

A Framework for Telecommunication Auctions

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Abstract

In this study, we examine telecommunication auctions and develop a framework of U.S. satellite spectrum licensing, foreign reactions to U.S. decisions, business assessments of opportunities and the feedback to the FCC's policy. This framework views the international licensing process as a series of actions, reactions, and feedbacks. We recommend policy makers to use this framework as a guide. We also recommend future studies on telecommunication auctions to use this framework as their starting point.

Keywords: Telecommunication, Telecom, Telecommunication Auction, Spectrum, FCC

1. The Cachet of Auctions

Auctions have become an attractive means of allocating licenses for radio spectrum in part because of the massive amounts of money that have thus far been raised in the U.S. (estimated at \$9 billion thus far). The efficient resource allocation that derives from awarding licenses to the bidder with the highest and best use for the spectrum is the main attractive policy feature of auctions. The full benefits of efficiency are achieved when several features of markets are present. Ideally, a large number of bidders participate, and financial markets are well-developed to provide capital to bidders, even those who are not large mature firms but who nonetheless have "bankable" investment projects. Regulatory expertise and infrastructure should be substantial enough to make the costs of running the auction low. A sufficiently stable legal and regulatory regime warrants participation with the knowledge that the rules will not change dramatically and that redress for grievances will be reliable. Equal access to a high level of expertise will ensure there are sufficient "informed" bidders.

Spectrum auctions have been lauded in at least eleven countries around the world, including the U.S., for their efficiency in allocating spectrum for new services. Alternative means of allocating licenses for spectrum—lottery, comparative hearing, first-come-first licensed—have not achieved the speed or cost efficiency that auctions in the U.S. have produced. The advantages of auctions are well-discussed in the literature (see McMillan 1995 and 1994)

requiring little further elaboration. However, the appropriateness of this means of distributing spectrum for international services still is being debated. Although nearly ideal conditions have developed in the U.S., the conditions are farther from ideal in many other countries. The use of auctions in those countries may not produce an efficient resource allocation. Furthermore, if the objective is to raise money for the government or to subsidize the telecommunications infrastructure, auctions could be sub-optimal if other means of charging for the spectrum license can be employed (In the U.S., auctions are the only means by which the FCC can raise money in excess of the administrative cost associated with the licensing process).

Several studies examine the auctions in Europe. Klemperer (2002a) show that there were large differences in the revenues from the European “third generation” (3G, or “UMTS”) mobile-phone license auctions, from 20 Euros per capita in Switzerland to 650 Euros per capita in the UK, though the values of the licenses sold were similar. The author argues that poor auction designs in some countries facilitated collusion between firms and failed to attract entrants. Klemperer (2002a) also adds that the sequencing of the auctions was also crucial.

Basili and Fontini (2003) evaluate the aggregate option value of the UK 3G telecom licenses. The authors calculate revenues, capital and operating costs of UMTS business for the period of licenses’ duration and show that the aggregate revenue extracted by the UK’s Government is (slightly) lower than the aggregate price of licenses payed by winning telecom companies.

Binmore and Klemperer (2002) examine the British third-generation mobile-phone license auction that concluded on 27 April 2000. At the time, it was widely described as the biggest auction ever. The authors discuss the possible problems in telecom auctions. They believe that the deposits that the bidders were required to put down were inadequate. These began at £50 million (about \$75 million), ratcheting up to £100 million when the bidding for any license reached £400 million. The authors argue that this amount might not provide an adequate disincentive for a winner in the auction who changed his mind about wanting a license after bidding several billions.

The authors find it fortunate that the winners were uninterested in defaulting (in fact, they all quickly paid their entire bids). The authors explain further: “With such small deposits, the slow pace at which the auction was run became more significant. The reserve prices were very low, and there was, in our view, an unnecessary maximum of 5% on the size of the minimum increment. The number of rounds per day was also much smaller than we would have liked and there were many recesses for holidays and weekends. We were very concerned that some external event might occur during the auction that would lead the bidders to lower their valuations below what they had already bid. What would have happened if a very negative discovery about the health implications of mobile phones had been made and reported during the auction? We were much less comfortable during the 7.5 weeks of the auction than we pretended to be. There was in fact a substantial dip in technology share prices during the auction that looked as though it might create a confidence crisis, but this scare proved to be only a paper tiger at the time, although it looks more like a real tiger now”.

Van Damme (2002) reviews the UMTS auctions during 2000 and 2001. According to the author, the anti-trust laws are too weak to combat anti-competitive behavior. The Italian rules

prohibit communications relating to strategy and contacts between the players. The author contends that in Italian auctions as well as in other European auctions, there were violations, even though not as extreme as in the Netherlands (i.e. in Netherlands, communication between players did take place). Although there was some evidence of anti-competitive behavior in Italian auctions, as in the Netherlands, this behavior was not penalized. The author warns that although it might be tempting to exclude some players from the auction, it would hurt the government's revenue.

Klemperer (2002b) argues that the most important issues in auction design are preventing collusive, predatory, and entry-detering behavior. According to the author, ascending and uniform-price auctions are particularly vulnerable to these problems. Klemperer (2002b) argues that, besides the design issues, effective anti-trust policy is also critical. The author concludes that auction design should depend on the circumstances.

Park, Lee, and Choi (2011) estimate the effects of the auctions and the licensing fees for the 3G spectrum on consumer prices, the timing of a new service launch, and the market structure using data from the mobile markets of 21 OECD countries. They find no evidence of negative effects of spectrum auctions in the mobile communications market. They call for more positive action toward spectrum auctions in many countries who seek to improve the efficiency and transparency of spectrum assignment.

Chattopadhyay and Chatterjee (2014) examine telecom auctions in India. According to the authors, the rolling out of services has been very slow due to problems with the rules and design of Indian auctions. Chattopadhyay and Chatterjee (2014) point out to the fact that, in case of 1991 auction, many rules came up once the auction was over (which was the restriction of the number of licenses that a single operator can possess). According to the authors, the decision for the second highest bidder to match the highest bid is not a good idea. This would create disincentive for the bidders and prevent them from bidding truthfully. The authors conclude that "In such cases, bidders become skeptical about what policies would prevail afterwards, unnecessary speculative activities crop up leading to untruthful bidding and the new outcome is an inefficient allocation."

As can be seen in the above mentioned literature, the issue is complex and it is not clear whether the auction design itself, the host country characteristics, the bidding firm/country characteristics, another currently unknown factor, or a combination of these factors determine the success of a telecommunication auction. To clarify the problem and perhaps to present it in a more organized way, in this paper, we build a framework that shows all of the actions, reactions, and feedbacks. This is a framework of U.S. satellite spectrum licensing, foreign reactions to U.S. decisions, business assessments of opportunities and the feedback to the FCC's policy. As mentioned above, in this framework, we view the international licensing process as a series of actions, reactions, and feedbacks.

2. Problems Induced by Satellite Spectrum Auctions

The U.S. became the first country to award a satellite communications license/orbital position through an auction mechanism on January 24, 1996 when MCI won a direct broadcast satellite license for \$682 million (Gruley, 1996; Robichaux, 1996). This event focused attention

in the U.S. on the differences between terrestrial PCS service and satellite service license awards. The differences between international satellite communications services and terrestrial communications stem from the time-consuming parade of licensing decisions, conflicting cultural norms, and differing technical and economic characteristics of geographically segmented markets.

Low earth orbit (LEO) satellite systems and some geostationary (GEO) systems must transmit radio signals across national boundaries because many of the services cannot succeed economically without providing service in multiple countries, i.e., in multiple licensing jurisdictions. This is a significant factor that is not faced by terrestrial domestic providers whose service can be "contained" within national boundaries. The LEO systems face this in an extreme form because they will operate with a "footprint" that is global. We examine the potential stream of events that will flow after a U.S. auction of satellite licenses.¹ In the proposed "sequential game" framework, governments and potential licensees play against one another to find the best strategy.

3. The Framework

The success of the PCS auctions in 1994 and 1995 presaged the FCC's decision to auction satellite communications (SATCOM) spectrum licenses for Direct Broadcasting Satellites (DBS) on January 24, 1996. However, due to differences in regulatory, economic, social, and cultural perspectives, foreign governments may produce some misgivings about auctions. As Levin (1986) indicates "the semantics of buying and selling of orbit spectrum (that go along with auctions) may evoke deep-seated reservations about the legal-political viability of market type mechanisms" (Levin, 1986). Therefore, evaluating the implications of foreign reactions to U.S. action is crucial to the FCC's policy decision on mechanisms for SATCOM licensing of additional satellite spectrum.

Figure 1 illustrates the framework of U.S. satellite spectrum licensing, foreign reactions to U.S. decisions, business assessments of opportunities and the feedback to the FCC's policy. The international licensing process is viewed as a series of actions, reactions, and feedbacks.

The cultural, economic, and public welfare issues in the host country affect that foreign governments' decision. The market structure and competition also affects the decision. Besides these factors, auction strategy and rules (i.e. the design) are also important for the foreign government's decision. Besides these factors, the FCC's policies and actions have a significant impact on the foreign governments' decisions.

After the foreign government makes the decision and the service starts, the market's structure and competition affects the profitability of the service. U.S. firms observing this foreign market looks at the profitability of the service and then decides whether it will bid for the auctions in that country.

Several factors within the U.S. affect FCC's policies and actions. U.S. Congress may force FCC or the budget situation in the U.S. may tie FCC's hands. ITU and WARC also may affect FCC's policies and actions. The U.S. market and the U.S. firms' winning the foreign bid may also affect FCC's policies and actions.

As can be seen in Figure 1, the whole framework is rather complex. We believe that this complex web of relationships between different groups/factors is what creates the whole “auction puzzle”.

4. Conclusion

In this study, we examine telecommunication auctions and develop a framework of U.S. satellite spectrum licensing, foreign reactions to U.S. decisions, business assessments of opportunities and the feedback to the FCC's policy. This framework views the international licensing process as a series of actions, reactions, and feedbacks.

The whole framework is rather complex. Several factors feed into each other. Factors like the host countries' cultural, economic, public welfare issues, the market structure and competition, the design of the auction, and the FCC affect foreign governments' decision. On the other hand, several factors affect FCC's policies and actions. For example, factors like U.S. Congress, the budget situation in the U.S., ITU, WARC, the U.S. market and the U.S. firms' winning the foreign bid affect FCC's policies and actions.

We believe that this complex web of relationships between different groups/factors is what creates the whole “auction puzzle”. We recommend policy makers to use this framework as a guide. We also recommend future studies on telecommunication auctions to use this framework as their starting point.

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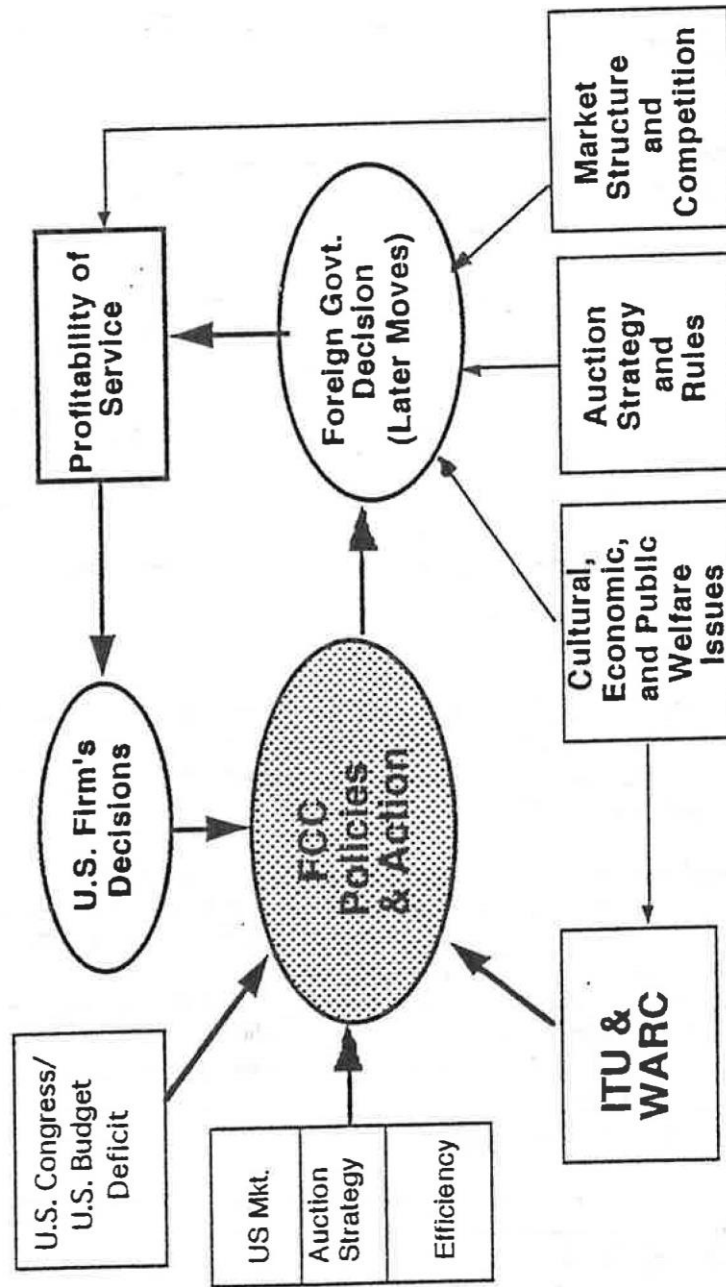
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Figure 1.
Satellite Communications Licensing Decisions and Feedback



Footnotes

1. Although spectrum auctions can be viewed as a tax on new satellite service operators that is not imposed on incumbent competitors whether satellite or terrestrial, we do not explore this motivation for concern about spectrum auctions. Clearly, this is important to satellite

operators and influences their decision on whether to enter this business; however, it should not influence the cost of service at the margin unless the provider has a monopoly in its market. Instead of focusing on this obvious issue, we focus on the longer term issues related to reactions in other countries to the U.S. auctions.