

## Validity and reliability of automotive consumer-based brand equity and consumer response measurement scales

Open  
Access

Raji Ridwan Adetunji<sup>1,\*</sup>, Sabrina Mohd Rashid<sup>1</sup>, Mohd Sobhi Ishak<sup>1</sup>

<sup>1</sup> Department of Media Management, School of Multimedia Technology and Communication, Universiti Utara Malaysia, Malaysia, 06010 Sintok Kedah, Malaysia

### ARTICLE INFO

#### Article history:

Received 2 July 2017  
Received in revised form 23 October 2017  
Accepted 25 October 2017  
Available online 8 November 2017

#### Keywords:

Automotive CBBE, consumer responses,  
content validity index, factor analysis

### ABSTRACT

Developing and managing brand equity are top priorities for many organizations because brands are one of the most valuable organizational assets. Consumer-Based Brand Equity (CBBE) also explains how brand knowledge and brand associations influence consumers' behaviors and consumer responses. The extant literature is filled with different types of models and scales for measuring CBBE. However, the literature on CBBE has not been able to produce a measurement scale that is employable universally across industries and different contexts. Subsequently, in view of the economic, technological and sociological importance of the automotive industry, this study attempts to assess the validity and reliability of measurement scales for Automotive CBBE and Consumer Response. The Content Validity Index (CVI) of both the items-level and the scale-level CVIs from the ratings of seven (7) experts revealed that the items in the scale proposed have good content validity. Furthermore, with the use of the Exploratory Factor Analysis (EFA) with Varimax rotation, the study presents a total of 48 items for measuring Automotive CBBE and 7 items for Consumer Response. Finally, the findings also demonstrate that the validated scales have acceptable values of reliability test.

Copyright © 2017 PENERBIT AKADEMIA BARU - All rights reserved

## 1. Introduction

Developing and managing brand equity are top priorities for many organizations because brands are one of the most valuable organizational assets [1, 2]. In view of the importance of brand equity, the academia continue to exert significant efforts towards understanding the factors that influence the development of brand equity, especially from the consumers' perspective [3]. According to Keller [4], CBBE also explains how brand knowledge and brand associations influence consumers' behaviors and consumer responses.

The extant literature is filled with different types of models and scales for measuring CBBE. Many of these models are developed conceptually while few others are empirically developed [1]. Although

\* Corresponding author.

E-mail address: [Raji Ridwan Adetunji \(rajiridwanadetunji@gmail.com\)](mailto:rajiridwanadetunji@gmail.com)

most of the empirically developed models mostly validate the conceptual models of CBBE [5, 6], the literature on CBBE has not been able to produce a measurement scale that is employable universally across industries and different contexts [7]. The review of past studies on the measurement of CBBE revealed that, to ensure the accuracy of any CBBE model or measurement scale, the research context, market sector, product category and specific industry must be taken into cognizance [8]. Subsequently, in view of the economic, technological and sociological importance of the automotive industry, this study attempts to assess the validity and reliability of measurement scales for Automotive CBBE and Consumer Response. Furthermore, the diversity of automotive products is fast changing [9-11]. These changes are directly increasing the complexity of the decision-making process of automotive consumers. Automotive consumers have become extra-ordinarily active and highly involved in making purchase decisions [12]. Several factors are seriously taken into consideration before making purchase decisions and most importantly, consumers rely on brand attributes and other brand assets of automotive products to simplify their decision-making process [13]. Thus, strong and successful brand equity becomes an important factor for automotive brands to differentiate themselves from competitors, ensure uniqueness and remain a tool for evoking purchase [14]. The factors that are considered most importantly by consumers are regarded as dimensions of CBBE of automotive products [15].

Measuring and developing CBBE remain a serious concern for both practitioners and academics [16]. Empirical studies on CBBE measurement have maintained that CBBE is a multi-dimensional construct which is measured with numerous dimensions that reflect both consumers' perceptions and attitudes [17, 18, 7, and 8]. The conceptual models of both Aaker [19] and Keller [4] have been the most widely adopted models for measuring CBBE. There have also been an enormous body of literature on development and measurement of CBBE. However, most of the dimensions for measuring CBBE are not empirical-based [1] and only few researchers have focused on developing empirical-based dimensions for measuring automotive brands [20]. Therefore, this study aims at empirically validating the measurements of CBBE for automotive brands by assessing the content and face validities, factor analysis and reliability of Automotive CBBE and Consumer Response scales.

According to experts, content validity is examined to determine the adequacy of items in measuring the conceptual meaning of the construct they are measuring [21-26]. However, Polit and Beck [22] bemoaned that many scale development studies do not reveal how the content and face validity of new scales are obtained, especially how the Content Validity Index (CVI) is calculated. Therefore, in addition to other methods of validity and reliability, this paper presents the process and findings of calculating CVI for Automotive CBBE and Consumer Response scales.

## **2. Literature Review**

### *2.1 Automotive Consumer-Based Brand Equity Measurement*

Developing and managing brand equity continue to gain more attention from researchers and practitioners in different industries and business sectors [27]. That is why the body of literature on brand equity and brand management is enormous. However, these studies are not without limitations. Among the major limitations is a lack of consensus on the universality or generalizability of CBBE measurements. Also, few empirical justifications have been proffered on brand equity dimensions in specific contexts and industries [20]. Subsequently, the current trend among CBBE researchers is developing industry-based or context-based CBBE measurements. This new trend is essentially important because brands function as important decision-making tools for customers and success determinants for business [28].

In addition, brands represent consumers' perceptions and mindsets about a product and its performance, which are based on consumers' judgments of the hedonic and functional attributes of products. The functional and hedonic attributes of products cannot be similar across industries because different products serve different purposes. Similarly, consumers' judgments of products' attributes are expected to differ. For example, what consumers take seriously or consider to be very important in evaluating high-involvement products like automotive products cannot be the same with low-involvement products such as soft drinks. This is why developing and validating industry-based dimensions for measuring CBBE is important [29, 20].

A review of CBBE literature revealed that a few studies considered empirically developing measurements or dimensions of CBBE that are relevant with attributes of automotive brands, which also play important roles in consumers' evaluation and judging of automotive brands [11]. However, majority of CBBE studies found in the context of automotive brands adopted or adapted, the general measurements drawing from the conceptual models of Aaker [19] and Keller [4] of CBBE [13]. For instance, Chattopadhyay, Shivani, and Krishnan [30], Chattopadhyay, Dutta, and Sivani [31], Santoso and Cahyadi [14], Chiu, Yin, and Jessica [32], Hanaysha [18] and Mahfooz, [12] are examples of previous studies which adapted the Aaker's and Keller's CBBE models, and employed similar dimensions such as brand awareness, perceived quality, brand loyalty, brand image, brand awareness and brand leadership to measure automotive brands.

Similarly, Thiripurasundari and Natarajan [9] and Mkhitarian [33] adapted the Keller's CBBE model to examine the determinants of brand equity of automotive brands. Brand knowledge, brand application and brand relationship were reported as important and significant factors that affect brand equity. Kiyani, Niazi, Rizvi, and Khan [34] also demonstrated that both brand trust and customer satisfactions significantly influence customers' loyalty to car brands and repurchase of car brands. The items for measuring the dimensions of CBBE by these studies were adapted from the general brand equity studies and were reworded to suit the performance or attributes of automotive products.

However, Brunello [11] is one the few studies that empirically developed dimensions for measuring automotive brand equity. According to Brunello [11], behavioral loyalty which include both brand personality and consumer personal traits is the main factor that influences consumers' purchase decisions of automotive brands. Measures of brand personality were adopted from conventional brand equity studies and the Big Five model was adopted for consumer personality traits. After going through the multi-item development stages, it found that refinement, competence and enthusiasm represent brand personality while agreeableness, openness and extraversion are acceptable measures of consumer personality. The findings of Brunello [11] can be accommodated in the contemporary brand equity theory because behavioral loyalty (brand personality and consumer personality) aligned with psychological benefits, in other words known as hedonic brand image, which is one of the two bases for measuring and developing brand equity. However, their measurement does not incorporate functional factors or functional brand image, which are important for consumers' evaluation of brands [20].

Drawing from the level of inconsistency in the variety of dimensions that have been adapted to measure CBBE [35], this study will dimension automotive brand equity as brand awareness, functional brand image, hedonic brand image and brand sustainability. The dimensions of CBBE are usually justified with their level of importance in the context or the industry in which brand equity is measured. For instance, Bruhn et al. [36] exceptionally adapted brand awareness, functional brand image and hedonic brand image as the dimensions of CBBE while focusing on three industries; tourism, telecommunication and pharmaceutical industries. The measurement of CBBE by Bruhn et al. [36] mainly focused on brand knowledge, which reflects consumers' perception of product

attributes and consumer attitudes, leaving out the benefit aspect of brand associations [13]. Subsequently, this present study adapts the measurement of CBBE purported by Bruhn et al. [36] and Baalbaki and Guzmán [1] from the consumers' perspectives.

## 2.2 Consumer Response Measurement

Previous studies on brand equity have asserted that there are two major phases to explaining CBBE; the attitudinal phase and the behavioral phase [7, 37 and 38]. The attitudinal aspect of CBBE explains the consumer's perception, mindset and of course, attitude towards a product [39]. Meanwhile, the behavioral aspect of CBBE explains consumers' reactions, responses and behaviors [38 and 17]. Numerous studies have empirically demonstrated that the attitudinal aspect of brand equity significantly leads to the behavioral aspect [40, 41, 36, 42, 43, 44, 45, 46 and 27]. The behavioral aspects are also known as consumer responses [43]. However, consumer responses, especially in terms of purchase intention and brand preference, are relevant because they mirror the types of consumers' behaviors that are aroused by the consumers' knowledge, perception and attitude, hence the attitudinal aspect of CBBE [47]. A review of previous studies have shown that consumer response has been studied on a piecemeal basis [39]. Hence, both purchase intention and brand preference are adopted as the dimensions of consumer response in this present study. Both brand preference and purchase intention are the most explanatory factors of consumer responses to successful brand equity [48].

## 3. Methodology

This paper reports the content validity, face validity, factor analysis and internal consistency of the Automotive CBBE and Consumer Response scales. Following the Churchill [26] multi-stage approach of scale validity, these series of assessments are initiated by adopting items from previous studies. For this purpose, items were adopted from previous CBBE, purchase intention and brand preference scales. To be specific, 29 items were adopted to measure the four dimensions of Automotive CBBE. 7 items were adopted from Yoo et al. [49], Hanaysha and Hilman [18] and Mahfooz [12] to measure brand awareness. 22 items were adopted from Bruhn, Schoenmueller and Schafer [36], Verhoef, Langerak and Donkers [50], Baalbaki and Guzman [1] and Brunello [11] to measure the hedonic brand image of automotive brands. 34 items were adopted from Baalbaki and Guzman [1], Verhoef, Langerak and Donkers [50], Kartono and Rao [15] and Fetscherin and Toncar [10] to measure functional brand image. Finally, 6 items were proposed to measure brand sustainability as adopted from Baalbaki and Guzman [1]. Furthermore, consumer response was measured by adopting items for both purchase intention and brand preference. Purchase intention is proposed to be measured with 4 items adopted from Brunello [11] and Maoyan, Zhujunxuan, and Sangyang [51]. Finally, brand preference is measured with 4 items as adopted from Baalbaki and Guzman [1].

Subsequently, a semi-structured interview was conducted among 10 informants who were either brand managers of an automotive brand or automotive brand users to purify the adopted items and to clarify the definitions of the variables and concepts understudied in this research, and also to generate additional items for measuring the concepts based on the understanding of the informants [52]. This stage resulted in adding two items to the brand awareness scale. Four items were added to the hedonic brand image scale. Finally, one item was added to the brand sustainability scale. The content validity and face validity of the items and the scale developed were examined by calculating the CVI of both the items-level and the scale-level CVIs from the ratings of seven (7) experts [22]. The item-level CVI involves the validity of the items while the scale-level CVI signifies the validity of the scale. For this purpose, seven (7) experts in the disciplines of Marketing

Communication and Research Methodology were recruited. According to Polit and Beck [22], calculating CVI from the ratings of 7 experts is appropriate because more than 10 experts is considered unnecessary. The experts were provided the objectives of the research and the conceptual definitions of the measured variables. The experts were requested to rate the relevance and clarity of the items with regards to the construct under which the items were placed. The experts were provided a 4-point scale using the following labels: 1 = “not relevant”, 2 = “somewhat relevant”, 3 = “quite relevant” and 4 = “highly relevant”. Finally, the experts were provided two types of comment boxes to provide additional comments on the items and on the overall scales. Furthermore, to examine the internal consistency of the scale, a survey was conducted among a convenient sample of 200 respondents who are users of four different automotive brands namely; PROTON, PERODUA, TOYOTA and HONDA. 151 usable responses were obtained and analyzed using SPSS. The scale that was used to record respondents’ agreement or disagreement to the statements in the survey is based on the values of 1-strongly disagree, 2-disagree, 3-not sure, 4-agree and 5-strongly agree.

#### **4. Findings**

##### *4.1 Content Validity Index (CVI) for Items and Scales*

The item-level CVI is calculated by converting both 1= “not relevant” and 2 = “somewhat relevant” ratings to 0 and 3 “quite relevant” and 4 “highly relevant” to 1. Thus, every 1 and 2 ratings from the experts are counted as 0 and every 3 and 4 ratings are counted as 1. The total number of items rated relevant is divided by the total number of raters (7 in the case of this research). According to Polit and Beck [22], an acceptable Item-Level CVI for raters more than six is 0.83. The results of the Item-Level CVI calculations were used for deleting items that were rated not relevant. Table 2 shows the results of the Item-Level CVI. The results showed that majority of the items scored 0.85 and above. The items that scored lower than 0.85 were deleted from the scales. Following this procedure, one (1) item was deleted from the brand awareness scale and seven (7) were deleted under the hedonic brand image variable. The deleted items were shaded in gray in Table 1. No single item was deleted in the consumer response scale.

Additionally, for the calculation of Scale-Level CVI, Polit and Beck [22] suggested using the average of the Item-Level CVI for calculating Scale-Level CVI. Thus, Scale-Level CVI is calculated by the mean of every item rated relevant divided by the total number of items. An acceptable Scale-Level CVI according to Polit and Beck [22] is 0.80. The results presented in Table 1 and Table 2 show that, all the scales have Scale-Level CVIs more than 0.80, indicating a good content validity of the overall scales. Furthermore, to examine the face validity, the 7 experts were requested to comment and make suggestions on how to improve the clarity of the items by suggesting better synonyms to certain technical words, so as to eradicate ambiguous wordings. This prompted some re-wording and paraphrasing of the wordings in the scales, which helped improve the clarity of the scales. Furthermore, 3 items were added to the brand sustainability scales based on suggestions from experts.

##### *4.2 Exploratory Factor Analysis (EFA)*

EFA was conducted in this study to validate the items in the proposed scales. This procedure allowed the data to statistically load on factors that were related in any initial or priori assumptions that guided the development of the scale [53]. According to experts, there are two prerequisite issues that are considered important when conducting a factor analysis.

**Table 1**  
 Item-Level and Scale-Level CVIs for Automotive CBBE

Items	Experts							Item-Level CVI
	1	2	3	4	5	6	7	
<b>Brand Awareness</b>								
I can recognize brand X among other car brands	4	4	4	3	3	4	4	7/7=1.00
I know what brand X looks like	4	4	4	4	4	4	4	7/7=1.00
I can easily recognize the brand name of brand X	4	4	4	4	4	4	3	7/7=1.00
Several characteristics of brand X instantly come to my mind	4	4	4	4	3	4	3	7/7=1.00
I easily recognize the symbol/logo of brand X	4	4	4	4	4	4	3	7/7=1.00
I am aware of the personality of brand X	2	4	3	4	4	4	3	6/7=0.85
Brand X is a well-known car brand	2	4	4	4	4	4	4	6/7=0.85
Brand X is well known globally	2	4	1	4	4	4	4	5/7=0.71
I know the country of origin of brand X	1	4	4	4	4	4	4	6/7=0.85
Proportion Relevant: S-CVI/Ave	0.55	1	0.88	1	1	1	0.95	6.38/7 = 0.87
<b>Hedonic Brand Image</b>								
Brand X is desirable	4	4	4	4	3	4	3	7/7=1.00
Brand X is strong in personality	2	4	4	4	4	4	4	6/7=0.85
Brand X has unique features	2	4	4	4	4	4	4	6/7=0.85
Brand X is fashionable	4	4	3	4	4	4	4	7/7=1.00
Brand X has a reputation for quality	4	4	4	4	4	4	4	7/7=1.00
Brand X provides users with a better lifestyle	4	4	4	4	4	4	4	7/7=1.00
Brand X provides good value to its users	4	4	4	4	4	4	4	7/7=1.00
Brand X improves the way I am perceived by others	4	4	3	4	4	4	3	7/7=1.00
Brand X would make a good impression on other people	4	4	3	3	4	4	3	7/7=1.00
Brand X would give me social approval	4	4	4	3	3	4	3	7/7=1.00
Brand X helps me feel accepted	4	4	3	3	3	4	3	7/7=1.00
Brand X makes attractive cars	4	1	2	3	4	4	3	5/7=0.71
Brand X makes classy cars	1	4	2	3	3	4	3	5/7=0.71
Brand X makes successful cars	1	4	1	3	4	4	3	5/7=0.71
Brand X makes fast cars	4	4	2	3	4	4	3	6/7=0.85
Brand X makes reliable cars	4	4	3	3	4	4	4	7/7=1.00
Brand X makes secure cars	4	4	3	3	3	4	4	7/7=1.00
Brand X makes cars that are up to date with the trends of the automotive industry	4	4	3	3	4	4	4	7/7=1.00
Brand X makes courageous cars	2	1	2	3	4	4	3	4/7=0.57
Brand X makes modern cars	2	4	3	3	4	4	3	6/7=0.85
Brand X makes affordable cars	2	4	4	3	3	4	3	6/7=0.85
Brand X makes users unique	1	4	1	3	4	4	3	5/7=0.71
Brand X befits people in my age group	1	4	4	3	3	4	2	5/7=0.71
Brand X has unique colors	1	4	1	3	4	4	3	5/7=0.71
Proportion Relevant: S-CVI/Ave	0.58	0.91	0.70	1	1	1	0.95	6.14/7 = 0.91
<b>Functional Brand Image</b>								
Brand X makes cars with very high engine performance reliability	3	4	4	3	4	4	4	7/7=1.00
Brand X makes cars with consistent engine quality	3	3	4	3	4	4	3	7/7=1.00

Brand X makes cars with consistent engine performance	3	3	4	3	4	4	4	7/7=1.00
Brand X makes cars with an acceptable standard of engine quality	3	3	4	3	4	4	4	7/7=1.00
Brand X makes cars with very good engine power	4	4	4	3	4	4	4	7/7=1.00
Brand X makes cars with good engine transmission	4	4	4	3	4	4	3	7/7=1.00
Brand X makes cars with good mechanical quality	4	3	4	3	4	4	4	7/7=1.00
Brand X has well made cars	4	4	4	3	4	4	3	7/7=1.00
Brand X has structurally attractive cars	1	4	3	3	4	4	3	6/7=0.85
Brand X has cars with very good designs	3	4	4	3	4	4	4	7/7=1.00
Brand X has cars with very good model varieties	1	4	4	3	4	4	4	6/7=0.85
Brand X has cars with attractive paints	1	4	4	3	4	4	4	6/7=0.85
Brand X has cars with body integrity	1	4	1	3	4	4	3	6/7=0.85
Brand X has cars with good body style	1	4	4	3	4	4	4	6/7=0.85
Brand X has cars with overlook ability	1	4	4	3	4	3	2	6/7=0.85
Brand X has cars with trunk volume	1	4	1	3	4	4	3	6/7=0.85
Brand X has cars with trunk accessibility	1	4	3	3	4	4	3	6/7=0.85
Brand X has cars with trunk variability	1	4	3	3	4	4	3	6/7=0.85
Brand X has cars with interiors that have very good functionalities	4	4	3	3	4	4	3	7/7=1.00
Brand X has cars with interiors that are very easy to use	4	4	4	3	4	4	4	7/7=1.00
Brand X has cars with beautiful interiors	4	4	4	3	4	4	3	7/7=1.00
Brand X has cars with quality interiors	4	3	4	3	4	4	4	7/7=1.00
Brand X has cars with interior variability	4	4	4	3	4	4	4	7/7=1.00
Brand X has cars with no interior noise	4	4	4	3	4	4	3	7/7=1.00
Brand X has cars with good driving stability	4	4	4	3	4	4	4	7/7=1.00
Brand X has cars with good corner handling	4	4	4	3	4	4	4	7/7=1.00
Brand X has cars with good steering handling	4	4	4	3	4	4	4	7/7=1.00
Brand X has cars with firm brakes	1	4	4	3	4	4	3	6/7=0.85
Brand X has cars with front space	4	4	4	3	4	4	3	7/7=1.00
Brand X has cars with back space	4	4	4	3	4	4	3	7/7=1.00
Brand X has cars with good cooling systems	4	4	4	3	4	4	3	7/7=1.00
Brand X has cars with good suspension	4	4	4	3	4	4	4	7/7=1.00
Getting in and out of the cars manufactured by brand X is easy	1	4	4	3	4	4	3	6/7=0.85
Brand X has cars with very good comfort	4	4	4	3	4	4	3	7/7=1.00
Proportion Relevant: S-CVI/Ave	0.70	1	0.94	1	1	1	0.97	6.61/7 = 0.94
<b>Brand Sustainability</b>								
Brand X has cars which are environmentally safe	4	4	4	3	4	4	2	6/7=0.85
Brand X has cars which are environmentally responsible	4	4	4	3	4	4	3	7/7=1.00
Brand X has sustainable cars	4	4	4	3	4	4	3	7/7=1.00
Brand X has healthy cars	1	3	4	3	4	4	4	6/7=0.85
Brand X has cars with efficient fuel usage	4	4	3	3	4	4	3	7/7=1.00
Brand X is not polluting the environment	4	4	4	3	4	4	4	7/7=1.00
Brand X has ecofriendly cars	4	4	4	3	4	4	3	7/7=1.00
Proportion Relevant: S-CVI/Ave	0.85	1	1	1	1	1	0.85	6.7/7 = 0.95

**Table 2**  
 Item-Level and Scale-Level CVIs for Consumer Response

Items	Experts							Item-Level CVI
	1	2	3	4	5	6	7	
I consider buying brand X as my first choice.	4	4	4	4	4	4	3	7/7=1.00
If brand X is temporarily off the market, I wouldn't buy another brand	4	4	4	4	4	4	3	7/7=1.00
There is high probability that I will recommend brand X to others	4	4	4	4	4	4	2	6/7=0.85
Brand X is my first choice	4	4	4	4	4	4	3	7/7=1.00
I consider myself to be loyal to brand X	4	4	4	4	4	4	3	7/7=1.00
I will not buy other car brands if brand X is not available	4	4	4	4	4	4	4	7/7=1.00
I am committed to buying brand X	4	4	4	4	4	4	4	7/7=1.00
Proportion Relevant: S-CVI/Ave	1	1	1	1	1	1	0.85	6.85/7 = 0.97

The first is the sample size, which needs to be more than 150 before considering a factor analysis, therefore a sample size of 151 is considered adequate for factor analysis. The second issue is the inter-correlation between the items before considering a factor analysis. With regards to the inter-correlation between items, Hair *et al.* [54] added that this is ensured using both Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Hair *et al.* [54] suggest that KMO values must exceed 0.50 to be deemed fit for factor analysis, otherwise the researcher would either need to collect more data and/or include more variables. In addition, the result of Bartlett's test of sphericity must be significant ( $p < 0.05$ ) before proceeding with factor analysis. To determine the adequacy of sample size, the KMO and Bartlett tests were first applied. The results indicates that the KMO value for the Automotive CBBE is 0.921 and Consumer Response is 0.811 respectively, indicating a meritorious level of sample adequacy [54], and thus factor analysis was deemed to be appropriate for this data. Furthermore, the output of Bartlett's test for Automotive CBBE can be represented with the following equation ( $\chi^2 = 2532.674$ ;  $DF = 378$ ;  $P < 0.05$ ). Additionally, the output of Bartlett's test for consumer response is reported with the following equation ( $\chi^2 = 490.865$ ;  $DF = 21$ ;  $P < 0.05$ ).

After confirming the necessary criteria for conducting factor analysis, a Principal Component Analysis (PCA) with Viramix rotation was performed on the Automotive CBBE and Consumer Response scales. Applying the latent root criterion, only the factors that accounted for the variance of at least a single variable were considered for retention [54]. From the 69 items that measured the Automotive CBBE - a total of 53 items - have a factor loading above 0.50 as presented in Table 3. The items with low loadings are deleted from the scales of Automotive CBBE. Furthermore, Table 4 presents the results of factor analysis for Consumer Response, showing all the 7 items rotated with loading higher than 0.50. Thus, no item was deleted under this variable.

#### 4.3 Internal Consistency

Cronbach's Alpha was used to determine the internal consistency of the items of both Automotive CBBE and Consumer Response scales (Sekaran & Bougie, 2013). The acceptable value of Cronbach's Alpha in this study is 0.70, according to the argument proffered by Hair, Black, Babin, Anderson and Tatham [54].



## 5. Discussions

This paper presents the results of content validity, factor analysis and reliability of Automotive CBBE and Consumer Response scales. The results of the series of validity and reliability assessments conducted in this study yields the final scales presented in Appendix A for Automotive CBBE and Appendix B for Consumer Responses. The Automotive CBBE scale entails four dimensions; brand awareness, hedonic brand image, functional brand image and brand sustainability. Brand awareness explains the easy and spontaneous occurrence of a particular brand in the consumer's memory when thinking of buying or engaging with a category of brands [4].

**Table 3**  
 EFA for Automotive CBBE

Items	Loadings			
	BA	HBI	FBI	BS
I can recognize brand X among other car brands	.838			
I know what brand X looks like	.818			
I can easily recognize the brand name of brand X	.879			
Several characteristics of brand X instantly come to my mind	.742			
I easily recognize the symbol/logo of brand X	.771			
I am aware of the personality of brand X	.691			
Brand X is a well-known car brand	.754			
I can recognize brand X among other car brands	.562			
Brand X is desirable		.584		
Brand X has unique features		.630		
Brand X provides good value to its users		.817		
Brand X improves the way I am perceived by others		.611		
Brand X would give me social approval		.608		
Brand X helps me feel accepted		.548		
Brand X makes fast cars		.584		
Brand X makes reliable cars		.630		
Brand X makes secure cars		.817		
Brand X makes cars with very high engine performance reliability			.702	
Brand X makes cars with consistent engine quality			.756	
Brand X makes cars with consistent engine performance			.748	
Brand X makes cars with acceptable standards of engine quality			.783	
Brand X makes cars with very good engine power			.767	
Brand X makes cars with good engine transmission			.685	
Brand X makes cars with good mechanical quality			.703	
Brand X has well made cars			.718	
Brand X has structurally attractive cars			.791	
Brand X has cars with very good designs			.762	
Brand X has cars with very good model variety			.666	
Brand X has cars with attractive paints			.573	
Brand X has cars with good body style			.639	
Brand X has cars with overlook ability			.653	
Brand X has cars with trunk volume			.564	
Brand X has cars with trunk accessibility			.651	
Brand X has cars with trunk variability			.557	
Brand X has cars with interiors that have very good functionalities			.626	
Brand X has cars with interiors that are very easy to use			.641	
Brand X has cars with beautiful interiors			.647	
Brand X has cars with quality interiors			.670	
Brand X has cars with no interior noise			.545	
Brand X has cars with good driving stability			.626	

Brand X has cars with good steering handling	.611
Brand X has cars with firm brakes	.662
Brand X has cars with good cooling system	.558
Brand X has cars with good suspension	.578
Brand X has cars which are environmentally safe	.698
Brand X has cars which are environmentally responsible	.697
Brand X has sustainable cars	.649
Brand X has healthy cars	.702
Brand X has cars with efficient fuel usage	.691
Brand X is not polluting the environment	.749
Brand X has ecofriendly cars	.812
Brand X has cars which are environmentally safe	.767
Brand X has cars which are environmentally responsible	.641

BA (Brand Awareness), HBI (Hedonic Brand Image), FBI (Functional Brand Image), BS (Brand Sustainability)

**Table 4**

Factor Loadings for Consumer Response

Items	Loadings
I consider buying brand X as my first choice	.702
If brand X is temporarily off the market, I wouldn't buy another brand	.713
There is high probability that I will recommend brand X to others	.701
Brand X is my first choice	.807
I consider myself to be loyal to brand X	.853
I will not buy other car brands if brand X is not available	.693
I am committed to buying brand X	.741

**Table 5**

Summary of Reliability Tests

Constructs	Number of Items	Cronbach's Alpha	Number of Items Dropped	Number of Items Retained
Brand Awareness	8	.927	None	8
Hedonic Brand Image	9	.918	2	7
Functional Brand Image	27	.975	3	24
Consumer Response	7	.861	None	7

The brand awareness variable explores respondents' ability to rightly and spontaneously connect brand features, characteristics and functional attributes such as name, logo, color and so forth with the brand in their memories [16,55]. Hedonic brand image reflects the consumers' perception of non-functional attributes of brands. This can be reflected by consumers' knowledge, feeling, experience or social influence, social approval and brand personality. Furthermore, functional brand image explores the perception and impressions of consumers that are related to the functional attributes, quality and performance of a brand [36,56]. Meanwhile, brand sustainability is included in the Automotive CBBE scale to determine the mechanical, economic and environmental consciousness of the respondents towards automotive brands, generally defined as organizational determination and consciousness of manufacturing products that are ethically, socially, financially and environmentally responsible [57]. This dimension is specifically influenced by recommendations by brand managers and brand researchers who pay serious attention to how consumers' perception of sustainability can increase brand value [58]. Finally, consumer response focuses on consumers' first purchase, repurchase and recommendation of a brand to others.

## 6. Conclusions

The findings of this study demonstrate the validity and reliability of both Automotive CBBE and Consumer Response scales. This study presents the initial findings on the validity and reliability of the scales. However, because the scales presented in this paper are still undergoing development, further validation, most especially by assessing their psychometric properties through CFA using SEM, is still ongoing. The implication of validating these scales is that they offer new perspectives to brand managers on how to measure consumers' perception towards automotive brands and how consumers respond to branding activities and efforts.

## References

- [1] Baalbaki, Sally, and Francisco Guzmán. "A consumer-perceived consumer-based brand equity scale." *Journal of Brand Management* 23, no. 3 (2016): 229-251.
- [2] Keller, Kevin Lane, and Donald R. Lehman. "Brands and Branding: Research Findings and Future Priorities." *Marketing Science* 25, no. 6 (2006): 740-59.
- [3] Williams, Paul, and Geoffrey N. Soutar. "Value, Satisfaction and Behavioral Intentions in an Adventure Tourism Context." *Annals of Tourism Research* 36, no. 3 (2009): 413-38.
- [4] Keller, Kevin Lane. "Conceptualizing, Measuring, and Managing Customer-Based Brand Equity." *Journal of Marketing* 57, no. 1 (1993): 1.
- [5] Pappu, Ravi, Pascale G. Quester, and Ray W. Cooksey. "Consumer-based Brand Equity: Improving the Measurement – Empirical Evidence." *Journal of Product & Brand Management* 14, no. 3 (2005): 143-54.
- [6] Netemeyer, Richard G., Balaji Krishnan, Chris Pullig, Guangping Wang, Mehmet Yagci, Dwane Dean, Joe Ricks, and Ferdinand Wirth. "Developing and Validating Measures of Facets of Customer-Based Brand Equity." *Journal of Business Research* 57, no. 2 (2004): 209-24.
- [7] Boo, Soyoung, James Busser, and Seyhmus Baloglu. "A Model of Customer-Based Brand Equity and Its Application to Multiple Destinations." *Tourism Management* 30, no. 2 (2009): 219-31.
- [8] Christodoulides, George, and Leslie Chernatony. "Consumer Based Brand Equity Conceptualization & Measurement: A Literature Review." *International Journal of Market Research* 52, no. July (2010): 44-53.
- [9] Thiripurasundari, U, and P Natarajan. "Determinants of Brand Equity in Indian Car Manufacturing Firms." *International Journal of Trade, Economics and Finance* 2, no. 4 (2011): 346-50.
- [10] Fetscherin, Marc, and Mark Toncar. "Valuating Brand Equity and Product Related Attributes in the Context of the German Automobile Market." *Journal of Brand Management* 17, no. 2 (2009): 45-134.
- [11] Brunello, Adrian. "Brand Equity in Premium Car Market." *International Journal of Communication Research* 5, no. 2 (2015): 128-35.
- [12] Mahfooz, Yasser. "Brand Equity-Consequence Relationship: Evidence from Automobile Industry." *International Journal of Business and Management* 10, no. 3 (2015): 81-90.
- [13] Hsieh, Ming-Huei. "Measuring Global Brand Equity Using Cross-National Survey Data." *Journal of International Marketing* 12, no. 2 (2004): 28-57.
- [14] Santoso, Cynthia Ratna, and Tabita Ella Cahyadi. "Analyzing the Impact of Brand Equity towards Purchase Intention in Automotive Industry: A Case Study of ABC in Surabaya." *iBuss Management* 2, no. 2 (2014): 29-39.
- [15] Kartono, Ben, and Rao V. R. "Linking Consumer-Based Brand Equity to Market Performance: An Integrated Approach to Brand Equity Management." *Zyman Institute of Brand Science*, 2005.
- [16] Chieng, Fayrene Y. L., and Goi Chai Lee. "Customer-Based Brand Equity : A Literature Review." *Journal of Arts Science & Commerce* 2, January 2011 (2011): 33-42.
- [17] Farjam, Sanaz, and Xu Hongyi. "Reviewing the Concept of Brand Equity and Evaluating Consumer- Based Brand Equity (CBBE) Models." *ISSN International Journal of Management Science And Business Administration International Journal of Management Science and Business Administration* 1, no. 8 (2015): 1849-5419.
- [18] Hanaysha, Jalal, and H. Hilman. "Advertising And Country Of Origin As Key Success Factors For Creating Sustainable Brand Equity." *Journal of Asian Business Strategy* 5, no. 7 (2015): 2225-4226.
- [19] Aaker, D., "Managing Brand Equity." *Journal of Marketing* 56, no. 2 (1991), 125.
- [20] Davcik, Nebojsa S, Rui Vinhas, Joe F Hair, and Joe F Hair. "Towards a Unified Theory of Brand Equity : Conceptualizations , Taxonomy and Avenues for Future Research." *Journal of Product & Brand Management* 24, no. 1 (2015): 3-17.
- [21] Rubio, D., Berg-Weger, M., Tebb, S. S., Lee, E. S., and Rauch, S. "Objectifying content validity: Conducting a content

- validity study in social work research." *Social Work Research*, 27, (June 2015): 94–104.
- [22] Polit, Denise F., and Cheryl Tatano Beck. "The Content Validity Index: Are You Sure You Know What's Being Reported? Critique and Recommendations." *Research in Nursing & Health* 29 (2006): 489–97.
- [23] Mackenzie, S. B., Podsakoff, P. M., and Podsakoff, N. P. "Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques." *MIS Quarterly* 35, no 2 (2011): 293–334.
- [24] Cheryl Burke Jarvis, Scott B. MacKenzie, Philip M. Podsakoff, Jarvis, C. B., MacKenzie, S. B., Podsakoff, P. M., ... Philip M. Podsakoff. "A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research." *Journal of Consumer Research* 30, no 2 (2003): 199–218.
- [25] Lewis, C. C., Weiner, B. J., Stanick, C., & Fischer, S. M. "Advancing implementation science through measure development and evaluation: a study protocol." *Implementation Science: IS* 10, (2015):102.
- [26] Churchill Jr., G. A. "A Paradigm for Developing Better Measures of Marketing Constructs." *Journal of Marketing Research* 16, (1979): 64–73.
- [27] Schivinski, B, and D Dabrowski. "The Consumer-Based Brand Equity Inventory : Scale Construct And Validation Bruno Schivinski \*, Dariusz Dabrowski \*\*." *GUT FME Working Paper Series A* 2014, no. 4 (2014): 22.
- [28] Keller, Kevin Lane. "Building Customer-Based Brand Equity : A Blueprint for Creating Strong Brands Building Customer-Based Brand Equity : A Blueprint for Creating Strong Brands." *Journal of Marketing Communications* 15, no. 2–3 (2001): 139–55.
- [29] Pinar, M., P. Trapp, T. Girard, and T. E. Boyt. "University Brand Equity: An Empirical Investigation of Its Dimensions." *International Journal of Educational Management* 28, no. 6 (2014): 616–34.
- [30] Chattopadhyay, Tanmay, Shradha Shivani, and Mahesh Krishnan. "Determinants of Brand Equity - A Blue Print for Building Strong Brand : A Study of Automobile Segment in India." *African Journal of Marketing Management* 1, no. 4 (2009): 109–21.
- [31] Chattopadhyay, Tanmay, Rudrendu Narayan Dutta, and Shradha Sivani. "Media Mix Elements Affecting Brand Equity: A Study of the Indian Passenger Car Market." *IIMB Management Review* 22, no. 4 (2010): 173–85.
- [32] Chiu, Yang, Sheng Sze Yin, and HO Jessica. "Local vs. Global Brands: Country-of-Origin's Effect on Consumer-Based Brand Equity among Status-Seekers." *Journal of Economics and Behavioral Studies* 7, no. 3 (2015): 6–13.
- [33] Mkhitarian, Davit. "Determinants of Brand Equity in Automobile Producing Companies in China." *Journal of Business Administration Research* 3, no. 1 (2014): 38–44.
- [34] Kiyani, Talat Mahmood, Mohammad Raza Ullah Khan Niazi, Riffat Abbas Rizvi, and Imran Khan. "The Relationship between Brand Trust, Customer Satisfaction And Customer Loyalty. (Evidence From Automobile Sector Of Pakistan)." *Interdisciplinary Journal of Contemporary Research in Business* 4, no. 1 (2012): 489–502.
- [35] Zhang, X., Bu, G., Wu, S., & Xie, Q. Research on Brand Equity of Automobile Industry - Based on Customer Experience and Modern Service. 2011 International Conference on Management and Service Science 3, no 1(2011): 1–4.
- [36] Bruhn, M., V. Schoenmueller, and D. B. Schafer. "Are Social Media Replacing Traditional Media in Terms of Brand Equity Creation?" *Management Research Review*, 35, no. 9 (2012): 770–90.
- [37] Campbell, Margaret C. "Building Brand Equity." *International Journal of Medical Marketing* 3, no. 2 (2002): 208–18.
- [38] Tuominen, P. "Managing Brand Equity." *LTA* 1 (1999): 65–100.
- [39] Buil, Isabel, Eva Martínez, and Leslie De Chernatony. "The Influence of Brand Equity on Consumer Responses." *Journal of Consumer Marketing* 30, no. 1 (2013): 62–74.
- [40] Abzari, Mehdi, Reza Abachian Ghassemi, and Leila Nasrolahi Vosta. "Analysing the Effect of Social Media on Brand Attitude and Purchase Intention: The Case of Iran Khodro Company." *Procedia - Social and Behavioral Sciences* 143 (2014): 822–26.
- [41] Ahmed, Mirza Ashfaq, and Zahra Zahid. "Role of Social Media Marketing to Enhance CRM and Brand Equity in Terms of Purchase Intention." *Asian Journal of Management Research* 4, no. 3 (2014): 533–49.
- [42] Bushelow, Elizabeth E. "Facebook Pages and Benefits to Brands." *The Elon Journal of Undergraduate Research in Communications* 3, (2012): 5–20.
- [43] Godey, Bruno, Aikaterini Manthiou, Daniele Pederzoli, Joonas Rokka, Gaetano Aiello, Raffaele Donvito, and Rahul Singh. "Social Media Marketing Efforts of Luxury Brands: Influence on Brand Equity and Consumer Behavior." *Journal of Business Research*, 2016.
- [44] Jalilvand, Mohammad Reza, and Neda Samiei. "The Effect of Electronic Word of Mouth on Brand Image and Purchase Intention." *Marketing Intelligence & Planning* 32, no. 4 (2012): 413–35.
- [45] Kim, Angella J., and Eunju Ko. "Do Social Media Marketing Activities Enhance Customer Equity? An Empirical Study of Luxury Fashion Brand." *Journal of Business Research* 65, no. 10 (2012): 1480–86.
- [46] Schivinski, B. "Effects of Social Media Communication on Brand Equity and Brand Purchase Intention." *PhD Interdisciplinary Journal*, 2011, 157–62.
- [47] Keller, Kevin Lane. "Building Strong Brands in a Modern Marketing Communications Environment." *Journal of Marketing Communications*, 2009.

- [48] Cobb-Walgren, Cathy J., Cynthia A. Ruble, and Naveen Donthu. "Brand Equity, Brand Preference, and Purchase Intent." *Journal of Advertising* 24, no. 3 (1995): 25–40.
- [49] Yoo, Boonghee, and Naveen Donthu. "Developing and Validating a Multidimensional Consumer-Based Brand Equity Scale." *Journal of Business Research* 52, no. 1 (2001): 1–14.
- [50] Verhoef, P. C., Langerak, F., and Donkers, B. "Understanding brand and dealer retention in the new car market: The moderating role of brand tier." *Journal of Retailing* 83, no 1 (2007): 97–113.
- [51] Maoyan, Zhujunxuan, and Sangyang. "Consumer Purchase Intention Research Based on Social Media Marketing" 5, no. 10 (2014): 92–97.
- [52] DeVellis, R. F. *Scale Development: Theory and Applications*. Applied Social Research Methods Series (Vol. 26) 2003.
- [53] Field, A. *Discovering Statistics Using SPSS*. Sage Publication (Vol. 58) 2009.
  
- [54] Hair, W.C. Black, B.J. Babin, R.E. Anderson, and R.L. Tatham. *Multivariate Data Analysis*. Prentice Hall, 2010.
- [55] Kim, Woo G., and Hong-Bumm Kim. "Measuring Customer-Based Restaurant Brand Equity." *The Cornell Hotel and Restaurant Administration Quarterly* 45, no. 2 (2004): 115–31.
- [56] Homer, Pamela Miles. "Perceived Quality and Image: When All Is Not 'rosy.'" *Journal of Business Research* 61, no. 7 (2008): 715–23.
- [57] Seyfang, Gill. "Carbon Currencies: A New Gold Standard for Sustainable Consumption?" *Environmental Politics* 14, no. 2 (2005): 290–306.
- [58] Lehner, Matthias, and Sue Vaux Halliday. "Branding Sustainability : Opportunity and Risk behind a Brand - Based Approach to Sustainable Markets." *Ephemera Theory & Politics in Organization* 14, no. 1 (2014): 13–34.

## **APPENDIXES**

### **Appendix A: Automotive CBBE Scale**

#### **Brand Awareness**

- I can recognize Brand X among other car brands.
- I know what Brand X cars looks like.
- I can easily recognize the names of Brand X cars.
- Several specifications of Brand X instantly come to my mind
- I can easily recognize the symbol/logo of Brand X
- I am aware of the personality of Brand X cars
- Brand X is a well-known automotive brand
- I know the country-of-origin of Brand X

#### **Hedonic Brand Image**

- Brand X is desirable
- Brand X has unique features
- Brand X provides excellent value to its users
- Brand X improves the way I am perceived by others
- Brand X would give me social approval
- Brand X makes fast cars
- Brand X makes reliable cars

#### **Functional Brand Image**

- Brand X makes cars with very high engine performance reliability
- Brand X makes cars with consistent engine performance
- Brand X makes cars with acceptable standard of engine quality
- Brand X cars with very good engine power
- Brand X makes cars with good engine transmission
- Brand X makes cars with good mechanical quality
- Brand X has structurally attractive cars
- Brand X has cars with very good designs
- Brand X has cars with very good model variety
- Brand X has cars with attractive paint
- Brand X has cars with good body style
- Brand X has cars with overlook ability
- Brand X has cars with trunk/boot volume
- Brand X has cars with trunk/boot accessibility
- Brand X has cars with interiors that have very good functionalities
- Brand X has cars with interiors that are very easy to use

Brand X has cars with beautiful interiors  
Brand X has cars with quality interiors  
Brand X has cars with no interior noise  
Brand X has cars with good driving stability  
Brand X has cars with good steering handling  
Brand X has cars with firm brakes  
Brand X has cars with good cooling system  
Brand X has cars with good suspension

**Brand Sustainability**

Brand X has cars which are environmentally safe  
Brand X has cars which are environmentally responsible  
Brand X has healthy cars  
Brand X has cars with efficient fuel usage  
Brand X cars do not pollute the environment  
Brand X has ecofriendly cars  
Brand X has cars with low cost of maintenance  
It is easy to get the spare parts of Brand X cars

**Appendix B: Consumer Response Scale**

I consider buying Brand X as my first choice.  
If Brand X is temporarily off the market, I wouldn't buy another brand.  
There is high probability that I will recommend Brand X to others.  
Brand X is my first choice  
I consider myself to be loyal to Brand X  
I will not buy other car brands if Brand X is not available  
I am committed to buying Brand X