

Discussion

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This paper describes the rules employed by the 15 countries in the European Union to decide, first, the number and type of third-generation mobile telephone licences to be sold and, second, the allocation mechanism among the potential buyers. The rules employed for each of these decisions can be roughly divided into two categories: 'bureaucratic' (i.e. determined by a public official) or 'auction' (i.e. determined in a competitive bidding process). Contrary to the standard classification, the authors argue that the process can be bureaucratic in the first stage and competitive in the second stage. Their main conclusions are: (1) governments have not been able to extract from the consultants all the information they possessed about the optimal partition of the spectrum; (2) bureaucratic procedures have not been less fair and transparent than auction procedures although (3) they have raised a substantially lower revenue and can be criticized by their inability to enforce the commitment of the applicants to their submissions; (4) some of the observed behaviours of bidders are hard to reconcile with the predictions of auction theory.

Overall, this is an enjoyable, easy to read, and informative study. The paper is very systematic, the arguments are well presented and the authors try to avoid an '*ex post* rationalization' of the observed behaviours. However, I was disappointed by the highly descriptive nature of the paper. I was hoping to see a model and/or an empirical analysis. Instead, there is only a description of different procedures grouped into categories and a careful interpretation of some of the observed facts. Furthermore, given the scarcity of data and the generality of the question (two problems for which we obviously cannot blame the authors) many conclusions are tenuous. I will now proceed to a brief discussion of some of the points made in the paper.

First of all, it is very frustrating to read a paper in which the objective function of one of the main players (namely the government) is not specified. It is certainly not the fault of the authors if each government can have a different objective and they all remain deliberately vague about the goals of the licensing award process (as it is clear from the quotes provided in the paper). Naturally, the overall function can only be a combination of the following criteria: surplus of consumers, profit of firms and revenue of government. However, every decision is going to affect each of these objectives differently. Therefore, it is very difficult, even impossible, to compare the expected and realized outcomes if the weights are not well specified.³¹ It would have been methodologically more satisfactory if the authors had stated what they believe

³¹ As an extreme (and obviously caricatured) case, suppose that the government only cares about the profits of firms. In that situation, lobbying cannot be considered as an unexpected or undesirable outcome.

is the objective function of the different governments and then used it as a benchmark for comparison. In that case, we could debate on whether it is a sensible and realistic choice of objective function. More importantly, we would have had a benchmark (however imperfect) for comparison.

I find the distinction between the first stage (determination of size and number of licences) and the second stage (allocation of licences) extremely interesting. It is very striking that all the governments that decided to have a bureaucratic procedure in both stages chose an almost identical partition of the spectrum, whereas the governments that decided to have a bureaucratic procedure only for the first stage chose very different partitions. I miss in the paper an interpretation of this fact. In my view, it could indicate that the incentives for lobbying the government in the first stage depended on the type of contest in the second stage. Incumbents might have found it desirable to persuade their government to increase the size and limit the number of licences when they anticipated that they had a good chance of being selected and the price was going to be fixed (beauty contest). By contrast, when they knew that they would have to bid for the licence in the second stage (auction), they probably anticipated that the government would capture in the bidding process most of the rents due to any restriction of competition.

One of the conclusions of the lobbying analysis is that consultants did not provide all the information they possessed about the optimal partition of the spectrum. It is hardly surprising to learn that interested parties strategically withheld information. However, a different issue is to know whether governments were able to deduce all the relevant information from the one received. A related issue (which goes back to my previous remark) is to understand why countries chose radically different partitions. One would think that the optimal partition (in efficiency terms) should be very similar in all countries. After all, it is mainly a matter of how much spectrum firms need to operate satisfactorily. It is then quite surprising to observe not only a wide range of choices but also a lack of coordination and communication between governments on this matter.

The analysis of bidding behaviour is, from a methodological viewpoint, somewhat unsatisfactory. The authors assume 'straightforward bidding' of firms. Then when NTL Mobile does not bid according to the predictions of this strategy they conclude that the firm 'had significant uncertainty about the value of incremental spectrum, and that it changed its mind about this value during the auction'. In my opinion, there is a big gap between the observation that a firm did not bid straightforwardly and the conclusion that it changed its valuation during the auction. In Section 6.3 the authors agree that firms might very well be following other (rational) bidding strategies. Unfortunately, the paper does not provide a theoretical model comparing in a systematic way the different predictions of the different strategies.

Related to that point, it seems that the authors have strong feelings against 'strategic bidding' of firms as a way to raise the rival's price. At some point, the authors state: 'governments do not seem to have found effective countermeasures yet'.

Yet it is not at all clear to me why strategic bidding is problematic. The authors argue that, under incomplete information, this strategy increases the *ex post* likelihood of winning by mistake (that is, without having the highest valuation). Yet, it is probably optimal for firms to bid this way, otherwise they would not rationally do it. Since the *ex ante* approach is obviously the appropriate one, my guess is that whether 'strategic bidding' is desirable or harmful from the government's viewpoint will crucially depend on its primary maximization criterion (consumer surplus, profit of firms or revenue of government). Once again, in the absence of a better sense of the government's objective function and a theoretical model, I find it difficult to make conclusive assertions about the desirability of eliminating that or any other behaviour.

I found especially interesting the section on 'beauty contests'. One conclusion of the paper is that this bureaucratic method worked relatively well: it has been problematic only in achieving commitment of the applicants to their submissions. I agree when the authors say that this is highly surprising for economists. Yet, from my reading of the paper, I would tend to be less optimistic about the average performance of this procedure. First, because one of the main criteria in determining if the method works well is precisely based on how successful it is in inducing firms to keep their promises.³² Second, because beauty contests have generated systematically lower revenues. I agree with the authors that it is difficult for governments to assess accurately the firms' willingness to pay (which is precisely the reason why some governments opted for the auction mechanism). I also agree that revenue maximization may not be the unique objective and that overestimation of the firms' valuation can be welfare damaging because it may end up generating an excessively concentrated industry, as in the case of France. However, differences in revenue like those shown here can only be explained either by lobbying or if the only argument in the governments' objective function is the maximization of the firms' profits. To my view, and at the risk of sounding somewhat radical, the two explanations are quite similar.³³

Building on this last comment, let me conclude with a suggestion for the future design of procedures to award licences. From the analysis of this paper, it seems that a basic distinction between the bureaucratic and the auction procedures is that only the former can take into account the identity of the bidder (which is good because the public official can then determine important factors such as the expected quality of the service, the likelihood that the firm will comply with the roll-out obligations, etc.). This has to be traded-off against the fact that the auction is best at revealing the willingness to pay of bidders. If this claim is correct, it should be possible to design a multi-dimensional auction in which firms submit proposals that include both a bid and details of the service (coverage, etc.) and governments do not commit to award

³² The case of Telenordia and Orange in Sweden is the perfect example of why allowing *ex post* renegotiation between firms and government is just a form of inefficient and unfair lobbying.

³³ Note that the revenue raised with the sale of licences is a form of non-distortionary taxation of firms. So, even if the government does not incorporate maximization of revenue as part of its objective function, as long as it is partly concerned with consumer's welfare, it necessarily has to value this revenue.

the licence to the highest bidder. It would then be very similar to the beauty contest, with the exception that the government would partly extract the bidders' willingness to pay for the licence. This means that the mechanism would then combine the strengths of both methods.

All in all, I think this is a very valuable and informative paper that anyone interested in the auction of telecom licences should read. I am also convinced that the lessons drawn from this analysis will be extremely helpful for the future design of licence award procedures.

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The allocation of spectrum rights for UMTS in Europe provides a wonderful research area for economists. By now more than 20 European countries have issued licences and they have done so in many different ways. There is not only the general distinction of whether licences were allocated via auctions or beauty contests. Even within both approaches, large differences with respect to size of licences, number of licences, duration of the contract, roll-out criteria etc. can be found. Tilman Börgers and Christian Dustmann have managed to make use of this variety in the licensing procedures and offer very interesting insights into European UMTS licensing. Whereas most papers so far have focused on design and outcome of auctions, the present paper widens the scope by including bureaucratic procedures.

This innovative approach yields particularly valuable insights into the political economy aspects of licensing. It allows the authors to deal with important questions such as: did incumbents benefit from favouritism in beauty contests? Did incumbents lobby for fewer licences to achieve a more concentrated market for mobile telecommunication services? Did potential licensees strategically withhold information from the government to influence the design of licensing procedures in their interest? As already said, the paper provides fascinating views on the outcome of the European licensing process. Nevertheless, there are several instances where the authors could have exploited the available information more efficiently to gain additional insights.

Auctions

When it comes to evaluating auction outcomes, the price paid per head of the population is often taken as an indicator of success – at least in terms of revenue. Börgers and Dustmann also use revenue data to evaluate whether auction outcomes are in line with predictions from auction theory (e.g., the effect of the number of bidders on revenue, revenues in open ascending auctions versus in sealed bid auctions). However, when undertaking cross-country comparisons of the outcome of European UMTS auctions, one should keep in mind that the differences in revenue are driven by two clearly distinct effects. One effect stems from variations in the auction design which influence revenues via entry of bidders and bidding strategies.