

Information Dispersion and Auction Prices

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Motivation

- Information Dispersion
 - Do bidders account for winner's curse?
 - Mixed results from experimental & commercial auction analysis
- Information Asymmetry
 - Does reputation affect prices through the bidder's perception of dispersion?
 - Prior work focuses on reputation's effect on expected value

Outline & Results

- Theory: common value (CV) auctions
 - Implications of dispersion & number bidders
- Data: eBay auctions & survey measure
 - 46 responses/auction for dispersion
- Test Implications
 - Prices consistent w/Nash under CV
- Measure bias, winner's curse, reputation
 - Incentive for sellers w/good reputation to reduce information dispersion

Common Value Auction

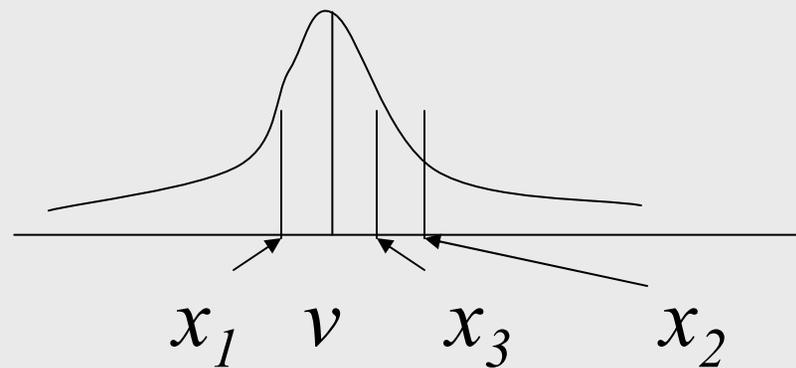
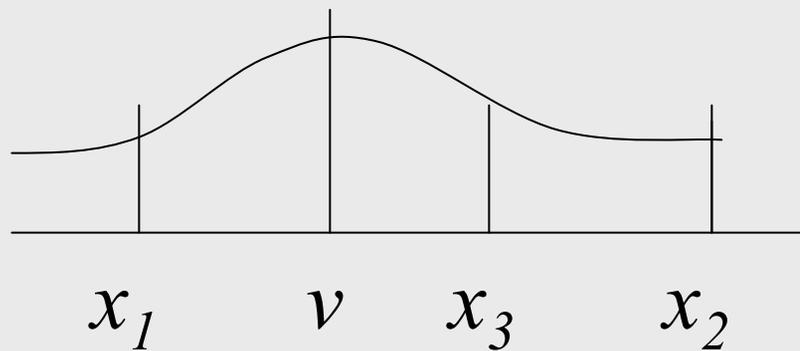
- Single, indivisible item with unknown common value v to be sold at price p
- $n = \#$ of bidders i
- $v \sim f_v(v)$
- Private information signal x_i
- $x \sim f_{x|v}(x | v)$

Assumptions

- A1: Risk-neutral bidders w/ utility $v - p$
- A2: $f_v, f_{x|v}$ continuous, 1st & 2nd deriv.
- A3: location $\mu_v, \mu_{x|v}$ & scale $\sigma_v, \sigma_{x|v}$

Information Dispersion

- Information Dispersion = $\sigma_{x|v}$



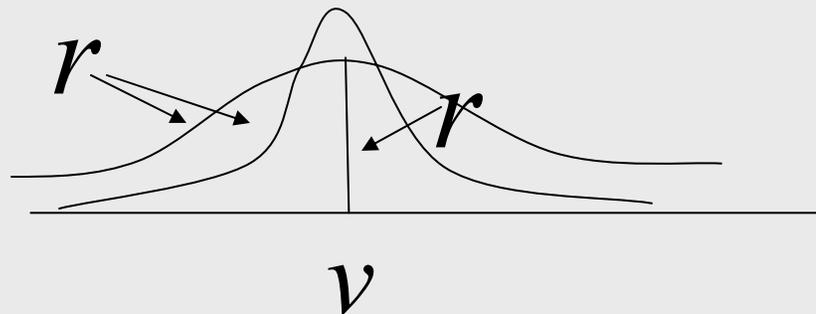
Model Implications

Comparative Static for 2 nd Price Auction	CV Nash	CV naïve	PV
$\frac{\partial p}{\partial \sigma_{x v}} < 0$	✓	x*	x*
$\frac{\partial p}{\partial n} < 0$	✓	x	x

* For symmetrically distributed signals

Info Asymmetry

- r = reputation/credibility of info
- $\sigma_{x|v}$ is reputation-free dispersion of information
- r enters p in 2 ways:



Reputation Tests

- $\tilde{\sigma}_{x|v} = \psi(\sigma_{x|v}, r)$

- $\frac{\partial p}{\partial r} > 0$

- $\frac{\partial \psi}{\partial \sigma_{x|v} \partial r} \geq 0$

Sample: eBay Auctions

- 222 auctions, 6/24/02, 7/12/02
- PC desktop category, recent Pentiums

<i>variable</i>	<i>mean</i>	<i>median</i>	<i>st. dev.</i>	<i>min</i>	<i>max</i>
P	\$359.01	\$255.00	\$369.16	\$9.51	\$2,802.00
SCORE	680	27	2601	0	19456
NEG	25.5	2	106	0	785
N	6.5	6	4	2	22

P=price

SCORE=seller overall feedback

NEG=seller negative feedback

N=observed # of bidders

My Survey

- Online Survey
- Auction description ONLY
- "What is the most she should pay?"

- Average of estimates \equiv V
- Std. dev of valuations \equiv sd

My Survey (cont.)

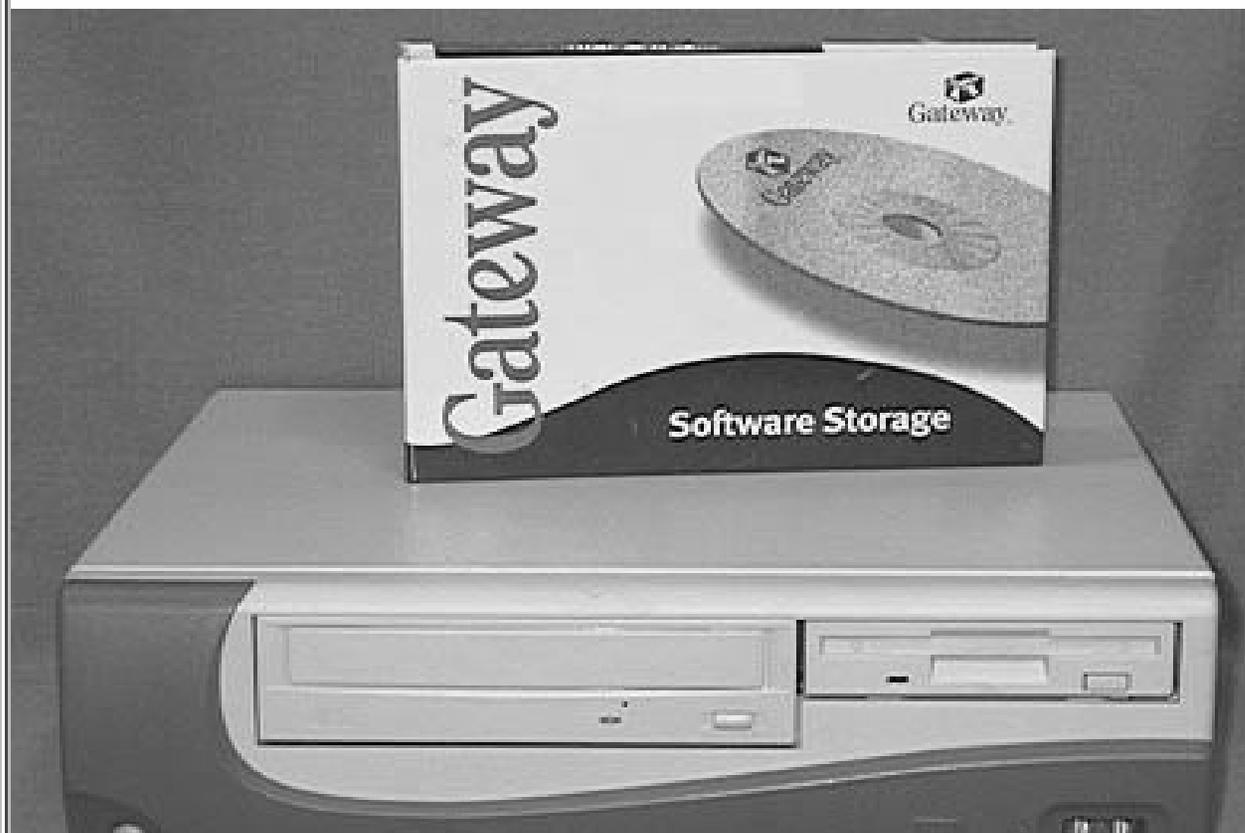
- 222 auctions

<i>variable</i>	<i>mean</i>	<i>st. dev.</i>	<i>min</i>	<i>max</i>
responses	46	6	25	65
V	\$666.43	\$317.28	\$101.48	\$1,817
sd	472.38	153.94	163.57	980.5

V=average of estimates

sd=st. dev. of estimates

Highest SD Auction



Description:

Gateway desktop Pentium computer. Motherboard appears to be dead. Other hardware components (drives, etc.) may still work. PC comes with original Gateway Restoration disks. Item sold AS-IS. See Picture!

****Buyer Pays Actual Shipping Charges!****

*We accept Money Orders, *Personal Check, or Credit Cards (PayPal, Billpoint) for same-day-shipping. *Item will not be shipped until check clears.*

High SD Auction

Whaam! Lot #12923



Worldwide Leader in Tech Reclamation™



Gateway E-4200 Pentium II-300 Desktop Computer System

**Pentium II-300 CPU
32Megs RAM
6.4Gig Hard Drive
CD-ROM
Zip 100 Drive
Network Interface**

This Gateway E-4200 Pentium II-300 Computer with 32Megs of RAM (similar in style, but not identical to the unit pictured above) has been cleaned and tested and is covered by the Whaam! Forever Guarantee. Manuals, disks, drivers and external cables are not included.

Handling, Clean-Up, Packaging and Delivery by UPS Ground Service to the continental US is \$59. Add \$15 for locations in the Mountain or Pacific Time Zones and Florida. Local pick-up is not available.

Illinois Sales Tax applies to in-state shipments. Whaam! accepts VISA/MC, checks, money orders, I-checks and Paypal. Whaam! reserves the right to re-auction any lot remaining unpaid after seven days. No unlicensed software is included. Questions should be sent to greatstuff@whaam.biz.

Low SD Auction

Hewlett-Packard Pavilion 6330 Computer	Prodigy installation disk
Includes:	Mindspring installation disk
Tower	CompuServe Wow! installation disk
Keyboard	HP Pavilion recovery disk
Mouse	Corresponding owner's manuals and documents
Power cord	Extra parallel port(installed in tower)
Phone cord	Requires:
Mousepad	Monitor
Norton Utilities	Printer
America Online 7.0 installation disk	Speakers

This computer works fine when hooked up only to a monitor, printer, and speakers with no other additional hardware options. Whenever

I connect my Iomega Zip Drive and scanner however, this computer starts to have problems. As long as you don't connect any unnecessary external hardware devices other than the printer and speaker you should be alright.

OLS

$$P = X\beta$$

VARIABLE	COEFF	S.E.
C	69.301	120.627
<i>v</i> **	1.046	0.059
<i>sd</i> **	-1.483	0.450
<i>sd</i> ² **	1.20E-03	4.26E-04
N	-11.811	11.145
N× <i>sd</i>	0.021	0.022
<i>sd</i> ×SCORE*	-1.16E-04	6.68E-05
<i>sd</i> ×NEGS	1.39E-03	1.73E-03
SCORE**	0.091	0.038
NEGS	-0.901	0.816

$R^2=0.72$

** sig @ 5%

* sig @ 10%

Correct Errors

- $x_{e,i} = \theta_0 + \nu + \varepsilon_{e,i}$
- $x_{o,i} = \gamma_0 + \gamma_1 \nu + \varepsilon_{o,i}$

Correct Errors

$$\hat{v} = \frac{J_e}{J} (V_e - \theta_0) + \frac{J_o}{J} \left(\frac{V_o - \gamma_0}{\gamma_1} \right)$$

$$sd_e = \sqrt{\frac{\sum x_e - (\hat{v} + \theta_0)}{J_e - 1}}$$

GMM

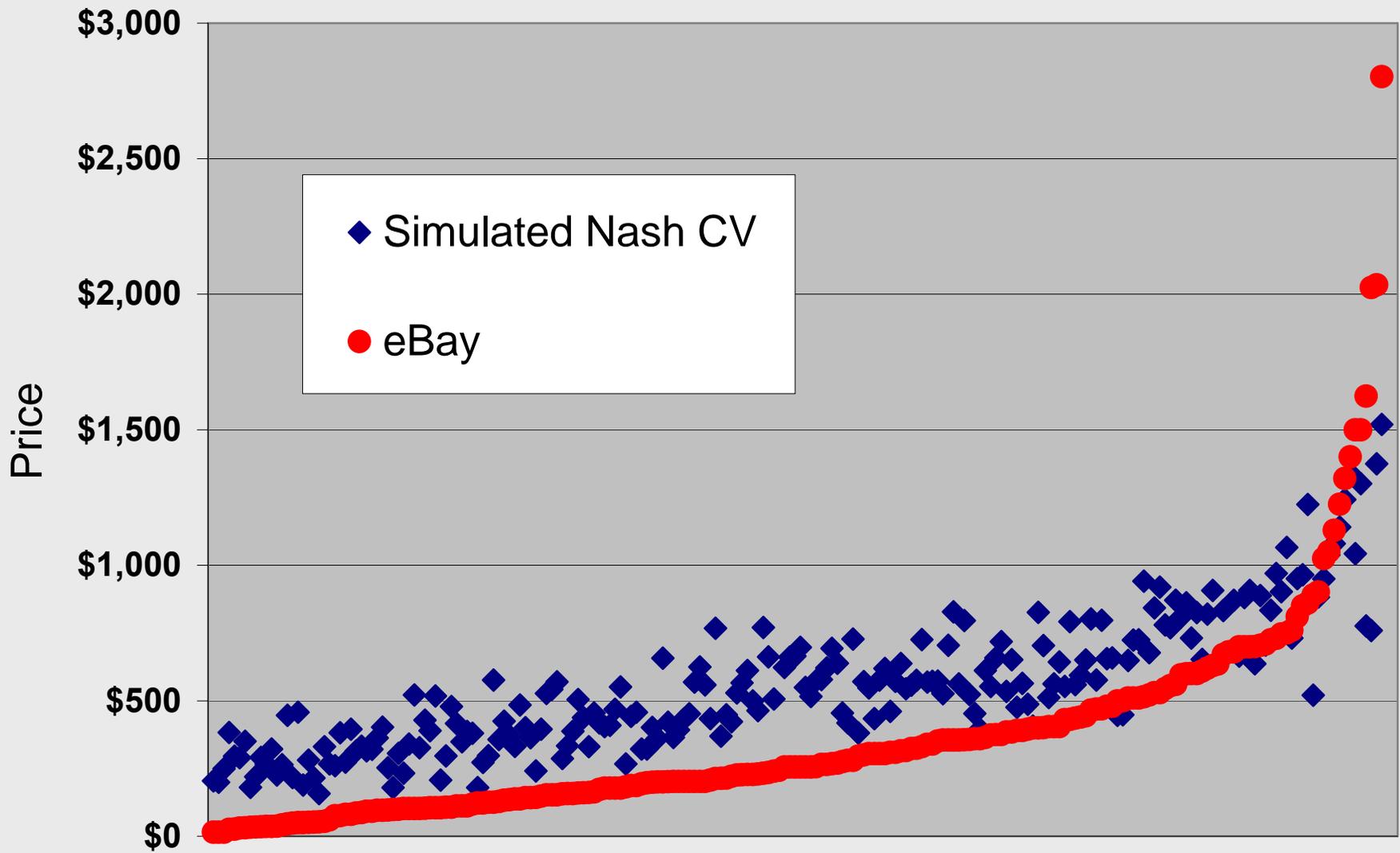
P, sd

VARIABLE	COEFF	S.E.
theta**	27.039	0.407
gamma0**	83.611	0.397
gamma1**	1.033	2.72E-04
eta**	-60222.6	803.752
delta0**	76381.0	268.241
delta1**	1.831	7.64E-03

** sig @ 5%

R-squared:

0.72



Auctions ordered by increasing simulated Nash CV price

Reputation & Dispersion

<i>change</i>	direct effect	interaction effect	total price change
decr. $\sigma_{x v}$	\$0.23	\$0.11	\$0.34
incr score	\$0.08	-\$0.04	\$0.04
both	\$0.31	\$0.06	\$0.38

Conclusion

- Testing
 - Survey permits tests w.r.t. dispersion
 - Prices fall with n & $\sigma_{x|v}$
 - Supports Nash CV model
- Measurement
 - eBay markets account for significant potential winner's curse
 - Reputation provides incentive for reducing uncertainty.