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Auction Pricing and Market-Space Competition

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1. Trading through Auctions

The volume of trading carried out through auctions has increased over the last few years as information technology has spread ever further and data transmission connections have improved. This resource allocation method originate long time ago[1], but has recently been the subject of growing interest on the part of markets[2] and the academic community. In short, an auction is a tool used to determine the exchange ratio, that is the price to be paid for goods, services or rights. Such a price can be quantified either in strictly monetary terms or in terms of obligations. In this sense, the role of an auction is either to allocate or distribute something, depending on the object: an auction could involve several suppliers in the buying of goods or airlines bidding for landing time slot availability at airports. The goal of an auction is either to maximize the income from a sale (or minimize the cost of a purchase) or distribute resources amongst several parties who are entitled to them.

Clearly the auction system is an alternative to the so-called 'take it or leave it' offer in a normal sales situation in which the seller sets a posted price and buyers decide whether to accept or reject the deal each time. Most goods sold and services provided (including for example our normal everyday purchases) have a price set by the seller, who tries to determine the most effective sales conditions to maximize revenue[3].

In markets characterized by excess of demand with respect to supply[4], the price (or tariff, when it is established by law) is determined mostly on the base of the cost structure (Guatri 1951, Dean 1951), plus an amount assigned to investment payback and profit (cost-oriented prices).

In markets subjected to competitive pressure, the offering differentiation process tends to adjust products to the requirements of demand, by measuring the value of a product, or of its individual components, as perceived by the customer, and setting the price accordingly (Valdani 1989, Busacca-Costabile-Pasini 1993, Dolan-Simon 1996). Once the variables most relevant to the customer have been singled out, price differentiation is implemented between groups characterized by

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different features or a willingness to pay the price for the various offerings (demand-oriented prices).

In a competitive situation, dominated by differentiated offerings, the development of different product versions aims to capture buyer preferences as much as possible (and then convert them into monetary value). 'The spatial element becomes essential as potential demand is closely associated to it'[5]. This means that the choice of location for company premises is crucial (especially for businesses providing services where the premises are the point of contact with the public) as it changes the value assigned by the customer and stimulates a 'competition in space terms'[6] amongst businesses (competition-oriented prices).

An epochal evolution has taken place in competition dynamics since the mid-nineties. Today, most markets are characterized by over supply and hence the presence of un-saleable goods. In particular, it has been observed that electronic commerce and communications provide complete information about various offerings, thus reducing the potential for differentiation and innovation, weakening the barriers to market entry and creating a loss of buyer loyalty in buying behaviour (Lambin, Brondoni, 2000-2001).

'In today's international dominance of over supply, 'hyper-competition' strategies are based on new paradigms, in that highly profitable businesses are only those that are able to shape an offering innovatively and create consumption 'bubbles'. These businesses manage to satisfy the 'bubble' before the competition does (time-to-market) and abandon them at the right time (time competition)'[7].

From the point of view of business management, 'weak bi-directional communication'[8] in which top management sets prices, the operational units apply them and then report back with information over the medium-long term concerning deviations from the planned goals, is not good enough anymore.

Today, the centre of gravity for the relationship between strategy and operations must be repositioned by:

a) Understanding the new market coordinates (market-space management).
b) Making decisions continually (time-based competition).
c) Allowing for increased independence of the operational system within more sophisticated planning.
d) Setting up a powerful information system.

Consequently prices become 'dynamic', governed by variables chosen more and more by the customer (demand- chosen prices).

The development and spread of auctions is precisely an example of this phenomenon, as the seller can decide to implement different forms of sale in different markets. He also may deem it more efficient not to set the price of the transaction but to let buyers indicate on the conditions they are willing to accept to make a purchase. The immediate effects of the adoption of more evolved price determination systems are, for example, price customisation, in which each customer pays a different price depending on the competitive conditions (in relation to both supply and demand) at the time the deal takes place and a broadening of the competitive space with Internet as the dominant market.

2. Types of Auctions

Without going into the theory of auctions, a topic investigated well enough by academics[9], it is at least necessary to clarify that the traditional auction procedures are categorized based on the type of goods auctioned (single and indivisible or uniform and divisible), on the auction format (sealed bid or sequential) and on the sale price[10]. The sale of a painting organized by a famous international auction house is an example of single, indivisible goods, while a specific quantity of airline or sport tickets represent homogenous goods that can be divided amongst several buyers.

The pursuit of efficiency requires that goods be sold to the buyer who assesses their value highest, even if this does not necessarily coincide with maximizing revenues from the sale. Corrections can also be introduced to preserve so-called social benefits, for example preference for a winner in order to avoid concentration or for other purposes.

The traditional auction methods are as follows:

- *First price sealed bid*. In this auction mechanism the bidders make their offers simultaneously, i.e. the price they are willing to pay the seller. The goods are assigned to the bidder who makes the highest bid, at the price he indicated.
- *Second price sealed bid,* or Vickrey auction, named after the Nobel Prize winner who determined the efficiency of the method in the sixties. Unlike the previous case, the goods are assigned to the bidder who makes the highest bid, but the price paid is that indicated by the second-highest bidder.
- *English auction*. This is the most common type of auction that is also used by the famous auction firms such as Christie's. It is conducted by an auctioneer who continues to foster ever-higher bids until no further bids are made.
- *Dutch auction*. Same as the English method but with decreasing bids.

It is important to point out that the auction mechanisms also differ in terms of the information available to bidders. In English auctions, bidders know the bids as they are made by participants right up to the final assignment of the goods. This does not happen in Dutch auctions, where the auctioneer keeps lowering the price until a bidder declares his willingness to buy. In the former case, the bids made by the other bidders can be used to make decisions. In the latter case, these bids are only known to each bidder.

The theory of auctions formalized the Theorem of equivalence of revenues for the different mechanisms. However, the result is true only as long as a single object is offered (object or service) and the bidders make private bids. In certain circumstances, bids are considered common instead of private for technical reasons such as the cost structure or because of collusion amongst the bidders.

'If the goal is the maximization of revenues, the presence of common bids suggests that English auctions be used. The presence of collusion makes the single-stage mechanisms more attractive, while risk aversion favours first price mechanisms'[11].

3. Online Auctions

In traditional auctions both sellers and bidders gather at the same place at a certain time, set in advance and communicated to all potential participants. Once the rules have been explained, the auction takes place. Clearly, the mere attendance represents a cost for all participants, if only because of travel expenses and transportation costs for the goods to be traded. Inevitably, the number of participants is limited to people who can be present physically (or through a proxy) at the auction site. Presumably both the cost and the inefficiency of the system affect the sale price or reduce the seller's margin. In terms of time, the transfer of goods or services happens rather quickly once the administrative auction procedures have been completed.

Apart from this 'classic' method, auctions that exploit the potential offered by digital technology and the Internet have recently become common practice:

> □ *The first Internet auction took place in May 1995 on the Onsale site, followed in September by the eBay.com site. Initially, Onsale sold its own goods like any other point-of-sale. After 1997, it then followed eBay's strategy and allowed the public to publish its own for sale notices in return for a publication fee (US$ 0.25 to US$ 2) and a small percentage of the sale revenue: all expenses were thus charged to the seller. In July 1999, eBay hosted almost 10 million auctions, representing a trading volume of about US$ 190 million*[12].

This trading system is remarkably efficient. First, the number of potential buyers is expanded, and hence also the number of goods traded. Some objects that are virtually un-saleable in limited local circles, may turn out not to be so when a larger number of potentially interested parties can be reached. Second, buyers can acquire detailed information about the goods for sale and about the other bidders. (Lucking-Reiley D., 1999). New intermediaries appear and 'facilitate the meeting of supply and demand (aggregators), and stimulate commerce by creating markets where they did not exist before (exchanges)'[13]. Unlike traditional auctions, online auctions can last for a long time, as long as bidders keep raising their bids[14].

Initially the goods traded were mostly collectibles and antiques, such as coins, stamps, jewellery, software or electronic components (Lucking-Reiley D., 1999). However, the auction mechanisms rapidly spread to providers of services: auctions are especially suited to this business sector, defined by limited capacity and the absence of stocks.

Online system users are not only, of course, individual buyers, business-to-business trading is also widespread.

Competitive conditions drive modern businesses toward an unending search for more effective ways to relate to their main markets, and the excess of supply characterizing the current environment makes such a search especially urgent.

> □ *COOP Italia, in this case acting as the buyer (reverse auction), plans to reduce supply costs by 10% with the introduction of WWRE*

(World Wide Retail Exchange)[15] *auctions. General Electric saved US$ 480 million in the year 2000*[16].

Today, the development of digital technology represents a new great opportunity for most market-oriented businesses to increase the value of their offering. This technology offers great potential for managing the flow of information and allowing the customisation of products to meet individual customer needs. Examples are found amongst service providers (telecommunications, financial services, logistics, …) but also in other sectors (for example, in publishing and component production).

4. Conclusions

The development of digital technology was thought to lead to markets that were very similar to the models characterized by perfect competition[17], because of the ease with which customers can access information and compare competitive offerings and prices, the reduction in transaction and transition costs, increased competition and the appearance of new digital intermediaries.

In reality, a general reduction in prices has not taken place: businesses have instead tried to use information (now available in real time) to determine the price that most closely matches what prospects customers are willing to pay[18] in each market sector. For example, Coca-Cola has recently introduced vending machines that change the price of beverages according to weather conditions.

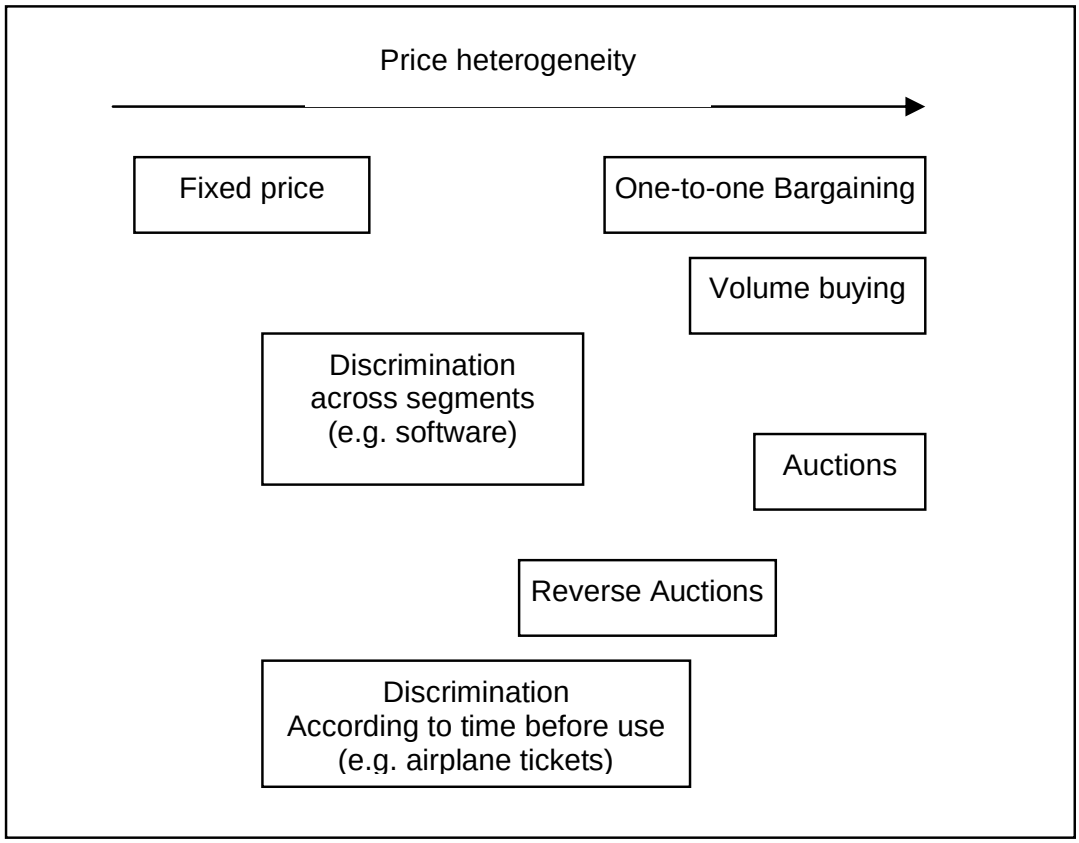
It is known that products are interchangeable within a situation of perfect competition, and thus companies have almost no power to influence market prices. This fact has lead to attempts at differentiating offerings to strengthen the relationship with customers by offering more value - and even through price heterogeneity. The weak form of dynamic price setting, characterized by prices changing over time, is complemented by stronger forms, with prices changing over time but also in relation to individual customers (Reinartz 2001). On the other hand, sensory stimuli are less relevant for online transactions compared to offline purchases, and the buyer tends to concentrate on aspects that require greater cognitive effort, such as brand and price[19]. Online auctions are particularly appealing as they allow the offering of products and services at completely flexible prices set by the customer.

□ *Connecting to www.ebay.com makes it possible to take part in auctions to buy airline tickets or entire holiday packages. A customer can see the current bid and then decides whether to make a higher bid or proceed to another auction. Most important, a customer can indicate his or her price (reserve price), thus allowing the operator to automatically raise the bidding until the auction reaches that price level. At that point the customer is informed and must decide whether to then raise the bid or abandon the auction. Visitors to www.priceline.com are immediately asked what price they intend to buy at, so as to offer deals only at the price required.*

From the management point of view, 'the seller is released from the responsibility of setting a price for an item for which demand is uncertain'[20]. At the same time, one cannot disregard the fact that there is a new kind of consumer to contend with, a consumer who feels empowered by excess supply and the growth in consumer associations, remarkably professional and competent in making buying decisions and oriented toward a new set of values (Lambin, Brondoni, 2000-2001).

Figure 1 below shows several price determination methods set out according to the level of price heterogeneity. Customer price acceptance seems to be very high for the extreme levels (fixed price and one-to-one bargaining) and much lower in the intermediate configurations. The acceptance level is influenced by the propensity to risk and the level of buyer experience (Puntoni, 2002).

Figure 1: *Level of Price Heterogeneity*



Source: Puntoni S., 2002.

In summary, one can state that in over supply situations where there is no separation between markets, such as the present competitive situation, firms have to face the competition by trying to exploit price volatility and erode previously acquired dominant positions. In such a context, price is a crucial ingredient within the offering. In fact, the composition of an offering is, more and more often, being entrusted to the customer who can choose his/her starting sector for each purchase by taking advantage of communication technology developments.

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Notes

[1] Auctions were used to trade cattle and slaves for the most menial jobs, or to marry off women. Recently auctions were used to assign offices to academic staff at the University of Arizona, radio frequencies to the various Italian and international mobile phone companies, and TV program rights. See Gilli M., 2001, I giochi e lo scambio. Elementi per una discussione sull'uso delle aste nella teoria e nella politica economica, in Economia e Politica Industriale, no. 110.

[2] In 1999, 63 million adult Americans declared awareness of eBay, the biggest online auction Internet site: See *Business Week*, 31 May 1999.

[3] 'Certainly the role of price is much more complex, as besides determining profitability it acts as a stimulus to demand by affecting consumer behavioural choices (Costabile, 1992; Ostrom e Iacobucci 1995), perceived value (Zeithaml, 1988), quality (Monroe, 1973) and the ability to attract and be retained in memory (Monroe e Lee 1999)'.

[4] According to the framework adopted here and based on work by S.M. Brondoni, markets (allowing for the necessary distinction between products) exhibited an excess of demand until the end of the fifties. After this so called economy of scarcity, a period of balance between supply and demand followed, called the Welfare State, from the sixties to the nineties.

[5] Vicari S., 1983, Imprese di servizi e politiche di mercato, Giuffre, Milan.

[6] Vicari S., 1983, *op. cit.*

[7] Brondoni S.M. 2002, preface to G. Cappiello, Politiche di prezzo e concorrenza basata sul tempo, Giappichelli, Turin.

[8] Golinelli G.M., 2000, L'approccio sistemico al governo dell'impresa, Cedam, Padova.

[9] For an extensive bibliography on the subject, see Gilli M., 2001, *op. cit.*

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[13] Ziliani C. 1999, E all'Asta manderemo il nostro agente, *Industria&Distribuzione*, no. 0.

[14] A single auction lasts between three and ten days. See Lucking-Reiley D., Bryan D., Prasad N., Reeves D. 2000, Pennies from eBay: the determinants of price in online auctions, working paper.

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[20] Lucking-Reiley D., 1999, *op. cit.*