
Factors Affecting the Price of Bullocks in the Organised Cattle Fairs of Rajasthan

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ABSTRACT

Transaction of different kinds of livestock species through the state level organised cattle fairs has been a long tradition in Rajasthan. Cattle bullocks constitute a major portion of animal transaction in the cattle fairs. In the present study an attempt has been made to analyse the different quantitative and qualitative factors affecting the price of bullocks. The study revealed that quantitative factors such as age, general appearance and body capacity and qualitative factors such as breed, inauspicious marks and training had significant impact on the price of bullocks in the cattle fairs. The study further revealed the importance of better health, housing and feeding management practices for obtaining the maximum price for bullocks. Government should take more initiatives for conservation and breeding of the famous Nagori bullock known for its excellent draft capacity.

Keywords: Cattle fairs, Livestock marketing, Bullock pricing.

JEL: Q11, Q13

I

INTRODUCTION

Rajasthan is blessed with different kinds of livestock species. It had 57.89 million livestock (18th Livestock Census, 2007), out of which bovine constituted 23.95 million (12.41 million cattle and 11.54 million buffaloes). Presently, Rajasthan has about 6.11 per cent of country's cattle population and 10.58 per cent of buffalo population and contributes over 10 per cent of total milk production in the country. Livestock sector plays an important role in shaping the rural economy by providing gainful employment and income to small and marginal farmers, agricultural labourers, farm women and other deprived sections. Approximately 50 per cent of the cattle population and 25 per cent of the buffalo population are used as draft power in the state. Further, livestock sector contributes 10 per cent of total gross domestic product (GDP) of the state (Government of India, 2008). Marketing of livestock through cattle fairs have immense importance in the socio-economic matrix of the state. For livestock marketing, 10 state level cattle fairs are organised every year by the Directorate of Animal Husbandry, Government of Rajasthan. Although the price settled for an animal in these cattle fairs depends on the bargaining power of the

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buyers and sellers, there are different quantitative and qualitative factors that play an important role in deciding the final price of an animal. A proper assessment of these factors causes a considerable difference in the price of animal. Cattle bullock occupies an important portion of transaction in the cattle fairs. In the present study, an attempt has been made to empirically examine the effect of different quantitative and qualitative factors on the price of bullocks in the cattle fairs of Rajasthan.

II

DATA AND METHODOLOGY

Multistage sampling technique was used during the present study. Rajasthan was selected purposively. Out of the ten state level cattle fairs, four cattle fairs, i.e., Ramdev (Nagaur), Veer Tejaji (Parbatsar), Jaswant (Bharatpur) and Puskar (Ajmer) were selected on the basis of the highest average number of bovine transacted during the last ten years i.e., 2000-01 to 2009-10. Primary data for bovine transactions were collected during 2011 from the randomly selected 30 sellers and 30 buyers from each cattle fair consisting of a total sample of 120 sellers and 120 buyers. Data on quantitative and qualitative factors were collected for 453 bullocks transacted by sample sellers and buyers in the four selected cattle fairs.

The influence of different quantitative and qualitative factors on the prices of bullock was estimated by using multiple regression analysis. Proper choice and specification of variables have considerable importance in the regression analysis. Even if a single relevant variable is omitted or an unwanted variable is included, the fitted model becomes biased in the economic sense (Heady and Dhillon, 1961). Therefore, for bullock pricing, the relevant quantitative variables included were age, general appearance, body capacity, temperament whereas qualitative variables were breed, inauspicious marks and training. The scores regarding general appearance and body capacity of bullock were given using Dairy Bull Unified Score Card developed by Dairy Cattle Association of Trimmerger *et al.*, 1987, as the parameters and their measurement adopted in this score card were equally applicable to cattle bullock. The score regarding temperament of bullock was given by using Temperament Score Card for cattle developed by Tulloh (1961). The common functional forms used by different researchers for the livestock pricing in the past have been linear and quadratic models. However, as reported by Foote and Fox (1954), it is difficult to choose mathematical form of a function *a priori* from the data before their actual estimation. Therefore, the final selection of a model was made after initial trials.

III

RESULTS AND DISCUSSION

Both quantitative and qualitative factors were included in the multiple regression model of bullock pricing. Among various factors, age, general appearance, body capacity and temperament were quantitative in nature whereas the qualitative factors

included were breed, inauspicious marks and training for which dummy variables were used in the model. The mathematical form of final bullock pricing model was as under:

$$Y = a + b_1 X_1 + b_2 X_1^2 + b_3 X_2 + b_4 X_3 + b_5 X_4 + b_6 D_1 + b_7 D_2 + b_8 D_3 + b_9 D_4 + u \quad \dots(1)$$

Where, Y = Unit price of bullock (in Rs.),

X_1 = Age (in years),

X_2 = General appearance expressed in standard score,

X_3 = Body capacity expressed in standard score,

X_4 = Temperament expressed in standard score,

D_1 = Dummy variable for breed with value "1" for Haryana and "0" otherwise (base = Local ND),

D_2 = Dummy variable for breed with value "1" for Nagori and "0" otherwise (base = Local ND),

D_3 = Dummy variable for inauspicious marks with value "1" for presence and "0" for absence (base = no marks),

D_4 = Dummy variable for training with value "1" for trained and "0" otherwise (base = no training),

u = Random error term assumed to follow normal distribution with zero mean and constant variance.

The results of the regression analysis of bullock pricing are presented in Table 1. It was found that 81 per cent of total variation in the price of bullock was explained by the variables included in the final model. The influence of different explanatory variables/factors on the price of cattle bullock is discussed as under:

TABLE 1. FACTORS INFLUENCING THE PRICE OF CATTLE BULLOCKS

Factors (1)	Regression coefficient (2)	Standard error (3)
Constant term	-731.32	475.73
Age (X_1)	1242.45**	67.26
Age (X_1^2)	-123.75**	12.58
General appearance (X_2)	524.21**	38.21
Body capacity(X_3)	181.12**	34.11
Temperament(X_4)	27.53	152.78
Haryana breed (D_1)	1952.46**	231.06
Nagori breed (D_2)	2681.53**	123.40
Inauspicious marks(D_3)	- 494.37**	30.54
Training(D_4)	324.75	181.42

$R^2 = 0.81$ N= 453 ** Significant (P<0.01) * Significant (P<0.05).

Effect of Age on Price

There was a non-linear relationship between the price and age of bullock in the cattle fairs. Both the regression coefficients associated with age, viz., X_1 and X_1^2 were statistically significant ($P < 0.01$). The positive sign of regression coefficient of X_1 and negative sign of regression coefficient of X_1^2 suggested the fact that the price of bullock had increased up to certain age, reached its maximum and thereafter its price started declining. From the estimated regression coefficients of X_1 and X_1^2 , it was found that at the fifth year of the age bullock commanded the maximum price in the fair; until fifth year, the price of bullock continued to increase and thereafter price decreased. The reasons for such a phenomena could be attributed to the bullock being mature enough at this age and possessed the good draft capacity for agricultural and transport operations. Raut and Singh (1974), Rathod *et al.* (1978), Arora and Pandey (1984), Kareemulla and Srinivasan (1992) found similar non-linear relationship between price and age of cattle bullock. However, Mishra and Nayak (1991) found that the market price of bullock decreased with the advancement of age as the buyers expected a longer service period from a young cattle bullock.

Effect of General Appearance on Price

The regression analysis of bullock pricing further revealed that general appearance was an important factor in deciding the price of bullock in the cattle fairs. The regression coefficient of general appearance (X_2) was found to be positive and significant ($P < 0.01$). It was found that buyers were ready to pay a higher price for a bullock which had better general appearance in terms of proportionate head, strong jaws, broad forehead, tight shoulder, strong feet and other characteristics.

Effect of Body Capacity on Price

The body capacity was found to be an important factor in deciding the price of bullock in the cattle fairs. The regression coefficient of body capacity (X_3) was found to be positive and significant ($P < 0.01$). This suggested that buyers were ready to pay higher price premium for a bullock which had better body capacity in terms of long, deep and strongly supported barrel, large and deep heart girth and wide chest floor.

Effect of Temperament on Price

In bullock pricing model, the regression coefficient for temperament was positive, but non-significant. Positive sign and non-significant regression coefficient implied only a small insignificant price premium for good tempered bullocks. Mishra and Nayak (1991) observed that animals having good temperament had price premium over dull tempered animals.

Effect of Breed on Price

Breed of a bullock plays an important role in influencing its price in the cattle fairs. There were three types of bullock breeds transacted in the fairs, viz., local non-descript and indigenous Haryana and Nagori breeds which have distinct characteristics. Therefore, in order to capture the impact of breed on the price of bullock, two dummy variables, i.e., D_1 and D_2 were introduced in the regression model of bullock pricing. Keeping local non-descript bullock as base, D_1 and D_2 dummies were introduced for Haryana and Nagori bullocks respectively. The regression coefficients of both the variables were found to be positive and highly significant ($P < 0.01$) indicating the fact that both Haryana and Nagori bullocks fetched higher price than local non-descript bullocks. Haryana bullock had price premium of Rs. 1952.46 whereas Nagori bullock had even a higher price premium of Rs. 2681.53 over local non-descript bullock. Higher price for these two well descript indigenous breeds could be attributed to their better draught capacity over local non-descript bullocks.

Effect of Inauspicious Marks on Price

In order to determine the net effect of the presence of inauspicious marks on the body of bullock, a dummy variable D_3 was introduced in the regression model of bullock pricing. It was observed that the coefficient for this dummy variable was negative and significant ($P < 0.01$). It was observed that there was a price discount of Rs. 494.37 for the bullocks with inauspicious marks over those without any marks. This price discount could be attributed to the fact that the buyers considered the animals with those marks as harmful and therefore, they purchased the bullocks with inauspicious marks at a discounted price.

Effect of Training on Price

A dummy variable D_4 was introduced in the regression model of bullock pricing in order to capture the effect of training on the price of bullock transacted in the cattle fairs. The regression coefficient of the dummy variable D_4 was found to be positive and significant ($P < 0.05$) which clearly indicated the fact that a trained bullock fetched a price premium of Rs. 324.75 over un-trained bullock with other things remaining the same. Well trained bullocks could be used for agricultural and transport operations immediately after the purchase without any hardship in handling whereas a un-trained bullock had to be trained first by the new buyer before such operations. Hence, well trained bullocks were found to be preferred over un-trained bullocks in the cattle fairs.

IV

CONCLUSIONS AND RECOMMENDATIONS

The study revealed that quantitative factors such as age, general appearance and body capacity and qualitative factors such as breed, inauspicious marks and training had significant impact on the price of bullocks in the cattle fairs. A bullock with good general appearance, strong body capacity, without any inauspicious marks in body, having little training and of five years age could fetch the maximum price in the market/fair. Further, among different breeds transacted, Ngori had the chance of getting maximum price. It was so because Ngori breed is one of the well known draft animals used for agricultural operations in Rajasthan and in the adjoining states. The extension personnel should create awareness among the farmers about these quantitative and qualitative characteristics of bullocks and advise them to sell bullocks in those specific stages to get the maximum price in the market/fair. Government should take more initiatives for conservation and breeding of the famous Ngori bullock available in Rajasthan. The study further revealed the importance of adopting proper health, feeding and housing management practices for bullocks as these affect the general appearance, body capacity and other characteristics which in turn have significant impact on the market price of bullocks.

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