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Bandwidth for the People

By Robert Crandall, Robert Hahn, Robert Litan, and Scott Wallsten

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HIGH-SPEED ACCESS to the Internet, or "broadband," could be a tremendous boon to economic growth. In March 2004, the Bush administration made rapid deployment of broadband a national priority. The president asserted, "We ought to have universal, affordable access to broadband technology by the year 2007." As state and national policies develop in response to this vision, it is important for policymakers to understand the costs and benefits of different approaches aimed at promoting the diffusion of higher-speed Internet connections.

Over the past few years, the broadband market has grown dramatically: The number of subscribers has increased by nearly 300 percent since 2000, prices have declined, and the speed of some services has increased. Nonetheless, there is room for further growth and improvement. Public policies can greatly affect how this market develops — for better or worse. The choices policymakers have before them include taxes and subsidies, incentives and price controls.

Policies should focus on the incentives for broadband suppliers to invest in network upgrades that extend service and improve quality and speed. State and federal regulators can help increase broadband penetration by eliminating any regulation of wholesale and retail prices and any policies that deter entry into these markets. Subsidies, meanwhile, should not generally be used to promote "universal" broadband service. They are likely to hurt the average consumer. If subsidies are required for political reasons, they should be offered only as one-time inducements to extend broadband into underserved areas. Likewise, a tax on access to broadband or on services delivered over broadband, such as Internet telephony, is likely to slow the spread of broadband and is also an economically wasteful way of raising revenues. Internet access or applications, therefore, should not be taxed. In short, the right set of policies will foster competition among suppliers and lower barriers to entry to the benefit of consumers in terms of both access and prices. Poor policy choices, on the other hand, though intended to improve access to broadband, could have the just the opposite effect.

Broadband's economic potential

BROADBAND INTERNET ACCESS could contribute substantially to economic growth. Consumers benefit from new ways to acquire information, enjoy audio and video entertainment, monitor remote locations, receive medical care, and buy items ranging from books to cars. A study in 2001 estimated that universal broadband adoption could yield annual consumer benefits of $300 billion.[1] Businesses, meanwhile, may benefit from new opportunities to reduce their costs and to reach consumers with products and services. By one estimate, the Internet could reduce business costs by $125 billion to $250 billion annually while also increasing competition by making it easier for consumers to compare prices and services. Achieving these gains depends on many factors, including the penetration and rollout speed of broadband Internet access.

While there is general agreement that broadband could stimulate economic growth, there is less consensus about whether consumers are getting access to this technology fast enough. Americans receive broadband Internet access primarily through coaxial cable by cable television systems and digital subscriber lines (DSL) by traditional telephone networks. High-speed access is also increasingly available over new wireless technologies, including WiFi, mobile cellular networks, and satellite services. The popularity of broadband has increased over the past few years as prices have come down, as the number of applications that use it has increased, and as the technology has become available to ever greater numbers of homes. By the end of 2003, the FCC estimates, there were more than 28 million subscribers to some form of broadband Internet service.

Some broadband enthusiasts, such as former Federal Communications Commission chairman Reed Hundt, believe that U.S. broadband adoption and speed are lagging and that government should play a more active role both in promoting universal penetration and in increasing the speed of available broadband connections. Although broadband penetration in the U.S. is increasing rapidly, consumers in some other countries have adopted broadband even more quickly. According to OECD estimates, as of June 2003, the U.S. had about eight broadband connections per 100 people, behind Korea with 23 connections per hundred people, Canada with 13, Iceland and Denmark with 11, Belgium with 10, and the Netherlands, Sweden, Switzerland and Japan each with about nine. Moreover, average available download speeds are faster in some countries than in the U.S.

Others, however, contend that there is little analytical basis to conclude that the U.S. has a "broadband problem." Consumers are signing up for broadband services at record rates. The number of broadband subscribers increased from 400,000 at the end of 1998 to more than 23 million by June 2003 to more than 28 million by the end of 2003. This growth rate compares favorably to the speed with which other new landmark consumer technologies and services have been adopted.

Different rates of adoption across the world, moreover, do not necessarily mean that one country is adopting broadband "too slowly." One reason for different rates of diffusion is that the U.S. has a much lower population density than Korea, Japan, or most European countries, making new network investments in broadband more costly per subscriber in the U.S. than elsewhere. Another reason may be differences in the demand for broadband in different markets.

Broadband policy in the U.S.

THE U.S. BROADBAND market is increasingly competitive, especially with the rollout of wireless broadband. According to the FCC, at least two companies provide high-speed service in nearly 75 percent of all zip codes. As telephone companies upgrade their networks and cable companies continue to expand their cable capacity, more and more Americans have a choice of service from these two sources. In some cities, more than one cable company offers broadband. Moreover, new technologies, such as wireless access, are increasing competition even further.

Although high-speed Internet access through cable and DSL are similar services, providers of these services face completely different regulations. Local telephone companies supply DSL through standard telephone lines. The FCC therefore classifies DSL as a telecommunications service subject to regulation. Local cable TV companies supply broadband through their coaxial cables. The FCC has attempted to classify cable broadband as an "information service," thus leaving it largely unregulated, but it has been rebuffed by a federal appeals court. This decision, if upheld, could potentially subject cable broadband providers to the same regulations currently facing DSL providers. The FCC has asked for a stay of the ruling and is currently preparing for an appeal to the Supreme Court. As of this writing, the future status of cable regulation is unresolved, but cable companies' broadband services are not currently regulated by the states or the federal government.

Telephone companies' DSL services have been regulated at the wholesale and retail levels. Retail DSL rates are subject to regulation at both the federal and state levels, although such regulation is not currently exercised in most jurisdictions. More important, under the theory that telephone companies control a "monopoly bottleneck" facility, they have been required to lease their networks to competitors. The regulatory environment has favored cable and has deterred broadband investment by telecommunications firms. Perhaps for this reason, as of June 2003, DSL providers held about 33 percent of the consumer market to cable providers' 58 percent. Yet it is noteworthy that in the first half of 2004, following changes in FCC regulations and court rulings, local telephone companies added more high-speed lines than cable companies did.

Policy options

ECONOMIC POLICY SHOULD address market failures. One type of market failure can arise if a firm has a dominant position that gives it the ability to block entry by competitors. A second type of market failure could arise if a critical mass of users is needed to make it worthwhile to develop new applications that would make use of broadband's faster service. Even if such market failures exist, however, government should intervene only when the expected benefits of doing so outweigh the potential costs. That is, government should try to correct a market failure only when the risks of "government failure" are low.

Regarding market structure, there is little reason to believe that any telecommunications firm has a truly dominant position today in providing high-speed Internet access; as we argued above, the market is likely to become more competitive. It is highly unlikely that any supplier will be dominant in the future. The regulatory approach to broadband that has historically deterred investment rather than encouraging competition is changing — for the better.

The market for broadband, or for services associated with the use of broadband, is, however, characterized by "network externalities." Suppliers of applications that use broadband will be more inclined to invest in those applications the larger the population of potential users is. Similarly, everyday consumers will be more inclined to demand broadband the larger the pool of useful broadband applications is. These externalities suggest, in principle, a reason for government intervention.

While externalities may present reasons to intervene in principle, in practice any such intervention is likely to prove counterproductive. Indeed, given the existing level of competition and the emergence of new wireless technologies, there is no clear economic rationale for any regulation of broadband service providers. Existing government regulation of broadband networks is counterproductive: It is time to complete the deregulation of broadband begun last year by the FCC.

Removing federal regulatory barriers to investment. As noted above, until recently local telephone companies were required to make their entire networks — including broadband facilities — available to competitors. The rationale for this regulation was that the local telephone companies were considered to be "dominant" providers and that competition would be "impaired" if new entrants did not have access to *all* of the incumbents' facilities. Yet even as early as 2001, the FCC noted that "residential broadband services . . . while still a nascent market, generally appear to be subject to significant intermodal competition." Competition, the report stated, came from "multiple platforms, including DSL, cable modem service, satellite broadband service, and terrestrial and mobile wireless services." The evidence suggests that DSL providers lack market power, eliminating any justification for regulating them as "dominant." Moreover, there is little evidence that any particular platform can be considered dominant any longer. Even dial-up service, especially with new "accelerator" technologies, is an acceptable substitute for broadband at much lower prices for some consumers.

In an August 2003 decision, the FCC began moving away from these regulations, loosening some "unbundling" requirements by eliminating the right of entrants to share the incumbents' lines at very low prices. Telephone companies no longer will have to give competitors access to most new broadband investments, thereby increasing incentives to invest in new infrastructure such as optical fiber to homes, which will provide faster data transmission capabilities than is possible over copper lines. However, the FCC rules allow the states to decide whether to require incumbent telephone companies to lease their entire platforms to competitors at wholesale rates, which the competitors could, in turn, use to deliver broadband service. The decision to allow states to mandate unbundling of all of the facilities in the network platform, however, has now been reversed by the D.C. Circuit. The administration has elected not to appeal this ruling, though the long-distance companies have appealed it to the Supreme Court. Allowing the D.C. Circuit's opinion to stand would remove an important investment disincentive for broadband, at least for the incumbent telephone companies.[2]

If the U.S. is to boost broadband penetration and download speeds, it should encourage additional investment in network facilities by creating conditions that allow for the emergence of facilities-based competition. Over time, competition between providers using their own distinct infrastructure is more likely to lead to real competition over a wider range of activities than is competition created by forced sharing of facilities. Such facilities-based competition can drive investment, particularly for network upgrades required to provide higher-speed broadband.

There is some evidence that loosening these unbundling requirements could boost broadband penetration. As noted above, broadband penetration in Canada is about 60 percent higher than in the U.S. The primary difference between the two countries, which have similar demographics and population density, is that Canada has less onerous unbundling requirements for local telephone companies and virtually no mandated network sharing for competitive broadband suppliers. Freeing broadband providers in the U.S. from inappropriate regulations and allowing them to realize returns from their investments would increase their incentive to invest in broadband networks and boost broadband penetration rates.

Universal service subsidies. The market for broadband and for services associated with its use is characterized by positive externalities. Suppliers of applications that require broadband will be more inclined to invest in those applications the more broadband users there are. Similarly, consumers will be more inclined to demand broadband the more ways there are to use it productively. The existence of these externalities suggests that the market might not provide optimal broadband service and that, in principle, there could be a reason for government to subsidize or otherwise provide financial incentives for broadband rollout.

We believe, however, that robust competition is the essential engine for delivering the menu of broadband services and prices that consumers and businesses want. While positive externalities clearly exist, similar issues arise in many information technology

contexts. Many of these markets, however, work quite well without government intervention. Take, for example, the online auction market or the market for online gaming. These markets also demonstrate externalities: The benefits generated by an additional user are larger than those that accrue to the user himself. Even so, few would seriously argue that the government should subsidize eBay or fund the next generation of Doom. In other words, the existence of externalities by itself does not necessarily mean that government subsidies are warranted. Likewise, there appears to be little need for government to provide subsidies to specific users to adopt broadband technology, and the cost to the economy of funding such subsidies would likely exceed any benefits they create.

Nonetheless, for political reasons it is possible that the government may consider a subsidy for broadband. If the government moves in this direction, it should keep several points in mind. Most generally, subsidies should actually result in a change of behavior in the desired direction rather than support current behavior. They should be targeted appropriately.

More specifically, to increase broadband penetration, subsidies 1) should be offered only as one-time inducements for suppliers to extend network facilities into unserved or underserved areas; 2) should not be provided directly to consumers, because the majority of the benefits would accrue to those who would subscribe anyway and because such subsidies — including the current "universal service" subsidies for ordinary telephone service, only a small fraction of which go to low-income subscribers — often become permanent because of the political difficulty in eliminating them; and 3) should be small and funded out of general revenues — not through a tax on broadband or other telecommunications services — to minimize the cost to the economy.

Internet access taxes. Internet access taxes are a politically sensitive issue. In 1998, Congress banned such taxes for three years, though it exempted a handful of states that had already imposed them. The ban was extended for three years in 2001, and the Senate recently voted to extend it again. Now Congress is debating whether to make the ban permanent.

Whether such a ban makes sense and will accomplish its goal of promoting broadband use depends primarily on two factors. First, how efficient are such taxes relative to other forms of taxation? That is, what is the economic cost of taxing Internet access? Second, how sensitive are consumers to broadband prices? That is, how much would penetration decrease with given price increases resulting from the tax?

Telecommunications services are taxed in a variety of ways, and scholars generally see these taxes as inefficient and costly to the economy. These taxes (including carrier access charges above cost) raise more than $20 billion a year but are far more costly to the economy than the same amount raised through general income or sales taxes.[3] There is little reason to believe that taxes on broadband access would be any more efficient than other telecommunications taxes.

Determining the effects of taxes on penetration requires knowing how price-sensitive consumers are for broadband service. One study using data from 2001 concluded that a 10 percent price increase would, all else equal, reduce broadband demand by about 12 percent. Likewise, a study using data from the 2000-era broadband market found that taxing Internet access could slow rates of innovation and adoption and even deter entry into the market.[4]

While the inefficiency of telecommunications taxes and these estimates of price sensitivity suggest that banning Internet access taxes would benefit the economy and help stimulate broadband penetration, it is difficult to apply those estimates of price sensitivity to today's market. Today, more applications, such as audio and video streaming and Internet telephony, require broadband than in 2001. Demand is thus stronger than it was, and consumers are probably less price-sensitive than they were then. As a result, a price increase from taxes would probably have less impact now on penetration than it would have had in the past.

In summary, Internet access taxes are likely to be inefficient and costly to the economy relative to certain other taxes; moreover, they will have some negative effect on broadband rollout. But these effects are probably small compared to the positive effects of competition, highlighting the importance of removing obstacles to investment and competition. Thus, while avoiding access taxes is important, it is probably a second-order concern compared to removing regulatory barriers to competition.

Removal of state barriers to deployment. Several states are implementing policies designed to promote broadband deployment. These include making it easier to get right-of-way access, reducing the direct cost of right-of-way access, removing regulation of retail broadband prices, and providing financial incentives to broadband providers and end users.

The effects of state efforts to promote broadband have not been analyzed rigorously, and we therefore have little information on their likely impact. In general, states should remove regulatory burdens that do not have an economic justification. Thus, for example, reducing the regulatory burden associated with right-of-way access and removing retail price regulation would appear to be worthwhile from an economic standpoint.

Building on a good start

PUBLIC POLICIES TOWARD the Internet are important in helping to achieve the goal of greater broadband access, but those policies should be of a deregulatory, not interventionist, nature as this competitive market undergoes rapid growth and technological change. Completing recent deregulatory efforts initiated by the FCC last year — that is, removing price and unbundling regulations — could help increase the diffusion of broadband by increasing investment incentives. Indeed, this is

probably the best thing that regulators can do to promote the economic rollout of broadband.

There is an important distinction between the economical and the uneconomical provision of broadband. The U.S. could, in theory, heavily subsidize broadband service to ensure that every home and business has it. But this would be a mistake: There is little economic reason to believe that such an approach would yield net benefits. It could, ironically, even block future innovation by distorting the market's development. The right approach is to remove artificial regulatory barriers and allow the market to work to provide broadband as consumers demand it.

Notes

[1] See Robert W. Crandall and Charles L. Jackson, *The $500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access* (Criterion Economics, 2001).

[2] Litan and Noll have argued that the unbundling requirements should have been allowed to sunset for some limited period, say three years, if the incumbent telephone companies dropped their opposition to the requirements. That option seems no longer viable, however, unless the long-distance companies succeed in persuading the Supreme Court to review the D.C. Circuit's opinion reversing the FCC's unbundling policy. This would give both the incumbent carriers and long-distance companies some incentive to settle. See Robert E. Litan and Roger Noll, "The Uncertain Future of the Telecommunications Industry," *Brookings Policy Brief* 129 (January 2004).

[3] Jerry A. Hausman, *Taxation by Telecommunications Regulation* (American Enterprise Institute, 1998) estimates that the cost to the economy from long-distance access taxes is approximately three times higher than cost of raising the same revenues through the income tax.

[4] See Austan Goolsbee, "The Value of Broadband and the Deadweight Loss of Taxing New Technology," working paper (University of Chicago, 2001).