

SIEPR

policy brief

Stanford Institute for Economic Policy Research

on the web: <http://siepr.stanford.edu>

Using Procurement Auctions to Allocate Broadband Stimulus Grants

By Paul Milgrom, Greg Rosston, and Andy Skrzypacz

Introduction

On April 13, 2009, 71 economists filed comments with the National Telecommunications Information Agency (NTIA) and Rural Utilities Service (RUS) to advocate that these agencies use auctions to guide their decisions in how to disburse more than \$7 billion in stimulus funding. (http://www-siepr.stanford.edu/broadband_document.pdf) This policy brief is a summary of that submission and explains why procurement auctions are more efficient and more consistent with the stimulus goals of allocating funds quickly than a traditional grant review process.

The broadband component of the American Recovery and Reinvestment Act (ARRA) has dual, and not entirely consistent, objectives of providing immediate economic stimulus and improving broadband service. NTIA/RUS face a formidable challenge in determining how to spend the money quickly and efficiently in ways that meet these goals. The traditional grant application process is long, complicated, and it involves subjective and arbitrary decisions regarding which projects to fund. In other words, requesting and reviewing grant applications is not an effective way to implement the plan.

continued on inside...

About The Authors

Paul Milgrom is the Shirley R. and Leonard W. Ely Jr. Professor in Humanities and Sciences. He is also co director of the Program on Market Design at SIEPR, which supports research into the ways that the rules of an auction, exchange, or other market affect its performance. He is a member of the National Academy of Sciences, a fellow of the American Academy of Arts and Sciences, the holder of an honorary doctorate from the Stockholm School of Economics, and winner of the 2008 Nemmers Prize in economics.



Gregory Rosston is the Deputy Director of SIEPR. Rosston's research has focused on industrial organization, antitrust and regulation. He has written numerous articles on competition in local telecommunications, implementation of the Telecommunications Act of 1996, auctions and spectrum policy. He served on the Obama transition team. Prior to joining Stanford University, Rosston served as Deputy Chief Economist of the Federal Communications Commission and helped with the design and implementation of the FCC's spectrum auctions.



Andrzej (Andy) Skrzypacz is Associate Professor of Economics at the Stanford Graduate School of Business. His research is on microeconomic theory, especially information economics, market design, and game theory/strategy. His recent papers consider auction design, bargaining theory, repeated games, and collusion in markets. He received his PhD in Economics from the University of Rochester and has since been working at the Stanford GSB. He is currently an associate editor for the American Economic Review.



SIEPR *policy brief*

Procurement auctions, in contrast, provide a mechanism that can allocate grant money quickly, efficiently, and according to well-defined rules. As a result, procurement auctions offer NTIA/RUS the most promising method of maximizing broadband improvement while also creating some level of “temporary, timely, and targeted” stimulus. We therefore strongly recommend that NTIA/RUS adopt procurement auctions as the preferred method of distributing grants.

Procurement Auctions Are More Efficient Than Traditional Grantmaking Approaches

Traditional Approaches for Distributing Grants Are Cumbersome and Slow

Traditionally, subsidy programs require firms to submit lengthy applications and the government to pick the “best ones” after reviewing all the competing applications. This approach has at least three problems for the purpose of distributing the funds from the stimulus bill.

First, the traditional approach is inherently time-consuming. Firms must complete complex proposals that government officials must

subsequently spend time reviewing. Such delays are inconsistent with the goals of speedy stimulus grants.

Second, the qualitative nature of the applications makes it difficult to compare one project with another. For example, it will be difficult to choose between, say, a fiber project in Texas and a wireless project in North Dakota. Reviewing and deciding between large numbers of grant applications will inevitably lead to inconsistent and seemingly arbitrary decisions.

Third, it is difficult to design a grant application system to ensure that firms receive only the minimum subsidy necessary to achieve a goal.

Procurement Auctions Can Allocate Funds Flexibly, Efficiently, and Fairly

An objective, “mechanistic” approach that applies specific, quantitative criteria can be easier to implement and lead to more efficient outcomes than traditional grant application review. In the simplest procurement or “reverse” auction, bids consist of how much an entity must be paid to provide a good or service. The procurement auction thus identifies the entity willing to provide

the good or service for the smallest amount of money.

Though it may sound exotic, a procurement auction is just a competitive bidding process and analogous to any government procurement. When the government needs to purchase something, it describes specifically what it wants, firms submit bids to provide the service, and the government picks the firm that submits the best bid. The best bid may be the lowest, but the government may also take other factors into account when making the decision, especially in the case of complex projects.

In procurement auctions for broadband, the government would specify its objective and ask firms to bid for the right to meet that objective. Consider, for example, a rural area with no broadband service. The government can ask firms to bid for a subsidy that would make it profitable for the firm to provide service. Firms and other organizations would compete against each other by bidding down the subsidy they need to offer service. The firm that commits to provide broadband in that area for the smallest subsidy would win the grant.



Procurement auctions have several advantages over traditional methods of distributing grants. First, once the auction rules are in place, they eliminate the subjective element in identifying the “best” projects—the government sets forth its criteria in advance of the auction. This also enables and encourages bidders to tailor their projects to the government’s actual objectives. Second, because auctions use competition among providers to determine the subsidy required to achieve any particular goal, the government does not have to estimate the subsidy actually required for any given project. Reducing the subsidy for any given project frees up money that can be used for additional projects. Finally, they inherently induce firms to contribute their own investment to increase the chance that their bid is accepted.

Procurement auctions are sound and have been used successfully around the world to bring telecommunications services to areas that previously had none. Experiences in

other countries including Australia, Chile, India, Peru, and others demonstrate that procurement auctions can substantially bring down the subsidies required to induce buildout.¹ Their experiences also teach us that it will be important to get the details right.

Clear Selection Criteria Are Critical for Any Selection Program

Crucial to the success of any plan, not just procurement auctions, is having clear objectives. In the case of the broadband stimulus the objectives include creating new jobs and improving broadband. In general, we set up a system where stimulus funds would be awarded to those bidders that maximize broadband expansion with the lowest subsidy amount. Through the auction process bidders would be able to “bid down” the subsidy as they compete with other bidders seeking the same stimulus dollars.

Careful auction design is crucial to ensuring an efficient outcome. It is important to keep in mind two general points. First, the criteria on

which the bids will be scored or ranked must be clear. As a simple example, bids could consist of subsidy requested per household connected or per household to which broadband service is newly available. Then bids could be ranked from smallest subsidy requested to the largest, and funds distributed according to that ranking.

Second, the ability to “game” the procurement process increases with the ambiguity of the rules and the number of criteria included in a bid. For example, an auction in which firms had to demonstrate that their bid was in the “public interest” and specify a subsidy per household, the number of new households served, the service speeds, reliability, latency, mobility, and price would not work well due to the ambiguity of what, exactly, “public interest” means and the large number of criteria on which firms bid.

Note that the need to identify unambiguous, simple criteria on which to judge bids in advance of the auction is actually an advantage, not a disadvantage, of procurement auctions. Any grant review

¹ See Wallsten, Scott, “Reverse Auctions and Universal Telecommunications Service: Lessons from Global Experience” *Federal Communications Law Journal*. <http://www.law.indiana.edu/fclj/pubs/v61/no2/9-WALLSTENFINAL.pdf>

process would need to include the same identification task to avoid arbitrary and inconsistent decisions.

In addition to those very general points, an auction must be designed in a way that does not arbitrarily benefit one technology over another. Organizations could, therefore, bid to upgrade copper services in order to make DSL feasible, upgrade or install coaxial cable to facilitate cable broadband, or upgrade or install wireless and satellite broadband equipment. With scoring rules set out in advance bidders could know how they would have to bid and consider competing technologies or providers in other geographic areas.

A Straw-Man Procurement Auction Plan for Allocating NTIA/RUS Broadband Subsidies

Auction Design

We now briefly describe the economic methodology and other considerations for devising an effective procurement auction program. The detailed rules of the auction will be crucial, as they will affect

the outcome. It would be useful to subject the rules to experiments in advance of holding the auctions.

The first step is the same for both a procurement auction and a traditional grant review process: NTIA/RUS must identify and define unserved and underserved regions.

The second important step is for NTIA/RUS to set out a framework for scoring projects in terms of a standard unit of supply. This could be a simple metric such as “newly served population” (defined as the population to which service above a minimum bandwidth threshold is newly available) or a more involved measure such as “effective bandwidth supplied” (defined as the population to which service is newly available adjusted for the speed of service²). Each bid would be characterized in terms of effective supply and cost. We advise against introducing additional dimensions to the evaluation. It is particularly problematic to introduce subjective criteria, which undermine the quick and objective comparisons required by an effective auction.

In a sealed-bid auction, the winning bids maximize the total effective supply, subject to the government’s spending and other constraints (for example, spending a minimum amount on new access to libraries).

Auctions are adaptable to respect a wide range of policy concerns. The government could use instruments similar to ones that have been employed in FCC auctions, such as limiting the number of projects won by any single bidder or offering bidding credits to small businesses. And, to spread the effects of the subsidy geographically, the government could give greater weight to the first households served in a state or region than to additional households.

Any subsidy or procurement plan—auction or otherwise—must include a strong mechanism for determining that firms fulfill their obligations. Performance and related assurances such as performance bonds and other mechanisms apply to any grant program and are not unique to procurement auctions. No matter what

continued on flap...

² An adjustment factor would reward bidders for providing higher speed service to unserved population. For example, 1 mbps service could have a factor of 1, 10 mbps a factor of 1.5, 50 mbps a factor of 2, and 100 mbps a factor of 3.



mechanism NTIA/RUS might choose to allocate competitive grants, it will still have to address compliance and auditing.

Award at Least a Portion of the First Wave of Broadband Stimulus Funding and Expand the Program if Successful

Using competitive auctions for disbursing subsidy grants may be viewed as a change in process and hence may involve some risk. As such, if auctions are not used for the entire subsidy process, we should at least try to compare how auctions perform compared with the traditional process. We recommend that NTIA/RUS designate at least one large geographical region in which the first wave of funds is distributed exclusively through a procurement auction process. This approach sets up a natural experiment allowing comparison of procurement auctions with the traditional approach. If the experiment is successful, the procurement auction mechanism can be expanded in scope to encompass other regions and stimulus dollars (potentially all remaining stimulus funds).

One way to use auctions for a portion of the first wave of stimulus grants would be to divide the country into large geographical regions that are roughly similar in terms of population size and urban/rural mix. Then, in the first wave of stimulus disbursement, part of the U.S. population would be served through procurement auction of stimulus funds and part through a conventional grant review process. The NTIA/RUS should then compare results of the two programs to make an informed decision whether to use procurement auctions in subsequent rounds.

Should NTIA/RUS decide to continue or expand the use of procurement auctions, the mechanism can be tweaked to incorporate lessons from the first wave. However, even if NTIA/RUS decide to proceed through entirely conventional means, the procurement auction will undoubtedly provide important lessons (e.g., bidder receptiveness to quantitative targets) that will inform refinements to the conventional approach. Finally, since similar procurement auction designs can be used in other public projects, the lessons are likely to

be valuable for broader policymaking.

Conclusion

A traditional grant application review process may prove to be inadequate to the herculean task of distributing broadband stimulus grants. It is likely to be slow, cumbersome, and result in a suboptimal allocation of resources. By contrast, competitive bidding, through the use of procurement auctions, can allocate the funds quickly and efficiently. While we advocate using procurement auctions to distribute all of the broadband stimulus money, allocating even a portion of the funds using procurement auctions would be useful as an experiment. At a minimum, the broadband stimulus funds present a golden opportunity to implement rigorous evaluation techniques, which will generate knowledge that can be applied to other current and future programs. To that end it is important to include procurement auctions at least as one approach to be tested.

SIEPR

About SIEPR

The Stanford Institute for Economic Policy Research (SIEPR) conducts research on important economic policy issues facing the United States and other countries. SIEPR's goal is to inform policymakers and to influence their decisions with long-term policy solutions.

Policy Briefs

SIEPR Policy Briefs are meant to inform and summarize important research by SIEPR faculty. Selecting a different economic topic each month, SIEPR will bring you up-to-date information and analysis on the issues involved.

SIEPR Policy Briefs reflect the views of the author. SIEPR is a non-partisan institute and does not take a stand on any issue.

For Additional Copies

Please see SIEPR website at <http://SIEPR.stanford.edu>.

SIEPR *policy brief*

A publication of the
Stanford Institute for Economic Policy Research
Stanford University
579 Serra Mall at Galvez Street
Stanford, CA 94305
MC 6015

Non-Profit Org.
U.S. Postage
PAID
Palo Alto, CA
Permit No. 28