

EUROPEAN CONSUMERS' WILLINGNESS TO PAY FOR U.S. BEEF IN EXPERIMENTAL AUCTION MARKETS: COMMENT

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In an article with important implications for international trade of agricultural products, Alfnes and Rickertsen used an experimental market to simultaneously auction four types of beef products. Experimental auction markets have become a popular method for valuing selected food product attributes (e.g., see, Lusk et al. or Rousu et al.) in large part because auction mechanisms such as the Vickrey second-price auction are designed so that participants have a weakly dominant strategy to bid their true willingness to pay (WTP) for a product. This dominant strategy for the Vickrey second-price auction occurs "regardless of risk attitudes or beliefs about others' values" for the products (Davis and Holt, p. 279). I show in this comment, however, that the simultaneous Vickrey-style auction mechanism used by Alfnes and Rickertsen does not give participants a (weakly) dominant strategy to bid their true WTP for a product. Two alternative experimental designs are discussed, both of which will result in auctions that are demand revealing. First, I provide a brief summary of the experimental design used by Alfnes and Rickertsen.

The participants in the Alfnes and Rickertsen study were participating in a Vickrey second-price auction.¹ Each participant was first endowed with 250 g of beef. Then, each participant placed bids to exchange 250 g of beef for 500 g of beef. Separate bids were simultaneously placed for four different types of beef: Domestic hormone free, Irish hormone free, U.S. hormone free, and U.S. hormone treated. Participants placed bids on each of the four types of beef in multiple

repeated trials. A participant was only allowed to purchase one of the four alternatives, however, even if she was the highest bidder for more than one type of beef. If a participant placed the highest bid on multiple products, she chose which product she would like to purchase. For the other product(s) for which that participant was the highest bidder, her bid was withdrawn from the distribution of bids and the second highest bidder would purchase the product for the third highest price. If a participant won a product, her bid was not withdrawn from the distribution of bids for any products for which she was not the highest bidder.² The following proposition will show how this simultaneous Vickrey auction is not incentive compatible.

PROPOSITION 1. *Consider a Vickrey second-price auction market where consumers simultaneously place separate bids for multiple items. If a participant is the highest bidder for more than one product, she chooses which product to consume. For the other product(s), the second highest bidder now becomes the highest bidder and purchases the product for the third highest bid price. The participant who purchases one product does not have her bid prices withdrawn from the distribution of bids for any products where she was not the highest bidder. In this auction, participants do not have a weakly dominant strategy to bid their true value for a product.*

I will prove this by contradiction. To show that truth-telling is not a weakly dominant strategy, one only needs to show one case where a participant can make herself better off by not bidding her true value for a product. Suppose all participants bid their true value for all products. For simplicity consider only two products. Further, without loss of generality, suppose that participant j values each product

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¹ The second-price auction works as follows. All bidders submit a bid (privately). The person with the highest bid wins the auction, and pays the bid price submitted by the second highest bidder.

² This is implied but not explicitly stated in the instructions to the participants.

at $\$P$ and suppose that she will be the highest bidder for one product (Product B) and the second highest bidder for another product (Product A), and that one other bidder (participant h) will have the highest two bids if participant j is not participating in the auction. Thus, participant h will bid $\$(P + X)$ for Product A and $\$(P - Y)$ for Product B for some $X > 0$ and $Y > 0$. Suppose that the next highest bids for both Products A and B are $\$(P - Y - K)$ where $K > 0$.

If participant j bids her true value, she will win Product B and purchase it for the bid price of participant h , $\$(P - Y)$, obtaining a surplus of $\$Y$. Consider the case where participant j instead bids $\$(P - Y - \delta K)$ for both products, for any $\delta \in (0, 1)$. Participant h will now be the highest bidder of both products and get to choose which product she prefers. Participant h will choose the product that yields her the higher surplus, which in this case is Product A. Thus, the second highest bid for Product B, which was submitted by participant j , now becomes the winning bid and participant j will purchase Product B for the third highest price, which is $\$(P - Y - K)$. This results in a surplus to participant j of $\$(Y + K)$, which is higher than the surplus obtained when participant j bid her true value for the product. Participant j will not bid her true value, which contradicts the initial assumption.

A participant might bid less than her true value if she thinks she will no longer be the highest bidder but still will win the auction. This problem could occur when, in a multiple unit auction, someone who is the highest bidder for one product has her bids count to set the price if she is the second highest bidder for a second product, but her bid is not used to purchase the product if she is the highest bidder for that second product. By having the bids "count" only in some circumstances, this auction is not demand revealing. A similar design that allows winning participants to choose which product they wish to purchase and removes their bids from the distribution of all other products is also not demand revealing.³ Note that the proof shown in this article discusses a case where a participant "knows" the bids that will come from the other bidders. In general, this does not occur, but the proof holds if the participant predicts the bids of the other bidders. As discussed later, the use of repeated trials (which were used in this

experiment) makes it more likely that the participants can accurately predict the bids of some of the other participants.

When people are allowed to choose which of multiple products they wish to purchase, the Vickrey auction is no longer demand revealing. Two slight variations on the design used in Alfnes and Rickertsen will provide consumers a (weakly) dominant strategy to bid their true value for products. One way to ensure that participants have a dominant strategy to bid their true value for a product is to have the auctions for all four products bind. However, Alfnes and Rickertsen correctly chose not to follow this design, as there can be a distortion of bids when participants can win multiple products that are close substitutes (see Rousu and Corrigan).⁴ A second method that can be used is for the experiment monitor to randomly select one product as binding after all bidding concludes and to actually auction only the product that is chosen as binding. This method was used in Roosen et al. and would give participants a dominant strategy to bid their true value for all products and does not allow the possibility of substitution effects from winning multiple products that are similar.

The proposition used in this comment looks at a very specific case where bidders know (or assume to know) what other participants' bid will be. In general, bidders will not know other participants' bids, but a participant may be able to hypothesize about what bids of opponents will be. The use of repeated trials that post the bid prices, which has become the standard practice of many experimental economics researchers, might exacerbate this problem by giving participants a signal of what the bid prices might be in future rounds. Thus, participants are often able to infer what the bids of other participants will be based on the posted bid prices. Examples of experimental auctions that use repeated trials include Buhr et al., Shogren et al., Hayes et al., and the experiment being commented on, Alfnes and Rickertsen. Experimental economists expend significant effort, relative to administering surveys, to conduct experimental auctions in large part so the participants will have an incentive to tell the truth about their preferences. This comment has shown that certain

³ A proof containing this result can be obtained from the author upon request.

⁴ Although Alfnes and Rickertsen and others (e.g., Hayes et al.) state that only allowing one round to count will help avoid income effects, it seems that substitution or demand curve effects are more likely to cause problems given the low costs for the items and the close substitutability of the products for sale in these auctions.

simultaneous Vickrey-style auctions do not have this property.

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