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By *Christian Ewerhart*

The paper documents and discusses bidding behavior during the Dutch UMTS auction as part of the political process between government, regulatory authorities, and telecom firms. The background information provided in the discussion is impressively comprehensive, and so the paper makes in particular a very interesting case study. The piece is also part of a larger research program (see, e.g., van Damme 2001a; 2001b) in which the author describes and analyzes various aspects of the Dutch mobile phone license auctions.

The main contribution of the paper is probably that it puts the design of license auctions into the necessary broader context. As a matter of illustration, I will mention only two examples here, both of which are related to the unfortunate fate of market newcomer Versatel, but both of which also point towards questions that, as I believe, call for clarification. To start with, it is reported that, once the decision in favor of the five-license design had been made – which was apparently at least in part due to lobbying efforts by the market leader in the 2G-market KPN – the entrant Versatel had no chance whatsoever to profitably outbid any opponent. From a naive point of view, this is just unfair. However, from a more critical perspective, this example puts into question an ingredient of the standard methodology of auction theory, at least for the case of license auctions. As the case study shows, when he stakes are sufficiently high, it is not always realistic to assume that the design of an auction is performed – or an ”independent” consultant is chosen – by a benevolent government.

Another story illustrating my previous claim is the description of Versatel’s cold-blooded strategy to increase the price level in the auction to the detriment of the other bidders. This story is probably interesting just for anybody who is intrigued in view of ingenious strategic behavior. However, I found this story also interesting because it illustrates very clearly the vulnerability of non-cooperative theory with respect to “collusive” behavior.

While the paper touches upon so many more interesting issues, such as signaling, insider trading, etc., I would like to focus the rest of this discussion on just one somewhat unexpected feature of the bidding behavior hat is well documented in the paper, but for which no explanation is offered! The reader will recall that there were two types of licenses, large and small, for sale in the Dutch

UMTS auction. So bidders, when being asked to submit a new bid, had to decide whether to bid on a small or on a large license. This decision may not be straightforward because, at any given round, the price level P_L that is necessary to acquire a large license will in general differ from the price level P_S that is necessary to acquire a small license.

In many settings, the following "benchmark strategy" seems appropriate to facilitate this decision. Let ΔV_i denote the additional value of a large license over the value of a small license for bidder *i*. Then it appears plausible that bidder *i* should place a bid on a large licence whenever $P_L - P_S \leq \Delta V_i$, and bid on a small license otherwise. This strategy, which is very much in line with economic intuition, has been suggested first by Börgers and Dustmann (2002). Somewhat surprisingly, however, bidders in the Dutch auction did not follow this rule. Rather, the valuation spread, especially for Telfort and Libertel, turned out to grow over the course of the auction.

To cite the relevant passages from the paper: "up to round 278, T[elfort] prefers to bid on a large lot as long as this is not more than (approximately) 600 more expensive than bidding on a small one, however, in round 278, the price difference is approximately 700 and T bids on [a large license]. In round 282, the difference is 900 and then T bids on a small lot." And then: "In the first part of the middle phase of the auction, L[ibertel] bids on the smaller lots when [the larger licenses] are not more than 535 more expensive, when prices reach higher levels, L is, however, willing to pay a premium of more than 800 for a large lot."

The comment in the paper is that "it is somewhat difficult to pin down the player's indifference curve."

As I now want to argue, the observed behavior may be rationalized when bidders are uncertain about their valuations and make some simplifying assumptions about their strategic problem. Specifically, firms might have had a comparatively accurate idea about the size of the investments that the new technologies would require, but a less clear picture on prospective demand. Let C_L and C_S be the expected net present value of investments necessary to realize a 3G business on the basis of a large and a small license, respectively. Similarly, let $\tilde{R}_L$ and $\tilde{R}_S$ denote the net present value of uncertain future revenues that would result for an owner of a large and a small license.

For simplicity, I will assume – in the spirit of Milgrom's (2000) notion of straightforward bidding – that at any stage, a bidder maximizes utility conditional on the case that his bid will end the auction. In the simplest case, when $\tilde{R}_L$ and $\tilde{R}_S$ are independently distributed, the benchmark strategy is in fact optimal in the above sense, where

$$\Delta V_i = E\left[\tilde{R}_L\right] - C_L - \left(E\left[\tilde{R}_S\right] - C_S\right) \tag{1}$$

However, the independence assumption, between types as well as between licenses of different size, appears somewhat unrealistic given the common nature of the business that will be persued with the licenses. I will therefore assume now that $\tilde{R}_L$ and $\tilde{R}_S$ are perfectly correlated in the sense that bidders assume

$$\tilde{R}_L = (1-a)\tilde{R}_S \tag{2}$$

for some constant $a > 0$. Under this condition, one would have

$$\Delta V_i = aE\left[\tilde{R}_S\right] - \left(C_L - C_S\right). \tag{3}$$

Given that the license holders operate in the same market, one expects also a strong common value component in the bidders' individual valuations. Under this condition, observing a high price level in the auction would generate a higher conditional valuation for a bidder, so that $E\left[\tilde{R}_S\right]$ would be increasing during the auction unless a bidder exits. Since there were only six bidders for five licenses, an exit could not happen during the auction, however. From (3), one can see therefore that the behavioral valuation differential ΔV_i would be increasing over time. But this is the behavior that the author documents in the Dutch UMTS auction.

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