Journal of Outdoor Recreation and Tourism 7-8 (2014) 65–74

Contents lists available at ScienceDirect

Journal of Outdoor Recreation and Tourism

journal homepage: www.elsevier.com/locate/jort

# A hedonic analysis of the price for horse riding lessons in Sweden

Sebastian Hess *, Yves Surry, Robert Kron [1], Carolina Liljenstolpe [1], Gunnar Lindberg [1], Hans Andersson

*Department of Economics, Box 7013, 750 07 Uppsala, Swedish University of Agricultural Sciences, Uppsala, Sweden*

ARTICLE INFO

*Article history:*
Received 22 November 2013
Received in revised form
15 September 2014
Accepted 16 September 2014

*Keywords:*
Riding schools
Horse-based leisure
Hedonic price regression
Outdoor sports
Sweden

ABSTRACT

Riding school businesses have evolved as popular providers of recreational services in many rural and peri-urban regions of northern and western Europe. We conducted a country-wide survey of riding schools in Sweden to analyse determinants of the price of riding lessons for adults and children. We found that riding schools depend heavily on the willingness of customers to commute, with a positive relationship between the price of a riding lesson and average household income, as well as population density in the municipality. Older schools charged on average higher prices than newly established schools and the presence of an indoor arena proved to be the single most important physical price determinant. Existing financial support to riding schools does not seem to affect the price per lesson directly. Education of riding school managers can be distinguished between various generic skills that allow riding lessons to be provided at a lower price, and specific riding instruction skills for which a premium can be charged.

## Management implications

- A hedonic price analysis was performed on data from a national survey of riding schools in Sweden. The findings indicate that the price of riding lessons decreases with increasing distance from urban areas, increases with rising average household income, and with increasing population density in the nearest municipality.
- Many riding schools have not only invested in horses for their customers, but also in specific infrastructure and facilities for guests and children. The majority of the schools surveyed had an indoor arena and provided access to showers, lockers, changing rooms, a café and other related leisure facilities.
- Riding school managers are typically female, middle-aged and have vocational or university education. However, specific, formal horse-related education yields a direct price premium per riding lesson only in the case of certified riding instructors for children and teenagers.
- Riding schools within our sample also actively incorporate non-monetary contributions of their customers into their pricing schemes.



## 1. Introduction

About five to six decades ago, horses were still commonly used as working animals on most northern European farms, but with the mechanisation of agriculture the numbers rapidly declined. However, the horse population in northern Europe has substantially increased in recent years and is still growing. This increase is entirely due to the rising demand for horse-related leisure activities (Liljenstolpe, 2009). One of the most popular activities in this respect in northern Europe is horseback riding, but far more people engage in this sport than actually own a horse. Riding schools fill the gap by providing access to horses for non-horse owners.

The typical northern European riding school is a peri-urban business that usually provides regular riding lessons, mainly to people who enjoy horse riding but do not own a horse. Therefore, the riding school typically owns a number of horses that are handed over to customers for the duration of a riding lesson (Rantamäki-Lahtinen & Vihinen, 2004). Customers commute once or several times per week to the riding school, with access to public transportation determining whether children and teenagers can travel to the riding school by themselves, or have to be chauffeured by their parents (Bailey, Williams, Palmer, & Geering 2000; Elgåker, Pinzke, Lindholm, & Nilsson 2010).

The provision of riding lessons constitutes a service and keeping horses for that purpose involves significant agricultural

* Corresponding author. Tel.: +46 18 67 1703; fax: +46 18 67 3502.
*E-mail address:* Sebastian.Hess@slu.se (S. Hess).
[1] Formerly at the Department, Box 7013, 750 07 Uppsala, Swedish University of Agricultural Sciences, Uppsala, Sweden.

http://dx.doi.org/10.1016/j.jort.2014.09.003
2213-0780/

activities, especially feed production unless large quantities of hay, straw and grain are purchased (Elgåker et al., 2010). Riding schools therefore constitute a horse-related type of business that is economically constrained to peri-urban areas, as large numbers of commuting customers need to be attracted to cover the costs of keeping and maintaining the required number of horses.

The number of people involved in various services in the horse sector is large and increasing in many northern European countries (Rantamäki-Lahtinen & Vihinen, 2004). However, the regional distribution of horses is much more uneven now than when horses were the standard draught animal on farms. Elgåker et al. (2010) showed that horses in Sweden nowadays tend to be concentrated in densely populated areas rather than in farming regions. Thus, while the total number of horses may still be far below the post-World War II level, grazing land for horses in peri-urban areas may soon become scarce, creating the potential for conflicts between outdoor riders and landowners, and posing new challenges for policymakers (Elgåker, Pinzke, Nilsson, & Lindholm, 2012).

Thus in principle, information about the location of riding schools and observations about the market for riding lessons is needed so that the spatial dimension of these horse-related activities, and their potential role in future policy design within rural areas, can be assessed.

Against this background, the aims of this study were to: (i) identify the factors affecting the prices of riding lessons for adults and children offered by riding schools in Sweden; and (ii) measure their contribution to determining the price of riding lessons. To achieve these goals, the market for riding lessons in Sweden was analysed using a hedonic price model, based on a country-wide survey conducted during spring 2011. Hedonic price models can be interpreted as reduced-form representations of a market equilibrium situation that stems from the interplay of supply and demand forces at a specific location (Rosen, 1974).

Hedonic price models are a widely employed methodological approach in empirical assessments of how different quality attributes explain observed variations in the price of a certain good or service. The method has been applied e.g. to recreational activities and tourism in rural areas (Roubi & Litteljohn, 2004; Shrestha & Alavalapati, 2004; Lloyd & Peel, 2007; Mollard, Rambonilaza, & Vollet, 2007; Oh-Sang & Hanho, 2010) and to horse breeding or racing activities (Stoeppel & Maynard, 2006; Taylor, Dhuyvetter, Kastens, Douthit, & Marsh 2006; Lange, Johnson, Wilson, & Johnson 2010).

Concerning sports, the hedonic approach has been used to assess a few sporting activities including alpine skiing (Falk, 2008; Pawlowski, 2011) and golf (Limehouse, Melvin, & McCormick, 2010), but to our knowledge, no previous study has systematically analysed the market for riding lessons. Zasada, Berges, Hilgendorf, & Piorr (2013) analysed peri-urban specialisation patterns in various types of horse farms around Berlin (Germany), but without including a market perspective. The previous empirical study closest in approach to the present study investigated the recreational equine market in Korea (Oh-Sang & Hanho, 2010).

The remainder of the paper is organised as follows: Section 2 describes how we applied the framework of hedonic price analysis to conceptualise the market for riding lessons in Sweden. Section 3 describes our dataset and presents descriptive results, while Section 4 summarises the econometric estimation strategy. Section 5 presents results of the hedonic price model adopted for riding school services in Sweden. Section 6 concludes the paper by discussing the empirical results.

## 2. A conceptual framework to model the market for riding lessons

In a review of farm diversification strategies by Zasada (2011), special emphasis is placed on the various dimensions of the term "multifunctionality". Horse keeping has been mentioned in this context as an example of farm diversification that constitutes an increasingly important alternative for farmers with respect to conventional commodity programmes (Bailey et al., 2000; Zasada, 2011 and the literature cited therein). However, little is said in this literature about the economic dependence of horse-related activities on the corresponding local demand and supply of these services.

From the perspective of economic theory, the market for riding lessons determines supply and demand for this service through the market price of a riding lesson. However, the service offered by riding schools in the form of riding lessons does not constitute a homogeneous good. Instead, the quality attributes of a riding lesson offered by a certain riding school vary widely, depending upon the qualifications and experience of the riding instructor, facilities for indoor and outdoor riding, additional amenities provided for spending leisure time, quality of the service provided and factors determined by the geographical location of the riding school.

The price of a 60-minute riding lesson is therefore a function of a vector of quality attributes: $p(z)=p(z_1, z_2, \ldots, z_n)$. This implies that customers with preferences for higher levels of some or all elements of the vector $z$ (e.g. high-quality instruction, sophisticated training facilities, etc.) will pay a higher price per riding lesson than customers who are willing to accept riding lessons e.g. outdoors only, with basic instruction, or similar low-cost attributes. The prices observed in the market can then be viewed as the interplay of supply and demand for riding lessons with different levels of these quality attributes.

On the supply side, under competitive conditions riding schools will provide a certain quantity $y$ of riding lessons at a specific level of quality attributes $z$. Riding schools will maximise their profit $\pi = revenue - cost$ by determining the quantity of riding lessons at which the marginal cost of a lesson for given attribute level $z$ is equal to the corresponding market price $p(z)$:

$$\frac{\partial C(y, z_1, \ldots, z_n)}{\partial y} = p(z_1, \ldots, z_n). \quad (1)$$

If this condition is fulfilled, the quantity $y$ is the profit-maximising quantity $y^*$ and will depend on $p(z)$: $y^*=y^*(p, z_1, z_2,\ldots,z_n)$. Furthermore, it can be shown that marginal price changes as a result of a change in quality attribute $z_i$, directly affect the average and marginal cost structure of a riding school (Rosen, 1974, pp. 41–43):

$$\frac{\partial p(z_1, \ldots, z_n)}{\partial z_i} = \frac{\left(\partial C(y^*, z_1, \ldots, z_n)/\partial z_i\right)}{y^*} = \frac{\partial C(z_1, \ldots, z_n)}{\partial z_i}. \quad (2)$$

On the demand side, it is commonly assumed that customers maximise the utility provided by a utility function that contains the vector of riding lesson attributes and the composite vector $x$ of all other goods consumed: $U=U(z_1, z_2,\ldots,z_n,x)$. However, this utility has to be maximised subject to the income constraint $I=p_x x+p(z_1, z_2,\ldots,z_n)$, implying that the customer's decision to consume higher quality levels of a riding lesson is bound by income $I$ and has to be traded off against forgone consumption of other goods $x$. It can be shown that the customers' marginal rate of substitution between other goods $x$ and any of the quality attributes of a riding lesson is given by the following condition:

$$\frac{\partial U(.)/\partial z_i}{\partial U(.)/\partial x} = \frac{\partial p(z_1, \ldots, z_n)}{\partial z_i}. \quad (3)$$

This condition states that the marginal change in the price of a riding lesson according to the marginal change in quality attribute $z_i$ will be equal to the customers' marginal rate of substitution between consumption of other $x$ and a unit of $z_i$.

In a market with many customers and many firms, an equilibrium price function $p(z)$ with certain levels of attributes $z_1, z_2,\ldots, z_n$ balances market supply $S(z)$ and market demand $D(z)$ such that