Impact of bidder learning on conservation auctions: An initial experimental analysis

MD SAYED IFTEKHAR and UWE LATACZ-LOHMANN

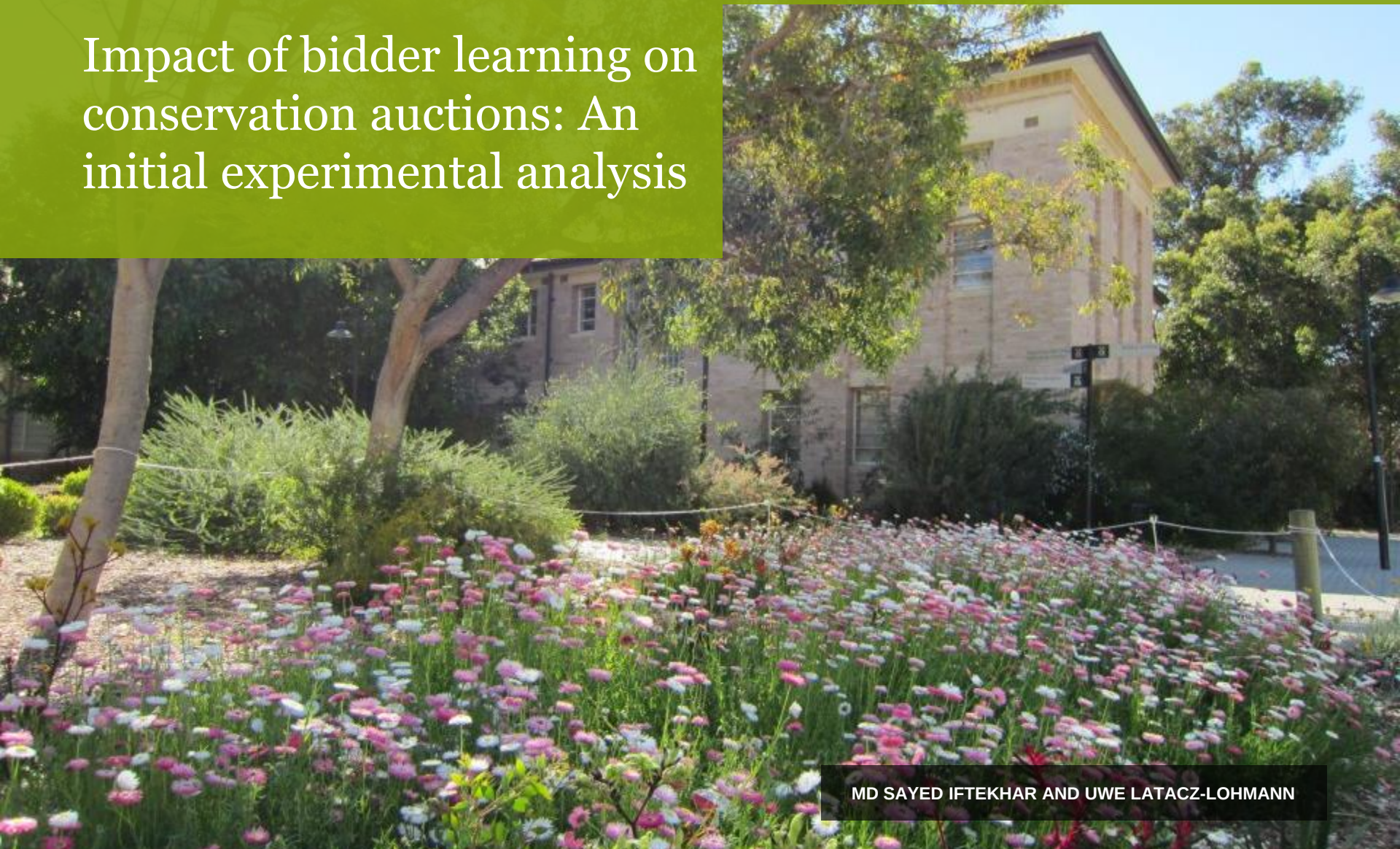
Contributed presentation at the 60th AARES Annual Conference,
Canberra, ACT, 2-5 February 2016

THE UNIVERSITY OF WESTERN AUSTRALIA

SCHOOL OF AGRICULTURAL & RESOURCE ECONOMICS

2016 AARES CONFERENCE, 2 – 5 FEBRUARY 2016, CANBERRA

Impact of bidder learning on conservation auctions: An initial experimental analysis



MD SAYED IFTEKHAR AND UWE LATACZ-LOHMANN

Conservation auction

- Conservation auctions are used to allocate conservation contracts to willing landholders – usually farmers – through a competitive bidding process.

- A common feature of many conservation auctions is that they are run over several contract periods, i.e. bids for the same environmental service are invited in multiple bidding rounds.

Learning and strategic bidding

- Learning negatively influence auction cost-effectiveness -
  - Kirwan, et al. (2005)
  - Reichelderfer and Boggess (1988)
  - Cason and Gangadharan (2004)
  - Schilizzi and Latacz-Lohmann (2007)
  - Reeson, et al. (2011)

- Learning improves auction cost-effectiveness -
  - Rolfe, et al. (2009)
  - Reeson, et al. (2012)
  - Vogt, et al. (2013)
  - Iftekhar and Tisdell (2014)

Motivation

- Very little systematic analysis on how auction environment could influence bidders learning and auction performance.
- This paper aims to fill this knowledge gap by systematically exploring bidders behaviour in two learning environments (self and networked).
- We use laboratory experiments.

Experimental set-up

- The experiment was set-up in the context of a pollution reduction program with a fixed budget.
- There were ten players in a group.
- Players knew about the budget as well as about their own cost.
- In each round they could submit a single offer.
- Depending on learning environment they would receive different information after each round.

Set-up: Self learning

- After each round they could see the status of their own offer and profit earned.

History		
Submitted Offer	Win	Profit (Offer - Cost)
18	1	2.00

Set-up: Networked learning

- In a networked learning it is possible to learn from others. Bidder i can send a proposal to bidder j to form a link.
- If the link is formed each bidder knows information about the bid submitted by the other bidder and the winning status.
- Bidder *i* can use this information to revise his bids

Set-up: Networked learning

Period

2

remaining time 115

Your Position 1

If you wish to form a link with a player please enter the bid information you wish to convey (otherwise leave it blank):

		Form link with Player 6?	
Form link with Player 2?		Form link with Player 7?	
Form link with Player 3?		Form link with Player 8?	
Form link with Player 4?		Form link with Player 9?	
Form link with Player 5?		Form link with Player 10?	

OK

Set-up: Networked learning

Period

2

remaining time 57

Link formation

Player	Link formation proposed?	Link formed?	Offer submitted by partner	Partner was successful or not?
Player 1	0	0	0	0
Player 2	0	0	0	0
Player 3	0	0	0	0
Player 4	0	0	0	0
Player 5	0	0	0	0
Player 6	0	0	0	0
Player 7	0	0	0	0
Player 8	0	0	0	0
Player 9	0	0	0	0
Player 10	0	0	0	0

Your Position 2

Your Cost

Your total link formation cost 0.00

Your Offer:

Continue

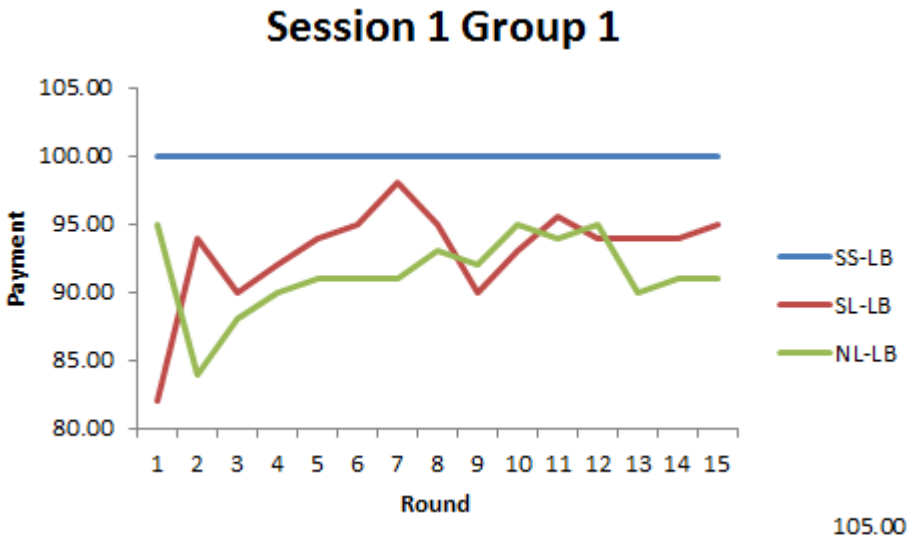
Experimental design

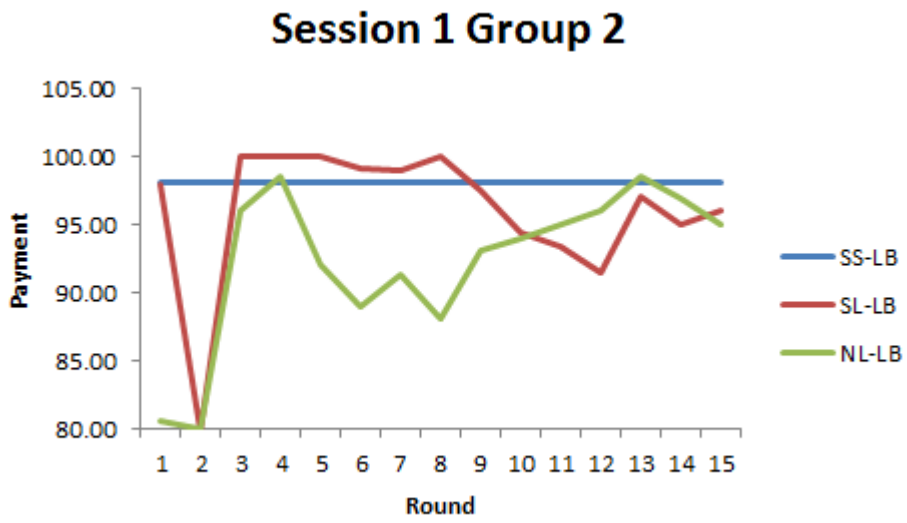
	Session 1		Session 2	
	LB		HB	
	SL	NL	SL	NL
Single-shot	G1	G2	G3	G4
15 rounds	G1	G2	G3	G4
15 rounds	G2	G1	G4	G3
	Session 3		**Session 4**	
	NL		SL	
	LB	HB	LB	HB
Single-shot	G5	G6	G7	G8
15 rounds	G5	G6	G7	G8
15 rounds	G6	G5	G8	G7

Performance measures

- Total payment in the final round
- Total profit in the final round
- Allocative efficiency: Opportunity cost of the winning bidders divided by the opportunity cost of the winning bidders if they were bidding their costs.

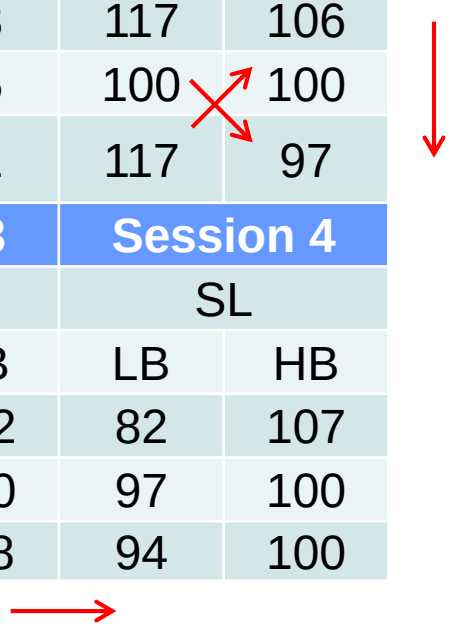
Initial Result – Payment





Result – Payment

	Session 1		Session 2	
	LB		HB	
	SL	NL	SL	NL
Single-shot	100	98	117	106
Final round	95	95	100	100
Final round	100	91	117	97
	Session 3		**Session 4**	
	NL		SL	
	LB	HB	LB	HB
Single-shot	94	102	82	107
Final round	92	120	97	100
Final round	92	118	94	100



Result – Rent

	Session 1		Session 2	
	LB		HB	
	SL	NL	SL	NL
Single-shot	41	38	56	42
Final round	46	53	45	48
Final round	42	40	45	51
	Session 3		Session 4	
	NL		SL	
	LB	HB	LB	HB
Single-shot	22	56	23	36
Final round	41	59	44	44
Final round	46	45	48	47

Result – AE

	Session 1		Session 2	
	LB		HB	
	SL	NL	SL	NL
Single-shot	0.596	0.606	0.616	0.647
Final round	0.495	0.515	0.556	0.485
Final round	0.546	0.424	0.727	0.495
	Session 3		Session 4	
	NL		SL	
	LB	HB	LB	HB
Single-shot	0.727	0.465	0.596	0.717
Final round	0.515	0.616	0.535	0.566
Final round	0.465	0.737	0.465	0.535

Concluding remarks

- Learning opportunities reduces allocative efficiency, but reduces total payment.
- Mixed evidence of performance between self and networked learning.
- More analysis of the data is currently being carried out.

Thank you