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Measuring the Effectiveness of the Broadband Stimulus Plan

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The newly enacted economic stimulus package includes $7.2 billion in grants, loans, and loan guarantees to bring broadband to rural areas lacking high-speed Internet services. The American Recovery and Reinvestment Act of 2009 charges government agencies not only with choosing grant recipients and setting performance benchmarks, but also with measuring results. Only a carefully preplanned evaluation strategy will enable them to accurately assess the effectiveness of the broadband stimulus.[1]

A Unique Opportunity

The broadband stimulus offers an unprecedented opportunity to examine the effectiveness of newly funded programs and to apply that knowledge to existing and future programs.

Because most government grant and loan programs are ongoing, they generate a vested constituency with little interest in a rigorous evaluation of their work, for fear that shortcomings would be revealed. By contrast, the broadband stimulus is a one-time plan that has not yet been implemented. As such, it has less of a constituency with a stake in a predetermined result, and government agencies should be able to review actual results relatively free of the distortions of self-interested grantees. And if the results are accurately measured, they can inform the many existing federal and state broadband programs that are already subsidized but that have not been evaluated.

What Is A Successful Project?

To determine how to assess the effectiveness of the broadband stimulus, we must first think carefully about what constitutes success. The stimulus act emphasizes the need to minimize waste, fraud, and abuse. Beyond these obvious goals, agencies face the more subtle but probably more important goal of ensuring that stimulus money is not used to fund initiatives that would occur anyway.

Unfortunately, it is difficult to determine whether a project would have occurred even in the absence of government funds. Imagine that a broadband provider secures stimulus funds to expand its network. With the expansion complete, the company reports to the government that it did what it promised to do on time and on budget. No one could blame a grant manager for concluding that the project was a success. But if the company would

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[1] The analysis I present in this paper does not address the issue of whether the subsidies are a net benefit to society. That is, it is not a cost-benefit analysis of broadband subsidies. Instead, it takes the subsidy program and the policy goals as given and provides a way to evaluate whether the program will have succeeded in that context.

have gone ahead with the project even without the subsidy and achieved the same results, then the stimulus money neither created jobs nor improved broadband service.

Thus, a successful broadband stimulus plan should fund only useful projects that broadband providers would not fund on their own. Similarly, stimulus grants should not cause providers to reallocate money from projects in which they would have invested on their own to grant-subsidized projects that would yield no additional investment.

The only way we can ever determine whether the stimulus funds subsidized projects that would not have happened without those subsidies is to build evaluation into the system from the beginning. If agencies examine only the performance of grant recipients after the fact, they will be incapable of assessing whether the project would have been undertaken anyway. The grantee may have done what it promised, but that doesn't mean the grant itself was responsible.

What Should We Measure?

There is a tension between the stimulus plan's goals of creating jobs and improving broadband. We can do both to some extent, but we cannot simultaneously maximize the number of new jobs and improvement in broadband.

To provide an extreme example, laying "fiber to nowhere" would create new construction jobs and additional demand for fiber, as no broadband provider would be likely to undertake such an investment on its own, yet the project would do very little to improve any aspect of broadband in the United States. In contrast, spending the full $7.2 billion subsidizing low-income households could generate a substantial boost in the number of households connected to broadband, but would generate very few jobs, as broadband infrastructure is already available to most low-income households even if they don't subscribe to it.

The bulk of the broadband stimulus money is intended to subsidize new infrastructure—broadband supply. Only $200 million of the $7.2 billion is targeted directly at potential users—demand—and even that money can go only to designated entities, such as nonprofits that aim to help low-income people, not to low-income individuals themselves.

Let us assume that the goal of the broadband stimulus is to maximize improvement in broadband infrastructure (supply), while still creating some additional employment. Thus, the key is some measurable indicator of new infrastructure, such as the increase in the number of households that have access to broadband infrastructure, whether or not they choose to subscribe.[2]

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[2] While we may be able to count new subscribers, the stimulus is unlikely to have a large overall effect on broadband adoption, even if every currently unserved area gains access. First, only 5 to 7 percent of households currently have no access. Second, many people who gain access to broadband will not subscribe, just as many who have access today do not subscribe. If we assume that demand for broadband is the same in unserved areas as it is elsewhere, then about 60 percent of those households would subscribe

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Measuring New Supply: The Gold Standard

Now that we know what to measure, how should we measure it? We know that measuring grant effectiveness retrospectively is imprecise, as we can never know which projects would have been completed without government aid. Overcoming this problem requires building evaluation into the grant selection process itself.

In 2002, Brandeis University professor Adam Jaffe proposed using randomized trials to measure the effectiveness of research and development grants. Under this model, an agency would begin by screening out the most inferior proposals and identifying a group of potential grantees. The agency would then randomly awards grants to certain applicants within this group. The grant recipients would become the treatment group, and the qualified but rejected proposals would become the control group. The government would then follow the progress of both sets of projects. If the projects in the control group did not proceed while the ones in the treatment group did, we could conclude the grants were effective. If projects in both groups proceeded and were equally successful, then it is less likely that the grants were effective.

If the idea of randomly choosing which grants to fund sounds foolish, consider that the government already uses this technique in other settings. For example, the Job Training Partnership Act included randomized trials to help learn what types of training led to better job outcomes. And FDA double-blind randomized drug trials are generally considered the "gold standard" of determining drug effectiveness. Arguably, if the government can subject the economically disadvantaged and the sick to randomized trials, we should have no qualms about subjecting broadband providers to such procedures.

**Measuring New Supply: The Silver Standard**

Unfortunately, for political reasons it is probably unlikely that the government will adopt this "gold standard." A more politically feasible method of measuring the plan's effectiveness may be a modified version of randomized trials. Under this second-best, "silver standard," agencies would track not only the broadband build-out of grant recipients, but also the build-out of providers not awarded grants—specifically, whether these rejected applicants continued with their proposed projects, even without a grant. This second group would serve as an imperfect control group.

Presumably, the National Telecommunications and Information Administration (NTIA) will begin its funding process by ranking all of the broadband stimulus proposals it

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if they could. Thus, if every currently unserved household gained access immediately and 60 percent of those subscribed immediately, national adoption would increase by only about 3 to 4 percentage points. Considering that household income in those areas is likely to be lower than the national median household income and that data from the U.S. Census Bureau demonstrate that income is a strong determinant of adoption, the true effect on adoption is likely to be even lower. The share of households with broadband subscriptions is already growing at about 3 to 5 percentage points per year, so the additional effect of the stimulus will be small.

receives on certain criteria. Next, it will fund the highest-ranked project and continue funding lower-ranked projects until the stimulus funding has been exhausted. At that point, the NTIA should collect data not just on projects funded through stimulus funds, but also on projects that the stimulus program rejected.

With that information in hand, the NTIA can examine outcomes, as in the figure on this page. Fitting regression lines between the points—controlling for factors such as population density and income, for example—it becomes possible to estimate the average "treatment effect," or, in other words, the effects of the broadband grants.[3] This description is an oversimplification, but the procedure is sound and should be implemented.
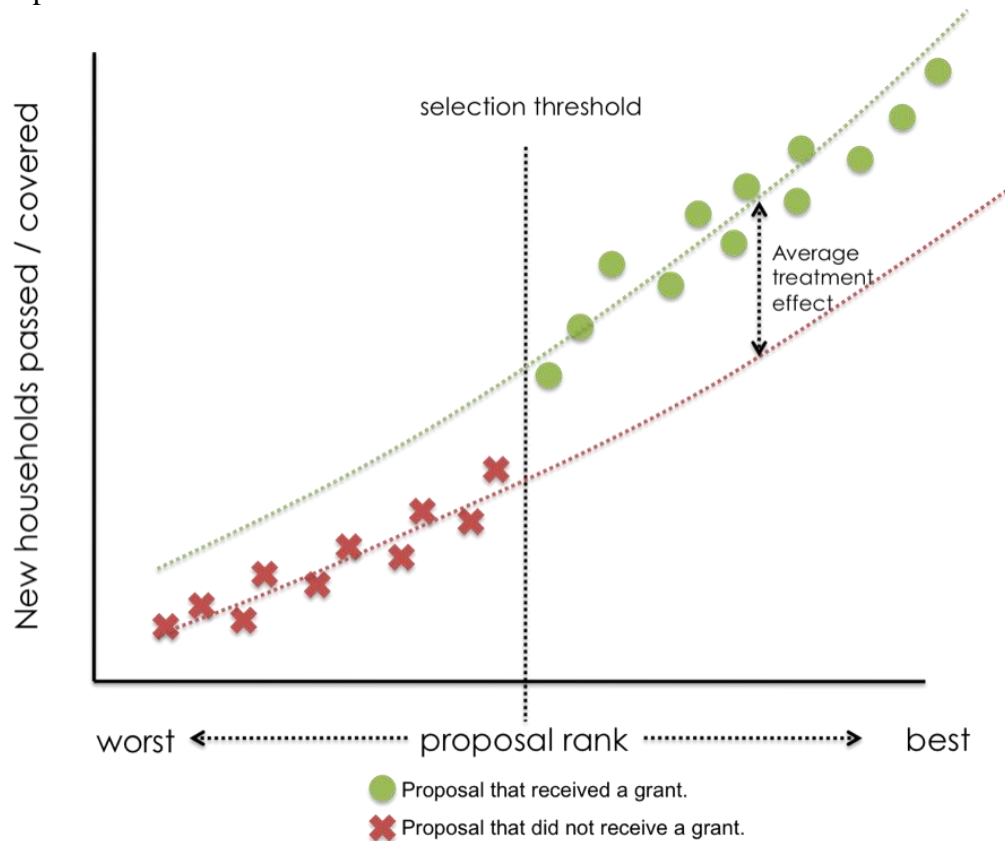
Source: Figure 1 in Jaffe (2002).

Conclusion

The broadband stimulus plan provides not just an opportunity to connect the few regions of the country that lack access to broadband, but also to learn what types of subsidies work and what do not. To realize both objectives, the agencies entrusted with distributing these subsidies should think carefully about how to evaluate their true effects and implement funding plans accordingly.

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[3] The figure presented here is drawn in a way that would show positive effects of the program. If the program was not effective we would see no significant difference between the two regression lines.

References and further reading

Jaffe, A. (2002). "Building Program Evaluation Into the Design of Public Research Support Programs," *Oxford Review of Economic Policy, 18,* pp. 22-34.

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