Auction Types

**English Auction:** This is what most people think of as an auction. Participants bid openly against one another, with each bid being higher than the previous bid. The auction ends when no participant is willing to bid further, or when a pre-determined "buy-out" price is reached, at which point the highest bidder pays the price. The seller may set a 'reserve' price, and if the auctioneer fails to raise a bid higher than this reserve the sale may not go ahead.

**Dutch Auction:** In a traditional Dutch auction, the auctioneer begins with a high asking price which is lowered until some participant is willing to accept the auctioneer's price, or a predetermined minimum price is reached. That participant pays the last announced price. This type of auction is convenient when it is important to auction goods quickly, since a sale never requires more than one bid. The Dutch auction is named for its best known example, the Dutch tulip auctions; in the Netherlands this type of auction is actually known as a "Chinese Auction". "Dutch Auction" is also sometimes used to describe online auctions where several identical goods are sold simultaneously to an equal number of high bidders. Economists call the latter auction a **multi-unit English ascending auction**.

**Sealed First-Price Auction:** Also known as Sealed High-Bid Auction or First-Price Sealed-Bid Auction (FPSB). In this type of auction all bidders simultaneously submit bids so that no bidder knows the bid of any other participant. The highest bidder pays the price they submitted.
Sealed second-price Auction, also known as a Vickrey Auction: This is identical to the sealed first-price auction, except the winning bidder pays the second highest bid rather than their own. In theory, this is mathematically equivalent to the English auction, because in both the first-place bidder receives the item at a price equal to the second-place bidder's willingness to pay, plus the bid increment. True strategic equivalence requires a modified model of the English ascending auction in which the price rises continuously with bidders choosing when to drop out. When all but one bidder drops out, the good is allocated to the remaining bidder at the price at which the second-to-last bidder dropped out. Implemented as such, this is known as a Japanese Auction.

Silent Auction: This is a sealed variant often used in charity events, but involving the simultaneous sale of multiple items. Participants submit bids normally on paper, near the item. They may or may not know how many other people are bidding or what their bids are. The highest bidder pays the price they submitted.

Procurement Auction: This kind of auction reverses the roles of seller and buyer. The buyer puts out an RFQ for a given commodity and providers offer progressively lower prices in hopes of getting the business. At the end of the auction, the lowest bid wins. Digital Art Auction: In this indefinitely long auction, designed for unreleased works that are trivially reproducible at zero cost (recordings, software, drug formulae), bidders openly submit their maximum bids (which may be adjusted or withdrawn at any time). The seller may review the bids and close with a price of their choosing at any time—the successful bidders that pay this price are those whose bid meets or exceeds it, and these are the only bidders who receive a copy of the item.

Open Outcry Auction: This type of auction is used in stock exchanges and commodity exchanges, where trading occurs on a trading floor and traders may enter verbal bids and offers simultaneously. Transactions may take place simultaneously at different places in the trading pit or ring. This type of auction is being replaced by electronic trading platforms.
If more than one identical item is sold, there are two possible generalizations of the second-price auction. In a uniform-price auction, all of the winning bidders pay the price submitted by the highest non-winning bidder. Bidders will not typically bid their true value in a uniform-price auction with multiple units. In a Vickrey auction, the pricing rule is more complicated, but preserves the property that bidders will bid their true valuation. It is also possible to auction each identical item individually. Once each item has been priced, the winning bidder is entitled to buy the remaining goods at the same price. Items the winning bidder opts not to purchase are auctioned again. This system creates a tension between the desire to hold back on bidding since later items will almost certainly be cheaper, and the chance that by losing the first round of bidding all possibility of purchasing will be lost.

Bidders in the traditional Dutch auction and sealed first-price auction will tend to underbid what they believe the item is truly worth in hopes of getting the item for less, or in order to avoid the winner’s curse. This behavior is known as bid shading. These two auctions are also theoretically equivalent, but in practice Dutch auctions will produce less revenue than sealed first-price auctions (one of the important results of Experimental economics.) Work in the theory of auctions contributed to Vickrey's 1996 Bank of Sweden Prize.

**What is the Winner’s Curse?**

*The following is taken from Wikipedia.org (2007).*

The winner's curse is a phenomenon akin to a Pyrrhic victory that occurs in common value auctions with incomplete information. In such an auction, the goods being sold have a similar
value for all bidders, but players are uncertain of this value when they bid. Each player independently estimates the value of the good before bidding.

The winner of an auction is, usually, the bidder who submits the highest bid. When each bidder is estimating the good's value and bidding accordingly, that will probably be the bidder whose estimate was largest. If we assume that on average the bidders are estimating accurately, then the person whose bid is highest has almost certainly overestimated the good's value. Thus, a bidder who wins after bidding what they thought the good was worth has almost certainly overpaid.

More formally, this result is obtained using conditional probability. We are interested in a bidder's expected value from the auction (the expected value of the good, less the expected price) conditioned on the assumption that the bidder won the auction. It turns out that for a bidder bidding their true estimate, this expected value is negative, meaning that on average the winning bidder is overpaying.

Savvy bidders will avoid the winner's curse by bid shading, or placing a bid that is below their ex ante estimation of the value of the good for sale - but equal to their ex post belief about the value of the good, given that they win the auction. The key point here is that winning the auction is bad news about the value of the good for the winner. It means that he/she was the most optimistic and if bidders are correct in their estimations on average, that he/she overpaid. Therefore savvy bidders revise their ex ante estimations downwards to take account of this effect.

The severity of the winner's curse gets stronger as the number of bidders increases. This is because the more bidders there are, the more likely it is that some of them have greatly overestimated the good's value. In technical terms, the winner's expected estimate is the value of the first order statistic, which increases as the number of bidders increases.
Since most auctions involve at least some amount of common value, and some degree of uncertainty about that common value, the winner's curse is an important phenomenon.

In the 1950’s, when the term winner's curse was first coined, there was no accurate method to estimate the potential value of an offshore oil field. So if, for example, an oil field had an actual intrinsic value of $10 million, oil companies might guess its value to be anywhere from $5 million to $20 million. The company who wrongly estimated at $20 million and placed a bid at that level would win the auction, and later find that it was not worth as much.

Other auctions where the winner's curse is significant:

Spectrum auctions in which companies bid on licenses to use portions of the electromagnetic spectrum. Here, the uncertainty would come from, for example, estimating the value of the cell phone market in New York City.

IPOs, in which bidders need to estimate what the market value of a company's stock will be.

**Types of Auctions: An In-depth Look**

The following on auction types is adapted from Kate Reynolds (1996d) and Wikipedia (2007).

Those bidding in auctions generally have one of two primary motivations for doing so: Personal consumption or re-sale/commercial use. People's bidding behavior changes depending upon which motivation is driving them.

If a bidder wants to acquire a good for personal consumption or use (e.g., wine, furniture), the bidder must first make a private valuation of the item to be auctioned. Most bidders motivated by personal consumption come to auctions with valuations and a goal of keeping this valuation
private. Why? Because if the seller a priorily knew the highest valuation of their good, there would be little point to holding an auction in the first place.

A second motivation among auction bidders is to acquire items with the ultimate goal of resale (e.g., art, classic cars). Here, bids are driven not only by private valuation, but also by estimating the subsequent valuation of the item by prospective future buyers. In auctions for items primarily to be resold for profit, each bidder attempts to guess the ultimate price of the item relying on a common value assumption: the item is really worth the same to all but the exact amount is unknown. Note that this does not mean every participant knows the precise value of the item being auctioned, it just means that all participants necessarily place the same value on the good being auctioned. For example, if a collection of historical coins is being auctioned, all participants in the auction may have incomplete information as to the value of the coins. However, it is still considered a common value auction since the collection will be worth the same amount to every participant in the auction. Regardless of whether the auction is for historical coins, art, or a land’s mineral rights, if the auctioned good is purchased solely for promotion on some secondary market, each bidder must guess what price the object might ultimately bring.

In 1961, William Vickery developed a taxonomy of auctions based upon the manner in which bids are tendered and the order in which prices are quoted. His taxonomy classifies four major types of auctions: English auction, Dutch auction, first price sealed bid auction, and second price sealed bid (or Vickrey) auction.

**English Auctions:**
The following on English auctions is primarily adapted from Kate Reynolds (1996d) and Wikipedia (2007).

The auction format most familiar to Americans, the English auction is commonly used to sell art, wine and numerous other goods. In an English auction (also called an open ascending-bid auction or open-outcry auction), the auctioneer begins the auction with the reserve price (i.e., lowest acceptable price) and then takes larger and larger bids from perspective buyers. This continues until no one will increase the bid and there remains only one bidder who wins the auction at the currently bidded price. The item is then sold to the highest bidder. Bidded-upon items are not always sold at an English auction. In some cases, the reserve price is not met. In others, an auction house shill “accidently” places the highest bid on the item but does not intend to purchase it. Shills (or “potted plants”) drive auction prices up with phony bids, seeking to provoke a bidding war among other participants. Because of this practice, some states require the auctioneer to state whether or not the item has been sold at the conclusion of bidding.

In an English auction, the auctioneer can exert substantial influence by manipulating the bids with his or her voice, tone, pace, and personality. The auctioneer can deliberately increase or slow the pace of the bids and even refuse to acknowledge certain bids (e.g., if he or she believes the bidder is a member of a ring, a group of bidders who promise not to outbid each other) in the course of the auction chant. An auction chant is a rhythmic repetition of numbers and "filler words" spoken by an auctioneer in the process of conducting an auction. The auction chant is a repetition of two numbers at a time which indicate the monetary amount involved with the sale of an item. The first number is the amount of money which is currently being offered by a bidder for a given item. The second number, which is the most repeated and frequently heard number in
the "chant", is the bid that the auctioneer wishes to receive. This is the amount the next bidder
will have to pay in order to buy the item for sale (“Auction chant,” 2007). In between the
numbers are "filler words" which are simple sayings, or rather a statement or an open-ended
question, which connect the two numbers involved and help to bridge them together. It serves as
a thinking point for both the auctioneer and the bidders. Typical filler words taught at schools of
auctioneering are "dollar bid", "now", and "will ya' give me?". Slurring filler words to make
multi-part filler word phrases is a key element, giving the illusion that the auctioneer is talking
fast, and thus creating more excitement among the bidding crowd (Janik & Rejnis, 1994).

Despite its seeming simplicity, the English auction system is quite complex with many
variations. Sometimes, the reserve price is not revealed. The auctioneer might do this to prevent
rings, whose ultimate goal is to lower the final
price. Another variation on the English auction
is the open-exit auction, where the bidders
must announce that they are dropping out of
the bidding. Once a bidder has dropped out, he
or she may not reenter the bidding. This
variation on the English auction provides
additional information to bidders about the
common value of an item than they would otherwise have when bidders can drop out secretly
and even reenter the bidding later.

In another variation, bids may be made with signals instead of being called out. Such signals can
include tugging an ear or raising a bidding paddle. This system reduces the noise from the
auction, decreasing the likelihood of error if more than one person is bidding on an item at the
same moment. When signals are utilized, a shared system of price intervals must be agreed upon
so that the auctioneer and bidders understand the signals. In the U.S., the auctioneer often has wide discretion, calling out the current bid as well as the bid he is seeking. However, in England the auctioneer is less likely to lead bidders, rather waiting to be told what a bidder will offer. In France, when the last and highest bid has been placed in an auction for an art object, a member of the Louvre can say "Préemption de l'état" (Pre-emption of the state) and buy the object for the highest bid. In France, the right to conduct an auction (the privilege is referred to as the chargé) is sold to a select few individuals (approximately 500 throughout the country) by the French government (“English auction,” 2007; Reynolds, 1996d).

An English auction has both advantages and disadvantages for the buyers and the seller. From a seller’s point of view, the key to any successful auction is the effect of competition on the potential buyers’ bids. On one hand, an advantage for sellers is that overbidding is common in English auctions. Winner’s curse sometimes occurs because inexperienced bidders get carried away in the heat of the moment (“Winner’s curse,” 2007). In economic terms, the price the winning bidder pays may be greater than the Marginal Utility (the value of one additional unit of something) of the second highest bidder. On the other hand, this type of auction is highly susceptible to rings. The object on sale can be bought for much less than its true value if bidding is intentionally slowed, and rings can take advantage of the nature of open ascending-bid auctions. In this case, underbidders increase the bid by only small increments. With patience, a bidder may acquire an item for considerably less than maximum valuation using this strategy of small incremental bids. A shortcoming of the English auction format for both buyers and sellers is that everyone must be in communication over the course of the auction, which can often be expensive and difficult.

**Dutch Auctions:**

The following on Dutch auctions is adapted from Kate Reynolds (1996c) and Wikipedia.org (2007).
A Dutch auction (also called an open descending-bid auction) is a type of open-bid (versus sealed-bid) auction where the auctioneer begins with a high asking price which is lowered until some participant is willing to accept the auctioneer's price, or a predetermined reserve price is reached. The winning participant pays the last announced price. When multiple units are auctioned, more buyers bid as the price declines. The highest bidder wins his or her item at the bid-upon price, while later bidders pay a lower price for their items. When the goods are exhausted, the bidding is over. A Dutch auction format is also sometimes used to describe online auctions where several identical goods are sold simultaneously to an equal number of high bidders.

This format is commonly used in the Netherlands to auction produce and flowers, hence the name “Dutch” auction. A Dutch auction format has also been utilized to sell fresh fish in England and Israel, foreign exchange in Jamaica and Bolivia, and to finance credit in Romania. This type of auction is common when it is important to auction goods quickly, since a sale never requires more than one bid. Theoretically, the bidding strategy and results of this auction are equivalent to those in a sealed first-price auction; however, experimental research suggests that a Dutch auction typically results in lower sale prices. On the other hand, in the Dutch system, if the bidder with the highest interest really wants an item, he or she cannot afford to wait too long to enter his or her bid. That means he or she might bid at or near his or her highest valuation of the item.

The United States Department of the Treasury, through the Federal Reserve Bank of New York (FRBNY), raises funds for the U.S. Government using a Dutch auction format. The FRBNY interacts with primary dealers, including large banks and broker-dealers who submit bids on behalf of themselves and their clients using the Trading Room Automated Processing System.
("TRAPS"), and are generally told of winning bids within fifteen minutes. For example, suppose the debt managers are seeking to raise $10 billion in ten-year notes with a 5.125% coupon, and in aggregate the bids are as follows:

- $1.0 billion at 5.115%
- $2.5 billion at 5.120%
- $3.5 billion at 5.125%
- $4.5 billion at 5.130%
- $3.75 billion at 5.135%
- $2.75 billion at 5.140%
- $1.50 billion at 5.145%

In this example, the bid-to-cover ratio is 1.95, therefore, not every bidder receive bonds. Bids will be filled from the lowest yield (highest price) until the entire $10 billion has been raised. This auction will clear at a yield of 5.130% and all bidders will pay the same amount. In theory, this feature of the Dutch auction format leads to more aggressive bidding as those who in this case bid 5.115% will receive the bonds at the higher yield (lower price) of 5.130%.

The introduction of the Dutch auction share repurchase in 1981 allows firms an alternative to the fixed price tender offer when executing a tender offer share repurchase. The first firm to utilize the Dutch auction was Todd Shipyards. A Dutch auction offer specifies a price range within which the shares will ultimately be purchased. Shareholders are invited to tender their stock, if they desire, at any price within the stated range. The firm then compiles these responses, creating a supply curve for the stock. The purchase price is the lowest price that allows the firm to buy the
number of shares sought in the offer, and the firm pays that price to all investors who tendered at or below that price. If the number of shares tendered exceeds the number sought, then the company purchases less than all shares tendered at or below the purchase price on a pro rata basis to all who tendered at or below the purchase price. If too few shares are tendered, then the firm either cancels the offer (provided it had been made conditional on a minimum acceptance), or it buys back all tendered shares at the maximum price.

In Economics, price discrimination occurs when a firm charges different prices to different customers for the exact same good or service. First degree, or perfect, price discrimination occurs when a firm knows the exact details about demand for its product, enabling the firm to sell each unit of its output at the maximum price that each individual consumer is willing to pay. This is rare in real life, and a Dutch auction is one of the few examples, because the winner in a Dutch auction pays the highest price that any consumer is willing to pay. Presuming all the auction bidders have not colluded, the seller in the auction has extracted all of the winning bidder’s consumer surplus.

First Price Sealed Bid Auctions:

*The following is adapted from Kate Reynolds (1996e) and Wikipedia.org (2007).*

The third major type of auction in Vickrey’s taxonomy is the sealed first price auction. The defining characteristic of this auction is that, unlike English and Dutch auctions, the bids are not revealed to other bidders. A sealed-bid format generally has two phases: 1) A bidding period for buyers, and 2) a resolution period where the bids are opened and the winner determined. Under this auction format, bidders submit their bid in a concealed fashion; the submitted bids are then compared, and the person with the highest bid wins the auction. Bidders submit valuations based upon supposed market (common) value and their own willingness to pay -- as opposed to engaging in competition through relative prices with other bidders. A winning bidder pays exactly the amount he or she bid. Usually, but not always, each participant is allowed one bid,
making bid preparation especially important. From a bidder's perspective, a high bid raises the probability of winning but lowers the profit if the bidder is victorious. Therefore, a suggested strategy in first price sealed bid auctions is to avoid the winner’s curse by shading the bid as close as possible to market (common) value. Because it is advantageous to a bidder to gather information about other bidders’ valuation before the auction, one criticism of the first price sealed bid format is its susceptibility to rings and collusion.

The name, first-price, refers to the fact that the buyer wins the item for making the highest offer on a single unit. However, when multiple units of the same product are being auctioned, this format is referred to as “discriminatory” because not all winning bidders pay the same amount for each unit. In this case, sealed bids are sorted from high to low, and units are awarded to the highest bids until the supply of items is exhausted.

Second Price Sealed Bid (Vickrey) Auctions:

*The following is adapted from Kate Reynolds (1996f) and Wikipedia.org (2007).*

The second price sealed bid auction (also called the uniform second price auction or Vickrey auction) was named after William Vickrey, winner of the 1996 Nobel Prize in Economic Science. Like the first price sealed bid format, bidders in a second price sealed bid auction submit written bids with no knowledge of competing bids. 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. For example, if bidder A bids $10, bidder B bids $15, and bidder C offers $20, bidder C would win, however he or she would only pay $15, the price of the second-highest bid. This type of auction
is strategically similar to an English auction, and gives bidders an incentive to bid an item’s true value.

Vickrey's (1961) original paper considered only auctions where a single, indivisible good is being sold. In this case, the terms Vickrey auction and second price sealed bid auction are used interchangeably. An interesting distinction from first price sealed bid auctions, when multiple identical units (or a divisible good) are being sold in a single auction, all winning bidders pay the same price (the highest losing price) for the items. This format is known as a uniform-price auction. The uniform-price auction does not, however, result in buyers bidding their true valuations as they do in a second-price auction unless each bidder only has demand for a single unit.

An obvious question is why would any seller choose this format to auction goods? While many assume that the seller would increase profits by using a first price auction format, experimental research has found this assumption to be false. Seasoned bidders fully understand the rules of Vickrey format and generally modify their bids. Because there is less deterrent to winning an auction with too high a bid (i.e., winner’s curse), bidders will tend to adjust their bids upward and pay closer to market consensus. Bid shading is less likely to occur because the winner bid is determined not by a private valuation of the auctioned good but by competitors’ bids. In addition, collusion is less likely as bidders are deterred from comparing notes before an auction.

Another question is why seal the bids? In a second price open outcry (rather than sealed bid) auction, buyers would bid in ascending fashion, and the highest bidder (i.e., the winner) would ultimately pay the price of the second-highest bid. However, an open format to a Vickrey auction would be an easy target for manipulation. For example, bidder A bids $25 for an item worth $100. Bidder B could quite easily and safely bid $800, assuming that no will bid more and
he will ultimately only pay $25 for the item. Clearly, it is imperative that bids are sealed under a Vickrey auction format.

Vickrey auctions are frequently studied in economic literature, but are not particularly common in practice. One market in which they have been used is stamp collecting. eBay's system of proxy bidding is similar, but not identical, to a Vickrey auction. A slight modification of a Vickrey auction is used in Google's online advertising program, AdWords, where real-time unmonitored auctions take place. Despite the Vickrey auction's strengths, it has shortcomings:

- The auction is not budget balanced. It does not maximize seller revenues. If the purpose of holding the auction is to maximize profit for the seller, as is often the case, the Vickrey auction is a poor choice.
- It does not allow for price discovery, that is, discovery of the market price if the buyers are unsure of their own valuations, without sequential auctions.
- Sellers may use shill bids to increase profit.

The Double Auction:

The following is adapted primarily from Kate Reynolds (1996b) and Wikipedia.org (2007).

Despite being the dominant trading format in U.S. financial institutions (e.g., New York Stock Exchange and American Stock Exchange) for the last century, the double auction is not classified as a major auction type. In these stock exchanges, a potential buyer bids a specific price for a stock and a potential seller asks a specific price for the stock. When the bid and ask prices match, a sale takes place on a first come first served basis if there are multiple bidders or askers at a given price. In a double auction, buyers (demand) and sellers (supply) submit bids simultaneously, generating supply and demand profiles which can be ranked in a queue from highest to lowest. A maximum volume of goods can be exchanged by matching selling (supply)
bids (starting with the lowest bid and moving up) and buying (demand) bids (starting with the highest bid and moving down). This format allows buyers to make offers and sellers to accept those offers at any particular moment.

A double auction market can be carried out by open outcry, in which buyers and sellers call out prices that they are willing to buy and sell at, and a match is made if a buyer and seller call out the same price. To illustrate, suppose four sellers of foreign exchange offer to sell a unit at prices of 100, 200, 300, and 400 domestic currency units (Feldman & Mehra, 1993). At the same time, four buyers offer to buy one unit at prices of 400, 300, 250, and 50 domestic currency units. Supply and demand are met at two units of foreign exchange (i.e., 300 and 400), while the bidding could continue among the remaining sellers and buyers.

A variation on the double auction is the continuous double auction, where multiple transactions are carried out at a single moment and trading does not stop as each auction is concluded. The Chicago Commodities market and the New York Stock Exchange (NYSE) are examples of a continuous double auction.

Another variation on this auction format is the double Dutch auction, where a buyer price clocks begins ticking at a high price and continues downward until the buyer stops it at a price he or she is willing to pay for an item. The seller’s clock then begins to tick upward until the seller stops it at the price he or she is willing to sell the item. If the buyer’s bid remains below the seller’s
price, the cycle of clock movements will resume until the two prices cross, at which point the purchase will be made. With research being conducted at the University of Arizona, the double Dutch auction format is evolving rapidly and may have numerous future applications in virtual, computerized auctions (McCabe, Rassenti, & Smith, 1992).

Many believe the historical roots of the double auction date back to ancient Egypt and Mesopotamia where “haggling” (i.e., buyer and seller take turns suggesting price) was common practice. With the invention of the telephone, stock traders of the late 19th century could communicate in real-time with interested selling and buying parties. Real-time communication became virtual communication with the computer revolution in the latter part of the 20th century as agents and financial markets moved toward automation.

Some exchanges are physical locations where transactions are carried out on a trading floor by open outcry. This type of auction is used in stock exchanges and commodity exchanges where traders may enter "verbal" bids and offers simultaneously (“Stock market,” 2007). The New York Stock Exchange (NYSE) is a physical exchange, where much of the trading is done face-to-face on a trading floor. Orders enter by way of brokerage firms that are members of the exchange and flow down to floor brokers who go to a specific spot on the floor where the stock trades. At this location, known as the trading post, there is a specific person known as the specialist whose job is to match buy orders and sell orders. The current bid price is the highest amount any buyer is willing to pay and the current ask price is the lowest price at which someone is willing to sell; if there is a spread, no trade takes place. For a trade to take place, there must be a matching bid and ask price. Once a trade has been made, the details are reported on the "tape" and sent back to the brokerage firm, who then notifies the investor who placed the order.

The other type of exchange is a virtual kind, composed of a network of computers where trades are made electronically via traders at computer terminals (“Stock market,” 2007). The Nasdaq is a virtual exchange, where all of the trading is done over a computer network. The process is
similar to the above, in that the seller provides an asking price and the buyer provides a bidding price. However, buyers and sellers are electronically matched. One or more Nasdaq market makers will provide a bid and ask price at which they will purchase or sell ‘their’ stock. Now that computers have eliminated the need for physical trading floors, the balance of power in equity markets is shifting.

The Simultaneous Bidding System:

The following is adapted from Kate Reynolds (1996a) and Wikipedia.org (2007).

In a simultaneous auction (also called a Japanese Auction), open bids are submitted (almost) simultaneously using agreed upon hand signals for specific monetary units. Hand signs signal the numbers one through nine, and two- or three-digit numbers can be signaled by rapidly repeating hand signs. However, two- or three-digit signals are sometimes not necessary at particular known bidding levels, as the auctioneer can infer that the hand sign for three represents 300 in an auction where the bidding has reached 250. All bidders are expected to register their maximum bid within the allotted time, and the winner of the auction is the highest bidder. Theoretically, the bids are submitted at the same time; but in practice, this process of bidding and auctioneer acknowledgement of the bids can take up to several minutes with some bidders managing to observe competitors’ bids and raise their own bids during the time allowed.

This type of auction is common in fresh food markets of Japan and is characterized by rapid bidding and substantial noise and confusion as many bidders try simultaneously to gain the auctioneer’s attention. The Tokyo Metropolitan Central Wholesale Market, commonly known as Tsukiji fish market is the biggest wholesale fish and seafood market in the world and also one of
the largest wholesale food markets of any kind. The "inner market" (jonai shijo) is the licensed wholesale market, where auctions and most of the processing of the fish take place, and where licensed wholesale dealers (approximately 900 of them) operate small stalls.

The market opens every morning except Sundays and holidays at 3:00AM with the arrival of the products by ship, truck and plane from all over the world. Particularly impressive is the unloading of tons of frozen tuna. The auction houses (wholesalers known in Japanese as oroshi gyousha) then estimate the value and prepare the incoming products for the auctions. The buyers (licensed to participate in the auctions) also inspect the fish to estimate which fish they would like to bid for and at what price. The auctions start around 5:00AM. As of 2005, tourists are no longer allowed to visit the auctions unless they obtain a special permit, but areas are available for tourists to view several auctions. Bidding can only be done by licensed participants. These bidders include intermediate wholesalers [nakaoroshi gyousha] who operate stalls within the marketplace, and other licensed buyers who are agents for restaurants, food processing companies, and large retailers. The auctions usually end around 7:00AM. Afterwards, the purchased fish is either loaded onto trucks to be shipped to the next destination, or on small carts and moved to the many shops located inside of the market.

Other Auction Formats

_The following information on other auction formats is adapted from Ralph Cassady (1967) and Kate Reynolds (1996a)._

The Written-bid Auction:

Written bid auction formats (i.e., “dumb” schemes) require that all bids be submitted in writing. After examining an item for auction, bids are submitted to a box within an allotted time period.
Once the time allotted has passed, the auctioneer opens the box to examine the bids and award the item to the winning bid (if the reserve price has been met). One limitation of this format is that it can be time consuming if multiple items are being auctioned separately. For example, if each bidding period on a single item lasts five minutes, only twelve items can be auctioned in one hour. Another drawback of this system is that the buyer is compelled to bid high, when he or she could have possibly attained the same item in an English auction format with a lower bid by raising the bid incrementally relative to competitors’ bids.

The Handshake Auction:

Originating in China and utilized until the late 1950’s, the handshake auction is one of the oldest recorded auction formats. Under this time-consuming format, a group of bidders encircle the auctioneer and take turns clasping the hand of the auctioneer. The hands of the bidder and auctioneer are concealed by a cloth so that only the bidder and the auctioneer know the true bid amount. The potential buyer indicates a bid by pressing some number of the auctioneer’s fingers, then announcing aloud the monetary unit to which the squeeze is referring. A bid of thirty can be indicated by squeezing three fingers simultaneously or by squeezing one finger three times sequentially, while announcing the monetary unit of ten. The auctioneer must remember each bid and announce the winner after each bidder takes one turn.

There are numerous opportunities for manipulation and deceit in a handshake auction. For example, the auctioneer could be guilty of collusion with a bidder or group of bidder(s) as the actual amount of the final sale is kept secret. Bidders can mislead competitors as well. For example, a bidder could grasp all four fingers of the auctioneer while announcing a small unit (e.g., ten), making his or her bid seem smaller than it really is. Conversely, a bidder could lead competitors to believe he or she is making a large bid by grasping only one finger while announcing a large monetary unit. A shill may attempt to increase the bids by taking an
auctioneer’s hand and making a bid then canceling it by scratching the auctioneer’s palm while announcing some large monetary unit.

The Audible-Bid Rotation Auction:

This auction format is a modification of the sealed handshake auction; in an audible bid rotation auction, open bids alternate in some set pattern. Similar to an English auction, the bids ascend; the auctioneer publicizes the current high bid (e.g., by writing it on a blackboard), and each bidder, in turn, either raises the bid or passes. The bidder who maintains the highest bid when all other bidders pass their turn to bid wins the auction.

The Whisper Auction:

Under this time-consuming auction format, potential buyers whisper their bids into the auctioneer’s ear without knowledge of competitors’ bids. Some international fish markets (e.g., Venice, Singapore) use this auction format. An advantage of both the whisper and handshake auction formats, is that the auctioneer can choose to ignore certain bidders (e.g., bidders known to be shills or bad credit risks). However, similar to the handshake method, the opportunity for auctioneer collusion exists.

The Time-Interval Auction:

A time-interval auction is similar in format to an English (open ascending bid) auction, except that all bidding must be completed within a specified allotted timeframe. This auction format is commonly utilized in the real-estate and manuscript markets, where auctions can take extend for periods of days or weeks. Historical time interval auction formats utilized sand through an hour glass or a burning candle to measure...
allotted bidding time. Property auctions used the burning candle method as recently as the early 20th century. A group of bidders would gather out of the wind, cut a candle to a length of approximately one inch and light it. Bids would be called out in ascending order as the candle burned, with the winner determined to be the high bidder when the candle burned out. Many strategies abounded in candle lit auctions including: early high bids to deter the competition, waiting until the final moments to offer a high bid, or bidding actively throughout the auction. One problem associated with this format is the difficulty of determining the winner if all bidders adopt the strategy of waiting until the last possible moment to vocalize their bid.

The Silent Auction:

A variation of both the English Auction and a written-bid auction is the silent auction. In this format, potential buyers enter written bids with knowledge of competitor bids. The selling price ascends because bidders can see the current high bid and offer an incrementally higher bid if so desired. A silent auction can take place over a period of hours, days, or weeks, and bidding strategies range from waiting to bid high until the last minute to bidding high early to discourage competition.

The Swiss Auction:

In Switzerland, the construction industry commonly awards contracts via a first price sealed bid auction format (Von Ungern-Sternberg, 1991). However, winning bidders may withdraw their bid, thus refusing the contract, if they do not wish to accept the project. Sellers favor the practicality of this format for their industry. For example, job-specific timetables and specifications may not be fully known until the conclusion of the auction, thus contractors must be afforded the opportunity to decline the contract if they do not feel they can meet the seller’s conditions. In addition, contractors often bid on multiple contracts simultaneously, which may affect timing, cost overruns, and labor and equipment availability if they are awarded more than
one project at any one time. Therefore, it is in the seller’s best interest to allow “winning” contractors to withdraw if the contractor does not believe they can meet contract specifications.

This auction format can be open to collusion. For example, the highest bidder could collude with the second highest bidder by offering to withdraw for some specified amount of money (i.e., kickback given to the highest bidder by the second highest bidder for declining the contract). Therefore, the auctioneer is given some discretion to combat this possibility; in this case, the auctioneer could force the “winning” company to meet its bid and honor the contract.

**Chinese Auction:**

*The following is taken from Wikipedia.org (2007).*

A Chinese auction is a type of auction (actually a combination of auction and raffle) that is typically featured at charity or other fundraising events. In a Chinese auction, bidders are not prospective buyers (as in the conventional English auction). Instead, they buy tickets, which are essentially chances to win items. Bidders may buy as many tickets as they like, and bid them on any item(s) they want by placing them in a basket or other container in front of the item(s) they are trying to win. At the conclusion of bidding, the winning ticket is drawn from the tickets bid on each item, and the item is awarded to the owner of that ticket. A bidder may increase the chance of winning by buying and bidding more tickets on a specific item. Although there is generally no limit to the number of tickets a given individual may bid on a specific item, the chance of winning depends on the total number of tickets bid by all individuals.

It is unclear whether this type of auction actually originated in China; it is much more likely that the term derives from "chance auction," which is another name for this type of auction. The Chinese auction is similar to the silent auction, with the difference being that in silent auction bidders submit bids listing specific amounts that they are willing to pay for a specific item.
Chinese auctions have become very popular on the Internet, with various websites offering a variety of items for auction.