

AUCTION OF H BLOCK LICENSES:
COMMENT ON PROPOSED COMPETITIVE BIDDING PROCEDURES
FOR FCC AUCTION 96

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This is a response to the FCC public notice DA 13-1540, issued on July 15, 2013, announcing the intended sale of a nationwide band of spectrum in upcoming Auction 96. The proposed auction rules for this “H block” auction take the basic simultaneous multi-round auction format, and add a simple form of package bidding known as Hierarchical Package Bidding (HPB). The FCC is also considering an alternative to the standard ascending price procedure, in which the licenses would be sold in a single-round sealed bid auction, perhaps using a hierarchical package bidding structure as well.

Hierarchical Package Bidding

The proposed structure involves selling 176 Economic Area licenses in the H block, with possible non-overlapping packages in hierarchical tiers. A simple version of this approach would involve two tiers: with a nationwide license that would be awarded if the high bid on that package ends up being greater than the sum of the high bids on the 176 individual licenses. A slightly more complex version would involve 3 tiers, with a nationwide license at the top, several non-overlapping regional licenses in the middle tier, and a bottom tier of the individual EA licenses. All of these hierarchical structures have the desirable property that the winning (revenue maximizing) bids can be calculated recursively. In a 3 tier setup, for example, the highest bids on each license in a region are compared with the highest bid on the regional package, which determines the “regional revenue.” A comparison of the regional revenues with the high bid on a national license determines whether the spectrum is sold in a nationwide block or in a mix involving individual EA licenses and/or regional packages. Thus the bidding in the auction determines whether the spectrum is sold in small economic areas or in larger regional or nationwide areas.

Mitigating Exposure Risk

A hierarchical package structure gives smaller companies a chance to bid on “bite size” licenses, but it also offers major providers the chance to establish a regional or national footprint with a winning package bid. This flexibility should enhance economic efficiency, since bidders for packages do not face the “exposure” risk of bidding high for a group of licenses and only winning a subset of them. The exposure risk is present whenever there are value “complementarities” in the sense that the value of a package of licenses is greater than the stand-alone values of the individual licenses in that package. Numerous laboratory experiments with financially motivated human bidders confirm that

efficiency and revenue are enhanced by permitting package bidding in settings with such value complementarities.

Mitigating the Threshold Problem

A key component of an ascending price auction is the role of prices that signal how high bids need to go in order to be competitive in the next round of the auction. If all provisional winning bids in a given round are for individual licenses, then those bids become the “prices” that (together with bid increments) determine minimum bids in the subsequent round. More interesting is the case where a package bid is winning, and the high bids for the licenses contained in that package must be scaled up so that they sum to the provisionally winning package bid. In this case, the high bid on the package determines the package price, and prices of the licenses it contains are such that bidding activity on all of those licenses will produce a sum that is competitive with the provisionally winning package bid. In this manner, the prices mitigate the “threshold problem” that small bidders encounter when faced with a high, provisionally winning package bid.

Mitigating Coordination Failures among Smaller Bidders

Another advantage of the specification of pre-defined, non-overlapping packages is that bidders at the local and regional levels are more likely to avoid overlaps that prevent them from mounting a strong challenge to a winning package bid. For example, suppose that there is one bidder with interests in all licenses A, B, C, D, E, whereas the other bidders are more interested in licenses at either the low or the high end of this list, perhaps due to budget constraints or complementarities with current holdings. If possible packages are fully flexible and these “regional” bidders submit bids for ABC and CDE, then the overlap at C implies that only one of these regional bids could be provisionally winning and, as a result, even a relatively weak bid on the national package ABCDE would be likely to win the round. Packages do not overlap in this manner under Hierarchical Package Bidding, so this kind of coordination failure is less likely.

There is clear evidence from laboratory experiments that formats like HPB with pre-specified package structures yield higher revenues and efficiencies than formats with fully flexible package bidding (Goeree and Holt, 2010, and Bichler et al., 2013, which are cited in the Public Notice).

Multi-round Ascending Auctions versus Single Round Sealed Bid Auctions

To summarize, the proposed multi-round HPB auction format goes a long way towards solving the “exposure problem,” especially if more than 2 tiers are used. Just as important, the use of an economically sensible pricing rule signals the needed increase in provisionally losing bids (for licenses or packages) in order to make them competitive in the subsequent round. These prices also tend to mitigate the “threshold problem” since the “overhang” that separates a provisionally winning package bid and the losing bids tends to be distributed among all individual licenses contained in the package. Finally, the use of non-overlapping pre-specified regional packages brings the synergy advantages of package bidding to mid-sized companies, with less risk of coordination failures due to overlapping sub-packages.

The advantages associated with price signals would vanish if the H block were to be sold in a single-round sealed bid auction, even if packages with a hierarchical structure are allowed. For example, consider again the 5-license (ABCDE) example given above, but now with the addition of predefined regional packages of ABC and DE. To be competitive with a serious nationwide package bid on ABCDE, the regional bidders would have to coordinate, with one of them bidding for ABC and the other bidding for DE. Two companies aware of each other's interests might be able to solve a simple coordination problem with public announcements, but the problem is much more difficult with larger numbers of bidders and a more complex license structure. On the other hand, a sealed-bid procedure does create risk if there is a major bidder that has to worry about "dark horse" challengers; this risk could have a revenue-enhancing effect.

It is important to remember that a sealed bid auction for the H Block would be a *single auction*, so results from laboratory experiments with a series of repeated sealed bid auctions might be misleading, even if the bidders' values were changing randomly from one test auction to the next. For this reason, it seems risky and ill-advised (at least in the absence of additional tests) to use a sealed bid procedure for the H block. This spectrum is a very valuable national resource, and the savings in auction costs from running a single-round auction are *de minimus* in comparison. If the FCC is concerned with avoiding a long drawn-out series of bidding rounds (which does not seem to have been a problem in the past), then one solution would be to reserve the right to announce that the next round will be the final round, and essentially end with a sealed-bid auction. It would be good to test such an approach before implementation.

Proportionally Allocated Compensation to Previous Spectrum Owners

There is a fixed amount of compensation that must be paid as a result of clearing and relocation of incumbent users of parts of this spectrum. The Public Notice specifies a formula for allocating the cost of this compensation among bidders, based on the amounts of their winning bids as a proportion of all winning bids, with some exceptions noted. This procedure is based on long standing policy, and has an alternative (population-based) formula that would be implemented if the licenses that are sold cover less than 40% of the US population. Either way, this procedure introduces some uncertainty, since the amount of the compensation is fixed and the burden on winning bidders could be high if a sizable group of licenses were not sold. This risk is even higher with a single-round sealed bid procedure. The effect of this risk might be to dampen bids and revenue. For example, with required compensation of about 108 million, it is reasonable to expect bidders to lower their bids in anticipation of the post-auction compensation cost. It is possible, however, that the compensation risk would cause auction revenue to fall by more than 108 million.

An alternative is for the FCC to announce that the compensation will be paid directly from auction revenues, with no additional payments made by winning bidders. This alternative eliminates the risk for the bidders, and which might even increase the post-compensation revenue for the government. In the unlikely event that the auction revenue falls below the required compensation, the auction could be nullified.

Summary

- The proposed multi-round hierarchical package bidding procedure is simple and transparent. HPB allows bidders the chance to acquire individual licenses needed to complement existing holdings, while permitting regional and national bidders to bid aggressively on valuable combinations of licenses, without facing extreme exposure risk.
- A structure with one or more middle tiers of regional packages offers flexibility advantages without significant increases in complexity or reductions in transparency or computational complexity.
- A multi-round format, which has been the predominant approach taken by the FCC in the past, provides price signals to bidders in a manner that can enhance economic efficiency and mitigate “free riding” responses to the threshold problem.
- The pre-specified, non-overlapping hierarchical package structure would (in combination with a multi-round setup) tend to prevent coordination failures that tend to weaken challenges to a provisionally winning package bid.
- The required compensation formulas and associated uncertainty may have the effect of reducing participation, and even a well designed auction may fail in the presence of minimal competition. The FCC should consider funding the required compensation to relocated incumbent users directly from auction revenues received, which would reduce the risk that bidders face and which may even enhance post-compensation revenue for the FCC.