

EXPLORATORY FACTOR ANALYSIS OF MARKETING MIX OF PURCHASING DECISION TO BUY GREEN PRODUCTS IN THAI CONSUMERS

Ampol Chayomchai ^a, Chaturong Charastrakul ^b

^aPhetchabun Rajaphat University, Phetchabun, Thailand.

^bChaturong Cooling Limited, Nonthaburi, Thailand.

Corresponding Email: ampolmarketing@gmail.com

Abstract

This research aimed to study the factors of marketing mix of purchasing decision to buy green products in Thai consumers. A total of 400 participants who took part in the study were Thai consumers who used refrigerators or influenced the buying decision of refrigerator. The purposive sampling method was performed and the online questionnaire survey was utilized. The research data was analyzed by the principle component analysis. The study used the exploratory factor analysis and rotated the axis by varimax method. The result revealed the 4 key factors of consumer purchasing decision in green products buying in Thai consumers were extracted include (1) Price and information benefits, (2) Product promotion, (3) Marketing promotion, and (4) Green product attributes. These factors could explain the accumulated variation by 53.64 %. So, this research suggests that the producers and distributors in green products should focus on the 4 key factors from this study for designing the business strategies and marketing mix to influence Thai consumers' purchasing decision.

Keywords: Exploratory Factor Analysis, Marketing Mix, Purchasing Decision, Green Products.

1. Introduction

Sustainability is a key concern today. It consists of 3 parts – society, environment, and economy (Savitz, 2013). Global warming and international regulation in the warming control are affecting all manufacturing including refrigerator products. Governments around the world are responding to the challenges of environmental issues and creating policy guidelines to control pollutants (Dey-LaGuardia, & Srinivasan, 2011). Government efforts to tackle climate change are creating new markets for low carbon technologies such as efficient vehicles, alternative fuels, and renewable energy systems (Kane, 2011). Various green movements have emerged (Bask et al, 2013).

To implement the sustainability strategy in the company, functions like logistics needs to play a prominent role in the operational efficiencies and the carbon footprint reduction (Dey-LaGuardia, & Srinivasan, 2011). Many producers use green technology in their operation to reduce the negative impact on the environment and more choose the eco-friendly raw materials in the production process (Shecco, 2014). Environmental concern and awareness have spread to society and industry in general, thus firms can respond to its potential markets using marketing mix strategies (Salgado-Beltran, et al, 2012). Also, consumers have become more aware of the consequences of their consumption decision (Bask et al, 2013). Shabani et al. (2013) explained that green or eco-friendly consumers refer to those who have examined the effect of company

operations and consumption in their buying behavior and relevant activities in the market. Thus, many companies see 'green' as a source of competitive advantage (Kane, 2011).

Many studies found that the eco-friendly material like Hydrocarbon in Green refrigerators was the choice of safety and it was better than the old technology in terms of energy saving and efficiency (Stafford & Hartman, 2013). In the past, some refrigerants had used in the refrigerator manufacturing, such as Chlorofluorocarbon (CFC), could negatively affect the environment and global warming (Dryzek, 1997). New safety refrigerants like Hydrocarbon (HC) were the natural agents which one many manufacturing selected to replace the old one because of concerns about global warming and environmental issues (Maclaine-Cross & Leonardi, 1997)

This study provides market evidence on how to approach Thai consumers, regarding marketing-mix elements of Green product purchase decision. The authors need to study the consumer behavior in Green product focused on the refrigerator market in Thailand because this market has a high potential for business growth. As Euromonitor data in 2016, Thailand is one of the key exporters in refrigeration appliances and the top manufacturers like Toshiba invest in research to understand consumer behavior for developing the new product to match changing lifestyles (Euromonitor, 2016).

2. Literature Review

2. 1 Consumer Purchase Behaviour

Trends in consumer behaviour are complex (Kane, 2011). Many factors contribute to a consumer's decision to buy products. For example, the consumer study of buying organic products found that some factors - income, education, marriage, and access to organic food - are associated with the buying and also the interaction between education and income had the effect on buying the organic products (Dimitri & Dettmann, 2012). Some study found that the consumers are willing to pay a premium price for sustainability features (Bask, Halme, Kallio, & Kuula, 2013). Greener business will become more trusted in the marketplace, attract customers who value environmental performance (Kane, 2011). Green consumption indicates consumers' endeavour to protect eco-environment during purchasing, use and disposal and minimize the negative effects on the environment (Lao, 2014). Kane (2011) stated that the green consumer products for the consumption such as eco-friendly cosmetics, appliances, vehicles, clothes, and food. Consumer innovativeness directly influenced consumer attitude and then further influenced green consumption intention and behaviour (Lao, 2014). The additional spending of consumers is tending to go towards low carbon purchases (Kane, 2011).

2. 2 Marketing Mix and Green Marketing

Gronroos (1994) discussed on the marketing mix – the mix of Four Ps – including product, price, place, and promotion. It found that the four Ps were never applicable to all markets and to all types of marketing situations. Thus, researchers and marketers have to develop the better one for fitting with the today situations. However, most of the business companies still use the four Ps for their business and strategic plans but they use this concept in different ways depending on their existing resources, market conditions, and customers' needs (Goi, 2009). Lin (2008) studied the banking and travel industries and concluded that brand image and perceived service quality was important for customers and have significantly influenced on customers' actual behaviour. Moreover, it found that the product involvement has not significantly influenced customer behaviour in both industries, but proved indirectly that the intervening factors like product attribute affected the relationship between the product involvement and customer behaviour. Some study suggested that for the success of green marketing it is necessary to add the four Ss – customer satisfaction, product safety, social acceptability and sustainability of the products – to four traditional Ps of marketing (Akehurst et al, 2012). Lao (2014) stated that the influence of consumption innovativeness on green consumption behaviour offers new ideas and new thoughts on the success of green marketing. Tactics to influence consumer behaviour in green products are designing the product to reinforce green behaviour, making green behaviour simple, pricing

products and product options to incentive green behaviour, and providing information about green or eco-friendly products (Kane, 2011). To make the green marketing success and attract consumers' interest, companies should make the green product novel, fashionable and take the lead by adopting innovative things during green marketing (Lao, 2014). Besides, companies implement green marketing strategies to satisfy the customers, it needs to divide the green market into different segments to formulate green positioning and green marketing mix strategies (Chen & Chang, 2012).

2. 3 Green Products

Generally, green consumer behaviour, especially green purchase behaviour, is well planned and targeted. They are not only reasoned, but also concerned about the environmental condition in consumption (Lao, 2014). The green product is one that fulfils the sustainability targets and many green companies have attracted investments (Kane, 2011). Chen and Chang (2012) explained that preparing resources to increase green perceived value and decrease green perceived risk is used to enhance green trust and green purchase intentions. Thus, marketers have to develop strategies for raising consumer perceptions of green value and enhancing the green trust of their customers. Akehurst et al, (2012) concluded that the consumers with higher ecologically conscious behaviour showed higher green purchase intention and ecologically conscious behaviour had a positive impact on green purchase behaviour. Luzio and Lemke (2013) noted that green consumer behaviour is influenced by compromise and confidence. Compromise is related to consumers' willingness to select between environmental benefit and their cost while confidence assesses the perception that related to environmental issues and product claims.

3. The Research Objectives

The main objective of this research was to study the factors of the marketing mix of purchasing decision to buy green products in Thai consumers. The study aimed to redefine the marketing-mix elements for Green refrigerator products in Thailand market.

4. Methodology

The target population in this study was the users who used the refrigerator products and influencers who involved in the decision process of refrigerator product buying. As the overall number of the target population could not be determined, this research has utilized Cochran's formula. According to the sampling technique of Cochran (1977) at the confidence level and error of 95% and 5 %, respectively, the sample size of 385 responses was expected. The structured questionnaire was designed to collect data. It had twenty items related to the proposed four dimensions of the marketing mix (Kotler & Keller, 2012). For content validity analysis by using Item Objective Congruence (IOC), the questionnaire was checked by 3 experts. It found that the IOC of all items was above .70. Therefore, the questionnaire was appropriate to use (Hair, et al., 2014). Next, a reliability analysis (Cronbach's alpha) was performed for all questionnaire items with the result of .92, well above a value of .70, indicating an acceptable reliability (Brace et al, 2012). So, the questionnaire was appropriate to use for this research. The specific items of the questionnaire are depicted in Table 1. The research participants were sampled by the purposive sampling method and the online questionnaire survey.

Table 1: Questionnaire items and codes

Codes	How important is each factor for your decision on whether to buy a refrigerator?
X1	Brand recognition and reputation
X2	Additional features, for example ice maker and drinking water dispenser
X3	Product and services - Design
X4	Energy efficiency

X5	Product and services being environmentally friendly
X6	Product and services using environmentally friendly refrigerant
X7	Value for money when compared to other brands
X8	Price that is inclusive of delivery and other services
X9	Warranty terms
X10	Possibility to pay by installments
X11	The channel is convenient with easy access
X12	Possible to learn about the product details through websites or emails
X13	Has a customer call center
X14	Offer special gifts and giveaways
X15	Offer price reduction or discounts
X16	Offer gift voucher rewards
X17	Points reward schemes
X18	Advertisements
X19	Giving useful information and recommendation
X20	Promoting by the sales person

In order to achieve the research objective, two main statistical techniques were employed. Firstly, descriptive statistical methods were used to examine the demographic information. Secondly, the exploratory factor analysis (EFA) was used to identify the underlying latent variables that significantly determine the factors of the marketing mix of purchasing decision to buy green products in Thailand.

5. The Research Results

A total of 400 usable questionnaires were used for further analysis. The authors ran the descriptive analysis first. And next, the exploratory factor analysis was employed to extract the marketing mix elements of Green product buying behaviour.

5. 1 Descriptive Analysis

The descriptive analysis described the characteristics of participants who used or influenced to buy the refrigerator products. The descriptive statistics used in this research consisted of frequencies and percentages (Table 2).

Table 2: Sample characteristics

Categories	Frequencies/Percentage
Gender	Male 196(49.0%); Female 204(51.0%)
Age	< 26 years 70(17.5%); 26-35 years 142(35.5%); 36-45 years 123(30.8%); 46-55 years 54(13.5%); > 55 years 11(2.8%)
Status	Single 170(42.5%); Married 217(54.3%); Divorced or Widowed or Separated 13 (3.3%)
Degree	Undergraduate 57(14.3%); Bachelor degree 286 (71.5%); Postgraduate 57(14.3%)
Income	< 600USD 84 (21.0%); 600-1,200USD 161 (40.3%); 1,200-1,800USD 86 (21.5%); 1,800-2,400USD 34 (8.5%); > 2,400USD 35 (8.8%)

The sample comprised of 400 respondents. Responses from 196 (49.0%) of Male and 204 (51.0%) of Female respondents were obtained. Within the age group of 26-55 years, about 97% of respondents were covered. In the aspect of Status, 42.5% of respondents were Single status and 54.3% of them were Married status. Next, it indicated that a majority of respondents was a

Bachelor degree. In terms of Income, the largest percentage was between 600-1,200 USD (40.3%).

5. 2 Exploratory Factor Analysis

The study utilized the exploratory factor analysis for finding the marketing mix elements of Green purchase behaviour. Thereby, using Principal Component Analysis with Varimax rotation was performed to see if the observed variables loaded together as expected and meet the criteria of reliability and validity.

The KMO and Bartlett's test was run to test the validity of the data. The KMO measure of sampling adequacy is a test of the amount of variance within the data that could be explained by factors, the value closer to 1 is better (Brace et al, 2012). According to the Table 3, the obtained measure was .873. Therefore, the value of .873 was a solid indicator of the validity of the data. The Bartlett's test indicates that the data is factorable if $p < .05$ (Brace et al, 2012). As it showed in Table 3, Bartlett's test of this study was $p < .05$.

Table 3: The result of the KMO and Bartlett's test

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.		.873
Bartlett's Test of Sphericity	Approx. Chi-Square	2734.838
	Df	190
	Sig.	.000

The results of the factor analysis are presented in Table 4. As can be seen in the table, four factors with Eigenvalues greater than 1 were extracted using principal axis factoring and oblique rotation. The pattern matrix extracted variables were grouped into four highly correlated constructs or factors. The four discrete factors explained a total variance of 53.6% in the data.

Table 4: Summary of the extracted factors

Components	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.268	31.338	31.338
2	1.875	9.375	40.713
3	1.501	7.506	48.219
4	1.084	5.420	53.639

As Table 5 showed the rotated components matrix, the factors demonstrated sufficient convergent validity, as the loadings recorded to be above the recommended minimum threshold of 0.350 for the sample size of 300 (Hair, et al., 2014). The factors also demonstrated sufficient discriminant validity, as the correlation matrix (Table 6) shows no correlations above 0.700.

Table 5: Rotated Components Matrix

Variables	Components				Items
	1	2	3	4	
X7	.676				Value for money when compared to other brands
X8	.610				Price that is inclusive of delivery and other services
X11	.604				The channel is convenient with easy access
X15	.598				Offer price reduction or discounts
X9	.554				Warranty terms

X12	.532		Possible to learn about the product details through websites or emails
X20	.715		Promoting by the sales person
X18	.645		Advertisements
X19	.613		Giving useful information and recommendation
X13	.537		Has a customer call center
X3	.490		Product and services – Design
X10	.462		Possibility to pay by installments
X17	.764		Points reward schemes
X16	.748		Offer gift voucher rewards
X14	.720		Offer special gifts and giveaways
X2	.467		Additional features, for example icemaker and drinking water dispenser
X1	.360		Brand recognition and reputation
X5		.837	Product and services being environmentally friendly
X6		.832	Product and services using environmentally friendly refrigerant
X4		.598	Energy efficiency

Table 6: Correlation matrix

Components	1	2	3	4
1	1			
2	.575	1		
3	.497	.604	1	
4	.448	.424	.271	1

After performing the EFA, the marketing-mix elements were renamed or redefined (Table 7). The first factor consisted of six variables and named 'Price and information benefits.' The second factor also consisted of six variables and was named 'Product promotion.' The third factor consisted of five variables and was named 'Marketing promotion.' And the last one, the fourth factor, named 'Green product attributes' and consisted of three variables.

Table 7: Components extracted

Components	Factor Names	Numbers of Variables	Factor loadings	Variables
1	Price and information benefits	6	0.532-0.676	X7, X8, X9, X11, X12, X15
2	Product promotion	6	0.462-0.715	X3, X10, X13, X18, X19, X20
3	Marketing promotion	5	0.360-0.764	X1, X2, X14, X16, X17
4	Green product attributes	3	0.598-0.837	X4, X5, X6

Cronbach's alpha .70 was an acceptable lower limit for reliability coefficient (Brace et al, 2012). As can be seen from the Table 8, the Cronbach's alpha value has exceeded .70 for all factors extracted through EFA indicating the internal consistency of the developed measures.

Table 8: Cronbach's alpha values of the factors extracted

Components	Factors	Number of Items	Cronbach's Alpha
1	Price and information benefits	6	.76
2	Product promotion	6	.77
3	Marketing promotion	5	.74
4	Green product attributes	3	.75

6. Discussion and Conclusion

The purpose of this research was to study and redefine the marketing mix elements of purchasing decision behavior of green products in Thailand context. Based on the result of the analysis of research findings, it can be concluded that green products' marketing mix was different from the traditional four Ps. The research model in Figure 1 shows that it has four marketing mix elements of Green product buying behaviour - Price and information benefits, Product promotion, Marketing promotion and Green product attributes.

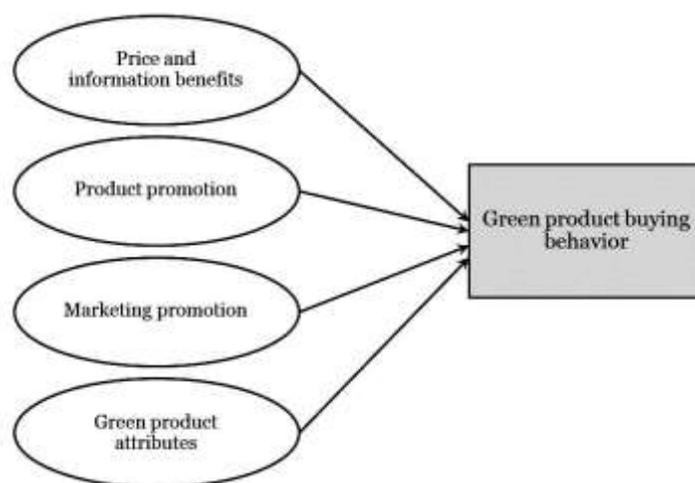


Figure 1: Research Model

Price and information benefits for this study include Value for money, Price with discount and others services, Warranty terms, and Convenient access with information through internet channel. This result implies that consumers will purchase the green product when they can receive and understand the price and information benefits of the green product. Another useful piece of information for consumers' decision is the green product attributes. This, it about environmentally friendly features like energy efficiency and eco-friendly materials use. This result is consistent with Luzio and Lemke (2013) who noted that green consumption behaviour is related to consumers' consideration in the environmental benefits and assesses the perception that related with environmental issues and product claims.

For product promotion and marketing promotion, they include Promoting by brand recognition, product and services details/designs, special offerings, sales-person promotion, advertisements, useful information and recommendation, and call center. This result implies that consumers' purchase decision is related to the green product promotion and the activities of marketing promotion. Kane (2011) explained that tactics to influence the green product purchase decision are designing the product and product options to reinforce green consumer behaviour and providing the key information about green or eco-friendly products.

In conclusion, companies or marketers could reevaluate their marketing strategies to ensure more understanding for consumers in green product attributes, product benefit information, price

benefits and special offerings, and the communication channel where they can access and find the green product information.

7. Research Implications

The managerial implication of this study is important for companies, both producers and distributors, in Thailand to recognize that the marketing mix elements of green purchasing are different. Marketers need to focus on green product attributes and the price and information benefits of the consumers. Also, it needs to focus on the promotion of both products attributes and marketing activities. Marketing strategies are assets which have to invest more effort in the market for increasing green product perception, trust, and purchase. This requires strengthening the consumer perception first in green-related communication, in all formats, be creative in express the relationship between a product/service and the environmental issues.

Finally, the authors recommend researchers to consider qualitative methods for collecting empirical data, especially on factors already developed in this paper using the qualitative approach. This could potentially further support the findings of this paper with a more profound analysis or lead to other conclusions.

References

- i. Akehurst, G., Afonso, C. & Goncalves, H. M., 2012. Re-examining green purchase behaviour and the green consumer profile: New evidence. *Management Decision*, vol. 50, no.5 , pp. 972-988.
- ii. Bask, A., Halme, M., Kallio, M. & Kuula, M., 2013. Consumer preferences for sustainability and their impact on supply chain management: The case of mobile phones. *International Journal of Physical Distribution & Logistics Management*, vol. 43, no. 5/6, pp. 380-406.
- iii. Brace, N., Kemp, R., & Snelgar, R. 2012. *SPSS for Psychologists*.5th ed. New York: Palgrave Mcmillan.
- iv. Chen, Y. S. & Chang, C. H., 2012. Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust. *Management Decision*, vol. 50, no. 3, pp. 502-520.
- v. Cochran, W. G., 1977. *Sampling techniques*. 3rd ed. New York: John Willey and Sons.
- vi. Dey, A., LaGuardia, P., & Srinivasan, M., 2011. Building sustainability in logistics operations: A research agenda. *Management Research Review*, vol. 34, no. 11, pp. 1237-1259.
- vii. Dimitri, C. & Dettmann, R. L., 2012. Organic food consumers: What do we really know about them? *British Food Journal*, vol. 114, no.8, pp. 1157-1183.
- viii. Dryzek, J. S., 1997. *The politics of the Earth: Environmental discourses*. Oxford: University Press.
- ix. Euromonitor. 2016. *Refrigeration appliances*. [Online] Available at: <http://www.euromonitor.com/refrigeration-appliances-in-thailand/report>. [Accessed June 10 2016]
- x. Goi, C. L.,2009. A review of marketing mix: 4Ps or more? *International Journal of Marketing Studies*, vol.1, no. 1, pp. 2-15.
- xi. Gronroos, C., 1994. From marketing mix to relationship marketing: Towards a paradigm shift in marketing. *Management Decision*, vol. 32, no.2, pp. 4-20.
- xii. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E., 2014. *Multivariate data analysis*. 7th ed. US: Pearson Education.
- xiii. Kane, G., 2011. *The green executive: Corporate leadership in a low carbon economy*. New York: Earthscan.
- xiv. Kotler, P.& Keller, K. L., 2012. *Marketing management*.14th ed. New Jersey: Prentice Hall.
- xv. Lao, K., 2014. Research on mechanism of consumer innovativeness influencing green consumption behavior. *Nankai Business Review International*, vol. 5, no. 2, pp. 211-224.
- xvi. Lin, W. B., 2008. Construction of on-line consumer behavior models: A comparative study of industries in Taiwan. *International Journal of Commerce and Management*, vol. 18, no.2, pp. 123-149.
- xvii. Luzio, J. P. P.& Lemke, F.,2013. Exploring green consumers' product demands and consumption processes: The case of Portuguese green consumers. *European Business Review*, vol. 25, no.3, pp. 281-300.
- xviii. Maclaine-Cross, I. L.& Leonardi, E., 1997. Why Hydrocarbons save energy. *AIRAH Journal*, vol. 51, no.6, pp. 33-37.
- xix. Salgado-Beltran, L., Espejel-Blanco, J. E., & Beltran-Morales, L. F., 2012. Marketing mix influencing organic foods purchase of Mexican consumers. *Proceedings of the 13th Management International Conference*, Budapest, Hungary, November 22-24, 2012.
- xx. Savitz, A. W., 2013. *Talent, transformation, and the triple bottom line: How companies can leverage human resources to achieve sustainable growth*. San Francisco: Jossey-Bass.
- xxi. Shabani, N., Ashoori, M., Taghinejad, M., Beyrami, H., & Fekri, M. N., 2013. The study of green consumers' characteristics and available green sectors in the market. *International Research Journal of Applied and Basic Sciences*, vol. 4, no. 7, pp. 1880-1883.

- xxii. Shecco, 2014. *Guide 2014: Natural Refrigerants: Continued Growth and Innovation in Europe*. [Online] Available at: <http://publication.shecco.com/publications/view/2014-guide-natural-refrigerants-europe> [Accessed July 10, 2016]
- xxiii. Stafford, E. R., & Hartman, C. L, 2013. Promoting the Value of Sustainably Minded Purchase Behaviors. *Marketing News*, pp. 28–33.