Billions from auctions: Wishful thinking

Six weeks ago, the auction in the UK of UMTS frequencies, the third-generation mobile telecommunication system, was closed. The auction yielded some GBP 22.5 billion (NLG 85 billion). In July, the Dutch UMTS auction will start. Just like in the UK, five licences will be auctioned simultaneously, and bidders will not be allowed to acquire more than one licence. The Dutch Minister of Finances, Gerrit Zalm, expects to gain NLG 20 billion from this auction, an amount of money that is based on the rule of thumb used frequently in this sector, viz., that 1 pound sterling in the UK equals 1 guilder in the Netherlands.[1] With this estimate, the Minister (and politicians and specialists with him) assumes, wrongly, that existing differences in the structure of supply and demand do not play a role and that a type of auction functioning well in a particular situation will also function well in another. In a recent paper, Paul Klemperer, co-designer of the British UMTS auction, points to the risk that a simultaneous public auction in several stages may turn out wrongly in situations in which certain potential bidders have a (small) advantage over other bidders.[2] The risk exists particularly when the number of licences to be auctioned equals the number of bidders with an advantage, which is the case in the Netherlands. A first-price, closed-bid auction is a better option in such a case.

Intuition suggests the following.[3] Assume that there is one licence to be auctioned and that there are two bidders – one insider and one outsider. Neither bidder knows the precise value of the licence. For the insider, however, the licence is worth somewhat more than for the outsider. In theory, this enables the insider to continue bidding somewhat longer than the outsider. Assume that the outsider intends to continue bidding until B. What is his expected profit and what is the optimal B? If the insider goes beyond B, the outsider's profit is zero. If the insider stops bidding before B, he obviously is of the opinion that the licence is worth less to him. But in that case, it is certain that it is worth less than B to the outsider. For each positive B for the outsider, there is an expected loss. According to the logic of Akerlof's lemons story, the outsider's optimal bid equals zero. In this type of auction, the insider wins and pays the outsider's bid: zero. For an auction of five licences with five insiders and an arbitrary number of outsiders, the same argument holds. The total proceeds of the auction equal zero!

In a first-price, closed-bid auction, the auction proceeds will, however, not equal zero. It is not optimal for the outsider to bid zero, as a winning bid greater than zero yields unexpected profit. Two factors play a role here. First, the insider is now not able to follow an all too aggressive strategy; in a first-price auction, he will have to pay what he bids in case he wins. The chance that the outsider wins the licence thus increases. Second, the risk that the outsider himself bids too high is diminished because he, in his bidding, already takes into account the winner's curse: the phenomenon that the one who wins the auction will be the one who overestimated the value of the commodity. This turns the outsider into a prudent bidder and decreases the chance of a loss.

In the Dutch UMTS auction, the five existing mobile telephone companies (KPN, Libertel, Telfort, Dutchtone and Ben) have an advantage over potential newcomers. For in launching a UMTS service, they have the possibility – in contrast to the potential newcomers – to offer their clients access to the existing services through their GSM networks. Following Klemperer's reasoning, the existing mobile telephone companies will be prepared to continue bidding somewhat longer than the newcomers. Thus, the newcomers will suffer an unexpected loss for every winning bid. They will, therefore, be reluctant to fight seriously for the licences. The existing companies will, therefore, obtain the licences at a low price.

Why then were the British successful in their auction? The answer must be found in their specific auction design, in combination with the fact that there were only four existing mobile telephone companies competing. One licence was reserved for a newcomer; the existing bidders were not allowed to bid on this. The auction was designed in such a way that the other four licences could not be sold at a lower price per MHz than the price per MHz of the reserved licence. In this auction, each of the existing companies was able to obtain a licence – not surprisingly, in light of Klemperer's theory!

In order to stimulate newcomers and to generate considerable auction proceedings, the Dutch government should have increased the licences to be auctioned from five to six or, as in the case of the UK, should have reserved one licence for a newcomer. The government could have opted for a first-price auction.

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1. 'Telefoonfrequenties leveren miljarden op' (Telephone frequencies yield billions), *NRC Handelsblad*, 1 May 2000.

2. P. Klemperer, 'Applying Auction Theory to Economics', discussion paper Oxford University, May 2000.

3. See also M.A. Haan, 'De vloek van de belanghebbende bieder' (The curse of the interested bidder), *ESB*, 7 May 1999, p. 354.