Conference Paper

Factors Determining the Prices of Thai silk: A Hedonic Price Analysis

Pacharaporn Supavitarn and Apichaya Lilavanichakul

Department of Agro-Industrial Technology, Faculty of Agro-Industry, Kasetsart University 50 Ngamwongwan Rd., Lad Yao, Chatuchak, Bangkok 10900, Thailand

Abstract

This paper aims to analyze factors determining the prices of Thai silk products by using the hedonic price model. A quantitative and qualitative approach were used to obtain the data of silk products. Findings from statistical estimated coefficients indicated that many factors were importance to Thai silk producers and related to consumers willing to pay for a premium price for some attributes. The results showed that the location of retail store, types of business model, and online distribution channel were factors affecting to price setting with a positive impact. The negative factors determining the prices were normal silk fabric (without the Royal peacock logo) and the variety of the product. The outcomes suggest that producers of Thai silk fabric should use the location of store, the business model, and the distribution channel as advantages of a product differentiation strategy to adding value to silk products.

Keywords: Royal Peacock Brand; Thai Silk; Hedonic Price Model; Utility

Corresponding Author
Apichaya Lilavanichakul
apichaya.l@ku.ac.th

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INTRODUCTION

Thai silk is a product related to culture heritage, folk wisdom, and local lifestyle for a long time, which has become one of the symbols of Thailand. The production of Thai silk can be divided into two segments: craft silk (94%) and industrial silk (6%). Major production area is located in Northeastern part of Thailand (81.2%) followed by Central part (15.1%), Northern part (3.5%) and the rest (1.4%). The total market of Thai silk and its products values 6,000 million baht in 2014, which about 90% of the total market is sold domestically and about 10% of the total market is exported [6].

Most Thai silk producers still are small and medium enterprise (SME), which lack of quality control and have a high production cost. In addition, some consumers cannot distinguish whether the silk is genuine or artificial. These are important factors to diminish consumer confidence and value of Thai silk. Therefore, the Royal Peacock

logo has been has established (by Her Majesty Queen Sirikit, Queen of Thailand) in order to ensure the quality of silk and fabric, as well as to support the farmers' sericulture and Thai silk producers. The Royal Peacock logo represents as the certification trademark of Thai silk standards under The Queen Sirikit Department of Sericulture. All silk fabric certified with the Royal Peacock logo must be produced in Thailand and will be presented in four colors: gold (Royal Thai silk), silver (Classic Thai silk), dark blue (Thai silk), and green (Thai silk blend) [5]. These colors emphasize the difference in the quality of raw materials and processes used in producing the silk fabric.

In Thai silk industry, the market is highly competitive business, so each producer attempts to differentiate the product from its competitors. Nowadays, the prices of Thai silk depend on not only the quality of silk and pattern format, but also various factors (i.e. folk wisdom), which could be direct or indirect use value to the consumers. In addition, consumers have become more complex and preferred unique products. Consumers have increasingly interested in the product attributes and the details of the product before making purchasing decision. With these reasons, many Thai silk producers are interested in using the Royal Peacock logo as a marketing tool to improve consumer confidence and create value of the Thai silk products. However, some producers use different marketing strategies (i.e. the location of production, branding, distribution channels, services, traceability technology, or geographical identification logo) and charge at a premium prices. Thus, it is necessary to Thai silk producers to know which factors affect consumers willing to pay for Thai silk products.

Several previous studies have investigated various sericulture farming and production techniques such as silk-reeling, dyeing, and weaving process. A few studies have focused on the market and economic impact of Thai silk [7]. Even though many study of market price of textiles and clothing have been investigated [1, 2], there has been little research conducted on the factors affecting the price setting of Thai silk products. Hedonic price analysis has frequently been used to investigate the values of agricultural commodity characteristics such as orange products [8]. Ethridge and Chen [2] investigated price premium for cotton-fiber characteristics (trash, color, length, strength, and micronaire) and found that most cotton quality attributes have an effect on price setting, excepting strength. Moreover, region difference also affects the price premium. Thus, the empirical framework from the literature review provides the development of the price analysis of Thai silk products by using hedonic price model in this study.

The objective of this paper aims to analyze factors determining the prices of Thai silk products by using the hedonic price model.

METHODOLOGY

The data was conducted from the questionnaire survey and interview the Thai silk businesses about the opinions on the Thai silk market. The questionnaire was developed from reviewing secondary data and in-depth interviews with experts. The data aims to concern about the difference between silk with and without the Royal Peacock logo, the location of production, the types of business, and the variety of products. The data of silk products was collected at the Royal Thai silk industry fair, Queen Sirikit center during 10-14 August 2016. In this paper, hedonic price method was used to analyze the factor determining the suitable price setting by silk producers. Transforming and analyzing the data was proceeded with the SPSS 19.0 program to estimate factors affecting the price setting using the ordinary least squares (OLS).

According to utility theory by Lancaster [3], consumer utility is derived as a function of the characteristics or attributes of goods. The utility of individual is represented by the attributes j of product i. The utility function is as follows (1):

$$U = u(Q_1, Q_2, .., Q_n, X_{11}, X_{12}, ., X_{1m}, X_{21}, X_{22}, .., X_{nm}) \quad (1)$$

where $Q_i$is the quantity of consumption of product i and X_{ij} is the attribute j of the product i where i = 1,2,...,n and j = 1,2,...,m.

The utility function is maximized under the budget constraint (B). The budget function is as follows (2):

$$B = \sum_{i=1}^{n} P_i Q_i \quad (2)$$

where P_i is a price of product i. Solving for price equation (3), P_i, gives

$$P_i = \sum_{j=1}^{m} \left(\frac{\partial x_{.j}}{\partial Q_i}\right)\left(\frac{\partial u/\partial X_{.j}}{\partial u/\partial B}\right) \quad (3)$$

where $\frac{\partial x_{.j}}{\partial Q_i}$ is the marginal benefit of attribute j of product i. $\partial u/\partial X_{.j}$ is the marginal utility of attribute j.

$\partial u/\partial B$ is the marginal utility of income.

$\left(\frac{\partial u/\partial X_{.j}}{\partial u/\partial B}\right)$ is the marginal implicit price of attribute j when the budget is equal to income.

The price of the product (P) can be calculated by the sum of marginal utility of attribute j multiple by the marginal implicit price of attribute j. Thus, the standard hedonic price model, as proposed by Rosen [4] is defined as follow:

$$P = \sum_{j=1}^{m} X_j P_j + \varepsilon \quad (4)$$

where X_j is a vector of product attributes with the product j P_j is a regression coefficient ε is a standard error of the price

Equation (4) implies that the price (P) that consumers are willing to pay for the product j is a function of attributes X_j, which can be obtained by partially differentiating with respect to each attribute. Each consumer chooses the optimal bundle of features that maximizes his/her utility, as well as manufacturers choose a bundle of attributes to maximize profits by setting a product's price.

In our study, we used a linear-regression approach to determine the effects of factors on price of Thai silk products. The variables of attributes are specified. The dependent variable is a price of Thai silk fabric (baht/meter). Total number of 11 attributes were selected where 10 variables are transformed to a dummy variable, and one variable is transformed to ordinal variable as presented in Table 1. The hedonic price equation (5) is as follows:

$$\ln(P) = f(LORS, INDT1, INDT2, CHNL1, CHNL2, RYPK1, RYPK2, RYPK3, RYPK4, RYPK5, VART) \quad (5)$$

RESULT AND DISCUSSION

From the survey, the total number of data of 177 Thai silk products were screened out because of missing data and not selling Thai silk fabrics. The completed data of 132 Thai silk fabrics were used for the analysis. After the analysis, the Thai silk products with the royal peacock logo attributes (*RYPK1, RYPK2, RYPK3, RYPK4*) are insignificant, so the Thai silk products with a dark blue color and green of the royal peacock logo attributes (*RYPK3, RYPK4*) were combined into one variable (*RYPK34*). Thus, the original hedonic price model with 11 attributes had gone down to the model with 10 attributes. Table 1 reported the estimated parameters of hedonic price equation.

The model fit the data quite well, as illustrated by the values of R^2 at 0.329. Half of the ated parameters were statistically significant at 95% level of confidence. **Table 2** Estimated statistic parametersfor Thai silk fabrics.

Estimated statistic parameters of hedonic price model for Thai silk fabrics were presented in Table 2. In general, findings indicated that the location of retail store attribute (*LORS*), types of business model attributes (*INDT1*, *INDT2*) and the online store attribute (*CHNL2*) had a statistically significant positive effect on the price of Thai silk fabrics. On the other hand, two factors: the Thai silk products without the royal peacock logo

Table 1: Description of variables in hedonic price model.

Variable	Description
P	Thai silk fabric price per meter.
LORS	Location of retail store, = 1 not located in North eastern of Thailand, = 0 located in North Eastern of Thailand
INDT1	= 1 Producing Thai silk products, = 0 not producing the product
INDT2	= 1 Selling Thai silk products under its own brand name, = 0 otherwise
CHNL1	= 1 Having a physical store to distribute the Thai silk products, = 0 otherwise
CHNL2	= 1 Having an online store to distribute the Thai silk products, = 0 otherwise
RYPK1	= 1 Thai silk products with a gold color of the royal peacock logo, = 0 otherwise
RYPK2	= 1 Thai silk products with a silver color of the royal peacock logo, = 0 otherwise
RYPK3	= 1 Thai silk products with a dark blue color of the royal peacock logo, = 0 otherwise
RYPK4	= 1 Thai silk products with a green color of the royal peacock logo, = 0 otherwise
RYPK5	= 1 Thai silk products without the royal peacock logo, = 0 otherwise
VART	A variety of product that is made from Thai silk

attribute (*RYPK5*) and the variety of product attribute (*VART*) had a negative significant relationship with price.

Firstly, among factors that had a positive effect on price, the location of retail store attribute (*LORS*) was the most valuable impact on pricing decision of Thai silk producers. This means that the retail store that is not located in Northeastern part of Thailand can markup with a higher price because of a few sellers in the market and the availability of raw materials. Most of Thai silk productions are not located in Northeastern part of Thailand, which causes a higher cost. For the channel distribution attribute (*CHNL2*), having online store added a positive value to Thai silk fabric. This may be because of easy to access for consumers.

For types of business model attributes (*INDT1*, *INDT2*), *INDT1* attribute represented the business that had produce the product they were assigned to make and then sold under the purchaser's brand name, meanwhile INDT2 represents the business that sell the goods under their own brand name. Although both attributes positively affected

Table 2: Estimated statistic parameters for Thai silk fabrics.

Independent variable	Hedonic Price model	
	Coefficients	Std.Error
LORS	0.509**	0.174
INDT1	0.454**	0.142
INDT2	0.219**	0.121
CHNL1	0.009	0.143
CHNL2	0.344**	0.156
RYPK1	0.334	0.387
RYPK2	-0.241	0.418
RYPK34	-0.375	0.393
RYPK5	-0.718*	0.441
VART	-0.280*	0.080
constant	7.730**	0.430
R^2	0.329	
Adjusted R^2	0.273	
Note: * means the level of significant at 0.10		
** means the level of significant at 0.05		

a premium price, producing Thai silk products can add a higher premium to Thai silk fabric than having its own brand name. One reason is that many Thai silk producers are small and medium enterprise (SME), which faces the problems of communication in marketing and lack of proper branding.

One interesting outcome was that the Royal peacock logo of all colors were not statistically significant at 95% level. This meant that the Royal peacock logo did not have an effect on price setting, even though Thai silk fabric with the Royal peacock logo could ensure the quality of the product. This might result from lack of building a brand awareness, leading to consumers were unable to distinguish the value differences between the Royal peacock logo and normal silk fabric. The results from an interview with the sellers at retail stores also provides a similar trend, which only a few customers were willing to pay for a premium silk and just only for a gold color of the Royal peacock logo. Thus, different colors of the Royal peacock logo did not create value differences to the Thai silk fabric. However, silk fabrics without the Royal peacock logo led to a price discount, compared with silk fabric with that logo.

Lastly, the variety of product (VART) represented the application uses of product made from Thai silk such as dress, scarf, and souvenirs. A negative sign of the variety of product attribute indicated that the more the variety of products is, the less the premium adds to Thai silk fabrics.

CONCLUSSIONS

Thai silk industry provides a significant economic and social impact to the economy of Thailand for a long time. To enhance the competitiveness of Thai silk industry and become recognition in the international market, this study focused on determining factors that add value to silk products. Hedonic price model was used to investigate factors affecting setting a product's price. Findings suggested that producers of Thai silk fabric may differentiate their products on the location of retail store, types of business model and the online distribution channel since the impact of these attributes were associated with a price premium. Interestingly, adding the Royal peacock logo did not lead to premium or discount on setting a product's price. This recommends that the different colors of the Royal peacock logo cannot induce willing to pay for a premium from consumers.

This study provided an interesting insight of pricing structures of Thai silk fabric relative to product, quality, and business model attributes in the Thai silk market. Furthermore, in the future research, more product attributes (i.e. types of silk fabric, the pattern, the product of origin, weaving process and dyeing color etc.) can be capture in the analysis.

Secondly, the comparison among different regression approaches should be addressed to determining the effects of factors on price.

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References

[1] Ethridge, D.E. 1992. Characteristic supplies and demands in a hedonic framework: US market for cotton fiber attributes. *American Journal of Agricultural Economics 74*(4): 991-1002.

[2] Ethridge, D.E. and Chen, C., 1997. Values Placed on US Cotton-fiber Attributes by Textile Manufacturers. *Journal of the Textile Institute 88*(1):4-12.

[3] Lancaster, K. 1996. A new approach to consumer theory. *The Journal of Political Economy* 74:132-157.

[4] Rosen, S. 1974. Hedonic prices and implicit markets: Product differentiation in pure competition. *Journal of political Economy*, 82: 34–55.

[5] Siriporn, B., P. Petchvijit and K. Kunatham.2014. *Standard of silk*, ACFT, Thailand.

[6] The Queen Sirikit Department of Sericulture. 2014. *An information of sericulture farmers and the production of silk 2014.* (http://www.qsds.go.th/newqsds/file_upload/2014-10-09-monmai_.pdf). Accessed on May 4, 2016.

[7] Ujjin, S., Chuprayun, S., Watcharapanyawong, K., Sunthararachun, S., and Chuprayoon, S. 2012. *Potentials of commercial manufacturing of Thai silk product: The Final Report.* The Queen Sirikit Department of Sericulture, Ministry of Agriculture and Cooperatives of Thailand. *(In Thai).*

[8] Yuwadee, L. and W. Limsomboonchai. 2008. Factors Determining the Prices of Orange Juice Products: A Hedonic Price Analysis. *Kasetsart Economic Journal* 15(2): 79-94.