The intention to adopt a green product (a study on a green fuel product (pertalite))

H Haryanto, H Purnomo and W Wiyono

Management Dept, Faculty of Economic and Business, Universitas Sebelas Maret, Jl. Ir. Sutami 36A Kentingan, Surakarta, Indonesia

Correspondent Author: aiahromo@gmail.com; haryanto@staff.uns.ac.id

Abstract. Indonesia Government through Pertamina Co. Ltd has launched a new fuel product, namely Pertalite that is more environmentally friendly than the previous one (premium). Premium is 88 octanes gasoline that is less environmentally friendly than Pertalite (90-octanes). Low-octane gasoline causes the inefficiency in usage so that more carbon will be released into the environment which contributes to global warming. Unfortunately, the premium consumption is still relatively high, which became the background of this research. The purpose of this study is to examine the influence of variables affecting the intention of adoption of environmentally friendly fuel product. This study is a survey that was conducted in Surakarta City, Indonesia by purposive sampling method. The criteria of respondents are the people who know the difference between premium and pertalite gasoline. Testing instruments and testing data used Structural Equation Modelling-Partial Least Square (SEM-PLS) method. The result showed the t-score of SEM-PLS analysis for the price fairness, relative advantage and product knowledge were 3.057, 9.134, and 4.668, respectively, hence influenced the attitude toward adoption. That scores are more than cut off 1.96 in T table with significance level 5%. Furthermore, attitude toward adoption influenced the intention of adoption with t-value 17.903.

1. Introduction

Consumers adopt new products based on various considerations, one of which is a relative advantage [1]. In addition, consumers also pay attention to the financial capabilities, namely, price fairness [2] and new product information [3]. These variables become a stimulus for the formation of consumer responses, known as the attitude variable [4], then that variable sparks the intention to adopt new products.

Individual behavior can be predicted through strong individual’s intentions before acting. Therefore, in various studies, the intention variable has become a variable of much concern [3]. The intention variable as a proxy for the decision to act, it applies in various fields of study such as the information technology [5][6], the online shopping [7], and also the transportation [8].

The intention to adopting new product can be seen based on customers attitude toward the product stimulus, in this case is Pertalite gasoline. Pertalite is an innovative product from Pertamina with a higher octane (90 octanes) than Premium gasoline (88 octanes). The new one is positioned as a green product to shift the previous product that has a low octane which is more polluting because of consumption inefficiency so more carbon will be released into the environment which contributes to global warming. Unfortunately, until 2017 the sale of Pertalite has not met the target yet, Premium
consumption is still high. Therefore, the objective of this study is to examine the antecedents of attitude towards the intention to adopt a green product (innovation product).

2. Variable and research model

2.1. Variable

2.1.1. Product knowledge and price fairness. The new products information received by consumers is a source of reference for consumers to assess products. According to Lin (2007) in Chiang and Chang (2014) [3], the product’s composition becomes a consumer concern in making decisions. This shows that product information is a part of consumers' judgment in making purchasing decisions. The study conducted by Arianto [9] also shows the same thing that consumers evaluate the attributes inherent in the product as information in purchasing decisions.

The product prices are also a variable that influences purchasing decisions. The prices offered to consumers is signals of product quality, setting a good price is important. Consumers do the analysis when dealing with the logical and acceptable price of the offer [10].

2.1.2. Relative advantage. New innovation products must be able to show that the product has a relative advantage. Assael [11] states that relative advantage is the level at which consumer’s judge new products to have superiority over older products. The ability of new products to be easily recognized in terms of superiority over old products makes consumer accept it quickly.

2.1.3. Attitude. Attitude is a psychological tendency that expressed through the degree to which a person evaluates that is favorable or not favorable to his behavior. Ajzen [4] states that the feelings of favorable or unfavorable associated with one's acceptance of the stimulus of an object that assessed. Attitudes are antecedent of intention variables based on Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) [4][12][13].

2.1.4. Intention. The intention is a tendency to take action or behavior or something that immediately precedes actual behavior [14]. The intention formed by various stimuli both impacting positive and negative attitudes. The intention to adopt is the desire of consumers to use effectively a product or service in the future.

2.2. Research model

This research focuses on the intention variable mediated by attitude. Antecedents of attitude variable obtained through exploratory research and literature studies that rely on diffusion innovation theory and the theory of planned behavior. The results of the construction formulated in the following research model.

![Figure 1. Research Model](image-url)
3. Methodology

3.1. Population and sampling method
The population in this study is the people in Surakarta city who consume gasoline. The sample is a portion of the population that represents the entire population [15]. This study using purposive sampling method, where the selection of sample members are members of the population with certain criteria [15]. The sample criteria are members of the population who know the difference between Pertalite and Premium products. The target sample for respondents were 120 participants, however, only got 100 respondent to fulfill the test completely.

3.2. Instrument test
This research used the questionnaire as data collection instruments. The questionnaire is feasible to use if it passes the validity and reliability test. The validity test uses confirmatory factor analysis, with a minimum loading factor of 0.4 [15]. Meanwhile, the reliability test uses Cronbach's alpha coefficient [15] with the rule of thumb is equal to or above 0.6.

3.3. Data analysis
The analytical method uses in this study is Structural Equation Modeling (SEM)) using a Partial Least Square (PLS) software. SEM is a multivariate technique that combines aspects of multiple regression and factor analysis to estimate a series of simultaneous dependency relationships [15].

4. Results

4.1. Instrument test (validity and reliability test)

| Indicators | PF  | Intention | PK  | RA  | Attitude |
|------------|-----|-----------|-----|-----|----------|
| PF1        | 0.893 |           |     |     |          |
| PF2        | 0.843 |           |     |     |          |
| PF3        | 0.915 |           |     |     |          |
| Int1       |       | 0.896     |     |     |          |
| Int3       |       | 0.930     |     |     |          |
| Int4       |       | 0.871     |     |     |          |
| Int5       |       | 0.891     |     |     |          |
| PK1        |       |           | 0.841|     |          |
| PK2        |       |           | 0.901|     |          |
| PK3        |       |           | 0.777|     |          |
| RA1        |       |           |     | 0.807|          |
| RA2        |       |           |     | 0.742|          |
| RA3        |       |           |     | 0.897|          |
| RA4        |       |           |     | 0.888|          |
| RA5        |       |           |     | 0.861|          |
| RA6        |       |           |     | 0.854|          |
| Att1       |       |           |     |     | 0.837    |
| Att2       |       |           |     |     | 0.904    |
| Att3       |       |           |     |     | 0.864    |
Table 2. Reliability test

| Variable  | Cronbach's Alpha |
|-----------|------------------|
| PF        | 0.865            |
| Intention | 0.919            |
| PK        | 0.793            |
| RA        | 0.918            |
| Attitude  | 0.917            |

PF: Price Fairness; PK: Product Knowledge; RA: Relative Advantage

Based on the result of validity and reliability test (Table 1 and 2), this research’s instrument met to the all of the rule of thumb for validity and reliability since the factor loadings for validity test were more than 0.4 [14] and also the Cronbach alpha for reliability test was more than 0.6 [15]. As a result, that instrument could be used to collect the data.

4.2. Result

Table 3. The result of SEM PLS Analysis

|               | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (|O/STDEV|) | P Values |
|---------------|---------------------|-----------------|----------------------------|-----------------|----------|
| PF -> Attitude | 0.152               | 0.154           | 0.050                      | 3.057           | 0.002    |
| PK -> Attitude | 0.226               | 0.224           | 0.048                      | 4.668           | 0.000    |
| RA -> Attitude | 0.421               | 0.422           | 0.046                      | 9.134           | 0.000    |
| Attitude -> Intention | 0.668               | 0.670           | 0.037                      | 17.903          | 0.000    |

PF: Price Fairness; PK: Product Knowledge; RA: Relative Advantage

Table 3 shows that all independent variables, namely price fairness, product knowledge, and relative advantage had the T-Statistics’ scores more than 1.96. That means independent variables influenced the attitude variable. Furthermore, attitude variable impact to intention variable since the T Statistics’ score is 17.903 which was more than cut off 1.96 in T table with significance level 5%.

This result implies that consumer attitudes towards innovation products are influenced by price fairness, consumer knowledge of the product, and the relative advantages of the product compared to the previous product. The higher the independent variable (price fairness, product knowledge, and relative advantage) the stronger the consumer's attitude. This result is supported by Rogers's research [1]. Further, according to the effect among the independent variable to attitude, the relative advantage is the highest in influencing attitudes, the original sample score is 0.421 (Table 3).

The positive attitude of consumers towards innovation products (green products) is an antecedent of the intention to adopt green products. The more positive the consumer's attitude is the stronger the intention to adopt. The effect of variable attitudes toward intention is supported by Ajzen's research [12] and Almahamid [5].
5. Conclusion
The intention to adopt an innovative product, especially a green product, depends on the consumers’ responses after getting some stimulus. According to this study, relative advantage is the most powerful variable in creating consumer response. Overall, price fairness, product knowledge, and relative advantage are a good predictor for attitude variable in intention to adopt a new innovative product.

The results of this study can be used by regulation-maker to reduce motor vehicle emissions in order to reduce the effects of greenhouse gases too. The education from regulation-maker to citizen done by emphasizing the superiority of green products compared to previous products. In addition, the reasonable product price also impacts the switch to environmentally friendly fuel consumption.

Acknowledgments
This study was financially supported by the Directorate General of Higher Education of Indonesia.

References
[1] Rogers E M 2003 Diffusion of Innovations (5th ed.) (New York: Free Press)
[2] Mahmud A, Jusoff K and Hadijah St 2013 The effect of service quality and price on satisfaction and Loyalty of Customer of commercial flight service industry World Applied Sciences Journal 23 354–9
[3] Chiang H-S and Chen C-C 2014 Exploring Switch Intention of Users’ Reading Behaviour: An e-book Reader Case Study The Electronic Library 32 434-57
Poddar A, Donthu N and Wei Y 2009 Website customer orientations, Website quality, and purchase intentions: The role of Web site personality Journal of Business Research 62 441–50
[4] Ajzen I 1991 The Theory of Planned Behavior Organizational Behavior and Human Decision Process 50 179–211
[5] Almahamid S., McAdams A C, Al Kalaldeh T and Al-Sa'Eed M 2010 The Relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government Journal of Theoretical and Applied Information Technology 30-44
[6] Davis F D 1993 User Acceptance of Information Technology: System Characteristics, User Perceptions, and Behavioral Impacts Intl. J. Man-Machine Studies 38 475–87
Cowen J B 2009 The Influence of Perceived Usefulness, Perceived Ease of Use, and Subjective Norm on the Use of Computed Radiography Systems: A Pilot Study (Thesis) (Columbus: The Ohio State University)
[7] Shin J L, Chung K H, Oh J S and Lee C W 2013 The effect of site quality on repurchase intention in Internet shopping through mediating variables: The case of university students in South Korea International Journal of Information Management 33 453–63
[8] Bamberg S, Rölle D and Weber C .2003. Does habitual car use not lead to more resistance to change of travel mode? Transportation 30 97–108
Chowdhury S and Ceder A A 2013 The effect of interchange attributes on public-transport users’ intention to use routes involving transfers Psychology and Behavioral Science 2 5–13
Fishbein M and Ajzen I 1974 Attitude Toward Objects As Predictors of Single and Multiple Behavioral Criteria Psychological Review 81 59–74
[9] Arianto A B 2013 Pengaruh Atribut produk, harga, kebutuhan mencari variasi dan ketidakpuasan konsumen terhadap keputusan perpindahan merek dari Samsung Galaxy Series di Kota Malang Jurnal Aplikasi Manajemen 11 294-305
[10] Jung H S and Yoon H H 2012 Why do satisfied customers switch? Focus on the restaurant patron variety-seeking orientation and purchase decision involvement International Journal of Hospitality Management 31 875–84
[11] Assael H 1998 Consumer Behavior and Marketing Action. Consumer Behavior and Marketing Action 6th ed. (Cincinnati, Ohio: South-Western College Publishing)
[12] Ajzen I, Brown T C and Carvajal F 2004 Explaining the Discrepancy Between Intentions and Actions: The Case of Hypothetical Bias in Contingent Valuation Pers Soc Psychol Bull. 30 1108–21

[13] Cronin J J, Brady M K and Hult G T M 2000 Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments Journal of Retailing 76 193–218

Fishbein M and Ajzen I 1981 Attitudes and Voting Behaviour: An Application of the Theory of Reasoned Action Progress in Applied Social Psychology I 253–313

[14] Kotler P and Keller K L 2009 Principal Marketing (New York: Prentice Hall)

[15] Sekaran U 2006 Research Method of Business Ed. 4 (New York: Prentice Hall)