


Comments on dotEcon's "Stirred Not Shaken: A recipe for reassigning spectrum "

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I. OVERVIEW

Summary

- dotEcon has advised a number of countries on spectrum auction design and implementation
- Recently, they have promoted a two-stage auction – described below.
- This two-stage approach has been implemented in some countries
- What follows is a brief explanation of the two-stage approach and then a review of its pros and cons.

II. THE TWO-STAGE AUCTION

The Two-Stage Auction Overveiw

- There are several variants of the the two-stage design
- The main rationale appears to have a first stage that provides enough spectrum in each package to ensure business continuity.
  - The intent is each package provides enough for a firm to remain in the market
  - Thus, all 1st stage winners will be in the market after the auction
  - So, the number of 1st stage puts a floor on the number of post-auction competitors – assuming all get 3 sold AND no post-auction resale
- However, in a few instances, the 1st stage package has been reserved for new entrants.

Why Two-Stages

1. Designed to ensure all 1st stage winners can credibly offer service.
2. Can provide more flexibility than tight caps.
   - Caps may still leave open the sibility of ex post asymmetries that can harm competition
   - 1st Stage packages need not be identical and can be designed to offset other asymmetries such as spectrum holdings in other bands.
3. Still allows competition and market determination of allocation for spectrum not offered in the 1st stage.
4. Limits risk that incumbents will need to shut down equipment in critical bands carrying a lot of traffic and replace it with equipment for use in other bands. In extreme cases in which one firm loses access to low band frequency, it would need to build new cell-sites to maintain coverage.
5. Reduce foreclosure incentives.

How Caps may Fail – from dotEcon

- The following example from the dotEcon paper provides an example in which caps cannot achieve the efficient outcome.
- Example assumes 2x75 MHz available in 1800 MHz band and 2x60 MHz in the 2100 MHz band.
- Example seems intended to illustrate the possibility that caps may not achieve optimal assignment. Offering 3 portfolios from a menu might solve that problem.
- However, menu auctions can have multiple equilibria.
- And not all packages get bids in this example – e.g., bids for 2x25 + 2x10 could be high

For example, suppose that we have received the following bids from three operators (X, Y and Z), indicating a preference for having a large endowment in one band compared with a split across both bands:

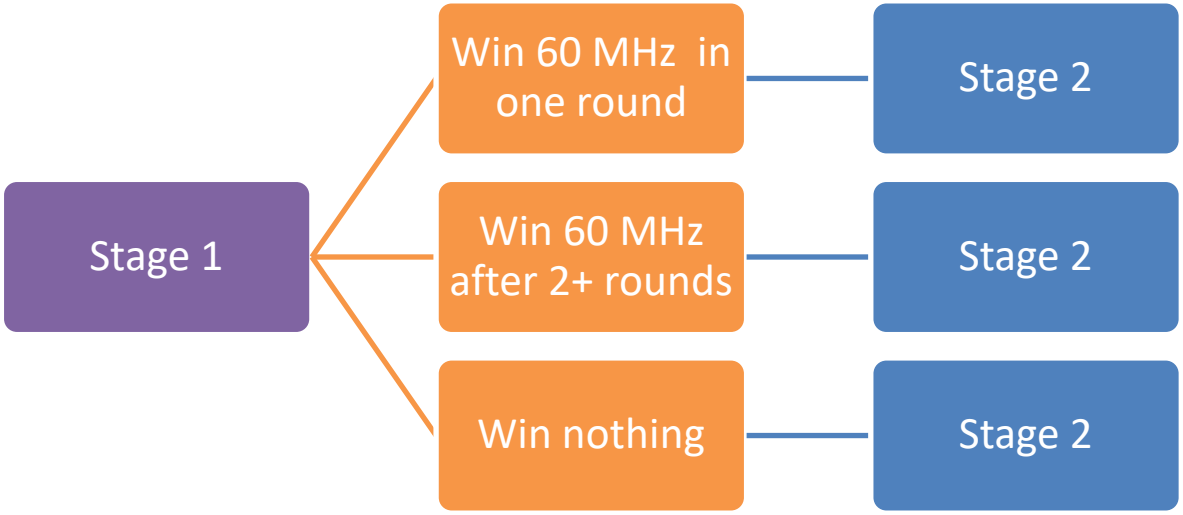
Portfolio	1800 MHz	2100 MHz	Bid X	Bid Y	Bid Z
A		2x35 MHz	80	60	
B	2x5 MHz	2x30 MHz			
C	2x10 MHz	2x25 MHz			
D	2x15 MHz	2x20 MHz	30	20	40
E	2x20 MHz	2x15 MHz	40	20	50
F	2x25 MHz	2x10 MHz			
G	2x30 MHz	2x5 MHz			
H	2x35 MHz		100	100	100

The Dutch 5G 2-Stage Auction

Confronted bidders with having to prepare for difficult decisions

- 300 MHz in 3.5 GHz band available
- Cap of 120 MHz
- Three incumbent MNOs
- 1st Stage had three blocks of 60 MHz. Bidders can win one block each. 2nd Stage had 12 blocks of 10 MHz.
  - 1st Phase: 3 blocks of 60 MHz auctioned in a clock auction
  - 2nd Phase: 12 blocks of 10 MHz sold in a clock auction.
- Bidders can win only one block in the 1st Phase.
- Bidders not bidding in the 1st Phase can win at most 50 MHz in the 2nd Phase.
- No information about the number of participants is provided – but bidders would know if there was a 4th bidder in Stage 1 if it would go more than one round

Decision Tree of Auction – Phase 1



- Phase 2 terminal valuations depend on outcome of the auction
- Phase 1 decisions could be difficult – prices in stage 1 might not be the same as stage 2

Further 2-Stage Auction Concerns

There are many questions about the 2-stage auction not fully addressed

1. What are the right packages for the 1st Stage.
   - One criterion for selecting Stage 1 packages should be preserving or enhancing competition in the market ex post and not just ensuring potentially marginally viable competition.
   - Mitigating potentially adverse market disruption due to need to switch bands should also factor in
2. Still has caps? Perhaps overall caps would be better than in-auction caps.
3. In some cases, e.g., 800 MHz with 6 blocks or 3500 MHz with 300 MHz and 100 MHz ”carrier” channels, efficient split is clear. Not sure what value the auction brings.
4. Asymmetric outcomes, increasing market asymmetries are still possible.
5. Opportunity for hold-up – an entrant can bid in the 1st Stage hoping that an incumbent will drop early and intending to resell (or use as leverage for an MVNO) after the auction.
6. Decision-making in Stage 1 can be difficult if an entrant shows up.