

Quantal Response Equilibrium and Overbidding in Private-Value Auctions

Instructions and Data Appendix

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Abstract

This paper reports the results of a private-values auction experiment in which expected costs of deviating from the Nash equilibrium bidding function are asymmetric, with the implication that upward deviations will be more likely in one treatment than in the other. Overbidding is observed in both treatments, but is more prevalent in the treatment where the costs of overbidding are lower. We specify and estimate a noisy (quantal response) model of equilibrium behavior. Estimated noise and risk aversion parameters are highly significant and consistent across treatments. The resulting two-parameter model tracks both the average bids and the distribution of bids remarkably well. Alternative explanations of overbidding are also considered. The estimates of parameters from a nonlinear probability weighting function yield a formulation that is essentially equivalent to risk aversion in this context. A model in which players experience a "joy of winning" provides a reasonable fit of the data but does significantly worse than the risk aversion model.

Appendix : Data for the First-Price Auction

Value - Bid (Other's Bid) for the first (0,2,4,6,8,11) session at Caltech

* indicates randomly chosen winner in case of a tie

	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	subject 7	subject 8	subject 9	subject 10
period 1	6 - 5 (5)	11 - 5 (7)	0 - 0 (0)	8 - 5 (5)*	0 - 0 (0)*	0 - 0 (3)	0 - 4 (1)	2 - 1 (4)	11 - 7 (5)	4 - 3 (0)
period 2	6 - 5 (0)	4 - 8 (6)	8 - 6 (11)	0 - 0 (5)	0 - 0 (3)	6 - 3 (0)	8 - 11 (6)	11 - 6 (8)	4 - 3 (5)	8 - 5 (3)
period 3	2 - 1 (5)	11 - 8 (1)	8 - 5 (1)	11 - 7 (2)	0 - 0 (2)	2 - 1 (8)	6 - 2 (7)	4 - 2 (0)	11 - 7 (3)	6 - 3 (7)
period 4	11 - 6 (0)	11 - 7 (4)	6 - 5 (0)	0 - 0 (5)	11 - 5 (6)	2 - 1 (3)	0 - 0 (6)	11 - 6 (5)	4 - 3 (1)	6 - 4 (7)
period 5	2 - 1 (4)	11 - 7 (3)	4 - 3 (7)	2 - 1 (4)	6 - 4 (6)	8 - 5 (1)	8 - 4 (1)	11 - 6 (4)	2 - 1 (5)	6 - 4 (1)
period 6	2 - 1 (6)	0 - 1 (0)	0 - 0 (1)	11 - 6 (1)	0 - 0 (6)	11 - 6 (0)	6 - 4 (0)	0 - 0 (4)	8 - 5 (3)	6 - 3 (5)
period 7	11 - 6 (5)	8 - 5 (1)	0 - 0 (6)	8 - 5 (6)	8 - 5 (3)	8 - 5 (2)	11 - 6 (0)	4 - 2 (5)	2 - 1 (5)	6 - 3 (5)
period 8	11 - 6 (4)	11 - 5 (6)	6 - 4 (0)	0 - 0 (4)	11 - 6 (5)	4 - 1 (5)	8 - 4 (6)	11 - 6 (1)	8 - 5 (1)	2 - 1 (6)
period 9	6 - 3 (2)	2 - 1 (5)	11 - 8 (4)	2 - 1 (5)	6 - 5 (1)	4 - 1 (6)	6 - 4 (8)	11 - 6 (1)	4 - 2 (3)	6 - 5 (1)
period 10	11 - 6 (4)	0 - 0 (7)	2 - 1 (3)	4 - 2 (6)	11 - 6 (2)	0 - 0 (4)	11 - 7 (0)	8 - 4 (0)	6 - 4 (6)	6 - 3 (1)
period 11	4 - 2 (4)	2 - 1 (5)	6 - 4 (2)	0 - 0 (0)	8 - 5 (2)	0 - 0 (0)*	8 - 5 (1)	6 - 2 (5)	11 - 7 (7)*	11 - 7 (7)
period 12	8 - 5 (1)	0 - 0 (6)	11 - 6 (0)	0 - 0 (3)	4 - 3 (0)	11 - 5 (5)	8 - 5 (5)	2 - 1 (5)	2 - 1 (1)	2 - 1 (1)*
period 13	2 - 1 (2)	6 - 4 (0)	6 - 3 (6)	0 - 0 (4)	11 - 6 (3)	0 - 0 (1)	11 - 7 (3)	2 - 1 (0)	4 - 3 (7)	4 - 2 (1)
period 14	8 - 5 (5)	0 - 0 (7)	4 - 2 (4)	6 - 4 (3)	8 - 5 (5)*	11 - 7 (0)	2 - 1 (4)	8 - 4 (1)	0 - 0 (1)	2 - 1 (0)
period 15	0 - 0 (7)	11 - 7 (0)	8 - 5 (4)	6 - 4 (5)	6 - 5 (5)	6 - 3 (7)	11 - 7 (3)	4 - 2 (0)	8 - 5 (5)*	0 - 0 (2)

Value - Bid (Other's Bid) for the second (0,2,4,6,8,11) session at Caltech

* indicates randomly chosen winner in case of a tie

	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	Subject 7	subject 8	subject 9	subject 10
period 1	0 - 6 (0)	4 - 3 (3)*	4 - 3 (3)	11 - 6 (6)*	0 - 0 (3)	4 - 3 (0)	0 - 0 (6)	6 - 4 (8)	11 - 6 (6)	11 - 8 (4)
period 2	6 - 6 (4)	0 - 1 (7)	4 - 3 (4)	6 - 4 (6)	6 - 4 (0)	11 - 6 (2)	4 - 2 (6)	6 - 4 (3)	0 - 0 (4)	11 - 7 (1)
period 3	2 - 4 (6)	8 - 4 (4)*	11 - 6 (4)	0 - 0 (3)	2 - 1 (0)	4 - 3 (1)	6 - 3 (0)	0 - 0 (1)	6 - 4 (4)	2 - 1 (3)
period 4	0 - 4 (3)	0 - 1 (2)	2 - 1 (5)	2 - 1 (8)	4 - 2 (1)	8 - 5 (2)	4 - 2 (5)	11 - 8 (1)	8 - 5 (1)	4 - 3 (4)
period 5	11 - 4 (5)	11 - 6 (4)	11 - 5 (4)	11 - 7 (3)	4 - 2 (2)*	2 - 1 (4)	6 - 4 (6)	4 - 2 (2)	6 - 4 (1)	4 - 3 (7)
period 6	11 - 6 (4)	0 - 1 (2)	0 - 0 (4)	0 - 0 (3)	6 - 3 (6)	4 - 2 (1)	0 - 0 (7)	6 - 4 (6)	11 - 7 (0)	6 - 4 (0)
period 7	8 - 4 (5)	11 - 6 (3)	11 - 5 (4)	11 - 6 (5)	6 - 3 (6)	8 - 5 (6)	0 - 0 (4)	6 - 4 (0)	4 - 3 (0)	0 - 0 (3)
period 8	11 - 6 (4)	6 - 4 (6)	2 - 1 (1)*	11 - 7 (1)	2 - 1 (7)	11 - 6 (0)	0 - 0 (8)	2 - 1 (1)	0 - 0 (6)	11 - 8 (0)
period 9	6 - 4 (6)	4 - 2 (1)	8 - 5 (0)	6 - 3 (2)	4 - 2 (3)	0 - 0 (1)	0 - 0 (5)	2 - 1 (2)	2 - 1 (0)	8 - 6 (4)
period 10	0 - 0 (3)	11 - 5 (0)	0 - 0 (5)	6 - 3 (1)	6 - 3 (0)	2 - 1 (3)	8 - 4 (3)	11 - 7 (3)	4 - 3 (7)	4 - 3 (4)
period 11	11 - 5 (7)	8 - 4 (1)	8 - 3 (5)	6 - 4 (6)	0 - 0 (6)	11 - 6 (4)	11 - 6 (0)	11 - 7 (5)	8 - 5 (3)	2 - 1 (4)
period 12	8 - 4 (5)	4 - 2 (1)	8 - 5 (4)	8 - 4 (5)	11 - 5 (0)	8 - 5 (4)	0 - 0 (5)	6 - 4 (5)	8 - 5 (4)	11 - 7 (2)
period 13	4 - 3 (2)	6 - 3 (7)	6 - 4 (6)	0 - 0 (7)	4 - 2 (3)	2 - 1 (2)	4 - 2 (1)	8 - 6 (4)	11 - 6 (3)	11 - 7 (0)
period 14	11 - 6 (6)	11 - 5 (6)	0 - 0 (6)	8 - 5 (1)	2 - 1 (5)	2 - 1 (3)	8 - 3 (1)	8 - 6 (0)	8 - 6 (6)*	8 - 6 (5)
period 15	6 - 4 (5)	2 - 1 (5)	11 - 5 (1)	0 - 0 (2)	11 - 6 (7)	4 - 2 (0)	11 - 5 (4)	11 - 7 (6)	6 - 4 (3)	4 - 3 (4)

Value - Bid (Other's Bid) for the first (0,3,5,7,9,12) session at Caltech

* indicates randomly chosen winner in case of a tie

	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	Subject 7	subject 8	subject 9	subject 10
period 1	3 - 1 (5)	3 - 2 (0)	0 - 0 (2)	5 - 4 (3)	3 - 3 (4)	9 - 7 (3)	5 - 3 (7)	9 - 5 (1)	9 - 7 (6)	7 - 6 (7)
period 2	5 - 3 (7)	3 - 2 (7)	3 - 2 (4)	7 - 4 (4)	9 - 7 (3)	5 - 4 (2)	9 - 7 (2)	3 - 1 (5)	7 - 4 (4)*	7 - 5 (1)
period 3	5 - 3 (3)	7 - 5 (5)	3 - 2 (6)	5 - 4 (0)	9 - 6 (2)	5 - 3 (3)*	0 - 0 (0)	9 - 5 (5)*	0 - 0 (4)	0 - 0 (0)*
period 4	9 - 6 (7)	5 - 4 (2)	9 - 6 (3)	5 - 3 (6)	3 - 2 (4)	9 - 7 (6)	3 - 2 (1)	9 - 5 (2)	3 - 1 (2)	3 - 2 (5)
period 5	3 - 1 (7)	9 - 6 (8)	12 - 8 (3)	9 - 6 (4)	5 - 4 (9)	12 - 9 (4)	12 - 8 (6)	12 - 7 (1)	7 - 4 (6)	5 - 3 (8)
period 6	3 - 1 (8)	0 - 0 (0)	0 - 0 (0)*	7 - 5 (3)	5 - 4 (9)	5 - 3 (3)	12 - 8 (1)	7 - 3 (5)	5 - 3 (3)*	12 - 9 (4)
period 7	7 - 5 (5)	3 - 2 (2)*	0 - 0 (6)	3 - 2 (2)	7 - 5 (5)	12 - 8 (0)	5 - 3 (10)	0 - 0 (8)	12 - 6 (0)	12 - 10 (3)
period 8	12 - 8 (0)	9 - 6 (7)	0 - 0 (6)	7 - 5 (3)	0 - 0 (8)	9 - 7 (6)	12 - 8 (6)	5 - 3 (5)	9 - 6 (8)	7 - 6 (0)
period 9	5 - 3 (0)	9 - 6 (0)	3 - 2 (9)	3 - 2 (8)	3 - 1 (0)	0 - 0 (3)	12 - 8 (2)	0 - 0 (1)	0 - 0 (6)	12 - 9 (2)
period 10	7 - 5 (5)	3 - 0 (5)	3 - 2 (6)	7 - 5 (0)	0 - 0 (5)	7 - 5 (0)	12 - 8 (1)	3 - 1 (8)	9 - 6 (2)	9 - 5 (5)
period 11	0 - 0 (1)	5 - 2 (0)	3 - 2 (8)	7 - 4 (5)	12 - 8 (6)	12 - 8 (2)	12 - 6 (8)	3 - 1 (0)	0 - 0 (2)	9 - 5 (4)
period 12	12 - 8 (0)	0 - 0 (1)	5 - 4 (7)	0 - 0 (8)	12 - 8 (3)	5 - 3 (8)	7 - 5 (4)	12 - 7 (4)	7 - 4 (5)	3 - 1 (0)
period 13	5 - 3 (0)	0 - 0 (3)	0 - 0 (3)	5 - 3 (0)	5 - 3 (0)	9 - 7 (0)	5 - 4 (1)	0 - 0 (7)	0 - 0 (3)	3 - 1 (4)
period 14	9 - 7 (5)	0 - 0 (0)*	7 - 5 (7)	7 - 4 (3)	7 - 4 (1)	3 - 1 (4)	5 - 3 (4)	0 - 0 (0)	12 - 6 (3)	7 - 3 (6)
period 15	3 - 1 (5)	3 - 1 (5)	3 - 2 (5)	12 - 6 (1)	12 - 8 (6)	7 - 5 (1)	7 - 5 (2)	9 - 5 (1)	9 - 6 (8)	5 - 1 (6)

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	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	Subject 7	subject 8	subject 9	subject 10
period 1	7 - 5 (4)	7 - 4 (7)	7 - 4 (5)	7 - 5 (5)*	0 - 0 (1)	12 - 7 (4)	12 - 6 (1)	3 - 1 (6)	7 - 5 (5)	3 - 1 (0)
period 2	9 - 7 (0)	5 - 4 (0)	9 - 5 (2)	0 - 0 (7)	4 - 3 (6)	7 - 5 (5)*	5 - 2 (5)	0 - 0 (4)	12 - 6 (3)	9 - 5 (5)
period 3	9 - 6 (2)	9 - 5 (5)*	3 - 2 (6)	3 - 2 (2)*	5 - 3 (0)	7 - 5 (5)	12 - 4 (6)	9 - 6 (4)	3 - 2 (2)	0 - 0 (3)
period 4	0 - 0 (4)	7 - 4 (0)	0 - 0 (0)	0 - 0 (0)*	0 - 0 (5)	0 - 0 (4)	7 - 4 (0)	9 - 6 (1)	9 - 5 (0)	3 - 1 (6)
period 5	5 - 3 (3)	0 - 0 (3)	7 - 4 (6)	5 - 3 (3)*	12 - 6 (4)	3 - 2 (8)	7 - 3 (0)	5 - 3 (2)	3 - 2 (3)	12 - 8 (2)
period 6	9 - 5 (2)	5 - 2 (5)	9 - 5 (3)	5 - 3 (5)	5 - 3 (3)	5 - 3 (3)	5 - 3 (4)	7 - 5 (3)	5 - 3 (5)	7 - 4 (3)
period 7	9 - 5 (2)	0 - 0 (5)	3 - 2 (5)	12 - 7 (1)	12 - 6 (3)	7 - 5 (0)	3 - 1 (7)	5 - 3 (3)	5 - 3 (3)*	7 - 3 (6)
period 8	0 - 0 (3)	5 - 3 (6)	12 - 7 (2)	3 - 2 (7)	7 - 4 (3)	12 - 6 (1)	3 - 1 (6)	5 - 3 (4)	12 - 6 (3)	12 - 3 (0)
period 9	5 - 4 (6)	12 - 5 (2)	7 - 4 (2)	3 - 2 (4)	3 - 2 (5)	12 - 6 (3)	12 - 6 (4)	5 - 3 (6)	9 - 5 (5)*	9 - 5 (5)
period 10	3 - 2 (5)	12 - 5 (5)*	5 - 3 (3)	3 - 2 (6)	12 - 6 (2)	9 - 5 (2)	12 - 6 (5)	9 - 5 (5)	9 - 5 (6)	12 - 3 (3)*
period 11	9 - 6 (4)	3 - 2 (2)*	0 - 0 (4)	12 - 6 (4)	7 - 4 (0)	12 - 5 (0)	7 - 4 (6)	0 - 0 (5)	3 - 2 (2)	9 - 4 (6)
period 12	3 - 2 (3)	3 - 2 (0)	3 - 2 (0)	0 - 0 (1)	5 - 3 (2)	0 - 0 (2)	5 - 3 (1)	7 - 5 (2)	3 - 2 (5)	3 - 1 (3)
period 13	3 - 2 (6)	12 - 6 (2)	9 - 5 (5)*	12 - 6 (2)	0 - 0 (6)	9 - 5 (5)	5 - 2 (6)	12 - 6 (0)	5 - 3 (4)	12 - 4 (3)
period 14	12 - 7 (1)	12 - 6 (4)	9 - 5 (4)	7 - 4 (5)	3 - 1 (7)	3 - 2 (5)	7 - 4 (6)	9 - 5 (2)	12 - 6 (4)	7 - 4 (6)
period 15	3 - 2 (2)*	3 - 2 (5)	9 - 5 (2)	3 - 2 (2)	0 - 0 (3)	12 - 6 (1)	7 - 3 (0)	12 - 5 (5)	7 - 5 (5)*	3 - 1 (6)

Value - Bid (Other's Bid) for the first (0,2,4,6,8,11) session at Virginia

* indicates randomly chosen winner in case of a tie

	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	subject 7	subject 8	subject 9	subject 10
period 1	11 - 6 (3)	4 - 2 (3)	11 - 5 (0)	0 - 0 (5)	0 - 0 (1)	6 - 4 (8)	4 - 3 (2)	4 - 3 (6)	11 - 8 (4)	2 - 1 (0)
period 2	6 - 4 (5)	11 - 5 (4)	11 - 2 (5)	0 - 0 (6)	2 - 1 (3)	4 - 3 (1)	6 - 5 (2)	8 - 6 (3)	4 - 3 (6)	11 - 6 (0)
period 3	4 - 2 (7)	11 - 5 (3)	8 - 3 (5)	8 - 7 (2)	11 - 4 (6)	8 - 6 (4)	8 - 6 (0)	0 - 0 (6)	11 - 8 (3)	6 - 3 (8)
period 4	6 - 5 (6)	11 - 5 (5)	2 - 1 (4)	6 - 5 (5)*	0 - 0 (3)	4 - 3 (0)	8 - 4 (0)	0 - 0 (4)	8 - 6 (5)	8 - 4 (1)
period 5	2 - 1 (1)*	11 - 5 (5)	4 - 2 (1)	6 - 5 (6)	8 - 5 (5)*	2 - 1 (1)	11 - 6 (5)	2 - 1 (2)	8 - 6 (0)	0 - 0 (6)
period 6	4 - 3 (6)	8 - 4 (5)	6 - 3 (3)*	2 - 1 (3)	8 - 5 (4)	8 - 6 (2)	4 - 3 (1)	4 - 2 (6)	4 - 3 (3)	11 - 6 (3)
period 7	11 - 7 (5)	6 - 4 (3)	11 - 5 (3)	4 - 3 (5)	6 - 4 (4)	8 - 5 (7)	6 - 4 (4)*	2 - 1 (1)*	2 - 1 (1)	6 - 3 (4)
period 8	6 - 5 (0)	6 - 4 (0)	8 - 4 (6)	11 - 8 (4)	4 - 3 (0)	0 - 0 (5)	0 - 0 (3)	0 - 0 (4)	6 - 4 (8)	11 - 6 (4)
period 9	4 - 3 (5)	11 - 5 (3)	0 - 0 (3)	4 - 3 (8)	11 - 6 (2)	8 - 5 (4)	6 - 4 (5)	4 - 2 (6)	11 - 8 (3)	6 - 3 (0)
period 10	2 - 1 (4)	6 - 4 (1)	4 - 2 (1)	6 - 5 (0)	6 - 4 (4)*	11 - 7 (4)	2 - 1 (2)	0 - 0 (5)	6 - 4 (7)	8 - 4 (4)
period 11	11 - 6 (1)	0 - 0 (6)	11 - 5 (6)	8 - 6 (5)	4 - 3 (6)	8 - 5 (3)	8 - 6 (0)	2 - 1 (6)	11 - 6 (3)	6 - 3 (5)
period 12	8 - 6 (3)	11 - 5 (3)	6 - 3 (5)	4 - 3 (6)	4 - 3 (1)	2 - 1 (1)*	11 - 6 (1)	2 - 1 (3)	2 - 1 (1)	4 - 1 (6)
period 13	6 - 5 (4)	8 - 4 (5)	11 - 6 (0)	6 - 5 (4)	0 - 0 (6)	6 - 4 (5)	11 - 6 (1)	4 - 2 (3)	2 - 1 (6)	6 - 3 (2)
period 14	2 - 1 (5)	11 - 5 (1)	8 - 4 (0)	4 - 3 (5)	8 - 5 (3)	4 - 3 (4)	0 - 0 (4)	6 - 4 (3)	11 - 7 (1)	2 - 1 (7)
period 15	8 - 6 (1)	2 - 1 (0)	11 - 6 (7)	2 - 1 (6)	0 - 0 (1)	11 - 7 (6)	4 - 3 (0)	0 - 0 (3)	11 - 6 (1)	4 - 1 (6)

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	subject 1	subject 2	subject 3	subject 4	subject 5	subject 6	subject 7	subject 8	subject 9	subject 10
period 1	8 - 6 (3)	11 - 6 (6)	6 - 3 (6)	4 - 3 (6)	6 - 5 (2)	6 - 6 (3)	4 - 3 (6)	4 - 6 (6)*	8 - 6 (3)	2 - 2 (5)
period 2	11 - 7 (4)	4 - 3 (1)	4 - 2 (0)	6 - 4 (7)	0 - 0 (5)	8 - 5 (0)	4 - 3 (2)	0 - 2 (3)	2 - 1 (3)	0 - 0 (2)
period 3	4 - 3 (8)	2 - 1 (3)	4 - 2 (4)	4 - 2 (5)	2 - 1 (4)	8 - 5 (2)	11 - 8 (3)	6 - 4 (1)	4 - 3 (1)	6 - 4 (2)
period 4	6 - 5 (0)	4 - 2 (3)	11 - 6 (2)	4 - 2 (6)	4 - 3 (5)	11 - 7 (8)	0 - 0 (5)	2 - 8 (7)	4 - 3 (2)	11 - 5 (3)
period 5	2 - 1 (7)	6 - 4 (6)	6 - 2 (3)	11 - 6 (4)	11 - 7 (1)	11 - 8 (0)	0 - 0 (8)	8 - 4 (3)	4 - 3 (2)	6 - 3 (4)
period 6	4 - 3 (5)	8 - 5 (0)	11 - 6 (3)	11 - 6 (6)	4 - 3 (6)	8 - 5 (3)	0 - 0 (5)	11 - 6 (6)	8 - 6 (5)	11 - 5 (6)
period 7	11 - 6 (7)	0 - 0 (1)	6 - 3 (0)	0 - 0 (3)	0 - 0 (1)	2 - 1 (0)	11 - 7 (6)	8 - 4 (4)	2 - 1 (0)	6 - 4 (4)
period 8	6 - 4 (6)	0 - 0 (2)	8 - 3 (8)	4 - 2 (2)*	2 - 1 (1)*	2 - 1 (1)	11 - 8 (3)	4 - 2 (2)	8 - 6 (4)	4 - 2 (0)
period 9	4 - 3 (5)	11 - 5 (1)	11 - 6 (3)	4 - 2 (0)	6 - 4 (0)	8 - 5 (3)	4 - 3 (6)	2 - 1 (5)	0 - 0 (2)	0 - 0 (4)
period 10	2 - 1 (2)	6 - 3 (3)	6 - 2 (1)	0 - 0 (1)	4 - 3 (7)	2 - 1 (0)	11 - 7 (0)	11 - 7 (3)	4 - 3 (3)*	0 - 0 (7)
period 11	11 - 6 (0)	0 - 0 (6)	0 - 0 (6)	8 - 5 (0)	4 - 3 (3)*	0 - 0 (5)	8 - 6 (0)	6 - 4 (0)	4 - 3 (3)	0 - 0 (4)
period 12	2 - 1 (2)	4 - 2 (3)	4 - 1 (5)	4 - 2 (1)	0 - 0 (7)	2 - 1 (1)	11 - 7 (0)	2 - 1 (1)	4 - 3 (2)	11 - 5 (1)
period 13	0 - 0 (5)	4 - 2 (2)	11 - 5 (0)	8 - 5 (6)	4 - 3 (4)	11 - 4 (3)	8 - 6 (5)	4 - 2 (7)	11 - 7 (2)	4 - 2 (2)*
period 14	6 - 3 (3)*	0 - 0 (0)	0 - 0 (0)*	8 - 5 (4)	2 - 1 (6)	11 - 4 (5)	8 - 6 (1)	8 - 5 (2)	4 - 3 (3)	4 - 2 (5)
period 15	2 - 1 (4)	4 - 2 (4)	0 - 0 (5)	8 - 5 (0)	4 - 3 (3)*	6 - 4 (1)	11 - 7 (0)	0 - 0 (7)	4 - 3 (3)	8 - 4 (2)

Value - Bid (Other's Bid) for the first (0,3,5,7,9,12) session at Virginia

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	subject 1	subject 2	subject 3	subject 4	Subject 5	subject 6	subject 7	subject 8	subject 9	subject 10
period 1	12 - 8 (6)	9 - 5 (5)*	9 - 7 (3)	5 - 3 (7)	5 - 4 (7)	0 - 0 (2)	12 - 7 (4)	7 - 5 (5)	3 - 2 (0)	12 - 6 (8)
period 2	7 - 5 (9)	7 - 5 (0)	0 - 0 (0)	12 - 9 (5)	7 - 5 (6)	0 - 0 (0)	7 - 5 (1)	0 - 0 (5)	9 - 6 (5)	3 - 1 (5)
period 3	9 - 7 (0)	7 - 4 (7)	7 - 5 (6)	3 - 2 (2)*	3 - 2 (2)	12 - 6 (5)	0 - 0 (7)	9 - 7 (4)	3 - 1 (0)	0 - 0 (1)
period 4	9 - 6 (2)	3 - 2 (0)	3 - 1 (0)	3 - 2 (6)	3 - 2 (4)	9 - 5 (5)*	7 - 5 (5)	0 - 0 (2)	0 - 0 (1)	5 - 4 (2)
period 5	12 - 7 (2)	5 - 3 (4)	0 - 0 (2)	3 - 2 (6)	3 - 2 (7)	3 - 1 (6)	9 - 6 (1)	0 - 0 (5)	9 - 5 (0)	9 - 4 (3)
period 6	7 - 4 (1)	5 - 3 (5)	0 - 0 (5)	0 - 0 (6)	9 - 6 (0)	12 - 7 (1)	9 - 5 (3)	7 - 5 (0)	3 - 1 (7)	3 - 1 (4)
period 7	5 - 3 (7)	0 - 0 (8)	12 - 9 (4)	12 - 8 (0)	12 - 7 (0)	3 - 1 (3)	5 - 4 (9)	3 - 0 (7)	5 - 3 (1)	12 - 7 (3)
period 8	5 - 3 (1)	7 - 5 (8)	9 - 7 (5)	9 - 6 (0)	5 - 3 (8)	3 - 1 (3)	0 - 0 (6)	12 - 8 (3)	9 - 5 (7)	12 - 8 (5)
period 9	7 - 4 (6)	7 - 5 (0)	5 - 3 (2)	3 - 2 (3)	9 - 7 (4)	3 - 1 (2)	5 - 4 (7)	9 - 6 (4)	0 - 0 (5)	3 - 2 (1)
period 10	5 - 4 (3)	0 - 0 (5)	0 - 0 (8)	9 - 6 (6)*	5 - 4 (1)	3 - 1 (4)	7 - 5 (0)	9 - 6 (6)	7 - 3 (4)	12 - 8 (0)
period 11	9 - 6 (1)	12 - 8 (9)	5 - 3 (6)	9 - 6 (3)	3 - 2 (8)	0 - 0 (7)	12 - 8 (2)	3 - 2 (5)	3 - 1 (6)	12 - 7 (0)
period 12	3 - 2 (3)	5 - 3 (7)	7 - 5 (0)	7 - 5 (0)	3 - 2 (1)	3 - 1 (2)	0 - 0 (5)	9 - 7 (3)	5 - 3 (7)	5 - 3 (2)
period 13	7 - 5 (5)*	12 - 8 (9)	12 - 9 (8)	3 - 1 (0)	5 - 3 (4)	7 - 4 (8)	7 - 5 (5)	5 - 4 (3)	0 - 0 (1)	12 - 8 (4)
period 14	5 - 3 (0)	5 - 3 (7)	0 - 0 (4)	5 - 3 (0)	0 - 0 (4)	0 - 0 (3)	12 - 7 (3)	5 - 4 (0)	0 - 0 (3)	7 - 4 (0)
period 15	12 - 6 (6)	3 - 2 (6)	9 - 7 (3)	7 - 3 (7)	0 - 0 (0)	0 - 0 (0)	9 - 6 (2)	0 - 0 (3)	12 - 3 (0)	12 - 6 (6)*

Value - Bid (Other's Bid) for the second (0,3,5,7,9,12) session at Virginia

* indicates randomly chosen winner in case of a tie

	subject 1	subject 2	subject 3	Subject 4	Subject 5	subject 6	Subject 7	subject 8	subject 9	subject 10
period 1	9 - 4 (0)	9 - 7 (1)	5 - 3 (7)	12 - 9 (7)	9 - 7 (9)	3 - 2 (7)	12 - 7 (3)	0 - 0 (4)	0 - 0 (2)	3 - 2 (0)
period 2	3 - 1 (4)	0 - 0 (5)	9 - 7 (3)	0 - 0 (8)	3 - 9 (4)	7 - 5 (0)	5 - 3 (7)	12 - 4 (1)	12 - 8 (0)	7 - 4 (9)
period 3	0 - 0 (4)	3 - 2 (3)	5 - 4 (0)	3 - 3 (6)	0 - 0 (3)	5 - 3 (8)	5 - 3 (0)	12 - 6 (3)	12 - 8 (3)	5 - 3 (2)
period 4	9 - 5 (9)	9 - 7 (6)	12 - 8 (9)	7 - 6 (7)	9 - 9 (5)	12 - 9 (8)	3 - 2 (4)	12 - 4 (2)	7 - 5 (3)	5 - 3 (5)
period 5	5 - 3 (4)	3 - 2 (0)	0 - 0 (2)	9 - 7 (3)	9 - 3 (7)	0 - 0 (5)	5 - 3 (3)*	9 - 5 (0)	5 - 3 (3)	9 - 4 (3)
period 6	0 - 0 (7)	9 - 7 (0)	7 - 5 (2)	5 - 4 (4)*	7 - 5 (3)	3 - 2 (5)	0 - 0 (4)	9 - 3 (5)	7 - 4 (4)	12 - 4 (0)
period 7	5 - 3 (2)	9 - 7 (3)	9 - 7 (8)	9 - 8 (7)	3 - 1 (3)	5 - 4 (8)	5 - 3 (1)	7 - 3 (7)	12 - 8 (4)	5 - 2 (3)
period 8	3 - 1 (4)	0 - 0 (7)	12 - 9 (0)	5 - 4 (1)	7 - 3 (5)	7 - 5 (3)	5 - 3 (4)	0 - 0 (9)	12 - 7 (0)	9 - 4 (3)
period 9	5 - 3 (6)	3 - 2 (0)	0 - 0 (2)	5 - 3 (5)	7 - 5 (3)	7 - 5 (3)	3 - 1 (4)	7 - 3 (5)	9 - 6 (3)	12 - 4 (1)
period 10	7 - 4 (7)	9 - 7 (5)	7 - 5 (2)	9 - 7 (4)	0 - 0 (3)	3 - 2 (5)	3 - 1 (4)	5 - 3 (0)	9 - 5 (7)	12 - 4 (1)
period 11	9 - 5 (5)*	3 - 2 (0)	0 - 0 (0)	0 - 0 (2)	12 - 5 (5)	7 - 5 (3)	3 - 1 (2)	5 - 3 (5)	0 - 0 (0)	3 - 2 (1)
period 12	7 - 4 (5)	5 - 3 (0)	12 - 8 (6)	9 - 7 (0)	12 - 6 (4)	0 - 0 (7)	0 - 0 (3)	9 - 5 (4)	9 - 6 (8)	7 - 4 (6)
period 13	0 - 0 (5)	12 - 7 (6)	7 - 5 (2)	9 - 6 (7)	7 - 4 (4)	3 - 2 (5)	7 - 4 (4)*	9 - 5 (0)	5 - 3 (0)	0 - 0 (3)
period 14	9 - 5 (6)	9 - 7 (0)	0 - 0 (7)	7 - 6 (5)	12 - 5 (5)	7 - 5 (5)*	5 - 3 (0)	0 - 0 (3)	0 - 0 (3)	7 - 3 (0)
period 15	12 - 7 (4)	0 - 0 (3)	3 - 2 (3)	12 - 9 (1)	5 - 3 (2)	5 - 3 (0)	7 - 4 (7)	7 - 3 (4)	3 - 1 (9)	12 - 4 (3)

Appendix B: Instructions (for the (0,2,4,6,8,11) treatment)

id: _____

We will begin with a series of auctions, and you will be identified by the ID number shown at the top of the page. In each auction you will be paired with another participant, using draws of numbered ping pong balls. Each ping ball is marked with one of the ID numbers of the ten people in the room. Here is a bucket of ping pong balls, and we will draw them two at a time to determine who is matched with whom. The two people who are matched will bid for a prize, as explained below.

In each auction, you will make a monetary bid for a prize that will be awarded to the highest bidder. Your prize value will be determined by a throw of a 6-sided die. A throw of 1 will determine a value of \$0, a throw of 2 will determine a value of \$2, a throw of 3 will determine a value of \$4, a throw of 4 will determine a value of \$6, a throw of 5 will determine a value of \$8, and a throw of 6 will determine a value of \$11. We will begin by coming to each of your desks to throw the die to determine the value of the prize for each of you. The value of the prize to you will be equally likely to be \$0, \$2, \$4, \$6, \$8, or \$11, which you will know before you make your bid, but you will not know the value of the prize to the person you are matched with. All you know is that the value to them is equally likely to be \$0, \$2, \$4, \$6, \$8, or \$11.

After each person finds out their own prize value, you will choose a bid in an integer dollar amount, which is recorded below. Then we will collect these sheets and use draws of numbered ping pong balls to match you with another bidder. The prize goes to the higher bidder. There are likely to be some ties, since every bid must be in integer dollar amounts (\$0, \$1, ...), and in the event of a tie we will decide who wins with the flip of a coin (heads and the person with the higher ID number wins, tails and the person with the lower ID number wins). If you are the high bidder (or win the flip in the event of a tie), you earn the difference between your own prize value and your bid, and if you are the low bidder, you earn nothing in this auction.

earnings = your own prize value - your bid

(if you are the high bidder or win the flip in case of a tie)

earnings = 0

(if you are the low bidder or lose the flip in case of a tie)

We will conduct 15 auctions, and your cash earnings for this part of the experiment will be determined by adding up the

earnings for each auction and dividing by 2. (If you bid above your prize value and win the auction, your earnings will be negative and will be subtracted to determine the total, which is then divided by 2.) You can use the record sheet that is attached to record your prize value and your bid for each auction. After you see your value and choose a bid, we will collect the sheet, match you with another bidder, and return the sheet to you with the other person's bid and your earnings.

Are there any questions? Please do not talk with others during the experiment. This part of the experiment will be followed by another, quite different decision making experiment. And your total cash earnings for all of the decisions made today will be paid to you in cash before you leave the room.