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May 12, 2005

Via email

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S.W. TW-A325
Washington, DC 20554

Re: Ex Parte Submission
Experimental Design Proceeding – DA 05-1267

Dear Ms. Dortch:

Pursuant to Section 1.1206 of the Commission's ex parte rules, 47 C.F.R. §1.1206, this letter is to notify you that on May 12, 2005, Professor Robert J. Weber, J.L. Kellogg Graduate School of Management, Northwestern University, on behalf of Telephone and Data Systems, Inc. spoke by telephone with Dr. Mark Bykowsky in the FCC's Office of Strategic Planning and Policy Analysis regarding the above-referenced proceeding. Attached is a copy of his follow-up email to Dr. Bykowsky describing the subject matter of their communication.

In the event there are questions regarding this matter, please contact the undersigned.

Sincerely,



George Y. Wheeler

cc via e-mail:

Mark.Bykowsky@fcc.gov

From: Bob Weber [mailto:rjweber@northwestern.edu]
Sent: Thursday, May 12, 2005 11:42 AM
To: Mark Bykowsky
Subject: Package bidding example, re Public Notice DA 05-1267

Dear Mark,

It was nice to talk with you again!

As I explained, my primary goal is to be sure that I'm interpreting the recent experimental proposal's Appendix D "pricing rules" correctly. The attached spreadsheet contains a few simple three-bidder, two-license examples, where the calculations are based on the assumption highlighted in red near the top of the sheet. In the example, I don't bother with exponential smoothing of prices, since I suspect that it would only change the examples slightly.

Am I fundamentally off-track here? It appears, if the examples stand up, that for the package procedure laid out in the experimental proposal "straightforward" bidding on the parts of all the bidders is not in equilibrium.

On a related note, I have copies of the July 3, 2000 public notice concerning Auction 31 rules, and the actual rules used for the (very short!) Auction 51. Are there later official notices or comments I should be looking at when evaluating the proposed experimental design?

I look forward to hearing from you and/or Martha.

Best regards, Bob Weber

847-251-7620

Issues "Small" Bidders Must Deal With

In order to see some of the challenges facing "smaller" enterprises (i.e., those with more limited objectives than other "larger" enterprises), consider the following simple example.

Bidder A wants only license X, and values it at (is willing to pay up to) 40.
 Bidder B wants only license Y, and values it at (is willing to pay up to) 40.
 Bidder C wants both licenses, i.e., the package XY, and values it at 50.

Also, assume a fixed bid increment of 10%.

10% bid increment

In this simple case, the "minimum bid" rules are easy to apply: If the current high bids on X and Y add to more than the current high bid on the package XY, then they determine the minimum acceptable bid on the package. If the package's current high bid exceeds the sum of the two separate current high bids, then the excess is split evenly in determining the new minimum acceptable bids on the single licenses.

If the bidders bid "nonstrategically," i.e., if each remains active in minimum increments on the license or package it actually desires, the outcome looks reasonable:

round	bids						bid minimums in next round		
	X	who	Y	who	XY	who	X	Y	XY
0	10.000	FCC	10.000	FCC	20.000	FCC	10.000	10.000	20.000
1	10.000	A	10.000	B	20.000	C	11.000	11.000	22.000
2	11.000	A	11.000	B	22.000	C	12.100	12.100	24.200
3	12.100	A	12.100	B	24.200	C	13.310	13.310	26.620
4	13.310	A	13.310	B	26.620	C	14.641	14.641	29.282
5	14.641	A	14.641	B	29.282	C	16.105	16.105	32.210
6	16.105	A	16.105	B	32.210	C	17.716	17.716	35.431
7	17.716	A	17.716	B	35.431	C	19.487	19.487	38.974
8	19.487	A	19.487	B	38.974	C	21.436	21.436	42.872
9	21.436	A	21.436	B	42.872	C	23.579	23.579	47.159
10	23.579	A	23.579	B	47.159	C	25.937	25.937	51.875
11	25.937	A	25.937	B	50.000	C	C places a "final bid" of 50.		

However, if B and C will bid "nonstrategically," A does much better by bidding with C on the package, thereby holding down the price of license X:

round	bids						bid minimums in next round		
	X	who	Y	who	XY	who	X	Y	XY
0	10.000	FCC	10.000	FCC	20.000	FCC	10.000	10.000	20.000
1	10.000	FCC	10.000	B	20.000	A,C	11.000	11.000	22.000
2	10.000	FCC	11.000	B	22.000	A,C	11.550	12.650	24.200
3	10.000	FCC	12.650	B	24.200	A,C	11.853	14.768	26.620
4	10.000	FCC	14.768	B	26.620	A,C	12.019	17.263	29.282
5	10.000	FCC	17.263	B	29.282	A,C	12.110	20.100	32.210
6	10.000	FCC	20.100	B	32.210	A,C	12.161	23.271	35.431
7	10.000	FCC	23.271	B	35.431	A,C	12.188	26.786	38.974
8	10.000	FCC	26.786	B	38.974	A,C	12.204	30.668	42.872
9	10.000	FCC	30.668	B	42.872	A,C	12.212	34.947	47.159
10	10.000	FCC	34.947	B	47.159	A,C	12.217	39.658	51.875
11	12.217	A	39.658	B	50.000	C	C places a "final bid" of 50.		

Obviously, the timing of the "move" from the package to license X is critical (in order for A to avoid winning the package at an unacceptable price). But clearly, some level of "hiding" (by bidding on the package) is warranted.

Now, if both A and B hide, things could work out as in the nonstrategic case:

round	bids						bid minimums in next round		
	X	who	Y	who	XY	who	X	Y	XY
0	10.000	FCC	10.000	FCC	20.000	FCC	10.000	10.000	20.000
1	10.000	FCC	10.000	FCC	20.000	A,B,C	11.000	11.000	22.000
2	10.000	FCC	10.000	FCC	22.000	A,B,C	12.100	12.100	24.200
3	10.000	FCC	10.000	FCC	24.200	A,B,C	13.310	13.310	26.620
4	10.000	FCC	10.000	FCC	26.620	A,B,C	14.641	14.641	29.282
5	10.000	FCC	10.000	FCC	29.282	A,B,C	16.105	16.105	32.210
6	10.000	FCC	10.000	FCC	32.210	A,B,C	17.716	17.716	35.431
7	10.000	FCC	10.000	FCC	35.431	A,B,C	19.487	19.487	38.974
8	10.000	FCC	10.000	FCC	38.974	A,B,C	21.436	21.436	42.872
9	10.000	FCC	10.000	FCC	42.872	A,B,C	23.579	23.579	47.159
10	10.000	FCC	10.000	FCC	47.159	A,B,C	25.937	25.937	51.875
11	25.937	A	25.937	B	50.000	C	C places a "final bid" of 50.		

But now the timing of the move back to a single license becomes even more critical. For example, if B flinches (moves to a single license) a round before A, prices change substantially:

round	bids						bid minimums in next round		
	X	who	Y	who	XY	who	X	Y	XY
0	10.000	FCC	10.000	FCC	20.000	FCC	10.000	10.000	20.000
1	10.000	FCC	10.000	FCC	20.000	A,B,C	11.000	11.000	22.000
2	10.000	FCC	10.000	FCC	22.000	A,B,C	12.100	12.100	24.200
3	10.000	FCC	10.000	FCC	24.200	A,B,C	13.310	13.310	26.620
4	10.000	FCC	10.000	FCC	26.620	A,B,C	14.641	14.641	29.282
5	10.000	FCC	10.000	FCC	29.282	A,B,C	16.105	16.105	32.210
6	10.000	FCC	10.000	FCC	32.210	A,B,C	17.716	17.716	35.431
7	10.000	FCC	10.000	FCC	35.431	A,B,C	19.487	19.487	38.974
8	10.000	FCC	10.000	FCC	38.974	A,B,C	21.436	21.436	42.872
9	10.000	FCC	21.436	FCC	42.872	A,B,C	17.290	29.869	47.159
10	10.000	FCC	29.869	B	47.159	A,C	15.009	36.865	51.875
11	15.009	A	36.865	B	50.000	C	C places a "final bid" of 50.		

Of course, there are other possible types of strategic behavior. For example, B, when flinching, could bid on both A and B in order to impose more of a cost-sharing burden on A. Or, from the start, while A hides, B could drive up the price of X rather than bidding on Y: This latter example is developed below:

round	bids						bid minimums in next round		
	X	who	Y	who	XY	who	X	Y	XY
0	10.000	FCC	10.000	FCC	20.000	FCC	10.000	10.000	20.000
1	10.000	B	10.000	FCC	20.000	A,C	11.000	11.000	22.000
2	11.000	B	10.000	FCC	22.000	A,C	12.650	11.550	24.200
3	12.650	B	10.000	FCC	24.200	A,C	14.768	11.853	26.620
4	14.768	B	10.000	FCC	26.620	A,C	17.263	12.019	29.282
5	17.263	B	10.000	FCC	29.282	A,C	20.100	12.110	32.210
6	20.100	B	10.000	FCC	32.210	A,C	23.271	12.161	35.431
7	23.271	B	10.000	FCC	35.431	A,C	26.786	12.188	38.974
8	26.786	B	10.000	FCC	38.974	A,C	30.668	12.204	42.872
9	30.668	B	10.000	FCC	42.872	A,C	34.947	12.212	47.159
10	34.947	B	10.000	FCC	47.159	A,C	39.658	12.217	51.875
11	39.658	A	12.217	B	50.000	C	C places a "final bid" of 50.		

And if B starts bidding up X, A might strike back by bidding up Y.