A Hedonic Price Model for Silk Cocoons in Srinivasapur Market, Karnataka

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ABSTRACT. *The price of silk cocoons at a given time is influenced by the levels of the various characteristics vested in it. The price paid, reflects the sum total of values of each characteristic. It is useful to identify the characteristics that are important in determining the value of silk cocoons. In this study, hedonic price model was used to identify the values of the quality attributes or the implicit prices of the silk cocoons. Silk cocoons are valued for their utility bearing characteristics. The prices of cocoons vary directly with the specific amount of each characteristic that the cocoon is embodied with.*

INTRODUCTION

The silk industry in India is in the process of transition from the production of traditional fabrics to the production of high quality fine fabrics, requiring the production of high quality cocoons. This study was undertaken with the principal objective of determining the value assigned to the quality attributes of silk cocoons by the buyers. The analysis was carried out in the hedonic price framework.

A hedonic price function is essentially a regression of the observed price of a commodity on levels of its quality characteristics. In this study, both the physical and visual attributes of the cocoons, such as lustre, floss, uniformity of the lot, compactness of the shell, number to weight, colour, size, shape and defective cocoons in the lot were evaluated to assess the contribution of each to the value. Only the significant variables were included in the final model.

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MATERIALS AND METHODS

Primary data were collected from Srinivasapur silk cocoon market. Ten lots were selected each day on randomly selected ten days during the period of April 1, to May 31, 1994. The levels of each characteristic were evaluated on a 5 point scale varying from 1 (poor) to 5 (very good). Information was collected from the reelers regarding the levels of characteristics in each lot of cocoons. A total of 100 sample lots were examined and data collected. The buyer (reeler) was asked to score the selected attribute in a lot which was then scaled to the price paid for the lot. Care was taken to ensure that time did not affect the price level.

A hedonic function is the regression of the price of a commodity based on the levels of its characteristics. It can be denoted as follows:

$$Y_i = f(X_1, X_2 \ldots X_p)$$

where,

Y_i = observed price of a commodity

$X_1, X_2 \ldots X_p$ = measures of the amount of each characteristic.

The below given three functional forms were tested.

1. $Y = a + b_1 x_1 + b_2 x_2 + \ldots + b_p x_p$

2. $Y = \log a + b_1 \log x_1 + b_2 \log x_2 + \ldots + b_p \log x_p$

3. $\log Y = \log a + b_1 \log x_1 + b_2 \log x_2 + \ldots + b_p \log x_p$

The standardized regression coefficients $b_i{}^*$ were calculated using the formula,

$$b_i{}^* = b_i \frac{Sx_i}{S_Y}$$

where, Sx_i and S_Y are the standard deviation of x_i and Y, respectively.

The equations were estimated by the method of ordinary least squares.

RESULTS AND DISCUSSION

The results of the hedonic price model are presented in Table 1. From the results it could be observed that lustre, uniformity and compactness had a positive influence, whereas floss and number of cocoons per kg had a negative influence on the value of cocoons (Figure 1).
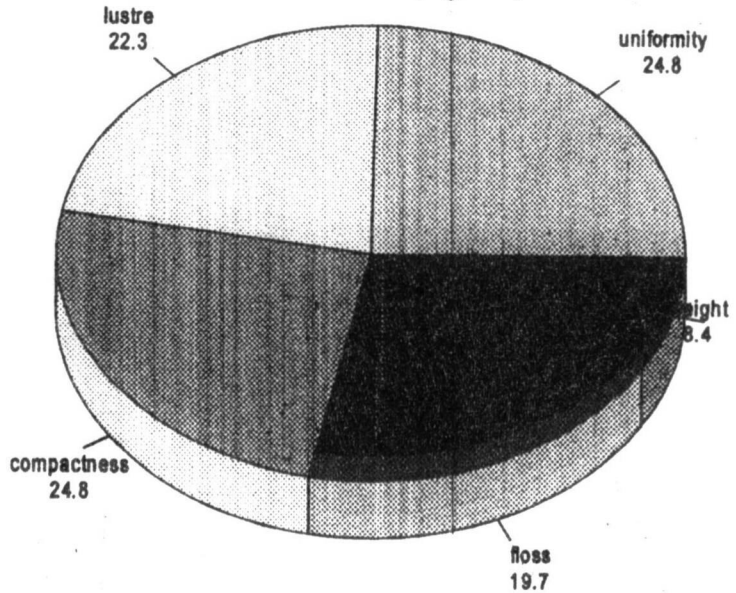

Figure 1. Value addition by quality attributes of multi bivoltine silk cocoons.

Small sized cocoons were not preferred as indicated by its negative relationship with price (Table 1). Similarly excessive floss was not desirable. Floss is the loose strands which gives the impression of a loosely wound cocoon. An increase in the floss by 1%, reduced the price paid for the cocoon by 0.2652%.

The standardized regression coefficients derived from the linear function were computed to examine on the relative contribution of the quality attributes to the value. The standardized regression coefficients indicated that the uniformity of the lot, compactness of the shell and lusture have the greatest effect on the price of the cocoons. To explain these relationships further, we have made use of the linear hedonic function. A one point increase in the level of uniformity increases the value of the cocoon by Rs. 12.219 per kg, while a similar increase in compactness and lustre of the cocoons raises the price by Rs. 4.328 and Rs. 5.698 per kg, respectively.

Table 1. Hedonic price model which estimated the influence of physical and visual parameters of silk cocoon on its market price.

	Intercept	Lustre	Floss	Uniformity	Compactness	No. cocoons per kg	r^2
Log	4.685	0.1584** (3.15)	-0.2652** (5.581)	0.2043** (4.388)	0.1189* (2.363)	-0.1271** (3.37)	0.74
Semi-log	5.2422	0.0782** (3.05)	-0.1639** (6.041)	0.1375** (5.205)	0.0356* (2.328)	-0.4206** (5.644)	0.78
Linear	162.47	5.698*	-10.931**	12.219**	4.328*	-34.544**	0.78
Standar-dized		0.608	-0.537	0.677	0.677	-0.230	

* = P<0.05   Figures in the parantheses are the SE
** = P<0.01

The three hedonic price models indicated that all the selected variables contributed significantly to the value of the silk cocoons. Further, the r^2 values implied that the variables selected explained over 75 per cent of the variation in the silk cocoon price.

IMPLICATIONS

The mulberry silk industry in India is in the process of transition from the production of traditional fabrics to the production of high quality fine fabrics. A second change that is visible is that there is a growing focus on the export sector. This transition calls for the production of high quality fabrics. However, this endeavour will call for improvements in all segments of the industry. The cocoon rearing segment which produces the basic raw material for the production of silk will have to be strengthened by helping the farmers to produce high quality cocoons. The physical attributes of the cocoons like uniform size, large size cocoons and a compact shell need to be addressed by the researchers. In addition, floss should be reduced and the lustre of the cocoons should be enhanced so as to fetch higher prices.

In future a greater emphasis will have to be placed on the quality aspect at every step in the production of silk. The research and extension system will have to play a leading role in putting the policy into practice.

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