

**AUCTIONING HEALTHCARE:  
The Need for a Clinical Trial of CMS'  
Competitive Bidding Program for Durable Medical Equipment**



DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR MEDICARE & MEDICAID SERVICES

Form Approved  
OMB No. 0935-1016

<b>MEDICARE DMEPOS COMPETITIVE BIDDING PROGRAM</b>	
<b>For CMS Use Only</b>	
Supplier Bidder No.	Date Application Received
Competitive Bid Area (CBA)	
<b>Supplier's Identifying Information</b>	
Supplier's Legal Business Name	Primary Supplier's Legal Business Name (if network)

**FORM A: APPLICATION FOR DMEPOS COMPETITIVE BIDDING PROGRAM**

**NOTE:** Please read all instructions completely. Suppliers with a single location or multiple locations must complete Section 1 -1a: Application for Suppliers. Networks, however, must complete Section 2-2b: Application for Networks.

May 2012

Jim Tozzi  
Bruce Levinson  
The Center for Regulatory Effectiveness  
1601 Connecticut Avenue, NW  
Washington, DC 20009  
202.265.2383  
[www.TheCRE.com](http://www.TheCRE.com)

**Auctioning Healthcare:  
The Need for a Clinical Trial of CMS'  
Competitive Bidding Program for Durable Medical Equipment**

**Abstract**

*Medicare's competitive bidding regulations for Durable Medical Equipment (DME) create an acquisition program that has the form, but not the function, of an auction. Federal and academic experts have explained that CMS' design for the bidding program violates accepted tenets of auction theory, selects an essentially random set of vendors, and results in a supply situation that is not viable.*

*The goal of this document is to assess the consequences of two unorthodox decisions made by CMS in designing the program: 1) permitting non-binding bids; and 2) setting price equal to the median accepted bid. As the paper explains, these two rules result in CMS continuing to function in a price setting role – the antithesis of what auctions are intended to achieve. CMS' approach to competitive bidding is in sharp contrast to that of the Federal Communications Commission. When the FCC was confronted with the need to develop an auction program, they:*

- 1. Sought the input on auction procedures from game theorists; and*
- 2. Subjected their proposed auction procedures to review by a "Clinical Trial," i.e., by having auction specialists conduct simulations to assess its strengths and weaknesses and to recommend modifications.*

*Accordingly, CMS should reform its bidding program to correct the fundamental problems on which there is broad consensus. Consequently, prior to Round 2 of the DME competitive bidding program, the agency should subject its DME bidding program to a Clinical Trial comparable to that conducted by the FCC.*

## I. Background

### **Congress Gives CMS Substantial Discretion in Implementing Competitive Bidding**

The statutory requirements for the DME competitive bidding program were set in §302 of the Medicare Prescription Drug, Improvement, and Modernization Act 2003 (MMA, Pub. L. 108-173) and supplemented by §154 of the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA, Pub. L. 110-275).

The statutes set certain requirements for the equipment to be covered by the program, the timing of the program, and directed CMS to set quality and financial standards for prospective bidders and to ensure that Medicare beneficiaries retain access to multiple providers. The statutes do not, however, constrain CMS' discretion in setting the bidding rules. Instead, the MMA simply directs the Secretary of HHS to “conduct a competition among entities supplying items and services described in subsection (a)(2) for each competitive acquisition area in which the program is implemented....”

In response to numerous problems with the original Round 1 auction, Congress effectively declared a mulligan<sup>1</sup> and, through MIPPA, instructed the agency to conduct a rebid. The problems with the original Round 1 bidding which were cited in a Medicare Payment Advisory Commission (MedPAC) presentation as contributing to Congress' decision to require the rebid included “Calculation of capacity and prices” and “Financial stability disqualifications.”<sup>2</sup>

It should be noted that MIPPA did not require CMS to use the same bidding rules in the Round 1 Rebid as they used originally. Instead, the statute stated that the Secretary “shall conduct the competition for such round in a manner so that it occurs in 2009 with respect to the same items and services and the same areas....” The phrase “in a manner” clearly provided, and continues to provide, CMS with the legal authority to reform their bidding rules devised for original Round 1 bidding, an authority CMS chose not to exercise.

### **CMS' Other Competitive Bidding Projects Failed**

The DME competitive bidding program is not CMS' only attempt at using an auction mechanism to reduce health care costs. The MMA also directed CMS to establish competitive bidding programs for clinical laboratory services and for outpatient drugs and biologicals.

CMS established a Competitive Acquisition Program (CAP) for outpatient drugs and biologicals in 2006. The program did not succeed. In September 2008, CMS indefinitely suspended the CAP. In announcing the *de facto* end of the program, CMS said that although while they “received several qualified bids” for

---

<sup>1</sup> Wikipedia, “Mulligan (games)” available at [http://en.wikipedia.org/wiki/Mulligan\\_\(games\)](http://en.wikipedia.org/wiki/Mulligan_(games)).

<sup>2</sup> MedPac, “MIPPA Update: Durable Medical Equipment Competitive Bidding,” Sept. 4, 2008, p. 5.

the planned 2009-2011 CAP, “contractual issues with the successful bidders resulted in CMS postponing the 2009 program.”<sup>3</sup>

CMS unveiled their design for a competitive bidding demonstration program for clinical laboratory services (CLS) in October 2006. The first site for the demonstration project (San Diego-Carlsbad-San Marcos, CA) was selected in October 2007.<sup>4</sup>

The CLS competitive bidding demonstration project was suspended by court order in April 2008 prior to CMS announcing the bid winners. In response to legal action taken by affected laboratories, the judge issued a preliminary injunction against CMS that ordered the agency not to carry out the bidding program “until further order of the Court.”

The judge ruled that the plaintiffs were likely to succeed on the merits of multiple claims made in their lawsuit including agency violation of the Administrative Procedure Act.<sup>5</sup> Congress repealed the program in MIPPA. In March 2010, the judge “denied a motion by CMS to dismiss the amended complaint originally filed by the plaintiff laboratories to challenge CMS’ retention of the bid information....”<sup>6</sup> In August 2010, federal attorneys and the plaintiffs agreed to destroy the bid documents.

### **Competitive Bidding: A Continuing Focal Point of the Health Care Reform Debate**

Federal use of auctions to reduce health care costs without sacrificing care quality continues to be a topic of debate across the political spectrum. For example, both the left-leaning Center for American Progress and the right-leaning American Enterprise Institute have advocated use of competitive bidding for Medicare.<sup>7,8</sup>

---

<sup>3</sup> Centers for Medicare and Medicaid Services, Competitive Acquisition for Part B Drugs & Biologicals; Overview available at <https://www.cms.gov/CompetitiveAcquisforBios/>.

<sup>4</sup> Centers for Medicare and Medicaid Services, Medicare News, “CMS Selects First Location for Clinical Laboratory Competitive Bidding Demonstration,” October 16, 2007 available at [https://www.cms.gov/DemoProjectsEvalRpts/downloads/MMA302b\\_PressRelease.pdf](https://www.cms.gov/DemoProjectsEvalRpts/downloads/MMA302b_PressRelease.pdf)

<sup>5</sup> Mark S. Birenbaum, Medical Laboratory Observer, “Court orders temporary halt to CBD,” May 2008.

<sup>6</sup> Dark Daily: Clinical Laboratory and Pathology News and Trends, “Feds to Destroy Bid Documents for Medicare’s Clinical Laboratory Competitive Bidding Demonstration Project in San Diego,” Aug. 18, 2010 available at

<http://www.darkdaily.com/feds-to-destroy-bid-documents-for-medicare%E2%80%99s-clinical-laboratory-competitive-bidding-demonstration-project-in-san-diego-8182>.

<sup>7</sup> Zeke Emanuel, David M. Cutler, Topher Spiro, Center for American Progress, “Expand Competitive Bidding in Medicare,” October 26, 2011 available at [http://www.americanprogress.org/issues/2011/10/medicare\\_bidding.html](http://www.americanprogress.org/issues/2011/10/medicare_bidding.html).

<sup>8</sup> Robert F. Coulam, Roger Feldman, Bryan E. Dowd | AEI Online, “Better Prices--Through Competitive Bidding--Can Help Solve Medicare’s Fiscal Crisis,” August 26, 2011 available at <http://www.aei.org/article/health/entitlements/better-prices--through-competitive-bidding--can-help-solve>

As discussed in Section II below, the specific auction design chosen by CMS has raised grave concerns regarding the program's economic efficiency, viability, transparency and impact on patients from sources ranging from the Congressional Budget Office to hundreds of auction experts, economists and other academicians.

Section III of this paper explains that the Federal Communications Commission (FCC) has blazed a path in demonstrating how federal agencies can develop and refine successful auctions. The FCC experience provides important guidance in how to reform the CMS program.

## II. Auction Design Raises Concerns: Implications of Non-Binding Bids and Median Bid Pricing

CMS chose to price its contract offers (the “single payment amount”) to winning bidders based on the median of the bids accepted. The use of median bid pricing meant that half of winning bidders were offered contracts at less than the they bid while the other winning bidders were offered awards prices of more than they bid to supply the equipment and associated services.

CMS did not require, however, that the bids be binding. Thus, bidders who were offered contracts at less than they bid did not have to accept the contract offer. Moreover, even if the contract offer was at or higher than their bid price, bidders still did not have to honor their bids. In short, CMS’ decision to allow non-binding bids meant that bidders did not have to be willing to actually provide the specified medical equipment at the price they bid.<sup>9</sup>

Allowance of non-binding bids and median bid pricing both created the incentive for providers to submit “low-ball” bids, *i.e.*, bids at prices the bidder did not intend to honor. The rational strategy for suppliers under the CMS rules was to underbid contracts to ensure they receive a contract offer while hoping they receive the offer at a price sufficiently over their bid to make it worth accepting.

Since all bidders have an incentive to bid low, the entire bidding process is distorted. CMS’ auction rules are analogous to staging a poker game in which players are allowed to withdraw their wager from the pot after the cards are dealt, a situation which would not be conducive to producing a rational, sustainable game.

---

<sup>9</sup> In a press interview, a senior CMS official stated that “CMS concluded that the law does not give the agency the authority to make bids binding because the DME program is voluntary.” There was no explanation, legal or otherwise, to support the statement. The Center for Regulatory Effectiveness asked their outside counsel, Multinational Legal Services which specializes in administrative law, to evaluate the statement. Their response was:

“The answer of legal counsel is that there is no basis for Mr. Blum’s position. All bidding is by its nature voluntary, and there is nothing in the DMEPOS provisions of the Medicare statute that requires, or even allows, non-binding bids. Long-established contract/auction law holds that a contract becomes binding upon acceptance of an offer, unless the offer is expressly stated to be non-binding. In fact, the Medicare statute defines a “bid” as an “offer,” and says nothing about allowing non-binding offers. 42 U.S.C. § 1395w-3(b)(6)(B). The legislative history of the law is consistent. The Congressional conference report stated that “[p]ayment for competitively priced items and services will be based on bids submitted and accepted.” It said nothing about allowing bids to be submitted as non-binding or allowing a bidder to decline to accept a contract once its bid had been accepted. H.R. Rep. No. 108-391, at 576 (conf. rep.). The line of federal cases holding that acceptance of an offer creates a binding contract extends back at least to the U.S. Supreme Court’s 1865 decision in *Blossom v. Milwaukee & C.R. Co.*, 70 U.S. 196, 205. This basic concept of offer and acceptance creating a binding contract remains at the heart of contract law. See, e.g., *In re GWI PCS 1 Inc.*, 230 F.3d 788, 807 (5th Cir. 2000); *In re NextWave Personal Communications, Inc.*, 200 F.3d 43, 60 (2d Cir. 1999); *Commodities Recovery Corp. v. United States*, 34 Fed. Cl. 282, 289 (1995).” [Emphasis added.]

***“Whacked Upside the Head by Having an Auction Failure”***<sup>10</sup>  
**The Congressional Budget Office Explains that CMS has Created  
an Unsustainable Bidding Program – It is NOT a True Auction**

The Congressional Budget Office’s (CBO’s) Chief of Medicare Cost Estimates opined on CMS’ DME competitive bidding program while speaking at the Medicare Auction Conference co-sponsored by the University of Maryland and the National Science Foundation.<sup>11</sup> In his remarks, the official explained that CMS’ DME auction is a non-transparent, two-stage process in which the agency engages in *de defacto* price-setting to compensate for the flaws in the auction methodology. Since the agency is engaging in a price-setting function, the process does not produce a competitively determined price.

Although CMS presents their competitive bidding program as being a single stage auction, the CBO official explained that it is actually a dual-stage process with bidders in the first stage bidding low, even offering prices they may not be willing to honor, just to make it to the second stage of the process.

*Why did it create an incentive to bid low? Because the bidders were not actually bidding for the price at which transactions would occur; they were bidding for an invitation to the next round. They were bidding to the invitation to the “any willing supplier” round or “any willing vendor” round.*<sup>12</sup>

One of the implications from the two-stage process is that an essentially arbitrary set of vendors made it to the second round, not necessarily the lowest cost providers. Many suppliers who did not read between the lines of the CMS’ process and game the situation correctly were therefore eliminated from the competition. Put another way, suppliers who took CMS at their word regarding the auction process and did not bid low while hoping for a higher eventual settlement price, had a reduced chance of making it to the second, unwritten, stage of the process.

The CBO official also discussed one of the oddest aspects of the CMS process, the agency’s decision to price at the median of the accepted bids, and the pricing rule’s consequences.

*I think they selected the median price because they realized that they had all these crazy low bids, and they needed to get them out of the calculation.*

---

<sup>10</sup> Transcript, Medicare Auction Conference, University of Maryland, Final Panel: “What Have We Learned?” (“Transcript”) April 1, 2011, p. 8, *available at* <http://www.cramton.umd.edu/papers2010-2014/medicare-auction-conference-final-panel-562.rtf>

<sup>11</sup> Medicare Auction Conference, 1 April 2011, Agenda *available at* <http://www.cramton.umd.edu/papers2010-2014/medicare-auction-conference-program.pdf>.

<sup>12</sup> Transcript, p. 5.

*What they did was they selected bidders up to the quantity well over the amount needed to clear -- to serve the given market, and then from that vastly expanded pool, they selected the median.*

*Fundamentally, that's an arbitrary number. It's a number that bears no relationship to the market clearing price other -- otherwise -- other perhaps than when they went up the scale of all the bidders, they were, in their judgment, going high enough so that the median of that distribution was what, in their judgment, was a reasonable approximation of that market clearing price.<sup>13</sup>*

There are three takeaways from the above statement:

**First: CMS Is Not Adhering To Their Own Final Rule**

According to the CBO official, CMS is likely intervening in the bid selection process by inflating the number of bidders offered awarded contracts as way of dealing with unreasonably low bids instead of simply disqualifying those bids as not bona fide, as required by their rules. Specifically, the Final Rule states,

*We recognize the necessity for a process to identify and eliminate irrational, infeasible bids. Accordingly, we will be evaluating bids to ensure that they are bona fide, and we may request that a supplier submit additional financial information, such as manufacturer invoices, so that we can verify that the supplier can provide the product to the beneficiary for the bid amount. If we conclude that a bid is not bona fide, we will eliminate the bid from consideration.<sup>14</sup>*

Thus, by their own rules, CMS is supposed to disqualify low-ball bids rather than keeping at least some of them in the mix and then increase the number of suppliers offered contracts to make up for bids at prices suppliers didn't intend to honor.

**Second: CMS – Not the Market – is the Price-Setter**

Since CMS is apparently moving up the ladder of bidders by price until perhaps, “in their judgment” they reach “a reasonable approximation of that market clearing price” it is the agency, not the market, which set DME prices in the Round 1 Rebid.

It could be argued that the agency's judgment in the competitive bidding process was informed by the bids and that their role under competitive bidding is quite different than it was under a fee schedule. Such arguments, however, don't hold up on examination. Although the auction process is materially different than the fee schedule system, particularly since it greatly reduces the number of suppliers allowed to

---

<sup>13</sup> Transcript, pp. 5-6. [Time stamp omitted].

<sup>14</sup> 72 Fed. Reg. 18047, Tuesday, April 10, 2007, col. 2.



provide DME under Medicare, the actual price-setting process is not that far removed from the agency-set fee schedule, either way the agency is setting the price based on the factors they consider relevant. The agency changing the way they set DME prices does not equal a competitively determined price – particularly since many of the bids that may be informing the agency’s judgment are “low ball” and do not reflect actual costs.

### **Third: Arbitrary Prices Lead to Auction Failure**

One of the results of CMS’ use of what are essentially arbitrary prices is that market-clearing price information is not communicated. Because the first round bid results are not communicating information to the market, which includes future Competitive Bidding Areas (CBAs), the agency is setting itself and Medicare beneficiaries up for future auction failure.

In the following statement, Congress’ Medicare cost expert explains why information communication is a basic auction function for any auction that is intended to be repeated. The official then explains why CMS’ price-setting process does not produce the necessary information.

*One of the things we learned is that the purpose of an auction that’s intended to be repeated -- and I think that’s an important part of what we’ve been discussing today -- is that it reveals the sustainable market clearing price; that is, the price at which the seller and the buyer are willing to contract to exchange something and then are expecting to be willing to come back to the auction on the next round.*

*The auction mechanism that CMS used in the first round was poorly suited to the task of revealing that sustainable market price. That auction mechanism creates very strong incentives for bidders to submit bids that are below the amount at which they’re willing and able to commit to deliver, and CMS’s price setting mechanism, once they got those bids in, was -- I’ll describe it as an interesting method of attempting to compensate for that incentive to bid low.<sup>15</sup>*

CMS’s use of an auction mechanism that does not provide the market with price data that would be needed to reveal the “sustainable market price” has regulatory as well as economic implications. From the regulatory standpoint, the Medicare auction is generating and disseminating price data that does not meet the quality requirements of the Paperwork Reduction Act, which directs that data which is disseminated by or on the behalf of agencies have “practical utility.” Misleading or useless price data resulting from the regulations may also fail to comply with the utility and objectivity requirements of the Data Quality Act and implementing guidance documents.

The CBO official further detailed how the information failure in CMS’ process sets up the agency for future problems even if the Round 1 Rebid were considered a success.

---

<sup>15</sup> Ibid., pp. 4-5. [Emphasis added, transcript time stamp omitted].

*The danger in that mechanism is that now having established that -- I don't know what the numbers are, but say they went up to 150 percent of expected quantity in a given product. They now have a bureaucratically approved value for how high they go up.*

*And that makes it far more difficult in the next round to do a similar compensation that will substitute somebody's judgment of the sustainable market clearing price for -- to calculate that price out of the bids they got because the incentive for the vendors to bid low exists. And more and more of them are going to bid low because they realize that this is only bidding for an invitation to the next round.<sup>16</sup>*

Thus, while some vendors in the Round 1 Rebid may have lost out because they didn't game the system and instead submitted bids they were willing to honor, fewer DME suppliers would make that mistake in Round 2 which means that CMS' pseudo-auction methodology is not sustainable.

The problems resulting from the lack of information transmission are not merely theoretical. The CBO official explicitly stated that they expected CMS' competitive bidding process to lead to auction failure.

*Let me remind you first that I said that the bidding mechanism they used in the first round doesn't provide bids that -- doesn't reveal the same old market clearing prices. And the next point is, I think, the probability of failure in a subsequent round of bidding is very high because mechanisms they use aren't actually designed to reveal those prices.<sup>17</sup>*

The CBO official spoke even more bluntly on the need for CMS to reform their competitive bidding process.

*If they don't change the mechanism they use, I think there is a high probability of failure in the near future. There is near certainty of failure sometime down the road. ... They may do that in time to avoid any of those failures. They may have to get whacked up side the head by having an auction failure.<sup>18</sup>*

---

<sup>16</sup> Ibid., p. 6.

<sup>17</sup> Ibid., p. 7. [Transcript time stamp omitted].

<sup>18</sup> Ibid., p. 8.

***“A Race To the Bottom – Fraud and Abuse Would Grow”***<sup>19</sup>  
**Academicians Criticize CMS’ Design for Competitive Bidding**

Over 160 economists, operations, and other auction and market mechanics experts signed a letter to the then-Chairman of the House Ways and Means Committee’s Subcommittee on Health. The letter explained several key flaws in CMS’ competitive bidding program, including allowing non-binding bids.

In the letter, which was written about six months prior to the conference at which the CBO official spoke,<sup>20</sup> the researchers emphasized that they “believe that competitive bidding can be an effective method of controlling Medicare costs without sacrificing quality.” CMS’ design for the program, however, results in “flaws that need to be fixed before it can achieve the objectives of low cost and high quality.”

The academicians explained why CMS’ decision to allow non-binding bids is fundamentally contrary to auction principles. As the auction experts stated,

*the auction rules violate a basic principle of auction design: bids must be binding commitments. In the Medicare auction, bidders are not bound by their bids. Any auction winner can decline to sign a supply contract following the auction. This undermines the credibility of bids, and encourages low-ball bids in which the supplier acquires at no cost the option to sign a supply contract.*<sup>21</sup>

As the CBO official explained, it was the presence of the low-ball bids that likely resulted in CMS intervening in the auction process by increasing the number of bids accepted. It was this intervention that resulted in the agency essentially acting as a price setter and negating the competitive potential of the auction. Thus, both the academicians and the CBO official both point to the use of non-binding bids as a basic problem with CMS’ design for DME competitive bidding.

The letter also discussed CMS’ “flawed pricing rule” which, according to the auction experts, “further encourages low-ball bids, since a low bid guarantees winning, has a negligible effect on the price and gives the supplier a free option to sign a supply contract.” Thus, the agency’s decisions to permit non-binding bids and to use median bid pricing both contributed to the suppliers submitting “irrational, infeasible bids” which resulted in CMS modifying but maintaining their role as Medicare’s DME price-setter instead of transitioning to a competitive acquisition system as instructed by Congress.

---

<sup>19</sup> Letter from 167 Concerned Auction Experts on Medicare Competitive Bidding Program, 26 September 2010, (“Letter from 167 Concerned Auction Experts”), p. 2 *available at* <http://www.cramton.umd.edu/papers2010-2014/comments-of-concerned-auction-experts-on-medicare-bidding.pdf>.

<sup>20</sup> The lead writer of the letter was the primary organizer of the conference.

<sup>21</sup> Letter from 167 Concerned Auction Experts, p. 1.

The use of median bid pricing, which contributed to undermining the competitive bidding process, is not a common auction practice. The practice is so unusual that none of the over 160 auction experts had ever come across the use of median bid pricing before.

*What is odd is that rather than paying winners the clearing price (the last-accepted bid), the auction pays winners the unweighted median among the winning bids. This is unique in our collective experience.<sup>22</sup>*

The letter cites additional problems with CMS' auction design including use of composite bids which are "an average of a bidder's bids across many products weighted by government estimated demand." As the academicians explain, composite bids induce additional distortions, resulting in bids being further away from costs.

Unlike previously discussed bidding problems where the ramifications are largely confined to future auctions, the problems associated with CMS' use of composite bids have potential consequence for Medicare beneficiaries in Round 1 CBAs.

*Bidders bid low on products where the government overestimated demand and high on products where the government underestimated demand. As a result, prices for individual products are not closely related to costs. Bid skewing is especially problematic in this setting, since the divergence between costs and prices likely will result in selective fulfillment of customer orders. Orders for low-priced products are apt to go unfilled.<sup>23</sup>*

The above-stated issue is of particular concern since it threatens to disrupt a vulnerable population's access to health care providers. The potential for supply interruptions indicates that the problems created by CMS' odd rules extend beyond economic inefficiencies.

Concerns' regarding the auction's transparency were also discussed in the letter. Specifically, the professors stated that it "is unclear how quantities associated with each bidder are determined" and that both "quality standards and performance obligations are unclear." The letter also stated that the "lack of transparency is unacceptable in a government auction."

It should be noted that the professors' concern regarding how quantities associated with each bidder are determined echoes the implementation problem highlighted by MedPAC regarding CMS' capacity calculations in the original Round 1 bidding process. The transparency concern also highlights the CBO officials' suspicion that CMS may have effectively manipulated capacity determinations by selecting "bidders up to the quantity well over the amount needed to clear."

---

<sup>22</sup> Ibid.

<sup>23</sup> Ibid. [Emphasis added].

The academicians make clear that they think that CMS' auction process is likely bound for failure and that beneficiaries and taxpayers would be left to deal with the consequences. Specifically the letter states:

*This collection of problems suggests that the program over time may degenerate into a “race to the bottom” in which suppliers become increasingly unreliable, product and service quality deteriorates, and supply shortages become common. Contract enforcement would become increasingly difficult and fraud and abuse would grow.*

***“it is now clear that the CMS design is not an auction at all but an arbitrary pricing process.”<sup>24</sup>***

**The Second Academic Letter**

After nine months with no discernable response from CMS to their letter (which was forwarded to them by the Chairman) regarding the problems with the DME auction process, a second letter was sent, this time to President Obama.<sup>25</sup> After additional research on and consideration of the CMS bidding system, over 240 auction experts – including additional Nobel laureates – signed the second letter.

The new letter made three key points:

1. CMS' “competitive bidding” is not an auction, it is continued government price-setting of DME accomplished through an arbitrary, opaque process;
2. Clinical tests performed at the California Institute of Technology and the University of Maryland demonstrate the inefficiency of the CMS DME acquisition program; and
2. The bidding program violates the Obama Administration's regulatory principles set forth in Executive Order 13563.

With respect to the first issue, that CMS has not fulfilled its most basic statutory mandate with respect to the competitive bidding program, using a competitive, market-based mechanism to price and acquire DME, the academicians explained:

*The problems with the CMS auction grow worse upon closer inspection. The complete lack of transparency is inappropriate for a government auction. For*

---

<sup>24</sup> Letter from 244 Concerned Auction Experts on Medicare Competitive Bidding Program, 17 June 2011, (“Letter from 244 Concerned Auction Experts”), p. 1 *available at* <http://www.cramton.umd.edu/papers2010-2014/further-comments-of-concerned-auction-experts-on-medicare-bidding.pdf>.

<sup>25</sup> Letter from 244 Concerned Auction Experts.

*example, we now know that CMS has almost complete discretion with respect to setting prices in a nontransparent way. CMS can and did manipulate the quantities reported by bidders during qualification. These quantities are essential to forming the supply curve, which ultimately sets the price in each product-region. To this date we know little about what quantities were used in the price determination. As a result of this lack of transparency, it is now clear that the CMS design is not an auction at all but an arbitrary pricing process.<sup>26</sup>*

Auctions consist of a set of rules designed to elicit certain economic behavior that reflects the lowest price(s) bidders are willing to accept (or the highest price they are willing to pay) for the specified goods and/or services. There is nothing inherently complex or mysterious about the process and, based on the auction rules, bidder behavior can be modeled and predicted. Thus, it is possible to determine – before the auction is held – whether the bidding rules selected produce economically efficient results.

As discussed in Section III, the Federal Communications Commission (FCC) has made extensive, well documented and successful use of modeling processes to improve their auctions. CMS, however, has chosen not to take advantage of simulation and testing techniques and the experience of a sister regulatory agency. Although CMS has declined to clinically test their system, academicians did test the CMS process and found significant problems. In describing the results of the experiments, the letter states,

*Since the writing of our letter in September, several of us have done further detailed scientific study to explore the properties of the CMS design and contrast it to modern efficient auctions. The findings are dramatic and illustrate the power of science to inform auction design. Specifically, auction theory was used to demonstrate the poor incentive properties of the CMS design and how these lead to poor outcomes. Laboratory experiments were conducted at Caltech and the University of Maryland that demonstrate that these poor theoretical properties are observed in the lab. Moreover, simple efficient auctions perform extremely well in both theory and in the economic laboratory.<sup>27</sup>*

President Obama’s Executive Order on improving regulations and the regulatory review process<sup>28</sup> directed agencies to “ensure the objectivity of any scientific and technological information and processes used to support the agency’s regulatory actions.”

The Order cited a White House Memorandum on Scientific Integrity along with its implementing guidance and stated that, consistent with the memo, “each agency shall ensure the objectivity of any scientific and

---

<sup>26</sup> Ibid., p. 2. [Emphasis added, citation omitted].

<sup>27</sup> Ibid., pp. 1-2. [Emphasis added, citation omitted].

<sup>28</sup> Executive Order 13563 of January 18, 2011, “Improving Regulation and Regulatory Review,” available at <http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf>.

technological information and processes used to support the agency’s regulatory actions.” The President’s Scientific Integrity directive requires that agencies use “well-established scientific processes, including peer review where appropriate....”<sup>29</sup>

The letter from the academicians to President Obama explained that, despite his clear directive to agencies on regulatory policy and scientific integrity, the President’s Order has been ignored with respect to the Competitive Bidding program.

*We find this especially distressing and unreasonable given your Executive Order of 18 January 2011 on regulation. In that order, you lay out numerous sensible principles of regulation that administrative agencies must follow. The CMS competitive bidding program violates all of the principles, especially the principles of transparency and of basing regulations on the best available science. Indeed, the current program is the antithesis of science and contradicts all that is known about proper market design.*<sup>30, 31</sup>

There is no public record of a response from the White House or a designee to the letter.

### **Concordance Between Federal and Academic Experts**

There are three broad areas of agreement between the CBO official and the academicians:

1. Support for federal use of auctions.
2. Conclusion that CMS’ DME competitive bidding process is fatally flawed and not actually an auction.
3. Belief that CMS’ competitive bidding system can and should be fixed.

The question then becomes, how should CMS’ process be fixed? Although the academicians don’t provide a specific recommended “fix,” they do provide a path to follow. Specifically, they explain that

---

<sup>29</sup> Barack Obama, Memorandum for the Heads of Executive Departments and Agencies, “Scientific Integrity,” March 9, 2009, *available at* <http://www.whitehouse.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09>.

<sup>30</sup> Letter from 244 Concerned Auction Experts, p.1. [Emphasis added].

<sup>31</sup> CMS’s description of their new DME acquisition program as “competitive” and an “auction” recalls to mind Lewis Carroll’s words from *Through the Looking Glass*, “‘When I use a word,’ Humpty Dumpty said, in rather a scornful tone, ‘it means just what I choose it to mean—neither more nor less.’”

CMS' competitive bidding program "is in sharp contrast to well-run government auctions such as the Federal Communications Commission spectrum auctions."

The issue, therefore, is how did the FCC develop an efficient auction process and how can CMS learn from the Commission's experience to ensure that their own auctions produce competitively-determined prices on a sustainable basis?

As discussed in the next section, the keys steps taken by the FCC included requesting auction experts to perform "clinical trials," *i.e.*, simulations of the planned auction rules *before* the actual auction in order to assess its viability, efficiency and hidden pitfalls. Thus, the way forward for CMS is two-fold:

1. Reforming the auction process to fix the obvious problems of median bid pricing, use of composite bids and allowing non-binding bids; **and**
2. Testing the planned new auction rules through open, peer reviewed simulation processes prior to Round 2.



### III. A Clinical Trial: The FCC Tests and Improves Federal Auctions

*“Another reason for the success of the Commission's auction program... its flexibility and responsiveness to bidders and the public”<sup>32</sup>*

#### **Why the FCC's Auction Experience is Relevant to CMS**

Federal spectrum auctions can be traced to a 1959 article by Ronald Coase in the *Journal of Law and Economics*.<sup>33</sup> In his groundbreaking paper, Coase argued that a market-based pricing system would outperform government allocation of scarce spectrum. As economic historians explained when reviewing Mr. Coase's contributions to competitive bidding, his

*spectrum auction proposal was mocked by communications policy experts, opposed by industry interests, and ridiculed by policy makers. Hence, it took until July 25, 1994 for FCC license sales to commence. Today, some 73 U.S. auctions have been held, 27,484 licenses sold, and \$52.6 billion paid. The reform is a textbook example of economic policy success.*<sup>34</sup>

As the FCC explained in a 1997 Report to Congress, “[e]vidence from the Commission's past license assignment methods and recent experience with auctions indicate that the auction approach has provided significant improvements over past methods...that were used by the Commission to award spectrum licenses.”<sup>35</sup>

Two of the points made in the FCC Report to Congress are directly applicable to CMS' DME competitive bidding program:

1. **Auction-Generated Price Information is Critical to Auction Success;** and
2. **Responsiveness to Bidders and the Public is Essential.**

With respect to the importance of auctions communicating price information, the FCC explained that,

---

<sup>32</sup> Federal Communications Commission, Wireless Telecommunications Bureau, “The FCC Report on Spectrum Auctions,” WT Docket No. 97-150, Released: October 9, 1997, (“FCC Report on Spectrum Auctions”), p. 3.

<sup>33</sup> R. H. Coase, “The Federal Communications Commission,” *The Journal of Law and Economics*, vol. 2, October 1959, pp. 1-40.

<sup>34</sup> T. W. Hazlett, D. Porter, V. Smith, “Radio Spectrum and the Disruptive Clarity of Ronald Coase,” Paper for Markets, Firms, and Property Rights: A Celebration of the Research of Ronald Coase, Conference at the University of Chicago School of Law (Dec. 4-5, 2009). Revised March 7, 2010, p. 1.

<sup>35</sup> FCC Report on Spectrum Auctions, p. 2.

*Auctions also provide valuable information about the opportunity cost of spectrum because they reflect the value that the next most efficient firm places on the spectrum license. This information allows both the private marketplace and policy makers to manage spectrum more effectively.<sup>36</sup>*

Thus, the Commission informed Congress that auctions must communicate clearing price information to stakeholders in order to function efficiently – the same point that both the CBO official and the 240+ academicians made with respect to the need to reform the DME program in order to avoid auction failure. The CMS “auction” has not communicated clearing price information because no such information was generated by the alleged auction.

The FCC also explained to Congress the importance of the agency listening to stakeholders and revising and improving their auction procedures based on what they learn not only from their own experiences but also from the experiences of the auction participants.

*Another reason for the success of the Commission’s auction program is its flexibility and responsiveness to bidders and the public. ... The resulting dialogue has led to a dynamic and evolving auctions program. The Commission is continually improving its auction process, and in a pending rulemaking proceeding, as well as in this Report, a number of proposed changes to auction design and procedures are recommended. Moreover, the FCC has consistently taken steps to anticipate needed change -- especially where innovation and auction design are concerned.<sup>37</sup>*

The FCC’s success in developing and operating auctions didn’t come easily or through implementation of a grand plan designed by elected officials or FCC policy experts. Instead, success resulted from both elected and policy officials and agency leadership working with economists, including game theory specialists, and other auction experts to develop and refine the FCC’s auction process.

The FCC held or co-sponsored a series of three multi-day conferences which examined auction theory and design. The conferences focused on a type of auction known as a “combinatorial auction.” As the FCC explains, combinatorial bidding, also known as “package bidding,” allows bidders to

*place bids on groups of licenses as well as on individual licenses. This approach allows bidders to better express the value of any synergies (benefits from combining complementary items) that may exist among licenses and to avoid the risk of winning only part of a desired set. In general, package bidding is appropriate when there are strong complementarities among licenses for some bidders and the pattern of those complementarities varies*

---

<sup>36</sup> FCC Report on Spectrum Auctions, p. 3.

<sup>37</sup> FCC Report on Spectrum Auctions, pp. 3-4. [Note omitted.]

*among bidders. Under these circumstances, package bidding yields an efficient outcome, ensuring that licenses are sold to those bidders who value them the most.*

*Package bidding procedures are also designed to allow the auction to proceed at an appropriate pace, to encourage straightforward bidding, and to permit bidders to employ flexible backup strategies.<sup>38</sup>*

CMS' DME competitive bidding has the potential to be a combinatorial auction since bidders need to provide a range of complementary goods such as various types of oxygen equipment and associated supplies and services. There may also be synergies from a single firm providing all of a patient's DME needs. The degree to which bidders offer complementary goods will vary since some suppliers specialize in certain types of equipment while others offer a full range of DME. Thus, the FCC conferences are directly relevant to CMS.

***“These are all issues, not readily anticipated by formal analysis, that can surface naturally in experiments...”<sup>39</sup>***  
**The FCC's Combinatorial Bidding Conference 2000**

The FCC's three day conference in May 2000 featured “a broad range of expert perspectives as the Commission sought to develop and evaluate the best feasible combinatorial auction mechanism. The conference also provided a forum for theoretical, empirical and experimental papers, panel discussions, and bidding experiments.”<sup>40</sup>

The FCC explained that one of their primary purposes was to discuss experimental results on bidding procedures used or considered by the agency. In the FCC's case, conducting such experiments was not only prudent, it was also required by law.

Even when not legislatively mandated, conducting auction experiments, also known as simulations, laboratory test bedding, and clinical trials, is a basic part of developing and refining auction rules. The experiments take place via analysis of the auction process based on a branch of mathematics called game theory which models various situations (“games”) and analyzes actors' choices and their expected outcomes. Auction theory is a specialized subset of game theory.

---

<sup>38</sup> FCC, “About Auctions, Auction Designs, Simultaneous Multiple-Round (SMR) Auctions,” available at [http://wireless.fcc.gov/auctions/default.htm?job=about\\_auctions&page=2](http://wireless.fcc.gov/auctions/default.htm?job=about_auctions&page=2).

<sup>39</sup> Cybernomics, Inc., “Theory, Experiment and the FCC Spectrum Auctions,” Contract Number C-9854019, March 15, 2000, (“Cybernomics”), p. 22 available at <http://wireless.fcc.gov/auctions/conferences/combin2000/releases/98540192.pdf>.

<sup>40</sup> The Conference Agenda may be available at [http://wireless.fcc.gov/auctions/default.htm?job=conference\\_agenda&y=2000](http://wireless.fcc.gov/auctions/default.htm?job=conference_agenda&y=2000)

A key concept used in analyzing auctions is known as the Revenue Equivalence Theorem, which, in simple terms means that under a set of basic (though not always realistic) assumptions, auctions of various standard types will yield the same average revenue. As one introductory text explains,

*The key idea of the theorem is that at equilibrium the revenue depends only on the allocation rule used by the mechanism. As a matter of fact, a more general revenue equivalence theorem states that for any social choice function  $f$  implementable by two mechanisms in a Bayesian Nash equilibrium, the payments/revenue will be the same with some normalization assuming losers pay 0.<sup>41</sup>*

The theorem was first proven by William Vickrey in his landmark paper, “Counterspeculation, auctions, and competitive sealed tenders”<sup>42</sup> and later expanded on by others. One of the key points made by Vickrey was on the need for Pareto-optimality (a situation where no player can be made better off without someone being made worse off) in order to reach a Nash equilibrium.<sup>43</sup> As Vickrey explained,

*If we abandon the requirement for Pareto-optimality and look for a general Nash-equilibrium point without this stipulation, the solution runs into considerable mathematical difficulty. ... While equation (16) is now a relatively simple differential equation involving only  $z_2(x)$ ,  $z_2'(x)$ , and  $x$ , it resists solution by analytical methods (even for  $\alpha = 0$ ) while if an approximate numerical quadrature is to be made, it is not immediately obvious what the required boundary conditions are to be that will determine  $\kappa$  and the second constant of integration.<sup>44</sup>*

Consequently, assessing whether CMS’ bidding program achieves Pareto-optimality is an important test of its auction design.

One of the papers presented at the conference was “Theory, Experiment and the FCC Spectrum Auctions” which explained that,

*The US Congress has mandated an independent evaluation of the Simultaneous Multiple Round (SMR) auction mechanism used by the FCC to award spectrum*

---

<sup>41</sup> C. Chekuri, CS 573: Algorithmic Game Theory, Lecture date: 28th March, 2008, available at <http://www.cs.uiuc.edu/~chekuri/teaching/spring2008/Lectures/scribed/Notes20.pdf>

<sup>42</sup> W. Vickrey, “Counterspeculation, auctions, and competitive sealed tenders,” The Journal of Finance, vol. 16, issue 1, March 1961, pp. 8-37, available at <http://www.thecre.com/pdf/Vickrey-Counterspeculation.pdf>.

<sup>43</sup> A Nash equilibrium is a “solution concept” that occurs when no player can benefit by changing their strategy if the other players keep their strategies unchanged. See, Game Theory: An Introductory Sketch, “Solutions” to Nonconstant Sum Games available at <http://faculty.lebow.drexel.edu/mccainr/top/eco/game/nash.html>.

<sup>44</sup> Vickrey, Appendix II, pp. 32-33.

*licenses to bidders. This evaluation was required to include an experimental study of alternatives to the SMR procedures that might better facilitate the acquisition of efficient combinations of the elementary licenses where complementarity is important, or in any case to increase understanding of the problems and the complexities of the SMR mechanism. This background report is the first that we expect to issue that provides such an evaluation; as the first such report, it provides a brief review of several issues and experimental findings that bear most directly on the conceptual and behavioral foundation of the FCC design problem.<sup>45</sup>*

In discussing an analysis of alternative auction designs for combinatorial auctions, the paper considers a test of a combinatorial auction design based on a 1982 paper by Rassenti, Smith and Bulfin. The FCC-commissioned paper explained that

*The RSB (1982) mechanism addressed three problems generic to the combinatorial features of the commodity space: (i) separating prices (Lagrange multipliers) in the optimization do not exist; (ii) in view of this what information should be reported to the bidders after each sealed bid auction allocation (or round in the case of multiple round auction mechanisms)?; (iii) what are the behavioral incentive properties of the resulting rules? An integer programming algorithm was devised that allocated integer elements  $\{0, 1\}$  to packages that maximized reported surplus as contained in the bids submitted for the packages, subject to constraints on the supply of each elemental resource. Two pseudo-dual programs to this primal problem were used to define a set of accepted packages,  $A$ , and a set of rejected packages,  $R$ ; also a set of lower bound prices  $\{w_i^*\}$  and a set of upper bound package prices  $\{v_i^*\}$  were determined. Then, (a) if a package bid was greater than the sum of its component values in the set  $\{v_i^*\}$ , it was in  $A$ , and, except in rare marginal cases, the bidder paid less for the package than her bid, providing good incentives not to underreveal true value; (b) if it was less than the sum of its component prices in  $\{w_i^*\}$  it was in  $R$ ; (c) all bids in between  $A$  and  $R$  were in a region where acceptance or rejection were critically dependent upon the integer constraints on the allocation of the elemental resources. Thus, each bidder knew that in a subsequent auction (or round if an iterated procedure is used) whether a best reply would certainly be accepted, certainly be rejected, or depended on the integral "fitness" of the bid.<sup>46</sup>*

The paper demonstrates the ability of the experiment/clinical trial to assess the efficiency of the auction process under consideration. Of particular note, the paper discusses bidders learning lessons that could be carried over to repeat auctions – an important point for the DME acquisition program since both

---

<sup>45</sup> Cybernomics, p. 2 [Emphasis added.]

<sup>46</sup> Ibid., pp. 38-39. [Note omitted]

academic and government experts expect that auction failure will result from repeat auctions using CMS rules.

The first results reported from the RSB mechanism provides a sense of the sort of results that clinical are able to provide.

Results

- (1) *This computational and feedback reporting process in RSB yielded efficiencies for experienced bidders no lower than 97.8% in a difficult combinatorial environment (Figure 7, lower panel), and no lower than 83.2% in an easy combinatorial environment (Figure 6, lower panel).*<sup>47</sup>

It needs to be recognized that, although clinical testing of an auction design can yield detailed, quantitative results, one of the most important functions of the testing is to uncover previously unrecognized problems before conducting the auction. As the paper explained,

*These experiments illustrate the following: you have a nice theoretically “optimal” procedure, but in testing you encounter behavioral incentive or “strategic” problems not part of the original theory or even considered.*<sup>48</sup>

The paper further explained that

*These are all issues, not readily anticipated by formal analysis, that can surface naturally in experiments, and make ex post sense.*<sup>49</sup>

Thus, conducting clinical trials of a planned auction design is an essential step in developing an auction.

---

<sup>47</sup> Ibid., p. 39.

<sup>48</sup> Ibid., p. 22.

<sup>49</sup> Ibid. [Emphasis in original]

***“FCC experience argues strongly for more intensive laboratory test bedding of proposed new FCC and other complex auction mechanisms”***<sup>50</sup>  
**The FCC’s Combinatorial Bidding Conference 2001**

The FCC’s second auction conference was held in October 2001, “in conjunction with the Stanford Institute for Economic Policy Research and National Science Foundation....” The conference “provided a forum for some of the nation’s experts in the economic science of auctions and the FCC’s auctions program managers to share information, present papers, and discuss the FCC’s auctions processes.”<sup>51</sup>

Discussion of experimental results was an important component of the 2001 conference. One of the papers presented was “Theory, Experiment and the Federal Communications Commission Spectrum Auctions” by researchers at Caltech and George Mason University.<sup>52</sup>

The Banks paper is of particular relevance to CMS since it discusses the design and execution of two different types of clinical trials:

- ▶ Tests which analyze specific bidding rules; and
- ▶ A comparative test of two different auctions designs.

Both types of experiments are important to reforming CMS’ DME competitive bidding program since: 1) the effects of various current specific bidding rules need to be quantified; and 2) the current bidding system needs to be tested against alternative auction models. With respect to testing specific rules, the paper explains that

*A market institution consists, in part, of a set of explicit rules that govern the actions and behavior of the market participants. Because of the complexity of the expected bidding environment and the potential for strategic behavior on the part of participants, the SMA [Simultaneous Multi-round Auction] employed by the FCC includes numerous rules. We examine the effects of two SMA rules – the rule that assigns unequal eligibility points to different licenses, and the rule that tapers the amount of eligibility that the bidder maintains during the course of the auction for a given level of bidding activity.*<sup>53</sup>

---

<sup>50</sup> J. Banks, M. Olson, et al, “Theory, Experiment and the Federal Communications Commission Spectrum Auctions” (“Banks, et al”) p. 43 available at <http://wireless.fcc.gov/auctions/conferences/combin2001/papers/vsmith.pdf>.

<sup>51</sup> The Conference Agenda may be found at [http://wireless.fcc.gov/auctions/default.htm?job=conference\\_agenda&y=2001](http://wireless.fcc.gov/auctions/default.htm?job=conference_agenda&y=2001).

<sup>52</sup> Banks, et al.

<sup>53</sup> Banks, et al., Part 2.0.

The FCC went beyond testing specific components of their bidding system. The agency contracted with a firm to design a combinatorial auction for spectrum that was similar in concept to the Commission's auction but with the contractor developing their own set of bidding rules. By conducting clinical trials on the two auction designs, it is possible to assess the strengths and weaknesses of each system.

*The Charles River and Associates' CMA [Combinatorial Multi-round Auction] yielded significantly higher efficiency, and significant lower revenue in all super additive environments, than did the SMA procedure. The higher revenue in the SMA was a consequence of losses incurred by bidders in failed (package) license aggregations. The better performance of the CMA, however, was attained at a transactions' cost of requiring three times as many auction rounds to complete the auctions. In many, but not all of the experiments, additional rounds did not change allocations or revenue, but this was not known by the participants who were ardently monitoring the process and seeking (without computational 'cobbling' assistance) from the mechanism their best alternatives in the form of collaborative package combinations.*

One of the paper's contributions to developing efficient government auctions is its description of how auction rules should appear to potential bidders with a strong emphasis on simple and easy to understand instead of rules which encourage bidders to game the system.

*One of the primary objectives of auction design should be to simplify, and reduce the cost of the bidding process for the participants. This may require mechanism computational support in the form of optimization algorithms when environments are superadditive. The auction should incentivize bidders to devote their resources to determining the value to themselves of the various individual and packages of licenses. The auction should provide a simple and clear way for bidders to declare their value structure, no matter how complicated, without fear of others free-riding on their investment in estimating or developing value. The auction should not obligate bidders to expend an inordinate amount of resources on consultant and management time trying to figure out how to bid strategically in order to realize their potential value.<sup>54</sup>*

Superadditivity is simply a formal mathematical expression of the phenomenon commonly referred to as synergy, *i.e.*, two or more items that combined have a value greater than the sum of the parts. This is a situation which may well exist in DME. For example, a business which offers oxygen equipment and service of the equipment is, *caeteris paribus*, likely to be worth more than the combined values of two separate business, one offering only oxygen equipment tanks and the other offering only service.

---

<sup>54</sup> Banks, et al., p. 42 [Note omitted]



The authors' contention that bidders should not have to try "to figure out how to bid strategically" is of particular relevance to the CMS DME program since, as the CBO official explained, "the bidders were not actually bidding for the price at which transactions would occur; they were bidding for an invitation to the next round." Thus, one of the flaws in the CMS program is that it incentivizes bidders to engage in negative behavior (bidding at prices that are not intended to be honored) which, among other problems, wastes private and public sector resources, a waste directly resulting from the program's lack of transparency.

The most important conclusion drawn from the clinical trials of the FCC and Charles River auction designs is the importance of conducting such tests in developing and improving an auction. As the paper concludes,

*The FCC experience in auction design, learning from its application, redesigning in the light of emergent design flaws, more learning in application etc., provides important lessons in parallelism between field and laboratory for experimentalists, theorists and economist generally, who have an interest in economic design:*

*(1) Many of the issues and attendant learning in laboratory experiments about strategic ("gaming") behavior—jump bidding, new forms of gaming induced by rules designed to limit strategic behavior, increased transactions cost and/or auction length induced by controls for gaming, collusive attempts when bidders cannot bid anonymously—subsequently emerged and were relearned in the FCC auction through similar parallel sequential experiences. (McCabe, Rassenti and Smith, 1988/1991).*

*(2) Besides providing new evidence on parallelism between the two study environments, FCC experience argues strongly for more intensive laboratory test bedding of proposed new FCC and other complex auction mechanisms. Elementary errors and their correction in mechanism design should be made in the laboratory, not in the field where the cost is very large and borne by others besides the designers and their founders. This argument is further supported by laboratory studies and field applications of market mechanisms for trading emission rights (Isikida, et. al.) and for electric power trading (Rassenti, Smith and Wilson, 2001).<sup>55</sup>*

Thus, the paper explains why agencies, not just the FCC, should engage in laboratory clinical trials of proposed auction rules prior to conducting the actual auction. The counter-arguments against conducting such tests remain murky at best.

---

<sup>55</sup> Banks, et al, p. 43 [Emphasis added].

***“field data obtained from actual auctions do not permit one to make a direct inference about the efficiency of the final allocation”***<sup>56</sup>  
**The FCC Solicits Public Comment on Clinical Testing (2005)**

The FCC describes their Simultaneous Multiple-Round auction technique (known as SMA or SMR) by explaining that “all licenses are available for bidding throughout the entire auction, thus the term ‘simultaneous.’ Unlike most auctions in which bidding is continuous, SMA auctions have discrete, successive rounds, with the length of each round announced in advance by the Commission.” The FCC further explains that the number of rounds is not preset but instead, bidding “continues, round after round, until a round occurs in which all bidder activity ceases. That round becomes the closing round of the auction.”<sup>57</sup>

The SMR auction design can accommodate combinatorial bidding which would allow participants to place bids on packages of licenses as well as individual licenses. To the extent that potential synergies exist in combinations of licenses, a combinatorial auction would allow the agency to capture those economic benefits in the auction.

There can be a tremendous difference, however, between what an agency or other organization expects would occur in a given auction and actual auction results. Moreover, even the actual results of a given auction would not provide information about the potential of the auction since the auction results do not reveal what bidders would have paid for the licenses in an alternative auction format.

To determine whether the SMR auction would be more efficient with or without combinatorial bidding, the FCC decided to test whether allowing combinatorial bidding improves the auction result. The FCC made two important decisions with respect to the testing process that serve as role models for other federal agencies engaging in auctions:

1. The agency contracted with outside academicians to design the test; and
2. The agency solicited public comments on the test design prior to it being conducted.

Thus, the FCC not only benefitted from specialized expertise in the design of auction tests, the agency also ensured transparency throughout the process. The FCC’s transparency decision meant that they (and taxpayers and spectrum users) benefitted from external comments and reply comments on the test design and enhanced public confidence in the process.

---

<sup>56</sup> FCC Record, Volume 20, No. 11, May 5, 2005, p. 8688.

<sup>57</sup> Federal Communications Commission; About Auctions; Auction Designs Simultaneous Multiple-Round (SMR) Auctions *available at* [http://wireless.fcc.gov/auctions/default.htm?job=about\\_auctions&page=2](http://wireless.fcc.gov/auctions/default.htm?job=about_auctions&page=2).

The Commission explained why they were conducting the test in their request for comments on the test design in their request for public comments. In requesting public comments, the FCC highlighted the importance of clinical tests to assess how bidders would actually respond to the auction,

*Experimental economics involves the study, in a controlled laboratory setting, of how financially motivated persons make decisions when confronted with real economic choices. Economic experiments increasingly are used to test the validity of economic theories, and to shed new light on complex economic situations in cases where theory has little to say. Economic experiments offer laboratory control, replicability, and a potential to establish cause and effect. The Bureau seeks to use economic experiments to test possible auction designs in order to observe the reactions of real people in situations where they must make bidding decisions in the presence of uncertainty, market complexity, and economic incentives.<sup>58</sup>*

The Commission received comments from interested parties including cellular service providers, industry consultants and academicians. The comments ranged from concerns that use of a combinatorial auction would be too burdensome on participants to detailed comments on the test design. For example, one commentor expressed concerns that,

*The sample population for economic experiments may well be different from the population of real-world decision makers for spectrum auctions. Either by screening out candidates with extensive knowledge of game theory, or by introducing candidates to the subject with little preparation. In practice we would expect to find that significant amounts of analysis (including consultation with experts) takes place prior to an auction.<sup>59</sup>*

The comments raise an interesting issue which is of relevance to CMS' DME program, the auction experience and sophistication of bidders should be taken into account in auction design and testing. With respect to the FCC's SMR spectrum auctions, the likely bidders were predominantly large companies with access to substantial technical expertise on auctions. By contrast, DME bidders are mostly, though not exclusively, small companies with little if any background in auctions and game theory.

The comments to the FCC quoted above discuss the importance of the addressing the sophistication and resources of auction participants when testing an auction design. The need for auction evaluations to

---

<sup>58</sup> Federal Communications Commission, Public Notice (DA 05-1267), "Comment Sought on Experimental Design for Examining Performance Properties of Simultaneous Multiple Round Spectrum License Auctions with and Without Combinatorial Bidding," available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DA-05-1267A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-05-1267A1.pdf). [Emphasis added]

<sup>59</sup> PA Consulting Group, Comments On the FCC Experimental Auction Design Report, 1 June 2005, p. 1, available at [http://wireless.fcc.gov/auctions/isas/PA\\_Consulting.pdf](http://wireless.fcc.gov/auctions/isas/PA_Consulting.pdf).

consider bidder experience and resources does not mean that auctions aimed primarily at smaller companies are not viable or are inherently less efficient than those targeted at large businesses. Rather, the auction design and testing of the auction need to be tuned to match the profile of expected bidders.

***“These efficiency gains are significant from a statistical point of view,  
and the economic magnitudes could be quite large”*<sup>60</sup>**  
**The FCC Report on Clinical Testing Experiment (2006)**

The FCC released the report they commissioned that contained the results of the lab experiments testing to see whether allowing combinatorial bidding to the Commission’s auction would improve the economic efficiency of the process. The report described the testing process used to evaluate the alternative auction procedures and explained that the tests “were run in a laboratory with networked PCs, using human subjects who were financially motivated to bid carefully and who had gained experience with the environment in earlier experiments.”

The researchers explained that the software “programmers implemented the required design features one by one, so as to spot problems at each stage. A related aspect of software development was the adjustment of the bidder interface to make it easily understood by the bidders and to minimize bidding errors due to misperceptions.” The software tools were further developed to “perform tedious calculations using the data generated from the experiments. The *jAuctions* software now contains several programs that calculate whether or not a competitive equilibrium outcome is reached in each auction, whether the outcome is in the Core, and if not, which constraints are violated.”<sup>61</sup>

The research report discussed above is an example of the testing that needs to be conducted on CMS’ DME acquisition program to determine the most efficient means of redressing the problems in the agency’s auction design that were highlighted by the hundreds of academicians writing to the agency and the President and by the CBO’s senior Medicare cost estimator.

The study commissioned by the FCC determined that allowing combinatorial bidding “results in higher efficiencies” under certain specified conditions. The report concludes,

---

<sup>60</sup> Jacob K. Goeree, Charles A. Holt, and John O. Ledyard, “An Experimental Comparison of the FCC’s Combinatorial and Non-Combinatorial Simultaneous Multiple Round Auctions,” July 12, 2006, p. 18 (“Goeree, et al”) available at [http://wireless.fcc.gov/auctions/data/papersAndStudies/fcc\\_final\\_report\\_071206.pdf](http://wireless.fcc.gov/auctions/data/papersAndStudies/fcc_final_report_071206.pdf).

<sup>61</sup> Goeree, et al., p. 4.

*These efficiency gains are significant from a statistical point of view, and the economic magnitudes could be quite large, given the high values of spectrum licenses.<sup>62</sup>*

The study's finding discussing the FCC's ability to improve the efficiency of their auctions is a way of saying that, in its current form, the agency is leaving money on the table. Moreover, as the academicians explained, CMS's auction design means that "fraud and abuse would grow."

The implications of the FCC report's conclusions for CMS are direct – auction inefficiencies mean that Medicare is leaving the taxpayer's money on the DME procurement table.

---

<sup>62</sup> Ibid., p. 18.

### **Seven Lessons Learned**

1. There is a broad consensus that Medicare’s new auction-style “competitive bidding” program is neither an auction nor competitive.
2. CMS’ decision to allow non-binding bids and other unusual auction provisions results in an unsustainable system that does not communicate price information to the market.
3. Unless CMS reforms the program, it will result in auction failure, threatening Medicare patients’ supplies of needed home medical equipment while increasing fraud and abuse.
4. The design of CMS’ competitive bidding program violates the President’s Memorandum on Scientific Integrity and Executive Order on Regulatory Review.
5. Auctions can be modeled and tested prior to being implemented to improve their efficiency and detect unrecognized design problems.
6. The FCC has demonstrated federal leadership in using auction experts and an open process to improve the efficiency of government auctions, these techniques could be used by CMS.
7. CMS is leaving the taxpayers’ money on the table through inefficiencies in their DME program.

### **Recommendation**

- ▶ A federally-sponsored clinical trial is needed for CMS’ DME bidding program, prior to Round 2, to determine how to reform its rules so as to create a sustainable competitive auction benefitting taxpayers and beneficiaries.