The Impacts of Policy and Macroeconomic Conditions on Horse Markets

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In the United States, horses have long served people as work animals, recreation companions, and even as family pets. While consumption of horse meat has never been a culturally accepted practice in the United States, there are several other countries where horse meat is consumed and often considered a delicacy. With a large supply of horses and no domestic demand for meat, the United States has historically been a net exporter of horse meat.[2]

The practice of slaughtering horses for meat is politically contentious and, over the past decade, several attempts have been made to ban horse slaughter in the United States. In September of 2007, the three remaining U.S. slaughter plants, located in Texas and Illinois, were closed due to passage of state laws banning horse slaughter. Since that time, exports of live horses to slaughter plants in Canada and Mexico have risen. The number of horses exported for slaughter in 2010 was 138,000; nearly the same as the total of horses slaughtered domestically and exported for slaughter in 2006 (GAO 2011).

Horses are not typically raised solely for slaughter, but the availability of a slaughter market does provide a salvage value for horses that do not have sufficient value in the recreation or work horse markets and are of an age and physical conformation suitable for slaughter. Closure of domestic slaughter plants in 2007 did not eliminate the slaughter market entirely because horses could still be exported to Canada or Mexico. However, it did increase the costs incurred by slaughter buyers to get live horses to a processing plant. The increase in costs is a result of both higher transportation costs (horses may be hauled longer distances) and higher transaction costs of moving live animals across international borders (e.g., paperwork, health inspections). As a result of slaughter buyers facing higher costs of doing business, they will bid less for live horses at market, thereby decreasing the salvage value of horses suitable for slaughter.

While ending domestic slaughter may have devalued horses, a nearly simultaneous factor putting downward pressure on prices in the horse market is the economic downturn that began in 2008. A recent report by the Government Accountability Office (GAO) suggests that the number of horses either abandoned or given to horse rescue facilities increased dramatically in the past four years (GAO 2011). This trend suggests that as household incomes decline, the ability of some households to continue caring for or to buy additional horses is reduced. The impact is a decline in the number of buyers and an increase in the supply of horses in the market. Both factors are expected to decrease the value of horses.

With the beginning of a recession and a slaughter ban taking effect in such a short time period, it is important to investigate not only if there are effects on the price of horses but also the relative magnitude of those effects. An estimate of the effects would serve to inform policy makers, horse owners, and potential slaughter plant investors of the change in live horse prices with the reopening of horse slaughter plants as well as how prices would have to change to return to pre-recessionary levels.

[2] In 2006, the United States exported horse meat to the following countries (listed in order by highest value importer): Belgium-Luxembourg, Switzerland, France, Russia, Japan, Mexico, Germany, Italy, Netherlands, Taiwan, and the Bahamas (FAS-GATS 2011).

Results of the economic analysis presented here are based on a study conducted to quantify the impacts of both the slaughter ban and the recession on the price of horses sold at auction. Data used for the study were obtained from a public horse auction in Billings, Montana; these data reflect horse sale transactions that occurred from 2004 and 2010. The time span covered by these data includes sale transactions occurring before and after both the slaughter ban and the recession. The econometric method used in the study employs a quantile regression framework to estimate a hedonic price function for horses sold at auction. This method was used to capture the effects of not only policy (slaughter ban) and macroeconomic (recession) factors, but also characteristics of the individual horses, feed costs, and seasonal trends in horse prices. By including these factors explicitly in the model, we improve the accuracy of the estimates of the slaughter ban and recessionary impacts on horse sale prices.

Analysis Data

The data used for this analysis include over 4,500 auction transactions. The horses sold in the sale came from 32 states and Canadian provinces, with the majority from Montana (29%) and Wyoming (16%). This auction averages over 393 horses sold per sale, with an average sale price of $1,492 per head and a median sale price of $1,100 per head. Summary statistics of sale prices, by year and sale are given in Table 1. The distribution of sale prices is highly skewed, as shown in Figure 1. This requires the use of the natural log transformation prior to empirical modeling.

Other data used in the hedonic price model include information specific to the horse and the way the horse is marketed. This information comes from the sale catalog, which is available to all potential buyers prior to the sale. Characteristics drawn from the catalog and used in the model include the horse's age, sex, breed, and training/experience. The model also contains marketing strategies by the seller such as including a picture in the catalog or the seller's contact information. The order in which the horses are sold and distances traveled by the horses to the auction are also included in the model.

Finally, to capture effects that are not unique to the horse being sold, we include a proxy for feed costs in the form of a drought index. To capture the effects of the recession, a 12-month average of the unemployment index reported by the Bureau of Labor Statistics (BLS) is included in the model. The effect of the slaughter closure enters the model as a fixed effect equal to one if the horse was sold after September 2007 and zero otherwise.

Econometric Results

The results of the econometric model suggest that both the slaughter ban and the recession negatively affected sale prices of horses sold at the Montana auction. However, the effects of the slaughter ban vary, depending on the price of the horse. The estimated effect of the ban on the median priced horse, which sold for $1,100, is 17.3% or a decrease of $190 per head. This decline assumes that all other factors are held constant. In other words, if the same horse were sold before the slaughter ban, it would have sold for approximately $190 more than if it were sold after the slaughter ban. This negative price effect does not impact all horses equally. The results suggest that horses priced near the bottom of the price distribution (e.g. less than $300 per head) have not been affected by the slaughter ban. This may be due to the age and conformation of the horses sold well below the median price, which likely is not suitable for slaughter. Also, horses that sold at prices near the top of the distribution (greater than $3,000) were not affected

by the slaughter ban. These horses are likely to still have a high enough value for other purposes that they are too expensive for slaughter buyers to competitively bid on.

The recessionary effects, as measured by the BLS unemployment index, suggest a much larger negative impact on sale prices. For horses sold at the median price of $1,100 per head, the effect is a 13.4% or $147 per head decrease in price for each 1 unit increase in the unemployment index (see Figure 2). To put this effect in context, the 12-month historical average of the unemployment index at the time of the spring sale in 2009 was 6.02. By the fall sale in 2009, the 12-month historical average of the index had risen 2.24 points to 8.26. This was the largest change in the index between sales in the data period observed for this study. This change would have caused a $330 ($1,100 × 13.4% × 2.24) per head discount for a median priced horse, if nothing else about the horse or market conditions had changed during that time period.

Summary

The primary objective of this analysis was to determine if the ban on horse slaughter and the recent recession impacted sale prices of U.S. horses. The results of the econometric model, estimated from several years of data from a large horse sale in Montana, suggest that both events adversely affected horse values. The relative magnitude of the events, however, may be quite different depending on the value of the horse.

The slaughter ban impacted horses selling near the median price level of $1,100 per head, presumably horses most likely to be bid on by slaughter buyers. Horses priced well above or below the median price do not appear to have been measurably affected by the slaughter ban. This result supports the idea that the slaughter market creates a salvage value for horses suitable for slaughter, but does not affect the value of horses unsuitable or too valuable for slaughter.

The recession, however, has had a negative price effect on most horses sold at this auction. The estimated impact on sale price for a median-priced horse is a discount of 13.4% for every one point increase in the unemployment index. Changes in the index observed during the study period ranged from 0.2 to 2.24, suggesting relatively large effects on the price of horses if the macroeconomic conditions, as measured by the BLS unemployment index, are changing quickly.

The results of this analysis indicate that policy changes affecting horse slaughter will affect the value of certain horses. With the recent lifting of the slaughter ban, if slaughter resumes to pre-ban levels and geographic location, horse owners can expect the value of their horses to increase by as much as 17.3%, for horses with a market value near $1,100. If legislation passes that ends the export of live horses for slaughter, a further decrease in value can be expected. The extent of these effects may be compounded by macroeconomic conditions if the recession continues or unemployment levels do not return to pre-recessionary levels.

References

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Table 1. Summary Statistics of Auction Prices from Billings, Montana ($/head)

	Spring Sale			Fall Sale		
Sale Year	# of Horses Sold	Average Sale Price	Median Sale Price[1]	# of Horses Sold	Average Sale Price	Median Sale Price[1]
2004	--	--	--	320	1,166	825
2005	402	1,558	1,300	527	1,690	1,000
2006	358	1,768	1,600	455	1,307	900
2007	396	1,741	1,550	478	1,570	1,000
2008	421	1,604	1,300	443	1,485	900
2009	339	1,484	1,000	318	1,011	550
2010	260	1,520	1,400	--	--	--

1 The median sale price is the midpoint of the price distribution. The average sale price is higher, due to a few horses sold at very high prices, but less representative of the full distribution (See Figure 1).

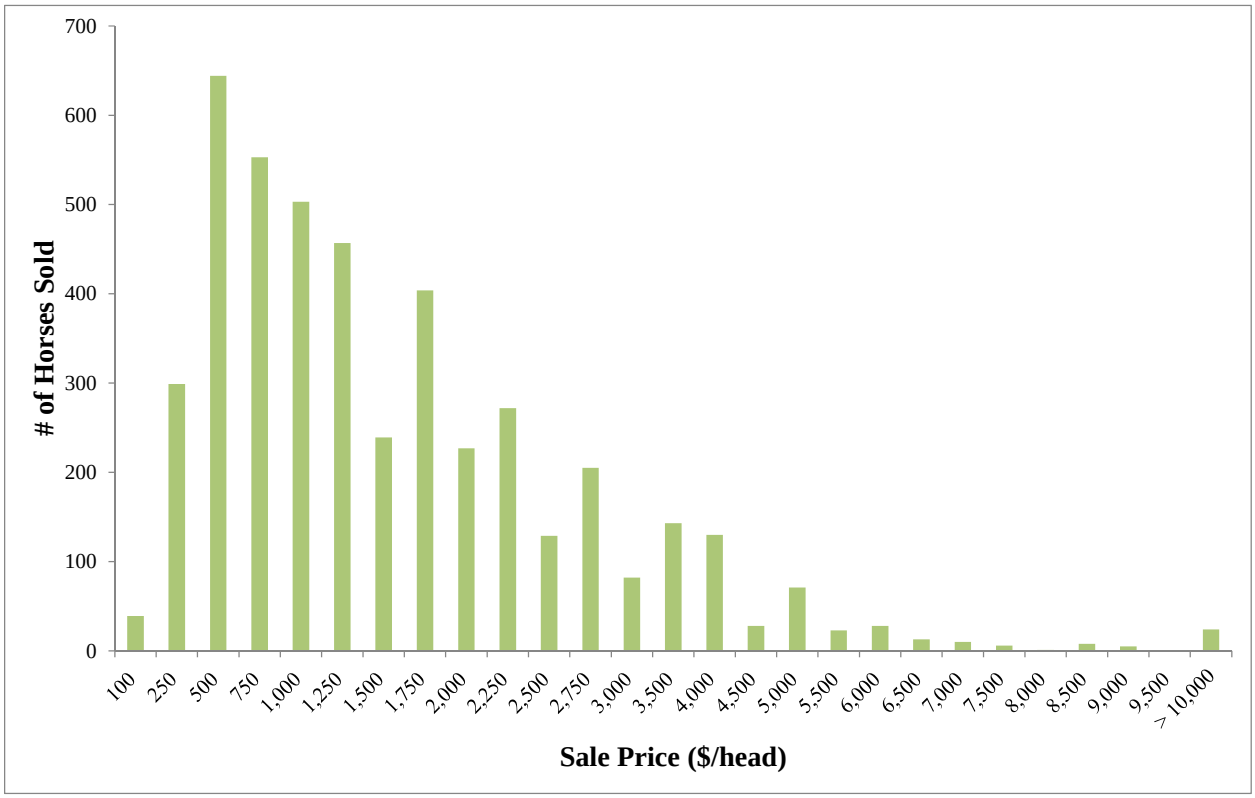

Figure 1. Distribution of horse sale prices from Billings, Montana auction, years 2004 to 2010.

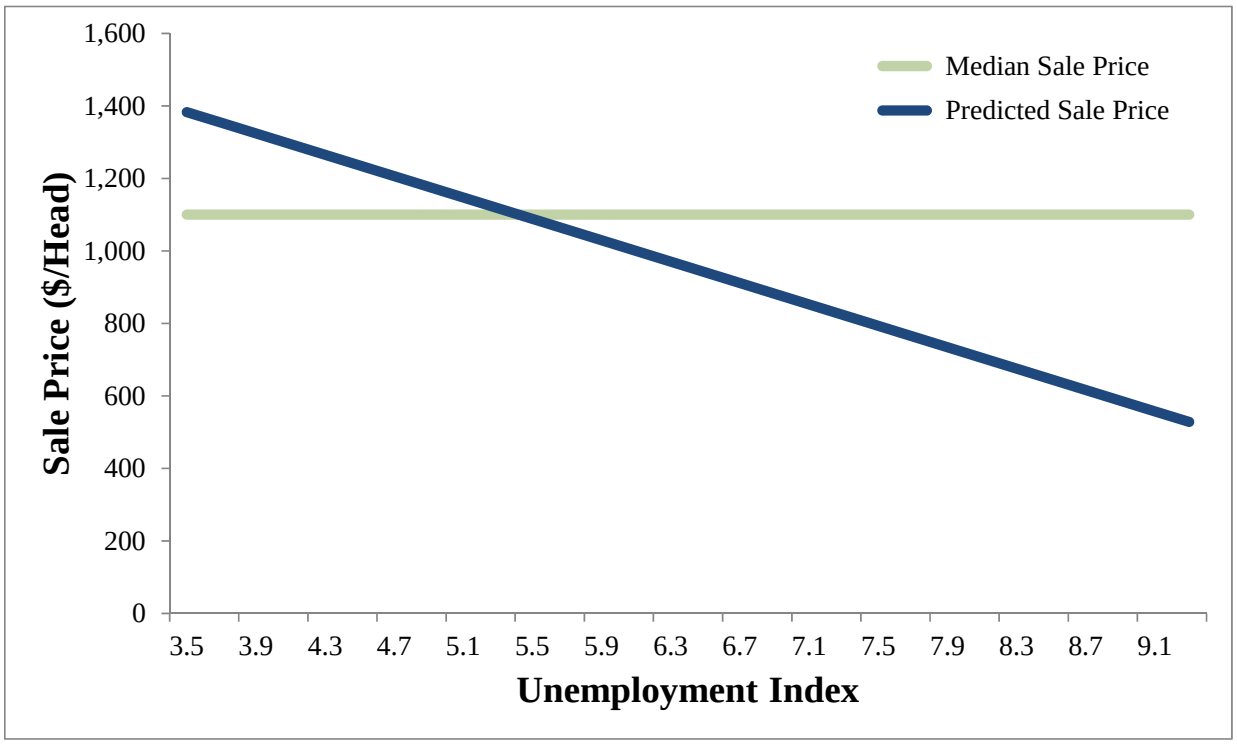

Figure 2. Estimated impact of changes in the unemployment index on a median priced horse ($1,100/head).