Abstract—The paper aims to construct the valid and reliable instrument to measure the customer-based brand equity in Indonesia especially for fuel retail brands. Object studied is Pertamax, a RON 92 fuel product from Indonesian state-owned oil company PT. Pertamina (Persero). This paper combines the framework for measuring customer-based brand equity and the concept of two brand equity scale. Sampling uses 205 respondents of private car users in Jakarta, Indonesia between March – July 2012 by judgemental sampling. Factor analysis was used to test the proposed model. Factor analysis results that 17 multidimensional brand equity variables from the framework for measuring customer based brand equity and 4 overall brand equity variables from two brand equity scale are valid and can be used to measure the customer-based brand equity in Indonesia.

Keywords—Multidimensional Brand Equity (Brand Awareness, Brand Associations, Perceived Quality, and Brand Loyalty), Overall Brand Equity, Pertamax, RON 92

I. INTRODUCTION

The fuel retail industry in Indonesia is getting more competitive as the foreign oil companies (Shell, Total, & Petronas) has been entering Indonesian market since 2008 and offers various non-subsidized fuel brands [17]; while ‘Undang-Undang Nomor 22 Tahun 2001 tentang Minyak dan Gas Bumi’ makes Pertamina has the same position with the competitors [3].

The concept of brand equity is important in managing brands and it can be used to measure the brand performance of particular fuel brands. Several studies in brand equity have been conducted, from using Natemeyer’s model in telecommunication brand [6] or retail store brand [18]; Aaker’s model [13]; until the model from Keller’s [19]. However, it appears to be no proper instrument to measure the customer-based brand equity (CBBE), especially for the fuel retail brands in Indonesia.

Furthermore, [12] constructed a valid and reliable instrument to measure the CBBE in Malaysian brands. The items developed for the instrument were based on the past studies from Yoo and Donthu (2001) and Lassar et al (1995). Result conveys that four factors has been created (perceived quality, brand associations, brand loyalty, & brand awareness) and the total of 14 items is valid to measure CBBE. Furthermore, there are two brand equity scale, which consists of multidimensional brand equity and overall brand equity, as both are used to measure the CBBE [21].

The objective of this research is to construct the valid and reliable instrument to measure the customer-based brand equity in Indonesia, especially for fuel retail brands. The model would adapt the framework for measuring customer-based brand equity from Yew Leh and Lee (2011) and the two brand equity scale from Yoo and Donthu (2001). The object of this study is Pertamax, a RON 92 fuel brands from PT. Pertamina, an Indonesian state-owned oil company. Research also conducted only in Jakarta due to the more competitive situation as many of the foreign oil fuel brands exist in Jakarta.

II. LITERATURE REVIEW

A. Brand Equity

According to Farquhar (1989, p.47), as cited in [10], brand equity is the “added value endowed by the brand to the product”. However, it has been argued that all of the unique effects resulted from the marketing programs of the brand becomes brand equity [7]. Swait et al (1993), defines the brand equity as “the customer’s implicit valuation of the brand in a market with differentiated brands relative to a market with no brand differentiation” as cited in [20]. Furthermore, Aaker and Joachimstaler (2000), as cited in [14] stated that brand equity is “set of brand assets linked to a brand’s name and symbol that adds to a product or services.” Another study stated that brand equity consists of two important things [1], brand assets and liabilities, which bond the customers of particular products/services with the brand (name or symbol).

The concept of brand equity can be studied in many perspectives: financial perspective, which assess the financial value resulted from the sales of the brand whether it is current or future profits, according to Kapferer (2008), as cited in [14]; customer-based perspective; and combined perspective which is the mixture of the financial concept and customer-based concept of the brand equity [4].

B. Customer-Based Brand Equity

Unlike the concept of financial perspective of the brand equity, the customer-based perspective can understand better how the customer perceived about the brand rather than valued it through numbers. Customer-based brand equity refers to how marketing programs of the brand creates a differential
outcome in brand knowledge of the customers, and there are 3 elements to build CBBE, which are “differential effect”, “brand knowledge”, and “consumer response to marketing” [8]. Also there is something called ‘customer equity’ which the particular brands are creating the strong relationships value with the customers [9]. Aaker (1991, 1996), as cited in [4], clarify that the brand equity has 4 important aspects, which are brand awareness, brand association, perceived quality and brand loyalty.

C. Framework for Measuring Customer-Based Brand Equity

The concept for the research was adopted from [20], where they were divide every elements of Aaker’s brand equity into more detailed components which builds the brand equity (see Figure 1):

1) **Brand awareness**:
   - Brand recognition means customer can recognize as they were exposed by certain brands [8].
   - Brand recall is a capability to remember particular brands, when given something as a clue such as situation [8].
   - Top of mind, when people are aware of certain brand and very easy to memorized [2].
   - Brand dominance. Aaker (1996) stated that brand dominance occurs when one particular brand is very superior than the other competitor, as cited in [16].
   - Brand knowledge is the brand identities (brand logo/symbol) and the brand name which refers to some kind of the brand from the product category [7].

2) **Brand associations**:
   - Functional product attribute is product performance evaluation by customers [11]. This divided into two [8]: the product’s solidity performance through years (reliability) and the long or short time of the product’s life cycle (durability)
   - Non-functional product attributes is more intangible and usually refers to the products symbolic attribute [20] which consists of social image, perceived value, trustworthiness, differentiation, and country of origin.
   - Corporate ability. Aaker (1996), argued that corporate ability also becoming one of the assessment by customer’s, since the organization which consists of people, values, and programs behind the brand are reflecting the way the organization handle their own brands, as cited in [20].
   - Corporate social responsibility. (Blumenthal and Bergstorm 2003), justified the corporate image from activity such as CSR can leverage the brand associations since the corporation have good ethics and put deep concern to their stakeholders produce or losing respects from their customers, as cited in [20].

3) **Perceived quality**:
   - Intrinsic attributes, defined as product’s physical characteristic such as taste, shape, and the appearance (Zeithaml 1988; Steempkamp 1997) as cited in [20].
   - Extrinsic attributes, refers to anything than can be related to the product aside from the physical aspects, such as price, promotion, packaging, and product information (Bernue’s et al. 2003), as cited in [20].

4) **Brand Loyalty**:
   - Frequency of repurchase. (Keller, 1998; Oliver 1997, 1999), justified that the loyalty measures by the amount of repeated purchased or “commitment to rebuy the brand as a primary choice” as cited in [20].
   - Top-of-mind. Keller (1998), as cited in [20], argued that the particular product will becomes a top-of-mind solutions from the customer’s when they facing a problem to be solved.
   - Price premium. (Aaker, 1992), justified that price premium is “the amount a customer will pay for the brand in comparison with another brand offering similar benefits”, as cited in [20].

D. **Two Brand Equity Scale**

Furthermore, [21] developed the two brand equity scale, which are Multidimensional Brand Equity (MBE) and Overall Brand Equity (OBE). MBE consists of brand awareness, brand associations, perceived quality, and brand loyalty. OBE refers to the overall end of customer’s evaluation towards a particular brand. Results conveys that from cross-cultural demography the scale for measuring the customer based brand equity is valid, reliable, concise, and can be implemented in several cultures and product categories.

In addition, the valid instrument’s measurement scale consists of 10 items or indicator for measuring the multidimensional brand equity, while there are 4 items in measuring the overall brand equity [21].

The instrument of the two brand equity scale consists of [21]:

Fig. 1 Framework for Measuring Customer-Based Brand Equity (Adapted from Yew Leh and Lee, 2011)
Ten-item Multidimensional Brand Equity:
1. Brand Loyalty, the indicator is:
   a. I consider myself to be loyal of X (which refers to particular brand name)
   b. X would be my first choice
   c. I will not buy other brands if X is available at the store
2. Perceived Quality, the indicator is:
   a. The likely quality of X is extremely high
   b. The likelihood that X would be functional is very high
3. Brand Awareness, the indicator is:
   a. I can recognize X among the other competing brands
   b. X would be my first choice
4. Brand Associations, the indicator is:
   a. I can quickly recall the symbol or logo of X
   b. Some characteristics of X come to my mind quickly
   c. I have difficulty in imagining X in my mind (reversed statement)

Four-items Overall Brand Equity:
1. It makes sense to buy X instead of any other brand, even if they are the same
2. Even if another brand has the same features as X, I would prefer to buy X
3. If there is another brand as good as X, I prefer to buy X
4. If another brand is not different from X in any way, it seems smarter to purchase X

III. METHODOLOGY

A. Research Design

The study aims to construct the valid and reliable instrument to measure the customer-based brand equity in Indonesia. So, the research would blend the concept from from Yoo and Donthu (2001) and Yew Leh and Lee (2011). Researcher would replace the ten-item multidimensional brand equity measurement scale from [21] with the detailed variables from the framework to measuring customer based brand equity from [20] and keeps the four items of overall brand equity to be tested.

The questionnaire constructed into two sections: demographic questions and consisting 23 variables to measure the brand equity of Pertamax. The demographic questions consists of 11 questions-respondent’s consumption of Pertamax in the past 6 month, age, gender, occupation, recent educations, monthly salary & expenditure, frequency of fuel refilling, quantity of fuel refilling, what kinds of brand would they choose if subsidized fuel is prohibited by government, and the awareness of Pertamax Eco-save Technology campaign. While the 23 variables to measure brand equity consists of 19 multidimensional brand equity variables and 4 overall brand equity variables as seen below (see Appendix A for futher indicator explanation):

Multidimensional Brand Equity:

<table>
<thead>
<tr>
<th>Component</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand Awareness</td>
<td>1. Brand Recognition</td>
</tr>
<tr>
<td></td>
<td>2. Brand Recall</td>
</tr>
<tr>
<td></td>
<td>3. Top of Mind</td>
</tr>
<tr>
<td></td>
<td>4. Brand Dominance</td>
</tr>
<tr>
<td></td>
<td>5. Brand Knowledge</td>
</tr>
<tr>
<td>Brand Associations</td>
<td>6. Reliability</td>
</tr>
<tr>
<td></td>
<td>7. Durability</td>
</tr>
<tr>
<td></td>
<td>8. Social Image</td>
</tr>
<tr>
<td></td>
<td>9. Trustworthiness</td>
</tr>
<tr>
<td></td>
<td>10. Perceived Value</td>
</tr>
<tr>
<td></td>
<td>11. Differentiation</td>
</tr>
<tr>
<td></td>
<td>12. Country of Origin</td>
</tr>
<tr>
<td></td>
<td>13. Corporate Ability</td>
</tr>
<tr>
<td></td>
<td>14. Corporate Social Responsibility</td>
</tr>
<tr>
<td>Perceived Quality</td>
<td>15. Extrinsic Attributes: Brand Name &amp; Symbol</td>
</tr>
<tr>
<td></td>
<td>16. Extrinsic Attributes: Service in the Gas Stations</td>
</tr>
<tr>
<td>Brand Loyalty</td>
<td>17. Frequency of Repurchase</td>
</tr>
<tr>
<td></td>
<td>18. Top-of-mind</td>
</tr>
<tr>
<td></td>
<td>19. Price Premium</td>
</tr>
</tbody>
</table>

Overall Brand Equity:
1. Feature
2. Performance
3. First Choice
4. Price

The data measurement used is Likert-scale range from 1 – 5, where “5” indicates strongly agree and “1” indicates strongly disagree. Pre-test was conducted randomly to thirty private car users in Jakarta to gain feedback and revised several questions to improve the validity and the reliability of the instrument.

B. Data Collection & Analysis

A number of 205 questionnaires were spread in several spots in Jakarta, such as Kawasan Industri Pulogadung, Kelapa Gading, Cempaka Putih, Kuningan, Sudirman and Thamrin in March – July 2012. Samples gathered using judgemental sampling. In order to analyze the data, Ms. Excel was used to check the validity and the reliability of the instrument. Also, SPSS was used to conduct factor analysis.

IV. FINDINGS

A. Demographics

The respondent consists of 70.7% male and 29.3% female. The great majority of the respondents (67.3%) were buying Pertamax in the past 6 months. Majority of 38.5% of the respondents are between 26 – 35 years old, while 35.6% are come between 19 – 25 years old. The great majority of the respondent’s occupation comes from private sector employees (59%). Undergraduate program represents 42% from survey.
The majority of the respondents earn above IDR 5 million a
month (31.2%), while 28.8% of them spend IDR 1 – 2 million
& IDR 2 – 3.5 million per month. The majority of the
respondents are those who refuel their cars 3 – 5 times a
month (52.7%) and most of them (45.9% of the respondents)
refilled the fuel about 15 – 25 liters each time they came to gas
stations. Although 50.2% of the respondents prefer to choose
Pertamax if the subsidized fuel is limited, nearly half of those
share (25.4%) would choose Shell Super as the main product
for their cars. Finally, 55.6% of the respondents stated that
they didn’t aware about the Pertamax Eco-save Technology
campaign.

B. Validity and Reliability

The validity of the results was analyzed using Ms. excel,
where the sum of each variable will be correlated with the
total score of all variables. Furthermore, [15] stated that the
item is invalid if the correlation between the each item and
total score is below 0.3. Among 23 variables tested, only two
variables were invalid (top of mind and extrinsic attributes:
brand name & symbol). Both of the variables will not used in
further analysis. Only 21 variables are left to be analyzed (17
MBE equity variables and 4 OBE variables). In addition, the
reliability of the instrument was analyzed through split-half
method. Result shows that the value of $r_{ij}$ is 0.949704. The
instrument are reliable if the correlation (value of $r_{ij}$) is above
0.8.

C. Factor Analysis: Multidimensional Brand Equity

The result shows that there is multicollinearity in
multidimensional brand equity variable, since the value of
KMO measure of Sampling Adequacy is 0.896 (above 0.5)
and the significance value in Bartlett’s Test of Sphericity is
0.000 (below 0.05). None of the 17 variables are omitted in
the factor analysis since each of the MSA value of MBE
variable is above 0.5. The factor analysis is conducted through
principal component analysis with the type of rotation is
varimax. The acceptance value for factor created is the factors
or components that possess eigenvalues above 1.0. According
to [5], for the sample size of 200, the minimum acceptance
value of factor loading is 0.4. Thus the factor loading from
rotation component matrix table that have value less than 0.4
would be omitted from the analysis.

With the four factors created (see Table II), the total
variance explained is 67.363%. Factor 1 (variance explained
is 44.026%) is labeled as brand associations because it consists
of several variables (e.g. corporate ability, differentiation,
trustworthiness, durability, and reliability) from the original
variables as seen in Table I. Second factor labeled as brand
loyalty, loaded with 5 variables with variance explained is
9.273%. Third factor named brand awareness, loaded with 2
variables with 7.461% variance explained. Fourth factor
labeled as perceived quality, loaded with 2 variables with
6.603% variance explained.

Table II conveys that several variables was not loaded into
the original component in Table I. For example, brand
dominance & Top-of-mind loaded into brand associations.
Brand recall, perceived value, and social image loaded into
brand loyalty. Brand recognition & brand knowledge stays in
the same component (brand awareness). Corporate social
responsibility loaded into perceived quality component.

<table>
<thead>
<tr>
<th>Factor Number</th>
<th>Factor Name</th>
<th>Variable</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brand Associations (44.026%)</td>
<td>Corporate Ability</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Differentiation</td>
<td>0.751</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Country of Origin</td>
<td>0.749</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brand Dominance</td>
<td>0.745</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trustworthiness</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durability</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Top-of-mind</td>
<td>0.555</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reliability</td>
<td>0.491</td>
</tr>
<tr>
<td>2</td>
<td>Brand Loyalty (9.273%)</td>
<td>Brand Recall</td>
<td>0.797</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency of Repurchase</td>
<td>0.782</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perceived Value</td>
<td>0.750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price Premium</td>
<td>0.711</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social Image</td>
<td>0.580</td>
</tr>
<tr>
<td>3</td>
<td>Brand Awareness (7.461%)</td>
<td>Brand Recognition</td>
<td>0.794</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brand Knowledge</td>
<td>0.753</td>
</tr>
<tr>
<td>4</td>
<td>Perceived Quality (6.603%)</td>
<td>Service in Gas Station</td>
<td>0.849</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corporate Social Responsibility</td>
<td>0.541</td>
</tr>
</tbody>
</table>

D. Factor Analysis: Overall Brand Equity

<table>
<thead>
<tr>
<th>Factor Number</th>
<th>Factor Name</th>
<th>Variable</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overall Brand Equity (90.950%.)</td>
<td>OBE : First Choice</td>
<td>0.966</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OBE : Feature</td>
<td>0.959</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OBE : Performance</td>
<td>0.950</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OBE : Price</td>
<td>0.939</td>
</tr>
</tbody>
</table>

Table III shows that there is multicollinearity in OBE
variables since the KMO of Sampling Adequacy value is
0.864 and the significance value in Bartlett’s Test of
Sphericity is 0.000. None of the 4 variables are excluded in the
factor analysis since all of the MSA value of MBE variables is
above 0.5. With acceptance eigenvalues is greater than 1.0,
only one factor created and factor rotation is not necessary.
The factor labeled as overall brand equity and loaded with 4
variables with total variance explained is 90.950%.
V. SUMMARY AND CONCLUSION

From Table II & III, it can be concluded that 17 multidimensional brand equity variables from the concept of framework for measuring customer based brand equity by Yew Leh and Lee (2011) and 4 overall brand equity variables from two brand equity scale by Yoo and Donthu (2001) is valid and can be implemented to measure the customer-based brand equity of certain brands in Indonesia. In this research, the measurement of customer-based brand equity is valid in assessing the fuel retail brands. In the future research, it is suggested to evaluate the brand equity using structural equation modeling (SEM) in assessing each variable of multidimensional brand equity and the overall brand equity. Also, it is suggested to includes the other fuel brands (Pertamax Plus, Shell Super, etc) as the object studied and conduct research in other cities outside Jakarta (e.g. Bandung, Surabaya, Medan, etc).

APPENDIX

A. Measurement Scales

Multidimensional Brand Equity
1. Pertamax is part of RON 92 fuel category
2. Pertamax can be used in different situation
3. Pertamax brand is very easy to memorized
4. Pertamax leading in the RON 92 fuel category
5. Logo, symbol, and the name of Pertamax reminds me of RON 92 fuel category
6. The car engine’s treated well when using Pertamax
7. Pertamax can reduce the risk of rusting tanks and fuel lines
8. Using Pertamax makes me proud
9. Pertamina pays great attention to the customer’s interest
10. The price is worth with the advantage in using Pertamax
11. Pertamax with the eco-save technology makes it different with the competitor
12. I used Pertamax due to it’s made in Indonesia
13. The experience of Pertamina convince me in using Pertamax
14. CSR program of Pertamina increase my respect
15. The name & logo of Pertamax is very unique
16. Service quality in Pertamina’s gas station is satisfying
17. I have commitment in using Pertamax as the first choice
18. Pertamax is the first brand I remember among the other RON 92 fuel products
19. I am willing to pay even though the price of pertamax is very high

Overall Brand Equity
1. Even if the other brand has same features with Pertamax, I will prefer to buy Pertamax
2. I will buy Pertamax even there is another brand as good as Pertamax
3. I will definitely choose Pertamax among the RON 92’s product category
4. I will definitely choose Pertamax even if the other competitor has the same price with Pertamax

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