Appendix: Experimental Instructions

Page 1

General: This is an auction in which you have the role of a bidder who is interested in purchasing a portfolio of assets, which will be referred to as "securities." Owning different securities is like owning different stocks. Just as shares of the same stock are identical, units of a specific security are identical. These units will be referred to as "contracts."

Security Values: There are 4 different securities, labeled **A**, **B**, **C**, and **D**. Each security has an underlying average value. The value of a particular security for one bidder may, however, differ from the value to another, due to differences in individuals' overall portfolios and financial needs. For each security, you will know *your* value, but you will not know the average value of the security or the security's value for any other bidder.

Auction Procedure: You will be bidding against **3 other bidders** in each auction. You will be given the chance to purchase contracts for each of the different securities that you have an interest in acquiring. The next several pages explain how the seller decides which bids to accept and which to reject.

Page 2

Seller Value Estimates: The seller has its own seller value estimate for each security. You may think of the seller value estimate as being an indicator of the value of that security across all bidders. These value estimates will be used by the seller to compare bids across different securities.

Bid Comparisons: The seller is not necessarily interested in accepting the highest price offers (bids). Instead, the seller is looking for the best deals, that is, bids that are the highest compared to its value estimates. For example, suppose that a bid of $110 is received on a security with a value estimate of $100, and a lower bid of $105 is received on a security with a value estimate of $80. Then the seller would prefer to accept the second bid, since the difference between that bid and the seller's value estimate is greater.

Normalized Bids: To compare bids across different securities, each bid submitted will be transformed into a **normalized bid** by dividing it by the **seller's value estimate** for that security. Hence a normalized bid above 1 means that the bid submitted is higher than the seller value estimate.

Bids: You can bid different amounts for different contracts (units) of the same security. For example, if you are bidding for 3 contracts of security A, you could submit bids of 85 for one contract, 92 for a second, and 103 for a third. Alternatively, you could submit the same amount for all three contracts.

Page 3

Seller Objective: The seller will accept bids for a given security that exceed the seller value estimate for that security, subject to some limits or sales revenue targets to be explained next.

Overall Sales Revenue Targets: The seller has an **overall minimum sales target** and an **overall maximum sales target** across **all securities**. This means that the seller will accept bids until the sum of all accepted bids across all securities exceeds the overall minimum sales target. After that, additional bids may be accepted as long as the total sales revenue does not exceed the maximum overall sales target

How Are Bids Accepted? First, the bids for all securities are normalized and ranked from high to low in **a single list**. The seller goes down the list. At each step, a bid is accepted until the overall minimum sales revenue has been reached. After that bids are only accepted if

1) the bid exceeds the seller value estimate, **and**

2) the overall maximum sales revenue target would not be exceeded.

Random Tie Breaking Procedure: In the event of tied bids at the cutoff, random numbers will be drawn to break the tie in a manner that gives each tied bid an equal chance of being accepted.

Page 4

Payments: If your bid is accepted, then the amount that you pay is the amount of your accepted bid, that is, this is a "pay as bid" auction. You pay nothing when your bid is not accepted.

Earnings: You earn nothing on bids that are not accepted. What you earn for each accepted bid is the difference between your value for that particular security and the amount of your accepted bid. So a bid equal to your value would result in earnings of $0. Lower bids yield higher earnings if they are accepted, but lower bids are less likely to be accepted. So there is a tradeoff that you need to face when you decide on which bids to submit.

Partial Acceptance at the Margin: The seller reserves the option of only partially accepting a bid, e.g. to avoid having sales revenue exceed a maximum target or to reach a minimum sales target with a bid that is below the seller value estimate. For example, if a bid is only half accepted, then the bidder would only pay half of the bid and would only earn half of the bidder's value.

Page 5

Example: A Combined Auction with Two Securities Suppose the bids are **$12**, **$10**, and **$8** for **security A**, and are **$22** and **$18** for **security B**. If the seller value estimates are **$10** for security A and **$20** for security B, then the ranked normalized bids are as shown below.

Security A:	**Security B:**
Bids = **$12**, **$10**, **$8**	Bids = **$22**, **$18**
Seller Value Estimate = **$10**	Seller Value Estimate = **$20**

Ranked Normalized Bids:

1.2 (=$12/$10)
1.1 (=$22/$20)
1.0 (=$10/$10)
0.9 (=$18/$20)
0.8 (=$8/$10)

Example with Minimum Combined Sales of $30: A minimum sales target of **$30** would be reached by accepting the bids of $12 and $22. The bid of $10, with the third highest normalized bid, could also be accepted since the bid-to-estimate ratio for this bid is 1 (as long as it is the case that including this third bid does not cause total sales to exceed the seller's maximum combined sales limit). The bids of $18 and $8 with bid-to-estimate ratios below 1 would be rejected.

Example with Minimum Combined Sales of $60: The bids with the four highest normalized bid ratios ($12, $22, $10, and $18) add up to a total of $62, and these would have to be accepted to reach a minimum combined sales target of **$60**. Note that this requires that the bid of $18 for security B is accepted, even though is it below the seller value estimate of $20 for that security. In this case, the $18 bid at the margin would only be partially accepted, at a rate of 16/18 or 8/9, which would cause the total sales revenue to be exactly $60. The bid of $8 (with a normalized bid of 0.8) at the bottom of the list would be rejected.

Page 6

Combined Sales Targets: The seller's **overall minimum sales target** for all 4 securities combined is **$1200**, and the **overall maximum sales target** is **$2000**

Security Average Values: Some securities will be worth more, on average, than others. The average value for each security has been drawn randomly from a range between **$20** and **$80**. All integer value amounts in this interval are equally likely. Hence, each security has an average value between **$20** and **$80**.

Your Security Values: Your value for a given security is drawn randomly from a range between **$10.00** below the security average value and **$10.00** above the security average value. All value amounts in this interval are equally likely. Others' values for a given security will be determined randomly in the same manner. The range of possible values for a given security with

a high average value will be higher than the range for a less valuable security. There will be a series of auctions, and new random values will be drawn independently for each security and for each bidder at the start of each auction.

High or Low Values: If you have a high value for a given security, it could be because your draw is high in the interval of possible values that bracket the average value, or it could be because the average value for that security turned out to be high, in which case the other bidders are also likely to have received high values. Conversely, all bidders' values will be low for a less valuable security with a low average value.

Seller Value Estimates: For each security, the seller uses best available information to estimate its market value. Note that a higher seller value estimate will generally correspond to a more valuable security.

Reserve Price: The seller will not accept any bid that is below $10, and your bid submission menu will not include lower bid amounts.

Summary Page

Bids specify the price at which you are offering to pay for contracts of a specific security.

Bids for all securities are considered together, starting with acceptance of the highest normalized bids (i.e. with the highest bid-to-seller-estimate ratios) and going down the combined list of ranked normalized bids. Once the overall minimum sales revenue target of **$1200** for all securities is reached, additional bids will be accepted if they exceed the seller value estimate until the overall maximum combined sales revenue limit of **$2000** is reached.

You will not find out the seller value estimates prior to making your bids; you will only be able to see those when the auction clears and you find out whether your bids are accepted or rejected.

Purchase Price = Accepted Bid, so all successful bidders will pay their (un-normalized) bid amounts.

The **sale price** for an accepted bid is the bid amount, so to make money, you will have to bid below your values for the securities you desire. But if you bid too low, your bids may not be accepted, and earnings are zero on bids that are not accepted.

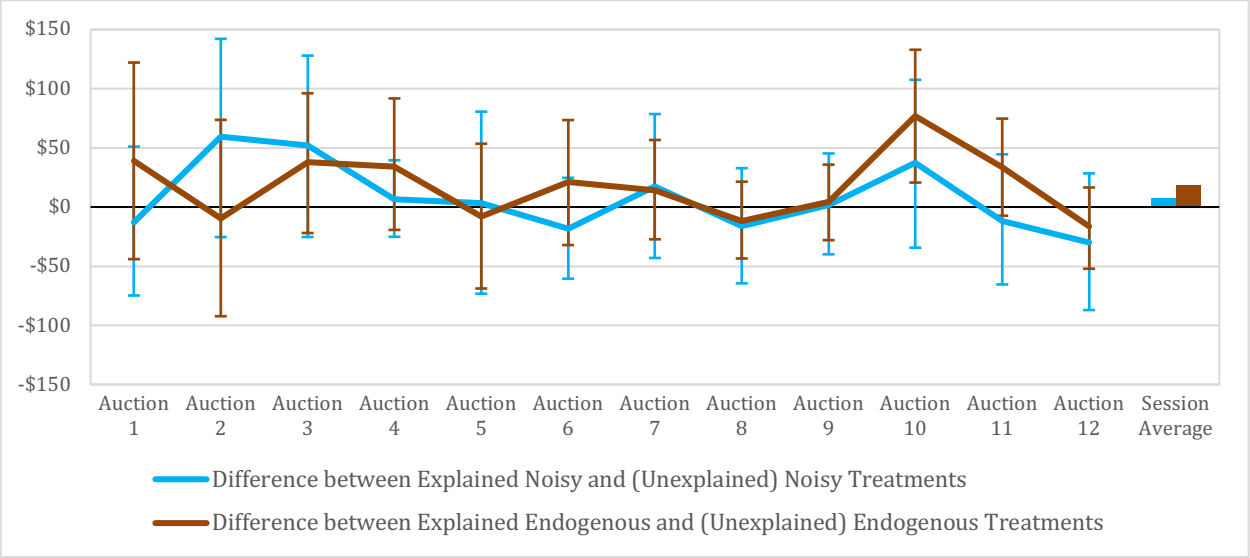
Average Values for each security will be drawn randomly from a range that is between $20 and $80.

Individual Values for each security for each bidder will be taken from a range that is within plus or minus $10.00 of the average value.

There will be **12 auctions**, and your security values will be randomly regenerated for each new auction. The program will keep track of your total earnings for all auctions.

Special Earnings Announcement: Your cash earnings will be **8%** of your total earnings at the end of the experiment.

Figure 7: Difference in Seller's Profit between Treatments with Full and Partial Disclosure



The points on a line represents the average of the 6 sessions conducted for the corresponding treatment in each of the 12 auctions. Recall that the points in each auction are directly comparable across treatments. The error bars around each point represent the 95% confidence interval. Bars on the right are per-auction treatment averages. The stars above the blue (respectively, brown) bar represent the outcome of a 2-sided permutation test of equal means between the Explained Noisy treatment and the Noisy treatment (respectively, the Explained Endogenous treatment and the Endogenous treatment). The absence of a star above a bar indicates no significant difference at the 10% level. The superscripts ***, **, and * indicate that the null hypothesis of equal means is rejected at the 1%, 5%, and 10% significance levels.

Figure 8: Difference in Allocative Efficiency between Treatments with Full and Partial Disclosure

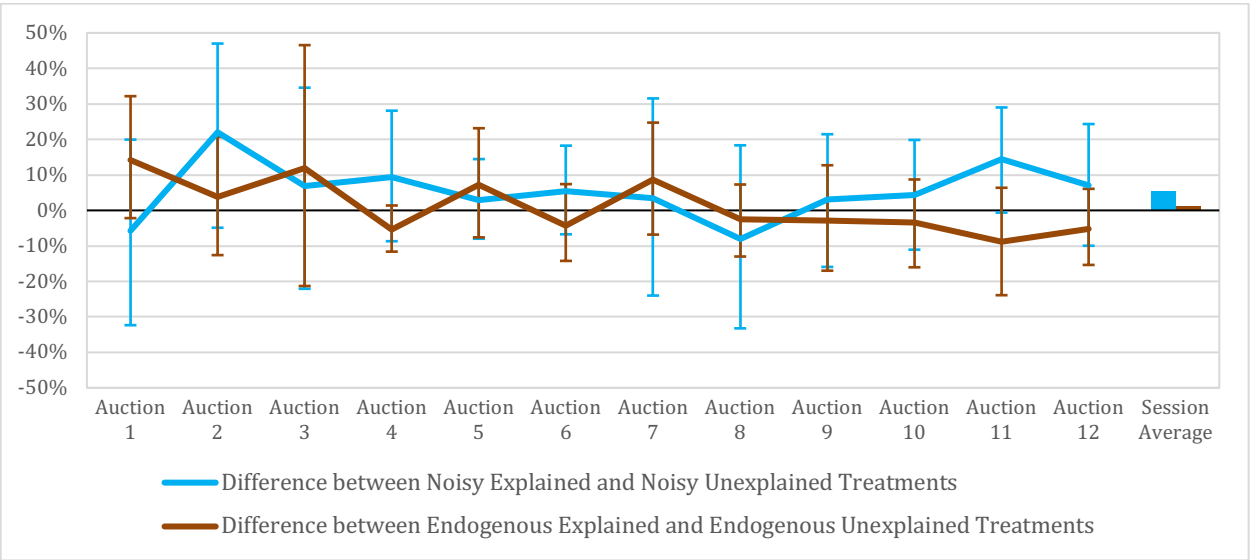


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Figure 9: Difference in Total Surplus between Treatments with Full and Partial Disclosure

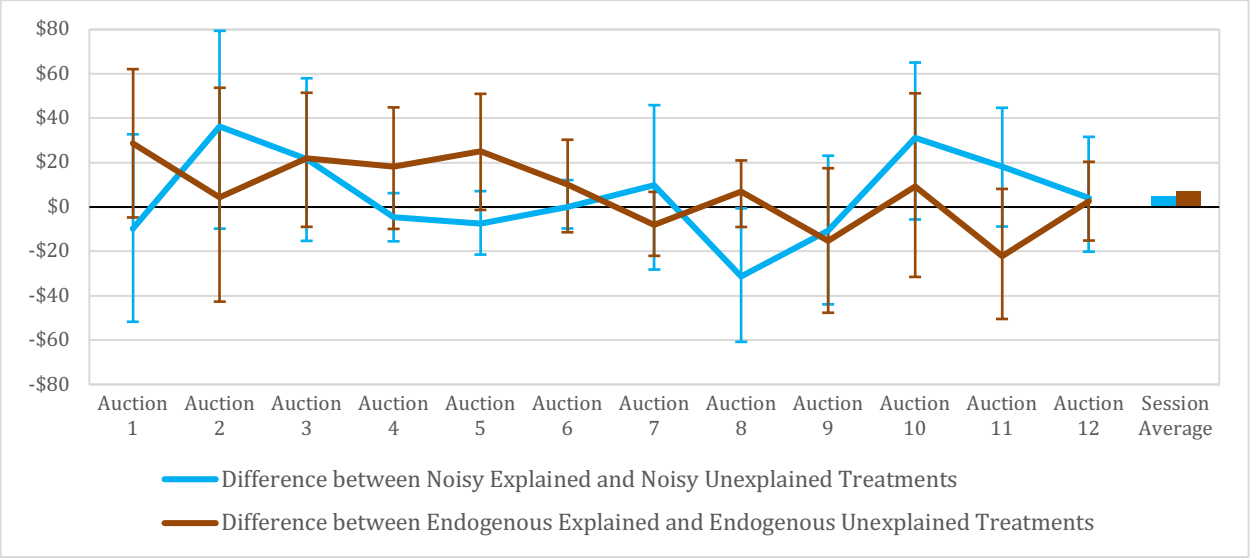

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Figure 10: Difference in Bid Discount between Treatments with Full and Partial Disclosure

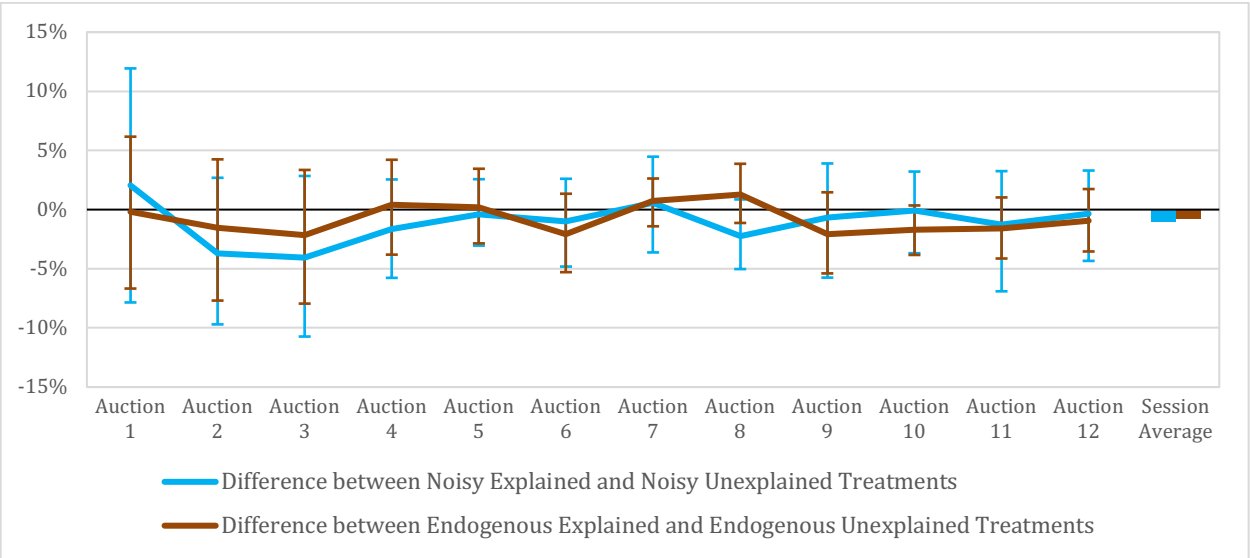

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Figure 11: Seller's Profit under Full Disclosure

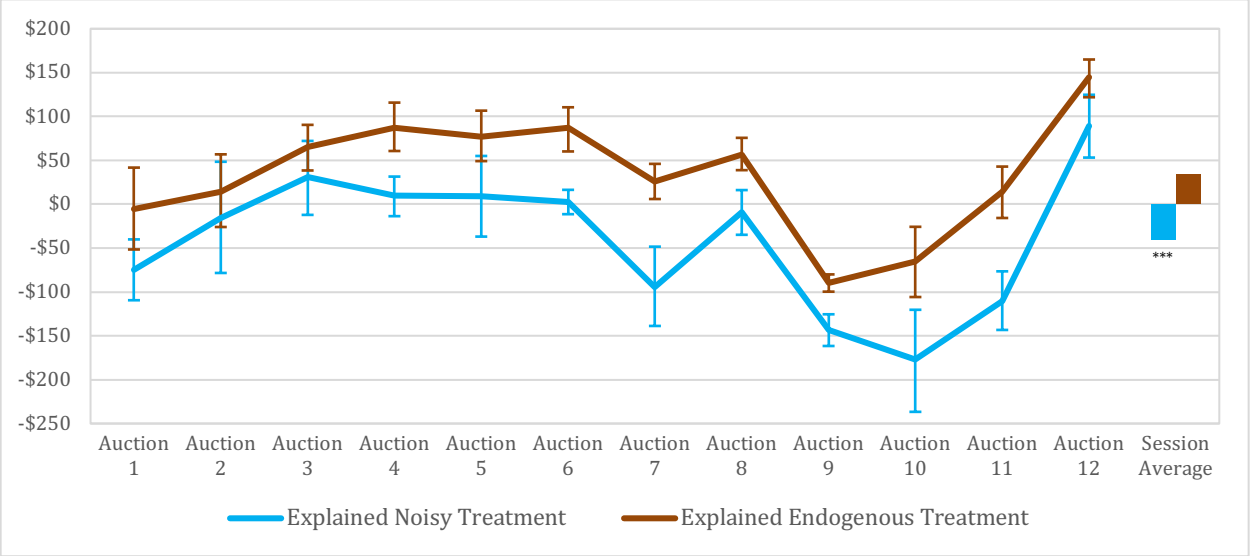

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Figure 12: Allocative Efficiency under Full Disclosure

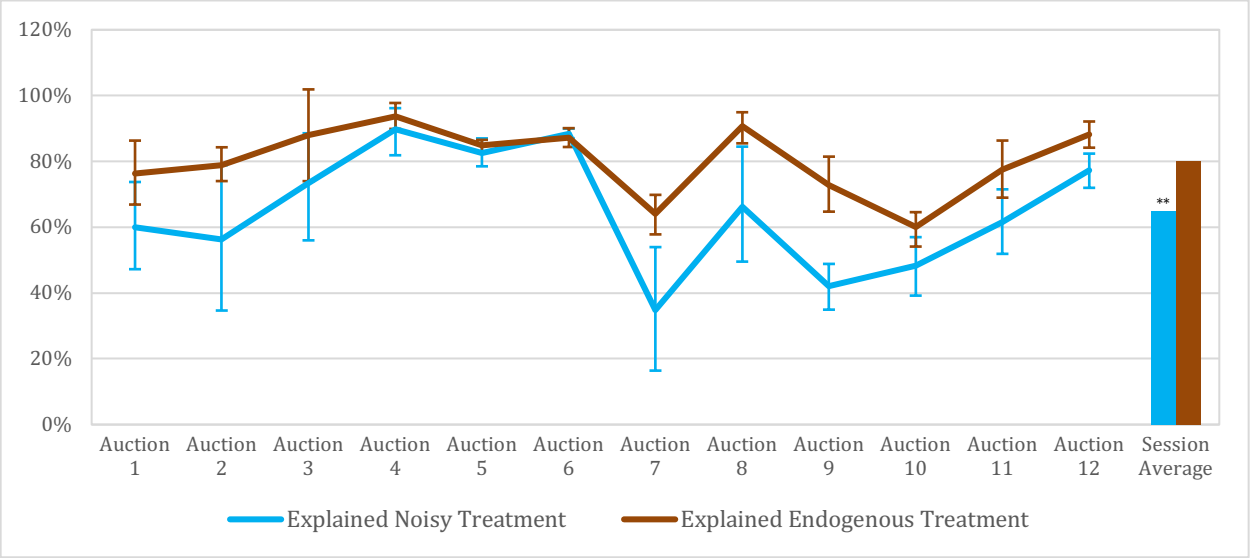

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Figure 13: Total Surplus under Full Disclosure

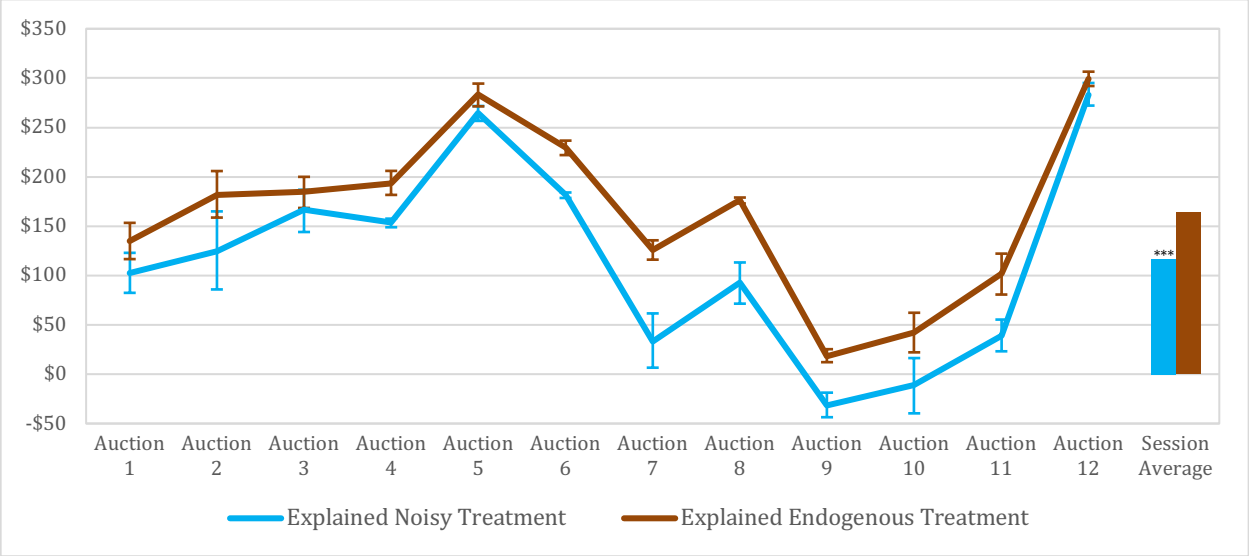

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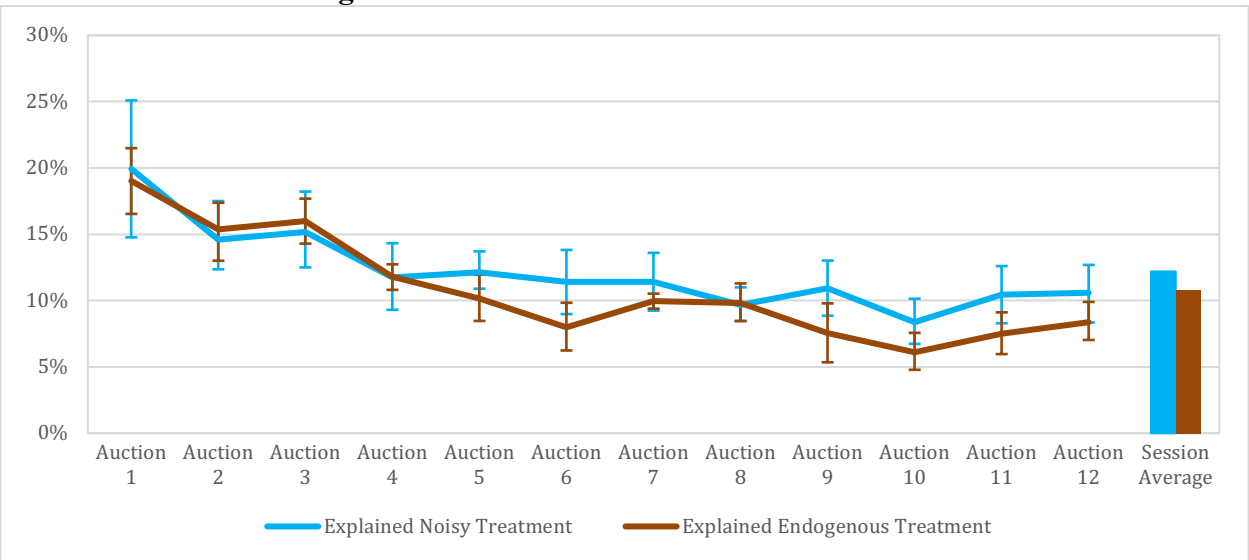
Figure 14: Bid Discount under Full Disclosure



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