Assessing the Interrelationships of Customer-Based Brand Equity: The Case of Automobiles Lubricant Industry in Malaysia

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Abstract: Brand equity has been recognized as one of the most decisive research topics in branding and marketing literature since three decades ago. Research on brand equity is motivated by financial performance and strategy based to improve brand positioning and marketing productivity. Although brand equity has been widely studied by scholars in different variety of contexts, its research on the customer-based brand equity of the automotive lubricant market is still very scarce. This study aimed to examine the interrelationships between dimensions of brand equity in the context of the automobiles lubricant industry. Data was collected from 412 respondents in Malaysia. Findings demonstrated that brand awareness was positively influenced on perceived quality and brand associations, While perceived quality was positively influenced on brand associations and brand loyalty, brand associations were positively impacted on brand loyalty and brand equity. However, perceived quality and brand loyalty were not related to brand equity. Future research should investigate antecedents and mediation effect dimensions of brand equity to understand the mechanism through which the causal variable affects brand equity.

Keywords: Customer-based Brand Equity, Automobiles Lubricant Industry

Type: Research paper

1. Introduction

Building brand equity with consumers is critical for a company's long-term success, but the consumers' path to get there has evolved dramatically in the past three decades (Tasci, 2021). As a result, the procedures for developing a strong relationship between a brand and customers receive increased attention in marketing research and practices (Vukasovi´c, 2016). Brand equity is studied due to its significant impact on financial brand value and strategy based, such as the value of having well or not well-known brand name and efficiency on marketing expenses (Keller, 1993). In addition, brand equity creates value for customers by enhancing information processing and shopping, building confidence in decision-making, reinforcing buying behaviours, and improving self-esteem (Singh and Pattanayak, 2016). Many marketers also value the concept of brand equity for its dynamic approach towards accelerating a company's business plans, generating growth in market share, and building a top-of-mind brand. For example, when a company has strong brand equity, it benefits from minimal vulnerability to competitive marketing actions, higher margins, stronger intermediary

cooperation and support, and brand extension possibilities. Therefore, measuring customer-based brand equity (CBBE) is essential to understanding its competitive strength in the marketplace.

Brand equity has emerged as one of the most extensively researched topics in branding and marketing since the 1990s (Tran, May and Taylor, 2021; Motameni and Shahrokhi (1998); Singh and Pattanayak, 2016). It began to be commonly used by advertising practitioners in the 1980s. Throughout the 1990s, significant scholarly contributors included those from Aaker (1991), Kapferer (1992) and Keller (1993). However, there has been no consensus on the content and meaning of brand equity (Vázquez, Del Rio and Iglesias, 2002) and its measurement (Washburn and Plank, 2002). Today, almost all definitions of brand equity agree that the phenomenon entails the value given to a product by customers' connections with and perceptions of a specific brand name and financial (Simon and Sullivan 1990). Numerous empirical research measuring CBBE as a multidimensional construct was devoted to various product categories, such as groceries and specific product classes (Lassar, Mittal and Sharma, 1995; Washburn and Plank, 2002). Scholars asserted that a brand is the most valuable asset of a company (Aaker, 1991, Kapferer, 1992) including multinational brands.

The rise of multinational brands competing in global markets raised the question of how brands should be managed in a global and competitive environment. While management of brand values has been extensively discussed in the literature from a domestic marketing perspective, few studies have done so from an international perspective (Vukasovi´c, 2016). For example, although lubricant companies are making significant strides in establishing brand equity, the assessment of brand equity for the lubricants industry has received less attention. Specifically, understanding interrelationships between dimensions of CBBE requires further investigation (Vukasovi´c, 2016), especially in the context of the Asian emerging economy. Although considerable evidence supports the correlation between the CBBE dimensions, the interrelationship between the brand equity dimensions and its role in building brand equity for the lubricant industry remains unresolved.

The lubricants industry is critical to the global industrial sector due to its role in optimising machinery operations (Hanaysha, 2016). The automobile industry's lubricant demand accounts for more than half of global demand. With increasing global demand for lubricants, the global market value of lubricants is expected to reach USD182.6 billion by 2025 (Sönnichsen, 2021). The forecasted growth is based on increasing demand for high-performance engines and renewable energy. In the lubricant industry, brand performance and trust are the key drivers of consumer purchase intention, as most consumers are less concerned about pricing (GFK, 2012). In the competitive landscape of a marketplace, maximising the uniqueness of a product's technology, quality, and design is challenging, as competitors can easily duplicate a design or technology and make ambiguous distinctions between the original product and its imitation. Thus, marketers and practitioners must ensure that customers can quickly identify original products by ensuring they are equipped with sufficient information. This study is expected to help marketers strategise brand positioning effectively and remain competitive.

In Malaysia, customer purchase decisions on automobile lubricants rely on mechanics or personnel at automobile workshops recommendations. The report (GFK, 2012) shows that 75% of customers accepted mechanic recommendations at workshops, and only 25% of consumers made their own decisions. The report also forecasted high brand switching if consumers have low brand awareness of a particular engine lubricants brand. Brand switching occurs when a customer is motivated to review available alternatives in the marketplace due to a change in competitive activities and changes of belief towards using a specific brand (Matzler, Strobl, Thurner, and Füller, 2015). On the other hand, low brand switching will result in brand loyalty, described by a deeply held commitment to rebuy or patronise a preferred brand consistently in the future, despite situational influences and marketing efforts having the potential to induce switching behaviour (Oliver, 1999).

As such, understanding CBBE by measuring the effects or impacts of each dimension and how they are related to each other is essential. For example, all dimensions may or may not be applied to

other product brands; however, its applicability to lubricant brands remains uncertain. Previous studies argued that brand awareness has a positive and direct impact on purchase intention (Keller, 1993). However, the emergence and growth of new lubricant brands recently show that simply being aware does not indicate a positive or negative perception. Thus, assessing the brand equity dimension is vital for marketing managers from lubricant industries, as they can then use the results further to rationalise the brand expenses and customer-related marketing activities. If marketing/brand managers often have limited resources (e.g. money, time, and workforce) to implement branding strategies, these findings can help them prioritise and allocate resources across the CBBE dimensions. Therefore, the main objective of this study is to assess the interrelationship among the dimensions of CBBE (Aaker, 1996). The findings from this study are expected to help managers design branding strategies by focusing on the dimensions of the CBBE model.

2. Literature Review

A. *Automobiles Lubricant Market*

The global lubricants demand will reach 37.4 million metric tons by 2023 (Sönnichsen, 2021). Lubricant is essential in the industrial world, widely used in transportation, automobile, and machinery. A lubricant refers to any substance that minimises friction and wears and provides smooth running and good life for machine elements. Friction is energy-intensive and wears out engine parts. In the context of resource-saving and cutting emissions for the environment, lubricants are increasingly attracting public awareness.

The primary purposes of using lubricants are to minimise wear and heat loss resulting from contact between surfaces in motion, decrease the coefficient of friction between two contacting surfaces, prevent rust, minimise oxidation, and act as an insulator in transformers. It also acts as a seal against dirt, dust, and water. Thus, lubricant usage is critical in an internal combustion engine, as it helps lubricate and protect parts and prolong engine life. Automobiles lubricants come in many types and brands, and managers or marketers should increase brand awareness to build substantial brand equity among customers, which will also help them make purchase decisions.

B. *Brand Equity*

Brand equity has emerged as one of the most crucial topics for marketing management (Singh and Pattanayak, 2016) and international marketing (Vukasoviˊc, 2016) since the 1990s. Brand equity was conceptualised in many ways. The most popular brand equity model by Aaker (1996) is widely used by many researchers across product and services contexts. Aaker (1996) refers to brand equity as a set of brand assets and liabilities linked to a brand, its name, and symbol, which add or subtract from the value provided by a product or service to a firm and/or firms' customers. However, Keller (1993, p.3) suggested brand equity as "the differential defined as the differential effect of brand knowledge on consumer response to the brand's marketing". Many marketers value brand equity for its dynamic approach towards accelerating a company's business plans, generating growth in market share, and building a top-of-mind brand. For this reason, constant research on brand equity and its determinants is essential, particularly for organisations intending to successfully position themselves in target markets and distinguish themselves from their competitors (Hanaysha, 2016). Brand equity creates value to firms by increasing marketing efficiency and effectiveness, building brand loyalty, improving profit margins, gaining leverage over retailers, and achieving distinctiveness over the competition (Bagozzi et al., 1998). Brand equity also enhances its marketing programs' competitiveness, effectiveness, efficiency, trade leverage, brand extension, and ultimately profit margins (Asamoah, 2014). Therefore, managers need to explore how they can optimise brand equity to increase brand value.

One way to leverage brand equity is to understand its dimensionalities. This study used Aaker's (1996) definition of brand equity and examined its dimensionalities. Although brand equity has been around for quite a while, approaches used by companies in developing marketing plans are continuously evolving. Many marketers value brand equity for its dynamic approach to accelerating a company's business plans, generation of growth in market share, and building a top-of-mind brand. Business scenarios continuously evolve due to challenging competition, branding prospects, and strategies to meet market needs. For example, automotive brands face severe challenges, particularly on differentiation issues, as the number of competitors is continuously increasing. Therefore, Nguetsop et el. (2016) proposed that marketing managers can use the results to justify brand and customer-related marketing activities and understand customers based brand equity. The advantage of conceptualizing brand equity from the consumer's perspective is that it enables managers to evaluate how their marketing program improves their brands' value in the minds of consumers (Singh and Pattanayak, 2016).

Brand equity has been investigated in various contexts. A study examining the CBBE model for the lubricants industry in Iran shows that perceived quality is related to brand loyalty (Kazemi, 2013). Brand loyalty is qualitatively different from the other significant dimensions of brand equity in that it is tied more closely to the user experience; thus, it cannot exist prior to purchase and use experience (Aaker, 1996). After experiencing usage, consumers can evaluate its quality, and if positive, it would lead to brand loyalty. Products such as engine lubricants are evaluated based on the performance of the vehicle. Vukasovi´c (2016) provide an evidence of investigating customer-based brand equity model in the food industry context. He found that brand awareness has a positive influence on brand associations and perceived quality. Brand associations have a positive influence on brand loyalty. Finally, brand loyalty, perceived quality, and brand associations all have a positive effect on brand equity.

3. Conceptual framework of Customer-Based Brand Equity

Keller (1993 p.3) defines customer based brand equity as "the differential effect of brand knowledge on consumer response to the marketing of the brand". This implies that consumers' respond marketing mix elements of particular products or services brand. Customer-based brand equity occurs when the consumer is familiar with the brand and holds some favorable, strong, and unique brand associations in memory (Keller, 1993). Aaker (1996) conceptualised brand equity as an aggregate variable of the five dimensions of brand assets: brand loyalty, brand awareness, perceived quality, brand association, and other proprietary assets. Past researchers believe that brand equity needs to be measured from multiple dimensions to approach the concept of brand equity from only a single or two dimensions (Eser, Pinar, Girard and Isin, 2012; Kim and Bumm, 2004). Buil, Martinez and De Chernatony (2013) and Motale and Dhurup (2016) reported the relationships between brand equity dimensions. The current study built from previous works suggesting that the customer-based brand equity model have a hierarchy of effects (Agarwal and Rao, 1996; Yoo and Donthu, 2001; Buil et al., 2013; Vukasovic (2016). This sequential process begins with cognitive, affective, and conative stages.

This study draws a model of brand equity by Aaker (1996) and adapted from the work of Vulkasovic (2016) and Buil et al. (2013). The distinctive contribution of this research comes from an integration of the existing brand equity models, which results in a multidimensional conceptual framework for the determinants of brand awareness, brand image, and brand equity in the food industry and Adidas and Nike for sportswear; Sony and Panasonic for consumer electronics; and BMW and Volkswagen for cars in European countries respectively. They only tested the direct relationship without considering the role of mediation effect of brand loyalty. Different countries have different social structures and cultures, so the concept of multidimensional and sequence of

brand equity may or may not be similar, and further study is needed to test the CBBE in Asian countries and other contexts. In this study, dimensions of brand equity adapted from the Aaker model are highly relevant as the dimensions perceived quality, brand awareness, brand associations, and brand loyalty represent customer perceptions of the brand and are applicable across markets and products (Taleghani et al., 2011). Figure 1 shows a conceptual framework for this study.

Figure 1: Conceptual Model
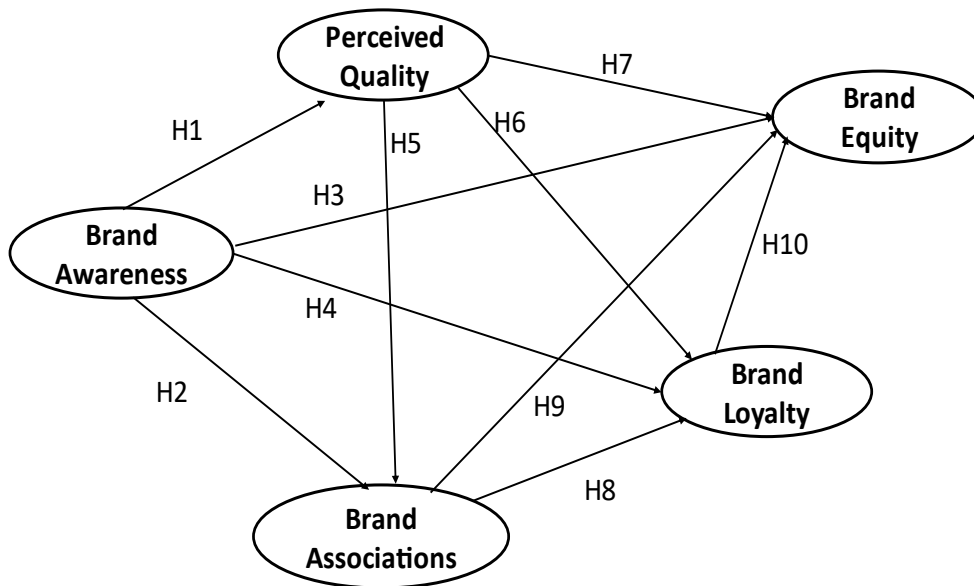
B. Brand Equity

Brand equity is defined as "quity 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 customer (Aaker, 1996). The difference in consumer response can be attributed to the brand name and demonstrates the effects of the long-term marketing invested into the brand" (Yoo and Donthu, 2001, p. 1). Yoo and Donthu's (2001) measures are considered reliable as they underwent rigorous psychometric tests. Brand equity has been measured from consumer-based (Rangaswamy et al., 1993; Park and Srinivasan, 1994; Agarwal and Rao, 1996; Huang and Sarigöllü, 2014), firm-based, and financial-based perspectives , accounting, and store-level scanner data for firm-based measures (Kamakura and Russell, 1993). According to Yoo and Donthu (2001), consumer-based means measuring cognitive and behavioural brand equity at the individual consumer level through a consumer survey.

C. Brand Awareness

Brand awareness is defined as a consumer's ability to identify or recognise brands (Rossiter and Percy, 1987). A product or service is guaranteed to have high visibility in the market via brand awareness. A potential buyer will identify, recall, and recognise a brand that belongs to a product

category (Aaker, 1991; Atilgan et al., 2005). Keller (1993) conceptualised brand awareness as one of the components of brand knowledge, consisting of brand recall and brand recognition. Keller (1993) defined brand recognition as product decisions made in stores and brand recall as consumers' ability to retrieve the brand from memory. Brand awareness refers to a potential buyer's ability to recognise or recall a brand from a particular product category (Aaker, 1996). Recognition is when consumers recognise a brand because they have seen or heard about it previously. A recall occurs when consumers are provided with a particular cue that reminds them of a brand (Ross and Harradine, 2004).

D. *Perceived Quality*

Perceived quality is defined by the performance of a product or service. According to Aaker (1996), perceived quality can be defined as customers' overall perception about the brilliance and quality of products or services relative to that of their competitors. Perceived quality is defined as "the customer's perception of the overall quality or superiority of a product or service for its intended purpose, relative to alternatives" (Zeithaml, 1988). Perceived quality augments brand value in several ways: high quality gives consumers a good reason to buy the brand and allow the brand to differentiate itself from its competitors, to charge a premium price, and to have a solid basis for the brand extension (Aaker, 1991). Studies show that the perceived product quality varies with consumer perceptions of intrinsic marketing cues associated with those products (Schiffman and Kanuk, 2000).

E. *Brand Associations*

Brand associations are defined as "the other informational nodes linked to the brand node in memory and contain the meaning of the brand" (Keller, 1993). Brand associations are categorised into attributes, benefits, and attitudes. Attributes are typically the defining features of a brand, symbolising what one gets when purchasing or consuming the product (Keller, 1993). Attributes are divided into product-related and non-product related; the former is essentially defined as the components of the core product or service function and in terms of service-related attributes, referring to the process of the core service (O'Cass and Grace, 2003), while the latter is defined as external aspects of the product or service that relate to its purchase or consumption (Keller, 1993).

F. *Brand loyalty*

Brand loyalty forms the core of brand equity, signifying a measure of attachment that a customer must have for a brand (Aaker, 1996). It is the heart of brand equity as it generates consumer-brand attachment relationships. Customer loyalty serves as the foundation of brand equity because a brand's value is worth as much as what customers are willing to pay (Aaker and Joachimsthaler, 2000; Clarke, 2001). In addition, brand loyalty represents a favourable attitude toward a brand resulting from involvement consistently with a brand over time (Assael, 1992). Therefore, brand loyalty is of paramount importance to marketers and consumer researchers (Aaker, 1996).

G. *Development of hypotheses*

This study suggests causal relations between the (four) brand equity dimensions. A conceptual framework between brand equity dimensions has been postulated in the literature (Yoo and Donthu, 2001). However, only a few studies have investigated how the brand equity dimensions' are correlated. As such, most studies only propose associative relationships among brand equity dimensions (e.g. Yoo et al., 2000).

Brand awareness is related to the functions of brand identities in consumers' minds and is reflected by how well the consumers can identify the brand under various conditions (Keller, 1993). A brand name that is easy to remember and is widely distributed was determined to be a critical

differentiator. Therefore, managers should first build brand awareness to improve perceived quality and build positive brand associations. Brand associations must be favourable, and the perceived product quality must be superior to its competitors. Nguyen, Barrett, and Miller (2011) stated that perceived quality is determined by customers' judgments of the brand features that are significant to them. When consumers consider a brand's quality superior to that of other brands in a competitive set, they are more likely to place a high premium on the brand, influencing their buy and repurchase choices. However, as previously mentioned, customers cannot recognise a brand's quality if they are unaware of it. As a result, awareness may assist consumers in becoming acquainted with the brand. These relationships are summarised in the hypothesis proposed below:

H1: Brand awareness has a positive effect on perceived quality.
H2: Brand awareness has a positive effect on brand association.
H3: Brand awareness has a positive effect on brand equity.
H4: Brand awareness has a positive effect on brand loyalty.

Focusing on the direct effects of brand equity dimensions on overall brand equity, the most significant influences are expected from perceived quality, brand associations, and brand loyalty. Marketers across all product and service categories have increasingly recognised the importance of perceived quality in brand decisions. Perceived quality and brand associations represent the antecedent step leading to brand loyalty. When consumers acquire a more positive perception of a brand, loyalty results. Perceived quality was considered as a significant factor of brand equity in the lubricants industry. Therefore, brand awareness may be considered as a precondition for brand loyalty. Together with brand awareness, perceived quality, which refers to "the customer's opinion of the overall quality or superiority of a product or service about its intended purpose, relative to alternatives," is essential (Nguyen et al., 2011). The following hypothesis is proposed:

H5: Perceived quality has a positive effect on brand associations.
H6: Perceived quality has a positive effect on brand loyalty.
H7: Perceived quality has a positive effect on brand equity.

Brand associations have been examined in previous works. Brand associations are believed to contain "the meaning of the brand for consumers" (Keller, 1993). Brand associations directly influence brand equity in the Indonesian fuel retail brand found that brand association (i.e., country-of-origin image) is positively related to brand equity. However, in the Chinese sportswear market, it was found that brand associations and brand loyalty are influential dimensions of brand equity. This study proposes the following hypotheses:

H8: The brand association has a positive effect on brand loyalty.
H9: The brand association has a positive effect on brand equity.

Brand loyalty is one of the main drivers of brand equity (Yoo et al., 2000; Atilgan et al., 2005), as loyal consumers show more favourable responses to a brand, which will help it grow. Loyal customers will also refer the brands to their family and friends and are less likely to switch to other brands. Scholars posited that loyalty could lead to increased purchase behaviours from customers, directly affecting the company's projected profitability. The following hypothesis is proposed:

H10: Brand loyalty has a positive effect on overall brand equity.

3. Research methodology

A. Sampling and data collection procedure

A self-administered survey questionnaire has been developed for this study. Questionnaires were distributed in English and the Malay language. This study applied purposive and snowball sampling that requires a screening process. The questionnaire was translated into the Malay

Language in order to ensure respondents understood the content. Users who own vehicles were qualified as respondents. The questionnaires were distributed via email and social media such as Facebook, Twitter, Instagram, Linkedin, and Google Plus. Based on the rule of sample size, a minimum recommended sampling size of 200 people was recommended.

B. Measurement Items

The measurements used in this study were adapted from (Yoo et al., 2000), Aaker (1996) and Netemeyer et al. (2004). Five items measure perceived quality; brand awareness, perceived quality, brand association, brand loyalty, quality, and overall brand equity. Respondents were asked to evaluate all the variables using a 5-points Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree". Out of 400 self-administered questionnaires distributed in Klang Valley, 275 were valid for data analysis; valid questionnaires have been collected in Selangor and Wilayah Persekutuan. Only 146 respondents responded online.

4. Results

A. Demographic analysis

The distribution of hardcopy questionnaires ensured the variability of input from several demographic factors and minimisation of biases. There was 421 valid response for analysis. Demographically, respondents were relatively young and almost equally divided between males and females. Male respondents are ~53.4%(225) vs 46.6% (196) of female respondents. Most respondents are from 26 – 30 years old (137 respondents with 32.5%). Coming in second is two age group variances, where the age group of 22 – 25 years old (83 respondents with a percentage of 19.7%), followed by the age group of 31 – 40 years old (83 respondents with a percentage of 19.7%). Third, 41-50 years age group with 60 respondents, standing at 14.3%. Fourth place is the age group of 21 and below, with 35 respondents at 8.3%. The age group of 50 years and above is the fifth age group, where 23 respondents answered the survey questions, at a percentage of 5.5%. Hence, there is no age group unrepresented in the research findings, as all are represented in the responses collected by the researcher.

B. Structural Equation Modelling (SEM)

The structural equation modelling (SEM) technique was used to explore the inter-relationship among components of perceptual brand equity, mainly perceived quality, brand loyalty, brand awareness, brand associations, and overall brand equity. SEM provides a very general and convenient framework for statistical analysis, including several traditional multivariate procedures, such as factor analysis, regression analysis, discriminant analysis, and canonical correlation as exceptional cases. This study used two statistical approaches to estimate a causal relationship model: a covariance-based or partial least squares structural equation modelling (or PLS-SEM). PLS-SEM is suitable for testing complex models and relationships between constructs (Henseler, Ringle, and Sinkovics, 2009). PLS-SEM is an appropriate procedure when the research objectives are exploratory, thus, it is suitable to analyse the hypothesised model as in this study because the model is complex (i.e., it involves 5 constructs) that need to run simultaneously.

C. Assessment of Measurement Model

Numerous steps were used in the assessment of the measurement model. First, an initial principal component (exploratory factor analysis) analysis was performed, followed by assessing convergent and discriminant validity and evaluating the measure's reliability. Table 1 shows the convergent

validity results comprised of AVE, Composite Reliability (CR), items loadings, and R-square. The convergent validity of the scale items was measured using three criteria. First, the factor loadings must be larger than 0.50, as suggested by Hair et al. (2010). Second, the composite reliability for each construct should surpass 0.70. Finally, the AVE for each construct should be above the recommended value of 0.50 (Fornell and Larker, 1981). This study found that all loadings were greater than 0.50, with most loadings exceeding 0.60. The factor loadings were 0.62 - 0.71. The high factor loadings led to the conclusion that the measures have convergent validity. All constructs factor loading exceeded 0.50.

Next step in investigating construct validity is the determination of the reliability of the construct items. Reliability is the degree to which a set of indicators are internally consistent, the extent to which the instrument yields the same results on repeated trials. Reliability is necessary but not sufficient for measuring validity; even measures with high reliability may not be valid in measuring the construct of importance (Hair et al., 2010). Reliable indicators should measure the same construct. A measure of internal consistency or composite reliability is a composite alpha value. This value was used to assess the reliability of the 10 constructs. Construct reliability coefficients should exceed the 0.70 lower limits (Hair et al., 2010; Rossiter, 2002). However, Nunnally (1967) suggested that values as low as 0.50 are acceptable for initial construct development. The composite reliability and Cronbach's alpha values for the studied constructs were computed by SmartPLS and ranged between 0.82 - 0.90. It is clearly stated that all the variables used in this research are reliable since they obtained the Composite Reliability and Cronbach's Alpha values of more than 0.7. Thus, all values fall within the acceptable range, leading to good reliability in this case.

Table 1. Assessment construct reliability

Constructs	Item	Loading	Cronbach's alpha	CR	AVE	R square
Brand Association	BAS_1	0.823	0.86	0.899	0.64	0.489
	BAS_2	0.751				
	BAS_3	0.826				
	BAS_4	0.831				
	BAS_5	0.767				
Brand Awareness	BA_1	0.869	0.895	0.923	0.705	0
	BA_2	0.858				
	BA_3	0.835				
	BA_4	0.82				
	BA_5	0.814				
Brand Equity	BE_1	0.812	0.901	0.926	0.715	0.531
	BE_2	0.876				
	BE_3	0.829				
	BE_4	0.824				
	BE_5	0.885				
Brand Loyalty	BL_1	0.825	0.846	0.891	0.62	0.49
	BL_2	0.847				
	BL_3	0.749				
	BL_4	0.734				
	BL_5	0.776				

Perceived Quality	PQ_1	0.793	0.83	0.88	0.597	0.229
	PQ_2	0.815				
	PQ_3	0.835				
	PQ_4	0.721				
	PQ_5	0.688				

The next step in the construct validation process is the assessment of discriminant validity. Discriminant validity represents the extent to which the measure stands alone and is not simply a reflection of other variables (Peter and Churchill 1986). There are several ways to evaluate discriminant validity. Average Variance Extracted (AVE) is a standard method of testing discriminant validity (DV) (Gerbing and Anderson, 1988). DV was evaluated by examining the cross-loadings of each item in the constructs and the square root of AVE calculated for each construct. All items should have higher loading on their corresponding construct than the cross-loadings on the other constructs in the model. In addition, the square root of AVE for all factors should be greater than all the correlations between that construct and other constructs. Table 2 shows the AVE and cross factor loading extracted for all latent variables. All the items have higher loading on their corresponding construct than the cross-loadings on the other constructs in the model. The reliability of the Fornell and Larcker (1981) criteria in finding discriminant validity has lately been questioned. As an alternative, Henseler et al. (2015) propose the multi-trait-multi-method matrix, often known as the heterotrait–monotrait (HTMT) ratio of correlations. To pass the discriminant validity test, all HTMT values must be larger than 0.85 (Kline, 2011) or 0.90 (Gold et al., 2001). Table V shows that the findings fulfil the HTMT0.85 (Kline, 2011) and HTMT0.90 (Gold et al., 2001) standards, indicating that they are discriminantly valid.

Table 2. Discriminant validity using Fornell and Larcker criterion

	1	2	3	4	5
1. Brand Association	**0.8**				
2. Brand Awareness	0.669	**0.839**			
3. Brand Equity	0.709	0.625	**0.846**		
4. Brand Loyalty	0.665	0.528	0.601	**0.788**	
5. Perceived Quality	0.505	0.48	0.433	0.524	**0.772**

Note: This table reports findings of the discriminant analysis using the Fornell and Lacker criterion. Bold diagonals represent the square root of the AVE, while the off-diagonals represent the correlations

Table 3. Discriminant validity using Heterotrait-Monotrait (HTMT)Criterion

	1	2	3	4	5
1. Brand Association					
2. Brand Awareness	0.741				
3. Brand Equity	0.798	0.693			
4. Brand Loyalty	0.768	0.602	0.675		
5. Perceived Quality	0.577	0.54	0.483	0.62	

D. Assessment of the Structural Model

Following Hair, Hult, Ringle, and Sarstedt (2016), the coefficients of determination (R^2) and path loadings were used to assess the structural model. Notably, R2 for brand associations (49%), brand equity (54%), perceived quality (23%), brand loyalty (49%) indicated medium or high predictive power for corresponding constructs. This section presents the results of the specific hypotheses predicted in this study. The evaluation criteria for confirming each hypothesis was the use of t values for each path loading. Significant t-values for path loadings signify support for the proposed Path Mean Std Deviation T-Statistic hypothesis. The cut-off criteria used was at t-value greater or equal to 1.645 for an alpha level of 0.05 for one tail (Hair et al. 2006). The pathways of the relationships are displayed in Figure 2.

Figure 2: Theoretical Model
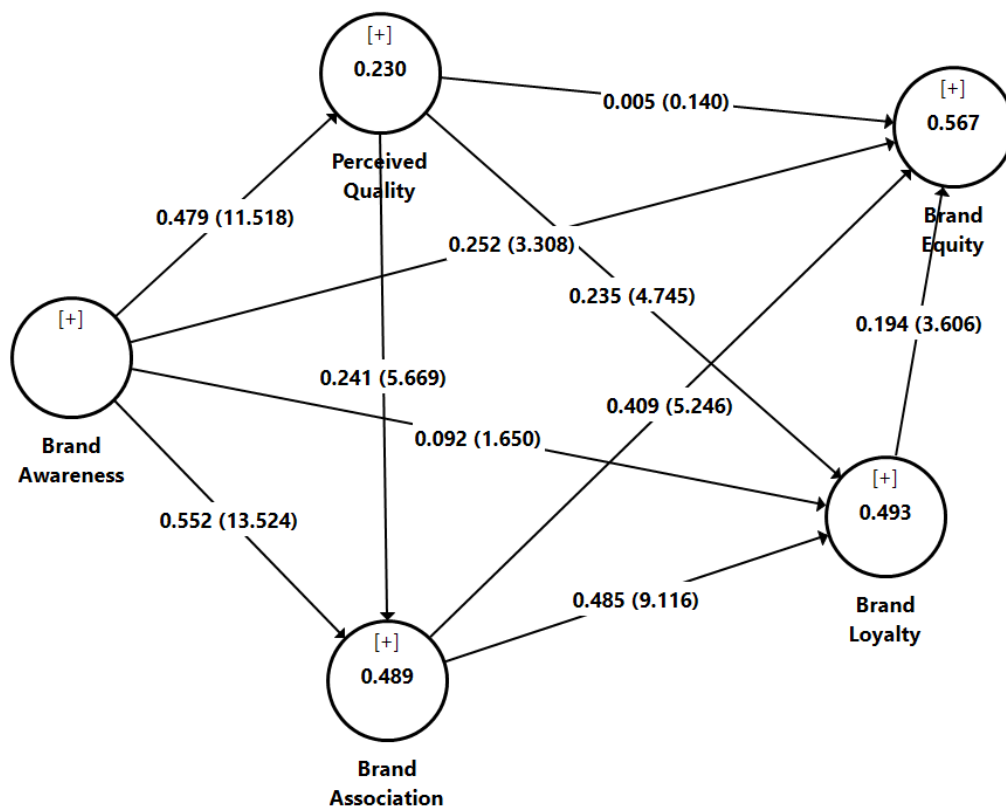
Based on the results, all of the hypotheses are supported except H6 that explain there is no relationship between perceived quality and brand equity (β = 0.05, p=0.14). Specifically, brand awareness are positively related to perceived quality (β = 0.479, p < 0.0001), brand associations (β

= 0.552, p < 0.0001), brand equity (β = 0.252, p = 0.001) and brand loyalty (β = 0.092, p= 0.05) respectively). Thus, hypotheses H1, H2, H3 and H4 were supported. Perceived quality is positively related to brand associations and brand loyalty (β = 0.241, p < 0.0001 and β = 0.235, p < 0.0001, respectively). Thus, hypotheses H5 and H7 were supported. Brand associations are positively related to brand equity and brand loyalty (β = 0.409, p < 0.05 and β = 0.485, p < 0.05, respectively), thus, hypotheses H8 and H9 were supported. In contrast, perceived quality was not related to brand equity (β = 0.005, p > 0.45) and brand loyalty was positive significantly related to brand equity (β = 0.194, p<0.001). Thus, hypothesis H10 was supported. The summary of the hypotheses testing results is shown in Table 3.

Table 3: Hypothesis testing

Hypotheses	Path	Loading	Standard Deviation (STDEV)	t-values	p-values	UL	LL
H1	Brand Awareness -> Perceived Quality	0.479	0.042	11.518	<0.0001	0.411	0.542
H2	Brand Awareness -> Brand Association	0.552	0.041	13.524	<0.0001	0.49	0.62
H3	Brand Awareness -> Brand Equity	0.252	0.076	3.308	0.001	0.132	0.378
H4	Brand Awareness -> Brand Loyalty	0.092	0.056	1.65	0.05	0.002	0.177
H5	Perceived Quality -> Brand Association	0.241	0.042	5.669	<0.0001	0.168	0.305
H6	*Perceived Quality -> Brand Equity*	*0.005*	*0.038*	*0.14*	*0.444*	*0.056*	*0.065*
H7	Perceived quality -> Brand Loyalty	0.235	0.049	4.745	<0.0001	0.154	0.316
H8	Brand Association -> Brand Equity	0.409	0.078	5.246	<0.0001	0.29	0.547
H9	Brand Association -> Brand Loyalty	0.485	0.053	9.116	<0.0001	0.407	0.574
H10	Brand Loyalty -> Brand Equity	0.194	0.054	3.606	<0.0001	0.102	0.279

5. Discussion

This study tested the interrelationships between dimensions of brand equity the context of lubricant industry in Malaysia. A similar model was adopted by Singh and Pattanaya (2016) and Vulkasovic (2016). The results differ due to the studies conducted in various industries. Based on the results of this study, brand awareness leads to improve perceived quality. In other words, when customers see that the brand is recognised and has a solid public image (brand awareness), they perceive a higher quality in the product (perceived quality). The finding is somewhat in line with Nguetsop et al. (2016) in the telecommunication industry and Saydan (2013) in the UK's context of the context of the airline industry. Nonetheless, the relationship between brand awareness and brand association being the positive effect is also supported by Buil and Martinez (2013).

Perceived quality was found to have a positive effect on brand associations and brand loyalty in the context of the engine lubricant industry in Malaysia. Nguetsop et al. (2016) suggested that customers rely on and trust the brand, future turnovers, and promises when perceived quality is strengthened. They added that it would also encourage customers to prolong their relationship with the brand and increase their loyalty toward the company. Buil and Maritinez's (2013) study on the influence of brand equity on the consumer reported contradictory findings, where there are no positive effects of perceived quality on brand loyalty. In this study, perceived quality hurts brand equity, per Buil and Martinez (2013). It is indicated that Malaysian car owners are uncertain about the engine lubricant of choice, and the finding contradicted previous research conducted in the Iranian lubricant industry.

In the engine lubricant industry context, the brand association positively affects brand loyalty and brand equity. Saydan (2013) claimed that when consumers want to buy a product, they are inclined to buy brands they are familiar with instead of those they have never heard of or seen. The findings are compatible with that of previous research, independent of the industry of countries. However, Kazemi's (2013) study involving the Iranian lubricant industry showed that brand association negatively affect brand equity. According to Kazemi (2013), the critical point to the lack of support for significant and positive direct influence on brand equity by brand association/awareness is evidence that success in the Sepahan oil company cannot be assured by high quality or brand name alone. In the Iranian market, the most significant influence on overall brand equity is perceived quality. Consumers prioritise lubricant quality, which translates into brand loyalty. This contradicts the results garnered from the Malaysian market. The final hypothesis indicated a negative finding, where brand loyalty does not positively affect the overall brand equity. This result is incompatible with that of Nguetsop et al. (2016). If there is a failure to build customers' brand loyalty, then the investment performance of an airline's branding management implementation is likely to be undesirable. Therefore, it can be concluded that brand loyalty is among the main issues that need to be rectified, as it was previously confirmed that brand switching is rampant in this industry.

6. Implications

A. Theoretical

This study helps to confirm and provide empirical evidence of the inter-relationships between dimensions of Customer-Based Brand Equity (CBBE) in the context of engine lubricants in Malaysia. The application of CBBE has been examined in various industries, mainly airline, telecommunication, sportswear, and engine lubricants in the past. This study confirms that brand awareness directly influences perceived quality, brand loyalty, brand associations, and brand equity and indirectly influences brand equity. The results are consistent with those reported in business-to-consumer research, confirming that brand awareness is a significant component of brand equity (Keller and Lehmann, 2006). Similarly, consistent with studies involving service branding in business-to-business research, the current study shows that brand awareness is imperative in driving brand equity (Davis et al., 2008). This alternative mechanism combines the various results from brand awareness and highlights this effect more comprehensively.

B.   Practical

From a managerial standpoint, this study has implications for brand and marketing managers for various industries. The lubricants industry in Malaysia can grow significantly as the number of lubricant brands is entering the market. Many small players in the industry could break through the market and tackle the pricing strategy. Small players such as Prince Lube, Arrow, Eneos, Lubetron, U.K. Eagle, or Stop Oil are slowly making their way through the industry by

promoting "performance-based products" at lower retail prices. The study also shows brand awareness is important to influence perceived quality, brand association and brand loyalty. Therefore, marketers could utilise these findings to enhance their brand equity and fulfil brand competitiveness beyond their competitors by using innovative marketing strategies. The marketing manager should consider factors that can quickly drive brand awareness, associations, perceived value, loyalty, and overall brand equity. Managers can use this findings to positioning their brand effectively in the mind of consumers. The first step for managers should be to increase brand awareness as a method of increasing perceived quality as well as the development of good brand associations. Any person who is influential including m arketing mix initiatives, should be considered conducted in order to raise the level of familiarity or memory A certain sort of brand should also be singled out for special consideration. perceived worth of connections.

Managers should also identify which brand associations or image is adequate to develop strong, unique, and favourable brand associations and ensure that customers can easily remember the uniqueness of the lubricant engine oil relative to those of the competitors. Finally, the manager needs to design attractive loyalty programs for customers to remain loyal to the brand.

7. Conclusions

Based on the CBBE model developed by Aaker (1996), Keller (1993), and Yoo and Donthu (2001), this study assessed the interrelationships between the dimension of brand equity, which is scarce in the literature on the lubricant engine industry. While previous studies investigated brand equity dimensions and drivers of consumers' responses as an outcome of consumer responses, this study provides empirical evidence on the role of each dimension of brand equity. For example, brand awareness has a role in directly and indirectly influencing brand equity via perceived quality, brand loyalty, and brand associations. The results contribute to developing a brand equity theory and understanding the theory's underlying mechanism and providing practical managerial and practical implications for international branding strategies and marketing communication and practices.

By applying innovative marketing strategies, marketers can utilise the findings to enhance their brand equity and fulfil brand competitiveness beyond their competitors. The engine lubricant market in Malaysia requires building impactful brand equity strategies, as a result, reveals a strong positive relationship between the brand equity dimensions. Hence, the marketing manager should consider factors that can quickly drive brand awareness, associations, perceived value, loyalty, and overall brand equity.

The current research faced a few limitations. First, the research relies on data collected solely in Malaysia. The results might not be applicable in other Asian countries, as Malaysia is made up of different cultural dimensions relative to other developed countries and respond differently in the experience of engine lubricant. Future research should examine these dimensionalities in the context of other countries. Second, this research does not take into account certain variables that could affect brand equity. Future research should consider incorporating control variables that could affect the relationships between the variables. With control groups, more precise results can be generated. Third, this study only investigated the relationships between the dimensions of brand equity. Future studies should explore the mediation effect of dimensions of brand equity to understand the mechanism of casual relationships better.

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