

# Implementation Issues

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# A Monte Carlo Study Someone Might Think about Running

Had the FCC significantly changed

1. The opening clearing target
2. The activity rule in the forward auction
3. The eligibility point structure in the auction

The revenues of the incentive auction probably would not have increased and could have decreased

# In a two-sided FCC auction

- Each stage is like its own one-sided auction
- A stage succeeds or fails if excess demand is sufficient to raise price above what is required (from the reverse auction)
- Excess demand at the start of each stage is key in determining whether a stage will succeed or fail

# An issue for consideration: increasing supply

- Because of the activity rule, demand is *forced* to have a traditional shape (downward sloping)
- Supply curve determination:
  - Seller preferences (reverse auction)
  - Interference modeling/optimization, which is new territory
- What if, for at least *some bidders*, demand appears to bend back?
  - At the start of the next stage quantity supplied increases
  - Excess demand disappears or is negligible

# Is this really that important?

## **When can this occur?**

- Geographic product space
- Daisy-chain
- More populated geographies weighted more in buy auction

## **LA/SD was predictable, why worry?**

- Supply might have been predictable, but buyer reactions to it were not
- Participation costs are already huge, why make them larger?

# Is the solution costly?

- Reverse/Forward auction dynamic
  - Auction gives itself ability to run multiple stages of reverse auction at outset
  - See what supply looks like
  - Select initial clearing target based on improved information
- Lessen the activity rule in the forward auction
- Reconsider geographic license sizes

# Could it improve the auction?

- \$88 billion for 100 MHz of spectrum (Stage 1) requires *6 forward auction participants* wanting nationwide 2x10 MHz at more than \$17.5 billion
- Start at 114 MHz clearing target? Lower?
- Fewer stages with just 1 round

# The FCC still has other issues it must consider

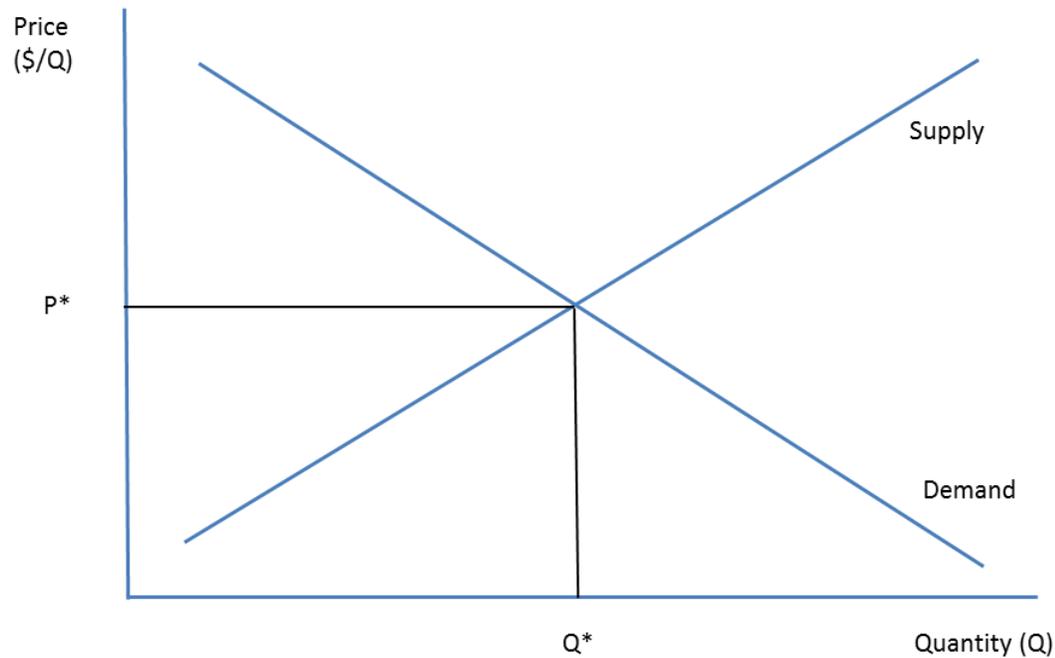
- Geographic license size
- Unwinnable bids, which are tied to geographic license size

# Appendix Graphs

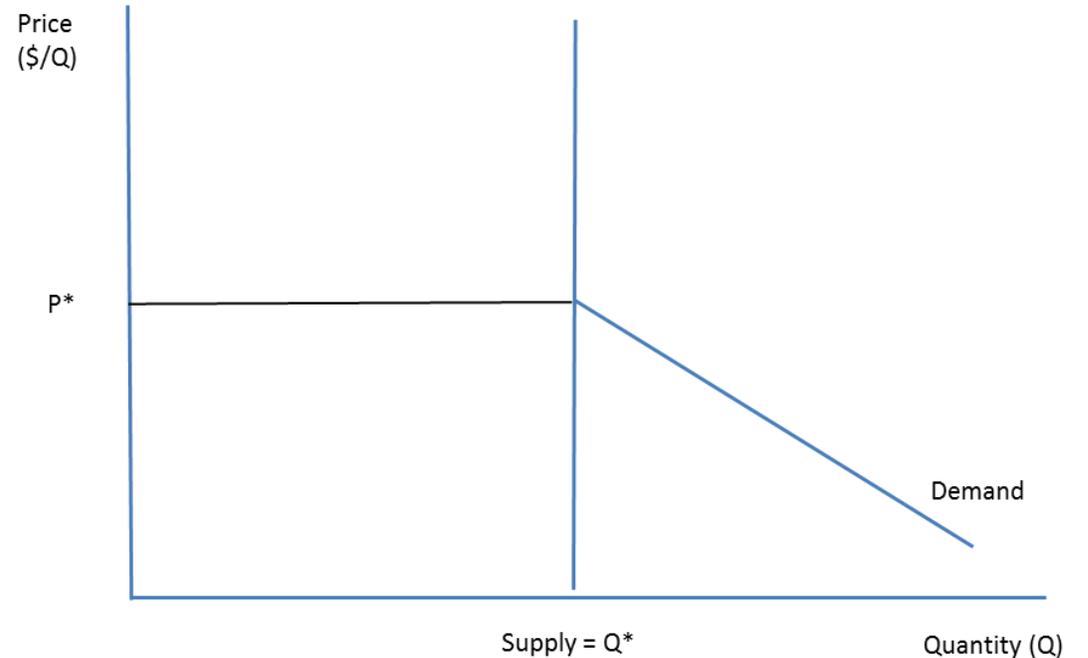
(In Case Anyone is Interested)

# *Simplified* Supply and Demand Graphs

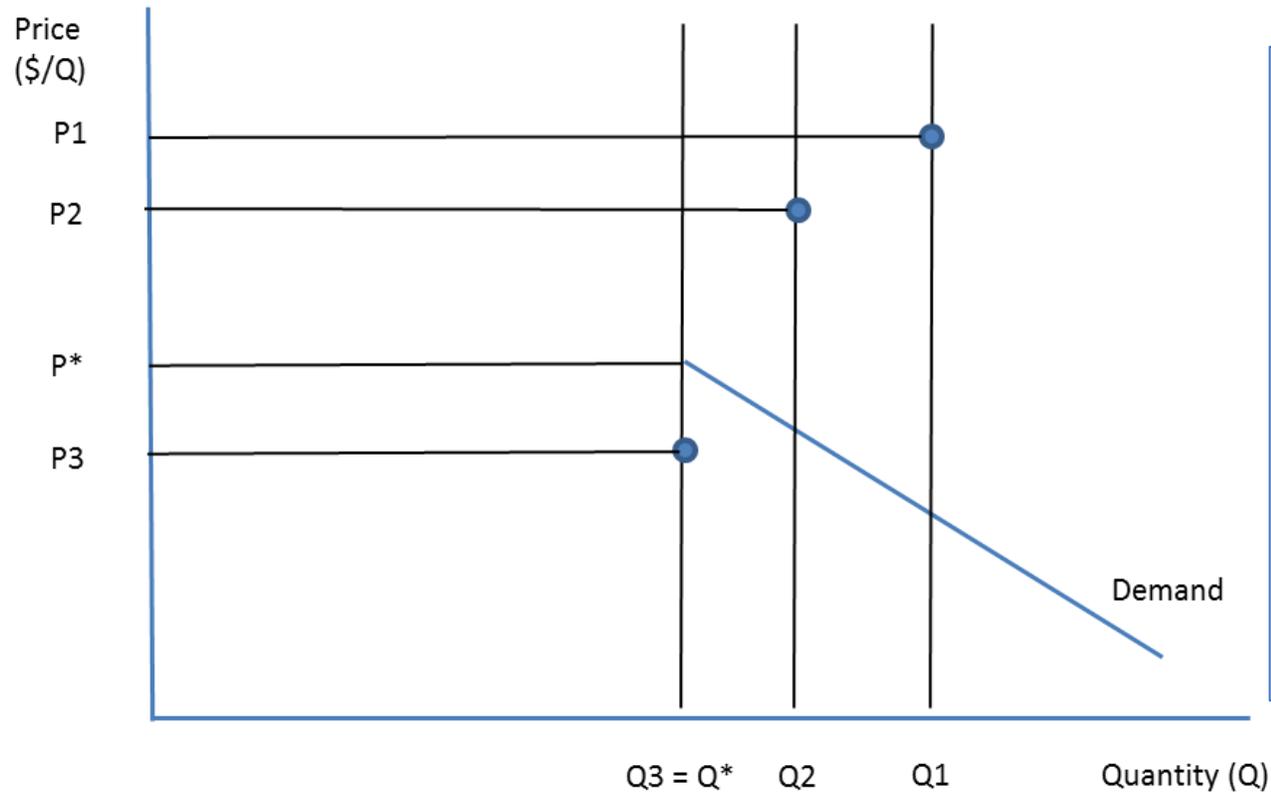
**What we are used to seeing**



***Simplified* supply and demand in a one-sided spectrum auction**



# *Simplified* picture of the incentive auction supply and demand



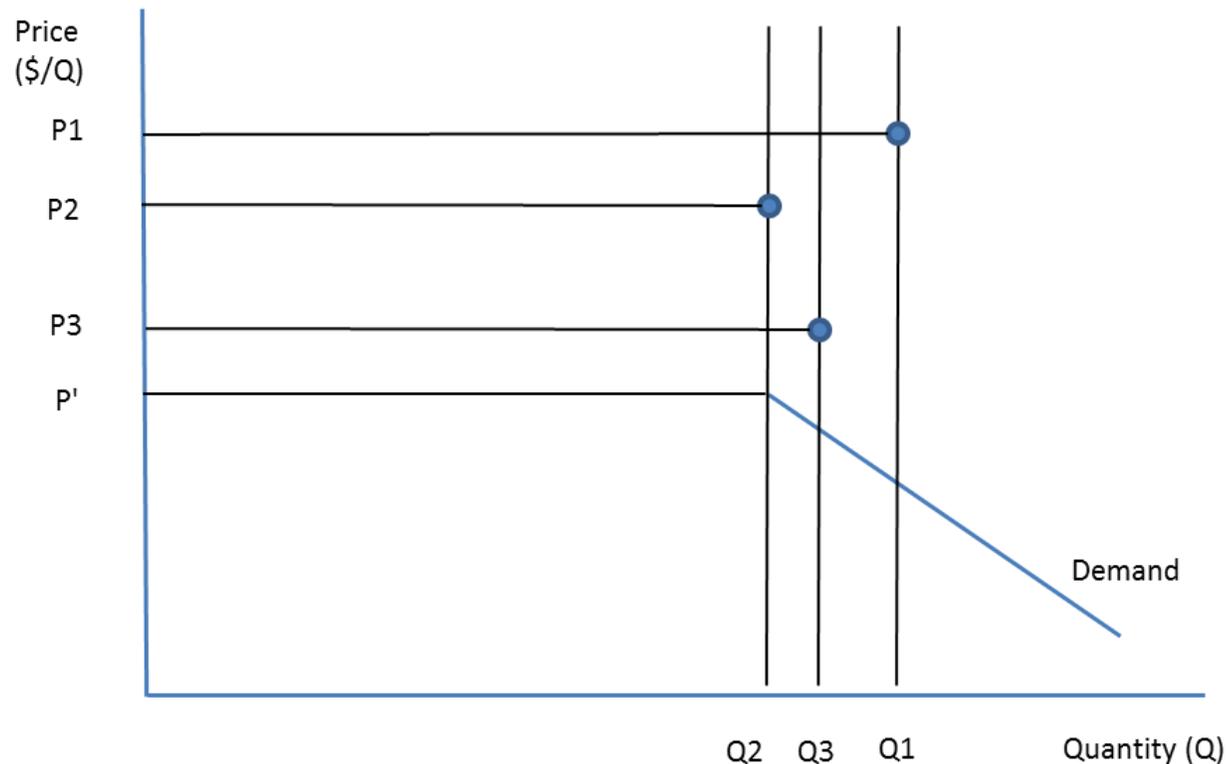
Large “dots” (from reverse auction stages) trace out a supply curve

To start each stage buyer  $Q >$  supply leading to excess demand

Auction clears in stage 3—the first stage in which buyers offer at least as much as sellers ask

$(P_3 - P^*) \times Q^* =$  Admin fees and Treasury proceeds  
 $P_3 \times Q^* =$  Broadcaster fund

# Supply Algorithm Expands Quantity between Stages 2 and 3



For one or more bidders  $Q_2 < Q_3 \rightarrow$  Excess Supply

Excess demand, which causes price to rise and the auction to clear, is lessened.

At best the auction will raise lower revenues than it would have otherwise because some bidders dropped demand too quickly.

LA/SD in the incentive auction