

Trust, Reputation, and Bidding Behavior in Online Mystery Auctions

Lesley Chiou
Department of Economics
Occidental College
Los Angeles, CA, USA

Jennifer Pate*
Department of Economics
Loyola Marymount University
1 LMU Drive, Suite 4200
Los Angeles, CA, USA
jennifer.pate@lmu.edu

We use transactions from a distinctive online environment of ‘mystery’ auctions to examine the role that trust plays and how it impacts bidding behavior when the exact characteristics of a good being auctioned are purposefully concealed from buyers. We show that buyers are generally trusting of seller claims in online transactions and that seller reputation becomes significantly more important to buyers (as demonstrated by their bids) when the quality (or value) of the good is unspecified. Our findings can be extrapolated to consider broader economic implications of bidding behavior impacted by trust, such as in financial markets, where over-bidding may lead to price bubbles.

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*Corresponding author

1 Introduction

'You are bidding on 1 of 8 gift cards that have been sealed in separate envelopes and mixed. There are two \$50.00 gift cards, two \$100.00 gift cards, one \$120.00 gift card, and one \$350 gift card.'

The winning bid for the auction was \$247.50. The winner of the auction was the seller.' -eBay blogger avior09092009

Trust and reputation play a particularly important role in online markets. If information about the seller or quality of the good is limited, buyers must rely on reputation signals to decide whether to purchase a good. We use a novel dataset of transactions from online mystery auctions to examine buyers' trust and how it impacts bidding behavior when the characteristics of a good are purposefully concealed.

Our study is related to previous work on trust and reputation in online markets that find inconclusive evidence on whether sellers with better reputations receive a price premium (Jin and Kato, 2006; Resnick and Zeckhauser, 2002; Melnick and Alm, 2002; Lucking-Reiley et al. 2007; Ba and Pavlou, 2002; Resnick et al., 2006)). This paper is also related to research on retail gift cards in the secondary market (Pate-Offenberg, 2007; Chiou and Pate, 2010) as well as the literature on information asymmetry and disclosure (Akerlof, 1970). Our study has the distinct advantage of allowing for a direct comparison between auctions for gift cards of known and unknown values. Moreover, the mystery auctions themselves exhibit varying degrees of information disclosure, allowing us to analyze the effects of more (or less) information on bidding behavior and the outcome. Gift cards are uniquely well-suited for this research because they exhibit no other quality differentiation.

Our results demonstrate that winning bidders are generally trusting of sellers' claims, but reputation is more relevant to buyers in highly uncertain environments. Under

mystery auctions, sellers with zero negative ratings receive an 11 percent premium on the winning price (relative to the small premium of 1 percent in regular auctions). Buyers evaluate auctions with no reported characteristics as having below-average minimum and maximum values. The evidence suggests unraveling, where sellers are more likely to disclose additional characteristics of the item over time. We also find evidence of the cursed equilibrium characterized by Eyster and Rabin (2005), where bidders underappreciate the connection between a seller’s type and their equilibrium action, resulting in over-valuation.

2 Data

A typical mystery auction on eBay lists one or more gift cards of unknown (or unspecified) value for sale. The seller may state a specific dollar value or between \$X and \$Y (see Figure 1). In these auctions, sellers can choose whether to reveal the store information, as well as the minimum or maximum value and the number of gift cards.¹

Figure 1: Sample Mystery Gift Card Auction

The screenshot shows an eBay auction listing for a 'WAL - MART Gift Card'. The listing includes a yellow smiley face icon, a 'FREE shipping' badge, and a 'WAL - MART' logo. The auction details are as follows:

- Winnning bid: US \$31.00
- Ended: Nov-01-06 07:53:37 PDT
- Shipping: FREE shipping US Postal Service First Class Mail® Service to United States
- Ships to: United States
- Item location: Las Vegas, NV, United States
- History: 22 bids
- Winnning bidder: n***u (44 ⭐) Not a registered user
- You can also: Email to a friend

Listing and payment details: [Show](#)

Meet the seller

Seller: ****ylubconnections*** (5d ⭐)

Feedback: 100 % Positive

Member: since Jun-25-05 in United States

- See detailed feedback
- Ask seller a question
- Add to Favorite Sellers
- View seller's other items

Buy safely

- Check the seller's reputation
Score: 54 | 100% Positive
[See detailed feedback](#)
- Check how you're protected
Buyer Protection with PayPal
Pay with PayPal and the full price is covered. [See terms.](#)

Description

WAL - MART Gift Card

I have six 3 Wal-Mart gift cards, each with a different amount ranging anywhere from \$5 to \$500. I will choose one gift card to put in your envelope. Each gift card's design is identical; therefore, I have no way of knowing which card holds which amount. Per eBay's rules, this is not a lottery, giveaway, or raffle. You are bidding only on the envelope -- the amount on the gift card is a gift from me to you.

Good luck!

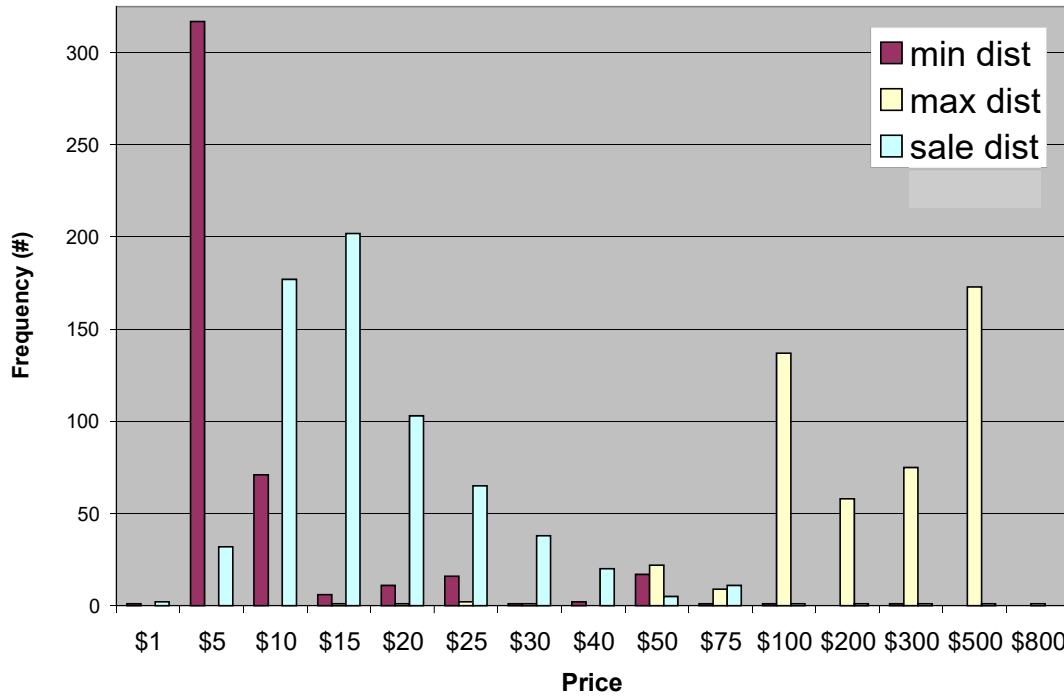
¹ Mystery auctions were banned in 2008 under eBay’s “chance listings policy” (eBay, 2016).

We use two datasets in our analysis. The first consists of *mystery* auctions for gift cards on eBay completed over a nine month period from 2007 to 2008. We observe winning bid, number of bids, starting bid, seller feedback ratings, time the auction closed, payment restrictions, and any shipping/handling costs. Figure 2 shows the frequency of minimum and maximum values reported by sellers and sale prices from completed mystery auctions. We compiled a second dataset of *regular* gift card auctions for three major retailers – Wal-Mart, Best Buy, and Home Depot, to use for comparison purposes as a full-information baseline. For these auctions, sellers disclose all relevant details, like the store and the face value of the gift card. Table 1 reports summary statistics.

Table 1. Summary statistics for mystery and regular auctions

Variable	Observations	Mean	standard deviation	min	max
<i>Mystery auctions</i>					
Winning price	1644	23.41	45.51	0.99	1212.5
Seller feedback	1666	161.00	278.09	-1	2919
Negative ratings	1667	0.52	0.50	0	1
Buy It Now	1667	0.03	0.17	0	1
Number of bids	1664	11.35	6.90	1	48
Payment restrictions	1664	0.57	0.50	0	1
Reported maximum	1287	319.20	231.68	1	5000
Reported minimum	736	17.27	41.82	0.01	500
Reported number of cards	470	26.44	103.90	1	2000
<i>Regular auctions</i>					
Winning price	1891	89.05	45.79	25	202.5
Seller feedback	1891	344.20	801.66	-1	8765
Negative ratings	1891	0.47	0.50	0	1
Buy It Now	1891	0.37	0.48	0	1
Number of bids	1891	7.83	7.52	1	40
Payment restrictions	1891	0.64	0.48	0	1

Figure 2. Summary of completed mystery gift card auctions



Comparing the sale prices to the maximum reported values, the information in Figure 2 suggests that honest sellers would likely have negative expected earnings in this market.² The reputation system on eBay was designed to counteract fraudulent sellers by allowing buyers to leave positive, negative, or neutral feedback for a given transaction. A positive feedback increases a seller’s rating +1, a negative -1, a neutral rating by 0, which are observable on the seller’s feedback page.

Buyers appear to incorporate reported information into their bids; 98 percent of auctions end with a winning bid that is less than the reported maximum value plus shipping/handling. Winning bidders generally trust sellers’ claims; of auctions reporting a minimum value, 92 percent end with a winning bid that is above the minimum reported value. Since we cannot observe a buyer’s maximum willingness to pay, the

² For auctions with reported min/max values and total number of cards, we calculate expected seller losses of \$79.96 per auction, using a conservative estimate of one legitimate card at the maximum stated value. Dishonest sellers (those with no cards at the maximum value) have expected profits of \$206.31 per auction.

remaining auctions may have ended with winning bids above the minimum value if a higher bid was required to win the auction, making 92 percent a lower-bound estimate.³

The mystery element forces bidders to create an expected value of the lottery based upon limited information. Forty percent of the mystery auctions report both a minimum and maximum value. Of these auctions, 96 percent end with a bid that lies strictly between the reported minimum and maximum values. To capture the extent to which buyers weigh this information, we calculate the percentage that the winning price (including plus shipping/handling) lies between the minimum and maximum values:

$$percentage\ bid = \frac{price - \min\ value}{\max\ value - \min\ value}. \quad (1)$$

The average winning price lies approximately 10 percent between the minimum and maximum, thus buyers do not place high weight on the reported maximum value.

3 Results

We first run a hedonic regression for the logarithm of the winning price of auction i at time t :

$$\begin{aligned} \log(price_{it}) = & \beta_0 + \beta_1 \log(\max) + \beta_2 \log(\min) + \beta_3 ncards + \beta_4 no\max + \beta_5 no\min + \beta_6 noncards \\ & + \beta_7 \log(feedback) + \beta_8 neg + X_{it} \alpha + \varepsilon_{it} \end{aligned} \quad (2)$$

where $price$ is the winning price of the auction (i.e., winning bid plus shipping/handling), max is the reported maximum value, min is reported minimum value, $ncards$ is the number of cards up for auction, $no\ max$ is a dummy variable that equals one if no maximum value is reported, $no\ min$ is a dummy variable that equals one if no minimum

³ Although we do not observe risk preferences explicitly, winning bidders could be characterized as exhibiting lower levels of risk aversion than non-winning bidders. The findings are thus driven, at least partially, by the risk preferences of the buyers in the market.

is reported, and *no ncards* is a dummy variable that equals one if the total number of cards is not reported. We include the seller's feedback score plus one and a dummy variable *neg* for whether the seller received any negative ratings to proxy reputation. The vector *X* contains auction characteristics, such as a dummy variable if the auction ended as Buy-It-Now, the number of bids, any payment restrictions, and a linear time trend.

We run a similar regression for the data on regular auctions and include a term for the logarithm of the face value of the card instead of the minimum and maximum values, since the value is known. Table 2 reports the results of our regression for both datasets. As expected, a seller's negative ratings have a large impact in mystery auctions. With limited information, negative seller ratings decrease the winning price of a mystery auction by 11 percent compared to 1 percent in regular auctions. However, the coefficient on seller feedback is imprecisely estimated for mystery auctions, yet statistically significant for regular auctions – though with a magnitude of less than 1 percent. When bidders evaluate reputation, negative feedback indicates past dishonesty but additional positive feedback does not appear to convey a greater likelihood of honest behavior to buyers.

Table 2. Winning price of regular and mystery auctions

	(1)	(2)
	Regular	Mystery
log(Seller feedback + 1)	0.004** (0.001)	0.007 (0.012)
Negative ratings	-0.014** (0.003)	-0.113** (0.033)
log(Face value)	1.003** (0.003)	
Buy It Now	-0.015** (0.004)	0.418** (0.136)
Number of bids	0.000* (0.000)	0.046** (0.002)
Payment restrictions	-0.008** (0.003)	-0.064* (0.029)
log(max value)		0.170** (0.023)
log(min value)		0.190** (0.025)
Total number of cards		-0.001** (0.000)
Missing max value		0.610** (0.127)
Missing min value		0.249** (0.058)
Missing total # of cards		0.019 (0.033)
Observations	1890	1636
R-squared	0.99	0.44

Notes: Robust standard errors in parentheses. Regression includes a linear time trend.

+significant at 10%; *significant at 5%; **significant at 1%

The positive coefficients on the dummies for missing maximum or minimum value indicates that reporting this information may result in a lower winning price. Without disclosure, buyers infer that the minimum and maximum values are approximately \$4 and \$36, thus they believe the maximum and minimum values are worse than average (see Table 1). Thus, auctions where the reported maximum is below \$36 receive a lower winning price than auctions where no maximum is reported at all.⁴

⁴ The coefficient on the log of the maximum value is 0.17, and the coefficient on the missing maximum dummy is 0.61. Comparing the contribution of each variable to the winning price: $0.17\log(\max) < 0.61$ when $x < 36$.

Auctions where the reported minimum is below \$4 receive a lower price than when no minimum is reported.

We document a non-linear relationship between winning price and completeness of information. Above a certain threshold (a \$4 minimum value and \$36 maximum value), the winning bid is greater than an equivalent auction with no information. Eyster and Rabin (2002) provide an example of a seller who can choose to reveal information about the object’s characteristic, but would prefer not to because it may stop cursed bidders from suffering the winner’s curse (and thus decrease expected revenue for the seller).

We also find evidence of market unraveling. The positive time trend indicates that over time more sellers report the maximum, minimum, and the total number of cards. To examine what information sellers choose to disclose, we run a probit analysis with the dependent variable as a dummy that equals one if the seller reported the minimum value, maximum value, or the total number of cards. Table 3 reports the probit marginal effects. This unraveling is consistent with theory on information asymmetry. The full disclosure principle indicates that if an individual can credibly disclose that she is above the average of a group, she will do so; consequently, in equilibrium, all individuals will disclose their private information (Akerlof, 1970).

Table 3. Seller’s reported information

	(1) report min	(2) report max	(3) report # of cards
log(seller feedback + 1)	0.025* (0.010)	-0.031** (0.008)	-0.043** (0.009)
any negative ratings	-0.056+ (0.029)	-0.033 (0.022)	0.093** (0.026)
time trend	0.003** (0.000)	0.002** (0.000)	0.002** (0.000)
Observations	1665	1665	1665

Notes: Robust standard errors in parentheses. Probit marginals are reported.
+ significant at 10%; * significant at 5%; ** significant at 1%.

4 Conclusion

Mystery auctions provide a novel environment to study bidding behavior under asymmetric information. However, even under an overtly defined ‘mystery’ setting, buyers are generally trusting of seller claims. Approximately 92 percent of mystery auctions have a winning price above a reported minimum, almost guaranteeing a winner’s curse, where the winning bidder is more than likely to receive a gift card worth less than they paid. Reputation is thus more relevant in a highly uncertain environment. In mystery auctions, sellers with no negative ratings receive an 11 percent premium on the winning price, as compared to a 1 percent premium in regular auctions.

Our findings can be extrapolated to consider broader economic implications of bidding behavior impacted by trust. In financial markets, for example, assets are often modeled as common-value items. The basic assumption is that potential bidders each receive a private signal of the true common value of the asset. In the absence of new information (or information specific to a certain individual), a buyer’s interpretation of publicly available information (for example, a stock’s 52-week high/low value) could alter bidding strategies, potentially resulting in over-valuation and, subsequently, price bubbles in markets.

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