THE HIDDEN EFFECTS OF OPENING BIDS IN ONLINE AUCTIONS

Research-in-Progress

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Abstract

Auction opening bid is one of the online auction features that can be manipulated to promote bidding activity. Oftentimes, auction sellers that expect high bidding volume set their opening bids low only to later realize a lower price premium in their auctions. The current study offers explanations to this phenomenon by approaching this situation in a more holistic way. It examines the impacts of auction opening bids on bidding behaviors. Auction data from eBay were collected and separated into two samples, including auctions with low and high opening bids (LOB and HOB auctions). We found that HOB auctions attracted more serious bidders as indicated by their commitment to stay longer in the auctions. We also found that some bidding strategies that were commonly considered undesirable by auction sellers produced positive price premium to HOB auctions but not to its counterparts. Theoretical and pragmatic implications are later offered in the study.

Keywords: Auction, Bidding Behaviors, Business Model, Electronic Markets, E-Business

Introduction

In online auction environments, auction sellers and bidders employ different strategies with an effort to achieve their auction goals. For sellers, their goals are generally 1) to sell their items (Akula and Menascé, 2007) and 2) to gain a higher price premium (Bapna et al. 2009; Fu and Chen 2011; Harstad 1990). Price premium was defined as a price received by sellers, which is above the average price for which the same products are sold (Ba and Pavlou 2002). Buyers however strategize 1) to win the auctions, 2) to pay the least amount for the items they won, and 3) to minimize auction monitoring costs (Bapna et al. 2004; Ockenfels and Roth 2006; Roth and Ockenfels 2002). Depending upon their situations, sellers and buyers may attempt to attain multiple goals in one auction and they therefore have to prioritize their goals. Sellers that have a pressing need to move their inventory quickly may have to set the opening bids of their auctions relatively low to ensure a materialized auction but have to face with an inherent risk of receiving marginal final prices. Bidders that cannot be available at the time the auction ends are forced to place their bids early and take risks of revealing their true valuation of the item they are bidding on to others.

While there are myriad studies that examined sellers' and bidder's strategies in online auction environment, they for the most part viewed these strategies as separate entities (i.e. Bapna et al. 2004; Lucking-Reiley et al. 2007). None, to the best of our knowledge, investigate where sellers' and bidders' strategies crossed and provided an integrated picture of the interconnectedness of these strategies. The current study strives to do just that and attempts to answer a question of "Can a seller's choice of strategy influence bidder's choice of strategy and its effectiveness in online auctions?".

We argue that integrating the concept of sellers' and buyers' strategies in online auction together can help answer some questions that remain in the online auction research. For instance, although previous studies has often witnessed higher price premium in the auctions with high opening bids (HOB auctions) than auctions with low opening bids (LOB auctions) (i.e. Lucking-Reiley et al. 2007), there is very little theoretical explanation offered to the online auction community. We argue that the explanation to this phenomenon lies in the hidden impacts of seller's choice of opening bid on bidders' strategy and the integration of bidders' and sellers' strategies have to therefore be put under a microscope.

The current study chose seller's opening bid strategy and examined its impact on bidder's behaviors because of two major reasons. First, opening bids is one of the most popular options offered by online auctioneers to sellers in the process of auction listing. Second, it reflects conflicting goals between online auctioneers and online sellers. Many online auctioneers such as eBay encourage auction sellers to adopt low opening bid (LOB) strategy by charging lower listing fee. LOB auctions are more likely to receive a bid and thereafter become materialized, guaranteeing a final commission fees to the auctioneers. Auction sellers that attempt to minimize their listing fee are attracted to the LOB option. By adopting the LOB strategy, they take a hidden risk of gaining lower price premium. On the other hand, setting a high opening bid provides sellers with some assurance that a certain price level will be received. Sellers who are more risk averse can set their opening bid higher to have a certain guarantee of auction final prices (Walley and Fortin 2005). Some sellers however are willing to take risk because they believe that lower opening bids encourage bidding wars in the auctions (Reynolds et al. 2009). While it is true that bidding wars are more commonly found in LOB auctions, it may not suffice to produce higher price premium. The current study therefore offered an alternative outlook and rationale that explain higher price premium found in auctions with the HOB strategy.

Theory Development

In the online auction research stream, many attempts have been made to study strategies adopted by online bidders and their effectiveness (Bapna et al. 2004; Hou and Rego 2007; Roth and Ockenfels 2002). Of these studies, Bapna and his colleagues proposed a systematic way to profile bidders in online auction. Three bidder variables, including their number of bids, time of entry (TOE), and time of exit (TOX), were used to perform cluster analyses on their two data sets (1999 and 2000). Their study discovered four common bidder classes/strategies in the two samples, including opportunists, evaluators, sip & dippers (S&D), and participators. Evaluators and opportunists shared one common trait – that is they generally placed a single bid in the auction in which they are taking part. The timings of their bids are however

different and signified their motivations. While evaluators are likely to enter their bids early and used their true valuation of the items in forming their bids, opportunists are likely to wait until the last minutes. Since evaluators put out their bids early, they allow other bidders to experiment on their bids – or to test the water. This bidding strategy was therefore found to be the least effective to win but it generated highest price to the sellers on average (Bapna et al. 2004).

Opportunists waited until the last minute so that they can learn from other bidders and form their bids accordingly. To learn about other bidders in the auctions, they incurred higher monitoring cost. Bapna et al. (2004) reported that this strategy yielded the highest pay-off in term of winning likelihood. Some researchers considered this bidding strategy undesirable since this strategy produced a risk of having a non-materialized auction (Bapna et al. 2001; Bapna 2003; Roth and Ockenfels 2002). Some even made suggestions of how to discourage this bidding strategy such as using a soft-closing auction rule, a rule that allows the auction's end time to be extended depending upon the bidding activities in the last minutes (i.e. Roth and Ockenfels 2002).

Participators are those that placed multiple bids and they generally entered each bid only at the minimum requirement (Bapna et al. 2004). They avoided using their true valuation as their bid amount. Their role in shaping auction price premium has however been inconclusive. In their early study, participators were found to gain higher surpluses in the auctions (Bapna et al. 2004). It was later found that the larger number of participators, the higher price premium received by an auction (Bapna et al. 2009). S&D was claimed to place two bids on average. Their winning likelihood was found to be on the high end but the auctions won by these bidders gained lower price premium (Bapna et al. 2004). Two other bidder classes, including agent bidders and middle evaluators, were discovered but they appeared only in one of the two samples. For more information about these bidder classes/strategies, please see Bapna et al. (2004).

The current study argues that seller's choice of auction strategies can alter bidder's strategies, their popularity, and their outcomes. To test this argument, we shed a spotlight to one of the most popular seller's strategies – seller's opening bids. This strategy has repeatedly been included in many online auction research. Seller's decision of auction opening bid is arguably tied directly to the bid activities in the auctions. LOB auctions generally have more bidders than HOB auctions (Bajari and Hortacsu 2003; Lucking-Reiley 2000; Reynolds et al. 2009). They also avail more opportunities for bidders to experiment since they leave a relatively larger gap between their possible final price and their beginning price point.

Although research in the area of online bidding behavior is an emerging topic in IS studies, we argue that some of the influences of seller's opening bid strategy on bidding behaviors can be predicted. For instance, bidders that adopt evaluator strategy face a risk of revealing their true valuation of the product they are bidding to others. To avoid revealing their true valuation, bidders that employ this strategy may prefer LOB auctions. These auctions project a larger space between the auction starting price and their highest bids, making it more difficult to others to figure out their true valuation. Thus, one may expect a larger proportion of evaluators in the LOB auction (H1a). Since S&D are bidders that employ few bids strategy, they are assuming similar risks faced by evaluators. By participating in the LOB auctions, the risk of unveiling their true valuations of product can be minimized. H1c therefore reflects the similar expectation of S&D distribution across the two opening bid strategies.

Unlike evaluators, opportunists have higher monitoring costs since they generally wait until the last minutes before placing their bids. Participating in the auctions with low opening bids can increase their monitoring costs because the auction prices in this auction setting can change more dynamically. To avoid such costs, opportunists may opt to participate more in the HOB auctions where there are fewer bidding activities. Thus, we expect a smaller proportion of opportunists in the LOB auctions than in the HOB auctions (H1b). This expectation will however change for the participator strategy. Of all bidder classes found by Bapna et al. (2004), participators was the one that exhibits a bidding behavior similar to incremental bidding behavior (Ockenfels and Roth 2006). Incremental bids are bids that are placed only to meet the minimum bid amount requirement (Ockenfels and Roth 2006). Participators adopt this strategy and do it multiple times in the auctions in which they are taking part. LOB auctions provide an environment conducive for this bidding strategy because they have more room for bidders to enter multiple bids in smaller increment. H1d below echoes the attractiveness of LOB auctions to participators.

H1: Distributions of bidder classes/strategies in LOB and HOB auctions are significantly different.
H1a: There is a *larger* proportion of evaluators in LOB auctions than in HOB auctions.

H1b: There is a *smaller* proportion of opportunists in LOB auctions than in HOB auctions.
H1c: There is a *larger* proportion of S&D in LOB auctions than in HOB auctions.
H1d: There is a *larger* proportion of participators in LOB auctions than in HOB auctions.

Not only can seller's choice of opening bids affect distribution/popularity of bidder strategy, it can play an important role in determining the winning outcomes or winning effectiveness of each strategy. For instance, evaluators that participate in the HOB auctions, although may implicitly disclose their valuations of the products they are bidding on, send an important message to other bidders. Their bids portrait their commitment and aggression to win because their bids are in close proximity to the upward price ceiling derived from previous auctions that sold identical items. This message may potentially propel other bidders from the auction, rendering a higher winning likelihood (H2a). Thus, we expect a smaller proportion of auctions won by evaluators in the LOB setting than in the HOB setting. A similar argument can be made for the bidders that employ opportunist strategy. Opportunists that are engaged in the HOB auctions minimize a chance for others to respond to their bids, not only because of their bid timing but also because of a smaller gap between price points. Thus, we can expect a larger proportion of auctions won by opportunists in the HOB setting, and vice versa (H2b).

On the contrary, we expect a larger proportion of auctions won by S&D in the LOB auctions (H2c). Although evaluators and S&D generally placed fewer bids to the auctions, S&D exhibits a more flexible bidding behavior since they generally place two bids on average as opposed to a single bid placed by evaluators (Bapna et al. 2004). Their willingness to adjust their bids will pay off but more in an auction setting that facilitates such a bid adjustment – case in point, the LOB auctions. The LOB auction setting should have a similar impact on the winning likelihood of bidders that employ participator strategy since LOB auctions provide more room for participators to experiment their bids on a more frequent basis. H2d therefore hypothesize that there is a larger proportion of auctions won by participators in the LOB setting.

H2: Distribution of winner classes/winning strategies in LOB auctions is significantly different from that in HOB auctions.
H2a: There is a *smaller* proportion of auctions won by evaluators in LOB setting than in HOB setting.
H2b: There is a *smaller* proportion of auctions won by opportunists in LOB setting in HOB setting.
H2c: There is a *larger* proportion of auctions won by S&D in LOB setting than in HOB setting.
H2d: There is a *larger* proportion of auctions won by participators in LOB setting than in HOB setting.

Another outcome of bidding strategy that has received tremendous attention from online auction researchers is the price premium generated by winners that adopted various strategies. In their initial work, Bapna and his colleagues found that opportunists are perhaps the least desirable bidders to auction sellers mainly because they are likely to enter their bids within the last minutes of the auctions. They also gained higher surpluses – producing lower price premiums to the auction that they won (Bapna et al. 2004). We however believe that opportunists have limited opportunity to observe and learn from other bidders when they participate in the HOB auctions. It is because these auctions have fewer bidders and bids. Thus, opportunists in HOB auctions are obliged to use their true valuation of the items to form their bids and potentially produce higher price premium to the auction they won. Although we expect varying price premium of other bidder strategies across the LOB and HOB auctions, the current study proposes a price premium hypothesis that is directionless and similar to those found in the baseline study (Bapna et al. 2004). This decision stems from the mixed findings from previous research (Bapna et al. 2004; Bapna et al. 2009) that renders no *a priori* assumptions regarding the direction of possible differences of price premium.

To fairly compare price premium of LOB and HOB auctions won by similar bidder strategy, one should take seller's reputations and their other strategies into account. Auctions in an electronic marketplace can be offered by different sellers – each has their own level of trustworthiness. Many online auctioneers such as eBay offer an opportunity to their buyers to leave a feedback after the transaction is complete. Buyers that are satisfied with their transactions can leave a positive feedback to the sellers. Such feedback is a valuable asset to the sellers because it helps the sellers gain more trust from their future buyers and will later be rewarded with a higher price premium (Ba and Pavlou 2002; Resnick et al. 2000). In contrast, sellers that did not honor their term of contract can be tagged with a negative feedback and the price premium of their future auctions can be compromised (Ba and Pavlou 2002; Pavlou and Dimoka 2006).

Besides the heterogeneities of sellers' reputation, each auction may differ by seller's other choices of strategies. Auction duration is another strategy that has been put to test frequently by auction sellers and researchers. It was reported that auction duration when being extended can help enhance auction price premium since it allows more exposure of the auction to a larger base of buyers (Reynolds et al. 2009). Thus, to fairly compare price premium of auctions won by similar bidder strategy, both seller's reputation and auction duration should be included in the equation and we propose;

H3: There is a significant difference of price premium in LOB and HOB auctions won by a similar bidder class after controlling for sellers' reputation and auction duration.

- H3a: LOB and HOB auctions won by *evaluators* will receive significantly different price premium after controlling for sellers' reputation and auction duration.
- H3b: LOB and HOB auctions won by *opportunists* will receive significantly different price premium after controlling for sellers' reputation and auction duration.
- H3c: LOB and HOB auctions won by *S&D* will receive significantly different price premium after controlling for sellers' reputation and auction duration.
- H3d: LOB and HOB auctions won by *participators* will receive significantly different price premium after controlling for sellers' reputation and auction duration.

Methods

To test the above hypotheses, auction data from eBay were collected over the two-month period during April and May 2010. iPads were selected as a product of interest due to two main reasons, its availability and commodity nature. Its commodity-like characteristic allows a fair comparison of price premium across the auctions. Two spider programs were developed to facilitate data collection process – one is to automatically select the auctions that offered the product of interest and the other is to monitor the selected auctions and download auction data after the auctions end. The program later extracted information pertaining to each bidder such as their number of bids, TOE, and TOX. TOE and TOX are elapsed number of seconds between their bid time and the auction end time. Since iPads come with many configurations, this study focused only on New iPad with 16 GB and WIFI features.

The initial sample produced 11,290 data points – of which are mostly irrelevant data such as iPad accessories, used iPad, or those that are bundled with other items. Such auctions were later eliminated from the sample. Auctions that ended prematurely or ended with buy-it-now option were also removed from the sample, rendering an immediate sample of 890 auctions. To examine the impacts of seller's opening bid strategy on bidder's behaviors, we chose auctions within two opening bid ranges, including 1) those that are $0.99 and under (LOB auctions) and 2) those that are $499 and above (HOB auctions).

The final sample contains 315 LOB auctions with 3,780 bidders and 345 HOB auctions with 904 bidders. It is clear that the LOB strategy helps attract larger number of bidders. LOB auctions however received significantly lower average total price of $589.37, as opposed to the average total price of $598.33 found in the HOB auctions ($p = 0.04$). The reported average total prices, which is a sum of auction final price and shipping fees, are adjusted after taking into account the heterogeneity of other seller's factors and strategies across the two samples. The average total price of the immediate sample is $590.29 and we used this average to calculate the price premium of the two samples – an approach that was suggested by Ba and Pavlou (2002). Others auction variables, such as auction duration, seller's positive and negative feedback, were also extracted and later used as covariates in the price premium comparison tests.

Data Analysis and Results

It is interesting to find that LOB auctions, despite its ability to draw more bidders and potential to create a bidding war, received a significantly lower average total price than HOB auctions. This finding is however consistent to prior studies in this area (i.e. Lucking-Reiley et al. 2007). We believe that such finding is attributed the types of bidders participating in the auctions. To understand why LOB auctions received lower premium than HOB auctions, the current study profiled bidders in the two auction samples (LOB and HOB auctions) separately. We followed the cluster analysis technique used by Bapna and his colleagues (Bapna et al. 2004) and used bidders' number of bids, TOE, and TOX as clustering variables. To indentify the proper number of clusters in each sample, a guideline offered by Hair and his colleagues

(Hair et al. 1998) was adopted. The data suggested six clusters in each sample. The distribution of bidder classes in each sample and their cluster variable statistics are summarized in Table 1. Statistics pertaining average TOE and TOX in Table 1 are shown in number of minutes.

Table 1: Cluster Analysis Results in Auctions with Low and High Opening Bids

Bidder Groups	Auctions with Low Opening Bids (LOB)				Auctions with High Opening Bids (HOB)			
	Number of Members	AVG Number of Bids (S.D.)	AVG $_{TOE}$ (S.D.)	AVG $_{TOX}$ (S.D.)	Number of Members	AVG Number of Bids (S.D.)	AVG $_{TOE}$ (S.D.)	AVG $_{TOX}$ (S.D.)
Early Evaluators	283	1.49	8,629.71	8,462.79	7	1.00	7,964.34	7,964.34
	7.49%	(0.94)	(2,221.77)	(2,254.48)	0.77%	(0.00)	(1,566.31)	(1,566.31)
Middle Evaluators	n/a	n/a	n/a	n/a	55	1.36	2,071.68	1,769.10
					6.08%	(0.85)	(1,007.74)	(1,133.15)
Late Evaluators	824	1.00	1,193.92	1,193.92	78	1.00	568.37	568.37
	21.80%	(0.00)	(423.43)	(423.43)	8.63%	(0.00)	(176.81)	(176.81)
Opportunists	1,155	1.00	157.30	157.30	579	1.00	64.71	64.71
	30.56%	(0.00)	(163.60)	(163.60)	64.05%	(0.00)	(86.96)	(86.96)
Early S&D	450	2.24	4,114.98	3,525.94	n/a	n/a	n/a	n/a
	11.90%	(1.84)	(1,499.09)	(1,346.15)				
Middle S&D	873	2.49	634.50	525.78	137	2.00	158.71	112.49
	23.10%	(0.70)	(542.82)	508.71	15.15%	(0.00)	(268.17)	(216.09)
Participators	195	7.89	1,387.38	851.48	48	3.71	166.66	41.77
	5.16%	(4.14)	(1,416.12)	(997.90)	5.31%	(1.05)	(414.47)	(80.33)
Total Bidders	3,780				904			

Our analyses discovered similar bidder classes found in the Bapna's study (Bapna et al. 2004). This result confirmed that number of bids, TOE, and TOX hold their segregating power very well. For instance, the average number of bids placed by evaluators and opportunists are approximately 1.0. Opportunists however placed their bids much closer to the end of the auctions – approximately 2.5 hours and 1 hour before the auctions ended for LOB and HOB samples, respectively (See Table 1). Timing of bids has however extended its segregating power to some bidder classes in our samples. For instance, evaluators were classified into 3 groups in the HOB auctions according to their TOE and TOX, including early, middle and late evaluators. S&D in the LOB auctions were also further classified into early and middle S&D. Early evaluators and S&D are those that came and left the auctions early (as indicated by their TOE and TOX) while middle/late evaluators or S&D placed their bids closer to the end of auctions.

This extended segregating power was also witnessed in one of the Bapna's samples where evaluators were separated into early and middle evaluators (Bapna et al. 2004). Although both samples revealed six clusters of bidders, their bidder classes are not all identical. The two samples have only 5 bidder classes in common. Each also has their own unique bidder classes – middle evaluators in HOB auctions and early S&D in the LOB auctions (See Table 1). Winning likelihood, average total price, and average price premium of each bidder class are reported in Table 2.

To test H_1, bidder classes found in our study were aggregated into the four common bidder classes for a comparison purpose (See Table 3). A chi-square test was performed. Its result supported H_1 ($X^2 = 492.23$: $X^2_{.05,\ 3} = 7.81$) and revealed that distribution of bidder classes across the LOB and HOB auctions are significantly different. A similar test was performed on the distribution of winners across the two samples and it yielded a similar finding ($X^2 = 143.03$: $X^2_{.05,\ 3} = 7.81$). Thus, we can claim that the distributions of winners across the two auction samples are also significantly different (H_2).

Using auction duration, seller's positive, and negative feedbacks as covariates, we conducted ANCOVA tests to examine the difference in price premium of auctions won by similar bidder classes across the two samples. Prior to the test, seller's positive and negative feedbacks have undergone a log transformation as suggested by Ba and Pavlou (2002). H_3 is partially supported by ANCOVA results. The result unveiled that there is no significant difference in price premium generated by evaluators (H_{3b}) and participators (H_{3d}) across the two samples (P = 0.52 for evaluators, P =0.58 for participators).

Table 2: Distribution of Adjusted Prices and Winning Likelihood across Bidder Profiles								
Bidder Groups	**Auctions with Low Opening Bids (LOB)**				**Auctions with High Opening Bids (HOB)**			
	Number of Auctions Won (% of Auctions)	**Number of Winners (% of Bidders)**	**Average Total Price**	**Average Price Premium**	**Number of Auctions Won (% of Auctions)**	**Number of Winners (% of Bidders)**	**Average Total Price**	**Average Price Premium**
Early Evaluators	2 (0.63%)	2 (0.71%)	$676.27	14.60%	2 (0.58%)	2 (28.57%)	$604.16	2.30%
Middle Evaluators	n/a	n/a	n/a	n/a	8 (2.32%)	8 (14.55%)	$592.14	0.3%
Late Evaluators	3 (0.95%)	3 (0.36%)	$575.57	-2.50%	16 (4.64%)	16 (20.51%)	$603.24	2.20%
Opportunists	178 (56.51%)	178 (15.41%)	$583.53	-1.10%	245 (71.01%)	245 (42.31%)	$596.23	1.00%
Early S&D	10 (3.17%)	10 (2.22%)	$579.74	-1.80%	n/a	n/a	n/a	n/a
Middle S&D	105 (33.33%)	105 (12.03%)	$594.57	0.7%	47 (13.62%)	47 (34.31%)	$605.11	2.5%
Participators	17 (5.40%)	17 (8.72%)	$613.44	3.90%	27 (7.83%)	27 (56.25%)	$605.83	2.30%
Total Winners	315				345			

There is however a significant difference in price premium of auctions won by opportunists (H_{3a}: P = 0.05). Bidders that employed this strategy in the HOB auctions produced significantly higher price premium than those using the same strategy in the LOB auctions. S&D winners showed marginally difference in price premium across the two auction samples (H_{3c}: P = 0.07). Although S&D winners in both samples produced positive premium, they paid less for the items when they used this strategy in the LOB auctions than in the HOB auctions.

Table 3: Distribution of Adjusted Prices and Winning Likelihood across Aggregated Bidder Profiles									
Bidder Classes	**H_1 and X^2 values**	**Number of Bidders**		**H_2 and X^2 values**	**Number of Auctions Won**		**H_3 and p-values**	**Average Price Premium/Total Price**	
		LOB	**HOB**		**LOB**	**HOB**		**LOB**	**HOB**
Evaluators	H_{1a}* $X^2 = 83.12$	1,107 (29.30%)	140 (15.50%)	H_{2a}* $X^2 = 78.16$	5 (1.59%)	26 (7.54%)	H_{3a}*** p = 0.05	4.20% $615.13	1.90% $601.23
Opportunists	H_{1b}* $X^2 = 477.92$	1,155 (30.60%)	579 (64.00%)	H_{2b}* $X^2 = 29.54$	178 (56.51%)	245 (71.01%)	H_{3b} p = 0.52	-0.90% $584.77	0.90% $595.34
Sip & Dippers	H_{1c}* $X^2 = 156.49$	1,323 (35.00%)	137 (15.20%)	H_{2c}* $X^2 = 77.94$	115 (36.51%)	47 (13.62%)	H_{3c}** p = 0.07	0.20% $591.69	3.0% $608.16
Participators	H_{1d} $X^2 = 0.04$	195 (5.20%)	48 (5.30%)	H_{2d} $X^2 = 3.98$	17 (5.40%)	27 (7.83%)	H_{3d} p = 0.58	3.90% $613.20	2.7% $606.26

* significant at p = 0.05 and d.f. =1, ** significant at p =< 0.10, *** significant at p <= 0.05

Discussion and Implications

The current study offered insights into how seller's opening bid strategy in online auctions influence bidders' behaviors and their effectiveness. Due to the limited space of this manuscript, the following discussion will highlight some key findings and implications from this study. For the most parts, the three main proposed hypotheses are supported by the data. More importantly, most of this study's results went in the direction that we expected. For instance, the HOB auctions drew a significantly larger proportion of opportunists than LOB auctions (H1b). We believe that this finding tapped on a domain that has been overlooked in online auction research – using a seller's strategy to draw quality bidders. Opportunists are

generally those that are committed to win as indicated by their willingness to stay in the auctions for a longer period of time, which consequently produced higher monitoring costs. With such a commitment, they won most of the HOB auctions (71.01%) (H2b) and these auctions earned positive price premium. While many prior studies purported that opportunists are not the most desirable bidders in online auctions (Bapna et al. 2004), we showed that they can enhance price premium of an auction – at least when the sellers adopted the HOB strategy.

We believe that the ability of HOB strategy to draw quality bidders did not reflect only on the group of opportunists but also on its other bidder classes. Upon a closer examination, we found that all bidders in the HOB auctions are willing to stay longer in the auctions regardless of their other strategies ($p = 0.00$). On average, bidders in the HOB auctions left the auctions 4.65 hours before the auction ended, as opposed to 25.45 hours average departure time of bidders in the LOB auctions. Their willingness to stay longer in the auctions is indicative of their determination to win – something that helps promote price premium in the HOB auctions. We hope that this result open a new forum of research in this area and provided an initial evidence showing that seller's choice of strategy can be used as a mechanism to filter out non-serious bidders from the auctions. In addition, auctions that have bidders with stronger commitment to win, in this case the HOB auctions, will be rewarded with a higher price premium.

We also found that the winning likelihood of evaluators, as expected, increased when this strategy is adopted in HOB auctions (H2a). In such an auction setting, the opportunity for other bidders to bid against an evaluator is limited. Sellers in these auctions have set the auction starting price in close proximity to the price ceiling created by prior auctions. In other words, there is very little room for other bidders to bid against an evaluator's bid in an attempt to figure out what the evaluators' true valuations of the item is. Thus, we suggest that bidders that avoid higher monitoring cost (evaluators) should participate more in the auctions with higher opening bid to improve their winning likelihood.

As mentioned earlier, online bidders and sellers adopt different strategies because they have different auction goals in mind. The result indicated that most opening bid strategies help fulfill only part, but not all, of bidder's goals with the exception of the LOB and S&D strategies. This study found that the goals of S&D bidders are more congruent with the LOB setting. Not only did LOB auctions draw more S&D bidders (H1c), it also improved their winning likelihood (H2c) and minimized the total price they paid for the auctions (H3c). This is consistent with the concept of using information technology as the incentive alignment (Ba et al. 2001) to bidders' goals.

Although H3 were proposed in a directionless fashion due to inclusive results from prior studies, the current study unveiled that evaluators generated highest possible price premium but only when whey won LOB auctions. The LOB setting allows other bidders to bid against evaluators' bids, creating a bidding war and perhaps making bidders more emotionally involved with the competition. This is perhaps what most sellers expect from the LOB strategy. Unfortunately, very few LOB auctions were won by evaluators (1.59%) and many sellers that opted for this opening bid strategy received a lower price premium at the end. A caution should however be made when interpreting this result due to its small sample size.

Despite the supported hypotheses discussed above, the result revealed that there is no significant difference of price premium across the LOB and the HOB auctions won by participators– a finding that is not in line with the results from prior study (Bapna et al. 2009) and our expectation (H3d). In addition, there is a significantly larger proportion of auctions won by participators in the HOB sample than in the LOB sample (H2d). We examined our data at a more granular level and found that a seller's choice of using the LOB strategy can be interfered by some bidding strategies.

When a seller chooses to set opening bid low, their strategy can be overwritten by competition among early evaluators in the auctions. Evaluators generally enter their bids by using their true valuation of the items they are bidding on. If there is a competition among this type of bidders early in the auction, the auction price will go up exponentially in a short period of time. Their competition will therefore transform an LOB auction to an HOB auction. Our further analysis showed that LOB auctions with multiple early evaluators have significantly smaller proportion of participators (3.38%) than HOB auctions ($X^2 = 10.26$). Early evaluators in these auctions may drive the auction prices even higher than the beginning price of HOB auctions in our sample, limiting opportunity for participators to be engaged in the auctions. We additionally found that these LOB auctions and the HOB auctions received similar price premium ($p = 0.758$). It is because the opening bids of these LOB auctions were replaced by the prices offered by their

early evaluators. LOB auctions with no competition among early evaluators however earned significantly lower price premium than HOB auctions ($p = 0.03$). These findings are more in line with our expectation.

A number of implications can be drawn from this study. We believe that the study offered an important explanation to a counterintuitive phenomenon found in the online auction environment. The common belief that using the LOB strategy will help enhance the auction price premium because LOB strategy helps promote a bidding war has been proven wrong in many studies (i.e. Hergert 2007). There has however been very limited explanation to this finding. This study showed that HOB auctions earned higher price premium than LOB auctions partly because the high opening bids acts a screening mechanism that encourage only quality and committed buyers to participate in the auctions.

In term of practical implications, we recommend that online auctioneers give a closer look into how bidder's strategies and seller's strategies interplay. Opportunist is a strategy that has received a bad reputation since it was claimed to be detrimental to auction price premium. The current study showed that HOB auctions that were won by opportunists received positive price premiums. Thus, a recommendation made by other studies to avoid and to discourage opportunist strategy (i.e. Roth and Ockenfels 2002) should therefore be reevaluated.

Limitations and Directions for Future Research

The current study faced some challenges and limitations. To collect data from eBay, we have limited control of what are useful in the final sample. The selection of opening bid ranges can also be considered subjective. We however chose these opening bid ranges mainly because they appears to elicit two extremes of opening bid strategies which allow us to observe their impacts of bidding strategies more clearly. We also recognize that the results of our study may differ when applied to other products. iPad was selected as our product of interest partly because electronics is one of the most popular products on eBay and its relatively expensive retail price that enables online sellers to adopt different levels of opening bids. Sellers that offer inexpensive products generally have very little room to play with their opening bids which should in turn affect bidders' strategy in a different fashion.

As online auction research continues to grow, we encourage more studies to examine the interdependencies between sellers' and buyer's strategies. More importantly, future studies may investigate their relationship in the opposite direction. One of the interesting findings of this study suggested that the LOB strategy can be overwritten by competition among early evaluators. Such finding portraits that their relationship is more complex than most believed and deserves more spotlights from researchers in this area.

Conclusion

In an attempt to avoid listing fees, many online auction sellers choose to set their opening bids low and expect to have more bidders participating in the auctions. This strategy however comes with a price – a lower auction price premium. On average, auctions with low opening bids in this study received approximately 1.50% lower price premium than auctions with high opening bids in our samples. To offer an explanation to such finding, the current study demonstrated that seller's choice of opening bids influenced distributions of bidder classes, which in turn affect their winning likelihood and auction's price premium. We additionally found initial evidence of differences in the level of commitment among bidders across the LOB and HOB auctions. Bidders in HOB auctions stayed in the game for a longer period of time. We also showed that opportunists, a bidding strategy that is arguably not desirable by many auction sellers, can benefit auctions with high opening bids. These are some of the examples of the hidden effect of auction opening bids that was unveiled by this study.

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