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# **Determinants of Weanling Thoroughbred Auction Prices**

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# Determinants of Weanling Thoroughbred Auction Prices

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## MOTIVATION

- Weanlings are less than one year old and may be as young as five months old when they are sold. They are no longer nursing from their dam.
- Predicting the future racing and/or breeding quality of a weanling Thoroughbred is especially difficult.
- Weanlings are unique in that they come from varying levels of pedigrees, conformation, and appearance, which may, or may not equate to a successful racing or breeding career.
- Weanlings are so immature in their growth process that conformation is difficult to assess; in addition, they are young enough that conformation problems may be grown out of or may be improved otherwise (McIlwraith et. al, 2003).
- The weanling auction market is very active; about 2,000 weanlings are sold at the November Breeding Stock Sale every year.
- Weanlings, whose quality and racing potential is unknown, often have hammer prices at auctions that range from low to high prices.

## OBJECTIVE

- To investigate the determinants of weanling Thoroughbred sales prices in in order to better understand this segment of the market.
- By using hedonic price analysis, the determinants of weanling sales prices can be identified and the corresponding marginal values of those determinates estimated.

## DATA DESCRIPTION

- A cross-sectional dataset of 1,343 weanlings sold at the 2010 November Breeding Stock Sale at the Keeneland Association, Inc., in Lexington, Kentucky.
- The sale price of a weanling serves as the dependent variable.
- Data is collected from the following sources:
  - Summaries and archives from the Keeneland Association, Inc. online sales database
  - 2011 Edition of the American Produce Records
  - BloodHorse MarketWatch December 2009 issue

## METHODOLOGY AND VARIABLES

- A hedonic pricing model is utilized to identify the determinants of weanling Thoroughbred auction prices.

$$\ln(y) = \alpha + x_{it} \beta + \varepsilon_{it}$$

- Assumption is that the price of a product is a function of the quantity and quality of its attributes. The “product” is a weanling Thoroughbred.
- Demand is assumed to depend on attributes of that weanling, including individual characteristics (age, gender, whether the weanling was foaled in Kentucky, and whether the weanling is Breeders’ Cup eligible) and pedigree variables such as the sire’s stud fee, whether a weanling’s sire is a freshman sire, and whether the dam and her progeny have earned black type.
- Information for the final dataset is chosen based on the relevancy of determining the factors in weanling prices that could be measurable.

Variable	Sign	Definition of Variable
InStudFee	+	The stud fee of a weanling’s sire reported for the year 2010.
FreshmanSire	+	Dummy: FreshmanSire=1 for a weanling’s sire that is a 2010 freshman sire.
DamBT	+	Dummy: DamBT=1 if a weanling’s dam is black type.
DamPBT	+	Dummy: DamPBT=1 if a weanling’s dam’s progeny is black type.
StateFoaled_KY	+	Dummy: Kentucky=1 if a weanling i foaled in the state of Kentucky.
Sex_Colt	+	Dummy: Colt=1 if the gender of the weanling is a young male.
BreedersCupEligible	+	Dummy: BreedersCupEligible=1 if a weanling is Breeder Cup Eligible.
RNA_DV	+	Dummy: RNA=1 if a weanlings reserve price is not attained.

## RESULTS AND DISCUSSION

Results from the hedonic pricing model are below, with corresponding marginal values.

Variable	Coefficient Estimate	Standard Error	Marginal Value
InStudFee	0.936***	0.068	\$1.101
FreshmanSire	0.485***	0.128	\$24,747
DamBT	0.344***	0.108	\$14,033
DamPBT	0.703***	0.108	\$31,908
StateFoaled_KY	-0.127	0.134	---
Sex_Colt	0.078	0.096	---
BreedersCupEligible	0.735***	0.115	\$18,335
RNA_DV	-0.572***	0.110	-\$17,959

- Results from the model suggest that a weanling’s quality is very desirable in determining the price of a weanling.
- A weanling’s sire stud fee adds significant marginal value to a weanling. For each dollar that is spent on a sire’s stud fee he adds \$1.10 value to every dollar on the weanling price.
- The effect of dam quality on price shows that if a dam is black type, and/or her progeny, the value of a weanling on average will increase by \$14,000 and \$32,000, respectively.
- A weanling marked for Breeder’s Cup eligibility is highly significant which signifies that it has potential to earn more and to sell at higher prices based off of its pedigree.
- Weanlings that did not reach their reserve price, on average, sold for about \$18,000 less.

## CONCLUSIONS

- An established sire adds credibility to a weanling who is not proven, and a sire that is hot of the racetrack (and who has not proven himself as a successful sire) intrigues buyers and shows that buyers are willing to take a chance on an unproven sires progeny.
- A dam’s black typed progeny more than doubles the average of a weanling’s price compared to that of the dam. A lineage of winners on the racetrack signals that a weanling might have a chance of having winning success on the racetrack.
- Buyers and sellers are striking while the sire and dam is “hot.”
- A weanling that is Breeder’s Cup eligible sends a signal that their racetrack earnings can exceed non-eligible weanlings, as well as their future sale price.
- Several breeders overvalued their weanling being Breeder’s Cup eligible, and because of this the reserve price was not met, and affects negatively the sale of a weanling.

## BUSINESS IMPLICATIONS

- A breeder capitalizing on a weanling’s value at a young age can see if they can gain a considerable profit from selling the weanling, or decide to hold on to it and develop it more as a yearling before taking it to the yearling auction the following year.
- A buyer can use this information to fairly place a value on a weanling based on these determinants, and determine whether a weanling is worth the risk or not.
- A seller can use these results to help determine a reasonable reserve price.
- This research fills in the information gap about weanling value and will aid in the decision making process of sellers valuing their weanlings and, perhaps, deciding whether to enter them in the sale, and buyers in their ability to fairly value their purchase of a weanling.

## CONTACTS

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