Appendix - EXPERIMENTAL INSTRUCTIONS [*Not for publication*]

INSTRUCTIONS FOR VICKREY AUCTION

This is an experiment in the economics of decision-making. Various research foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money, which will be paid to you in cash at the end of the experiment.

All amounts in the experiment are expressed in Experimental Currency Units (ECU). The money you make in ECUs will be converted to US Dollars at a rate of 50 ECU= $1, and paid to you in addition to your $10 participation fee.

- This experiment will have 30 periods.
- You will be randomly assigned one of the two following roles: Local bidder and Global bidder.
- Your role will be the same in all 30 periods.
- In every period two Locals and a Global will be randomly matched into a group of 3 people.
- Matching will change every period: you are not playing against the same people every time.
- Each period consists of an **Auction** where you will bid.
- The exact rule of earning calculation will be explained shortly.

AUCTION

- In each group of 3, bidders will bid for items of two markets (Market A and B).
- In each of these markets, there is one item for sale and two bidders (one Local and the Global).
- In each market, there is one Local bidder who is able to bid only for the item in that market.
- The Global bidder is interested in both markets, so the Global is able to bid for the items in both markets.

Values:

- In each period, prior to bidding, Global and Local bidders are assigned values for the items.
- There are three values: one for Global bidder (Global value) and one for each Local bidder (Local values).

- Values are privately known. That is, Global bidder does not know the values of the Local bidders. Similarly, a Local bidder does not know the value of the Global bidder or the other Local bidder.
- For each Local bidder, her Local value represents the amount she will receive if she wins an item in the auction.
- The Global value represents instead the amount that the Global will receive if she wins only one item (either in market A or in market B).
- If the Global wins both items, she receives **3 TIMES the Global value**. (for example: when the Global value is 40, the global receives 40 if she ends up with a single item and receives 3x40=120 if she ends up with both items).
- All values are random integer numbers between 0 and 100. Each number is equally likely.
- All values are drawn independently (meaning they are most likely different).

Bidding:

- The item in Market A and the item in Market B are auctioned simultaneously.
- Each Local bidder will submit a bid only for the item in her market.
- The Global bidder will submit bids for each item and a bid for the package containing both items. Therefore, Global submits three bids (a bid for item A, a bid for item B and a bid for the package)
- Bids can be any integer number from {0, 1, 2, 3,…,300}. So the smallest possible bid is zero and the largest one is 300 in an auction.

Example:

In this example, you see the values of everybody to understand the environment. However, in the real experiment, values are private information and you only observe your own value.

Note first that each Local has a single column that indicates variables that are specific to her or decisions she makes. Global instead has three columns representing her value from getting only the item in market A, the package including both items, and only the item in market B. After observing the values, bidders enter their bids.

	Market A			Market B	
	Local	Global	Global Package	Global	Local
Value	45	32	96	32	64
Bid	42	25	76	30	39

Auction Outcome:

- The computer allocates the items to the bidders who submitted the highest combined bids for the two items.
- In particular, the computer has four cases to look at:
    1) Locals win in both markets,
    2) Local wins in Market A, Global wins in Market B,
    3) Global wins in Market A, Local wins in Market B,
    4) Global wins both markets.
- The computer will compute the total bids in each case. Then it will allocate the items as in the case with the highest total bids.

Example:

Allocation of the Items

	Case 1	Case 2	Case 3	Case 4
Market A	**Local A**	Local A	Global	Global
Market B	**Local B**	Global	Local B	Global
Total bids for two items	**42+39=81**	42+30=72	25+39=64	76 (package bid)

In this example, Case 1 has the highest total bids for the two items; therefore, Local bidders will get the items.

Prices:

- If you did not get an item, you do not pay anyting.
- Only the winning bidders pay some amount for the item(s) they get in the auction.
- A winning bidder, however, will not pay her bid. Instead, she will pay the difference between how much the highest total bid would be if she was not present and how much the other winning bidder bid in the current highest total bid.

That means, if you win, the price you pay is

(the highest total bid if you were NOT present) – (the other winner's bid in the current highest total bid)

- Notice that when the Global bidder wins both items, there is no other bidder in the wining allocation. Therefore, in that case the Global just pays the sum of the Local bids.

Example:

In the example above Locals won the items and this allocation has a total bid of 81.

- *Price paid by Local A:* Note that if Local A did not participate, the allocation would be as in Case 4, and Global would get both items. This is because when we sorted the total submitted bids in cases where Local A is not present (cases 3 and 4), the highest total bid would be 76 (see the table below). In the highest total bids in the presence of Local A, the other bidder's bid is 39. Hence, Local A will pay 76 - 39 = 37.

	Case 1	Case 2	Case 3	Case 4
Market A	Local A	Local A	Global	Global
Market B	Local B	Global	Local B	Global
Total bids for two items	42+39=81	42+30=72	25+39=64	76 (package bid)

- *Price paid by Local B:* Note that if Local B did not participate, the allocation would be as in Case 4, and the Global would get both items. This is because when we sort the total submitted bids in cases where Local B is not present (Cases 2 and 4), the highest total bid would be 76 (see the table below). In the highest total bids in the presence of Local B, the other bidder's bid is 42. Hence, Local B will pay 76 – 42 = 34.

	Case 1	Case 2	Case 3	Case 4
Market A	Local A	Local A	Global	Global
Market B	Local B	Global	Local B	Global
Total bids for two items	42+39=81	42+30=72	25+39=64	76 (package bid)

Earnings:

- Your earnings in a period will depend on two things: (1) the values of the items you get in the auction (if any), and (2) the price that you paid.

- If a bidder does not win any item in the auction then her payoff will be zero.

- If a Local bidder wins an item, her payoff is: Local Value – Price
- If Global wins a single item, her payoff is: Global Value – Price
- If Global wins both items, her payoff is: (3 x Global Value) – Price

The computer will randomly pick 20 periods out of 30 periods. The selection of each period is equally likely. Your final earnings will be the sum of your earnings in those 20 periods and $10 participation fee.

Example:

Consider the values, bids, the winning allocation and the prices in the previous example, the earnings of bidders become:

Local A: 45 - 37 = 8

Global: 0

Local B: 64 - 34 = 30

Questionnaire

Answer the following questions:

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	54	46	138	46	60
Bids	54	34	110	10	90
Got Item					
Auction Price					

	Case 1	Case 2	Case 3	Case 4
Market A	Local A	Local A	Global	Global
Market B	Local B	Global	Local B	Global
Total bids for two items				

1) Compute the Total Bid for each of the four possible allocations of the two items in the second table above.
2) Complete the table identifying the auction winners and how much each bidder pays in the first table above.
3) Find the earning of each bidder?

Local A: Local B: Global:

INSTRUCTIONS FOR SIMULTANEOUS SECOND PRICE AUCTIONS WITH RESALE

This is an experiment in the economics of decision-making. Various research foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money, which will be paid to you in cash at the end of the experiment.

All amounts in the experiment are expressed in Experimental Currency Units (ECU). The money you make in ECUs will be converted to US Dollars at a rate of 50 ECU= $1, and paid to you in addition to your $10 participation fee.

- This experiment will be 30 periods.
- You will be randomly assigned one of the two following roles: Local bidder and Global bidder.
- Your role will be the same in all 30 periods.
- In every period two Locals and a Global will be randomly matched into a group of 3 people.
- Matching will change every period: you are not playing against the same people every time.
- Each period consists of two stages: an **Auction Stage** where you will bid, followed by a **Resale Stage** where you may trade the items allocated in the Auction stage.
- The exact rule of earning calculation will be explained shortly.

1. AUCTION STAGE

Bidding:

- In each group of 3, bidders will bid for items in auctions in two markets (Market A and B).
- In each of these markets, there is one item for sale and two bidders (one Local and the Global).
- In each market, there is one Local bidder who participates in the auction only in that market.
- The Global bidder is interested in both markets, so the Global is present in both markets.
- Therefore, the Global and Local A bid in Market A auction and the Global and Local B bid in Market B auction.
- How much a person values an item will be explained later.

- Each Local bidder will submit a bid for the item in her market.
- The Global bidder will submit bids for the items in both markets.
- Bids can be any integer number from {0, 1, 2, 3,…,300}. So the smallest possible bid is zero and the largest one is 300 in an auction.
- In each market the bidder with the higher bid wins the item:
    - If the Global's bid is greater than the Local's bid in a given market, the item of that market goes to the Global bidder.
    - If instead the Local's bid is greater than the Global's bid, the item goes to the Local bidder in that market.

Auction Prices:

- If a Local bidder gets the item in a market, she pays the Global's bid in that market.
- Similarly, if the Global bidder gets the item in a market, she pays the Local's bid in that market.

2. RESALE STAGE

- Once the Auction Stage is over, a Resale Market for each item will open: Resale Market A, and Resale Market B.
- The same three people who participated in the auction stage continue in the resale stage.
- In each resale market, the bidder who got the item of that market in the auction stage may sell it to the other bidder.
- For each item, the current owner of the item will offer a price to sell the item.
- After seeing the offer, the other bidder either accepts the offer and buys the item at the offered price, or rejects the offer and have no item.
- This is a take-it-or-leave-it offer, and there is no room for further negotiation.
- The exact timing of the resale offers will depend on the outcome of the auction and are explained below.

Timing of the Resale Market Offers

Since we have two markets, we have four different cases for the outcome of the Auctions. The timing of the resale market is explained below for each of these cases.

Case 1: Global bidder wins the auctions in both markets.

- In this case, the Global bidder makes simultaneous offers to each Local bidder. The Global may offer different prices to each Local.
- Upon observing the offers, each Local bidder decides whether or not to accept the offer.
- If an offer is accepted, the buyer receives the item and pays the offered price to the seller.

Case 2: In Market A, Local bidder wins the auction; in Market B, Global bidder wins the auction.

- First, Local bidder in market A makes an offer to sell the item to the Global bidder.
- After seeing that offer, the Global bidder makes an offer to sell the item of market B to the Local bidder in market B.
- Local bidder B sees Global's offer and decides whether or not to accept it.
- After learning the decision of Local bidder in market B, Global bidder decides whether or not to accept the offer in Market A.
- If an offer is accepted, the buyer receives the item and pays the offered price to the seller.

Case 3: In Market B, Local bidder wins the auction; in Market A, Global bidder wins the auction.

- This is analogous to Case 2 switching A and B.
- First, Local bidder in market B makes an offer to sell the item to the Global bidder.
- After seeing that offer, the Global bidder makes an offer to sell the item of market A to the Local bidder in market A.
- Local bidder A sees Global's offer and decides whether or not to accept it.
- After learning the decision of Local bidder in market A, Global bidder decides whether or not to accept the offer in Market B.
- If an offer is accepted, the buyer receives the item and pays the offered price to the seller.

Case 4. Local bidders win the auctions in both markets.

- In this case, at the beginning of the resale market the computer randomly determines which local bidder offers a price first. Both local bidders have 50% chance to make the first offer. The rest of the timing goes as follows.
- The local that goes first, makes the offer to sell the item to the Global bidder.
- The local that goes second sees the first offer in the other market and makes her own offer to the Global bidder.
- The Global bidder sees both offers and decides which items she wants to buy if any.
- If an offer is accepted, the buyer receives the item and pays the offered price to the seller.

Earning of the Period

- Earnings of the period will depend on three things: (1) the values of the items to their final owners, (2) the prices paid in the Auction stage, and (3) the prices paid or received in the Resale stage.
- Prices in the Auction and in the Resale markets have been explained previously. It only remains to explain how values of the items to their final owners are determined.

Values:

- In each period, prior to bidding, Global and Local bidders are assigned values for the items. There are three values: one for Global bidder (Global value) and the values for each Local bidder (Local values).
- Values are privately known. That is, Global bidder does not know the values of the Local bidders. Similarly, a Local bidder does not know the value of the Global bidder or the other Local bidder.
- Each Local value represents the amount that the Local bidder with that value will receive if she becomes the final owner of an item after the Resale Market.
- The Global value represents instead the amount that the Global will receive if she becomes the final owner of only one item (either in market A or in market B).
- If the Global gets both items at the end of the period, she receives **3 TIMES the Global value**. (for example: if the Global value is 40, the global receives 40 if she ends up with a single item and receives 3x40=120 if she ends up with both items).
- Values are random integer numbers between 0 and 100. Each number is equally likely.
- All values are drawn independently (meaning they are most likely different).

Earnings:

Values are not equal to earning of the period. Prices paid or received during the Auction and the Resale stages must be taken into account as well. When a period is over, you will receive the value of the item(s) you own after the resale stage, if any, and the amount of money you got in the resale stage (if you sold some item). From this amount, all the payments you made in the auction and resale stages will be subtracted.

The computer will randomly pick 20 periods out of 30 periods. The selection of each period is equally likely. Your final earning will be the sum of your earnings in those 20 periods and $10 participation fee.

Example 1

In this example, you see the values of everybody to understand the environment. However, in the real experiment, values are private information and you only observe your own value.

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	54	46	138	46	60
Bids	30	55		40	65
Got Item in Auction	No	Yes		No	Yes
Auction Price		30			40
Resale Offer		45			70
Decision	Accepted			Rejected	
Owns Item after Resale	Yes	No		No	Yes

In this table you can see the whole sequence of events within one period. Note first that each Local has a single column that indicates variables that are specific to her or decisions she makes. Global instead has three columns representing her value from getting only the item in market A, the package including both items, and only the item in market B.

Each bidder sees her value privately (i.e. no one else can see it in the whole period.). In this example, Local A has a value of 54 and Local B has 60. Global has values of 46 for single items, and 138 for the package of two items.

Immediately below, bidders are allowed to bid simultaneously in their corresponding fields (no one sees your bid at the time of bidding). Locals bid 30 and 65 in markets A and B, respectively; and Global bid 55 and 40 in markets A and B, respectively. In each market the highest bidder wins and pays the other bid of that market. As $30 < 55$, the Global wins item A and pays 30; and as $65 > 40$ local bidder wins the item in market B, and pays 40.

The second part of the table represents the resale stage. The resale starts when each winner of the auction puts for sale the item she got in the auction. An auction winner does that by posting a *Resale Offer* that indicates at which price she wants to sell her item. In our example, first the Local B asks 70 for item B. After observing this, Global asks 45 for item. Then Local A decides to accept or reject and in this example Local A accepted the Global's offer. Then Global decides whether to accept or reject Local B's offer. Here the Global rejects to buy item B at price 70.

In the end, in our example, Local bidders own the corresponding items and Global does not own any item.

Earnings are as follows.

- Local A, did not win the auction so paid nothing in the auction. However, she bought the good in the resale market at price of 45. Since she is the final owner of item A, she receives her value of 54 and her earning is $54 – 45 = 9$.
- Local B won the auction and paid 40. Later, she put item B for sale at price of 70, but the Global rejected the offer so there was no resale trade in Market B. In the end Local B kept the item and since her value is 60, her earning is 60-40=20.
- Global won item A in the auction and paid 30. Later Global put that item for sale at 45 and Local bidder A bought it in market A. In market B, Global did not win the auction and rejected Local's offer in the Resale. Since Global owns nothing in the end, she does not receive any value. In sum, Global receives the resale price of 45 for item A and pays the auction price of item A, 30. The Global's earning is 45-30=15.

Example 2

In this example, you see the values of everybody to understand the environment. However, in the real experiment, values are private information and you only observe your own value.

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	63	20	60	20	39
Bids	42	30		25	34
Got Item in Auction	Yes	No		No	Yes
Auction Price	30				25
Resale Offer	70				35
Decision		Rejected		Rejected	
Owns Item after Resale	Yes	No		No	Yes

As before, each Local has a single column that indicates variables that are specific to her or those decisions she makes. Global instead has three columns in the middle representing, respectively, her value from getting only the item in market A, the package including both items, and only the item in market B.

Each bidder sees only her value privately (i.e. no one else can see it in the whole period.). In this example, Local A has a value of 63 and Local B has 39. Global has values of 20 for single items, and 60 for the package of two items. Immediately below, bidders are allowed to bid simultaneously in their corresponding fields (no one sees other's bid while bidding). Locals bid

42 and 34 in markets A and B, respectively; and Global bid 30 and 25 in markets A and B, respectively. In each market the highest bidder wins and pays the other' bid of that market. As 42 < 30, the Local wins item A and pays 30; and as 34 > 25 Local bidder wins the item in market B, and pays 25. So in this example Global wins nothing.

The second part of the table represents the resale stage. The resale starts when each winner of the auction puts for sale the item she got in the auction. An auction winner does that by posting a *Resale Offer* that indicates at which price she wants to sell her item. If both locals win the auction (as here), the computer randomly picks one local to post the first resale price. In our example, first the Local A asks 70 for item A and Local B asks 35 to resale item B. After observing these offers, Global rejects both. So none of the resale deals takes place and Locals keep the items (meaning they are the final owners) and Global does not own any item in the end.

Earnings are as follows:

- Local A won the auction in market A and paid 30 to the auctioneer. Since she is the final owner of item A, she receives her value of 63 and her earning is 63 – 30 = 33.
- Local B won the auction and paid 25. Later, she put item B for sale at price of 35, but the Global rejected the offer so Local B could not sell the item and she is the final owner of item B. Her value is 39 and so her earning for the period is 39-25=14.
- Global did not win any item in the auction so she paid nothing to the auctioneer. In the resale market, Global is offered 70 and 35 ECUs for each item but she rejected them. Since Global owns nothing in the end, she does not receive any value. In sum, Global paid nothing and received nothing so her earning for the period is zero.

Questionnaire

Answer the following questions:

1) In the example below, who wins each auction and how much do they pay?

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	54	46	138	46	60
Bids	54	34		10	90
Got Item in Auction					
Auction Price					

2) In the example below, who is the final owner of each item and what is each bidder's earning?

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	54	46	138	46	60
Bids	54	34		10	90
Got Item in Auction	Yes	No		No	Yes
Auction Price	34				10
Offer Resale	45				70
Decision		Accepted		Rejected	
Owns Item after Resale					

Earning: Local A _____ Earning: Global _____ Earning: Local B ____

INSTRUCTIONS FOR SIMULTANEOUS SECOND PRICE AUCTIONS WITHOUT RESALE

This is an experiment in the economics of decision-making. Various research foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money, which will be paid to you in cash at the end of the experiment.

All amounts in the experiment are expressed in Experimental Currency Units (ECU). The money you make in ECUs will be converted to US Dollars at a rate of 50 ECU= $1, and paid to you in addition to your $10 participation fee.

- In this experiment, you will participate in 30 auction periods.
- You will be randomly assigned one of the two following roles: Local bidder and Global bidder.
- Your role will be the same in all 30 periods.
- In every period two Locals and a Global will be randomly matched into a group of 3 people.
- Matching will change every period: you are not playing against the same people every time.
- The exact rule of earning calculation will be explained shortly.

Bidding:

- In each group of 3, bidders will bid for items in auctions in two markets (Market A and B).
- In each of these markets, there is one item for sale and two bidders (one Local and the Global).
- In each market, there is one Local bidder who participates in the auction only in that market.
- The Global bidder is interested in both markets, so the Global is present in both markets.
- Therefore, the Global and Local A bid in Market A auction and the Global and Local B bid in Market B auction.
- How much a person values an item will be explained later.
- Each Local bidder will submit a bid for the item in her market.
- The Global bidder will submit two bids: one for each item in each market.
- Bids can be any integer number from {0, 1, 2, 3,…, 300}. So the smallest possible bid is zero and the largest one is 300 in an auction.

- In each market the bidder with the higher bid wins the item:
    - If the Global's bid is greater than the Local's bid in a given market, the item of that market goes to the Global bidder.
    - If instead the Local's bid is greater than the Global's bid, the item goes to the Local bidder in that market.

Auction Prices:

- If a Local bidder gets the item in a market, she pays the Global's bid in that market.
- Similarly, if the Global bidder gets the item in a market, she pays the Local's bid in that market.

Values:

- In each period, prior to bidding, Global and Local bidders are assigned values for the items. There are three values: one for Global bidder (Global value) and the values for each Local bidder (Local values).
- Values are privately known. That is, Global bidder does not know the values of the Local bidders. Similarly, a Local bidder does not know the value of the Global bidder or the other Local bidder.
- Each Local value represents the amount that the Local bidder with that value will receive if she wins an item in the auction.
- The Global value represents instead the amount that the Global will receive if she wins only one item (either in market A or in market B).
- If the Global wins both auctions, she receives **3 TIMES the Global value**. (for example: if the Global value is 40, the global receives 40 if she ends up with a single item and receives 3x40=120 if she ends up with both items).
- Values are random integer numbers between 0 and 100. Each number is equally likely.
- All values are drawn independently (meaning they are most likely different).

Earnings:

In each period, you will receive the value of the item(s) you won in the auction. From this amount, the price you paid in the auction will be subtracted.

Auction Payoff = Value of the Item(s) – Auction Price (If you win any auction)

Auction Payoff = 0 (If you do not win)

The computer will randomly pick 20 periods out of 30 periods. The selection of each period is equally likely. Your final payoff will be the sum of your earnings in those 20 periods and $10 participation fee.

Questionnaire

1) In the example below, answer the following questions: Who wins each auction? How much do they pay? What are the earnings of each bidder?

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	54	46	138	46	60
Bids	54	34		10	90
Got Item in Auction					
Auction Price					

Earning of Local A = _____

Earning Local B = _____

Earning Global = _____

2) In the example below, answer the following questions: Who wins each auction? How much do they pay? What are the earnings of each bidder?

	Market A			Market B	
	Local	*Global*	*Global* Package	*Global*	Local
Values	93	50	150	50	12
Bids	90	67		48	11
Got Item in Auction					
Auction Price					

Earning of Local A = _____

Earning Local B = _____

Earning Global = _____

Appendix - EXPERIMENT SCREENSHOT

SIMULTANEOUS SECOND PRICE WITH RESALE