BRAND SWITCHING FOR THREE SARONG BRANDS IN MARUTHAMUNAI: A USE OF THEORY OF STOCHASTIC PROCESS

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ABSTRACT

Brand switching occurs in consumer products since they can be substituted for each other. Most of the people in Maruthamunai wear sarongs specially, three brands such as white brand, normal colour brand and full colour brand. Previous studies witness that switching behaviour of consumer products have been analysed in different setting. However, studies in Srilankan context are limited to researchers' search. Thus, there is a need to study about switching behaviour in different industries. Objectives of this study are to know brand insistence for selected three brands; to know the switching rate i.e. switching behavior for selected three brands and to know the brand loyalty of selected three brands. This study used 385 sarong users in Maruthamunai. They were selected on the basis of random sample selection. Research instrument was a questionnaire. This study used stockastic matrix, Markov Chains and notations of Markovian Model. Results revealed that there is high brand insistency for white brand. Moderate brand insistency exists for normal colour brand. Low brand insistency exists for full colour brands. Findings revealed that the highest switching rate would happen in white brand. Switching rate would be moderate for normal colour brand. The lowest switching rate would happen in full- colour brands. Further, it was found that the highest brand loyalty exists for white brands than normal colour brand and full colour brand. It concluded that of the three brands, white brand has the highest brand insistence, brand switching and highest brand insistence, brand switching and brand loyalty. Normal colour brand has the moderate in all these three aspects. Full colour has the lowest in all these three aspects. This study has the implication for the producers of all three brands.

Keywords: *Brand switching, Maruthamunai, sarong brands, stochastic process.*

Introduction

Brand is a name, sign, symbol or design used to identity a product and distinguish it from another product, service or business. Brand insistence refers to tendency to be continued with existing brand in future. Brand switching is the process of choosing to switch from routine use of one product or brand to steady use of a different but similar product. Brand switching occurs in consumer products since they can be substituted for each other. Brand loyalty refers to consumer's behaviour of repeatedly purchasing a specific brand over a certain period of time. Sarong usage is common in Ampara Coastal Belt Areas. That customers evaluate brands, develop images of brands with varying degrees of loyalty is well established (Keller, 1993; Park, Jun & Shocker, 1996; Arvind Nivedita, 2010). Product attributes are the image building features of a product which may include packaging, branding, labeling, design, colouring, quality, price, warranty and servicing (Biodun, 2002). Maruthamunai is one of the villages situated in Ampara Coastal Area that produce and market sarongs too other parts of the Island. Most of the

people in Maruthamunai wear sarongs specially, three brands such as white brand, normal colour brand and full colour brand on many occasions such as off- office hours, village functions, festivals, weddings, home visits, and so on. However, sarong users switch from one brand to another time to time. Chaarlas & Rajkumar (2012) indicated that if a consumer's propensity to switch is known, the market can be modeled to indicate future market share and the relative positioning of the competing brands.

Statement of the problem

Different studies have been conducted in different countries and in different industries. Empirical evidences shows that switching behaviour has been modeled in numerous studies. Awogbemi, Oloda and Osama (2012) studied about modeling brand switching in consumers' products in Nigeria. In this study, it was examined the relevance of product attributes to switching rates with reference to three brands of soft drinks. Markov chains were employed to determine the brand loyalty of the consumers of the soft drinks and the future market shares in the long run. Sequel to the balance vector generated, it was discovered that the consumers exhibited the most brand loyalty towards Fanta. Similarly, Joe, Alice and Sternthal (1978) studied about brand switching. They used panel data for two consumer packaged goods indicates that media-distributed coupons and cents-off deals induce brand switching and result in less loyalty when retracted than if no deal is offered. In contrast, package coupons stimulate brand loyalty which is maintained when they are retracted. It was concluded that the extent to which economic utility theory and self-perception theory follows the brand switching. Previous studies witnessed that switching cost results in sales decline for products. Some other studies have proved that brand switching causes varying competition. Due to these reasons, there may be chances for sales fluctuation and increased competition among three brands such as white brand, normal colour brand and full colour brand. These previous studies witness that

switching behaviour of consumer products have been analysed in different setting. However, studies in Srilankan context are limited to researchers' search. Thus, there is a need to study about switching behaviour in different industries. In addition to these empirical findings of previous search of literature, evidence from industrial experts termed as owners of weaving centres were also not in same opinion regarding the switching behaviour of sarong users among three brands i.e. white brand, normal colour brand and full colour brand. Thus, researcher selected weaving products for studying about switching behaviour.

Objectives of this study

Objectives of this study are to:

1. To know brand insistence for selected three brands

2. To know the switching rate i.e. switching behavior for selected three brands

3. To know the brand loyalty of selected three brands

Significance for the study

Number of studies has been conducted time to time since they play an important role in marketing for marketer, customer and the community. Customers evaluate brands, develop images of brands with varying degrees of loyalty is well established (Keller, 1993; Park, Jun & Shocker, 1996; Arvind Nivedita, 2010). Product attributes are the image building features of a product which may include packaging, branding, labeling, design, colouring, quality, price, warranty and servicing (Biodun, 2002). Every consumer of a product is expected to have utility function for each of these attributes. Utility function enables a consumer of a product to study how product satisfaction varies with alternative levels in each of the attributes. A good brand induces competitive advantage and prevents competition. For instance, Lake (2014) stated that brand brand is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of

other sellers. Therefore it makes sense to understand that branding is not about getting your target market to choose you over the competition, but it is about getting your prospects to see you as the only one that provides a solution to their problem. Therefore, marketers have to prevent customers from brand switching. Branding has many advantages such as delivering clear message to customers, confirming marketers' credibility, connecting marketers' target prospects emotionally, motivating the buyer and generates user loyalty. When marketer allows customers to switch from one brand to another, gaining these advantages would become questionable. Thus, a marketer has to be concentrated on brand switching about their brands. Brand switching is a loss to the company. To succeed in branding marketer must understand the needs and wants of their customers and prospects. Thus, brand switching analysis should be conducted time to time for the betterment of the company. Brand resides within the hearts and minds of customers, clients, and prospects. It is the sum total of their experiences and perceptions. Maruthamunai is one of sarong producing city in the Island. Sarong production fulfills the local demand for men who wear sarongs. Thus, when studying about brand switching behaviour of sarong users consumers may be sustained for long term for local consumption of sarongs. Sometimes, brand switching can lead sarong users to shift from one to another. Thus, a particular manufacture may face switching cost in due course. This is why this study is undertaken to make awareness about the switching behaviour among sarong manufacturers.

Review of Literatures

Brand switching can be studied using the stochastic theory. Properties of stochastic theory relates to probability and the time series. This is why a number of researchers have started their studies on brand switching using stochastic theory. Research has been conducted from the earliest. Frank (1974) studied about the theory of stochastic preference and brand switching. Study provided strong evidence using brand choice

behavior. Study found that brand choice behaviour is substantially stochastic. This study tested a general theory of stochastic preference. Study concluded that brand switching data were in substantial agreement with the theory. Similarly, another study was conducted by Givon (1984) who studied about variety seeking through brand switching. Research analysed the concept of variety seeking behavior is modeled as a stochastic brand choice model that yields a measure of variety seeking for each individual consumer. Study used panel data for 28 products. Study concluded that each household and the possibility of market segmentation are consistent with by variety seeking behavior.

Following these studies, there were few recent studies in the areas of brand switching. For example, Harald, Gupta and Dick (2003) studied about sales promotion bump due to brand switching. Research argued that several researchers have decomposed sales promotion elasticities based on household scanner-panel data. study offer a complementary decomposition measure based on unit sales. The measure shows the ratio of the current cross-brand unit sales loss to the current own-brand unit sales gain during promotion. Study reported empirical results for this measure. Study also derived analytical expressions that transform the elasticity decomposition into a decomposition of unit sales effects. These expressions show the nature of the difference between the two decompositions. Fudenberg and Tirole (2000) studied about customer poaching and brand switching. Study examined switching and repeat purchase effects of advertising in mature, frequently purchased product categories. Study draw on consumer behavior theories of framing and usage dominance to formulate a logit choice model for measuring these effects. Study estimate the model using single-source scanner data. Results suggest that advertising induces brand switching but does not affect the repeat purchase rates of consumers who have just purchased the brand, a result consistent with usage dominance rather than framing. It was found that the switching influence to be largely confined between the current and previous purchase occasions. Study

concluded that the magnitude of this effect and explore potential profitability. In the first study, scanner-panel data were used. Similarly, in the second study, logit choice model were used. These two studies used different methodological aspects for their study.

Some other studies have been conducted for analysing the relationship between two variables along with different methodological views. One of the study conducted by Deighton, Caroline and Scott (1994) studied about the effects of advertising on brand switching and repeat purchasing. Study determined the multiple effects of retail promotions on brand loyal and brand switching segments of consumers. Segments were determined by an iterative Bayesian procedure. The variations in within-segment brand shares within a store are related to promotional variables by a logit model estimated by nonlinear least squares. Store share was modeled as a function of store attractiveness, a summary measure of the store's promotional activity on the multiple brands. Finally, category volume is related to overall product category attractiveness in a model that includes both current and lagged effects. The research approach is applied to the IRI ground coffee data. Result of the first finding disclosed that the market can be characterized by brand loyal segments, each of which buys mostly their favorite brand, and switching segments, each of which switches mainly among different brands of the same type (e.g., drip, percolator). The second finding was that promotional variables have significant effects on within-segment market shares.

Some other studies have been conducted about modeling Richard (1989) studied about brand switching model with implications for marketing strategies. Study collected switching data in the areas of durables and services. A two-class "hard-core loyal" and "potential switcher" latent model for the analysis of brand switching data is proposed. Some previously unpublished automobile data will be presented and analyzed along with another data set for frequently purchased packaged goods. Study showed how simple model can be easily estimated using a standard log-linear modeling approach. Naufel, and Dipak (1991) modelled purchase-timing and brand-switching behavior incorporating explanatory variables and unobserved heterogeneity. This study used a continuous-time semi-Markov approach to analyze in a single framework the purchase-timing and brand-switching decisions of households for a frequently purchased product. Study found that the probability distribution of interpurchase times is not the same for various switching between brands, revealing extra information about the purchase-timing decisions. Further, it was found that though the marketing mix and household demographic variables explain a large part of the variation in the brand-switching rates, they account for only a small part of the variation in the repeat purchase rates. Another finding from the analysis is that the rates of switching between brands due to promotional activities such as special displays and price reductions are in reverse order to the share of purchases of the various brands.

Methodology

Sample selection

This study used 385 sarong users in Maruthamunai. They were selected on the basis of random sample selection. Major sarong weaving centres, Textiles, retailer outlets and wholesale outlets were considered for selecting these samples.

Material

Research instrument was a questionnaire that was distributed with final year Undergraduates, Faculty of Management and Commerce, South Eastern University of Sri Lanka, Oluvil. Items in the questionnaire was tested using satisfactory Cronbach alpha values.

Method and procedure

This study uses stockastic matrix, Markov Chains and notations of Markovian Model for analyzing objectives of this study.

Stockastic matrix

In mathematics, a stochastic matrix (also termed probability matrix, transition matrix, substitution matrix, or Markov matrix) is a matrix used to describe the transitions of a Markov chain. Each of its entries is a nonnegative real number representing a probability. It has found use in probability theory, statistics and linear algebra, as well as computer science and population genetics. There are several different definitions and types of stochastic matrices. They are (1) A right stochastic matrix is a square matrix of nonnegative real numbers, with each row summing to 1. (2) A left stochastic matrix is a square matrix of nonnegative real numbers, with each column summing to 1.

In the same vein, one may define stochastic vector (also called probability vector) as a vector whose elements are nonnegative real numbers which sum to 1. Thus, each row of a right stochastic matrix (or column of a left stochastic matrix) is a stochastic vector.

Markov Chains

Markov model is a stochastic process used in terms of a random variable indexed with respect to time. Its analysis also takes cognizance of a sequence of events. The state probabilities at a future instant given the present state of the process do not depend on the states occupied in the past. The behavior of the system in each state memorizes i.e the future state of the system at $tn+1$ depends on its present state at tn (Dilip, Rupam & Anupawa, 2009). Markov chains have been used in many applications; see Jarrow, David and Stuart (1997), Zipkin (1993), White (1993), Sandman (2005), Guedon (1993), Glennon, Dennis and Peter (2005) among others.

Notations of Markovian Model

Suppose Xn with n denotes random variable on discrete space S. The sequence $X = (Xn : n)$ is called a stochastic process. If P is a probability measure of X such that $P(Xn+1 = j/X0 = i0...,$ $Xn = in) = P(Xn+1 = j/ Xn = in)$ for all $i0,...$ in, and , then the sequence X is a Markov chain on S. The probability measure P is the distribution of X, and S is the state space of X. If the conditional probability $P(Xn+1 = j/Xn = in)$ are independent of time index n , then the Markov chain X is homogeneous and denoted by $P(Xn+1 = j/Xn = i) = Pij$ for all $i,j\epsilon S$. Pij describes the probability of movement from state i to state j during a specified or discrete time interval. Table 3.3.31 tabulates the probability P_{ij}.

Table 3.3.31: The probability Pij

	From ......To	S1	S2	.....	Sn
	S1	P11	p12	.....	P1n
	S2	P21	P22	.....	P2n
Pij	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	Sn	Pn1	Pn2	.	Pnn

Where; $\Sigma Pij = 1$, $Pij \geq 0$ for all i,j and S1 S2, . . . Sn are discrete states. However, if a Markov chain has initial probability vector $X0 = (i1, i2, .$ . . $in)$ and transition matrix Pij, the probability vector after n repetition is $X0 . p^{n}{}_{Ij}$ which defines the future state probabilities.

Data Analysis, Results and Presentation

Collected data were tabulated in Table 4.1.

Table 4.1: Collected data

From ......To	White Brand	Normal Colour Brand	Full Colour Brand
White Brand	100 (White Brand to White Brand)	50 (White Brand to Normal Colour Brand)	35 (White Colour to Full Colour Brand)
Normal Colour Brand	40 (Normal Colour Brand to White Brand)	80 (Normal Colour Brand to Normal Colour Brand)	15 (Normal Colour Brand to Full Colour Brand)
Full Colour Brand	10 (Full Colour Brand to White Brand)	15 (Full Colour Brand to Normal Colour Brand)	40 (Full Colour Brand to Full Colour brand)

Brand preferences are shown in Table 4.2.

Table 4.2: Brand Preference

Brands	Number of sarong users
White Brand to White Brand	100
White Brand to Normal Colour Brand	50
White Brand to Full Colour Brand	35
Normal Colour Brand to Normal Colour Brand	80
Normal Colour Brand to White Brand	40
Normal Colour Brand to Full Colour Brand	15
Full Colour Brand to Full Colour brand	40
Full Colour Brand to Normal Colour Brand	15
Full Colour Brand to White Brand	10
Total	**385**

(Source: From Field survey, 2014)

Brand insistence and switching rate are shown in Table 4.3.

Table 4.3: Brand insistence and switching rate

From ……To	Frequency	Percentage	Probability for sub total	Probability for grand total
White Brand to White Brand	100	54	0.540541	
White Brand to Normal Colour Brand	50	27	0.27027	45
White Brand to Full Colour Brand	35	18	0.189189	
Sub total	185		1	0.480519
Normal Colour Brand to Normal Colour Brand	80	59	0.592593	
Normal Colour Brand to White Brand	40	29	0.296296	40
Normal Colour Brand to Full Colour Brand	15	11	0.111111	
Sub total	135		1	0.350649
Full Colour Brand to Full Colour brand	40	62	0.615385	
Full Colour Brand to Normal Colour Brand	15	23	0.230769	38
Full Colour Brand to White Brand	10	15	0.153846	
Sub total	65		1	0.168831
Total	**385**			**1**

(Source: From Field survey, 2014)

Transition frequency is tabulated in Table 4.4. Transition matrix is shown in Table 4.5.

**Table 4.4: Transition Frequency**

From ……To	White Brand	Normal Colour Brand	Full Colour Brand	Frequency
White Brand	100	50	35	185
Normal Colour Brand	40	80	15	135
Full Colour Brand	10	15	40	65
Total				**385**

Table 4.5: Transition Matrix

From ……To	White Brand	Normal Colour Brand	Full Colour Brand	Probability
White Brand	0.540541	0.27027	0.189189	1
Normal Colour Brand	0.592593	0.296296	0.111111	1
Full Colour Brand	0.615385	0.230769	0.153846	1

Transition diagramme is shown in Figure 4.1.
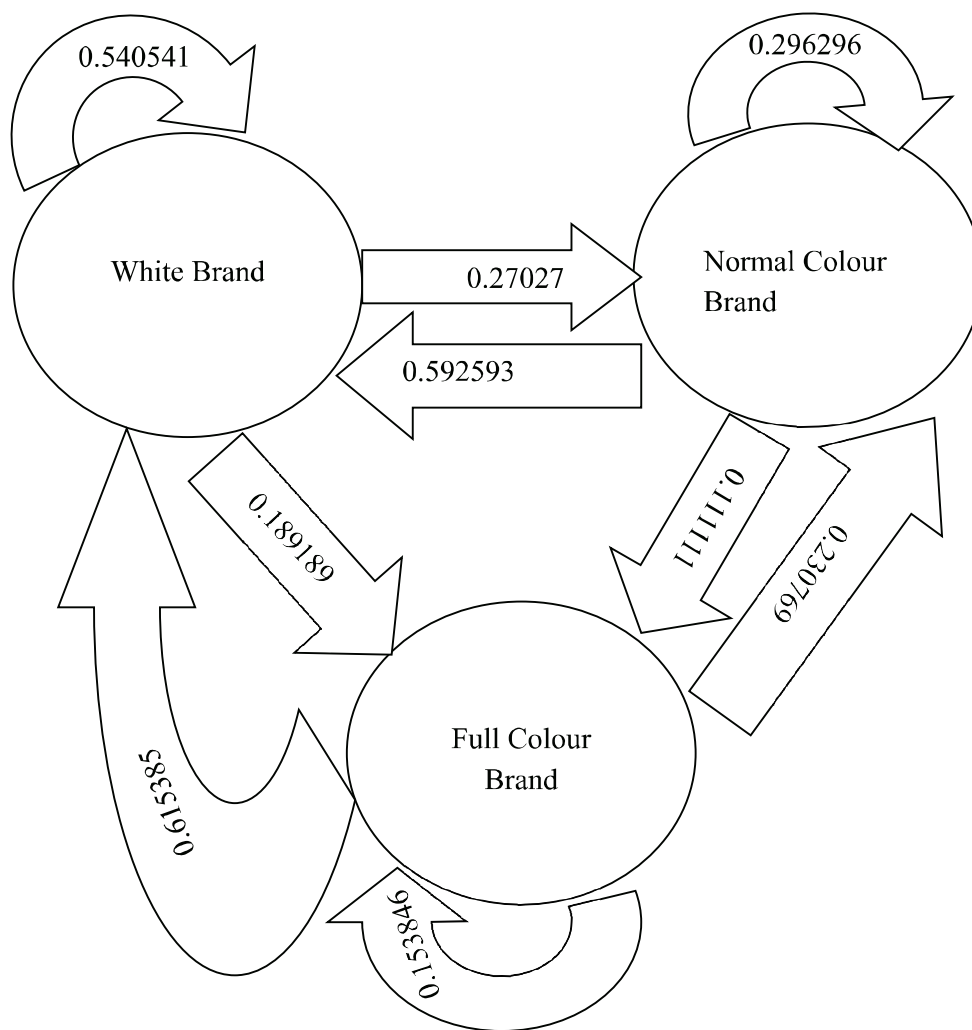
Figure 4.1: Transition diagramme

Brand loyalty using forecasting

Brand loyalty is measured using general rules for forecasting for next period with the support of formulas stated in 4.1.1 and 4.1.2.

$$X^{(n)} = X^{(n-1)} P \ldots\ldots\ldots\ldots\ldots\text{Equation (4.1.1)}$$

$$X^{(n)} = X^{(0)} P^n \ldots\ldots\ldots\ldots\ldots\text{Equation (4.1.2)}$$

Forecast for the 0th period is predicted by frequency for transition matrix for each brand such as white brand, normal colour brand and full colour brand divided by total frequency. Table 4.1.1 shows the frequency ad probability for forecasting 0th period.

Table 4.1.1:
The frequency and probability for forecasting for 0th period

Frequency	Probability
185	185 / 385 = 0.480
135	135/ 385 = 0.350
65	65 / 385 = 0.168
385	

Forecast for the 1st period is predicted by $X^{(n)} = X^{(0)} P^n$. i.e. $X^{(0)}$ is 0.480, 0.350 and 0.168. These values are multiplied by P^n found in transition matrix. Table 4.1.2 shows forecasting for 1st period.

Table 4.1.2: Forecasting for 1st period

From ......To	$X^{(0)}$	White Brand	Normal Colour Brand	Full Colour Brand
White Brand	0.480, 0.350 & 0.168	0.540541	0.27027	0.189189
Normal Colour Brand		0.592593	0.296296	0.111111
Full Colour Brand		0.615385	0.230769	0.153846
		0.480 * 0.540541 = 0.2594	0.350 * 0.27027 = 0.0945	0.168 * 0.189189 = 0.0317
		0.480 * 0.592593 = 0.2844	0.350 * 0.296296 = 0.1037	0.168 * 0.111111 = 0.01866
		0.480 * 0.615385 = 0.2953	0.350 * 0.230769 = 0.08076	0.168 * 0.153846 = 0.0232
		0.8391	0.2789	0.0736

Table 4.1.3 shows the forecasting for 0th and 1st period

Table 4.1.3: Forecasting for 0th and 1st period

From ......To	White Brand	Normal Colour Brand	Full Colour Brand
0	0.480	0.350	0.168
1	0.8391	0.2789	0.0736

Conclusions

From Table 4.3, brand insistency varies brand to brand. It could be understood that majority 100 users of the sarong users insist on white brand. 80 users insist on normal colour brand users. Low number (40) of sarong users insists on full colour brand. There is high brand insistency for white brand. Moderate brand insistency exists for normal colour brand. Low brand insistency exists for full colour brands. In case of brand switching, 85 white brand sarong users wish to switch to normal colour brand (50) full colour brand (35). 55 normal colour brand sarong users wish to switch to white brand (40) and full colour brand (15). 25 full colour brand sarong users wish to shift their brand as normal colour brand (15) and as white brand (10). The highest switching rate would happen in white brand. Switching rate would be moderate for normal colour brand. The lowest switching rate would happen in full- colour brands. With regard to the brand loyalty, forecasting values for 0th and the 1st period, values of white brand, normal colour brand and full colour brand are 0.480 & 0.8391; 0.350 & 0.2789 and 0.168 & 0.0736. Thus, the highest brand loyalty exists for white brands than normal colour brand and full colour brand. In toto, of the three brands, white brand has the highest brand insistence, brand switching and brand loyalty. Normal colour brand has the moderate in all these three aspects. Full colour has the lowest in all these three aspects.

Managerial Implications

White brand has highest brand insistence, brand switching and brand loyalty among users. There is a significant number of switching brand users. Thus, it is not a good sign for producers of white brand sarongs. Awareness has to be given to prevent the brand switching by way of new designs, new decorations and so on. Normal colour brand has the moderate in all these three aspects among users. Brand switching rate is nearing to white brand. Thus, similar efforts have to be taken by producers of normal colour brands. Full colour has the lowest in brand insistence among users. This is danger to the producers. Thus, full colour is not preferable among users. Thus, production of full colour should be limited. Full colour brands cannot be inventoried.

Value addition

This study applies the stochastic probability method in this study for brand switching behaviour in weaving industry in Ampara Coastal Area.

Limitations and further research avenues

This study is limited among the sarong users of Maruthamunai. This geographical limitation can be extended to some other places in future studies.

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