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Just a small delay? Bidding Behavior and Efficiency in overlapping multiple auctions

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Just a small delay? Bidding Behavior and Efficiency in overlapping multiple auctions*

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December 1, 2008

Abstract

Online auction platforms like eBay provide a wide range of auctions containing substitutable goods. Some of these auctions exhibit parallel elements which means that two or more auctions run side by side for a certain time. Experiments have shown that multiple auctions ending at the same time, result in significantly lower efficiency due to the coordination failure of the buyers. I introduce an experimental setup with three sellers and four buyers in an overlapping multiple second price auction environment, where every seller runs one auction with a homogeneous good and the buyers are confronted with single unit demand. Furthermore, I vary the degree of the overlap between the successive auctions. One main result is that sellers revenue is significantly higher in overlapping multiple auctions than in parallel multiple auctions. Moreover, I observe a lower coordination failure of the buyers in overlapping auctions than in parallel multiple auctions. Due to these results, efficiency in overlapping multiple auctions is higher compared to the efficiency in parallel multiple auctions.

Keywords: internet auctions, cross bidding, market design, electronic business

JEL classification: D44, C92

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1 Introduction

Many online auction markets, for example, eBay offer similar or even homogeneous goods of several sellers in a sequence. Due to the increasing number of auctions these offers are mostly listed side by side for while. However, the starting and the ending times of these auctions are delayed. For this case we can talk about *overlapping multiple auctions*. The characteristics of overlapping multiple auctions give bidders the possibility of cross-bidding behavior. Theoretical as well as empirical research dealing with overlapping multiple auctions has shown that cross-bidding may lead to lower efficiency losses. Moreover, there exists experimental evidence that parallel multiple auctions, an extreme case of overlapping multiple auctions, result in high efficiency losses.

In this paper I study participants' behavior and performance in an overlapping multiple auction market with homogeneous goods. Furthermore, this paper analyzes the impact of different degrees of overlaps. I present an experiment with three sellers each offering one unit of a homogeneous good and four bidders each with a one-unit demand. This market is organized in parallel ascending second price auctions. One focus lies in the bidding behavior of the bidders and their coordination between the offered auctions. The second research question concerns with the influence of behavior on the efficiency in overlapping multiple auctions.

Sellers receive a significantly higher revenue in the experiment than theory predicts. Furthermore, sellers‘ revenue in overlapping multiple auctions are significantly higher compared to parallel multiple auctions. The differences in the degree of overlap are not statistically significant. However, bidders earn less payoff than predicted by theory. In addition to this, I do not find significant differences in the bidders´ payoff between overlapping multiple auctions and parallel multiple auctions. Due to a higher proportion of cross bidding and a lower frequency of exposure, I find less coordination failures in overlapping multiple auctions. This leads to a significantly higher efficiency in overlapping multiple auctions compared to parallel multiple auctions. Comparing the efficiency of the two overlap auction treatments with a different degree of overlapping the differences are statistically indistinguishable.

The reminder of the paper is structured as follows. Section 2 presents the existing related literature for parallel multiple auctions. In section 3 I introduce the experimental design for the parallel multiple auctions setup as well as the the double auction market control experiment. The section 4 is divided into three subsections, whereas the subsection 4.1 depicts the result for the seller side. Subsection 4.2 presents the outcomes for the party of the bidders. Finally, subsection 4.3 discusses the efficiency performance both for the parallel multiple auctions experiment and the double auction market experiment, section 5 concludes.

2 Related Literature

Hoppe (2008) analyzes in an experimental setup the behavior and the performance of participants in a parallel multiple auction market with a homogeneous good. Parallel multiple auctions are similar to overlapping multiple auctions in this way that they are also listed side by side for a while. However, the difference of overlapping multiple auctions lies in their successive end. In the experiment there are three sellers, each offering one unit of a homogeneous good, and four bidders, each with one-unit demand. Furthermore, the market is organized in parallel hard close ascending second price auctions. The study shows that there exist coordination failures between the bidders just as Hoppe (2008) observes late bidding and bid concentration on single auctions. This has a significantly negative impact on the efficiency in parallel multiple auctions. Both bidders and sellers receive a significantly lower profit than predicted by the theory. This paper compares the results of the paper of Hoppe (2008) with the results for the overlapping multiple auction market concerning the bidding behavior and the efficiency.

Stryszowska (2005) extends her theoretical model for parallel multiple auction for the case of overlapping multiple auctions. Just as in the parallel multiple auction model there exist two second price hard close auctions. Each auction sells one identical item and auction 2 starts one bidding stage delayed after auction 1. There are three bidders with one-unit demand. Due to the fact that bidders should coordinate between the offered auctions Stryszowska (2005) derives a bayesian nash equilibrium where the bidders sort themselves in the order of their private values. In the equilibrium all bidders first submit bids in auction 1. After this the bidder who wins the sorting mechanism stays at this auction and bids his private valuation at auction 1. The losing bidders switch to auction 2 where they submit bids which are equal to their own valuation. According to this BNE the two bidders with the highest values receive an item and have to pay a price which is equal to the private value of the third bidder. Hence the resulting outcome is efficient. Just as in the parallel multiple auction environment there must be multiple bidding and cross bidding in overlapping multiple auctions to get into the bayesian nash equilibrium. I will check for multiple bidding and cross bidding in my experiment, too (see subsection 4.2).

Huang et al. (2007) present a theoretic analysis of bidding in soft close ascending auctions with overlaps. The authors assume T English auctions, each offering one identical object with a sequential start and an overlapping component. Every auction lasts for two periods where every following auction has a one period overlap. Therefore in each period there are two active auctions. In every period, a new auction starts and a new bidder enters. The winning bidder of an auction leaves the market. Hunag et al. (2007) explicitly define two prices, a standing price for the first period of the "‘new started"’ auction and a final price at the end of the second period for the "‘existing"’ auction. They find that in equilibrium there exists no cross-bidding. Furthermore, the bidders will only compete in the auction which ends first. The expected equilibrium prices are identical among all auctions. Huang et al. (2007) also analyze data of ebay *Casio G-Shock Watch* auctions. In this empirical part they use a linear regression model. They show that bidders rarely submit their bids in auctions that are not the next ending auction. In addition to this, they find that the current price of an auction increases, if this auction is the next auction to end.

In their empirical work Anwar et al. (2006) collect data for Intel Pentium CPU's on the internet auction site eBay. They divide their data set into three samples, i.e. the daily-, hourly- and the minutewise sample. The three samples stand for the different degree of overlapping. Anwar et al. (2006) show that 76 percent of the bids were submitted on the auction with the lowest current price. However, the proportion of the bids submitted on auctions with the lowest standing price is statistically indistinguishable between the samples. Auctions with a higher degree of overlap receive a smaller amount of bids compared to auctions with a lower degree of overlap. Furthermore, the data suggests that the bidders tend to bid across the parallel auctions. As the difference in the ending time becomes smaller, the proportion of bidders who bid across increases. They find that these cross-bidders pay a significantly lower price in all of the three samples.

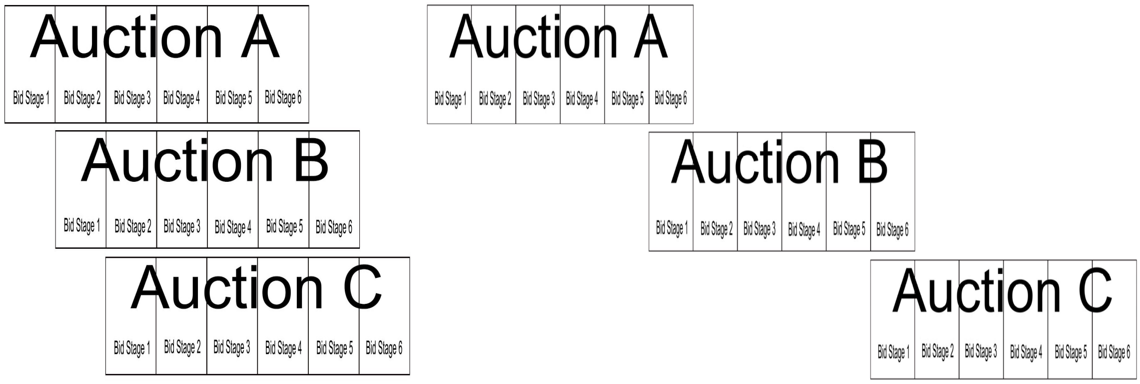
Zeithammer (2005) derives a Markov perfect equilibrium bidding function for an online auction environment. In case auctions end within a small time frame as in eBay, bidders only see the general frequency of auctions in the near future but not the types of the individual future objects. According to his model, bidders should reduce their bids more whenever there are more near future auctions, especially when more of these auctions offer a unit of the desired item. Furthermore, Zeithammer (2005) analyzes data of *MP3-player* and *DVD movie* eBay auctions to test the prediction of his model. The data provides strong evidence that there exits bid reduction between three and seven percent when the same type of item will be offered within the next five auctions.

Bapna et al. (2007) collect data from the internet online auction side Sam's Club. The main difference of Sam's Club compared to online auction markets like eBay is that there is only one seller in Sam's Club auctions. They analyze three different electronic goods: a speaker package, a DVR system and a home theater set. One focus of the empirical work of Bapna et al. (2007) is to examine the impact of the degree of overlap. Both the preceding and the following overlap have a significantly negative impact on the prices of a current auction. The impact increases when the degree of overlap gets better. However new auctions which are reflected by following overlap have a three times stronger effect than previous overlapping auctions.

3 Experimental Design

The experiment was conducted in April 2007 at the Magdeburger Experimental Laboratory (MaXLab) at the University of Magdeburg. The programming and implementation was performed with the software z-Tree (Fischbacher 2007). All subjects were undergraduates from the University of Magdeburg, recruited with the online recruitment system Orsee (Greiner (2004)). The subjects were paid according to their performance. Each subject was paid an average amount of 10 Euro per hour which is equivalent to the regular hourly wage rate of students. Every experiments session lasted nearly 1.5 hours.

An ascending second price auction format is used with six bidding stages in each auction. In every of the six bidding stages bidders could submit bids. I use a hard close ending rule which is also used in the theory. I run two treatments of overlapping multiple auctions. The difference between the two treatments lies in the degree of overlap. First, overlapping auctions with a maximum overlap (MaxO), which are similar to parallel multiple auctions. The three auctions start and end one round delayed. Second, overlapping auctions with a minimum overlap (MinO), which are similar to sequential multiple auctions. If auction i is in the last bidding stage 6, auction $i + 1$ starts with bidding stage 1. Except for the degree of overlap I use an identical design for the two treatments. Figure 1 shows the structure



(a) Maximum of overlapping **(b)** Minimum of overlapping

Figure 1: Structure of the two overlapping treatments

of the two overlapping treatments. Auction A is the auction which starts first. Auction B starts on the second position. Auction C is the last auction during the sequence of the three auctions.

On the supply side there are three different sellers, each offering one unit of a homogeneous object. Each seller can determine a starting price for his own auction. All three sellers have an endowment of 300 ECU[1]. The private valuation of the sellers for every single auction of each round was independently drawn from a uniform distribution between $[20, 80]$. Sellers were informed that they were confronted with two further sellers and that all three auctions were running in an overlapping environment. A screenshot for the decision situation of a single seller is contained in the appendix (see figure 9). On the demand side there are four bidders each with a one unit demand. Every private valuation for the one unit was independently drawn from an uniform distribution with domain $[50, 150]$. Due to the one unit demand of every single bidder the private valuations for items $n > 1$ were equal to zero. Every bidder was provided with an endowment of 300 ECU. A screenshot of the decision-situation of a single bidder for both treatments is contained in the appendix (see figure 10 and figure 11).

[1]The exchange rate in this experiment was 1 Euro = 0,017 experimental currency unit (ECU).

Bidders receive information about their own endowment and their private valuation. Furthermore, bidders have identical information about the three different auctions: the starting price, the current standing price, and the second highest bid history of every bidding stage. Bidders could submit bids in each of the three different auctions at every bidding stage. However, they could also decide not to submit any bid in an auction. Due to the fact that sellers offer their items every auction round in another auction of the auction sequence, which follows a random process, the bidder cannot identify the sellers' identity behind the auctions.

After each auction round the bidders receive information about the starting prices, the final prices, the second highest bid history, and their own submitted bid for every of the three auctions. The sellers also receive information about the starting prices, the final prices and the second highest bid history. Furthermore, all subjects receive individual information about their completed transactions, their profit at this stage, and their current endowment.

The three sellers and the four bidders remain in their roles and the matching is the same for all fifteen auction rounds. I conducted five sessions with 21 subjects for every treatment (3 independent groups each). Hence, a total of 210 subjects participating in this parallel multiple auction experiment. Altogether there exist 15 independent observations for the maximum overlapping treatment and 15 independent observations for the minimum overlapping treatment.

4 Results

In the following, I analyze the data with respect to the side of the seller, the side of the bidder and the efficiency. Further, in order to account the change of behavior over the time, I group the results of the auctions of each independent auction group into three sections of five auction rounds (1-5, 6-10, 11-15). I run statistical tests for all of these three sections.

The results are based on 51 independent observations.[2] Summing up most of theories predicts full efficiency with a price equals the (n-k)'s bidders private valuation. Whenever I compare my results to theory, I will use this outcome as a benchmark. The first subsection investigates the market side of the sellers, whereas the second subsection examines results of the bidders. In the third subsection, I consider the efficiency aspects in comparsion to the parallel multiple auction market experiment.

4.1 The Sellers

Due to the delay of the auctions in an overlapping auction environment sellers can choose different starting prices that depend on their position in the auctions‘ sequence. One might expect the lower number of active bidders could lead to a decrease in starting prices. Riley and Samuelson (1981) show for one seller and given certain assumptions, that the optimal reservation price lies above the private valuation of the seller. Caillaud and Mezzetti (2004) derive a model for sequential auctions with equal sarting prices in all auctions. These starting prices are identical to the optimal reserve price in a single item auction. Figure 2 presents the ratio of starting price to private valuation for the two overlapping auction treatments as well as the ratio of the starting price to private valuation for the parallel auction experiment of Hoppe (2008) for the three auctions.

The three graphs in Figure 2 show that the starting price to private valuation ratio lies above 1.0 for the main part of the auction rounds. It follows that the starting prices set by the sellers are higher than their private valuation.[3] Furthermore, I find significantly higher starting prices in the parallel multiple auction markets compared to the minimum overlap

[2] 15 independent observations of each of the overlapping multiple auction treatments and 21 independent observations of the parallel multiple auctions of Hoppe (2008).

[3] I find weak significant differences for the two overlapping multiple auction treatments MaxO,$p = 0.0964$; MinO, $p = 0.0964$ according two tailed Mann Whitney U Test. However the starting prices in the parallel multiple auctions are significantly higher compared to theory (Hoppe (2008)).

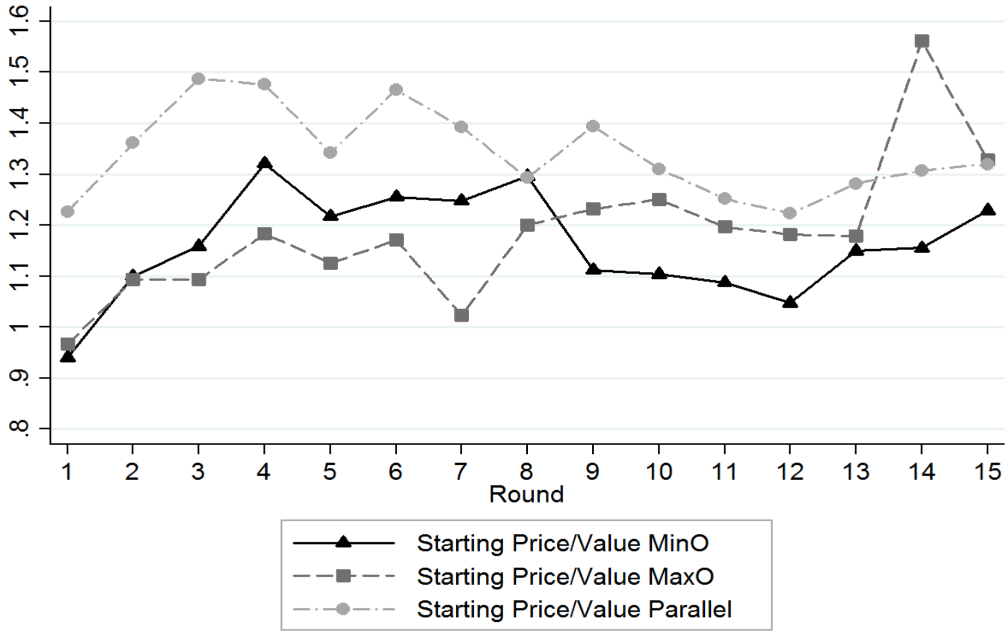
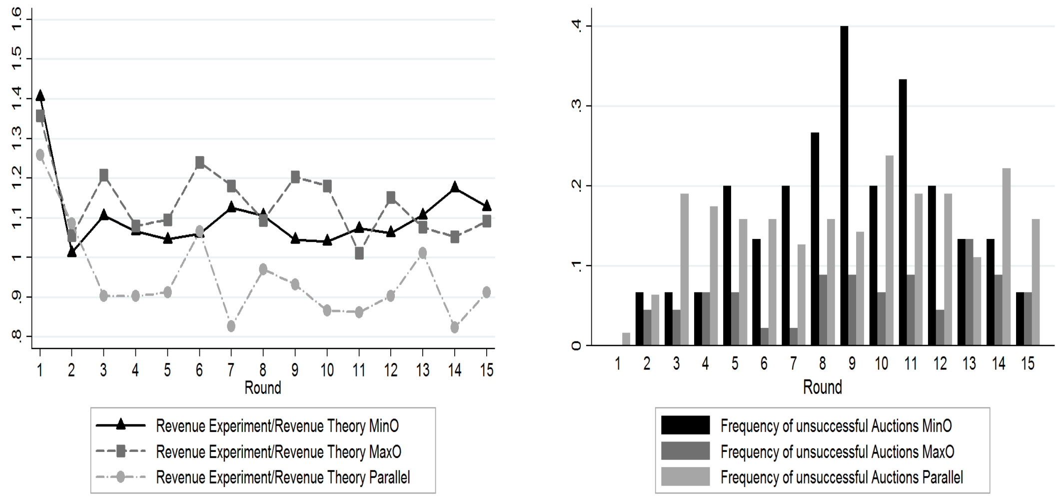


Figure 2: Ratio Starting Price to Private Value

treatment using two tailed Mann Whitney U Test ($p < 0.05$). Both, the differences in the starting prices between the parallel multiple auction treatment compared to the maximum overlap treatment and the minimum overlap treatment to the maximum overlap treatment are statistically indistinguishable. However, I find significantly lower starting prices compared to the optimal reservation price according to Riley and Samuelson (1981) as well as Caillaud and Mezzetti (2004) on a $p < 0.01$ (according two tailed Mann Whitney U Test).

Stryszowska (2005) has shown for both a parallel multiple auction environment and a overlapping multiple auction environment that the revenue in each auction equals the private valuation with the lowest private value. Huang et al. (2007) find a similar result where the price is represented by the losing bidders valuation. Figure 3 shows the ratio of the average revenue to the revenue according to the theory. In both theories all auctions are completed successfully and outcomes are efficient. Furthermore, Hoppe (2008) has shown that there exists a negative correlation between the revenue and frequency of unsuccessful auctions. Due to coordination failure about 20 percent of the parallel multiple auctions end without



(a) Ratio of observed to theoretically predicted revenues

(b) Frequency of unsuccessful auctions

Figure 3: Ratio of observed to theoretically predicted revenues and frequency of unsuccessful auctions

a transaction. Figure 3 also depicts the average frequency of unsuccessful auctions for all three multiple auction treatments.

Figure 3a shows that the revenue in the maximum overlap auction treatment as well as in the minimum overlap auction treatment is significantly higher than theory predicts ($p < 0.01$ according two tailed Mann Whitney U Test). The curve for the parallel multiple auctions provided in Figure 3a lies under the two curves of the overlapping multiple auction treatments with the exception of round 2. I find significantly higher revenues in the maximum overlap auction treatment compared to the parallel multiple auction market on a significant level $p < 0.01$ using two tailed Mann Whitney U Test. Furthermore, I also find significantly higher revenues in multiple auctions with a minimum overlap compared to parallel multiple auctions ($p < 0.05$ according two tailed Mann Whitney U Test). Using the Mann Whitney U Test, I did not find significant differences in revenues between the two overlapping auctions.

Part b of Figure 3 indicates the average frequency of unsuccessful auctions for the three market forms. The bars for the analyzed treatments of the frequency of unsuccessful auctions lie above zero. For multiple auctions with a maximum overlap, I find a low proportion of auctions without a transaction. In contrast, the multiple auctions with a minimum overlap and the parallel multiple auctions show a high proportion of auctions without a transaction between round 8-13. I observe a significantly lower frequency of unsuccessful auctions in auctions with a maximum overlap compared to auctions with a minimum overlap and multiple parallel auctions on a significance level $p < 0.01$ (according two tailed Mann Whitney U Test). However, the differences between the parallel multiple auctions environment and overlapping auctions with a minimum overlap are statistically indistinguishable.

Due to the results of the frequency of unsuccessful auctions I suggest that sellers in an overlapping multiple auction environment with small delays receive higher revenues than in parallel multiple auctions. Furthermore, I find higher revenues in the multiple auctions treatment with a minimum of overlap compared to parallel multiple auctions. However, this difference in revenue does not seem to be a result of different proportion of auctions without a transaction.

4.2 The Bidders

Figure 4 depicts the ratio of the bidders' observed to the theoretical payoff. Just as in the case of the seller, I compare the observed outcomes to the outcomes predicted by Stryszowska (2005). As Figure 4 shows, the ratio for the profit in the experiment to the profit theory predicts lies for all three treatments under the 1.0 line. On average bidders receive significantly lower profits in all rounds than predicted by the theory (using according two tailed Mann Whitney U Test, $p < 0.01$). In addition to this, I observe lower profits between the rounds 1-5 for the parallel multiple auctions and overlapping multiple auctions with a maximum overlap. For the rounds 6-15 the curves settle down to a level between 0.5 and 0.7. However, the ratio observed profit to theoretical profit for overlapping multiple auctions with a minimum overlap reaches this level with the beginning of auction round 2. I find significantly higher profits in auctions with a minimum overlap comparing to parallel multiple auctions and overlapping auctions with a maximum overlap using pairwise two tailed Mann Whitney U Test ($p < 0.05$). In the rounds 11-15 the differences in the payoffs are statistically indistinguishable for all three treatments.

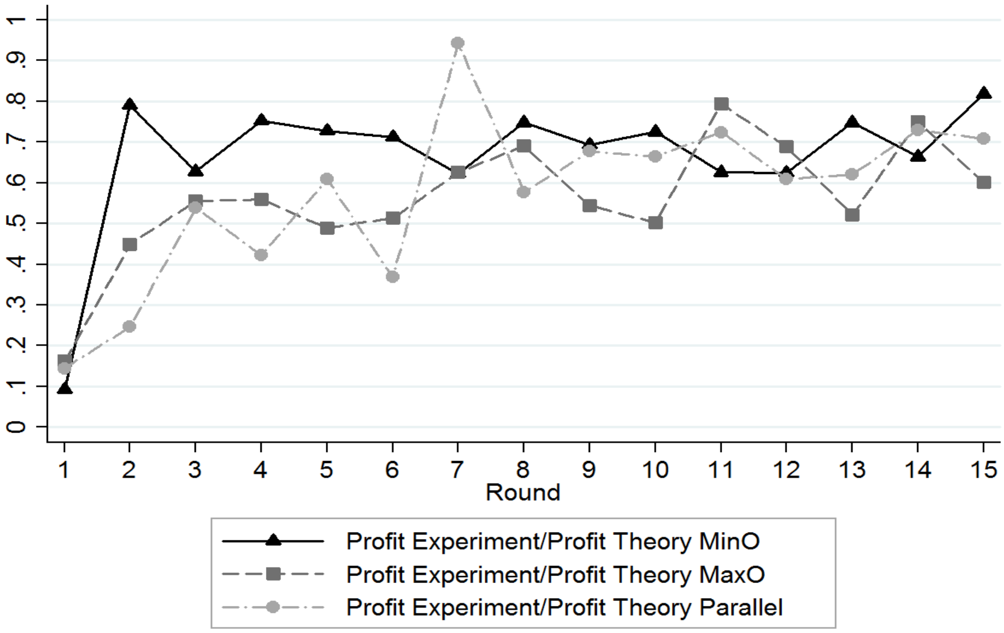


Figure 4: Ratio of the observed to theoretically predicted payoff

There are three possible reasons for observing buyer payoffs that are lower than predicted. First, bids may be too high. Second, there may be coordination failures that keep high value bidders from buying an item. Third, some bidders may face exposure problems, i.e. may buy more than one unit.

4.2.1 Higher Bids

To check for the first reason, I analyze the ratio of the maximum bid to the private valuation of a bidder. Let the maximum bid of a bidder be the highest bid, that the bidder submits in an auction. Figure 5 shows the average ratio of the observed bids to private valuation for all six bidding stages. Furthermore, every graph in figure 5 shows one auction in the overlapping auction sequence. Figure 5 depicts also a graph for multiple parallel auction of Hoppe (2008).

Figure 5 shows that the maximum bid to value ratio is lower than 1.0. Solely for the first round in the overlapping multiple auctions environment with a maximum overlap I find a ratio higher than 1.0. However, the differences are statistically significant using two tailed Mann Whitney U Test on a significance level $p < 0.01$.

I find an increase in the difference between the last stage (stage 6) bids to the bids of the earlier stages (stages 1-5) for all three treatments. However, figure 5 shows that this difference is higher for the overlapping multiple auction markets compared to the parallel multiple auctions. This result is significant according to the two tailed Mann Whitney U Test ($p < 0.05$). The differences between auctions with a minimum overlap and auctions with a maximum overlap are statistically indistinguishable. Altogether the bidding behavior shown in Figure 5 could be a sign for sniping. Ockenfels et al. (2006) show that bidders submit their bids very late in auctions with a hard close ending rule.

4.2.2 Coordination Failures

In addition, I examine the bidder's behavior and categorize it by the willingness to bid at more than one auction. I find three different bidder types. First, *single object bidders* who submit bids just in one single object. Second, *cross-bidders* who switch between the objects. Third, *multi object bidders* who submit bids in more than one object. Stryszowska (2005) has shown the relevance of cross bidding for efficiency. However, Hoppe (2008) shows that the proportion of cross bidders is lower than 30 percent in parallel multiple auctions. Since most bidders concentrate on a single auction many cases of coordination failures are observed . Figure 6 depicts the proportion of the three bidder types for each of the three treatments of multiple auctions.

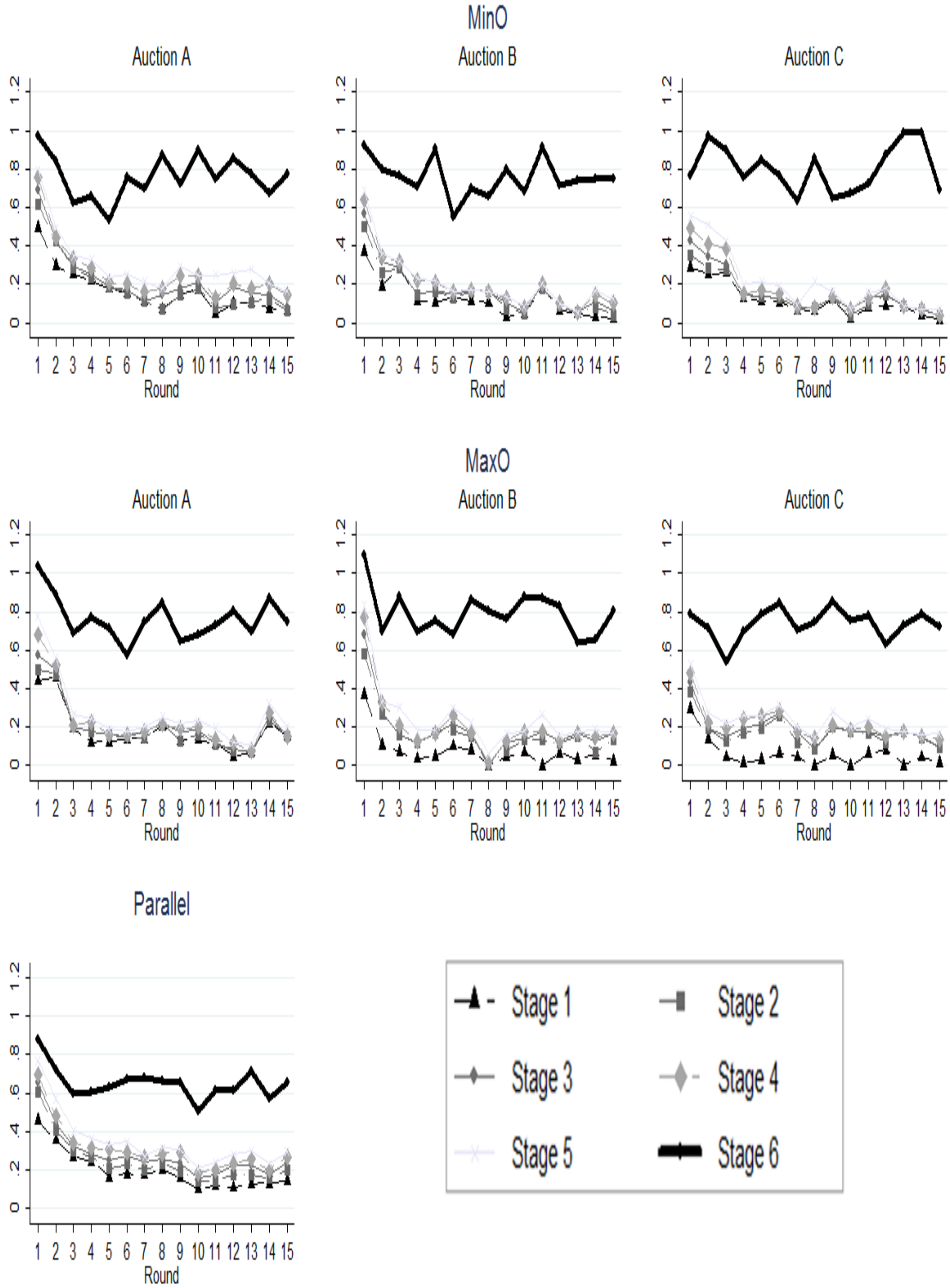


Figure 5: Ratio bid to private valuation

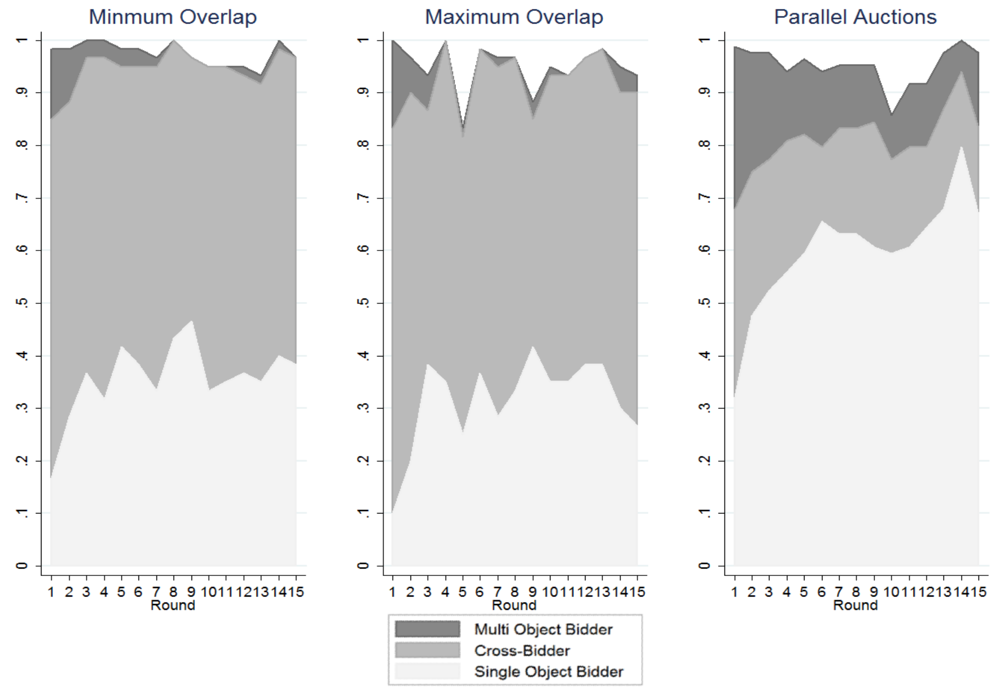


Figure 6: Bidder categorization

The average proportion of cross-bidders stays at a level of about 60 percent in both types of overlapping multiple auctions. For the single object bidders in this treatments, I find an increasing proportion in the auction rounds 1-5 after which the proportion levels out at about 30 percent. This is an indication that the winner of the first auction leaves the auction process, whereas the remaining bidders switch to another auction. The average proportion for parallel multi object bidders stay on a marginal level in the two overlapping auction markets. In contrast, figure 6 shows that for parallel multiple auctions the majority of bidders are single object bidders. Moreover, the proportion of cross bidders decreases over the auction rounds.[4]

Furthermore, I examine the payoffs of the three bidder types. In the minimum overlap treatment; I find for the rounds 1-5 significantly higher payoffs for single object bidders comparing to cross bidders and multi object bidders (according two tailed Wilcoxon Sign

[4]Due to the fact that sometimes bidders do not participate in the auction process the aggregate of the proportions is smaller than 1.

Rank Test, $p < 0.05$). Single auction bidders also earn higher payoffs compared to the other two bidder types between the rounds 6-15. However, these differences in the payoffs are not significant. The differences in the payoffs for the three bidder types in the overlapping multiple auction environment with maximum overlap are statistically indistinguishable.

4.2.3 Exposure Problems

The lower observed profit in the three market forms compared to the profit predicted by the theory could be due to the frequency of exposure. With exposure I refer to situations in which a bidder wins more than one auction. Due to the one-unit demand constraint exposure leads to profit reduction. Figure 7 shows the frequency of exposure for the three multiple auction treatments.

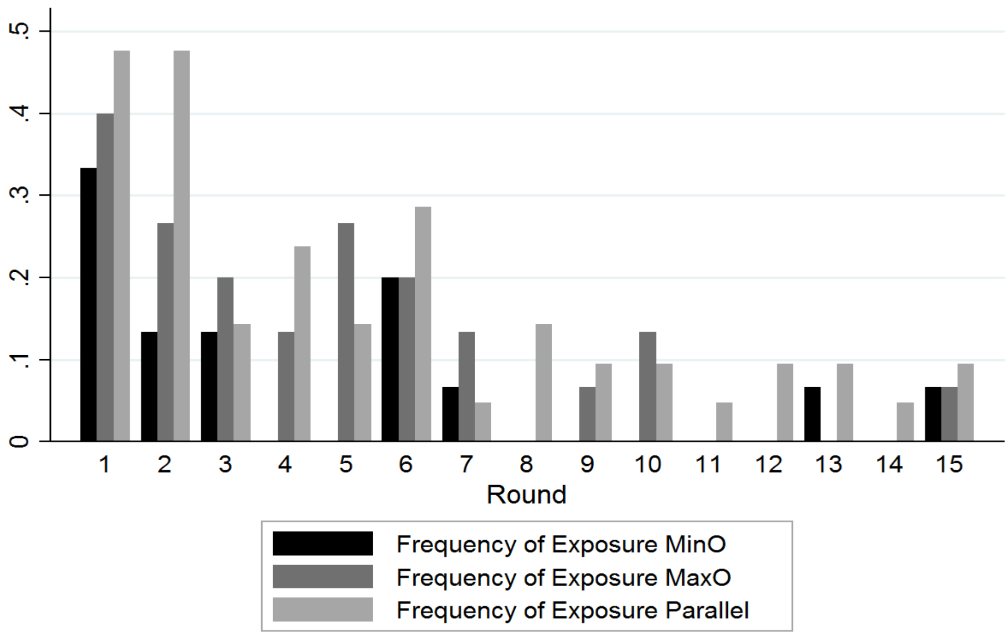


Figure 7: Frequency of Exposure

Figure 7 shows the high frequency of exposure for the first 6 rounds for the overlapping multiple auctions as well as for the parallel multiple auction market. However, the frequency of exposure for all three treatments decreases over the auction rounds. Hence, I find significantly lower frequencies of exposure in rounds 11-15 compared to rounds 1-5 for the three multiple auction environments according to the two tailed Wilcoxon Sign Rang Test at a level of $p < 0.01$. Furthermore, Figure 7 indicates different frequencies of exposure between the three treatments. I find a significantly lower frequency of exposure in overlapping multiple auctions with a minimum overlap compared to parallel multiple auctions between the round 1-10 (using two tailed Mann Whitney U Test, $p < 0.05$). Figure 7 also indicates a lower frequency of exposure for overlapping multiple auctions with a maximum of overlap compared to parallel multiple auctions. However, I did not find significant differences. The differences in the frequencies of exposure between the two overlapping multiple auctions are statistically indistinguishable, too.

4.3 Efficiency

To analyze the efficiency of overlapping multiple auctions, I compare the mean observed efficiency in the two overlapping treatments to the mean observed efficiency of parallel multiple auction markets of Hoppe (2008). Figure 8 shows the mean efficiency both for overlapping multiple auctions and parallel multiple auctions.

As Figure 8 depicts the mean efficiency is below 100 percent for the two overlapping multiple auction treatments as well as for the parallel multiple auction treatment. However, I find a significantly higher efficiency for the overlapping multiple auctions with a minimum overlap compared to parallel multiple auctions using two tailed Mann Whitney U Test $p < 0.01$. I also find higher efficiency for overlapping multiple auctions with a maximum overlap compared to parallel multiple auctions. The differences in the efficiency between overlapping multiple auctions with a minimum and a maximum overlap are statistically indistinguishable. Thus, I can conclude that only a small delay in overlapping auctions is necessary to achieve a higher degree of efficiency than in parallel multiple auctions.

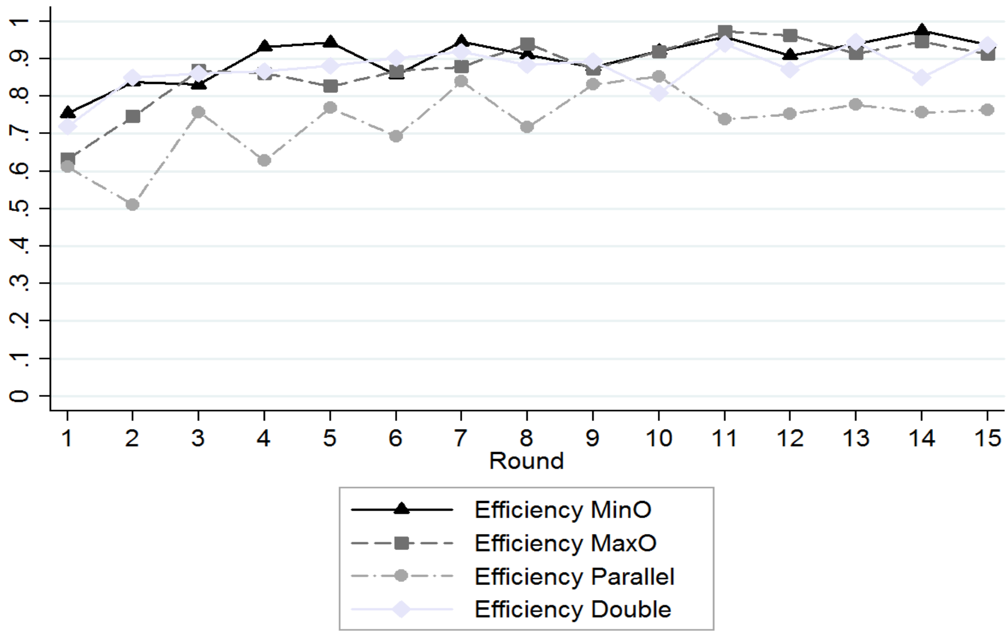


Figure 8: Efficiency

5 Conclusions

In this paper, I investigate the results of overlapping multiple auctions with varied degree of overlaps. I compare them to theoretical benchmarks and empirical evidence of parallel multiple auctions. Theory predicts, both for overlapping multiple auctions and parallel multiple auctions that the sellers receive a revenue that is equal to the private valuation of the losing bidder. However, the results of the experiment for overlapping multiple auctions show that sellers on average receive significantly higher revenues than predicted by the theory. Additionally, I identify significantly higher revenues for the seller in overlapping multiple auctions compared to parallel multiple auctions. Surprisingly, sellers‘ revenues in the two overlapping multiple auctions are statistically indistinguishable.

Multiple auctions are an increasingly important phenomenon, due to the growing number of auctions that are conducted online every day. Previous research shows that exposure problems and coordination failure can impede efficiency in multiple auctions when these are run parallel. In this paper I show that these problems are resolved as soon as the auctions are not perfectly synchronized. The delay between the multiple auctions should be long enough to ensure that bidders can switch from auction to auction. This leads to higher efficiency and seller revenues compared to the efficiency and revenues of parallel multiple auctions.

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A Screenshots Experiment Parallel Multiple Auctions

Figure 9: Seller Decision in the Overlapping Multiple Auction Experiment

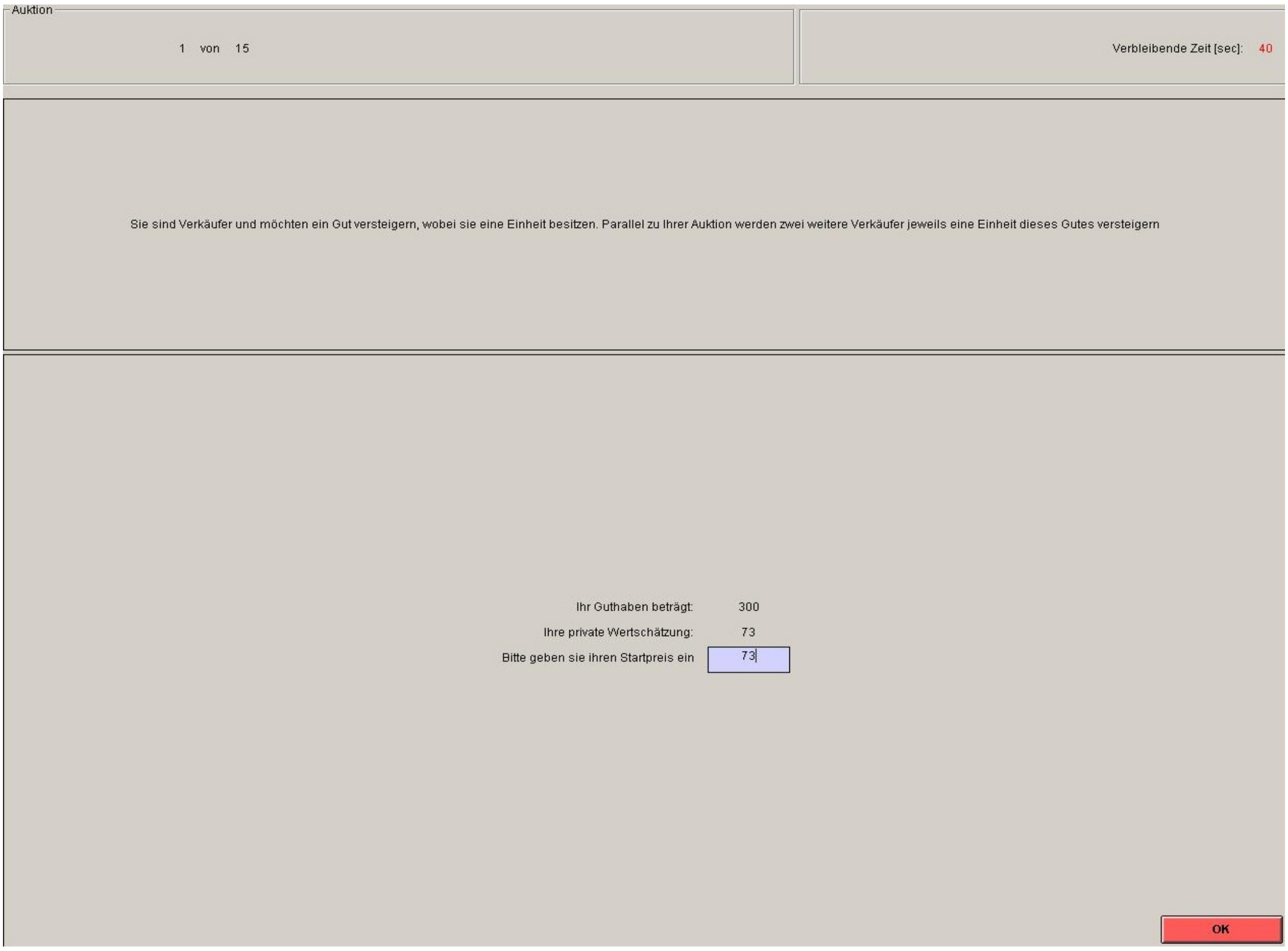


Figure 10: Bidder Decision in the Overlapping Multiple Auction Experiment MAO Treatment

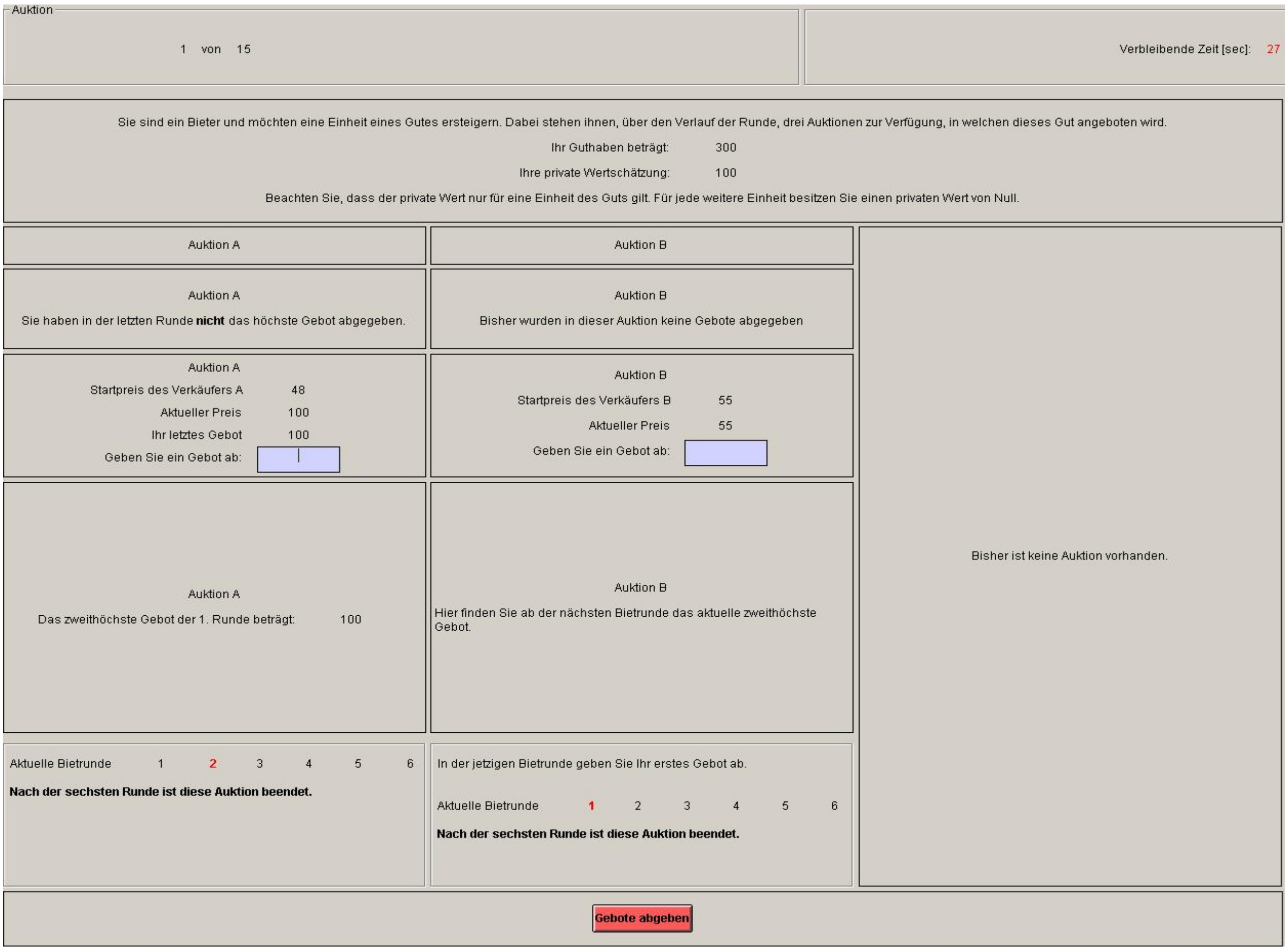
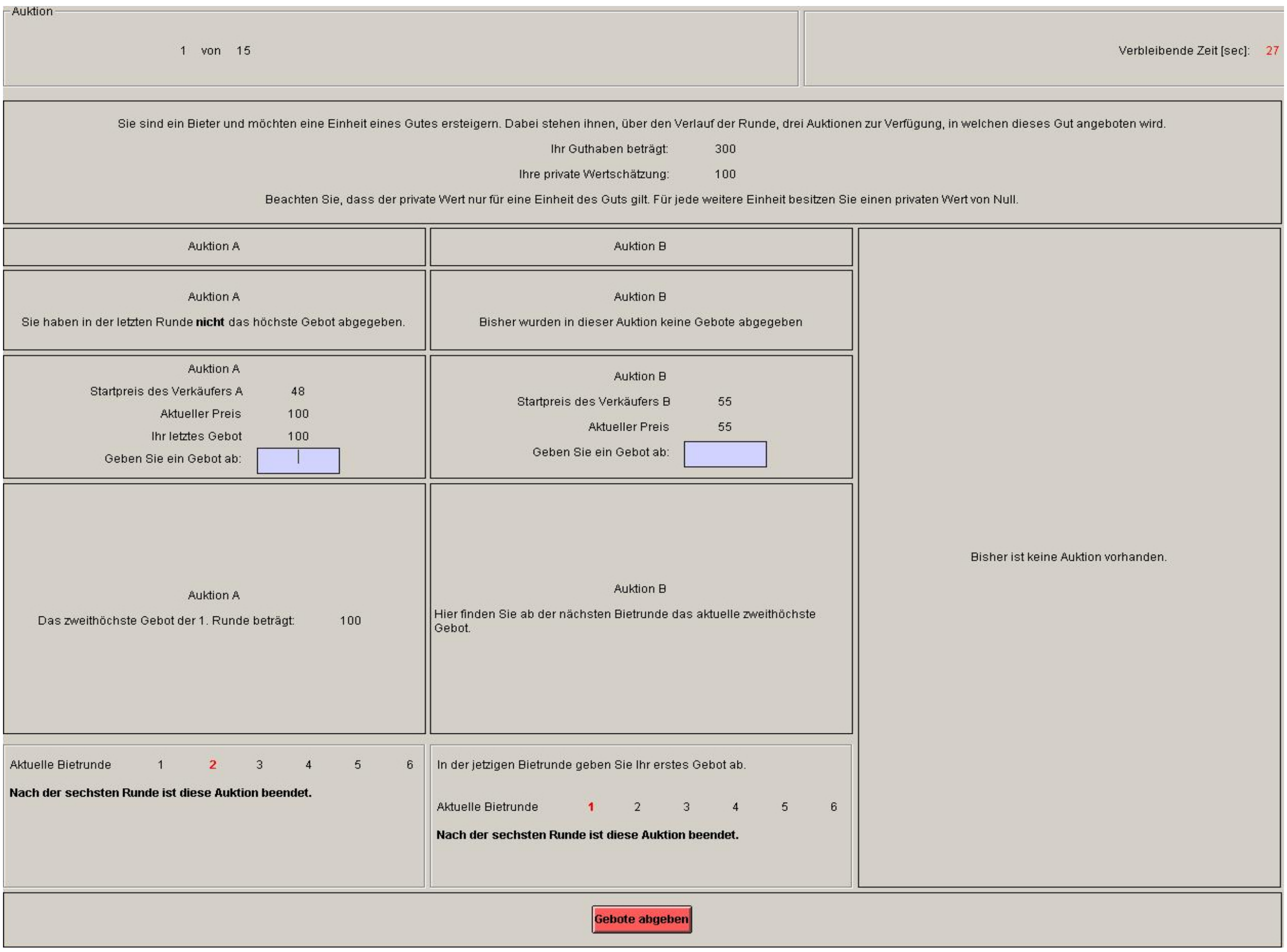


Figure 11: Bidder Decision in the Overlapping Multiple Auction Experiment MIO Treatment



B Instructions

Welcome to the Magdeburg experimental lab MAXLAB!

You are participating in a study in the context of experimental economic research concerning decision behaviour. During the experiment you will make a sequence of decisions. In doing so you will earn money. How much money it will be, on the one hand depends on your decisions and on the other hand on the decisions of the other players. Your entire profit will be paid to you in cash at the end of the experiment. Your decisions as well as your specific profit will be confidential, i.e. no other player will know about it.

The decision situation:
Your group consists of seven participants. All seven participants will only interact within the group. Just like you, the other six participants are currently located at a computer terminal. All participants have received the same instructions.

The group consists of three sellers and four buyers. After reading the instructions, but before the beginning of the experiment, you will be randomly assigned to a role. During the entire experiment you will be assigned to the same role.

Seller:
You will receive a credit of 300 ECU. In 15 sequent rounds you will face the following identical decision problem: You are participating in a second price auction. You own a good, which you want to sell at auction. You are randomly assigned to a valuation of the good you want to sell. This valuation results from an uniformly distribution [20,80]. After that you have to fix a starting price for your auction. This starting price has to amount to at least 1 ECU. In addition to your auction, each other seller of your group is also selling one unit of the same good at auction.

These two sellers also own a credit of 300 ECU and have also been assigned to a valuation from the uniformly distributed distribution [20,80]. During the 15 rounds, each seller will offer his good five times in auction A, five times in auction B and five times in auction C.

After each round you will receive the following information. All starting prices, final prices and the bidding structure of the second highest bid of all three auctions, will be displayed to all sellers. Furthermore you will receive information at which auction you have sold your good, your private valuation, the profit for the particular round and the total profit.

The profit per round for the seller is:
profit = final price - private valuation
The total profit is the sum of all achieved profits of all performed rounds.

Buyer:
You receive a credit of 300 ECU. In 15 sequent rounds you will face the following identical decision problem: You are participating in a second price auction. Each round consists of three independent auctions in which have the possibility to buy one unit of a good in each auction. For the first unit you are randomly assigned to a private valuation. This valuation results from the uniformly distribution [50,150]. For each further unit you have a private valuation of zero.

Each of the three auctions consists of six bidding rounds. In each bidding round you have the possibility to bid in the auctions. In doing so, you receive information concerning the starting price and the current price of the auctions.

From the second bidding round on you will be informed whether you are the highest bidder or not, or if there have been no biddings at all at one auction. Furthermore, you will receive a bidding structure of the second highest bid of the previous bidding rounds.

In case an auction has not been started, it will be accordingly displayed to you. Also when you have been the highest bidder in an already ended auction, this will be displayed to you when viewing other auctions you are bidding on.

After each round you receive the following information: For each auction each bidder receives the information if he was the highest bidder and if he won the bid. In case two bidders equally hold the highest bid, chance decides who wins the bid. In addition to that each bidder receives information about his private valuation, the starting price and the final price of each auction. Furthermore, you receive information about your profit in the particular round and your total profit.

Profit for the bidder per round is:
profit = private valuation - sum of all final prices of auctions, in which one won the bid
The total profit is the sum of all achieved profits of all performed rounds.

Pay-Out:
After finishing the 15 rounds your total profit and your starting credit of 300 ECU will be added up (i.e. your credit of the 16th round). The result will be multiplied by 0.017. The resulting amount will be paid out to you in cash after completion of the experiment.

Remember: Your decisions are made anonymously from your computer terminal and your payment will be carried out confidentially.

Thank you very much for your participation!