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Cross-bidding impact throughout the product life cycle

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ABSTRACT

Two products at different points of the product life cycle have been chosen to analyse the effect of cross-bidding in competing auctions. The findings indicate that this strategy can have a different impact depending on the phase of the cycle.

1. Introduction

Within the framework of Internet auctions are to be found *competing auctions*, that is, the auctioning of homogeneous items during the same period of time, where sellers are rivals, and thus do not possess the power of the typical monopolist's market. Peters and Severinov (2006) outlined the *cross-bidding* strategy among competing auctions, i.e., bidders placing bids in the auction in which the price is the lowest of all those that are competing with a similar item at the time that they enter the bidding. Given the growing importance of online auctions it is crucial to analyse these strategies and their potential effects. Anwar et al. (2006) corroborates the existence of a significant number of participants doing cross-bidding who obtain an average discount on the selling price. McCart et al. (2009) observed similar results and Pages and Mochon (2010) conducted some empirical research to test the presence of cross-bidding.

This paper is focused on analysing the effects of the cross-bidding strategy on buyers and sellers. The main novelty of the research is that the analysis has been done for products that are in different phases of their life cycles. In this way, the paper seeks to test whether the cross-bidding strategy has different effects depending on the phase of the life cycle a good is in.

2. Empirical data

Data was collected from the eBay.com website for the time interval 28th June–20th August, 2009. All auctions included in the sample satisfied the following prerequisites:

- Sellers and buyers had to be registered in the USA (homogeneous shipping costs).
- Only reputable sellers have been included.
- Homogeneous items during a similar time-frame and with a specific end time have been considered to be competing auctions (between 00:00:00 and 23:59:59 PST).[1]

The study was conducted for the following items (only new lots that still maintained all their 'factory-fresh' features where included):

- Item#1: Sandisk Cruzer USB 2.0 16 GB. Average sample price $25.73.
- Item#2: Sandisk Cruzer USB 2.0 8 GB. Average sample price $15.03.

The first good was in the initial phase of its cycle. The first time it became available on Internet was in February, 2009. The second good is a product in the final phase of its life cycle. It has been on the market since October, 2001 and is an electronic good that has

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[1] This is the same time-frame considered by other authors, such as Anwar et al. (2006).

become obsolete. Item#1 is the substitute of item#2. The search method used was that proposed by Anwar et al. (2006), as it is the most trustworthy method of ensuring the maximum homogeneity required for the study. Details of the auctions analysed for each type of item are summarised in Table 1.[2]

3. Results and discussion

3.1. Effect of cross-bidding on buyers

We have corroborated a significant number of participants doing cross-bidding in the selected sample. The number of participants bidding among competing auctions is over 26% for both items. Additionally, there is at least one bidder using this strategy in 72.5% of the auctions for item#1 whilst this figure stands at 56.15% for item#2. The cross-bidding strategy involves a need for the buyer to use the "last minute bidding" or *sniping* strategy, see Roth and Ockenfels (2002). In this paper we have confirmed the sniping strategy following the methodology presented by Bajari and Hortacsu (2003), see Figs. 1 and 2. For both items, in 86% of cases the winning bid is not made until at least 90% of the auction time has passed.

Finally, we have analysed the effect of this behaviour on the final price and the chances of winning a lot. The data reveals that cross-bidders pay, on average, a lower price than non-cross-bidders (discount of 3.80% in item#1 and 6.90% in item#2). Furthermore, cross-bidders have a greater chance of eventually winning the lot for which they bid both in item#1 and item#2. Thus, cross-bidders are better off than non-cross bidders. These results confirm previous findings (Anwar et al. (2006) and McCart et al. (2009)).

3.2. Effect of cross-bidding on sellers

There are authors who state that the final price is affected by the starting price.[3] To prevent any possible bias, all auctions have been classified according to the price interval to which they belong. The interval in which each auction is included equates to the percentage of the final price that the starting price represents. The intervals considered are the following: $0\% \leq \text{I} < 10\%$; $10\% \leq \text{II} < 60\%$ and $60\% \leq \text{III} < 80\%$.[4]

Table 2 compares the average prices for auctions with and without cross-bidders for item#1. The results illustrate that the presence of cross-bidders translates into an increase in the average price in the main intervals with respect to auctions without cross-bidders. This difference is statistically significant for the second interval ($10\% \leq \text{II} < 60\%$), which is also the widest. The same results for item#2 are set out in Table 3. In this case, the effect on the seller's revenue is the opposite, i.e., in competing groups where there is cross-bidding the average price is lower than those groups where there is no cross-bidding. The difference is statistically significant for the second interval ($10\% \leq \text{II} < 60\%$). If we focus on intervals for which differences are statistically significant Fig. 3 exhibits a plot box that reflects the average final prices for both items.

We have observed that these differences are not due to any of the following variables: length (in time) of the auctions, end-time or intensity of sniping strategy usage, all of which are variables that the scientific literature has stated to have an influence on the end price of auctions.

Table 1
Descriptive analysis of auctions included in the sample.

	Item#1	Item#2	Total
Total no. of auctions	248	166	414
Total no. of valid auctions[a]	244	139	383
Total no. of bidders	1588	770	2,358
Average no. of bidders per auction	6.50	5.46	5.97
Total no. of bids placed	2559	1121	3,680
Average no. of bids per auction	10.48	7.95	9.21
No. of competing auction groups	41	30	71

[a] Once the auctions that were not sold from and to the American market have been omitted.

Table 2
Comparison of average price with and without cross-bidding for item#1 by interval.

	$0\% \leq \text{I} < 10\%$	$10\% \leq \text{II} < 60\%$	$60\% \leq \text{III} < 80\%$
Average final price without cross-bidding	26.79	23.86	27.17
(standard deviation)	(4.29)	(4.38)	(2.77)
Average final price with cross-bidding	26.78	25.55	27.54
(standard deviation)	(3.55)	(3.74)	(2.36)
Difference	−0.069%	6.615%[a]	1.314%

[a] Statistically significant difference.

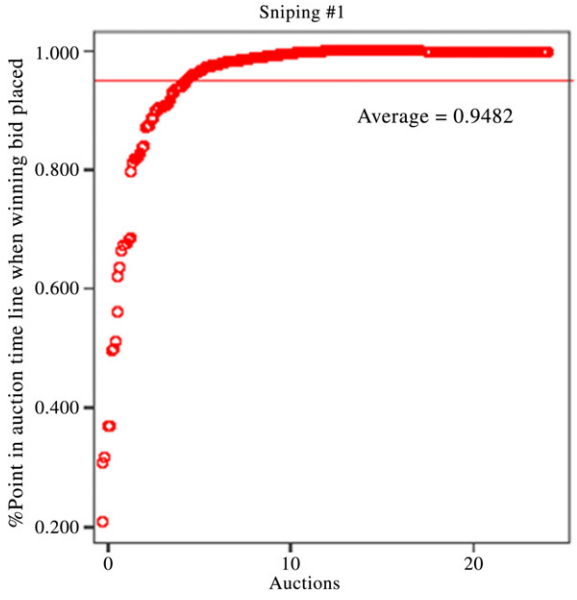

Fig. 1. Bids evolution for item#1.

The main distinction between the two goods is the phase of their life cycle in which each is located, which affects both the demand (bidders and bids placed) and supply (number of auctions), see Table 4. Note that all values are higher for item#1 than for item#2.

Item#1 is a new product, just on the market, which is at the beginning of its life cycle. To a certain degree, it is "in fashion" and replaces item#2. For goods with these characteristics, buyers have a greater incentive to keep bidding and prefer to guarantee the purchase even though it does not yield a price reduction (bidders have low price sensitivity). Consequently, cross-bidders foment competition (greater numbers of bidders and bids placed) and thus raise the final price. However, a cross-bidder will only be motivated to purchase a good that has already been replaced if

[2] Bajari and Hortacsu (2003) used 407 completed; Roth and Ockenfels (2002) used a total of 480.

[3] See Bajari and Hortacsu (2003).

[4] Auctions for which the final price represents more that the 80% of the starting price have not been included because both prices were so close that no significant differences were found.