CHI -> PCV -> PAS		0.367	0.046	(0.554, 0.701)	7.862**				
H12) MOB -> PCV -> PAS		0.394	0.048	(0.433, 0.615)	8.398**				
H13) SEC -> PCV -> PAS		0.339	0.051	(0.485, 0.654)	7.553*				

Note: **p<0.001, *p<0.05; IE = Indirect Effect; CI = Confidence Interval; AMB (Ambience), BSF (Basic Facilities), CON (Convenience), CHI (Check-In), MOB (Mobility), SEC (Security), PCV (Perceived Value), PAS (Passenger Satisfaction); Effect Size (T: Trivial, S: Small; M: Medium; L: Large)

DISCUSSION

The primary purpose of this research was to examine the antecedents that lead to passenger satisfaction in airports based on the ECSI (1998) model. This study found that perceived value is a key antecedent impacting passenger satisfaction, displaying the largest effect size compared to the other factors. The findings are consistent with past studies that have highlighted perceived value as a key factor in predicting passenger satisfaction (Koklic, Kukar-Kinney & Vegelj, 2017).

Moreover, this study has found that ambience has a positive influence on perceived value. This finding supports Wattanacharoensil et al. (2016), who demonstrated that the overall ambience of an airport impacts passengers' perceived value during transit. Likewise, it has been revealed

that basic facilities significantly contribute to perceived value. Additional research has shown that the comprehensive facilities provided at airports reflect passengers' overall evaluation of their perceived value (Correia & Wirasinghe, 2004). It has also been shown that an efficient check-in process at the airport increases the overall experience of passengers and their perceived value, as suggested by Chen, Batchuluun and Batnasan, (2015). In addition, convenience plays a role in positively influencing perceived value. This study also confirms that providing accessible facilities for passengers results in a seamless journey experience and is vital in forming their perceived value (Kim & Park, 2019). Mobility has been found to be a significant driver of perceived value as well, which aligns with Awad, Alzaatreh, AlMutawa, Ghumlasi and Almarzooqi, (2020)'s evidence that mobility is crucial at the airport in providing passengers with clear directions and signage to navigate the airport. Lastly, this research has proven that security positively influences perceived value, which implies that security is an essential and crucial factor in the overall evaluation of passengers' satisfaction (Boonchunone, Nami, Pongthavornvich & Suwunnamek, 2021).

This study further supports that perceived value mediates the relationship between airport service quality and passenger satisfaction. Together, service quality and perceived value can be seen as core determinants for airports in providing a seamless experience for passengers that can eventually develop as an added advantage (Chen & Chang, 2008). Specifically, passengers who exhibit a high level of perceived value, often beyond their awareness, expectations, and needs, show a greater tendency towards pleasant feelings, leading to their overall satisfaction in the airport (Moon, Yoon & Han, 2016). Moreover, perceived value's role as an intervening mechanism that links airport service quality to passenger satisfaction implies that passengers perceive value as a proxy in determining their overall satisfaction, primarily when the perception of value reflects the comparison between service performance and the price paid for such service (Tang, Weaver & Lawton, 2017).

THEORETICAL IMPLICATIONS

This study applied the ECSI model to examine the impact of airport service quality on passenger satisfaction. The study identified six variables of airport service quality that impact passenger satisfaction, including ambience, basic facilities, check-in, convenience, mobility, and security. The findings suggest that effective airport service quality in all these aspects has a positive influence on perceived value, which in turn affects passenger satisfaction. This supports the ECSI proposition that satisfaction is a post-consumption response.

The measurement items used in the final model are associated with key elements of airport service, such as service efficiency and comfort. Therefore, the study emphasises the importance of these elements in shaping passengers' perception of value. The results also validate the mediating effect of perceived value between airport service quality and passenger satisfaction, highlighting the role of value in shaping passengers' satisfaction. Overall, this study offers a comprehensive understanding of the satisfaction mechanism among passengers travelling in an airport, complementing prior studies in this area.

MANAGERIAL IMPLICATIONS

From a managerial perspective, the research outcomes offer practical and significant results for marketers to improve passengers' satisfaction in airports. Focusing on services and resources

from a passenger's perspective can help airport practitioners unlock growth opportunities and improve airport revenues. Among the factors examined, perceived value exhibits the strongest effect on passenger satisfaction. Therefore, it is crucial for airport practitioners to understand and improve passengers' perceived value in order to meet their needs. This can be achieved by effectively strategising to provide services and facilities at a proper quality level.

The positive correlation between airport service quality and perceived value indicates that marketers should pay attention to passengers' actual expectations to effectively plan and provide desired services and facilities at a high level of quality. Passengers perceive different aspects of airport service performance, as demonstrated by the airport service quality dimensions. Therefore, the results of this study can help airport managers efficiently improve their facilities and services in a competitive environment.

Furthermore, perceived value mediates between airport service quality and passenger satisfaction, implying that a more value-for-money strategy should be implemented. The airport service quality, which includes exceptional basic facilities, tranquil ambience, unrestricted mobility, seamless check-in, thorough security, and continuous convenience, is at the core of the airport's attention. Advanced and modern services and facilities can also be an added advantage that enables the airport to provide excellent value to passengers while they are in the airport.

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

This study drew on the ECSI model to examine the determinants of passenger satisfaction in airports. The results evince that passenger satisfaction is positively influenced by perceived value, with airport service quality being a necessary precursor of such value and satisfaction.

Despite these insightful findings, the study has some limitations. First, data was only collected in Malaysia, making it impossible to observe passenger perceptions and behavioural attitudes in other major airports. Future research on behavioural intentions could address this issue by collecting data from different countries, which may provide additional knowledge and understanding of the impact of passengers' perceptions of airport service quality. Additionally, to enhance the significance of this study, future studies should consider exploring passenger expectations and their perception of value concerning different attributes of airport services and facilities.

Second, this study was conducted during the COVID-19 relaxation travel phase, which might have influenced the results. Linden (2021) emphasised that individuals face an increased risk of prolonged COVID-19, which might have negatively impacted their behaviour, especially within the hospitality industry. While the travel industry's recovery seems promising, future studies should further explore how improved all-inclusive facilities and services offered in airports during the post-COVID-19 era affect passengers. Lastly, it would be interesting for future research on passenger satisfaction to examine how technologies are incorporated into facilities and services offered in airports.

REFERENCES

Akama, J. S., & Kieti, D. M. (2003). Measuring tourist satisfaction with Kenya's wildlife safari: A case study of Tsavo West National Park. *Tourism management*, 24(1), 73-81.

Ali, F., Kim, W. G., & Ryu, K. (2016). The effect of physical environment on passenger delight and satisfaction: Moderating effect of national identity. *Tourism Management*, *57*, 213–224. https://doi.org/10.1016/j.tourman.2016.06.004

Awad, M., Alzaatreh, A., AlMutawa, A., Al Ghumlasi, H., & Almarzooqi, M. (2020). Travelers' perception of service quality at Dubai International Airport. *International Journal of Quality & Reliability Management*, 37(9/10), 1259-1273.

Anderson, E. W., & Fornell, C. (2000). Foundations of the American customer satisfaction index. *Total Quality Management*, *11*(7), 869–882.

Babin, B. J., Griffin, M., & Hair Jr, J. F. (2016). Heresies and sacred cows in scholarly marketing publications. *Journal of Business Research, 69*(8), 3133–3138.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74–94.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly*, 421–458.

Bezerra, G. C. L., & Gomes, C. F. (2015). The effects of service quality dimensions and passenger characteristics on passenger's overall satisfaction with an airport. *Journal of Air Transport Management*, *44–45*, 77–81. https://doi.org/10.1016/j.jairtraman.2015.03.001

Bezerra, G. C. L., & Gomes, C. F. (2019). Determinants of passenger loyalty in multi-airport regions: Implications for tourism destination. *Tourism Management Perspectives*, *31*(April), 145–158. https://doi.org/10.1016/j.tmp.2019.04.003

Bezerra, G. C. L., & Gomes, C. F. (2020). Antecedents and consequences of passenger satisfaction with the airport. *Journal of Air Transport Management*, *83*, 101766.

Bezerra, G. C. L., de Souza, E. M., & Correia, A. R. (2021). Passenger expectations and airport service quality: Exploring customer segmentation. *Transportation Research Record*, 2675(10), 604-615.

Blichfeldt, B. S., Pumputis, A., & Ebba, K. (2017). Using, spending, wasting and killing time in airports. *International Journal of Culture, Tourism and Hospitality Research*.

Bogicevic, V., Bujisic, M., Bilgihan, A., Yang, W., & Cobanoglu, C. (2017). The impact of traveler-focused airport technology on traveler satisfaction. *Technological Forecasting and Social Change*, *123*(March 2016), 351–361. https://doi.org/10.1016/j.techfore.2017.03.038

Boonchunone, S., Nami, M., Pongthavornvich, J., & Suwunnamek, O. (2021). Impact of airport service quality, image, and perceived value on loyalty of passengers in Suvarnabhumi airport service of Thailand. *Acta Logistica*, 8(3), 237-257.

Bruno, G., Diglio, A., Genovese, A., & Piccolo, C. (2019). A decision support system to improve performances of airport check-in services. *Soft Computing*, 23, 2877-2886.

Cao, M., Li, L., & Zhang, Y. (2023). Developing a passenger-centered airport: A case study of Urumqi airport in Xinjiang, China. *Journal of Air Transport Management*, 108, 102363.

Chen, C. F., & Chang, Y. Y. (2008). Airline brand equity, brand preference, and purchase intentions-The moderating effects of switching costs. *Journal of Air Transport Management*, 14(1), 40-42.

Chen, J. K. C., Batchuluun, A., & Batnasan, J. (2015). Services innovation impact to customer satisfaction and customer value enhancement in airport. *Technology in Society*, *43*, 219–230. https://doi.org/10.1016/j.techsoc.2015.05.010

Chen, L., Li, Y. Q., & Liu, C. H. (2019). How airline service quality determines the quantity of repurchase intention-Mediate and moderate effects of brand quality and perceived value. *Journal of Air Transport Management*, 75, 185-197.

Chin, W., Cheah, J. H., Liu, Y., Ting, H., Lim, X. J., & Cham, T. H. (2020). Demystifying the role of causal-predictive modeling using partial least squares structural equation modeling in information systems research. *Industrial Management & Data Systems*, *120*(12), 2161–2209. https://doi.org/10.1108/IMDS-10-2019-0529

Chitty, C., Ward, S., & Chua, C. (2007). An application of the ECSI model as a predictor of satisfaction and loyalty for backpacker hostels. *Marketing Intelligence and Planning*, *25*(6), 563–580. https://doi.org/10.1108/02634500710819941

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Earlbaum. New Jersey.

Correia, A., & Wirasinghe, S. C. (2004). Evaluating level of service at airport passenger terminals: Review of research approaches. *Transportation research record*, 1888(1), 1-6.

ECSI. (1998). European customer satisfaction index: Foundation and structure for harmonised National Pilot Project. *ECSI Steering Committee*.

Fakfare, P., Wattanacharoensil, W., & Graham, A. (2021). Exploring multi-quality attributes of airports and the asymmetric effects on air traveller satisfaction: The case of Thai International Airports. *Research in Transportation Business & Management*, 41, 100648.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191.

Fodness, D., & Murray, B. (2007). Passengers' expectations of airport service quality. *Journal of Services Marketing*, *21*(7), 492–506. https://doi.org/10.1108/08876040710824852

Gartner (2018). Key findings from the gartner customer experience survey. Retrieved 28 March 2023 from https://www.gartner.com/en/marketing/insights/articles/key-findings-from-the-gartner-customer-experience-survey

Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, *4*(1), 7.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, *61*(1), 101–107. https://doi.org/10.1093/biomet/61.1.101

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*.

Han, H., Lee, M. J., & Kim, W. (2018). Role of shopping quality, hedonic/utilitarian shopping experiences, trust, satisfaction and perceived barriers in triggering customer post-purchase intentions at airports. *International Journal of Contemporary Hospitality Management*, *30*(10), 3059-3082

Harding, J. (2019). A research-based approach for improving the airport wayfinding experience. *Journal of Airport Management*, *13*(2), 133-143.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Hong, S. J., Choi, D., & Chae, J. (2020). Exploring different airport users' service quality satisfaction between service providers and air travelers. *Journal of Retailing and Consumer Services*, 52, 101917.

Huang, P. L., Lee, B. C. Y., & Chen, C.-C. (2019). The influence of service quality on customer satisfaction and loyalty in B2B technology service industry. *Total Quality Management & Business Excellence*, *30*(13–14), 1449–1465.

Jordan, P. J., & Troth, A. C. (2020). Common method bias in applied settings: The dilemma of researching in organizations. *Australian Journal of Management*, *45*(1), 3–14.

Junior, A. C. P., Hollaender, P. S., Mazzanati, G. V., & Bortoletto, W. W. (2021). Efficiency drivers of international airports: A worldwide benchmarking study. *Journal of Air Transport Management*, 90, 101960.

Kim, J. H., & Park, J. W. (2019). The effect of airport self-service characteristics on passengers' perceived value, satisfaction, and behavioral intention: based on the SOR model. Sustainability, 11(19), 5352.

Kline, R. B. (2011). Principles and practice of structural equation modeling.

Knol, A., Sharpanskykh, A., & Janssen, S. (2019). Analyzing airport security checkpoint performance using cognitive agent models. *Journal of Air Transport Management*, 75, 39-50.

Kock, N., & Lynn, G. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, *13*(7).

Koklic, M. K., Kukar-Kinney, M., & Vegelj, S. (2017). An investigation of customer satisfaction with low-cost and full-service airline companies. *Journal of Business Research*, *80*, 188–196.

Li, F., Aw, E. C. X., Tan, G. W. H., Cham, T. H., & Ooi, K. B. (2022). The Eureka moment in understanding luxury brand purchases! A non-linear fsQCA-ANN approach. *Journal of Retailing and Consumer Services*, *68*, 103039.

Liao, W., Cao, X., Liu, Y., & Huang, Y. (2022). Investigating differential effects of airport service quality on behavioral intention in the multi-airport regions. *Research in Transportation Business & Management*, 45, 100877.

Lim, Y. M., Cheng, B. L., Cham, T. H., Ng, C. K. Y., & Tan, J. X. (2019). Gender Differences in Perceptions and Attitudes Toward Online Shopping: A Study of Malaysian Consumers. *Journal of Marketing Advances and Practices*, *1*(2), 11-24.

Lim, X. J., Ngew, P., Cheah, J.H., Cham, T. H., & Liu, Y. (2022). Go digital: can the money-gift function promote the use of e-wallet apps?. *Internet Research*, *32*(6), 1806-1831.

Lin, H. F. (2022). The mediating role of passenger satisfaction on the relationship between service quality and behavioral intentions of low-cost carriers. *The TQM Journal*, 34(6), 1691-1712.

Linden, E. (2021). Pandemics and environmental shocks: What aviation managers should learn from COVID-19 for long-term planning. *Journal of Air Transport Management*, *90*, 101944. https://doi.org/https://doi.org/10.1016/j.jairtraman.2020.101944.

Mey, L. P., Akbar, A. K., & Fie, D. Y. G. (2006). Measuring service quality and customer satisfaction of the hotels in Malaysia: Malaysian, Asian and non-Asian hotel guests. *Journal of Hospitality and Tourism Management*, 13(2), 144-160.

Moon, H., Yoon, H. J., & Han, H. (2016). Role of airport physical environments in the satisfaction generation process: Mediating the impact of traveller emotion. *Asia Pacific Journal of Tourism Research, 21*(2), 193-211.

Nesset, E., & Helgesen, Ø. (2014). Effects of switching costs on customer attitude loyalty to an airport in a multi-airport region. *Transportation Research Part A: Policy and Practice*, *67*, 240–253.

Ni, A., Zhang, C., Hu, Y., Lu, W., & Li, H. (2020). Influence mechanism of the corporate image on passenger satisfaction with public transport in China. *Transport Policy*, *94*(April), 54–65. https://doi.org/10.1016/j.tranpol.2020.04.014.

Pandey, M. M. (2016). Evaluating the service quality of airports in Thailand using fuzzy multi-criteria decision making method. *Journal of Air Transport Management*, 57, 241-249.

Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12-40.

Pike, S., Pontes, N., & Kotsi, F. (2021). Stopover destination attractiveness: A quasi-experimental approach. *Journal of Destination Marketing & Management*, *19*, 100514.

Prebensen, N. K., & Xie, J. (2017). Efficacy of co-creation and mastering on perceived value and satisfaction in tourists' consumption. *Tourism Management*, *60*, 166-176.

Prentice, C., & Kadan, M. (2019). The role of airport service quality in airport and destination choice. *Journal of Retailing and Consumer Services*, *47*, 40-48.

Prentice, C., Wang, X., & Manhas, P. S. (2021). The spillover effect of airport service experience on destination revisit intention. *Journal of Hospitality and Tourism Management*, *48*, 119-127.

Podsakoff, N. P., Podsakoff, P. M., MacKenzie, S. B., & Klinger, R. L. (2013). Are we really measuring what we say we're measuring? Using video techniques to supplement traditional construct validation procedures. *Journal of Applied Psychology*, *98*(1), 99.

Qing, Z., Sun, C., & Reneker, J. (2021). Evaluation of airport wayfinding accessibility with the use of a wheelchair simulator. *Transportation Research Record*, *2675*(4), 52-60.

Rajapaksha, A., & Jayasuriya, N. (2020). Smart airport: A review on future of the airport operation. *Global Journal of Management and Business Research*, *20*(A3), 25-34.

Rezaei, J., Kothadiya, O., Tavasszy, L., & Kroesen, M. (2018). Quality assessment of airline baggage handling systems using SERVQUAL and BWM. *Tourism Management*, *66*, 85-93.

Saleem, M. A., Zahra, S., & Yaseen, A. (2017). Impact of service quality and trust on repurchase intentions–the case of Pakistan airline industry. *Asia Pacific Journal of Marketing and Logistics*, *29*(5), 1136-1159.

Sarstedt, M., & Cheah, J. H. (2019). Partial least squares structural equation modeling using SmartPLS: a software review. *Journal of Marketing Analytics*, *7*(3), 196–202.

Shin, T., & Roh, T. (2021). Impact of non-aeronautical revenues on airport landing charge in global airports. *Transportation Research Record*, *2675*(10), 667-677.

Sohn, H. K., & Lee, T. J. (2017). Tourists' impulse buying behavior at duty-free shops: The moderating effects of time pressure and shopping involvement. *Journal of Travel and Tourism Marketing*, *34*(3), 341–356. https://doi.org/10.1080/10548408.2016.1170650.

Stone, M. (1974). Cross-validation and multinomial prediction. *Biometrika*, *61*(3), 509–515.

Streukens, S., & Leroi-Werelds, S. (2016). Bootstrapping and PLS-SEM: A step-by-step guide to get more out of your bootstrap results. *European Management Journal*, *34*(6), 618–632. https://doi.org/https://doi.org/10.1016/j.emj.2016.06.003.

Tang, C., Weaver, D., & Lawton, L. (2017). Can stopovers be induced to revisit transit hubs as stayovers? A new perspective on the relationship between air transportation and tourism. *Journal of Air Transport Management*, *62*, 54–64.

Thampan, A., Sinha, K., Gurjar, B. R., & Rajasekar, E. (2020). Functional efficiency in airport terminals: A review on Overall and Stratified Service Quality. *Journal of Air Transport Management*, *87*, 101837.

Tse, D. K., & Wilton, P. C. (1988). Models of consumer satisfaction formation: An extension. *Journal of Marketing Research*, *25*(2), 204-212.

Urdang, B. S., & Howey, R. M. (2001). Assessing damages for non-performance of a travel professional - A suggested use of "Servqual". *Tourism Management*, *22*(5), 533-538.

Usman, A., Azis, Y., Harsanto, B., & Azis, A. M. (2022). Airport service quality dimension and measurement: A systematic literature review and future research agenda. *International Journal of Quality & Reliability Management*, *39*(10), 2302-2322.

Van Asch, T., Dewulf, W., Kupfer, F., Meersman, H., Onghena, E., & Van de Voorde, E. (2019). Air cargo and airport competitiveness. *Journal of Air Transport Studies, 10*, 48-75.

Wattanacharoensil, W., Schuckert, M., & Graham, A. (2016). An airport experience framework from a tourism perspective. *Transport Reviews*, *36*(3), 318–340.

Wattanacharoensil, W., Schuckert, M., Graham, A., & Dean, A. (2017). An analysis of the airport experience from an air traveler perspective. *Journal of Hospitality and Tourism Management*, *32*, 124–135. https://doi.org/10.1016/j.jhtm.2017.06.003.

Wattanacharoensil, W., Fakfare, P., & Graham, A. (2022). Airportscape and its effect on airport sense of place and destination image perception. *Tourism Review*, *77*(2), 549-569.

Yuan, Y. P., Dwivedi, Y. K., Tan, G.W.H., Cham, T. H., Ooi, K.B., Aw, E. C. X., & Currie, W. (2023). Government Digital Transformation: Understanding the Role of Government Social Media. *Government Information Quarterly*, 101775.

Zauner, A., Koller, M., & Hatak, I. (2015). Customer perceived value - Conceptualization and avenues for future research. *Cogent Psychology*, *2*(1), 1061782.