PROJECT J: WILD HORSE AND BURRO MARKETING STUDY PURSUANT TO H.R. 2419, P.L. 109-103, SECTION 208

BLM WILD HORSE AND BURRO POLICY: AUCTION DESIGN AND HORSE PARK FEASIBILITY STUDY

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INTRODUCTION

In legislation passed in 1971, Congress declared that "wild free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West; that they contribute to the diversity of life forms within the Nation and enrich the lives of the American people." And further that it "is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands" (US Code 2006).[1]

While there is little dispute about both the historic and symbolic nature of the free-roaming animals, the extent to which the wild horses and burros are an 'integral part of the natural system of the public lands,' has been a matter for debate and a focus of policy discussion. Despite the Congressional declaration there are concerns that, collectively with private livestock and native grazing animals, excessive numbers will contribute to rangeland degradation. This concern is heightened as evidence is gathered that confirms that the degradation can facilitate the spread of invasive plant species, changing wildfire cycles and stressing native ecosystems (Whisenant 1990).

The policy issues are particularly relevant for Nevada where about half of the 33,000 animals on federal public lands are to be found. These animals represent only a portion of the population of interest since a similar number, about 30,000 nationally, have been removed from the range in order to address the economic and ecological concerns noted above. Although the overall costs of maintaining the horses in captivity has increased, budget allocations for the BLM horse management program has fallen.[2] At the same time the rate of adoptions of horses in captivity by private citizens has fallen from 10,225 in 1998 to 4,732 in 2007.

Since the adoption of wild horses by members of the public plays an important role in the overall management policy, a research team in the Department of Resource Economics at the University of Nevada, Reno investigated several aspects of wild horse adoption, with a particular focus on how auctions have been used to distribute the animals. Previous work by Harris et al. (2005) included surveys of potential adopters which determined values they place on different characteristics of the horses. The authors discovered that there is significant heterogeneity in preferences. This chapter extends the original study, by (i) examining adopter preferences directly from horse auction data, (ii) conducting experimental research on auction design that focuses on the price impact of the preference heterogeneity issue, and (iii) using the original survey data in combination with other information to simulate potential revenues of a national wild horse and burro adoption center in Nevada.

This chapter is structured as follows: Section II presents a brief overview of the field auctions, while Section III discusses the experiments in auction design. This section begins by introducing the methodology of 'design economics' before presenting preliminary results from the study. Section IV presents the results of the stochastic revenue simulation study of the potential national wild horse and burro adoption center and Section V is a conclusion section.

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[1] Public law 92-195; the Wild Free-Roaming Horses and Burros Act of 1971. Additional background on the legislative and regulatory regimes are in Appendix 1.

[2] We refer to 'horses' as a shorthand for 'horse and burros' throughout the document unless otherwise noted.

WILD HORSE AND BURRO AUCTION MARKETS

Field auctions for wild horses are conducted both on site where the horses are housed and over the internet. This section reviews the data from each auction type. The data sets were provided by the BLM Western Regional office and BLM Eastern States office. Data from the Western Regional office contains the full bidding history of U.S Internet Wild Horse and Burro auctions between 2006 and 2008 in which 525 animals were sold. The recorded data includes characteristics of the animals that include age, color, gender, type, as well as the winning bid, and the number of bids for the adopted animals. The second data set contains similar variables from the in-person adoptions for the period from between 1997 to 2008 and contains a total of 26817 observations. The tables and the discussion below restrict attention to on-site data from 2006-2008 in order to make the most relevant comparison to the internet data.

There are some differences between the datasets. For example, the internet technology allows collection of data on the number of bidders for each adoption event and specific actions that include bid revisions. This data is not available for the onsite adoptions. The dataset for the onsite adoptions does contain data on the level of training of the horses; information that is omitted from the internet auctions.

Table 1 indicates that the group of internet bidders were more conservative than their counterparts onsite at the expositions as evidenced by the lower mean bid. Further, the value of the standard deviation is much lower for the internet auctions, 110 as compared to 329, demonstrating an element of consistency in the bids across bidders relative to the onsite auctions. Regression analyses that control for the characteristics of the horses for sale provide additional information on bidder motivation. Table 2 presents the range of characteristics among the horses as they relate to color and type.

Table 1. Live auction data, 2006-2008.

Auction Type	Number	Mean	Std. Dev.	Min	Max
Internet	2308	198.27	110.10	125	1095
Onsite	4791	230.25	328.58	125	7800

Table 2. Characteristics - color and type.

Color	Color Grouping	Code
bscb	bay, sorrel, chestnut, brown	*1*
bb	blue roan, blue	*2*
rrs	red, red roan, strawberry roan	*3*
dbg	dun, buckskin, grulla	*4*
wcp	white, cremello, palomino	*5*
ppg	pink, pinto, gray	*6*
black	Black	*7*
appaloosa	Appaloosa	*8*
O9ther	Other	*9*

Table 3. Characteristics - color and type (continued).

Type	Type Definition	
Colt	age less than 4, male, horse	*1*
Filly	age less than 4, female, horse	*2*
Gelding	gelding, horse or burro	*3*
Mare	age 4 or greater, female, horse	*4*
Jack	male, burro	*5*
Jenny	female, burro	*6*
Stud	age 4 or greater, male, horse	*7*
Others	Others	*8*

The analysis on characteristics showed that "*bscb" (*bay, sorrel, chestnut, and brown), "*wcp" (*white, cremello, and palomino), and "*dbg"* (dun, buckskin, and grulla) are the most popular color groups among the bidders. Further the level of training of the horse, only found in onsite datasets, had a critical impact on bidder valuations, with 'well-trained' horses receiving bids up to 75% greater than the untrained. Table 3 lists the proportion of trained horses in the on-site auction data, around 15.24% of the animals are trained among the animals between 2006 and 2008; the figure is much higher than the 7.23% among observations between 1998 and 2008, indicating a tendency to increase training. Given the revenue consequences, further analysis of the returns to training is warranted.

Table 3. Impact of training of wild horses.

Training	Observations	Percent	Bids	
			Mean	*Std. Dev*
TRAINED	730	15.24	$421	489.61
UNTRAINED	4061	84.76	$195	276.72

From Figure 1, "Gelding" and "Others" are the two favorite types in Onsite Adoption with the highest average bid amount, while the preferences are more evenly distributed among Internet-based adopters in terms of horse types. Regarding the color groups shown in Figure 2[3], *"dbg"* (dun, buckskin, and grulla) is the favorite group among onsite bidders followed by *"wcp"* (white, cremello,and palomino) , and for Internet bidders, *"bb"* (blue roan, and blue) and *"wcp"*(white, cremello,and palomino) yields the highest average bids. Overall, *"wcp"* (white, cremello, and palomino) color group exhibits attractiveness across two types of adoptions.

As mentioned above, number of bids information is only found in Internet Adoption data (see Table 4); "Gelding" ranks the highest among all type. Noticeably, comparing to the result shown by Figure 1, where "Gelding" did not generate the highest average bid amount, ongoing research is being undertaken to understand this result.

Further research is being conducted by using more sophisticated models to determine which of the bidding formats are more effective in eliciting the maximum willingness to pay for the animals.

[3] For Internet Adoption, "Other" color group has no observation.

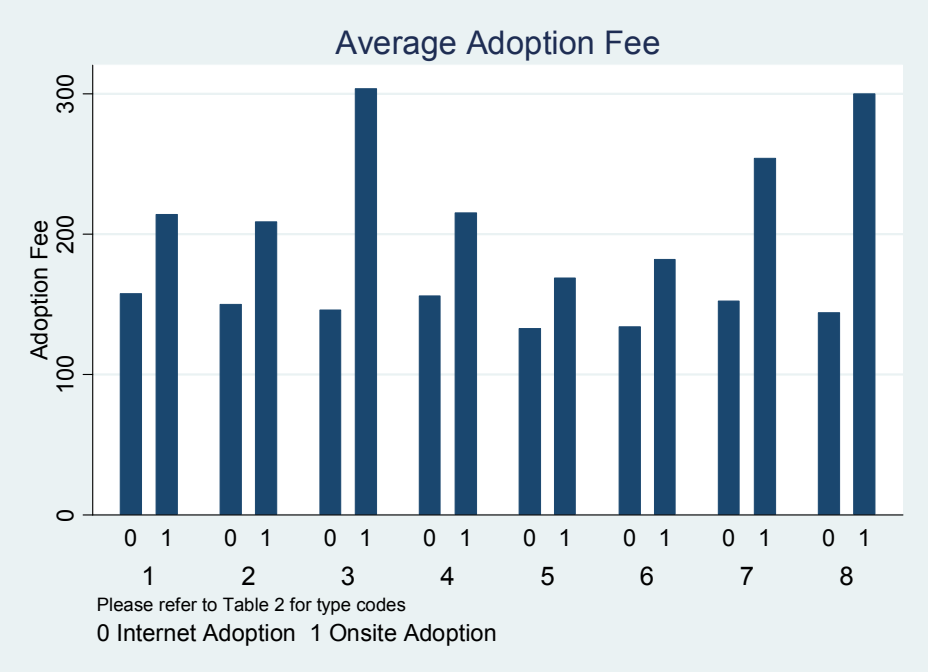

Figure 1. Average adoption fee between internet and onsite adoption over the type groups.

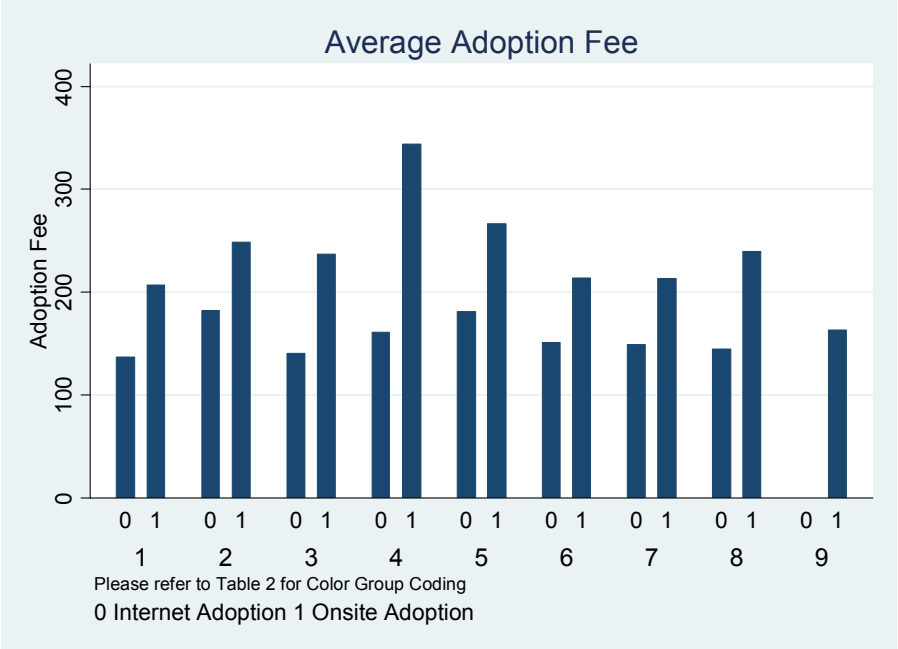

Figure 2. Average adoption fee between internet and onsite adoption over the color groups.

Table 4. Number of bids received by each type in Internet Adoptions.

Type	Type Definition	Number of Bids
Colt	age less than 4, male, horse	*359*
Filly	age less than 4, female, horse	*578*
Gelding	gelding, horse or burro	*723*
Mare	age 4 or greater, female, horse	*284*
Jack	male, burro	*74*
Jenny	female, burro	*79*
Stud	age 4 or greater, male, horse	*178*
Others	Others	*33*

AUCTION MARKET EXPERIMENTS

Design Economics

Auctions markets are an important method for allocating a wide variety of goods and services that include art, financial instruments, houses and horses. Because of their prevalence, a great deal of effort has been devoted to the theoretical study of auctions and this work has been recognized as one of the successful research programs in modern economic theory.

Auctions, like other market institutions, arise naturally as a result of the human propensity to "truck, barter, and exchange" (Smith 2007). However, there are also often intentional elements in market institutions either when creating them de novo or when placing constraints on the behavior of participants existing markets. Often, the intentional elements result from a regulatory process that is influenced by legislative, administrative, and judicial actors.[4] Perhaps surprisingly, only recently have economists begun to play a key role in the process of intentional market design. We believe that the value added by the economics profession is due largely to the development and refinement of experimental methods.

As in other sciences, experimental methods allow researchers to implement controlled changes in whatever phenomenon is under study and therefore to identify causal relationships. The usefulness of experimental methods in economics has been widely recognized by the profession as a whole as evidenced by the award of the Nobel Prize to Vernon Smith and Daniel Kahneman, two early contributors to the field.

Smith's fundamental contribution was to demonstrate that small changes in market institutions can have a large impact on economic efficiency. By announcing prices of transactions to traders in a double auction market, Smith showed prices move quickly to an efficient outcome, in contrast to an earlier study that had found similar markets without these characteristics were inefficient (Chamberlain 1948).[5]

Interestingly, Smith found that equilibrium is achieved in his double auction markets even though conditions that economic theory suggests are important, such as a large number of traders and price-taking behavior are absent. This result stresses the importance of the

[4] This discussion draws on Roth (2002).

[5] Kahneman's work at the intersection of psychology and economics has also had an enormous impact on the field but with less direct relevance to market design (see e.g. Kahneman 2003).

experimental approach for market design issues, and also the possibility for experimental results to spur advances in economic theory.[6]

Experimental methods are being used with increasing frequency to develop markets in areas as diverse as government auctions of electromagnetic spectrum, tax and tariff design, tradable pollution permits, water management in drought conditions, as well as in online commercial auctions and electricity markets. The flurry of activity in this area has led to the creation of the subfield of "design economics" (Roth 2002), which is thriving due to the high benefit/cost ratio associated with these efforts.

Experiments offer the benefit of being transparent and replicable, thus fostering informed debate about what are often contentious policy decisions. They are also relatively low in cost when compared to pilots conducted in field settings. Relative to pilot projects they reduce the possibility that the public will be exposed to policies with unanticipated negative consequences that can be costly to reverse. In brief, market design informed by experimental methods has an important role to play in the development and implementation of economic policy.

Wild Horse Auction Design Research

The market design effort to inform policy for wild horse adoption focuses on two alternative auction market structures; a sequential (SEQ) or good-by-good auction, and a right-to-choose (RTC) auction. In the SEQ each good is offered sequentially and the highest bidder purchases the good. In the RTC the highest bidder wins the right to choose from among the goods that are available at the time of that particular auction. The choice of market structures is motivated by the evidence of preference heterogeneity from both the survey data and the existing auction markets. Given the diversity of characteristics preferred by different adopters, it is often the case that there will be relatively little competition for a particular animal. Theoretical work and preliminary laboratory experiments suggest that the RTC can 'thicken markets' by creating competition across goods that are evaluated independently of each other in the SEQ setting. The experimental approach is straightforward. We sell sets of identical goods to subjects who are randomly allocated to the RTC and SEQ institutions. Ceteris paribus, differences in bidding behavior and auction revenues are therefore attributable to the different institutions.[7]

Theoretical research has shown that for risk-neutral bidders, revenue is equivalent in the two auctions, but that the RTC auction will outperform SEQ when bidders are risk-averse and subjects have heterogeneous preferences (Burgeut 2007). Intuitively, the possibility that one's preferred good will be chosen early makes the value of the later auctions less certain. Risk-averse buyers therefore are willing to pay a premium to secure their favored good in an early round.

[6] Smith and his colleagues also went on to make fundamental contributions to the field of applied market design with seminal studies in areas such as airline deregulation, and electricity and natural gas markets (Rassenti, Smith and Bullfinch 1982, McCabe, Rassenti and Smith 1991, Rassenti, Smith and McCabe 1994).

[7] We collect some additional information on characteristics of the bidders that include a measure of their attitudes to risk and demographics such as age, income and education. This allows a more careful analysis of the data when there are some differences in the subject pool across the two auction institutions.

The existing evidence on the performance of the RTC relative to the SEQ is from laboratory experiments using induced values and the results are generally supportive of the theory (Goeree, Plott, and Wooders 2004; Eliaz, Offerman, and Schotter 2005).8 Since we are interested in learning about the performance of the RTC institution in a setting similar to that of the BLM auction, we introduce real goods that are similar in value to the horses rather than the abstract 'goods' used in the laboratory studies. However, since we are recruiting bidders from the general public, rather than offering horses for sale, we use a variety of goods that we believe members of the general public will have an interest in.

In summary, and in contrast to the analysis of live auction data, experimental controls are used to insure that the effect of the auction institution is cleanly observed. The controls include the random allocation of subjects to the RTC and SEQ institutions, and the collection of additional information on risk attitudes which are known to have an impact on bidding behavior. Participants also complete a short survey that includes demographic and personality questions that will provide further controls in the analysis. The research therefore is a hybrid 'field experiment' that incorporates the most relevant elements of traditional field studies in economics with appropriate experimental controls (Harrison and List 2004).

Auction Design

In each auction session three goods were sold in three separate bidding processes. The goods included (i) hiking equipment, (ii) an Apple iPod and speaker system, and (iii) high quality wines. Each bundle has a retail value of approximately $250. Experimental sessions were conducted that varied the auction type (RTC vs. SEQ) and the information provided about the goods (high/low information). The study therefore consisted of a 2x2 factorial design with sessions allocated across the treatments as shown in Table 5.

Table 5. Experimental design.

	Information Condition	
Auction Type	Low	High
Right to Choose	8 sessions	12 sessions
Sequential	8 sessions	12 sessions

Each session contained either 5 or 6 bidders. In the SEQ treatments all goods were sold to the highest bidder at the second highest bid value. Similarly, in the RTC treatments the right-to-choose was sold to the highest bidder at the second highest bid value. Full instructions for both auction institutions are in Appendix B. In addition to the auction each session included a risk elicitation exercise based on the design of Holt and Laury (2002) and a short survey. These materials are also included in Appendix B.

Experimental Results

Figure 3 presents results from the risk elicitation protocol which yields evidence of risk aversion among bidders in both auction institutions. In addition Table 6 provides evidence from

[8] With induced values, subjects are assigned a value for an abstract good (Smith 1976). If they are successful in purchasing the 'good' at a price below the assigned value, the difference between their value and the purchase price is their profit. This methodology creates salient incentives for participants, though the abstract nature of the good raises concerns regarding the transferability of results to the policy domain.

the survey of diverse preference orderings over the goods. Under these conditions, the theory developed by Burguet predicts that the RTC will raise more revenue than the SEQ. However, we observe the opposite, revenues in the SEQ treatment are slightly higher on average, although the difference is not statistically significant, and so we fail to reject the null hypothesis of no difference in revenues across the two institutions. Table 7 presents the figures for total revenues as well as revenues in each phase for the RTC auctions.

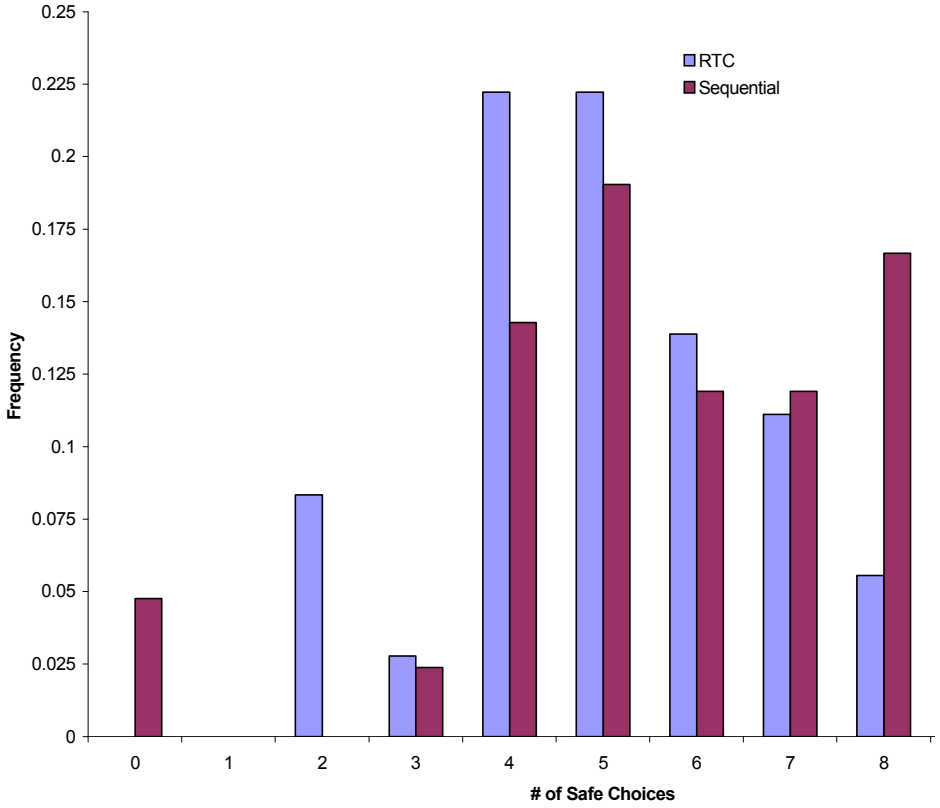

Figure 3. Distribution of safe choices in risk experiment.

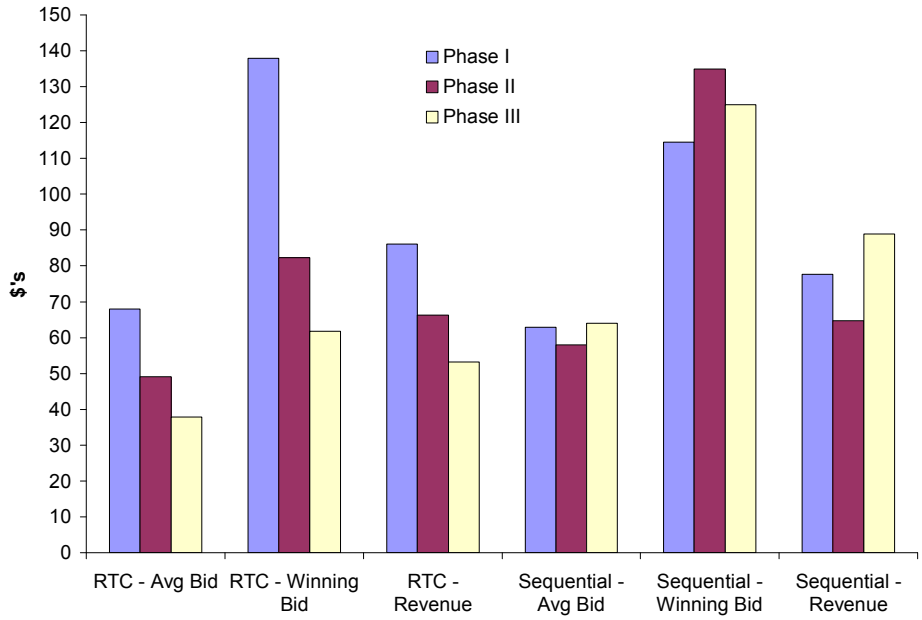

Figure 4. Observed bids and revenues by auction phase.

Table 6. Auction item preferences.

Auction Type	Good	Most Preferred Item	2nd Most Preferred Item	Least Preferred Item
Right to Choose	Wine Package	10	19	13
	Hiking Equipment	6	14	22
	iPod	26	9	7
Sequential	Wine Package	15	9	11
	Hiking Equipment	6	14	15
	iPod	14	12	9

Table 7. Auction revenues.

	Phase 1	Phase 2	Phase 3	Total
RTC	86.13	66.25	53.13	205.5
	(17.2)	(24.2)	(15.3)	(48.8)
Sequential	NA	NA	NA	231.33
				(86.3)

Note – revenue in dollars

Although the RTC does not result in increased revenues, the pattern of bids and revenues provides evidence that the subjects do understand the institution. As expected, revenues decline across phases, and bids are non-decreasing from phase-to-phase for those bidders whose preferred good remains available. What is surprising is that risk attitudes are associated with lower bids rather than higher bids as predicted by theory (Burguet 2007). Evidence for this result is found in Table 8 which presents models of individual bidding behavior. The *risk posture*

variable is categorical from 1 to 10 with a higher number indicating more risk aversion. Note that the coefficients on *risk posture* for the SEQ models (3 and 4) are not significantly different from zero, as expected.[9] In the RTC models (1 and 2) however the coefficients are negative and significantly different than zero.

Table 8. Random effects estimates - Individual auction bids.

	Model 1 – RTC	Model 2 – RTC	Model 1 – Sequential	Model 2 - Sequential
Model Constant	34.09**	20.25	23.79	-12.14
	(14.43)	(13.34)	(18.19)	(23.37)
IQ Proxy	8.08**	5.67**	5.39	1.51
	(3.79)	(2.55)	(4.42)	(5.23)
Risk Posture	-3.47**	-3.24**	-0.18	3.33
	(1.71)	(1.19)	(2.50)	(2.88)
Above Average Wealth	16.76**	12.55**	9.71	10.91
	(8.31)	(5.60)	(10.24)	(12.25)
Most Preferred Good	31.33**	5.90	61.99**	79.21**
	(6.86)	(5.87)	(9.30)	(12.48)
2nd Most Preferred Good	14.77*	11.95**	19.89**	26.92**
	(7.90)	(5.79)	(9.30)	(10.89)
Lagged Revenue		0.31**		0.25
		(0.12)		(0.16)
# of Observations	126	84	105	70
Log Likelihood	-612.15	-372.91	-543.05	-361.66

Understanding the result on risk is critical to determining the suitability of the RTC auction format for wild horse adoption, and more generally for understanding where this institution may be usefully applied in the field. Our results suggest that both additional experimental treatments and extensions to the existing theory are needed. The theoretical framework assumes that each bidder has a known private value for the good and also knows the distribution of values among the other bidders. It is frequently true, however, that bids can be motivated by both private and common values, for example, when market price and resale opportunities enter into bidder calculations. Alternatively, individual uncertainty either about their own value, if they lack experience with a particular item, or about others values could affect bidding behavior. In the latter case, we would expect individuals may behave strategically in order to learn about other's values during a session.

Evidence on the importance of learning in our data is found in model 2 of Table 8 which models bidding behavior in the RTC. In this model, the lagged revenue is included as an explanatory variable and is found to have an important effect on bids. This suggests that individuals are learning from others bids in early phases of the RTC auction, forgoing potential profits in order to gain information on others values.

In the high information treatments detailed descriptions from the manufacturers, consumers and from independent reviewers are provided to the bidders to help resolve value uncertainty. Bidding in these treatments does differ from the low information treatments;

[9] In the sequential auction treatments the second-price institution means that bidding true value is a dominant strategy, unaffected by risk posture.

however, the impact does not vary across the auction formats. To investigate the common value and strategic learning alternatives further research using a combination of laboratory and field experimental protocols is proposed.

The laboratory sessions are useful because it is possible to eliminate any common-value motivations and also systematically vary the amount of information bidders have about others' values. In the field setting, a simple change to the protocol, not announcing the price at which the good is sold will diminish the ability of bidders to learn about values of others. With this change in protocol only the winner will gain specific information on prices (since the price is set by the second highest bidder), and losing bidders will not learn more than that there bid was not the highest. We hypothesize that eliminating the possibility of learning about others values will move to bidding more consistent with the existing theoretical predictions.

REVENUE SIMULATION STUDY

This section reports the results from a stochastic simulation study based on the survey responses in Harris et al. (2005). One of the goals of Harris et al. (2005) is to estimate the value of characteristics of wild horses offered at BLM horse auctions, that is, to identify which horses are most attractive and most likely to be purchased. The study shows that larger size, younger age, quiet, and less expensive are the common desirable wild horse characteristics using the probit econometric model.

This section utilizes the econometric estimation result in Harris et al. (2005). The estimation result is reported in Table 9 which is the respondents at the Reno wild horse and burro exposition (Harris et al., 2005).

Table 9. Probit estimation result in Harris et al. (2005).

Variable	Estimated Coefficients
constant	-0.57593
Size	0.04959
$Size^2$	-0.00017
Expense	-0.00064
Under 2	0.31935
2-6 years	0.27518
7 to 10	0.18527
Sorrel	-0.32584
Bay	-0.34574
Palomino	-0.19866
Gray	-0.38383
Gentle	-0.13269
Quiet	0.27706

The probit model was employed to derive the probability of a horse being adopted given different horse characteristics. The stochastic simulation model will derive different probabilities of horse adoption in order to complete a stochastic simulation.

The simulation is performed for identifying the potential distribution of revenues from a supply of horses given the preferences for horse characteristics among potential bidders in Nevada. First, the random horses are generated, that is, generate values of horse characteristics and expense. All of the wild horses' characteristics are assumed to be independent. Second, probability P_i is calculated using the estimated coefficients in Table 9. Third purchase decision is made with P_i, which is assumed to follow Bernoulli distribution which is binary decisions, purchase or not. The higher P_i value implies the larger chance to be purchased. The simulation is conducted on a sample of 2,000 horses and total revenues are calculated for the entire group. The simulation is iterated 100 times to generate a distribution of revenues.

Revenue is defined as the sum of adopted horses times the average price for a horse. The simulation results are presented in the table below which shows that on average, 718 of the 2,000 horses are sold for an average price of $506 (Table 10).

Table 10. Simulation results (2000 Horses).

	Total Revenue (dollars)	Number of horses sold (horses)	Average horse price (dollars)
Average	363,560	718	506
StDev	11,646	21	9

Figure 5 shows the distribution of revenue from possible wild horse auctions. From Table 10, the most likely (median) revenue for a wild horse was $362,020 with minimum revenue of $335,229 and maximum revenue of $406,276. These stochastic revenue estimates can be contrasted to operating and capital cost of a potential national wild horse and burro adoption center. Finally, a distribution of annual net returns from this proposed faculty can be developed. From distribution of net returns, policymakers can estimate potential net revenues in best, most likely, and worst times. This distribution of potential net returns would assist risk adverse decision makers in developing strategies for the construction and operation of a national wild horse and burro interpretive center.

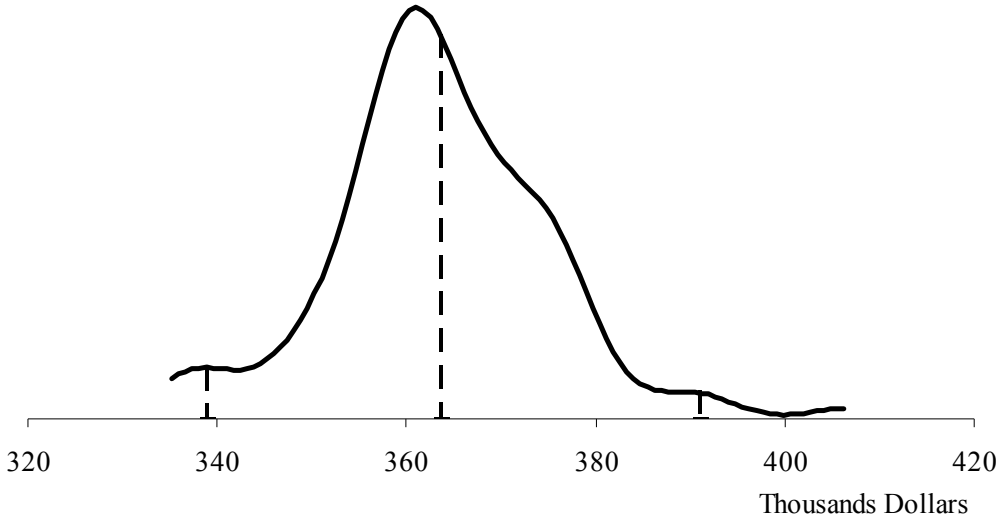

Figure 5. PDF approximation of total revenue.

CONCLUSION

Wild horse and burro policy is currently driven by several goals that include the mitigation of damage to rangeland, the commitment to humane treatment of the animals, and the control of regulatory costs. Placing animals with private owners and raising revenue from the distribution of the horses complements all these goals.

This study has investigated post studies to derive characteristics of wild horses that could increase rates of adoption. This study has also investigated alternative auction strategies that potentially could increase adoption rates of wild horses. Lastly, the study has employed stochastic simulation procedures to provide wild horse adoption decision makers with a range of potential revenues for wild horse adoptions. This range of revenues combined with capital and operation cost estimates of a potential wild horse and burro interpretive center would provide decision makers with information as to potential distribution of net returns. From the distribution of net returns, decision makers could decide on construction and operation of a national wild horse and burro interpretive center in a risk adverse vantage.

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APPENDIX 1: LEGISLATION RELATING TO WILD HORSES[10]

The Wild Horse Annie Act

During the 1950s in Nevada, Velma B. Johnston, later known as Wild Horse Annie, became aware of the ruthless and indiscriminate manner in which wild horses were being gathered from the rangelands. Ranchers, hunters and "mustangers" played a major role in harvesting wild horses for commercial purposes.

Wild Horse Annie led a grass roots campaign, involving mostly school children, which outraged the public and ultimately got them fully engaged in the issue. Newspapers published articles about the exploitation of wild horses and burros and as noted in a July 15, 1959, Associated Press article, "Seldom has an issue touched such a responsive chord."

In January 1959, Nevada Congressman Walter Baring introduced a bill prohibiting the use of motorized vehicles to hunt wild horses and burros on all public lands. The House of Representatives unanimously passed the bill which became known as the "Wild Horse Annie Act." The bill became Public Law 86-234 on Sept. 8, 1959, however, it did not include Annie's recommendation that Congress initiate a program to protect, manage and control wild horses and burros. Public interest and concern continued to mount, and with it came the realization that federal management, protection, and control of wild horses and burros was essential.

The 1971 Act - Public Law 92-195 Wild Free-Roaming Horses and Burros Act

By 1971, the population of wild horses had diminished drastically due to the encroachment of man and the mustangers elimination of them.

In response to public outcry, members of both the Senate and the House introduced a billed in the ninety-second Congress to provide for the necessary management, protection and control of the wild horses and burros. The Senate unanimously passed the bill on June 19, 1971. After making some revisions and adding a few amendments, the House also passed the bill by unanimous vote. Former President Richard M. Nixon signed the bill into law on December 15, 1971. The new law became Public Law 92-195, The Wild Free-Roaming Horses and Burros Act of 1971.

The Wild Free-Roaming Horses and Burros Act were later amended by the Federal Land Policy and Management Act and the Public Rangelands Improvement Act. Public Law 94-579, the Federal Land Policy and Management Act, dated Oct. 21, 1976, allowed for the Secretaries of the Interior and Agriculture to use or contract for the use of helicopters and motorized vehicles for the purpose of the management of wild horses and burros on public lands.

Public Law 95-514, the Public Rangelands Improvement Act of 1978, established and reaffirmed:

(i) the need for inventory and identification of current public rangeland conditions (monitoring);

(ii) the management, maintenance and improvement of the condition of public rangelands to productively support all rangeland values;

(iii) continuance of the law protecting wild free-roaming horses and burros from capture, branding, harassment or death, while at the same time facilitating the removal and disposal of

[10] This information retrieved from www.blm.gov.

excess wild free-roaming horses and burros which pose a threat to themselves and their habitat and;

(iv) the transfer of title after one year to individuals who had adopted wild horses and burros removed from public rangelands, provided the animals had received proper and humane care and treatment during that year.

APPENDIX 2: EXPERIMENTAL PROTOCOLS

Experimental Instructions [Right-to-Choose Auction]

Welcome to Jonesie's Auctions. You have the opportunity today to bid in an auction where we will be selling the three bundles of goods displayed on the table in front of you. We will provide you an opportunity to examine each of the items before the bidding begins. We ask that you do not talk with any of the other participants during the session. If you have a question at any time during the session, please raise your hand and a monitor will come to your seat and answer it in private.

Description of the available goods

Good 1: I-Pod and Speakers

- 2 GB iPod Nano with 500 song capacity
- JBL On Stage Micro portable music dock for I-Pod

Good 2: Hiking Equipment and Backpack

- REI Ridgeline backpack
- REI Hiker First Aid Kit
- Katadyn Hiker Microfilter

Good 3: Riedel Wine Glasses and Wine

- Set of 4 Riedel Chardonnay Glasses
- One bottle of 2006 Laird Family Estate Carneros Chardonnay
- Set of 4 Riedel Pinot Noir Glasses
- One bottle of DuNah Vineyards Russian River Valley Pinot Noir
- Set of 4 Riedel Cabernet/Merlot Glasses
- One bottle of 2004 Chappallet Napa Valley Cabernet Sauvignon

There are five bidders in this auction which will consist of three phases. Rather than sell the goods one by one, we will sell 'rights to choose' one by one. If in any phase you win one of the rights to choose, you will be able to choose which of the goods remaining at that time you want. To be more precise, in each phase a 'right to choose' is sold to the highest bidder. In the first phase, all five bidders will submit a bid for the first right to choose. The highest of these five bidders wins the first right to choose and selects the good that he or she prefers. At the end of the first phase, every bidder will be informed whether they won the first right to choose and which good was selected by the winning bidder.

Once the winning bidder from the first phase has selected their preferred item, the second phase starts. In the second phase all bidders will submit a new bid for the second right to choose. The highest of these bids wins the second right to choose and selects the good that he or she prefers from amongst the two remaining items. At the end of the second phase, every bidder will be informed whether they won the second right to choose and which good was selected by the winning bidder. In the third and final phase, all bidders will submit a new bid for the remaining item. The highest bidder in the third phase will win the final item.

***Auction Rules*:**

In each phase, you are asked to submit a bid indicating the maximum amount you are willing to pay to acquire the particular good being sold. Bids may be submitted in intervals as fine as one cent although there is no restriction on the amounts that you can bid. If you do not place a bid, it will be counted as a bid of zero dollars. Once I have received bids from all five bidders, I will order them from highest to lowest to determine the winner in that phase. The price that the winner in each phase pays depends on the bids of the other participants in the market. To be precise, in each phase the individual that submits the highest bid will be awarded the item for a price equal to the second highest bid submitted for that phase. If you do not submit the highest bid, you will not win the item in that phase and will not be asked to pay anything.

If two (or more) individuals submit the same high bid, then one of these bidders will be randomly selected and awarded the good for that phase. In such an instance, the winner pays a price equal to their own bid amount.

Example: If the bids in the first phase are ranked highest to lowest as follows:

$A (bid from bidder A)
$D (bid from bidder D)
$E (bid from bidder E)
$B (bid from bidder B)
$C (bid from bidder C)

Bidder A would win the first item and pay a price equal the amount of the bid submitted by bidder D.

The bidding process would then be repeated with everyone submitting a bid for the second item being sold. If the bids in the second phase are ranked highest to lowest as follows:

$E (bid from bidder E)
$C (bid from bidder C)
$F (bid from bidder F)
$B (bid from bidder B)
$A (bid from bidder A)

Bidder E would win the second good and would pay a price equal the amount of the bid submitted by bidder C. The bidding process would be repeated one final time with bidders submitting a bid for the final good.

Example: Before you submit your actual bids, I would like you to work through an example. Consider an auction where the following bids were submitted in the first phase of the auction if the good being sold is the I-Pod and Speakers. We want you to determine who will win the auction and how much they will pay to obtain the I-Pod and Speakers

Bidder 1's First Bid = 1103¥

Bidder 2's First Bid = 850¥

Bidder 3's First Bid =1200¥

Bidder 4's First Bid = 250¥

Bidder 5's First Bid = 475¥

Take the two highest bids and order them from highest to lowest:

Highest Bid _____ 2nd Highest Bid _____

Now, determine which bidder has won the I-Pod and Speakers and the amount that he or she will have to pay. Fill in those numbers here.

Winning Bidder _____ Amount Paid _____

To assure that you understand how this auction mechanism operates, I will check your work after you complete this example. Please raise you hand once you have completed the example.

***Final Transaction*:**

The winners in each phase will be required to pay me (cash or check) for the items that they have won at the end of the session. Once I have received payment, the respective item will be awarded to the winning bidder.

I understand that you may not have anticipated the need to bring cash or your checkbook with you for this experiment. In the case that you do not have the necessary cash (or a check) to pay for the items, we will provide you with a stamped envelope in which to mail the payment. Upon receipt of your cash or check, I will send you the items that you won. All postage will be paid by Jonesie's Auctions for items mailed to the winners.

Note that while this is a real auction for the items displayed on the table in front of you, I plan to use data on the bids in this auction for economic research. I guarantee to sell all three of the items to the winners of this five-bidder auction, whatever the final auction prices turn out to be. Your bids represent binding commitments to purchase the items you win at the prices specified by the auction outcomes.

Good luck – we now invite you to spend a few minutes examining the goods on the table at the front of the room. Once you have examined the items, please return to your seats. Once everyone has been seated, we will ask you to write your bid for the first phase on the sheet provided.