The US AWS Auction
The Traditional SMRA—A Long and Winding Road to the Finish

It has been a long run. The FCC has been using variations of its standard “simultaneous multiple-round auction” (SMRA) format to implement spectrum auctions since 1994. The latest auction, for the AWS-III band, ended yesterday, raising nearly $45 billion. Based on revenue alone, the auction was a huge success. However, from a governance perspective the auction was a nightmare—especially for smaller bidders. In this short paper, we highlight some of the challenges encountered in the FCC’s implementation of the standard SMRA and explain why they posed particular problems for smaller bidders. Looking forward, we expect that some of those challenges would be alleviated through the use of clock-style pricing instead.

The AWS-III auction process took an incredible 341 rounds over 75 days. As is typical, competition was initially focused on the most valuable regions, with prices in big cities like New York, Los Angeles, and Chicago soaring to record levels within a few days. In the first 5 days and 19 rounds of bidding, the auction raised 54 percent of final revenues. Subsequently, competition spread to many smaller regions, and by round 100, the auction had raised 98 percent of final revenues. Then competition stagnated. The final 258 rounds of the auction took 6 weeks but raised only 2 percent of total revenues.

This slow auction pace disguises a pattern of intense price competition for many regions and licenses over short periods of time. In the big cities, some lots saw price changes of up to $615 million in a single day.2 In smaller regions, there are lots that saw price changes of up to 750 percent in a single day.3 These are the worst possible conditions for sensible governance: long periods of inertia punctuated by short, unpredictable bursts of dizzying competition. Uncertainty over when prices might rise and how much they might increase means that bid teams cannot predict when they might breach reference bid limits and senior managers who approve budget increases have to be kept on standby.

By Richard Marsden and Jonathan Pike
Based on changes announced through the auction, it is apparent that the FCC was struggling with the conflicting pressures of giving bidders adequate time to respond to price changes and progressing the auction to a close:

- The auction started at a sedate 4 rounds per day, but the FCC repeatedly increased the pace to 6, then 8, 10, 14, 16, and finally 21 rounds per day, often with less than one day's notice.

- The FCC planned for two activity rule stages: 80 percent and 95 percent. In the rules PN (§162), it stated that: "Based on our past experience, we believe that two stages with 80 percent and 95 percent activity requirements should facilitate the auction progressing at a reasonable pace." However, during the auction, it added two additional activity rule stages at 98 percent and 100 percent.

- The FCC adopted a per-band stopping rule which said that bidding will close across either the paired or unpaired bands if there are 5 consecutive rounds without a bid, withdrawal, or waiver placed on any license within the same band. Late in the auction, the FCC dropped the threshold to just 1 round.

For this auction, the FCC experimented with new bid increment rules, which varied the percentage increase by lot depending on the level of competition. The formula used is quite complex, but essentially it causes prices to rise faster for lots receiving multiple bids and for lots receiving bids in consecutive rounds. The minimum price increase per round was about 10 percent but, this could rise to 20 percent within 3 rounds. Towards the end of the auction, with 21 rounds per day, it would have been theoretically possible for the price of a single lot to have risen by over 3000 percent in a single day.

The bid increment rules appear to have encouraged a “hit and run” approach to bidding where bidders push the price of a lot up by the minimum, then move away if they are outbid, returning only once the bid increment falls back towards 10 percent. In between, such bidders may have hit other targets or simply parked their demand on lots that they did not actually want but where they expected to be overbid. This behavior appears to have contributed to the governance issues that we raised above.

Furthermore, the FCC used percentage bid increments throughout, so that the absolute size of bid increments grew each time a lot went up in price. When prices are close to opening bid amounts, a 10 percent or even 20 percent increment may not amount to very much, but at later high prices in some regions, these were huge dollar increases. After just 5 days of bidding, bid increments in New York and Los Angeles climbed to a staggering $285 million and $201 million respectively. The FCC sensibly responded to this by introducing a new rule capping the size of absolute bid increments at $50 million per round, which at least eased governance pressures for some of the major bidders. However, it never introduced a comparable lower absolute cap for smaller regions.

Smaller, regional bidders may have been hit particularly hard by this aspect of the auction. Firstly, participation costs for small bidders are likely much higher as a proportion of their valuations as compared to larger bidders, so they suffer disproportionately from a very long auction. For example, the opportunity cost of having one or more people dedicated to staring at bids on a computer screen for weeks on end is rather higher for a small rural operator in
Montana than for a national carrier. Secondly, small bidders feel the impact of sudden price changes on individual lots much more strongly. Continuing our example, a 20 percent increase on your one remaining target lot in Montana is a much bigger governance challenge than a similar increase for a national carrier, for whom this is just one element in a huge portfolio.

The activity rules also made life harder for smaller bidders. The FCC imposed activity restrictions preventing bidders from bidding on regions that they did not include in their applications. Thus, small bidders that made honest applications only for regions where they operate will not have had the same flexibility as larger rivals to shift demand around in order to manage the impact of price increments. Such bidders will also have found it hard to move between substitutable lots within regions, owing to the FCC’s decision to sell lots in different sizes and with different regional footprints, and to give these lots different eligibility requirements. Larger bidders are less constrained because they can arbitrage eligibility points across many regions. Of course, there was nothing to preclude smaller bidders from applying for surplus eligibility and bidding out of region for lots that they did not want, but this is a more risky strategy if you are small and may not be feasible if you are budget constrained.

The challenges for bidders that we’ve described above are not unique to this award. Past FCC auctions using the SMRA format and featuring similar lot structures, took many weeks to complete and had percentage price increments that escalated in absolute terms. However, this auction was particularly long, winding, and just as strategic as ever, despite the fact that the FCC took measures to try and discourage gaming behavior and speed up the process (for example, they also restricted transparency and limited withdrawal rights).

The reality is that no amount of tweaking the detailed rules of the traditional SMRA is likely to eliminate such concerns. To address such problems, a more radical overhaul may be required, but this may only be possible if the band structure can be simplified. Such a change is proposed for the 600 MHz Incentive Forward Auction, where the FCC plans to use a clock auction format to sell generic 2x5 MHz lots in each region. Bidders bid each round for a number of lots that they wish to buy in a given region at a single clock price rather than bidding a separate price for specific frequencies. In addition to speeding up the auction, the approach results in identical prices for identical lots.

A further advantage of clock pricing is that it is certain to speed the auction up because the price for all perfectly substitutable lots for which there is excess demand will go up in price each round, as opposed to the current system where only the lots that receive new bids go up in price. Of course, you still need a separate clock for every separate lot category (region), so there may be many clocks, but the number of clocks may be much lower than the number of lots.

With fewer rounds needed to escalate prices, it should also be possible to use more modest bid increments. In particular, a structure with a cap on absolute dollar increments per round and per day, perhaps linked to the underlying population for regional lots, would greatly help bidders in managing their governance processes, as they would have much greater ability to forecast how their payment exposure may grow.
The FCC is not the only spectrum regulator experimenting with clock rules and simplified lot structures. For example, in the UK, Ofcom—which had previously experimented with combinatorial auction formats—has proposed an SMRA for the forthcoming auction at 2.3 GHz and 3.5 GHz, but with a clock-style pricing rule and two categories of identical generic lots, one for each of two bands. If the 600 MHz auction goes well, the FCC may well be inclined to use similar rules for future awards. If so, the AWS-III auction may be the last FCC auction where there is such a long, winding road to the finish line.

Notes

1 The Authors advised a successful bidder throughout the AWS-III auction process. The views expressed are personal ones and do not necessarily reflect the views of our client.
2 NYC J lot, November 18, day 4, rounds 12-15.
3 North Dakota 2 – Bottineau G Lot, January 13, day 34, rounds 200-213.
4 The FCC used a three-round bidding schedule for the initial day of the auction to give users the opportunity to acclimate to the auction software.
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