



## eBay Auctions: Bidding and Information

In recent years, the use of auctions and dynamic pricing for procurement and sales has been steadily increasing.<sup>1</sup> Much of the emphasis of “e-sourcing” in the business-to-business (B2B) context is on creating ways for improving access to suppliers, facilitating competition, and driving down prices through the use of procurement internet auctions. Because internet auctions have lower participation and transaction costs and provide ready access to large markets, companies often use them to buy and sell excess inventory, as well as first-run goods and commodities.

Sometimes sellers are uncertain of the true market value of the goods they are selling, and auctions are extremely effective in helping sellers determine this true market value. These situations sometimes arise in the B2B context with the marketing of new products, and they are also quite common in the business-to-consumer (B2C) and consumer-to-consumer (C2C) contexts, when the seller is uncertain about the true value of the object being sold.

Examples of such objects include antiques, art, and musical instruments, and this is one of the reasons why eBay has become such a popular platform for selling these goods. For example, on a typical day, over 250,000 objects are listed on eBay in the “Antiques” category, over 270,000 objects under “Art” and over 150,000 under “Musical Instruments.”

In this simulation, we will use the eBay market for musical instruments to provide context. Musicians (professionals as well as serious amateurs) are quite particular and knowledgeable about their instruments, and purchasing a new instrument is an important decision to a musician. High quality musical instruments are made to last, so they not only retain their value well, but also sometimes become more valuable over time, and are therefore often purchased not just to be used for making music, but also as an investment.

### Willingness to Pay

We can think of an individual’s *willingness to pay* for a specific instrument as consisting of two separate components:

- The instrument’s *resale value*, and
- The individual’s own *use value*.

The *resale value* of a musical instrument is often not readily apparent from the description posted on eBay because it depends on many dimensions, and often sellers themselves are not aware of the instrument’s true value. Descriptions, however, often include specialized technical information, such as the serial number, the year made, the manufacturer’s lot number, and so on,

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<sup>1</sup> According to a recent report by AMR Research, the revenues from strategic e-sourcing tools have increased from \$191 million in 2000 to \$952 million in 2003, and are projected to increase to \$2.8 billion by 2005 (Kraus and Mitchell 2002).

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and this technical information can be useful to experienced bidders in evaluating the instrument's true resale value.

There are also *experts* who shop on eBay (often they are dealers who purchase instruments to be re-sold) who may be able to discern the precise resale value of an instrument based on the technical information provided in the description.

Experienced eBay bidders are often aware of who the experts are (because over time they have learned to recognize experts' eBay IDs), but may not be themselves knowledgeable enough to determine the exact resale value of an instruments. The information provided in the description is often sufficient for an experienced bidder to come up with an *estimate* of the resale value, which is not as accurate as the expert's estimate. For this reason, experts often find it important to try to protect their information.

The second component of the willingness to pay is the *use value*, or in other words, how much is owning (and using) this instrument is actually worth to an individual. The use values vary among different individuals because of differences in income, access to similar instruments, geographical locations, or simply taste.

The total willingness to pay is the sum of the resale value and the use value. A bidder may be pretty sure of his or her own use value, but the true resale value is typically not revealed until the auction is over, and the winner can have the instrument appraised.

In this simulation all the students in this class will play the role of eBay bidders, in the market for a French Horn. One of you will be an expert. The expert will know the true resale value of the French Horn, but all others will only have an *unbiased estimate* of this resale value.

### **What is an unbiased estimate?**

An estimate is unbiased when its expected value is equal to the true value. Some people's estimates will be higher than the true value, and others' will be lower. But the highs and the lows will cancel each other out, so *on average* the estimates will be correct.

### **Your Private Information**

Each of you will receive a private email from the instructors that will include:

- Your *individual estimate of the resale value*. In addition to being unbiased, this estimate will be no more than \$50 off the actual resale value.
- Your *private use value*. Private use values are assigned at random.
- The name and the eBay *account of the expert*. There will be only one expert in this class, so this expert's identity will be the same in all private emails.
- Instructions for how to find our class auction on eBay.

One further piece of information you need to know is that the expert is a dealer of musical instruments, and the dealer's mark up for this type of French Horn is typically about \$40. In

other words, the dealer does not intend to use the instrument, but can typically find a buyer who is willing to pay about \$40 more than the actual resale value.

## Second Price Auctions

Note that eBay has a bidding proxy feature. This allows you to participate in an auction, even while away from the computer. When a bid is entered by someone, one of two things occurs. If the bid is higher than what anyone else has entered, the system enters a bid that is one unit higher than the next lowest bid (but keeps the actual amount secretly on file). If the bid is equal to or lower than the highest entered bid on file, the system ups the existing winning bid by just enough to better the new bid. So, the winner of any auction will always be the person who entered the highest bid, but they will pay only one unit above the second highest bid!

## How do you make money?

You can make money from this simulation by bidding in the class auction. If you do not win the auction, you will not make or lose any money. If you do win the auction, your earnings will be:

$$\text{The resale value} + \text{your own use value} - \text{the amount you paid.}$$

Remember that, unless you are the expert, you will not find out the real resale value until after the end of the auction. You will know your own use value because it will be included in the private email you will receive. The private email will also include your estimate of the resale value (which will be unbiased and within \$50 of the true value). If you are the expert than you will know the true resale value, and your use value will be \$42 (in line with the above supposition).

**Example:** Suppose your private email says that your estimate of the resale value is \$237, your use value is \$50, and the expert is somebody who is not you. Suppose you bid in the auction and end up winning the object for \$280. Suppose that after the auction is over, it turns out that the actual resale value was \$250. In this case your profit is:

$$\$250 \text{ (real resale value)} + \$50 \text{ (your own use value)} - \$280 \text{ (what you paid)} = \$20.$$

The instructor will pay you this amount in cash at the end of the auction.

N.B. that it is possible to lose money in this auction. For example, if you ended up winning the auction and paying \$320, than you would have actually owed the instructor \$20 – and you should expect the instructor to collect it!