AUCTIONS

Going ... Going ... Gone!

One in a Series of Articles from Agorics, Inc.

What exactly is an auction? You've seen auctions in movies, you've read about them, you've probably participated and believe nothing could be more simple, right? Someone bids, the price goes up, someone else bids, and when everyone is silent, the object is sold. Well . . . sometimes.

More to the point, why does it matter? Perhaps because auctions are a multi-billion dollar business, and the mortgage rate you pay is determined in part by auctions held by the U.S. Treasury. Perhaps because that particular auction is not the kind of auction you think it is. Perhaps because some bidders spend years mastering strategies that enable them to exploit the misunderstandings of the unwary. And perhaps because smart auction principles can be used to buy and sell computer resources in a way that substantially optimizes human time and money. However, before all that, what exactly is an auction?

Even the term auction (root, "auctio", means increase) is a misnomer because not all auctions have ascending price schemes. In fact, there are many different auction formats including the familiar ascending bid, but also including the descending, sealed-bid, simultaneous, handshake, and whispered forms of bidding. Many of the more unusual formats have been practiced for hundreds of years including one variety in which huge estates have been sold during the time it took for a single one-inch candle stub to flicker out.

Auctions are useful when selling a commodity of undetermined quality. Banks compete for loan customers of uncertain risk, graduate schools compete for students of unknown ability, [Vincent] wine merchants may not have tasted the wares. Auctions can be used for single items such as a work of art and for multiple units of a homogeneous item such as gold or Treasury securities. For countries changing from centrally-planned to market-based economies, auctions offer an ability to value goods that might not otherwise be available. They are useful in circumstances wherein the goods do not have a fixed or determined market value, in other words, when a seller is unsure of the price he can get.

Choosing to sell an item by auctioning it off is more flexible than setting a fixed price and less time-consuming and expensive than negotiating a price (such as happens in a car lot). In a price negotiation, each bid and counter-bid is considered separately, but in an auction the competing bids are offered almost simultaneously.

In fact, an auctionable resource can be nearly anything--public land, livestock, wine, flowers, fish, cars, construction contracts, equity shares, or contracts in the game of bridge. The common denominator is that the value of each item varies enough to preclude direct and absolute pricing. In one fascinating experiment, external offices (with prized windows and locations) were auctioned off as a way of solving the quandary of how to allocate physical resources at Arizona State University's College of Business without infuriating the entire staff. [Boyes]

Simply stated, an auction is a method of allocating scarce goods, a method that is based upon competition. It is the purest of markets: a seller wishes to obtain as much money as possible, and a buyer wants to pay as little as necessary. An auction offers the advantage of simplicity in determining market-based prices. It is efficient in the sense that an auction usually ensures that resources accrue to those who value them most highly and ensures also that sellers receive the collective assessment of the value. (In later chapters, we will see that sellers do not necessarily receive maximum value in the ascending-bid format. [Varian]) What is unique about the auction is that the price is set not by the seller, but by the bidders.

On the other hand, it is the seller who sets the rules by choosing the type of auction to be used.

One oddity regularly occurs in the wine auction market. [Ashenfelter] It is commonly understood in wine circles that when identical lots of wine are peddled at the same auction, later lots are frequently sold for a lower price than early lots. Auctioneers know this but are reluctant to reveal this information to inexperienced participants because such bidders often conclude that the auction house is dishonest. Thus, auctioneers have learned to disguise this anomaly by offering small lots of wine A before offering larger lots of wine A. People assume the reason for the price difference comes from a quantity discount, and so they pay no attention. In fact, the difference is real.

An auction is unusual also in that, unlike other methods of selling, generally the auctioneer doesn't own the goods, but acts rather, as an agent for someone who does. Frequently, the buyers know more than the seller about the value of the item. A seller, not wanting to suggest a price first out of fear that his ignorance will prove costly, holds an auction to extract information he might not otherwise realize.

There are different ways to classify auctions. There are open auctions as well as sealed-bid auctions. There are auctions where the price ascends and auctions where the price drops at regular intervals. Generally, experts agree that there are four major one-sided auction formats: English, Dutch, First-Price sealed-bid, and Vickrey (uniform second-price). One difficulty is the lack of commonality in naming conventions. What some people call a uniform second-price auction is known in financial communities as a Dutch auction, and no end of confusion results.

Which auction is best? The answer depends upon many variables. A seller's perspective is different from that of a buyer. Some auctions types decrease the incentives to cheat while others provide ample room for mischief. Sometimes speed is important. If you are selling flowers or fresh fish or anything that has to get to market quickly, an auction that takes weeks or even hours is not a good solution. In some auctions the buyer must be present, and that is sub-optimal if the auction is in New York and you are in Tokyo. Different circumstances dictate different answers.

Sometimes an auction is useful in hindering dishonest dealings. If the mayor of New York were free to accept the first bid made by a contractor on a new city building, the contractor would probably be a relative and the taxpayers would lose money (again).

Are there drawbacks to auctions? Of course. "Winners curse" is widely recognized as being that phenomenon when a "lucky" winner pays more for an item than it is worth. Auction winners are faced with the sudden realization that their valuation of an object is higher than that of anyone else.

In auctions in which no bidder is sure of the worth of the good being auctioned, the winner is the bidder who made the highest guess. If bidders have reasonable information about the worth of the item, then the average of all the guesses is likely to be correct. The winner, however, offered the bid furthest from the actual value. [Thaler]

(Actually, winner's curse is everywhere in subtle forms. Do you really want to hire the employee who has been passed over by other employers? Do you want to be the publisher who buys a manuscript that other editors have rejected?)

All in all, the auction, though not always as simple as it appears, can be thought of as a pure marketplace at work in its finest form.

Auction Types -- English

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An important observation must be made before discussing the various auction formats and that is that people generally have one of two motivations for participating in an auction of any type. The first reason is when a bidder wishes to acquire goods for personal consumption (wine or fresh flowers), and in this case the bidder makes his own private valuation of the item for sale. All bidders have private valuations and tend to keep that information private. There would be little point in an auction if the seller knew already how much the highest valuation of an object will be.

The second reason for bidding in an auction is to acquire items for resale or commercial use. In this case, an individual bid is predicated not only upon a private valuation reached independently, but also upon an estimate of future valuations of later buyers. Each bidder of this type tries (using the same measurements) to guess the ultimate price of the item. In other words, the item is really worth the same to all, but the exact amount is unknown. This is called a common-value assumption, and one example is that of art purchased solely for promotion in some secondary market. Purchasing land for its mineral rights is another example. Each bidder has different information and a different valuation, but each must guess what price the land might ultimately bring.

People's bidding behavior changes depending upon which motivation is driving them.

William Vickrey [Vickrey] established the basic taxonomy of auctions based upon the order in which prices are quoted and the manner in which bids are tendered. He established four major (one sided) auction types.

The English auction is the format most familiar to Americans and is known also as the open-outcry auction or the ascending-price auction. It is used commonly to sell art, wine and numerous other goods.

Paul Milgrom [Milgrom-1] defines the English auction in the following way. "Here the auctioneer begins with the lowest acceptable price--the reserve price-- and proceeds to solicit successively higher bids from the customers until no one will increase the bid. The item is 'knocked down' (sold) to the highest bidder."

Contrary to popular belief, not all goods at an auction are actually knocked down. In some cases, when a reserve price is not met, the item is not sold. (In other instances discussed later, an item is not really sold because a shill from the auction house has accidentally bought it.) Some states require the auctioneer to state at the conclusion of bidding whether or not the item has been sold.

Sometimes the auctioneer will maintain secrecy about the reserve price, and he must start the bidding without revealing the lowest acceptable price. One possible explanation for the secrecy is to thwart rings (subsets of bidders who have banded together and agree not to outbid each other, thus effectively lowering the winning bid).

Despite its seeming simplicity, this auction format is quite complex. Often bids are not made aloud, but rather signaled--tugging the ear, raising a bidding paddle, etc. This system of signaling has several advantages. First, an auction hall would be bedlam if voices were required. Audible bids increase the likelihood of error because there may be more than one person bidding at a single instant and an auctioneer cannot be expected to hear them all. Many traders prefer the semi-anonymity--a known expert in a certain field may not want others to know he is bidding because it would probably increase the bidding interest. When a decision to accept signals is made, a system of price intervals must be introduced so that seller and buyer understand the signals. In certain situations, an auctioneer has wide discretion. In America the auctioneer often calls out the amount he has in hand and the amount he is seeking as well. In England, however, often the auctioneer does not lead bidders this way, but rather waits to be told what a bidder will offer.

Adding to the complexity, competition is at its highest in the English auction, with some bidders becoming carried away with enthusiasm. Winner's curse (paying more for an item than its value) is widespread in this type of auction because inexperienced participants bid up the price.

One variation on the open-outcry auction is the open-exit auction in which the prices rise continuously, but players must publicly announce that they are dropping out when the price is too high. Once a bidder has dropped out, he may not reenter. This variation provides more information about the valuations (common or public) of others than when players can drop out secretly (and sometimes even reenter later).

In another variation, an auctioneer calls out each asking price and bidders lift a paddle to indicate a willingness to pay that amount. Then the auctioneer calls out another price etc.

In the ascending-bid format, the auctioneer can exert great influence. He can manipulate bidders with his voice, his tone, and his personality. He can increase the pace or even refuse to notice certain bidders (for example, if he believes someone is a member of a ring, the auctioneer might choose to ignore him).

Eric Rasmusen [Rasmusen] mentions one unusual variation on the English auction that occurs in France. After the last bid of an open-cry art auction, a representative of the Louvre has the right to raise his hand and say, "préemption de l' état" and take the painting at the highest price. It might be noted that in France, the auction privilege (the right to conduct an auction) is sold to a select few individuals (some 500 throughout the country) by the central government. This privilege is called the chargé.

The key to any successful auction (from a seller's point of view) is the effect of competition on the potential buyers. In an English auction, the underbidder usually forces the bid up by one small step at a time. Often a successful bidder acquires an object for considerably less than his maximum valuation simply because he need only increase each bid by a small increment. In other words, the seller does not necessarily receive maximum value, and other auction types may be superior to the English auction for this reason (at least from the seller's perspective). [Varian]

Another disadvantage to the English system is that a buyer must be present which may be difficult and/or expensive. Finally, this auction type is highly susceptible to rings.

Auction Types--Dutch

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The descending-price auction, commonly known in academic literature as the Dutch auction, uses an open format rather than a sealed-bid method. It is the technique used in Netherlands to auction produce and flowers (hence, a "Dutch" auction). Unfortunately, the financial world has chosen to refer to another type of auction as the Dutch auction. In the financial world, the auction known as "Dutch" is what is referred to in the academic world as a uniform, second-price auction. Great confusion results. In this series of articles, the "Dutch" auction will mean a descending-bid structure.

In a Dutch auction, bidding starts at an extremely high price and is progressively lowered until a buyer claims an item by calling "mine", or by pressing a button that stops an automatic clock. When multiple units are auctioned, normally more takers press the button as price declines. In other words, the first winner takes his prize and pays his price and later winners pay less. When the goods are exhausted, the bidding is over.

Dutch auctions have been used to finance credit in Rumania and for foreign exchange in Bolivia, Jamaica, Zambia and have also been used to sell fish in England and in Israel.

Dutch auctions are common in less obvious forms. Filene's, a large store in Boston, keeps in its basement a variety of marked-down goods, each with a price and date attached. The price paid at the register is the price on the tag minus a discount that depends upon how long ago the item was tagged. As time passes and the item remains unsold, the discount rises from 10 to as high as 70 percent.

It is believed that the English system may be inferior to Dutch in one area. The key to any successful auction (from the seller's point of view) is the effect of competition on the potential buyers, and in an English auction, the underbidder usually forces the bid up by one small step. The winner may end up paying well under his valuation and thus the seller does not receive the maximum price.

However, in the Dutch system, if the bidder with the highest interest really wants an item, he cannot afford to wait too long to enter his bid. That means he might bid at or near his highest valuation.

Characteristics of Different Types of Auctions	
Type	**Rules**
English, or ascending-price. Open.	Seller announces reserve price or some low opening bid. Bidding increases progressively until demand falls. Winning bidder pays highest valuation. Bidder may re-assess evaluation during auction.
Dutch, or descending-price. Open.	Seller announces very high opening bid. Bid is lowered progressively until demand rises to match supply.

Auctions -- First-Price, Sealed Bid (Discriminatory)

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The third auction type considered here has a primary characteristic of being sealed (not open-outcry like the English or Dutch varieties) and thus hidden from other bidders. A winning bidder pays exactly the amount he bid. Usually, (but not always) each participant is allowed one bid which means that bid preparation is especially important. To confuse matters the financial community refers to this type of auction as an English auction (except in Great Britain where it is known as the American auction!). In these articles we will use the academic name rather than that used in financial circles.

Speaking generally, a sealed-bid format has two distinct parts--a bidding period in which participants submit their bids, and a resolution phase in which the bids are opened and the winner determined (sometimes the winner is not announced).

An important distinction must be made as to quantity--how many goods are being auctioned--one or multiple items. The name "first-price" comes from the fact that the award is made at the highest offer when a single unit is sold. When multiple units are being auctioned, it is called "discriminatory" because not all winning bidders pay the same amount.

It works like this: In a first-price auction (one unit up for sale) each bidder submits one bid in ignorance of all other bids. The highest bidder wins and pays the amount he bid. In a "discriminatory (more than one unit for sale) auction", sealed bids are sorted from high to low, and items awarded at highest bid price until the supply is exhausted. The most important point to remember is that winning bidders can (and usually do) pay different prices. From a bidder's point of view, a high bid raises the probability of winning but lowers the profit if the bidder is victorious. A good strategy is to shade a bid downward closer to market consensus, a strategy that also helps to avoid winner's curse.

This type of auction is used for refinancing credit and foreign exchange. Up until 1993, the U.S. Treasury used the discriminatory auction to sell off its debt, but this method is not without its detractors. In the case of U.S. Treasury securities, Milton Friedman warned early on that the discriminatory auction was susceptible to collusion. An investor is reluctant to expose his valuation to the Treasury because the stated intention of the Treasury is to gain the highest price possible. It is advantageous to a bidder to gather information about a competitor's valuation before the auction. Milton Friedman proved to be prophetic. The U.S. Treasury securities auction will be discussed later in greater detail.

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Dutch, or descending-price. Open.	Seller announces very high opening bid. Bid is lowered progressively until demand rises to match supply.
First-price, sealed bid. Known as discriminatory auction when multiple items are being auctions.	Bids submitted in written form with no knowledge of bids of others. Winner pays the exact amound he bid.

Auctions -- The Vickrey Auction

(Uniform second-price)

One in a Series of Articles from Agorics, Inc.

The uniform second-price auction is commonly called the Vickrey auction, named after William Vickrey, [Vickrey] winner of the 1996 Nobel Prize in Economic Sciences, who classified it in the 1960s. Like the first-price auction, the bids are sealed, and each bidder is ignorant of other bids. (In the financial community, the uniform, second-price auction is called the Dutch auction, but in these papers we will use the academic names.)

The item is awarded to highest bidder at a price equal to the second-highest bid (or highest unsuccessful bid). In other words, a winner pays less than the highest bid. If, for example, bidder A bids $10, bidder B bids $15, and bidder C offers $20, bidder C would win, however he would only pay the price of the second-highest bid, namely $15.

There is one interesting and crucial point and that is that when auctioning multiple units, all winning bidders pay for the items at the same price (the highest losing price). We will see later that the U.S. Treasury Department is experimenting with this type of auction to sell the national debt.

One wonders why any seller would choose this method to auction goods. It seems obvious that a seller would make more money by using a first-price auction, but, in fact, that has been shown to be untrue. Bidders fully understand the rules and modify their bids as circumstances dictate. In the case of a Vickrey auction, bidders adjust upward. No one is deterred out of fear that he will pay too high a price. Aggressive bidders receive sure and certain awards but pay a price closer to market consensus. The price that winning bidder pays is determined by competitors' bids alone and does not depend upon any action the bidder undertakes. Less bid shading occurs because people don't fear winner's curse. Bidders are less inclined to compare notes before an auction.

This type of auction has been used in former Czechoslovakia to refinance credit and in Guinea, Nigeria, and Uganda for foreign exchange.

What about changing the format just a little and having a second-price, open-outcry auction? In such a case, participants could bid in the ascending format and the winner would ultimately pay the price of the second-highest bid. One might imagine that such an auction would have much the same results as an English (ascending, open-outcry) auction, but, in fact, an auction like that would be easy to manipulate. Imagine bidder A bidding $25 for an item worth $100. Some other bidder could quite easily and safely bid $750, knowing that no one will bid more and that he will only pay $25. Clearly it is imperative to seal the bid.

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Dutch, or descending-price. Open.	Seller announces very high opening bid. Bid is lowered progressively until demand rises to match supply.
First-price, sealed bid. Known as discriminatory auction when multiple items are being auctions.	Bids submitted in written form with no knowledge of bids of others. Winner pays the exact amound he bid.
Vickrey auction or second-price sealed bid. Known as uniform-price auction when multiple items are being auctioned.	Bids submitted in written form with no knowledge of the bids of others. Winner pays the second-highest amount bid.

The Double Auction

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Although not classified as one of the major four auction types, the double auction has been the principal trading format in U.S. financial institutions for over a hundred years.
In this auction both sellers and buyers submit bids which are then ranked highest to lowest to generate demand and supply profiles. From the profiles, the maximum quantity exchanged can be determined by matching selling offers (starting with lowest price and moving up) with demand bids (starting with highest price and moving down). This format allows buyers to make offers and sellers to accept those offers at any particular moment. It can be confusing to think about the double auction in light of overlapping buy and sell orders. A good way to avoid this confusion is to understand that at one single instant of time, they do not overlap.
It works like this: Suppose 4 sellers of foreign exchange offer to sell one unit at prices of 100, 200, 300, and 400 units of domestic currency, and 4 demanders of foreign exchange offer to buy one unit at prices of 400, 300, 250, and 50 units of domestic currency. Supply and demand are met at three units of foreign exchange but the price would remain indeterminate, falling somewhere between 200 and 250. [Feldman]
The origins of the double auction are not well known, but it is recognized that this form of auction has roots that go back to ancient Egypt and Mesopotamia. Almost certainly the double auction stems from "haggling" in which buyer and seller each suggest prices. [Friedman, Daniel]
Much later (in the last quarter of the nineteenth century) when the telegraph and telephone were invented, traders in the stock market could speak directly to interested outside investors. This was viewed at the time not only as a novelty but also as something of a threat. The computer revolution of the twentieth and twenty-first centuries portend far greater shifts as agents and financial markets become automated. [Friedman, Daniel]
A "continuous double auction" is one in which many individual transactions are carried on at a single moment and trading does not stop as each auction is concluded. The pit of the Chicago Commodities market is an example of a continuous double auction and the New York Stock Exchange is another. In those institutions a specialist matches bids and asking prices to find matches.
One interesting variation is the Double Dutch auction. Work on this is being done at the University of Arizona. [McCabe]
It works like this: A buyer price clock starts ticking at a very high price and continues downward. At some point the buyer stops the clock and bids on the unit at a price favorable to him. At this point a seller clock starts upward from a very low price and continues to ascend until stopped by a seller who then offers a unit at that price. Then the buyer

clock resumes in a downward direction. The trading period is over when the two prices cross, and at that point all purchases are made at the crossover point.
The DA (double auction) has many variants and is evolving rapidly. Economists believe that the double auction will have many applications as auctions become computerized.

Auction Offshoots

(Much of this section was written using information in Ralph Cassady's book, Auctions and Auctioneering.) [Cassady]

The Simultaneous Bidding System

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In the simultaneous format (also known as the Japanese system) all bids are offered by prospective buyers at (almost) the same time using individual hand signals for each monetary unit. In theory, all bidding occurs at exactly the same moment, but in practice it takes several minutes for buyers to get their hands in the air and also for the auctioneer to read the signals. The winner is the highest bidder, and all bidders are expected to register their maximum bids within the allotted moments. In practice, some bidders manage to see the bids of others and raise their own within the time allowed.

Each of the hand signs represents a number from one to nine. Two- or three-digit numbers are indicated by rapidly repeated hand signals. The use of two-digit numbers is not always necessary if the auctioneer and bidders know a particular bidding level, and in a case such as this, the bids may be partly inferential. For example, a man signaling three may actually be bidding three hundred (in much the same way that one American real estate agent might tell another that a certain house is selling for seven when she means seven hundred thousand dollars).

This form of bidding is extremely fast which is important in the fresh food markets of Japan when time lost means fish that cannot be sold. It is characterized by great noise and confusion as many bidders try to gain the attention of one auctioneer.

Haphazard Systems

Ralph Cassady [Cassady] refers to several auction types collectively as "haphazard" formats meaning that in each system every bidder communicates privately to the auctioneer who then considers the bid and later announces the winner. It is haphazard in that the bidding is not required to either ascend or descend, but instead is carried out in some random order.

The Written-bid Auction

This format, sometimes called the "dumb" scheme, requires all bids to arrive in written form. In that respect it is very much like the sealed-bid system used to award housing contracts, but there are a couple of differences. In a sealed-bid scheme awarding a housing contract, the bidders are actually sellers more than they are buyers. In addition, housing contracts are granted after a period of weeks or even months, whereas in the written-bid system, participants have but a few moments to formulate and tender their bids. It has been used in Japan to sell dried fish.

It works this way: Bidders (after examining the various lots for sale) deposit their bids in a box which is then handed to an auctioneer. After some agreed-upon time interval has expired, the auctioneer announces the winner (if the reserve price has been met). This is a relatively slow method especially when the lots are put up separately. Consider that if each bidding period averages three minutes, then only twenty lots can be sold in an hour. Time may not be important in a market of imperishables (dried fish), but busy sellers and buyers object to spending long hours in a process that can be accomplished faster.

One way of speeding up this type of auction is to offer several lots simultaneously, but this can prove cumbersome. Often a buyer only wants to bid on a certain lot only if he has been unsuccessful in winning others. For example, if a participant has $500 to spend, he cannot bid intelligently on Lot B until he learns if he has won Lot A, and if so, how much he has paid for it. If too many lots are offered simultaneously, the participant cannot know which lots he has won until the entire auction is complete. Another disadvantage is that a bidder has little flexibility. If he wants something, he must bid high. He could possibly attain the goods for less under the English system by raising his bid one step higher than the competitor.

The Handshake Auction

The handshake format is one of oldest auction schemes in existence. Buyers communicate their bids to an auctioneer by squeezing his fingers in a certain prescribed manner. This method originated in China and was used until the late 1950's.

It works as follows: A group of bidders stand in a circle around the auctioneer and each, in turn, clasps the hand of the auctioneer. The hands are hidden under a cloth and so only the bidder and the auctioneer know the amount of the bid. The potential buyer indicates a bid by pressing some number of the auctioneer's fingers and simultaneously announcing aloud the monetary unit, first "tens", then "rupees", then "anas". Multiple squeezes offer flexibility to the bidder--a bid of twenty can be offered either by squeezing two fingers simultaneously or by squeezing one finger twice while announcing the unit as ten.

The auctioneer is expected to remember each bid, and he announces the winner after all have taken a turn (one turn per bidder). The actual amount of the sale is kept secret, and of course this offers the auctioneer an opportunity for collusion.

Adroit bidders frequently want to mislead the competitors and have learned deceptive techniques. If, for example, a bidder wants to convince others that his bid is lower than it really is, he can grasp all fingers including the thumb, announce the smallest unit (tens), and squeeze repeatedly and quickly.

If he wants to convince others he is making a high bid, he can grasp only one finger and announce a larger unit.

Sometimes a bidder doesn't wish to bid on a certain lot but still wants to hide this from others. In such a case, he can take the auctioneer's hand, make some bid and then cancel it by scratching the auctioneer's palm while he announces the monetary unit.

The handshake method is very time-consuming.

The Whisper Auction

In this system, the auctioneer announces that an item is for sale, and buyers whisper their bids in his ear. As in other haphazard auctions, the bids have no pattern and participants offer bids without knowledge of the bids of others. This method is used in some fish markets (Venice, Singapore). Like the handshake method, the whisper auction is very time-consuming.

The whisper auction and the handshake format do offer a singular advantage to the seller and that is that a seller can ignore certain bids or bidders. For example, a seller will not want to consider the offers of people known to be bad credit risks and in this method, the seller does not announce the winning bid. The bidder, of course, has no motivation to reveal pricing information. Another advantage to sellers is that the whisper method keeps them well informed of the demand for fish. Management can price fish intelligently with this information, however, the opportunity for auctioneer collusion certainly exists.

Non-Haphazard

The Time-Interval Auction

Basically, the format of a time-interval auction is similar to an English (ascending bid) form, however all bidding must be completed within a certain time allotment. An advantage to bidders is the ability to revise a bid upward. Also, the bids are public which means that a bidder need raise his bid only slightly to beat the competition. The time-interval method is used in the real-estate market and, more recently, in the manuscript market where publishers bid on high profit manuscripts within certain time limits. In the real-estate and manuscript markets an auction can consume days or weeks. Other time -interval auctions can be completed in the time it takes for sand to pour through an hourglass.

One of the very oldest time-interval auctions is that in which a burning candle is used to measure total bidding time, and this method has been used to sell property as recently as the early twentieth century.

It works as follows: A circle of people gather together out of the wind. One of them cuts a candle to a length of about one inch and then lights it. Participants call out their bids in ascending order as they keep one eye on the flame. The winner is the person who made the highest bid before the candle flickered out. An offshoot used sometimes in Cornish auctions, requires the auctioneer to insert a pin one inch below the top of the candle. As long as the pin stays in place, the bidding can continue. When the pin drops, the auction is over and the goods are sold.

Interesting bidding strategies are used in a candle lit auction. Sometimes a participant will make a high bid early on to scare off the competition. Another technique is to wait until the final moments before offering a comparatively high bid. This usually forces opponents to rethink the matter, but before they have time to do so, the auction is over. Mostly, however, participants bid actively throughout. Sometimes all bidders adopt the strategy of waiting until the final moments and then a glut of bids come at the end making it hard to determine a winner.

The Silent Auction

The silent auction is a variation of the written-bid auction, (and also the English auction) but in this format the participants bid knowing how much competitors have offered, and so prices move steadily upward. Would-be buyers enter their names on a sheet of paper next to the amount they are willing to bid. (The sheet of paper contains the minimum acceptable bid if applicable.) Bidders can thus check to see the current high bid while they consider their options. This auction can take place over a period of hours or days.

Bidding strategies include waiting for the last minute to bid (thus lulling the competition into false security) or bidding high immediately to discourage competition.

My husband and I participated in one silent auction in which there was an unusual (and unfortunate) result. We had been bidding with great spirit for a jar of chocolate truffles, and as time wore on, our competition was reduced to one other bidder. Moments before the final bell rang, my husband entered what he assumed to be the winning bid, and we sat down to dinner to watch the rest of the program (which included the announcement of winners). Unfortunately, our competitor (who was assisting the auctioneer) sneaked over after the final bell, crossed off our bid and wrote in a new one. At this writing my husband is still angry.

The Audible-Bid Rotation Auction

In the handshake auction, each bidder takes his turn and all the bids are kept secret. In the audible-bid rotation method, bidders also alternate in a rotation pattern, but the bidding is open. As in the English auction, the bids are ascending (not haphazard). The auctioneer writes the current high bid on a blackboard and erases it as larger bids are made. Each bidder, in turn, either raises his bid or passes. The merchandise is awarded to the highest bidder at the highest price.

The Swiss Auction

The Swiss construction industry awards contracts on a first-price, sealed-bid basis. [Von Ungern-Sternberg] What is unusual about the Swiss auction is that if the designated winner does not wish to accept the project, the architects will usually (but not always) allow him to withdraw the bid. The bid itself may not be modified, but the winner can choose whether to accept or refuse the project. There are very practical reasons for this auction.

Architects argue in favor of this method because timetables and specifications nearly always require modification and there is no point in working with a contractor who doesn't want a certain job.

A Swiss auction also takes into account certain constraints on the part of the construction company. Construction companies often have to bid on more than one project at a time which affects timing, cost overruns, labor availability. Frequently the specifications change on a current job and thus they cannot predict their own future availability. It is reasonable to let them withdraw if they cannot meet the contract specifications. Only when there is a significant difference (say, ten percent) between the winning bid and the second-highest bid, is the winner forced to accept the job.

The ability to withdraw is not written formally into the rules because of the open invitation to cheat. A high bidder could approach the second-highest bidder, offer to withdraw, and obtain a nice side payment. A certain amount of discretion is given to the auctioneer to avoid this; the auctioneer can force a company to meet its bid.

The overall effect is that often contractors bid more aggressively because they have this option that allows for flexibility.

Auction Strategies

One in a Series of Articles from Agorics, Inc.

The truth is that the entire subject of auction strategy is numbingly complex with numerous variables coming into play. Is a bidder risk-averse or risk-neutral? Is the auction for one item or multiple units? Do you plan to resell the acquired object or use it yourself? If you plan to resell it, are the other bidders symmetric? That is, do they use the same measurements to estimate their valuations? Do you have secret information about the object? Might others have secret information?

All of these factors play a part in auction strategy, and so this section can only provide an overview with a few assorted general ideas. Those readers wishing to know more are invited to read the bibliography which contains excellent references, and those references in turn point to other more technical papers.

It is safe to make a few general remarks.

Buyers really do bid differently depending upon the rules of an auction, and it is worth understanding the rules of an auction thoroughly. In fact, the one piece of information available to all is the rules.

Economists use a framework called game theory to think about auction behavior. Using game theory economists examine rational behavior and decisions made in varying conditions.

A seller, on the one hand, is faced with choosing an auction type, and so he must predict the behavior of bidders. On the other hand, a bidder tries to predict the behavior of the other bidders. Each bidder makes an estimate of his own value of the object and also an estimate of what others will bid on it. Good bidding is often the result of correct predictions about the behavior of others and sometimes that means guessing the extent of someone else's information correctly. [Mester]
Economists try to devise sets of rules to determine dominant strategies under a huge array of variables. Bidders, of course, tend to worry more about their bids than their strategy.

From a Seller's Perspective

In any auction a seller can influence results by revealing information about the object. Intuitively, a bidder's profits rise when he can exploit information asymmetries (when the bidder has information not available to others). In general, the more information a bidder has, the more the price-dampening effect of winner's curse is lessened. So a seller's optimal strategy is to reveal information and to link the final price to outside indicators of value (an authoritative evaluation). It is also a good idea because if a seller seems reluctant to disclose something, a buyer always assumes the hidden information must be unfavorable.

Revealing information removes uncertainty.

Theoretical literature demonstrates that, under assumption of private value, all four basic auction types can be shown to yield the same expected price and revenue to the seller when bidders are risk neutral and symmetric. This implies that auction choice is not crucial because each format yields on average the same payoff.

But revenue equivalence does not hold true under common value assumption (when bidders have similar evaluations). It has been shown that the four auction types can be ranked from highest to lowest as follows: English ascending-price; the second-price, sealed bid auction; Dutch (descending) auctions and first-price, sealed bid auctions tied. The rankings illustrate advantages of increased information. Remember that an English auction reveals information about rival bidder valuations and permits dynamic updating of personal valuation (which leads to more aggressive bidding). In comparison, bidders, recognizing winner's curse, bidding in first-price auctions bid less aggressively and shade their bids. Similar reasoning applies to Dutch (descending) auctions. In contrast, in second-price sealed-bid format, the winner pays the bid of the next highest so bidders raise bids, secure that they will not be disadvantaged if rival bids are lower.

In Dutch and first-price auctions, bidders behave in the same way, and so, it does not matter which of these auctions a seller chooses nor does it matter whether the bidders have private values or common values. The reason that a bidder behaves the same in both kinds of auction is that he makes the same decision and this decision is based upon the same information. In both auctions a bidder knows that if he wins he must pay exactly what he bid. He knows also that he only wins if his bid is higher than that of everyone else. He must also decide upon his bid without knowing what others will do.

There is disagreement over this. Paul Milgrom [Milgrom (3)] argues that in general an English auction generates more money in more environments than the Dutch or sealed bid auction types (on average), and this probably helps explain its popularity.

In the case of choosing between a second-price and an English auction, however, the decision must be based upon whether bidders know their private valuations or whether they are uncertain about the single common value of the item for sale. In an auction wherein bidders have independent private values, the auctions both yield the same.

However, in a common value auction the English and second-price auctions do not yield the same revenue. Remember that in an English auction a bidder can gain useful information by observing other bidders. He can watch to see how many bidders drop out of the auction (they value the object less) and he can see also exactly when they dropped out (how high was their last bid?). If lots of bidders remain in an auction this gives a bidder confidence that a high valuation was correct, and so he tends to bid higher.

(This chart taken from "Going, Going, Gone", by Loretta J. Mester) [Mester]
But the risk characteristics of a bidder are important too. A bidder who is risk averse (meaning he absolutely requires the item being auctioned) tends to bid higher so that he will have a greater chance of victory. A risk neutral bidder does not.

In the independent value behavior when all bidders are risk neutral, a seller receives the same revenue from both the English and second-price auction.

However, if the bidders are risk averse, then the first-price (and also the Dutch) yields greater revenue than English and second-price auctions.

(This chart taken from "Going, Going Gone", by Loretta J. Mester) [Mester]

From a Bidder's Perspective

Theoretical literature assumes that auction participants are homogeneous (risk neutral and symmetric--they use the same distribution function to estimate valuations). It assumes bidders all focus on maximizing profits and that only one item is being auctioned.

Paul Milgrom [Milgrom (1)] describes a strategy for contract bidding. "To make money in competitive bidding, you will need to mark up your bids twice: once to correct for the underestimation of costs on the projects you win and a second time to include a margin for profit. Don't let the presence of several competing bidders push you into making too aggressive a bid. The markup to adjust for underestimation will have to be larger the larger the number of your competitors and the more you respect the accuracy of their cost estimation; you may, however, want to make the profit markup smaller when there are more competitors."

Students point out that you can't make money if you are too cautious. Milgrom [Milgrom (1)] says in response, "The most important lessons to be learned from both the theory and the experiments are that the returns in bidding come from cost and information advantages, that naive bidding strategies can squander these advantages, and that bidders without some advantage have little hope of earning much profit, but could with a little bit of carelessness suffer large losses."

What about irrationality amongst bidders? What if Louise, a bidder, understands winner's curse, but her opponents, Ellen and Sam do not? What should Louise do? She knows that her rivals will overbid. Answer: she should scale down her bid even further because winner's curse is intensified against over-optimistic rivals. If Louise wins against a rival who commonly overbids, Louise has probably erred in her valuation.

A bidder uses the same strategy in both Dutch and first-price sealed auctions because the same information is available in each. In a Dutch auction, a bidder considers and selects a cutoff price. He will claim the object if no one has claimed it before. In a sealed-bid first price, the decision is exactly the same. All bidders have the same strategies for these auctions--shade bids down slightly so as not to be caught by winner's curse.

English Strategy

In a private-value English auction, a player's best strategy is to bid a small amount more than the previous high bid until he reaches his valuation and then stop. This is optimal because he always wants to buy an object if the price is less than its value to him, but he wants to pay the lowest possible price. Bidding always ends when the price reaches the valuation of the player with the second-highest valuation.

An advantage to English auctions is that a bidder gains information. He can observe and see not only that other players drop out, but also the price at which the competition abandons the bidding. That tells a bidder a great deal about the valuations of others and allows a bidder to revise his valuation on the fly.

A player's strategy is his series of bids as a function of (1) his value, (2) his prior estimate of the other players' valuations, and (3) the past bids of other players. His bid can be updated as information changes.

If you attend an auction in person, it is good to remember that auctioneers sometime appreciate the first bid on an item because it helps get the auction started. Sometimes they show their appreciation by giving a first bidder what is called a "fast knock". From the point of view of the auctioneer, a fast knock is a calculated sacrifice, something akin to a loss-leader in a department store sale.

Another point to remember is that some people are intimidated by rings, but you can always outbid a ring. Their strategy has to be based upon buying an item at a low enough price to make a profit.

Dutch Strategy

The problem for the bidder in a Dutch auction is exactly the same as that facing a bidder in a sealed-bid auction. At some point in advance, the bidder must decide the maximum amount he will bid. He must decide when to stop the auction based upon his own valuation of the object and his prior beliefs about the valuations of other bidders.

This auction type is strategically equivalent to first-price sealed auction because no relevant information is disclosed in the course of the auction, only at the end when it is too late.

First-Price, Sealed Bid Strategy

It is difficult to specify a single strategy because a profit-maximizing bid depends upon the actions of others. The tradeoff is between bidding high and winning more often, and bidding low and benefiting more if the bid wins (bigger profit margin).

Most bidders attempt to shade their bids to move closer to market consensus. This also helps to avoid winner's curse.

Vickrey Strategy

Paul Milgrom [Milgrom (1)] suggests that the dominant strategy for a bidder in a Vickrey (second-price) auction is to submit a bid equal to his true reservation price because he then accepts all offers below his reservation bid and none that are above. A participant who bids less is more likely to lose the auction and all that strategy accomplishes is to lower the chance of victory. Bidding high carries the risk of winner's curse. Neither affects the price paid if he wins.

When each bidder adopts a strategy of bidding his true price, the outcome is that the item is awarded to the bidder with the highest valuation at a price equal to the second highest valuation. The existence of a dominant strategy means that bidder can determine his own sealed bid without regard for the actions of others. So a second-price auction duplicates the principal characteristics of an English auction. It should be noted that a second-price auction participant chooses a strategy without regard for the actions of others.

A potential drawback is that this system requires total honesty from the auctioneer (s). If the auctioneer is not trustworthy, he could open the bids, find the winner and insert a new bid just barely under that to ensure higher revenues.

Auction History

(Most of these historical facts come from Ralph Casady's book, Auctions and Auctioneering.) [Cassady]

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Some scholars argue that the very first auction occurred when Joseph of the Many-Colored Coat was sold into slavery by his brothers, however the first generally accepted auctions occurred in Babylon in about 500 B.C. In those times an auction was held annually, and women were sold on condition that they be married. Beautiful maidens engendered lively bidding, but less comely women had to pay a dowry to be accepted and thus the price could be negative.

Ancient Romans also auctioned goods. Those auctions were held in the "atrium auctionarium", and the trading was carried out by four functionaries: the dominus, on whose behalf the property was sold; the argentarius, who organized, regulated, and possibly financed the sale; the praeco, who advertised and promoted the auction as well as conducted the bidding; and the emptor, the highest bidder (recall caveat emptor, let the buyer beware.). It is not known whether the auctions were ascending or descending, but ascending is presumed since auctus means increase. Bidders normally did not call out openly, but rather winked or waved to indicate a bid.

After a military victory a Roman soldier would plant his spear in the ground to mark the location of his spoils. Later he would put these goods up for sale at auctions. The now-rare term, subhastation, meaning a sale by auction, came from the Latin, subhastare (to sell by public auction) which in turn comes from sub (under) and hasta (spear). Subhastare--under the spear. Roman business agents were said to have accompanied warriors into battle to facilitate the expected sales.

The Romans also used the auction to liquidate property. Marcus Aurelius is said to have auctioned off prized heirlooms and furniture (that auction lasted over two months).

One of the most astonishing auctions in history occurred in the year 193 A.D. when no less than the entire Roman Empire was tossed on the block by the Praetorian Guard. First they killed Pertinax, the emperor, and then they announced that the highest bidder could claim the Empire. Didius Julianus outbid all comers and became the emperor for the price of 6,250 drachmas per Guard. Unfortunately, he was beheaded a mere two months later when Septimus Severus conquered Rome. Julianus may have been the first victim of winner's curse. Later, the Empire was restored to the people.

Less is understood about the auction as used in other civilizations. It is known that the auction was one of the four money-raising institutions (the others being pawnshops, mutual financing associations, and lotteries) used by Buddhist temples and monasteries, and as early as the seventh century, the possessions of deceased monks were sold on the block.

The earliest reference to the auction as practiced in Great Britain is from an entry in the 1595 Oxford English Dictionary, but nothing more is known until the final years of the seventeenth century. At that time auctions were held in taverns and coffeehouses to sell art. It is likely that such auctions were held daily and that catalogs, announcing the availability of certain merchandise, were printed.

The firm of Sotheby's was established in 1744, and Christie's was founded in 1766.

Terms of sale were largely the same in the eighteenth century as now: [Brough]
1). High bidder is the buyer. If a dispute arises as to which bid is highest, goods will be put up for sale again.

2). No bidder may advance another's bid by less than six pence when the amount offered is less than one pound, or by less than one shilling when the price is one pound or more.

3) Merchandise for sale is warranted as perfect, and before removing goods from premises, any buyer may accept or reject them.

4). Each buyer must give his name and make a deposit of 5 shillings on each pound sterling (if demanded); no deliveries will be made during the sale.

5). All purchases must be taken away at the buyer's expense, and the amount due shall be paid within three days of purchase.

6). Any would-be buyer unable to attend the sale may have his commission executed by a representative of the auction firm.

One seventeenth century catalog describes a process called "mineing", which was similar to the Dutch auction because the auctioneer started the bidding high and worked down. A lot was claimed when someone yelled, "Mine". There was an interesting twist though. After the bid descended to the point where a bidder claimed an item, the bidding actually resumed but this time in an ascending format. So the bids went down and then back up again.

The auction migrated to America where it was used to liquidate goods and to sell unsalable goods at the end of a season. Domestic animals have been sold this way as have tobacco, natural resources, horses, debt, credit, and, of course, slaves.

Collusion and Tricks

Which auction type is the best? As discussed earlier, there is no single answer to that question, but one way of approaching that subject is to think about collusion; the extent to which incentives to collude vary under different auction types can help determine which type of auction to choose. All auction types are susceptible to collusion, but degrees of incentives vary.

Rings

Rings are simple to understand. A subset of bidders gather together and agree not to outbid each other which has the overall effect of lowering the winning bid. Later the item is re-auctioned amongst ring members and the profits are shared. (This poses an interesting conflict because in this instance, the ring-bidders are also owners/sellers. Motivations of buyers and sellers are quite different.) In essence, these buyers agree to reduce competition by not competing against each other.

It works like this: A ring of 5 people agree to band together and bid on a necklace. Frank is appointed the designated bidder, and he buys the necklace for $50. After the auction, the ring members meet and hold another auction at which the necklace is sold to Blanche for $100. Now, from the $100, Blanche reimburses Frank for the original $50 he paid out, and she pays each other person (including Frank and herself) $10. So, Blanche ends up paying $90 for a necklace worth about $100, and the others make a $10 profit. (In theory it is possible for some ring member never to win a lot and just collect payments from the others, but in practice such a person would be ejected from the ring.)

Interestingly, cartels themselves often have an enforcement problem because it is in the private interest of each member to cheat the others. They are aided in this to some extent because generally the auctioneer does not reveal the name of the winner, and this creates opportunity for ring members to cheat each other and bid privately. One theory is that open formats (English, Dutch) ensure that no ring member exploits the ring by making a side deal simply because it is so easy to monitor compliance amongst ring members. A cheater can be seen calling out his bid.

In the English format, it is thought that collusion problems diminish as the number of bidders increases. Intuitively, a ring will work best if the majority of bidders belong. Intuitively, the more bidders there are, the less likely it is they will all be ring members.

However, intuition is sometimes wrong. Consider the fact that rings are usually formed by choosing only those bidders who might be expected to know that an item has special characteristics causing it to be more valuable than the vendor knows. In this case, a ring would consist of only informed bidders, and uninformed bidders would not be included in the ring. There might indeed be vigorous bidding in the early stages and then when the highest uninformed bidder has finished, one ring member would step up and buy the item. Such an arrangement would actually help the ring members: auctioneers are constantly on the lookout for rings (or possible rings) and vigorous initial bidding would help allay fears.

Generally, it is assumed that such a cartel credibly reveals private information to each other and then chooses a "designated winner" and a bidding strategy. Usually the designated winner is the ring member who has the highest valuation of the object for sale.

Sluggish bidding is a tip-off to the possible presence of a ring. Sometimes the auctioneer refuses to recognize a known ring leader and simply ignores his bid. At other times the auctioneer holds back good merchandise.

Robert Wraight, [Wraight]an art critic, reveals that sometimes there are inner rings. The outside ring reduces competition in the public auction, and the inner ring pays off unimportant members (impoverished bidders who are knowledgeable and therefore too dangerous to ignore) for a small fee, thus leaving the major advantage to the central few.

An inner ring works like this: A ring of five men buy a painting, they then need to resell it amongst themselves. A, B, and C form an inner ring. A (by prior agreement with B and C) outbids D and E. Later the three inner members (A, B, and C) bid against each other in the third and final auction.

Nearly every regular auction attendee becomes a ring member sooner or later. If you and another antique piggy-bank collector arrive at the same auction and find two good piggies, it doesn't take a rocket scientist to figure out that you each buy one without competing.

Bidder Tricks

Over the years bidders have developed creative ways to deceive auction houses and other bidders. The methods are not always illegal.

Frequently, bidders do not want others to know they are bidding. An example might be a famous art critic who understands that the price of an unknown painting will skyrocket if he is known to be bidding on it. Some bidders hide behind pillars at an auction house, call out or (preferably) signal a bid, and then move to another location.

Sometimes bidders work out hand signals with the auctioneer before the sale. Of course, frequently this is illegal collusion, but at other times the reason can be innocent. There is a story about a man who wanted to buy a certain painting as a surprise for his wife's birthday, but she always went with him to the auctions. He arranged with the auctioneer in advance that he would be bidding as long as his glasses were held in his hand. The ruse was successful, the man won the auction, and his wife learned of her present only on the way home.

Some bidders are quite good at casting doubts on the authenticity or quality of an item. Before an auction they examine the lots and offer opinions as to the poor quality of this or that item. They will then bid and win the goods.

Another trick is to switch rare items from one lot to another. For example, a dishonest bidder could steal a rare letter from Lot 49 and hide it in a group of low-quality letters in Lot 23. He then buys Lot 23 at a low price and nobody notices (at least not until later). An alternate method is to switch the lot numbers marking the groups so that rare items are purchased well below their value.

Some people have been known to steal part of a lot and then offer it for sale to the buyer of the lot. For example, a thief could snip a button from a coat said to have been worn by George Washington and hide it. After the coat is purchased, the thief approaches the winner, says he owns a button that seems to match. The unsuspecting owner often buys the button he already rightfully owns.

Auctioneer Tricks

Auctioneers, sellers, and auction houses do not lag behind in creativity. Some houses employ a shill to bid up the merchandise and keep the auction active. On the occasions that the shill accidentally winds up buying the merchandise, the auctioneer simply sets the lot aside to be sold at another auction. Alert auction attendees should watch to see if some lots are pushed aside, and sometimes that is a clue that shills are in the audience.

Auction houses have been known to rent an old stately mansion and then advertise an auction full of antiques. There may be genuine antiques present, but also the house may have crammed it full of dealer merchandise. This is known as "salting".

There is also the phenomenon known as the "phantom bidder". Sometimes, in order to keep an auction going (or even to start one) an auctioneer will look to a dark corner of the room and nod as though accepting a bid. This technique is quite successful even in a whole roomful of people.

Another auctioneer trick is to pretend that the reserve price is higher than it really is or even to pretend that there is a reserve price when there is none. A variation on the general theme is to raise a price intentionally under the theory that some people will only bid if the price is high enough.

Some sellers arrange to have an object authenticated falsely. This is simple to accomplish because often an expert's own salary is tied to the price of the item he is authenticating. In other words, an expert promising that a painting really is a Monet will receive more money than if he establishes that the same painting is a fake.

Some auctioneers cheat by dishonest use of the "left" bid. A "left" bid is one which has been deposited by a person unable to attend the auction in person and is that person's maximum bid. For example if a book were auctioned and the people present bid a high of $50, the book would be sold to the absent person who offered a maximum of $100. In such a case, an honest auction house would knock down the book for $55--slightly over the highest in-person bid.

Crooked dealers would charge the entire hundred dollars or perhaps cheat by announcing at the beginning of the auction that there was an opening bid of $100 in an effort to realize more than they otherwise might.

Which Formats are Most Susceptible to Collusion?

ALL auction types can be manipulated. If the stakes are high enough people will find a way to circumvent the rules. Here are a few general theories:

In 1987 Walter Mead [Mead] formulated a hypothesis that the ascending-bid open (English) formats are more susceptible to collusion than are sealed-bid auctions. This belief may explain the popularity of sealed-bid auctions even though ascending-bid formats generate greater revenue. Under the English (ascending, open outcry) scheme, it is easy to form rings.

Sealed-bid auctions, on the other hand, are vulnerable to collusion involving the auctioneer and one or more bidder. This format is less prone to rings because sealed bidding tempts participants to bid higher than the agreed-upon price in order to cheat the others. This is also true for the Dutch format, even though it is an open format since the first defecting bidder ends the auction. Paul Milgrom points out that "collusion is hardest to support when secret price concessions are possible, and easiest to support when all price offers must be made publicly."

The four major formats can be ranked from most prone to collusion to least as follows: (1) English (2) Uniform second-price (3) Discriminatory first-price (4) Dutch.

The English auction is most susceptible to collusion because there is no incentive to betray the ring--more aggressive bidding does not win the item, and also attempts to cheat are visible. For example: Louise values an object at 15, and other buyers in her ring value the object at 12. They all agree to bid no more than 5. If someone cheats and bids 7, Louise is willing to go all the way to 15, and so the cheater gains nothing.

In a first-price sealed auction it is hard to prevent buyers from cheating in a one-shot game (only one trading period). After all, by the time the cheater has been discovered, the auction is over.

By the same reasoning, some economists consider that the Dutch auction is the least susceptible to collusion because ring members will have trouble enforcing collusive behavior. When a ring member bids more aggressively than was agreed, his actions are obvious, but once again the auction is over before anyone can react.

Many auction techniques share a serious problem with trust. An auctioneer is required to be totally trustworthy, and that is not easy to attain or certify. Consider, for example, that an auctioneer has great opportunity and motivation to cheat in a second-price sealed-bid auction. He need only open the bids and insert a bid just slightly under the highest bid offered. His profits would increase.

Matthew K. Franklin and Michael K. Reiter point out that "there are numerous possibilities for corruption and misbehavior in a sealed-bid auction. Possibly the most difficult to counter are those that involve the misbehavior of *agents* in charge of executing and overseeing the auction (e.g., employees of the auction house), especially when this behavior involves collaboration with certain bidders."

They list several ways to cheat:

The agent opens bids prior to the close of the bidding period and informs a collaborator of the amounts bid.

An agent closes the bidding period prematurely so as to preclude certain bids.

The agent allows a bidder to withdraw (or insert) his bid after the bidding period has ended.

The agent collects money from losing bidders.

The winning bidder refuses to pay claiming insufficient funds.

In the future, as more and more auctions are conducted via computer, the above problems must be addressed.

Auction Terminology

Common Value--objects acquired primarily for profitable resale in secondary markets. Individual bids not predicated only on personal valuation but also on valuation of prospective buyers. Each bidder tries to estimate value of an object using the same measurements. Each one tries to estimate object's ultimate worth using same standard. Art bought for resale is an example.

Discriminatory Auction--More than one item is being sold in a sealed-bid auction. Winners pay exa ctly what they bid.

Fast Knock--a strategy used by auctioneers to gain attention and to stimulate an audience when the auction is going slowly. He puts up a lot, asks an unusually low opener and quickly knocks the item down (declares it sold) to first bidder.

First Price--when a single item is sold for the exact amount bid. (As opposed to a second-rpice auction when the second-highest price is paid or opposed to a discriminatory auction in which more than one item is for sale).

Jump Bid--a bid suddenly higher than other increments. Has shock value.

Knocked Down--sold

One-Shot Auction--only one trading period.

One-Sided Auction-- only bids are permitted, but not "asks". A double auction is not one-sided because bids and asks take place at the same time.

Private Value or Valuation--when an object is wanted for personal consumption and a bidder has no primary motive to resell. The bidder is motivated to pay up to a certain maximum, independent of valuations made by others. Art bought for personal pleasure is an example. A private valuation is a subjective decision. It is private in that one bidder does not know another's value. Sometimes it is possible to infer this information by observing other bidders. What do they bid? When do they stop bidding?

Repeated Auction--more than one trading period.

Reserve Price--lowest acceptable price. Useful in discouraging buyer collusion.

Rings--Some subset of bidders who band together and agree not to compete against each other.

Risk Averse bidders--people likely to raise their bids so that they are more likely to win.

Risk Neutral bidders--people who bid exactly their valuations.

Second-Price Auction The winner pays the second highest bid price. When multiple items are sold, the N-highest bidders are each awarded an item, and all pay the price bid by the N + 1st bidder. This format gives bidders an incentive to bid their real estimate of the value of the goods.

Two-Sided auction--bids and asks allowed. This occurs in a double auction.

Uniform Auction--all the units are sold at the same price (the second-highest bid) in a sealed-bid auction.

Value or Valuation --An object can be acquired primarily for personal use (private value) or acquired for resale (common value).

Winner's Curse--Paying more for item than its value. A winner is suddenly faced with the realization that other participants estimated a lower market value for the item. You win but really lose because your profits decrease (a phyrric victory). The winner is the bidder who made the largest positive error in his valuation. The losers lose the item, but not any money. Anyone winning a bid against experts should wonder why the experts bid less.

In auctions in which no bidder is sure of the worth of the good being auctioned, the winner is the bidder who made the highest guess. If bidders have reasonable information about the worth of the item, then the average of all the guesses is likely to be correct. The winner, however, offered the bid furthest from the actual value.

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