

ABOUT US

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governments around the world.

We combine in-depth industry experience and rigorous analyses to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Our consultants and advisors are internationally recognized experts from both the public and private sectors and have participated in many high profile engagements over the past two decades.

We have offices in Cambridge, MA; San Francisco, CA; and Washington, DC. We also have offices in London, Madrid, and Rome.

For more information, please visit www.brattle.com.

PRACTICE OVERVIEW

The Brattle Group assists clients by serving as auction valuation and bidding advisors, auction managers, and as experts in auction theory. We have extensive experience in forward wireless broadband spectrum auctions and valuing wireless broadband licenses. Our economists advise the U.S. Congress and administrative agencies, and serve as experts on behalf of private clients in litigation and various other advocacy matters.

Our experience includes auction design and evaluation, and real-time auction support in numerous auctions, such as the 700 MHz (United States, 2008), AWS (Canada, 2008), and 3G (India, 2010) spectrum license auctions. We offer support in auction rule evaluation and education, analysis of competitors, strategy development, mock auctions, bid formation and analysis tools, and real-time auction war-room support.

FCC'S FORTHCOMING REVERSE INCENTIVE AUCTION

Brattle's experts have detailed expertise forecasting results for the upcoming reverse auction for TV broadcast spectrum and estimating the value of wireless broadband spectrum in the associated forward auction. In order to successfully clear up to 120 MHz of spectrum and set aside \$9 billion for Public Safety, the auction must attract substantial participation by broadcasters, and ensure that the forward auction reaches market prices. Even under the simplest auction rules, participating in this auction will be complicated; devising a winning bid strategy will be key to achieving positive results.

Our unique qualifications allow us to offer critical advice on nearly all aspects of the upcoming FCC incentive auctions, from predicting market-by-market prices for TV broadcast licenses and estimating wireless broadband license values, to identifying the implications of key auction rules and advising on strategy in both the reverse and forward auctions.



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AUCTION CAPABILITIES

PROPRIETARY REVERSE INCENTIVE AUCTION MODELING TOOL

Early Work on Reverse Broadcaster Auction

In early 2011, experts at *The Brattle Group* developed a detailed analysis of repacking television broadcast channels. The objective of this model was to efficiently approximate the FCC's repacking algorithm for TV broadcast licenses, and estimate the expected market-by-market auction payments from an incentive auction. We conferred with the FCC to understand their optimization model, and simulate the likely auction rules. Combining the results of this modeling with our expertise in predicting wireless broadband spectrum values, we estimated at the time that the net proceeds (net of payments to broadcasters) from an incentive auction would be \$15 billion.

Consistent with the principles of the FCC's rulemaking proceeding, our repacking algorithm employs both engineering and economic considerations. One unique feature of the reverse procurement auction is the inter-relationship of outcomes between markets. Due to the potential interference from stations in neighboring markets on the same channel, the number of full power broadcast stations remaining in one market will impact the capacity of neighboring markets to repack full-power stations. By accounting for all existing engineering constraints, our model yields a realistic picture of the number of viable channels in any market, and identifies the tradeoffs between markets. Our model utilizes a nationwide, networked repacking algorithm, incorporating all channel and co-channel interference constraints both within and between markets. Finally, we employ economic principles to estimate broadcaster behavior and accepted bids based on broadcaster revenues.

Current Reverse Incentive Auction Capabilities

In 2012, we updated our model to reflect the latest broadcaster revenue data, and extended the model's capabilities to test individual market sensitivities to various bidder behavior, policy prescriptions, and auction rules. While we do not replicate the entire FCC optimization, our model gets close enough to run numerous policy analyses about the impact of specific rules and bidder strategies on auction outcomes. Our updated model includes:

- ◆ *Precise locations of all digital high powered, Class A low powered, digital and analog Mexican, and digital Canadian TV broadcast stations, as well as Land Mobile authorizations in the TV band*
- ◆ *All rule-based co-channel and adjacent channel restrictions*
- ◆ *2011 revenue data for the U.S. stations and estimated bids proportional to these revenues*
- ◆ *An algorithm to repack all U.S. stations, using various station priority rankings associated with a diverse set of potential policy decisions*
- ◆ *Estimates of clearing and repacking scenarios based on a flexible target amount of spectrum cleared or band plan*
- ◆ *Market-by-market estimates of market clearing prices*

Given the immense complexity of this novel auction, there are several benefits to our approach. This analytic tool and possible extensions of it can be used to test bid price sensitivities, evaluate the merits of potential auction rules, and develop optimal bidding strategies for broadcasters.

ADVISORY SERVICES

The Brattle Group is uniquely positioned to advise on the two key components of the incentive auction: 1) the reverse auction for broadcast licenses, and 2) the forward auction for wireless broadband spectrum. We can offer support in nearly all aspects of preparing for and participating in incentive auctions, including:

- ◆ *Forecasting the results of both the reverse and forward auctions*
- ◆ *Estimating the impact of various policy objectives and potential FCC rules*
- ◆ *Preparing high quality economic analysis to support FCC advocacy on specific rule changes*
- ◆ *Advising on bidding strategies for either the reverse or forward auction*

The Reverse Auction

We focus on individual markets to understand the clearing prices, risks, and drivers in that market. For any media market or broadcaster location in the country, we can estimate the specific clearing prices of that market and test sensitivities to various factors, including bidding behavior in the target market and surrounding markets, policy prescriptions, rule variations, etc. The winning bid prices in any market are likely to be impacted by a number of important factors, particularly the auction rules and bidding behavior of other stations in the target and neighboring markets.

Using our model, we can estimate the sensitivities of auction prices to various bidding scenarios, and identify which inter-market relationships are likely to be key drivers of auction prices for any market in the country. Indeed, our model can be very useful in illustrating the revenue and participation implications of various policies. Following are some of the issues that we address:

- ◆ *Estimate the impact of various inter-market location based pricing rules on winning bids and participation*
- ◆ *Identify which rules are likely to encourage participation and robust bidding, resulting in high auction prices and strong returns to broadcasters*
- ◆ *Evaluate channel sharing scenarios, including potential revenue differences for which shared channels remain*
- ◆ *Assist broadcasters in understanding the value of their license at auction and develop a successful bid strategy based on the bidders' objectives*

The Forward Auction

A successful broadcast TV auction also requires strong participation in the forward auction to support payments to TV broadcasters. As discussed above, we have extensive past experience with forward spectrum auctions. We can assist clients on:

- ◆ *Auction design: Forecasting the impact of particular auction rules and submitting filings accordingly*
- ◆ *Spectrum valuation: Estimating the value of spectrum licenses at auction, contingent on auction rules*
- ◆ *Bid advising: Strategy development and war room planning*

With respect to the rule-making process, we can help in evaluating the impact of various auction rules on the forward auction clearing prices and receipts and license structure issues. We can also provide research on the impact of broader telecommunications policy decisions, such as the potentially detrimental effects of restricting participation on auction revenues. Such analysis can be useful in advocating for specific rules, including ones that address the interaction of the forward and reverse auctions.