AUCTION PRICING: OPTIONS AND IMPLICATIONS

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INTRODUCTION

Auctions are mechanisms for competitive marketing and pricing. As such, they contrast with other mechanisms for pricing and allocating products (goods or services) in a market economy such as private treaties and price listing. The essence of competition via auction is that buyers (sellers) bid as rivals to purchase (sell) specified products in a setting where all terms of exchange are specified prior to sales negotiations except for price and, in some situations, quantity.

No reliable data exist regarding the relative importance of auction pricing compared to price listing and private treaty pricing in the U.S. or other market economies. However, price listing, or take-it-or-leave-it marketing, is the most common means of pricing in the U.S. retail trade. Large wholesale buyers (sellers) of manufactured products and raw materials may employ the same procedure for dealing with numerous sellers (buyers). Marketing by private treaty, a situation in which price and other terms of exchange are negotiated privately between buyer and seller, is used extensively in markets for raw materials, many agricultural products, real estate and some consumer products such as automobiles and domestic services. It is also common in the retail trade of less developed countries and in clandestine (e.g., black) markets.

Auctions are used extensively for selling (buying) products that are characterized by irregularity of supply (demand). This includes collectibles such as antiques, art objects and rare wines; agricultural commodities such as livestock, wool, fresh fruits and vegetables and tobacco; fresh fish; used goods such as second hand furnishings, machinery and automobiles; forced (e.g. sheriff's) sales and liquidations of items such as real estate, damaged and salvaged goods, and unclaimed merchandise; rights to minerals and other natural resources such as oil and timber; financial instruments such as treasury bills and corporate securities; and construction contracts. Government agencies also make wide use of auction-type competitive bidding for purchasing. The typical legal requirement that government purchases and sales be by competitive bid illustrates a widely held faith in the fairness and efficiency of the auction method of pricing.

Auctions have also been of historical importance to human bondage. According to Herodotus, auctions existed around 500 B.C. in Babylon, where once a year women of marriageable age were sold on the condition that they be wed.[1/] American slave auctions in the late 18th and early 19th centuries are more recent examples.

Types of Auctions

For convenience auctions will be discussed as if the seller is in the passive role with buyers bidding competitively. The reader will be aware that auction pricing is equally applicable for competitive bidding by sellers (e.g. sellers of construction services) with the buyer in a passive role.

To the casual observer, an auction is a procedure where an auctioneer cries successively higher prices to a group of rival bidders until only one remains active. However, there are numerous variations in auction procedures,

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[1/] Herodotus, The Histories of Herodotus, trans. Henry Clay (New York: D. Appleton and Company, 1899), p. 77. as quoted in [2], p. 26.

many of which bear only remote resemblance to this stereotype. One way of classifying auction procedures is by the type of bidding behavior evidenced during the auction sale of a given product or lot. These classifications are: ascending bids (English auctions), descending bids (Dutch auctions), converging bids (double auctions), simultaneous bids (Japanese auctions), and sealed bids.

Ascending Bid Auctions. The ascending bid, or English auction is most familiar, at least in the English speaking world. These are also variously referred to as progressive or increasing bid auctions. The latin root of auction, auctus, literally means to increase. Potential buyers bid against each other at incrementally higher prices until no buyer is willing to advance a higher bid. If the last bid equals or exceeds the seller's reservation price, if any, the sale is awarded to the final bidder at the last (highest) price bid.

Typically, an auctioneer seeks an initial bid from one of the group of potential buyers, then recognizes successively higher bids which may be verbally solicited by the auctioneer or volunteered by a potential buyer, and finally decides when the bidding is complete and the item or lot should be sold. In some instances, the auctioneer will use a book bid (a bid submitted in advance to the auctioneer by an outside buyer to purchase a specified product or lot at any price up to the maximum indicated) or recognize phantom or planted bidders in order to encourage the assembled buyers to bid at higher prices.

This method makes maximum use of the auctioneer. The style and demeanor of the auctioneer varies from a seemingly unintelligible chant of the tobacco auctioneer (L. A. "Speed" Riggs, famous as the Lucky Strike auctioneer, holds the world speed record for chanting 784 words per minute) to the quiet and reserved role of the auctioneer selling a rare objet d'art in the Sotheby

Parke Bernet galleries in New York. Regardless of its form, the chant of the auctioneer in soliciting bids and/or keeping the buyers informed has become a traditional part of the ascending bid auction.

Descending Bid Auctions. In the Dutch auction, the initial price is put at a level above that for which the item or lot is expected to sell. Progressively lower prices are then called until a buyer indicates willingness to pay the last price called. There is only one bid per sale, the winning bid. The auctioneer selects the starting price, based upon knowledge of the market and expected selling price. The descending price quotes are either called verbally by the auctioneer or displayed by an electrical or mechanical device which is designed specifically for that purpose. Buyers register their bids by calling "mine" when the auctioneer announces the price quote at which they desire to buy, or by pushing a button or other mechanism which stops the electrical or mechanical price quoting device at the desired bid price. The first buyer to so signal is the successful bidder.

The most commonly used device for indicating successively lower prices is a clock-like mechanism which is manufactured by a Dutch firm. The circumference of the dial is marked off into standard price decrements. A pointer moves counterclockwise pointing to successively lower prices until a buyer activates a personal stop button. The device electronically identifies the activating bidder and the sale is awarded at the price indicated by the stopped pointer. This device is commonly called the Dutch clock.

As with the English auction, items or lots are typically sold one at a time and some information on the strategy of buyers is revealed over the course of the auction. In some cases, the first successful bidder is allowed to designate what portion of a lot he will buy, then the clock is restarted to sell what remains. Regardless, there is typically less

information on buyer strategy revealed in the Dutch than in the English auction where no price movement occurs without overt action by a buyer.

Converging Bid Auctions. Some markets operate in a double auction mode, with both offers to sell and bids to buy called out among numerous potential traders. Buyers may raise their bids while sellers may lower bids until the bids converge and a deal is consummated. No auctioneer is present. Essentially, each buyer and seller acts as his own auctioneer, and a given trader may switch rather quickly between roles as buyer and seller, or may actually be both a buyer of one item and a seller of another simultaneously. The exposure of all bids and offers to all other traders in the market, along with standard procedures for matching and consummating trades, distinguishes this type of auction from private treaty trading.

Organized markets for commodity futures contracts (e.g.,Chicago Board of Trade and Chicago Mercantile Exchange), financial futures contracts (e.g., International Monetary Market and Commodity Exchange Inc.) and corporate securities (e.g., New York Stock Exchange and American Stock Exchange) operate as converging bid auctions. Membership and access to the trading floor is usually limited with members trading for their own account and as agents for other traders. While most of the transactions on the stock exchanges are executed in the auction mode, these exchanges include firms called specialists who act as dealers in specified stocks or bonds to provide a continuous market for less actively traded securities.

Simultaneous Bid Auctions. The simultaneous bid auction apparently originated in the Japanese fish markets and is thus frequently referred to as the Japanese auction. With this method, all bidders on a given item or lot place their bids with the auctioneer at the same time. The auctioneer identifies the highest bid and awards the sale. In the past, bidders in

the Japanese fish auctions would flash their bids to the auctioneer, upon signal, using hand signs not unlike those used by floor traders on the securities and commodity futures exchanges. This procedure creates the impression of confusion, and an experienced auctioneer is necessary in order to rapidly identify the winning bidder. More recently, electronic keyboards have been provided in some Japanese auctions upon which buyers can record their bids numerically and the highest bid is displayed automatically. This has greatly streamlined the simultaneous bidding procedure.

This auction method is very fast, as sales are awarded almost instantly upon going up for bid. The time for bidding is so short that little if any bid adjusting can be accomplished on any particular lot or item. When only the winning bid is announced, information on buyer strategy is much like that in a Dutch auction. However, if all bids are reported, a more complete picture of overall buyer demand is available.

Recently, another type of simultaneous auction has been proposed [7]. Under this procedure, several lots would be put up for auction at the same time, with progressive bidding encouraged for each during a specified time period. Electronic or mechanical devices would be used for recording and displaying the variety of bids.

Sealed Bid Auctions. As the name implies, individual buyers in this type of auction submit secret or sealed bids to the auctioneer anytime during a designated period. These bids are known only to the auctioneer who determines the winning bid and bidder and announces same. Unsuccessful bids may or may not be announced at the conclusion of the auction. However, during the bidding process on any given item or lot, no bidder knows what bids have been submitted by others, thus a buyer's bid depends upon his own evaluation of the item or lot being offered and his perception of likely actions of

other buyers. Bids are generally written and not opened prior to a specific time. Sealed bid auctions are often used for selling real estate, oil and gas leases, treasury bills, timber rights, and for awarding construction contracts. Government purchases are typically made in this manner.

In variations, bids have been submitted by squeezing the auctioneer's hand or fingers (the handshake auction), by whisper (the whisper-bid auction) or by electronic device. The length of time during which bids are received is usually specified, but in instances has been determined by the time a candle burns (candle auction) or sand running through a glass (sand glass auction).

The Impacts of Auction Allocation and Pricing

It is widely accepted that auctions are mechanisms for competitively establishing prices and market allocations. Additionally, it is generally recognized that the type of auction method used may affect the price and allocation outcome.

Assuming the existence of several (at least more than one) buyers and the lack of buyer collusion, it is clear that auctions are buyer competitive. That is, buyers are active rivals in competing for the right to purchase. Sellers, on the other hand, are relatively passive. With the exception of converging bid auctions, sellers hand over their goods to an auctioneer who agrees to sell them according to a specified set of auction rules and procedures. It is generally understood that the auctioneer will seek to obtain the highest possible price. Sellers have little direct control over the actual sales price other than, where the auction rules permit, to set a minimum acceptable (reservation) price below which no sale will be made, or to enter the bidding and buy their own products if they feel other buyers are not bidding high enough.

The relative passivity of sellers at least sometimes results in a different price than would result from bilateral bargaining between seller and buyer [1, p. 7]. In bilateral bargaining, sellers often reveal information about their true reservation prices. In auctions, however, buyers do not generally receive this potentially useful information and thus do not know the sellers supply schedule. Therefore, pricing in auctions tends to more directly reflect the buyers purchase-price schedule, adjusted for uncertainty regarding the supply-price schedule, than the result of direct buyer-seller interaction. At least one study [9] suggests that this results in a higher price than that which would be obtained through bilateral bargaining.

It is not clear if auction pricing results in a Pareto Optimal distribution of products and resources. Theoretically, recontracting or Walrasian tatonnement is necessary for general equilibrium price formation. Auction sales are sequential and seldom include procedures for repricing or cancellation of early sales if prices in those sales deviate appreciably from the apparent market equilibrium price level. Where repricing or cancellation procedures are not provided, deviations in early sales prices from equilibrium price levels established during the course of the sale may be viewed as evidence that recontracting has not occurred and thus, that prices are not Pareto Optimal.

On the other hand, many auction markets provide reoffer options for buyers or facilitate private transactions among traders at the conclusion of the auction. These allow people who traded early in the auction to retrade if an early sale or purchase is perceived to depart significantly from the equilibrium price that emerges over the course of the auction. In essence, this is recontracting. One could view any trades made during the course of the auction which are not subsequently recontracted as being perceived by

traders as reasonably accurate reflections of market conditions at the time of the transaction and thus, as valid trades in the process of evolving toward a market equilibrium. As such, they could be interpreted as Walrasian tatonnements, or gropings toward the Pareto Optimal equilibrium.

Considerable attention has recently focused upon the extent to which the type of auction affects the auction results. This interest has been stimulated by the very large sums of money involved in auctions of oil and gas leases [4]. Some argue that the descending auction causes buyers to bid higher prices than in an ascending auction because, in the former they tend to overestimate what competitors will pay while in the latter the winning bid needs to be only one price increment more than that of the nearest competitor even though the winner may be willing to pay more. However, one experimental comparison of the two methods did not reveal significant price differences [5]. A more recent experiment indicated that prices in a Dutch auction were significantly lower than those in English auction [3].

It has also been argued that sealed bid auctions result in higher prices than oral auctions because less information on competitors strategies is available. A study of auctions of timber rights provided confirmatory evidence [10]. The nature of timber rights, which are more readily assessible to nearby mills than to others, may lead nearby buyers to bid higher than necessary in sealed bid auctions to reduce the risk of losing an advantageous tract. The opposite result was indicated in an experimental comparison [3]. The scope for bidding strategy variation appears to be greater in the sealed bid case.

Little analysis has been reported on the price impacts of the converging bid auction procedure. Because this procedure involves active price bidding

by both buyers and sellers there is probably less of a "risk premium" built into the buyers bids than in other auction systems where the sellers are more passive and reveal less information on their reservation prices and supply-price schedules. If the buyers imputed risk premium is generally positive (in order to help assure purchase) then prices in converging auctions would be expected to be somewhat lower than those resulting from other auction methods. However, this has not been empirically validated.

It has been shown that the order in which products are sold during an auction affects prices and allocations in the absence of reoffer or recontracting procedures [8]. Prices are higher and sales volume less when items are sequenced from those with the lowest reservation prices selling first, than if the sequential order is reversed.

Much attention has been focused upon the so-called "winners curse." This curse is that the successful bidder in an auction is the one who overestimates the true value of the item by the largest amount. There is, however, no evidence that auctions consistently overestimate, or underestimate, true market values for products marketed in this manner.

Advantages and Disadvantages of Auctions

As a mechanism for competitive pricing and allocation, auctions have several important advantages and limitations when compared to other exchange mechanisms such as price listing and private treaties.

Advantages. Perhaps the single most important feature of auctions is their ability to establish prices where values are unknown prior to the sale. Whenever a group of buyers can be assembled, competitive bidding through an auction procedure will result in price establishment regardless of the uniqueness of the product or the rapidity with which market conditions are changing. This explains much of their use for marketing rare and one-of-a-kind items such as antiques and works of art and products that have an irregular

or uncertain supply such as agricultural commodities and used goods. This also provides an efficient means of price establishment where product values vary significantly over time or space.

A related benefit is assurance of sale. Auctions are typically structured in a way that maximizes the liklihood that a sale will occur. The ability to lower the bidding price level until a buyer is found is the key, assuming the seller has a correspondingly low or no reservation price. This helps explain their use for selling distressed merchandise, perishable products and forced liquidations. It also makes auctions a viable pricing mechanism during temporary market gluts.

Auctions also provide a public view of trading, or in essence become a window to the marketplace. Because they depend upon broad participation by both buyers and sellers for effective operations, they are by nature open markets, operating in plain view. The results of trading are clearly observable, as is the trading process itself in all but the sealed bid auction. Furthermore, nonprice terms of exchange are usually standardized and well known, thus there is little that affects value which is hidden from the pricing process. As a result, auction pricing can provide a useful price base for other market transactions such as private treaties.

Other benefits include prompt delivery, specified payment requirements, reservation pricing options for sellers, and flexibility in bidding strategy.

Disadvantages. There are some aspects of auctions which limit their use. Perhaps one of the most important limitations is timing. Auctions require that a group of buyers be ready to purchase at the same time. However, buyers of some products have unique purchase schedules. Most consumer goods and many industrial components are examples. Price listing is more compatible with such "buy-when-you-want" type marketing.

Auction purchasing usually requires quick action and prompt financing by buyers. Many big ticket purchases such as real estate, automobiles and capital goods demand longer term planning and are often inclined toward bilateral negotiations. Additionally, auction goods are normally sold on a caveat emptor basis and thus are not particularly well suited to the marketing of products where performance warranties are of critical importance. Auctions are also a relatively slow process for making routine sales of products whose values are fairly stable.

Some traders may consider the public nature of trading information in auctions as a limitation to their use, particularly where control of information can be used for private gain. Local monopoly or monopsony situations are examples. Other problems that must be considered include potential buyer collusion, unethical auctioneering tactics (such as price trotting, using phantom bids and merchandise switching), determining appropriate starting prices for descending bid auctions and length of bidding periods for sealed bid auctions, determining when the highest bid has been made in an ascending bid auction, and breaking ties in the simultaneous and sealed bidding systems.

Recent Developments

Auctions have traditionally been assembly markets, assemblying the products to be sold in one location and bringing the buyers together at the same location both to inspect the products for sale and to engage in competitive bidding. For unique and one-of-a-kind items, this assembly and inspection process is probably essential.

However, it is both expensive and time consuming to transport large numbers of products and buyers to central auction locations. Many products sold at auction are fairly standard in quality or at least can be placed into groups of consistent quality and described verbally and/or pictorially.

This allows products to be sold by description rather than by personal inspection. Description selling eliminates the need for physically assemblying products and buyers at one location.

Electronic devices have been used for bidding by assembled buyers in both Dutch clock and Japanese simultaneous bid auctions for several years. More recently, electronic capability has been extended to buyers located remotely from the auction house, thus facilitating the auctioning of products by description to a network of distant buyers at separate locations. Remote computer terminals, teletype repeater networks, and even common telephones have been used for this purpose. Corporate securities and several agricultural commodities including eggs, hogs, feeder pigs, lambs, cattle and cotton are being sold on such electronic auctions in the U.S. and Canada. The feasibility for more extensive applications is currently undergoing thorough analysis.

Electronic auctions offer the potential advantages of speed, broader market coverage, lower travel and transportation costs, easier market access and more rapid and complete information dissemination compared to more conventional assembly auctions. Any of the auction bidding strategies can be adapted, and electronic bid identification can virtually eliminate tie bids. They do require the development of clear and comprehensive descriptive criteria and terminology for products traded, more precise trading rules, and a high degree of trader integrity.

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