

The Influence of Fuel Switching Behavior on Consumer Mobility in Indonesia

Sanitarianing Anggraini¹, Rizal Edy Halim², Asnan Furinto³, Athor Subroto⁴

Abstract

Consumer migration performed by customers when faced with several brand products. We investigate that it is critical to understand the influence of consumer mobility in Mega city towards fuel purchase in Indonesia. The determinants and consequences of fuel switching behavior examined some company strategies and policies. By using longitudinal time series data that involves 139 respondents, simulation model provides the estimations of switching behavior performance consumer fuel mobility through providers. We also find the impact of the factors can influence switching behavior performance over a certain of time. Furthermore, the dynamics hypotheses towards fuel have significant effect on the subsequent mobility consumer performance in business-as-usual condition. Finally, managerial implications with sensitivity estimations allow the company to do with the relevant strategies consideration.

Keywords: *fuel, migration, mobility, strategies, switching behavior.*

Introduction

Migration activity has been occurred during early 1970's. In recent years, there was a trend in the spatial distribution of population that have been changed. The phenomena that occurs was about the rate of population growth in metropolitan areas slowed consideration because the population in central city of many metropolitan areas has been declined and the suburban growth rapidly. According to this circumstances, the historical trend of migration that people go out from nonmetropolitan areas into metropolitan areas (Greenwood, 1985).

Fuel is a primary need to support daily activities and it purchased everyday with increasing amounts. The fuel availability at gas station must be managed by the government under the auspices of the National Oil Company (NOC). Rubenstein et.al (2009) have been observed broadly that marketing also operates in an ambiguous, fast-changing, uncertain, and complex-marketplace. Consumer will continue to do purchasing activities to meet their needs. They will be exposed variety of products of different types and this may become some driving force for them to change or switch their choices from the previous one and then compare them with expectations formed in their minds.

Indonesia, as one of development country in Asia, has consumer who price sensitive characteristic. The government open new market opportunities for competitors from foreign in order to fill the gap, then NOC's business competition turned over from

¹ Department of Management, Faculty of Economics and Business, Universitas Indonesia, Depok-Indonesia, sanitianing@gmail.com

² Department of Management, Faculty of Economics and Business, Universitas Indonesia, Depok-Indonesia

³ Bina Nusantara University, Jakarta-Indonesia

⁴ Department of Management, Faculty of Economics and Business, Universitas Indonesia, Depok-Indonesia

monopoly into an oligopoly market competition. Under the Oil and Gas Law, subsidized fuel Public Service Obligation (PSO) is open to all business entities, therefore, there are become opportunities for foreign competitors to enter this industry. Competition in the globalization era faced by NOCs is about the availability of similar products between the local and the foreign countries. The global orientation such as global consumption and global identity are the key factors of the attitude variance (Guo, 2013). The high demand for subsidized fuel results in over quota because many customers who are not the target consumers buy the products as well (Issetiabudi, 2019). In order to avoid the scarcity of fuel subsidized, the government issued a policy to start reducing and eliminating fuel subsidies so the available in the gas stations change to non-subsidized. The non-subsidized fuels known with contained high octane (above RON 90) which is considered have a better quality for engine performance and also be responsible the environment friendly impact with assign minimum octane to reduce air pollution.

Consumer switching behavior is a phenomenon that described a complex system due to social change. There are several factors that influence customer to do or not to do switch. This phenomenon issue plausible to solve with system dynamics method. This method is to enhance learning in complex system and fundamentally interdisciplinary (Stermann, 2000). From the previous research usually identified consumer switching behavior model as a part of the methodology but somehow it was made for understanding and intended change in world view as perspective rather than implementation. It is necessary that model will be offered made for estimate the impact so in order to understand a dynamics social change, including policy or behavior (Randers, 2018).

Research problems

The issue about fuel supply and demand gap needs to be consider by the NOC provider to face the increasing customer needs. Meanwhile, NOC has already opened the market in order to fill the gap. The fuel providers consist from foreign country as NOC's competitor, meanwhile consumer recognize the choices of the fuel with different company brands. There has been very limited research in marketing discussed especially in an oligopoly competition. This issue need to be consider by the fuel company to maintain their supply sustainability in order to keep customer satisfaction in long term, especially when faced foreign competitors. We are trying to examine the paradigm on fuel oil intention to switch and identify the switching behavior in dynamics system model (migration behavior). Switching behavior previous research has been conducted based on linear thinking. The framework of migration theory will tried to be apply on this context with the suitable research by offering a new perspective into research model on system dynamics based on non-linear thinking. To complement the existing research gap, the novelty that will be given in this study ,first, to identify the factors of consumer migration behavior in purchasing fuel with limited brand choices. Second, contributes a new perspective of switching behavior research models in different contexts and theoretical approaches through system thinking and provide managerial implications.

Literature Review

Migration theory

The concept of consumer migration in marketing was first reached by Bansal et al (2005). He has tried to identify the framework of switching behavior through service provider by looking at the variables that might be influence it such as quality, value, attitudes, (Bansal and Tylor, 1999), perceived cost (Ping, 1993), alternatives attractiveness (Jones et.al 2000), trust (Chaudhuri and Holbrook, 2001), commitment (Henning et al, 2002), social influence, variety seeking, and also satisfaction (Dabholkar et.al 1999). In previous research, there were factors that can influence this behavior both negatively and positively according those variables. The negative factors may cause push people away to

move to leave the origin (Stimson and Minnery, 1998) while positive factors will pull toward them, but there are also a factor which hold consumer to stay at their origin as known as mooring variable (Moon, 1995). This development paradigm usually called “Push Pull Mooring” (PPM) Theory (Bansal et al, 2005). The existing variables that conceptualization through pull effect was shown as alternative attractiveness that framing consumers intention to switch positively vice versa. The variables including push effects such as satisfaction, value, trust, quality, and price perception were discuss. Besides, mooring effect, known as moderating variables, has individual’s consideration to switch because of their financial, time, effort, ability cost, past behavior, variety seeking, and also the subject norms (social influence) that reflected engagement in certain behavior (Ajzen and Fishbein, 1975).The basic rationale for consumer switching behavior was obtain from migration theory that has been presented by Lee (1966) and advanced by Boyle (1998). The concept of migration was adapted into marketing management science. Bansal (2005) has examined brand-switching into some variables such as switching cost and alternative attractiveness, however only straight to consumer purchase intentions.

Price

Price is become a main factor in order to describe push factors which leads to switching intention. Price fairness examine a consumer’s perception when price has been interpreted reasonable and acceptable and also become determinant of consumer satisfaction and advanced behavioral intention (Liu and Jang, 2009). Price is the most switching determinant and more important than service quality and loyalty (Lee and Murphy, 2005). Price perception may the cause of people do switch. In a provider context, price can be a basic consideration or main reason to examine their loyalty through the product.

Sampling parameters

The variables used in this study are latent with using Likert-6 scale, from strongly disagree – strongly agree. Then it would be converted into a certain quantitative data to be used in the simulation model. Each variable consist of some indicators and the indicators will be calculating by converting the Likert scale into average and summation then be used as input data in the model.

Table 1 Sampling parameters

Sampling parameter	Choices
Setting	Consumers who make fuel purchasing in gas stations in actual time in Jakarta, Bogor, and Depok (in selected location)
Respondents	Consumer who are making a purchase of fuel, have a car, min. fuel purchase frequency once a week, number of fuel purchase.
Date and time	Panel, Everyday (in a month) (7 days a week, Monday-Sunday, gas station operational hours)

Proposed Conceptual Model (non-linear)

The core of the system thinking described that the relationship between each factors are not only give influence in one direction but have a mutual influence to each others. As both cause and effect become consequence of the feedback perspective, then the system dynamics approach tend to look within the system of its problem behavior. In this dynamics model will examine the effect of the relationship between push, mooring, and pull variables into a system. The research model shows the simulation relationship between variables (Figure I) and describe the behavior towards fuel.

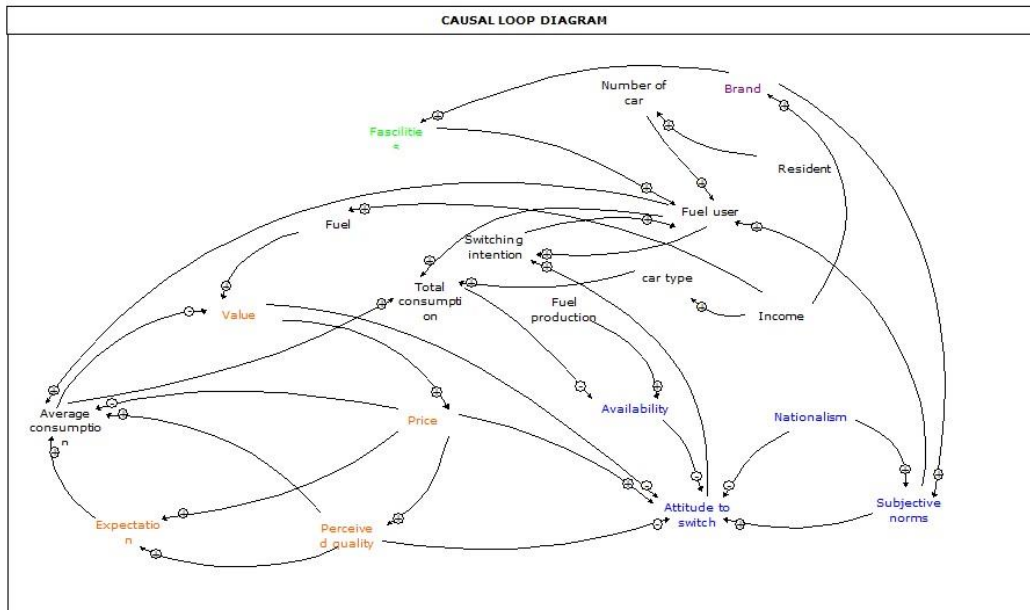


Figure 1 Causal Loop Diagram (CLD) of fuel switching behavior

Hypothesis

Dynamics hypothesis 1: the expectation felt by consumers before they make purchasing will be the basis in order to consider evaluation after purchase. From the way of logical thinking, the first factor that will be affect expectation in this context is price. In normal condition, the expectation is become a boundary that will affect other factors. Based on the characteristics of consumers in Indonesia, the expectation that are considered by first-time by consumers are about the price attached to the product to be purchased. The effect of expectations on prices is positive. The increasing of expectation will also increase the price because it will be related to the perceived quality. Price has a role before consumers make a purchase when it became more expensive than consumers will tend to switch to other similar product. Likewise, the price has an impact on quality. The increasing of the price then the expected quality will have the same polarity. The more expensive in price will be followed by better perception of quality. A good product quality will give good perception of value. The value may consist of what consumer in actual or feel such as satisfaction and the benefit through product. Those will be evaluated towards expectation.

Dynamics hypothesis 2 : Subjective norms is a factor that usually used as an antecedent of mooring factors. It refers to the individu perception respected with their performance or not to perform into spesific behavior (Ajzen and Fishbein, 1975). In order to this understanding, the examination from subjective norms may effect another variable such as switching cost. A its definition that switching cost is representing all cost incurred when customer do switch between different brands or products (Chen and Hitt 2002), including transaction cost, learning cost, and artificial or contractual cost (Klemperer, 1987). Those kinds clasification of the costs become consumer consideration due to decision of the attitudes. Somehow, subjective norms involve the perception of others value assesment to products or services. In the context of this study, subjective norms are emphasized more on the influence of group references because they are may giving strong influence on fuel purchasing decisions. Group references take a part to examine consumer switching behavior. The influence from the people around consumers has an impact on consumer attitudes towards switching. The behavior of people around individual consumers will usually give recommendations or information based on their individual experiences so it will affect consumer attitude toward switching. It exerted can be in the form both positive or negative influences on the evaluation of a product so

consumer will tend to consider their intention to switch. The polarity between group references to attitude toward switching is positive.

Dynamics hypothesis 3 : Consumer intention to switch is something that needs to be anticipated by local company (NOC). When consumer has the intention to switch then they will evaluate and compare with the suitability of expectation previously. The results of this evaluation may affect consumer attitude whether to switch or not to switch in order making further purchase. Attitude is a moored factor that will be against with pull factors. Supporting facilities as a pull factor that will be considering at this logical thinking because the things involved in this factor are be able to change consumer's intention to switch.

Dynamics hypothesis 4: The goals of this research is to examine consumers switching behavior over switching intention. Consumer switching behavior described as the level of the consumer propensity to do switch from one product or service provider to another in the purchase situation (Ping, 1993). Nevertheless, consumers should be have an intention before they decide to behave. The influence given by switching intention on switching behavior is assumed to be positive, vice versa. Commonly, when consumers have an intention then they are usually act in accordance with what is intended. However, the effect of behavior to intention were the opposite depend on the some leverage considerations. This path of system thinking can be used as another dynamics hypothesis.

Result

The dynamics hypotheses that have been identified previously; the model simulation results do not show a change in the polarity relationship between variables. In the dynamics of hypothesis 1, the push factor variable has a positive polarity relationship between variables. From the results of qualitative data collection, consumer expectations of fuel are currently affordable fuel prices and are in accordance with fuel RON. The current condition is close to consumer expectations for fuel products of 100%. Prices that are considered affordable and in accordance with the current fuel quality in 2021. Price is one of the factors that can encourage consumers to switch to other providers. In the context of this study, the price also has an influence to push consumer away from previous choice.

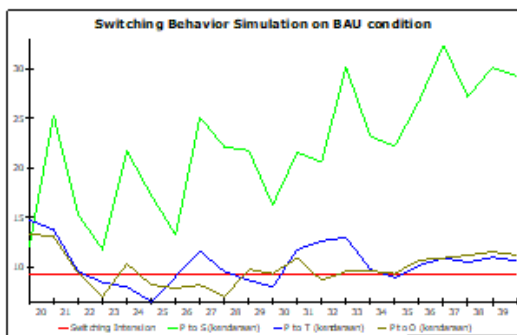
Business as usual condition

Business-as-usual condition is a description of existing conditions that occur without any scenarios set on the behavior of the system. The business-as-usual score is a standard score to determine the baseline for each indicator in each factor before determining changes in the scenario. Consumers have a minimum perception requirement on each indicator. Consumer wants to have a maximum satisfaction towards their expectations, so it determined in a maximum percentage of 100% for the optimal condition. There is a difference in the BAU score for each brand provider. The average BAU score on push factor for the Pertamina, Shell, and Vivo providers are in the range of 70% -77%, means in the same range, while for the BP brand it reaches 90%. From these results, it can be seen that the highest percentage score for push factor is BP user's providers, so it is very possible for BP users to doing switch behavior to other providers because the average value of the push factor is higher than others. However, for the other three brands, the average value of the push factor is relatively the same with each other so that the influence of the push factor on brands other than BP AKR. In addition, of the four brand providers, Vivo has the highest average pull factor value (see Table 2).

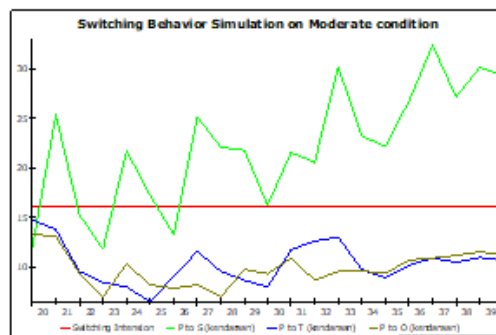
Table 2 Business-as-Usual (BAU) score

Factors	Variables	Company Fuel Providers			
		Pertamina	Shell	Vivo	BP AKR
Push	Expectation (%)	100	100	100	100
	Price (%)	69.81 (IDR 7650)	64.47 (IDR 10580)	66.11 (IDR 7190)	90.56 (IDR 9075)
	Perceived Quality (%)	83.47 (RON 90)	82.84 (RON 92)	75.14 (RON 89)	91.67 (RON 90)
	Perceived Value (%)	76.61	79.01	72.34	89.35
Average score		77.30	74.44	71.20	90.52
Mooring	Subject Norms (%)	57.44	55.64	54.17	77.78
	Nationalism (%)	66.81	66.22	73.15	76.39
	Availability (%)	68.47	72.41	72.22	57.87
Average score		64.24	64.76	66.51	70.68
Pull	Facilities (%)	76.97	78.07	88.33	68.33

The dynamics simulation behavior below shows how Pertamina user towards other fuel providers. From Figure 2 below, the switching behavior on the quality of RON 92 fuel products is based on two conditions (a) BAU condition and (b) moderate condition. Figure 6 (a) shows that switching intention is at a score of 9.68% with the condition of the push, mooring, and pull factors being in the condition of the BAU score. This score means that in the BAU condition, 9.68% of fuel users have the intention to switch. The dynamics of switching behavior shown by the simulation in the graph shows that the switching behavior based on the intention of the fuel user is the largest Pertamina user switching to Shell when compared to the intention to switch behavior from Pertamina to Vivo and Pertamina to BP AKR. Meanwhile, the intention to switch from Pertamina to Vivo and BP AKR is at the switching intention line. This explains that the intention of Pertamina users to switch to Vivo or BP AKR is still low. If you look at the dynamics conditions of switching behavior in moderate conditions in Figure 2(b), it shows an increase in intention to switch by fuel users, which is 15.75%. The moderate condition shows the percentage change in score for several push, mooring, and pull factors from existing conditions.



(a) BAU condition Pertamina user



(b) Moderate condition Pertamina user

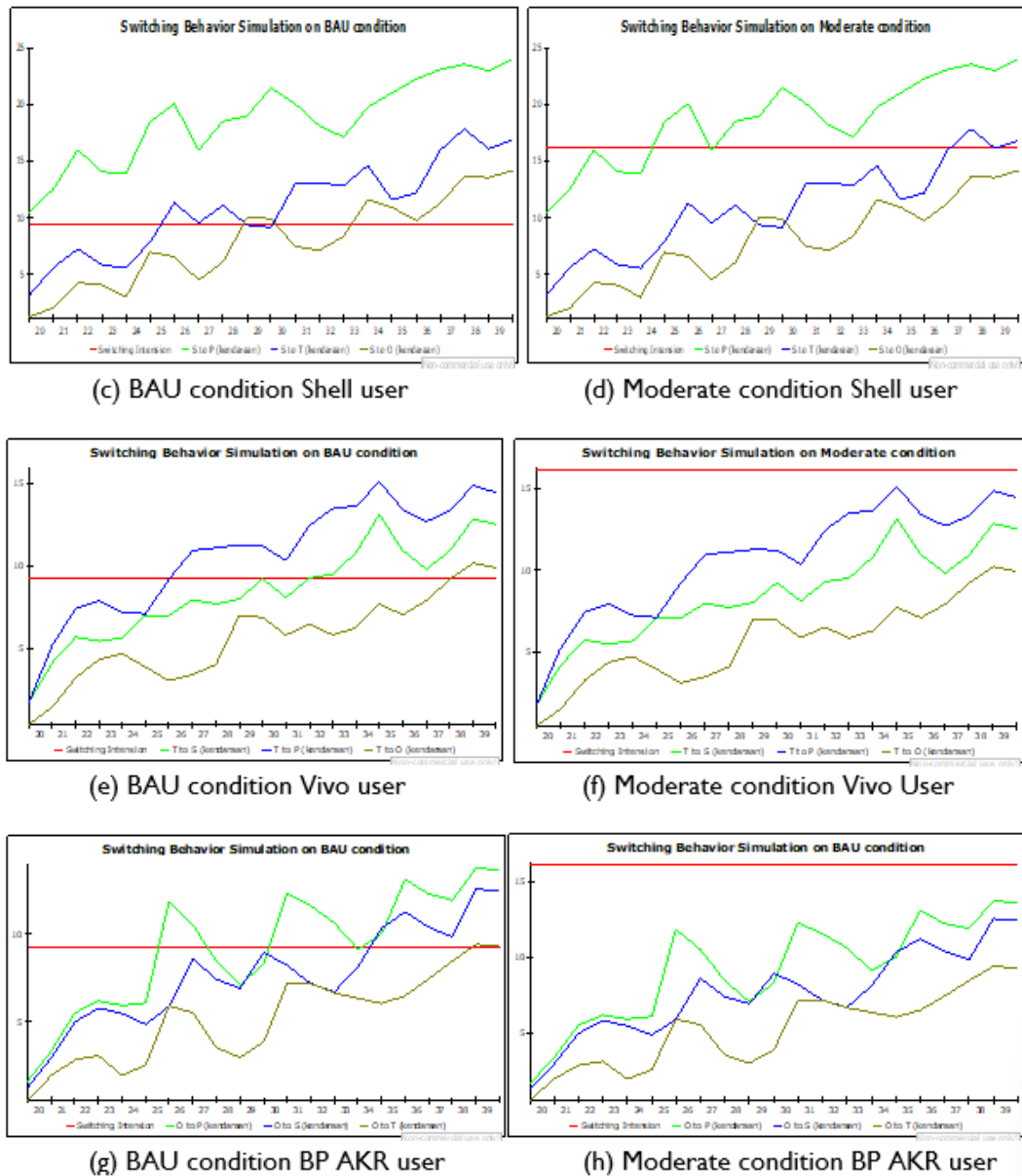


Figure 2 Switching behavior simulation between providers in BAU and Moderate

Conclusion

This study focuses on switching behaviour towards fuel products where the competition that occurs is in an oligopoly market involving four fuel providers making its possible for consumer mobility in mega city of Indonesia. Consumers who use cars to support their daily activities require a high supply of fuel. NOC products facing foreign competitors are a threat needs to be anticipated through the appropriate strategic policies because switching behavior in RON 92 usually follows. Therefore, based on the migration theory which is the basic reference the focus of this research has identified and examined the factors that can influence switching behavior through this context. The push factor has an influence on the positive polarity between the variables, starting from expectations, prices, perceived quality, and perceived value. This polarity relationship did not change in the results of the study. In addition, the mooring factor has been adapted to the research context. The existence of a new variable involved in the context of the study was investigated to see its effect to increase the sense of moored. Meanwhile, the supporting facilities as the pull factors also give influence and attract consumer to switch.

Strategic Implementation

The government as the owner of the NOC company must be able to determine the policy on the availability of fuel at the gas station. In addition, it is also necessary to support the policy of setting a stable fuel price with or without subsidies. From this study, expectations have an important influence and role in determining fuel purchasing behavior before identifying other factors that can have an impact on switching behavior. One important factor that must be given attention by the government is the mooring factor so that fuel users do not switch to foreign products. In addition, the pull factors owned by competitors also need to be maintained and further identified so that the government maintains the facilities owned by domestic products.

Limitations and Further Research

During these findings, several different issues have appeared and the researchers see that some interesting propositions for other research can be applied. The context of the research for future research can be developed by considering some external factors so a higher rate of change could be more interesting to analyze switching behavior. The data collection in this research is longitudinal data information and future research should consider a larger number of respondents from other potential locations to provide more generalized results. The variables used in the measurement of switching behavior through push, pull, and mooring factors can still be added or challenged and adapted to the wider context and scope with different respondent characteristics. From this study only consisting of competition between four providers, future research is still possible to examine more than four competitors with more comprehensive dynamics models switching behavior.

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