Conceptualization and Measurement of Consumer Based Brand Equity for Airlines

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Abstract

The study aimed at conceptualizing and measuring consumer based brand equity in the airline industry. This was achieved by focusing on the key dimensions of consumer based brand equity such as brand awareness, brand image, perceived service quality, and brand loyalty. The study proposed and tested a model of airline brand equity using a sample of 646 domestic air passengers. The research model was constructed on the recommendations of previous studies. To measure the dimensions of consumer based brand equity, a 13 item scale was constructed and validated using EFA and CFA. The scale exhibited convergent and discriminant validity. Measurement invariance test was conducted to examine the proposed brand equity dimensions as an indicator of the same latent variable for different airlines companies. Findings of the invariance test confirmed the equivalence of factorial measure across different airline brands. After the study, the model was validated through second-order factor analysis. The research findings supported the four - dimensional model of consumer based brand equity in the airline industry. All the dimensions were confirmed to be related constructs and accounted for airline brand equity. The explanatory power of the dimensions of consumer based brand equity was calculated by examining the path coefficient of higher order construct. It was found that perceived service quality was the most reliable indicator and brand awareness the least. Finally, an ABE index was calculated for different airline brands based upon the weight of each dimension and mean value of constructs for different airline brands.

Keywords : **airlines, brand equity, brand awareness, brand loyalty, brand image, service quality**

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Brand equity has long intrigued the minds of practitioners. There is no common consensus about what it actually means. Numerous models have been developed by scholars examining it from different dimensions and perspectives. Earliest was of Srinivasan (1979), who used the multi-attribute model to measure brand equity ; Aaker (1991) and Keller (1993) conceptualized, studied, and measured consumer based brand equity (CBBE) ; Kamakura and Russell (1993) looked at the perceived quality and brand intangible value ; Swaiť, Edem, Louviere, and Dubelaar (1993) proposed a measure of brand equity in terms of the 'equalization price' ; Park and Srinivasan (1994) measured brand equity at the individual level as the difference in overall brand preference and multi-attribute brand preference ; Koçak, Abimbola, and Özer (2007) emphasized brand equity as the overall utility that consumers associated with the brand; Konecnik and Gartner (2007) conceptualized consumer based brand equity for destinations; Rajasekar and Nalina (2008) conceptualized a new brand equity model in India; Davis, Golicic, and Marquardt (2009) measured brand equity for logistics services ; and Tong and Hawley (2009) empirically measured customer-based brand equity from the sportswear market in China. Despite these considerable research works, the research of brand equity on the airline industry is still in a nascent stage. There is a need for a generalized conceptual framework for brand equity of airline brands.

The conceptualization and measurement of brand equity for airline brands is important, as branding has become an almost important activity for brand managers and firms are investing hugely on it (Davis, 2000 ; Kapferer, 1997), and so, firms want to be aware of the outcome of their efforts. It becomes imperative to have a contemporary

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valid and reliable framework for measuring airline brand equity. Furthermore, airline services are intangible and complex, and the value derived from the service brand is subjective. There are several divergent viewpoints on the dimensions of airline brand equity, the factors that influence it, the perspectives from which it is to be conceptualized, and the ways to measure it.

In general, Aaker (1991) suggested a conceptual framework of brand equity with five dimensions: brand awareness, perceived quality, brand image, brand loyalty, and other proprietary brand assets (Keller, 1993). Other frameworks were also conceptualized, tested, and validated in a number of studies in the past for product and service brands. Lassar, Mittal, and Sharma (1995) measured brand equity in terms of performance, social image, value, trustworthiness, and attachment ; Yoo and Donthu (2001) put forth a multidimensional brand equity scale with dimensions similar to Aaker's (1991) model ; Washburn and Plank (2002) modified the scale of Yoo and Donthu (2001) ; Netemeyer et al. (2004) and Pappu, Quester, and Cooksey (2005) improved Aaker's (1991) dimensions of brand equity ; Guizani, Triguerio, and Valette - Florence (2008) used dimensions of Aaker (1991) to develop a scale for French consumers ; Rajasekar and Nalina (2008) gave a new dimension of brand equity as performance, social image, value, trustworthiness, and attachment for Indian consumers ; Buil, de Chernatony, and Martinez (2008) added personality dimensions to Aaker's (1991) brand equity dimensions ; Chen and Chang (2008) suggested brand equity dimensions for airlines ; Davis et al. (2009) measured logistics services on the dimensions suggested by Keller (1993) ; Boo, Busser, and Baloglu (2009) developed a destination brand scale as per Aaker's (1991) dimensions ; Atilgan, Akinci, Aksoy, and Kaynak's (2009) study resulted into the emergence of brand trust as a new dimension instead of brand awareness of Aaker's (1991) dimensions ; Christodoulides, Cadogan, Veloutsou, and de Chernatony (2012) suggested awareness, heritage, uniqueness, reliability, and willingness to sacrifice as an alternative to Aaker's (1991) brand equity dimensions ; Shashikala and Suresh (2013) measured the brand equity of apparel companies operating in India using dimensions of Aaker (1991).

This research further tries to develop and validate the underlying vital dimensions of brand equity for airlines. It will be useful to the practitioners as the investigation adequately captures the important dimensions of airline brand equity at higher-level of abstractions and would provide aviation managers with actionable strategic directions.

The study addresses the airline brand equity model that offers a deeper analysis of brand equity dimensions applicable to the aviation sector. Developing and testing an aviation brand equity model will expand the domain of brand equity literature to a new perspective. It will provide aviation firms with an instrument that enables them to better understand the impact of branding on their passengers.

Brand Equity

Farquhar (1989) defined brand equity as, “the added value with which a given brand endows a product” (p. 24). This added value may be the outcome of consumer response to a brand's marketing mix (Aaker, 1991; Keller, 1993) ; the increased utility that the brand names give to products (Erdem & Swait, 1998 ; Wernerfelt, 1988) ; or the added value in financial terms, the firm's market value minus its tangible asset value (Simon & Sullivan, 1993).

Aaker (1996) explained brand equity as, “a set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers” (p.7). He conceptualized brand equity with five dimensions: brand awareness, brand loyalty, brand associations, perceived quality, and other proprietary assets. Keller (1993) referred to brand equity as CBBE (consumer based brand equity), and explained it as, “the differential effect of brand knowledge on consumer response to the marketing of the brand” (p. 2). He conceptualized brand equity in terms of brand knowledge and its two components: brand awareness and brand image. According to him, the value of a brand rests in consumers' mind based on what they perceive and learn from brand marketing and interaction with a brand.

A substantial number of studies elucidated brand equity as : a brand - specific effect (Srinivasan, 1979) ; implied

utility and value assigned to the brand by a consumer (Kamakura & Russell, 1993) ; monetary expression of the utility a consumer attributes to a brand (Swaiṫ, Erdem, Louviere, & Dubelaar, 1993) ; the difference between overall brand preference and multi-attributed preference based on objectively measured attribute levels (Park & Srinivasan, 1994) ; the difference between subjective and objective preference of a product (Jourdan, 2002) ; value that accrues to the branded products when compared with non branded products at the same level of features (Yoo & Donthu, 2001) ; revenue premium that firms get over their brands (Ailawadi, Lehmann, & Neslin, 2003).

Of all the conceptualizations, Aaker's (1991, 1996) and Keller's (1993) brand equity is the most influential one that consists of four main dimensions: brand loyalty, brand awareness, perceived quality of the brand, and brand associations (image). As proposed by Aaker (1991, 1996) and Keller (1993, 2003), these dimensions may be used to explore the findings of marketing and consumer behaviour research in relation to brand equity of any products and services. In this study, airline brand equity model is conceptualized on these dimensions.

Keller (1993) explained brand awareness as the, "likelihood that a brand name will come to mind with ease when some relevant cue is given or confronted about the brand" (p.3). Aaker (1996) referred to it as, "the ability of a potential buyer to recognize or recall that a brand is a member of a certain product category" (p. 10). He further described 'brand recognition' as consumers' ability to identify a brand when they are given brand as a cue, and brand recall as correctly memorizing the brand when given the product category, or purchase, or usage situation as a cue. He further elucidated brand awareness as the first step in building brand equity. In order to measure brand awareness, brand recognition and recall are to be measured (Aaker, 1996 ; Keller, 1993).

Keller (2003) defined brand image as, "perceptions about a brand as reflected by the brand associations held in the consumer's memory. It is the mental picture of the brand in the minds of people...it is what people believe about a brand - their thoughts, feelings, and expectations" (p.3). Aaker (1996) explained brand image as, "a set of brand associations that are anything linked in memory to a brand, usually in a meaningful way" (p.25). According to him, brand image constitutes strength, favorability, and exclusivity of brand association. The creation, change, or reinforcement of associations depends upon the quality of contact or experience a consumer has with a brand (Keller, 2003). In order for associations to have a positive effect on brand equity, they must be unique, strong, and favourable (Keller, 2003).

Oliver (1997) defined brand loyalty as, "a deeply held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand set purchasing despite situational influences and marketing efforts having the potential to cause switching behaviour" (p. 392). The concept of brand loyalty has had various views from different researchers and scholars, like repeat purchase of products and services (Jacoby, 1971) ; biased behavioural response consistent over time and a function of the psychological process (Jacoby & Kyner, 1973); re-buying as a function of behaviour and attitudes both (Dick & Basu, 1994). According to Kumar and Menon (2017), brand loyalty is something that bars switching behavior of consumers. Ajzen and Fishbein (1980) supported the concept of attitude and behaviour loyalty under a high involvement situation.

Loyalty in the case of service is quite different from consumer's product loyalty due to it being intangible and heterogenous in nature (Zeithaml, Berry, & Parasuraman, 1996). Service loyalty is more dependent on the experiential quality aspect of the consumer with earlier service encounter, the quality of interactions, and interpersonal relations with the service provider (Macintosh & Lockshin, 1997) as well as the level of perceived risk in switching (Chen & Chang, 2008). Brand loyalty is one of the important dimensions of brand equity (Yoo & Donthu, 2001).

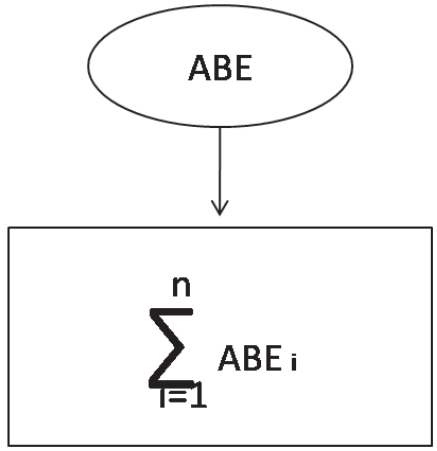
Perceived quality was defined as, "the consumer's judgment about a product's overall excellence or superiority" (Zeithaml, 1988, p. 3). It is based on consumers' or users' subjective evaluations of product or service quality (Aaker 1991, p. 109). It is a very complicated phenomenon because it is difficult to understand how a consumer perceives services and evaluates service quality (Zeithaml, Berry, & Parasuraman, 1996). Parasuraman, Zeithaml, and Berry (1988) put forth five dimensions of service quality: tangibility, reliability, responsiveness, assurance,

and empathy, and suggested to measure perceived service quality on these five dimensions. They proposed that perceived service quality can be estimated by calculating the difference between expectations and perceptions of actual service performance. Kaur and Singh (2017) recommended that service quality has an impact on customer satisfaction, and improvement in service quality increases satisfaction. Several researchers like Kloppenborg and Gourdin (1992) ; Gourdin (1988) ; Fick and Brent Ritchie (1991) ; Gourdin and Kloppenborg, (1991) ; Young, Cunningham, and Lee, (1994); Park (2007) ; and Pappachan and Koshy (2014), all suggested service quality dimensions for airlines to include industry specific dimensions like baggage handling, bumping procedure, operations and safety, in-flight comfort, connections, reservation related services, airport services, and employee services. Service quality is important for firms as it genuinely increases the real value of their services brands. High perceived service qualities convince the customers to reuse the services and could be a source of competitive advantage (Aaker, 1991).

The Study Model

The brand equity framework is a multidimensional construct including brand awareness, brand image, perceived service quality, and brand loyalty (Aaker, 1991 ; Keller, 2003). The measures of these may all be accounted for the common higher order general factor, that is, brand equity. Multi-dimensional constructs can be measured in several ways (Bagozzi & Heatherton, 1994 ; Babakus, Eroglu, & Yavas, 2004) as : (a) a unidimensional construct, where all the item scores of scales are summated and/or averaged and indicated in a totally aggregated form across the dimensions comprising the construct, as presented in the Figure 1; (b) a partially disaggregated complex construct where individual items are dimension wise aggregated and used as an observable indicator for each construct, as shown in the Figure 2; (c) a first - order factor model, where items measuring the unique dimension are allowed to correlate themselves, allowing to predict behaviour at two levels : of abstraction at the attribute level and at the first-level latent variables. The Figure 3 depicts the first order factor model ; (d) a second - order factor

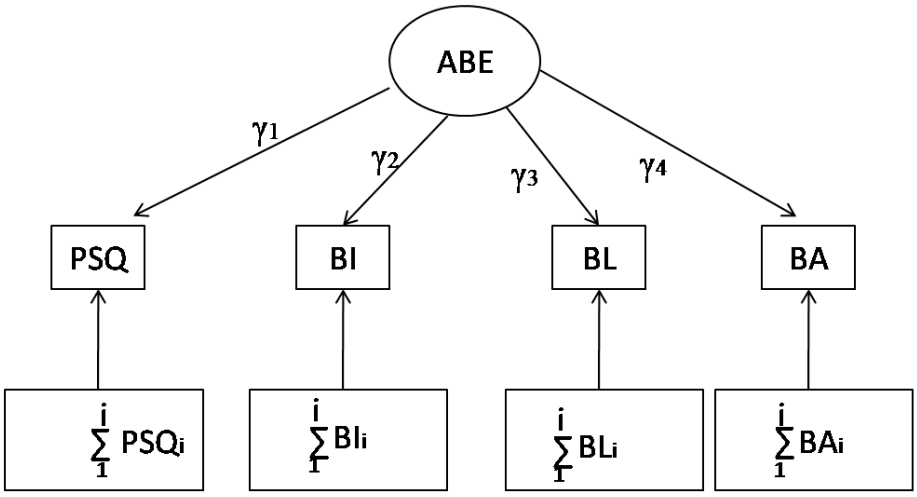
Figure 1. Total Aggregation Model



ABE = "Airline Brand Equity", a unidimensional construct represented as the aggregate of all attributes

Source : Babakus et al. (2004)

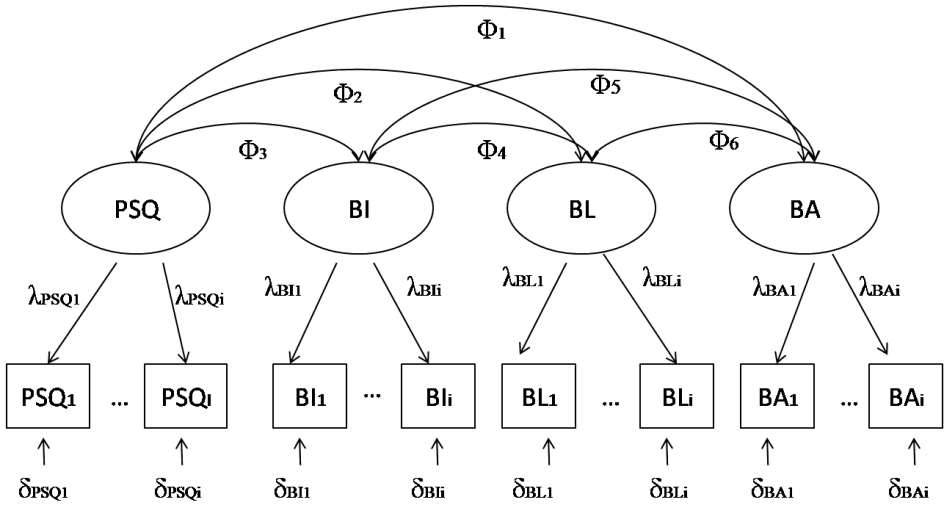
Figure 2. Partial Aggregations Model



ABE = "Airline Brand Equity" variable represented by four indicator, PSQ, BI,BL,BA
PSQ = Observable indicator that is itself the aggregate of perceived service quality attributes
BI = Observable indicator that is itself the aggregate of brand image attributes
BL = Observable indicator that is itself the aggregate of brand loyalty attributes
BA = Observable indicator that is itself the aggregate of brand awareness attributes

Source : Babakus et al. (2004)

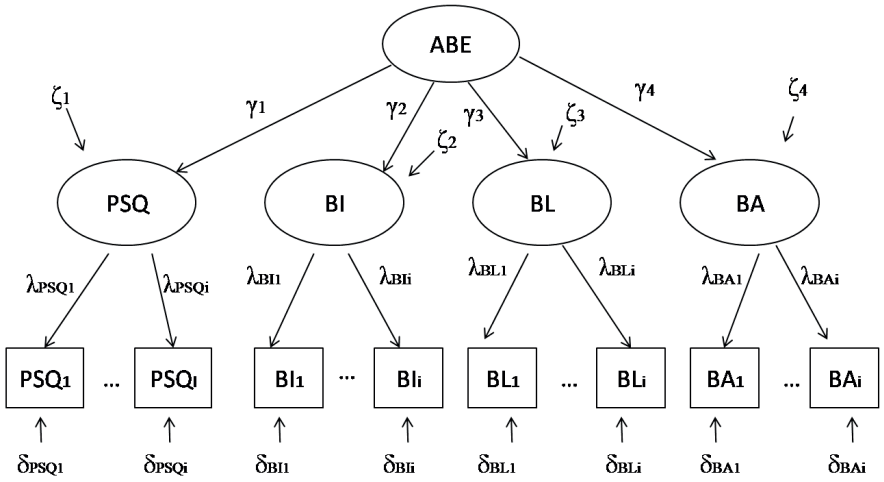
Figure 3. Total Disaggregation First Order Model



PSQ = Exogenous latent variable "Perceived Service Quality"
BI = Exogenous latent variable "Brand Image"
BL = Exogenous latent variable "Brand Loyalty"
BA = Exogenous latent variable "Brand Awareness"
PSQ1 ....PSQi = Perceived Service Quality attributes PSQ1 ....PSQi
BI1 ....BIi = Brand Image attributes BI1 ....BIi
BL1 ....BIi = Brand Loyalty attributes BL1 ....BLi
BA1 ....BAi = Brand Awareness attributes BA1 ....Bai

Source : Babakus et al. (2004)

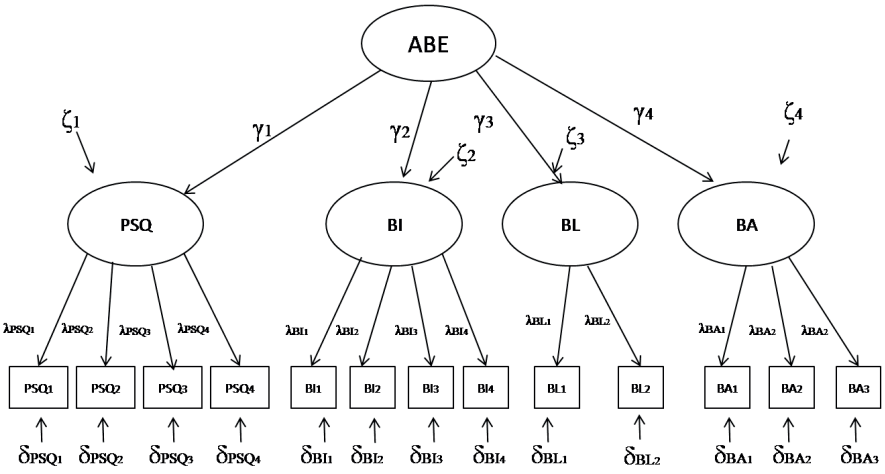
Figure 4. Total Disaggregation Second Order Model



ABE = Overall exogenous latent construct "Airline Brand Equity"
PSQ = Exogenous latent variable "Perceived Service Quality"
BI = Exogenous latent variable "Brand Image"
BL = Exogenous latent variable "Brand Loyalty"
BA = Exogenous latent variable "Brand Awareness"
PSQ1 ....PSQi = Perceived Service Quality attributes PSQ1 ....PSQi
BI1 ....BIi = Brand Image attributes BI1 ....BIi
BL1 ....BIi = Brand Loyalty attributes BL1 ....BLi
BA1 ....BAi = Brand Awareness attributes BA1 ....Bai

Source : Babakus et al. (2004)

Figure 5. Second-Order Conceptual Model



Source : Babakus et al. (2004)

model, as illustrated in the Figure 4, where intercorrelational path of the first-order factor model is converted into causal paths of the higher-order factor model without adding or deleting any item path ; through a second-order factor model, the behaviour can be studied at three levels of abstraction (Babakus et al., 2004).

The underlying theory of the proposed model is based on Aaker's (1991, 1996) and Keller's (1993, 2003) conceptualization of brand equity. The four dimension construct for consumer based brand equity for aviation is conceptualized (Stelzl, 1986 ; Yoo & Donthu, 2001) using a second-order factor model as demonstrated in the Figure 5. It is hypothesized that the four dimensions contribute significantly to brand equity and that the effect

could be measured. The hypothesis, if proven, will validate that the four sets of attributes (brand awareness, brand image, perceived service quality, and brand loyalty) are manifestations of brand equity for airline brands.

Methodology

The purpose of this research is to develop and validate a framework for explaining the vital dimensions of brand equity within the context of airlines and to measure it. A questionnaire was designed consisting of measure items for suggested dimensions of brand equity for airlines. Construct validity and reliability are checked using EFA, CFA, and factorial invariance. Thereafter, second-order factor analysis is carried out to validate the dimensions, and method to measure airline brand equity is proposed and confirmed.

Questionnaire Design : The questionnaire was designed to survey the proposed constructs in the model and to test the hypothesis. The scale items in the questionnaire are based on extensive literature review and are reframed according to the needs of the study for specific airlines industry characteristics.

The survey questionnaire consisted of two sections. The first section was designed to obtain demographic information about the respondents, their age, gender, income, occupation, and other travel-related information like a most preferred airline for air travel, and number of travels in a year.

The second section contained 13 questions designed to obtain respondents' perception towards the airline's service quality (four items), brand awareness (three items), perceptual brand image (four items), and brand loyalty (two items).

The four items of assessing perceived service quality for airlines was structured by considering four dimensions of measuring airline service quality as suggested by Young et al. (1994) as "reliability," "empathy," "flight frequency and connection," and "comfort," taking one item for measuring each dimension. Parasuraman, Zeithaml, and Berry (1985) suggested that the measure of perceived service quality is the discrepancy between the expected service and perceived service, when the expected service is less than the perceived service, consumer perceived service quality is more than satisfactory and when the expected service is more than the perceived service, consumer perceived service quality is unsatisfactory; this fact was used to measure the airline service quality.

Airline's brand awareness was assessed by identifying "recall" and "recognition" of airlines' brand identities by the respondents ; three item scales were framed to measure each dimension, the measure was constructed based on Aaker (1996) and Keller (2003) scales with some modification to fit for measuring airline brand awareness.

To measure airline brand image, four items were developed to know about respondents' perception about airlines' "financial soundness," "uniqueness," "successful," and "ethical business conduct." The brand image measures were framed as suggested by Keller (2003).

Airline brand loyalty was measured by framing two items, each one representing "attitudinal brand loyalty" and "behavioural brand loyalty" (Chaudhuri & Holbrook, 2001; Dick & Basu, 1994).

For all 13 items, the respondents were asked to indicate their agreement with the statements on a 5-point Likert scale anchored by *"strongly disagree* (= 1)" to *"strongly agree* (= 5)". The Appendix Table A exhibits the content of the scale items with the corresponding indicators used in this study.

Analysis and Results

(1) Data Collection : A self-administered questionnaire survey was conducted at one of the international airports in India from January - March 2017. This study adopted the convenience sampling approach. Domestic passengers were invited to participate in the survey. One thousand questionnaires were distributed with the assurance of

confidentiality, and 646 valid samples were obtained after excluding the incomplete ones, yielding a 64.6% response rate.

The respondent data consisted of male (71.1%) and female (28.9%) respondents. The majority of the respondents were aged between 25 and 45 years of age (72.6%). Of the sample, 78.2% of the respondents were in public or private sector jobs. A maximum number of respondents (77.6%) had a monthly income between INR 40,000 and INR 80,000. The data further showed that the most preferred airlines by the respondents were : Air India (20%) ; Jet Airways (31%) ; Spice Jet (17%) ; Go Air (9%) ; Indigo (3%) ; and Air Asia (19%). The frequency of air travel in a year was more than three for each case. It varied up to 10 - 12 times in a year.

(2) Measurement Validity : Exploratory factor analysis (EFA) and Cronbach's alpha suggested by Churchill (1979) were conducted for the assessment of the measurement instrument quality, and confirmatory factor analysis (CFA) was conducted for ascertaining convergent and discriminant validity (Anderson & Gerbing, 1988). EFA was conducted by SPSS 23. Attribute measure reliabilities were checked by estimating Cronbach's alpha for the items loaded on factors after conducting EFA. EFA was performed using principal component analysis and varimax rotation was used to obtain interpretable factor matrix ; 13 items decomposed into four constructs/factors, with Eigenvalues greater than 1.0, which accounted for 65.6% of the total variance. The KMO value is .810, which is nearer to 1, which indicates that patterns of correlations are relatively compact and so factor analysis yielded distinct and reliable factors. Bartlett's test of sphericity, chi - square = 2723.082, $df = 78$, $p < 0.0001$ is highly significant ($p < 0.001$), denoting that the original correlation matrix is not an identity matrix, therefore, some relationships exist between the variables. The Table 1 presents the output of exploratory factor analysis with factor loadings and the corresponding Cronbach's α.

From the Table 1, it can be observed that the items measuring similar/same attributes loaded heavily to unique factors. Hence, it can be concluded that the structure of the data of the constructs is unidimensional. The

Table 1. Results of Exploratory Factor Analysis[a]

Items	Perceived Service Quality	Brand Image	Brand Awareness	Brand Loyalty
	α = 0.790	α = 0.767	α = 0.784	α = 0.685
This airline has sufficient flight frequency.	.801			
Airline is comfortable.	.768			
Airline is dependable.	.730			
Employees have the best interest in their hearts for passengers.	.673			
This airline is successful.		.794		
This airline company is unique.		.772		
This airline company is financially sound.		.751		
This airline conducts business ethically.		.613		
I can easily recognize the logo and design of this airline company.			.874	
I can easily recognize the design and colour of this airline company.			.808	
I can easily recall the name of this airline company in my mind.			.758	
I would recommend my friend to prefer this airline next time for air travel.				.838
I will prefer this airline next time I plan my air travel.				.754

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

[a] Rotation converged in 4 iterations.

Cronbach's alpha for the measuring instrument with 13 items is 0.827, the values between 0.7 – 0.8 are considered as an acceptable range (Cronbach, 1951) ; thus, EFA and Cronbach's alpha ensure that the measurement tools and measures of the construct are reliable and valid.

Hair, Black, Babin, and Anderson (2014) suggested checking the convergent and discriminant validity of the measurement scale using confirmatory factor analysis (CFA). The Table 2 shows the first - order confirmatory factor analysis results. The fit indices χ^2 (df = 59) = 324.39 are highly significant ($p < 0.001$), indicating that the model fails to fit in an absolute sense. Hair et al. (2014) recommended using other goodness of fit measures. The goodness of fit index (GFI) = 0.93, adjusted goodness of fit index (AGFI) = 0.88, confirmatory fit index (CFI) = 0.93, normalized fit index (NFI) = 0.91 - are all greater than the recommended value of 0.9 (Bagozzi & Yi, 1998). The root mean square error of approximation (RMSEA) = 0.07, which is a measure of fit between the proposed model and the population covariance matrix, has a value less than 0.10, which indicates an acceptable fit (Hair et al., 2014).

Table 2. The Results of First - Order Confirmatory Factor Analysis (n = 646)

Construct	Indicator	Standardized Factor Loading	Error Variance	Construct Reliability (CR)	Average Variance Extracted (AVE)
Perceived Service Quality - PSQ				0.83	0.55
	PSQ_1	0.69*	0.52		
	PSQ_2	0.80*	0.36		
	PSQ_3	0.79*	0.37		
	PSQ_4	0.68*	0.54		
Brand Awareness – BA				0.83	0.64
	BA_1	0.66*	0.56		
	BA_2	0.90*	0.18		
	BA_3	0.81*	0.35		
Brand Image – BI				0.81	0.53
	BI_1	0.68*	0.53		
	BI_2	0.68*	0.54		
	BI_3	0.85*	0.28		
	BI_4	0.67*	0.55		
Brand Loyalty - BL				0.74	0.58
	BL_1	0.72*	0.48		
	BL_2	0.80*	0.36		

* Significant at p – values < 0.01

Maximum Likelihood Ratio Chi-Square (χ^2) = 324.39; $p < 0.01$, Df = 59, CFI = 0.92, RMR = 0.36, GFI = 0.92, AGFI = 0.88, RMSEA = 0.07

Table 3. Correlation Matrix of Constructs

	PSQ	BA	BI	BL
(√AVE)	**0.74**	**0.80**	**0.73**	**0.76**
PSQ	1.00			
BA	0.32*	1.00		
BI	0.48*	0.43*	1.00	
BL	0.67*	0.25*	0.38*	1.00

Note : * Significant at p - values < 0.01

The adequacy of each multi-item scale in capturing its respective construct is examined. All factors loadings (λ) are found to be highly significant (*t* - value > 2.64 ; $p < 0.01$), and the standardized factor loading is found in between 0.66 to 0.90, demonstrating that the chosen measurement item in the measurement model for each latent variable reflects a single underlying construct. Anderson and Gerbing (1988) suggested that the evidence of convergent validity for the first-order model exists if all the observable indicators load significantly on their respective latent variables.

The construct reliability and average variance extracted (AVE) are calculated to determine internal validity. As seen in the Table 2, the construct reliabilities of the four constructs range from 0.74 to 0.83 and are well above the recommended value of 0.7 (Hair et al., 2014). The AVE of each measure ranges from 0.53 to 0.64, which is more than 50% of the variance as suggested by Bagozzi and Yi (1988). The Table 3 presents correlations between the factors, with the value in the first row as a square root of average variance extracted. It is evident from Table 3's first row that square root of AVE for each construct is greater than the correlation coefficients of corresponding inter-constructs, confirming discriminant validity (Fornell & Larcker, 1981). Thus, the scale representing the dimension of consumer based airline brand equity exhibits convergent and discriminant validity.

From the Table 3, the correlations between the factors that are in between 0.25 to 0.67, significant at $p < 0.01$, conclude an indicator of multicollinearity as none of the coefficients (α) are greater than 0.90. It also confirms nomological validity that a meaningful conclusion can be drawn (Hair et al., 2014). The Appendix Table B presents the correlation between the underlying variables of constructs.

(3) Testing Measurement Invariance : The purpose of conducting a test for measurement invariance is to examine whether the same construct is measured across different groups. Its requirement is to confirm whether the same item is an indicator of the same latent for each group or it differs. If invariance is achieved, it establishes that similar latent variables are present in the group (Meredith, 1993; Widaman & Reise, 1997). In confirmatory factor analysis, the whole analysis process is done ignoring the individual brand survey results. Need was felt for performing the invariance test for examining the equivalence of a factorial measure across different airline brands so that the brand equity index could be compared meaningfully across samples due to metric equivalence.

The hypothesis is whether the factor structure is statistically invariant among the six samples of different airline brands. Meredith (1993) suggested comparing an unconstrained model with the constrained. In the unconstrained model, the factor structure is specified to vary across different airline brands ; whereas, in the constrained model, the factor structure is constrained to be the same. The insignificant chi-square difference between the models suggests that the factor structure is invariant across the sample (Widaman & Reise, 1997).

The chi-square fit index for the unconstraint model is $\chi^2 = 982.69$ ($df = 450$), and the constraint model is $\chi^2 = 1001.10$ ($df = 468$) ; thus, the chi-square fit difference is insignificant ($\Delta\chi^2 = 18.42$; $df = 18$; $p > 0.05$). Other fit indices are RMSEA (.04) less than 0.5, CFI (.91) and GFI (.89) are above 0.90 (Chin & Todd, 1995) ; these results confirm the hypothesis that the factor structure is invariant across the airline brands and meaningful brand equity measurement across the sample (airline brands) can be done due to metric equivalence. The maximum likelihood estimate for the 13 items for all airline brands, all factor loadings, error, and factor intercorrelational estimates are significant at the 0.0001 level (due to space constraints, the invariance results are not reported here, but are available from the author upon request).

(4) Second - Order Model : The second order factor analysis was done using LISREL 9.30, as consumer based airline brand equity (ABE) being the Ksi (ξ) variable, and perceived service quality (PSQ), brand image (BI), brand loyalty (BL), and brand awareness (BA) as the Eta (η) variable. The Figure 5 presents a second-order structural model for validating and measuring airline brand equity. Model fitness indicator supports appropriate fitting of the model. Model fit statistics/indices are chi-square ($df = 61$) = 362.25, which is highly significant ($p > 0.01$), which does not shows a good model fit (Joreskog & Sorbom, 1989) ; GFI (0.92), AGFI (0.88), and RMR (0.065) are

Table 4. Structural Equation Estimation

Structural Equation		Error Value		Standardized Coefficient	(R^2)
PSQ = 0.47*ABE	t = 14.03**	0.26	t = 3.89**	0.857	0.73
BI = 0.32*ABE	t = 10.76**	0.66	t = 8.22**	0.582	0.33
BL = 0.46*ABE	t = 12.09**	0.44	t = 5.94**	0.748	0.55
BA = 0.29*ABE	t = 8.123**	0.82	t = 8.66**	0.416	0.17

Note : **Significant at the 0.01 level, *Significant at the 0.05 level.

Table 5. Covariance Matrix of Latent Variables

	PSQ	BI	BL	BA	ABE
PSQ	0.303				
BI	0.151	0.304			
BL	0.219	0.149	0.385		
BA	0.140	0.095	0.138	0.509	
ABE	0.472	0.321	0.464	0.297	1.00

respectively above 0.90, above 0.80, and below 0.05 (Chin & Todd, 1995). NFI (0.90) is > 0.90, RMSEA (0.08) > 0.10 shows a good model fit. The results of standardized path coefficients between the first - order construct and higher order is given in the Table 4.

In the second order model, the essential condition for convergent validity is that the relationship between the endogenous latent factor (η) and the exogenous (ξ) overall factor captured by gamma coefficients (γ) must all be significant. The gamma coefficients (γ) between the first-order factor (η) : perceived service quality (PSQ) $\gamma_1 = 0.85$ ($t = 14.00, p < 0.01$) ; brand image (BI) $\gamma_2 = 0.58$ ($t = 10.76, p < 0.01$) ; brand loyalty (BL) $\gamma_3 = 0.74$ ($t = 12.09, p < 0.01$) ; and brand awareness (BA) $\gamma_4 = 0.41$ ($t = 8.123, p < 0.01$) on second-order factor (ξ) consumer based airline brand equity (ABE) are all positive and significant.

The hypothesis that perceived service quality (PSQ), brand image (BI), brand loyalty (BL), and brand awareness (BA) are related constructs and account for consumer based airline brand equity (ABE) is being supported (refer to Tables 4 and 5). The Table 5 presents the covariance matrix of the latent variables.

The standardized γ coefficient is highly informative since it tells us about the relative importance of the first order factor in the model. The results suggest that perceived service quality ($\gamma_1 = 0.85$) is the most reliable indicator of consumer based airline brand equity, followed by brand loyalty ($\gamma_3 = 0.74$), brand image ($\gamma_2 = 0.58$), and lastly, brand awareness ($\gamma_4 = 0.41$).

(5) Airline Brand Equity Index : For computing airline brand equity index (ABEI), the path coefficient (γ) is the basis. The weight of a dimension is calculated as the proportion of the path coefficient of that dimension with the

Table 6. Relative Weight of Airline Brand Equity Dimensions

Dimensions	Standardized Path Coefficients (γ)	Weight
PSQ	0.857	0.33
BI	0.582	0.22
BL	0.748	0.29
BA	0.416	0.16

Note: Weight for PSQ is calculated as 0.33 = 0.85 /(0.85+0.58+0.74+0.41). In the same way, the weight is calculated for BL, BI, and BA.

Table 7. The ABE Index of Aviation Brands

Airlines Brand	*n*	Mean and (Standard Deviation)				ABE Index
		PSQ : *F* = 2.77*	BI : *F* = 2.37*	BL : *F* = 1.67	BA : *F* = 9.16*	
Air India	130	4.06 (0.61)	3.81(0.86)	3.82 (0.91)	4.43(0.72)	4.0
Jet Airways	203	3.87(0.68)	3.56(0.74)	3.61(0.90)	4.19(0.73)	3.8
Spice Jet	111	3.77(0.75)	3.59(0.72)	3.53(0.93)	4.05(0.76)	3.7
Go Air	59	3.81(0.76)	3.47(0.92)	3.57(1.04)	3.89(1.22)	3.7
Indigo	22	3.67(0.90)	3.45(0.81)	3.39(1.19)	3.35(1.10)	3.5
Air Asia	121	3.81(0.81)	3.61(0.83)	3.57(0.99)	4.12(0.77)	3.7

Note : *ANOVA p <.05

Note : Airlines brand equity index for Air India is calculated as 4.0 = (0.33*4.06) + (0.22* 3.81) + (0.29* 3.82) + (0.16* 4.43). In the same way, ABE index is calculated for Jet Airways, Spice Jet, Go Air, Indigo, and Air Asia.

total of the path coefficients of all the dimensions, as shown in the Table 6 (Yoo & Donthu, 2001).

The Table 7 illustrates the *F*-statistics for the mean difference for brand equity dimensions of different airline brands and the ABE index. The mean difference for perceived service quality, brand awareness, and brand image across six different airline brands is significant. The calculation of the ABE index for the six airline brands in India presents highest score for Air India (4.0), followed by Jet Airways (3.8), Spicejet, GoAir, and Air Asia (3.7), and lastly, Indigo (3.5).

Discussion

The purpose of this research is to develop a framework to examine and measure consumer based airline brand equity. The four-factor model fits the data well. The factor loadings are large and significant, indicating convergent validity. The overall goodness of fit results of second-order confirmatory factor model support the four dimension model. The results indicate that perceived service quality ($\gamma_1 = 0.85$), brand loyalty ($\gamma_3 = 0.74$), brand awareness ($\gamma_4 = 0.41$), and brand image ($\gamma_2 = 0.58$) are valid dimensions of airline brand equity, confirming to traditional Aaker (1991) and Keller (1993) conceptualizations of the brand equity model as well as the conceptualization of Cobb - Walgren, Ruble, and Donthu (1995), but unexpectedly, the results do not conform to the Yoo and Donthu's (2001) brand equity conceptualization, whose study resulted in three dimensions – brand loyalty, brand perceived quality, and brand awareness/association. The reason for this difference is that Yoo and Donthu's (2001) conceptualization was not customer focused ; rather, it depended on scale development. Also, the brand association construct being fully subjective is difficult to measure. Baalbaki (2012) in her doctoral thesis also argued that conceptual models developed on purely theoretically basis, if not confirmed and validated with customers, lead to an unacceptable consumer based brand equity model. Washburn and Plank (2002) also contradicted the four - dimension model of brand equity.

The results of this study suggest perceived service quality ($\gamma_1 = 0.85$) as the most reliable indicator of consumer based airline brand equity. This finding is in line with the study results obtained by Kayaman and Arasli (2007), who depicted that components of service quality had a significant and direct effect on brand equity. This finding is also consistent with the findings of Aydin and Ozer (2005), who stated that perceived quality is necessary for brand equity, but is in contradiction with the findings of Camarero, Garrido, and Vicente (2010), who pointed out that quality is an important but not imperative factor when appraising brand equity.

The results also provide empirical evidence that brand loyalty ($\gamma_3 = 0.74$), brand awareness ($\gamma_4 = 0.41$), and brand image ($\gamma_2 = 0.58$) contribute significantly to brand equity of airlines. The findings of Levidge and Steiner (1961) were also similar to this finding that perceived quality precedes brand loyalty. Perception of high quality is highly

correlated to brand loyalty (Oliver, 1997). Madhavaram, Badrinarayanan, and McDonald (2005) in their study propagated that "brand equity means strong brand awareness and favourable brand image" (p. 77). The results of this research establish the point, which is in line with the findings of Konecnik and Gartner (2007), that "brand equity cannot be created without brand awareness" (p. 32). The conceptual framework that is developed works for measuring airline brand equity.

Managerial Implications

This study is useful to practitioners in many ways. This framework expands the knowledge base in brand equity, particularly in airline brand management. The results indicate perceived service quality, brand loyalty, brand awareness, and brand image are valid dimensions of airline brand equity. Thus, to strengthen brand equity, the airline firms should focus more on these dimensions. The firms should assure a good service experience to the passengers that will leave a good memory in the minds of passengers, thereby increasing brand recall and develop loyalty. Firms should also focus more on advertising spending and on other forms of marketing communication to improve brand awareness. Brand image needs to be high - the firms should also use available means such as brand touch points, employees, corporate social responsibility, event sponsorship, and public communication. Brand loyalty is found to be the most important and more complicated dimension of brand equity to understand and manage.

In the study, the items proposed to measure brand equity dimensions are found to be reliable, valid, and parsimonious ; these attributes can give a deeper understanding to managers to identify areas of intervention to develop brand equity. "Connection," "reliability," "comfort," and "empathy" are found to be the quality attributes focusing on which passengers would perceive the service as highly satisfactory. The airline brand equity index can be used to compare competitors' brand performance in the industry as well as firms' own performance in different time periods.

Limitations of the Study and Scope for Future Research

The study has certain limitations that need to be addressed. First, the study is limited to the domestic airlines' passengers only. It is feared that the measurement used here cannot converge dimension wise, specifically for international passengers, and passengers from another cultural context. Second, service quality is an industry - specific phenomenon ; the attributes of service quality change as the context changes. So, the measurement tool used in this research cannot be generalized for other service industries. Third, the data were collected from a single airport using convenience sampling, which is adequate for the illustrative purpose of the study, however, data from a random sample of passengers from different airports in the country would be necessary to generate more dependable results using the current model.

This piece of research work will be helpful for more similar studies using different research settings and contexts such as comparing brand equity of low-cost airlines with full-service airlines ; domestic airlines with international airlines ; schedule airlines with chartered airlines. It would also be fruitful to examine which brand equity dimensions across different contexts, and to what extent, converge or diverge. The same study could be replicated in the same settings to cross-validate the findings ; it could be furthered into different service industries such as hotels, banks, and logistics, etc. Empirical research could be conducted on how and why passengers tradeoff between various dimensions. Future research could also include additional dimensions into airline brand equity to obtain more insights into airline brand management.

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Appendices

Appendix A. Measurement Scale, Indicator, and Descriptive Statistics (*n* = 646)

Measurement Items	Indicator	Mean	Std. Deviation
Employees have the best interest in their hearts for passengers.	PSQ_1	3.74	0.953
This airline has sufficient flight frequency.	PSQ_2	3.84	0.963
Airline is dependable.	PSQ_3	3.91	0.924
Airline is comfortable.	PSQ_4	3.98	0.861
I can easily recall the name of this airline company in my mind.	BA_1	4.18	1.011
I can easily recognize the logo and design of this airline company.	BA_2	4.24	0.942
I can easily recognize the design and colour of this airline company.	BA_3	4.01	1.046
This airline company is financially sound.	BI_1	3.45	0.994
This airline company is unique.	BI_2	3.68	1.043
This airline is successful.	BI_3	3.55	1.104
This airline conducts business ethically.	BI_4	3.76	1.034
I would recommend my friend to prefer this airline next time for air travel.	BL_1	3.48	1.130
I will prefer this airline next time I plan my air travel.	BL_2	3.76	1.052

Appendix B. Correlation Between the Measurement Parameters

	BA_1	BA_2	BA_3	BI_1	BI_2	BI_3	BI_4	BL_1	BL_2	PSQ_1	PSQ_2	PSQ_3	PSQ_4
BA_1	1												
BA_2	0.55**	1											
BA_3	0.46**	0.65**	1										
BI_1	0.15**	0.20**	0.25**	1									
BI_2	0.25**	0.14**	0.22**	0.47**	1								
BI_3	0.23**	0.28**	0.28**	0.51**	0.50**	1							
BI_4	0.30**	0.30**	0.22**	0.33**	0.36**	0.52**	1						
BL_1	0.17**	0.12**	0.11**	0.16**	0.18**	0.26**	0.22**	1					
BL_2	0.15**	0.17**	0.12**	0.15**	0.13**	0.18**	0.22**	0.52**	1				
PSQ_1	0.18**	0.19**	0.16**	0.20**	0.18**	0.22**	0.26**	0.27**	0.34**	1			
PSQ_2	0.21**	0.19**	0.23**	0.22**	0.20**	0.24**	0.20**	0.28**	0.39**	0.56**	1		
PSQ_3	0.17**	0.15**	0.18**	0.22**	0.18**	0.30**	0.26**	0.39**	0.35**	0.48**	0.54**	1	
PSQ_4	0.13**	0.14**	0.19**	0.30**	0.21**	0.24**	0.15**	0.21**	0.31**	0.33**	0.49**	0.51**	1

Note : **. Correlation is significant at the 0.01 level (2-tailed).

About the Author

Dr. Balgopal Singh is an Associate Professor of Marketing in the Faculty of Management Studies, Banasthali Vidyapith, Rajasthan. He has been teaching management subjects for several years ; he received his Ph.D. for research work in 'branding strategy' in the year 2010. His research focuses on brand management, and he has published more than 14 research papers on a wide range of topics in branding.