FRAMING A NATIONAL BROADBAND POLICY

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I. INTRODUCTION

It is difficult to pick up a business or technology magazine without reading that the United States is falling behind other nations in broadband telecommunications. The real question is not whether the United States is falling behind—it is, as will be demonstrated—but whether the country should have a national broadband policy in response and, if so, what it should look like.

The answer to this question is not obvious. After all, a host of other exciting digital technologies have recently been introduced, and there is no talk of an Xbox gap or a national MP3 player strategy. On the other hand, broadband is unique in that the social returns of broadband investment exceed the private returns to companies and consumers. Therefore, market forces alone will not generate the societally optimal level of broadband in the foreseeable future.

Part II of this article assesses how far and why the United States has fallen behind in broadband. Part III then discusses why leaving broadband to the market alone will likely lead to adoption of broadband at a less than societally optimal rate. These reasons, laid out in Part IV, are: (1) network externalities; (2) "prosumer" investment externalities; (3) competitiveness externalities; and (4) regional externalities. Part V considers the trade-offs between various broadband goals, including universal deployment to all places, universal take-up by all individuals, faster broadband speeds, and increased competition. Finally, Part VI concludes that the reasons discussed necessitate a national broadband policy, and suggests that crafting such a policy must involve significant analysis, debate, and consideration.

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II. COMPARING COMPARISONS: DETERMINING HOW FAR BEHIND THE UNITED STATES HAS FALLEN

A first step in determining whether the United States needs a proactive national broadband policy is to assess its rank in the world with regard to factors such as broadband accessibility, usage, and cost. Various international rankings of broadband adoption demonstrate that the United States does indeed lag behind other nations. According to the most current Organisation for Economic Co-Operation and Development ("OECD") data, the United States ranks fifteenth among thirty OECD nations in the number of subscribers per capita,[1] down from fourth in 2001.[2] Using the broader measures of the share of *households* subscribing to broadband, average broadband speed, and broadband prices,[3] the United States ranks only slightly better, at twelfth place.[4] By comparison, Iceland's broadband subscription rate is more than sixty percent higher than that of the United States.[5] Those in the United States pay seven times more per megabit of speed than do South Koreans, and average speeds in Japan are almost thirteen times faster than average speeds in the United States.[6]

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[1] Organisation for Econ. Co-operation and Dev., OECD Broadband Statistics to December 2006 (2007), *available at* http://www.oecd.org/sti/ict/broadband (last visited Nov. 12, 2007).

[2] *Id*. A more accurate measure would also include broadband availability, in addition to broadband take-up. A possible reason that the United States lags behind other nations in broadband, is that although broadband is available, many choose not to subscribe.

[3] DANIEL K. CORREA, ASSESSING BROADBAND IN AMERICA: OECD AND ITIF BROADBAND RANKINGS 4 (2007), *available at* http://www.itif.org/files/BroadbandRankings.pdf.

[4] *See infra* tbl.1.

[5] *See infra* tbl.1.

[6] *See infra* tbl.1.

Table 1. Information Technology and Innovation Foundation ("ITIF") Broadband Rankings[7]

Rank	Nation	Penetration	Speed	Price	Overall Score
		Subscribers per Household	Average Speed (mbps)	Price per Month for 1 mbps of Fastest Technology (USD PPP)	
1	South Korea	0.90	45.6	0.45	15.73
2	Japan	0.52	61.0	0.27	14.99
3	Iceland	0.83	6.0	4.99	12.14
4	Finland	0.57	21.7	2.77	12.11
5	Netherlands	0.73	8.8	4.31	11.87
6	Sweden	0.49	18.2	0.63	11.54
7	France	0.49	17.6	1.64	11.41
8	Denmark	0.70	4.6	4.92	11.37
9	Norway	0.64	7.4	4.04	11.29
10	Canada	0.62	7.6	6.50	11.11
11	Belgium	0.54	6.2	6.69	10.60
12	United States	0.51	4.8	3.33	10.47

The low and falling rank of the United States is a clear indicator of the need for a more proactive national broadband policy. Even if the United States led the world in broadband penetration, the policies recommended by this article would remain valid; the fact that the United States lags behind many other countries only adds urgency to the broadband policy debate.

As the issue of a broadband policy has become increasingly contentious, opponents of a proactive policy have attacked the OECD rankings as inaccurate, irrelevant, or both. For example, Scott Cleland, chairman of Netcompeti-

[7] CORREA, *supra* note 3, at 4 tbl.1. Each nation's overall broadband ranking score is the sum of its standard deviation score for each of the three indicators. For household penetration, ITIF has converted OECD's April 2007 per capita penetration data using the average household size in each country. For broadband speed, ITIF calculated average speeds from OECD's 2006 report "Multiple Play: Pricing and Policy Trends," which benchmarks the speed offerings of some major incumbent DSL, cable, and fiber providers in OECD countries. National averages were calculated based on the speed and respective market shares of each technology in each country. Lastly, the ITIF Rankings measure price per bit for the fastest widely available technology listed for each country in the "Multiple Play" report. Prices are calculated in U.S. dollars and purchasing power parity. *Id.*

tion.org, sought to dismiss the rankings by claiming that "America has more broadband connections and more Internet users than any other country."[8] But following this logic, even if every person in Iceland (a leader in broadband take-up[9]) subscribed to broadband, that nation would still lag behind the United States because its fifty-eight million connections dwarf the eighty-eight thousand Icelandic connections.[10]

Increasingly, those who want to portray the relative picture of the United States in a more favorable light rely on the European Commission's *E-Communications Household Survey*[11] to support the claim that broadband penetration in the United States far exceeds that of the European Union.[12] Using this survey as a benchmark, the United States has a higher household broadband adoption rate than all but four European Union countries.[13]

The problem, however, is that the European Commission's data are contradicted by most other studies of European broadband penetration. For example, according to the European Commission, Austria's household penetration had reached only twenty-one percent by late 2006.[14] By contrast, conversion of the OECD's broadband statistics to a household basis indicates that Austria's household broadband penetration is closer to forty-two percent.[15] Such discrepancies beg the question of which findings are correct. According to Austria's telecommunications regulatory authority, forty-one percent of households had broadband by late 2006.[16] This represents just one example of the widespread discrepancies that plague the Commission's data.[17] Furthermore,

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[8] Scott Cleland, Commentary, *America's Unique Internet Success*, WASH. TIMES, Mar. 1, 2007, at A16.

[9] *See* Organisation for Econ. Co-operation and Dev., *supra* note 1 (ranking Iceland third of thirty countries in broadband take-up).

[10] *Id*.

[11] EUROPEAN COMM'N, E-COMMUNICATIONS HOUSEHOLD SURVEY (2007), *available at* http://ec/europa.eu/public_opnion/archives/ebs/ebs_249_en.pdf.

[12] *See* Scott Wallsten, *Everything You Hear About Broadband in the U.S. is Wrong*, PROGRESS ON POINT, June 2007, *available at* http://pff.org/issues-pubs/pops/pop14.13wallstenOECDbroadband.pdf.

[13] *Id*. at 7.

[14] EUROPEAN COMM'N, *supra* note 11, at 74.

[15] *Supra* tbl.1.

[16] RUNDFUNK & TELEKOM REGULIERUNGS-GMBH, RTR TELEKOM MONITOR: 2.QUARTAL 2007, at 31, *available at* http://www.rtr.at/de/komp/TKMonitorQ22007.

[17] Ireland is another good example of the European Commission's seemingly inaccurate data. According to the Commission, household broadband penetration stands at eleven percent, but the OECD statistics (after conversion) indicate that thirty-seven percent of households have broadband. However, according to Ireland's telecommunications regulatory authority, household broadband penetration is thirty percent. *See* COMM'N FOR COMMC'N REGULATION, IRISH COMMUNICATIONS MARKET: QUARTERLY KEY DATA REPORT, JUNE 2007, at 22 (2007), *available at* http://www.comreg.ie/_fileupload/publications/ComReg0734.pdf.

using the European Union as a yardstick against which to measure broadband penetration in the United States excludes the leading broadband nations in Europe: Iceland, Norway, and Switzerland, which are all non-members of the European Union.[18]

Taken together, the available data from OECD, Point Topic,[19] and national regulatory bodies suggest that the Commission's data on broadband penetration in European Union countries are very much outliers. As such, the oft-maligned data from OECD remain, despite their shortcomings, a more reliable international measure of broadband penetration.[20]

Some critics point to other indicators of digital progress to support the claim that the United States is not falling behind. Progress and Freedom Foundation scholar Scott Wallsten argues that "[t]he share of the Americans who are Internet users, for example, compares much more favorably with the rest of the world and is higher than those of other countries often held up as models to be emulated, such as Japan."[21] While its rankings regarding the share of its population online may be higher than its rank in the use of broadband, this is because the United States has a significant percentage of users who still use slow dial-up connections.[22] This is due to the fact that many other nations charge dial-up users by the minute, prompting more subscribers to switch to flat-priced broadband.[23] Moreover, while the same proportion of Japanese households subscribe to broadband as do households in the United States,[24] many do so at speeds that are twelve to one hundred times faster than broadband speeds in the United States.[25]

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[18] *See* Organisation for Econ. Co-operation and Dev., *supra* note 1 (ranking Iceland, Switzerland, and Norway as third, fifth, and sixth, respectively, in subscribers per capita).

[19] Point Topic, Global Broadband Statistics, http://point-topic.com/home/gbs (last visited Nov. 12, 2007) (providing statistical reports of broadband subscriber information).

[20] See CORREA, *supra* note 3, for further discussion of the OECD data.

[21] Seth Sacher & Scott Wallsten, Perspective, *What U.S. Broadband Problem?,* CNET NEWS, July 3, 2006, http://news.com//2010-1034_3-6090408.html.

[22] NAT'L TELECOMM. & INFO. ADMIN., DEP'T OF COMMERCE, A NATION ONLINE: ENTERING THE BROADBAND AGE 5 (2004), *available at* http://www.ntia.doc.gov/reports/anol/NationOnlineBroadband04.pdf.

[23] Julie Hedlund, LESSONS FROM GLOBAL BROADBAND LEADERS (Washington, DC, forthcoming). This is ironic given that many commentators, including the author, argued in the late 1990s that these nations were doomed to lag behind in the digital revolution because they charged dial-up access by the minute. But in a classic case of policies having perverse and unexpected results, this original policy actually spurred faster broadband adoption.

[24] Organisation for Econ. Co-operation and Dev., *supra* note 1.

[25] *Compare*, YOSHIKAZU OKAMOTO & TAYLOR REYNOLDS, ORG. FOR ECON. CO-OPERATION & DEV., MULTIPLE PLAY: PRICING AND POLICY TRENDS 51 tbl.21 (2006), *available at* http://www.oecd.org/dataoecd/47/32/36546318.pdf (noting broadband speeds offered in Japan), *with id.* at 67 tbl.36 (noting broadband speeds offered in the United States).

While some rely on the argument that the OECD statistics paint an overly bleak picture of broadband in the United States as compared with European nations, others reject altogether the idea of comparing the United States to other nations. Such critics cite factors such as differing population densities that they claim excuses the poor performance of the United States.[26] Deploying broadband to urban apartment buildings in Seoul is obviously less costly to the government than deploying it to rural towns in Wyoming. The flaw in this argument, however, is the fact that the majority of those in the United States do not live in rural towns in Wyoming, but rather, in urban areas.[27] Using a measure of "urbanicity" that takes into account both the percentage of people living in urban areas and the average density of those areas, there is virtually no correlation between a country's urbanicity and its level of broadband adoption.[28] In other words, OECD countries with more densely populated urban areas do not necessarily have higher levels of broadband take-up.

Apologists for the low and declining rank of the United States ultimately rely on one core argument: there is no "right" amount of broadband; there is only the amount provided by the market. In other words, these market-oriented conservatives ask what right a critic has to say that the amount of broadband bought and sold in the United States is too limited. As a matter of faith, these conservatives accept that whatever amount firms in the United States produce and their customers consume is the proper amount, because this level is set by an infallible market process. Therefore, they argue, if there is more broadband in other nations, that increase must be caused either by higher consumer demand or by government intervention generating a broadband excess.

Imagine this debate taking place in the 1930s, with some analysts arguing that the United States had the correct amount of electrical connections, and that any efforts to accelerate near universal access to electricity was not only unnecessary, but harmful. At the time, nearly ninety percent of urban dwellers had electricity, while only ten percent of rural residents had the same.[29] The Rural Electric Administration not only worked to establish rural electric cooperatives, but it also helped private utilities extend service.[30] Just as wiring the

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[26] *See, e.g.*, Wallsten, *supra* note 12, at 19–21.

[27] U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE U.S. § 1, at 36 tbl.33 (2007), *available at* http://www.census.gov/prod/2006pubs/07statab/pop.pdf (estimating that seventy-nine percent of the population in the United States live in urban areas, based on the 2000 census).

[28] S. DEREK TURNER, FREE PRESS, BROADBAND REALITY CHECK II: THE TRUTH BEHIND AMERICA'S DIGITAL DECLINE 11 (2006), http://www.freepress.net/docs/bbrc2-final.pdf.

[29] Dan Campbell, *When the Lights Came On: USDA Program Brought Electricity and a Better Way of Life to Rural America*, RURAL COOPERATIVES, July/Aug. 2000, at 6, 6, *available at* http://www.rurdev.usda.gov/rbs/pub/aug00/aug00.pdf.

[30] *Id*.

nation for electricity seventy years ago led to a host of other positive developments, accelerated widespread adoption of high speed broadband will do the same today. Luckily, any opposition to electricity was ignored or nonexistent, and policymakers worked to bring electricity to virtually every household in the United States.[31] Such ubiquitous penetration of broadband would be just as beneficial to the United States today, and in the future, as electrical penetration was and has been over the past century.

III. BROADBAND IS NOT AN XBOX: WHY MARKET FORCES FAIL TO PROVIDE ENOUGH INTERNET ACCESS

Those wishing to paint a rosier picture of the broadband position of the United States have one central motivation for doing so: acknowledging that there is not "enough" broadband opens the door for government policies to spur broadband deployment and adoption.[32] That is, if the United States lags behind in broadband technology, and if that matters, then the market must not be performing adequately. Therefore, the government may need to be more involved than it is currently. For many market-oriented conservatives, this violates the fundamental tenet that government should be limited. For example, Scott Cleland seeks to portray the rank of the United States in a positive light because to do otherwise would portray a poor performance that emboldens proponents of net neutrality legislation.[33] Yet, while there are many good arguments offered for net neutrality legislation, boosting the broadband ranking of the United States is not one of them.[34] Others worry that the poor ranking will lead to calls for price regulation, but again, it is difficult to fathom a link between price regulation and more broadband.

Others fear that the falling rank of the United States will be seen as a repudiation of its broadband regulatory strategy of favoring inter-platform competition—letting cable and telephone companies compete in the broadband marketplace.[35] Yet, other nations, including most of the OECD leaders, allow intra-platform competition (requiring the incumbent telephone monopolies to share their lines with other broadband Internet Service Providers ("ISPs")). But the OECD numbers do not necessarily reflect that line sharing is responsible for the widespread broadband availability in those nations.[36] Lacking robust

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31 *Id*. at 8.

32 *See* Cleland, *supra* note 8.

33 *Id.*

34 ROBERT D. ATKINSON & PHIL J. WEISER, A "THIRD WAY" ON NETWORK NEUTRALITY 5 (2006), *available at* http://www.itif.org/files/netneutrality.pdf.

35 *Id*. at 7.

36 *Id*. at 9.

competition from cable companies, those nations chose the intra-platform approach largely because they knew that if they wanted to "generate" competition, forcing the incumbents to share their lines was the only way to do so.[37] In contrast, in the United States, cable companies were in the marketplace first, and the incumbent phone companies, or "Bells," have had to struggle to catch up.[38] Moreover, while some broadband-leading countries in Europe and Asia embraced line sharing, so too have many of the lagging ones.[39]

Finally, dissenters generally worry that any government action is a bad thing. Harold Furchtgott-Roth, of the Federal Communications Commission ("FCC") argues that not only is a national policy for broadband superfluous, but that such a proactive policy "would be bad for broadband."[40] At the core of conservatives' arguments against a proactive national broadband policy is the belief that broadband is similar to other products that the market does an adequate job of producing and distributing.[41] For these conservatives, broadband is no different than other consumer technologies, such as MP3 players. Essentially, opponents of a proactive national broadband policy see broadband as a consumer technology, and believe it is best to let the market alone allocate its distribution. However, high-speed broadband is different from consumer devices like MP3 players and DVD players in two important ways.

First, as the United States transforms into a digital society in which many aspects of everyday life are conducted online, widespread access to broadband becomes a central factor in ensuring opportunity for all those in the United States. Whereas universal access to digital music players is not a legitimate matter of public policy concern, access to key technologies such as broadband is an important concern. To the extent that some cannot afford broadband access or cannot subscribe to it, there is an equity argument that can be made for a government role to ensure widespread adoption. To date, broadband has been deployed unevenly, with lower-cost, higher-income areas receiving access first.[42] Given that broadband is largely provided by private companies that seek to maximize subscribers, such deployment patterns make sense. However, this does not mean that government should not do more to spur deployment

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37 Hedlund, *supra* note 23.

38 ATKINSON & WEISER, *supra* note 34.

39 Hedlund, *supra* note 23.

40 Harold Furchtgott-Roth, *National Policy Would Be Bad for Broadband*, N.Y. SUN, Apr. 2, 2007, at 10, *available at* http://www.nysun.com/article/51637.

41 Cleland, *supra* note 8.

42 U.S. GAO, TELECOMMUNICATIONS: BROADBAND DEPLOYMENT IS EXTENSIVE THROUGHOUT THE UNITED STATES, BUT IT IS DIFFICULT TO ASSESS THE EXTENT OF DEPLOYMENT GAPS IN RURAL AREAS, 10 (2006), *available at* http://www.gao.gov/new.items/d06426.pdf.

and take-up in high cost areas or by low income individuals. In fact, such market forces will continue to deprive low-income and rural areas of broadband access, without government intervention.

IV. A LITTLE SOMETHING EXTRA: THE EXTERNALITIES PROVIDED BY BROADBAND ACCESS

The second, and most important way that broadband is different from other unregulated consumer products is the significant positive externalities generated by its adoption. The notion of externalities is straightforward: it is a divergence between private costs and social costs (or benefits).[43] Externalities occur when one market participant's action affects others without compensation being paid or received.[44] In a competitive equilibrium with the presence of costs (or benefits) that do not accrue to the individual economic actor, the competitive markets alone will not achieve optimal outcome—what economists refer to as Pareto optimality.[45] The classic case of an externality is pollution: a company's smoke imposes costs on its neighbors that are not paid for by the company. But externalities can also be positive. For example, when a company conducts scientific research, some of the benefits usually accrue to others. Because the benefits of research spill over, most governments have instituted some type of tax incentive that rewards companies for research and development, thereby encouraging such actions.[46]

The presence of positive externalities often means that absent some public intervention, there will be less of an item than is economically optimal. To see why, consider Figure 1. If consumers only take into account their own private benefits from subscribing to broadband, the market will end up at expenditure Ep and quantity Qp. However, if there are positive externalities where the benefits spill over beyond users, then the net social demand curve shifts to the right. The supply of broadband should then be increased as long as the marginal social benefit exceeds the marginal social cost. In this case, the optimal supply of broadband is at expenditure Es and quantity Qs. Absent proactive

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[43] Peter Lewin, *Pollution Externalities: Social Cost and Strict Liability*, 2 CATO J. 205, 206 (1982), *available at* http://www.cato.org/pubs/journal/cj2n1/cj2n1-6.pdf.

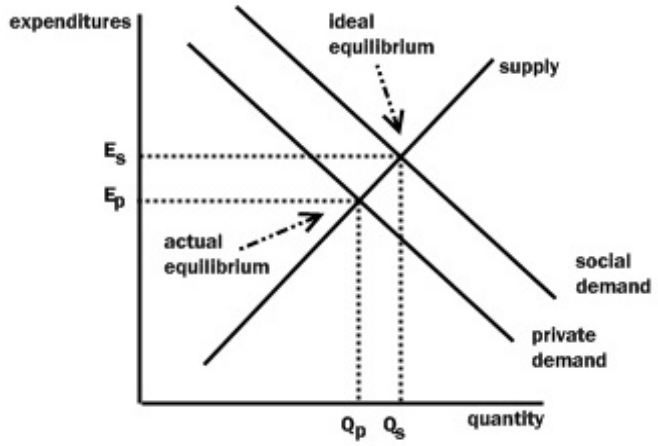
[44] CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 183 (1998).

[45] Pareto optimality is a state in which no individual can be made better off without another individual being made worse off.

[46] ROBERT D. ATKINSON, THE RESEARCH AND EXPERIMENTATION TAX CREDIT: A CRITICAL POLICY TOOL FOR BOOSTING RESEARCH AND ENHANCING U.S. ECONOMIC COMPETITIVENESS 5 (2006), *available at* http://www.itif.org/files/R&DTaxCredit.pdf.

public policies, the market will undersupply broadband at point Qp, instead of the more efficient point Qs.

Figure 1: Supply and Demand for Broadband with Positive Externalities



The issue of broadband externalities goes to the heart of the debate over whether the United States should have an explicit national broadband policy. Few broadband externalities indicate that the market is supplying the "right" amount of broadband, and that the proper role of government is to simply reduce regulatory barriers to deployment, and perhaps ensure more equitable access (e.g., by helping spur deployment and take-up in high cost areas and by low income individuals). However, there is considerable reason to believe that there are significant externalities from high speed broadband, and that if left to themselves, market forces alone will lead to less investment in broadband than is societally optimal. There are four kinds of broadband externalities: (1) network externalities; (2) "prosumer" investment externalities; (3) competitiveness externalities; and (4) regional externalities.

A. Network Externalities

Broadband exhibits several kinds of positive externalities, perhaps the most important are network externalities. Network externalities are the effects on a user of a product or service of others using the same or compatible products or services. Positive network externalities exist if the benefits are an increasing function of the number of other users. In this case a good or service becomes more valuable to individual consumers as others also purchase that good or service. The classic example is a telephone service that becomes more valuable to a user if more people are connected. Indeed, telephone network externalities

have long been recognized, and have been a major motivator of universal service policies. Broadband externalities are likely to be even more significant, in part because broadband enables new services to emerge that will benefit broadband users.

There are two kinds of network externalities from broadband, direct and indirect. Direct externalities relate to subscribership. Just as the fax system became more valuable when more people had fax machines, broadband becomes more valuable when more people have broadband. Moreover, the more people in possession of broadband, the more likely others are to subscribe. This is in part because the decision to purchase broadband is dependent on having sufficient knowledge about it. Unlike a service like haircuts or a product like televisions that most people are familiar with and can accurately value, fewer people are familiar with broadband and its benefits. Empirical evidence suggests that this is a factor affecting subscribership. Austan Goolsbee, Professor of Economics at the University of Chicago, and Peter Klenow, Professor of Economics at Stanford University, found that a person is more likely to buy his first computer if he lives in an area in which a high proportion of households own computers, or if a large percentage of his friends and family own computers—even controlling for other factors affecting computer ownership.[47] If ownership rates are ten percent higher in one city than another in a given year, the gap will be eleven percent the following year, assuming all other factors remain constant.[48] This is because the number of experienced and intensive computer users creates a "spillover" effect for non-users.[49] The effect is most likely related to the use of the Internet, which is "consistent with the view that computers are components of local communication and information networks."[50] The effect is also probably related to the notion that people who have friends and neighbors with broadband are more likely to understand its value. The rise of more bandwidth-intensive applications—such as sharing of digital photos and video telephony—also generates direct network externalities.

Indirect network externalities from broadband involve its effect on applications and content that require broadband to work effectively.[51] One reason that broadband take-up is not higher is because data-rich applications that could be

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[47] Austan Goolsbee & Peter J. Klenow, *Evidence on Learning and Network Externalities in the Diffusion of Home Computers*, 45 J.L. & ECON. 317, 318 (2002).

[48] *Id*. at 328.

[49] *Id*. at 334.

[50] *Id*. at 339.

[51] Austan Goolsbee, *Subsidies, the Value of Broadband, and the Importance of Fixed Costs, in* BROADBAND: SHOULD WE REGULATE HIGH-SPEED INTERNET ACCESS? 278, 278–79 (Robert W. Crandall & James H. Alleman eds., 2002), *available at* http://www.aei-brookings.org/publications/abstract.php?pid=301 (follow the hyperlink to "Chapter 12").

accessed over broadband have not developed faster. It does not make sense to develop a high bandwidth-intensive Web application like Internet television or telemedicine when very few people would have the capability to access it at the required speeds. For example, YouTube has only become successful in the last year, once enough broadband users existed to make the business model viable.[52] This "chicken-or-egg" issue slows the deployment of high-speed broadband. More data-intensive applications would make high-speed broadband more valuable, while more high-speed broadband subscribers would make data-intensive applications more commercially viable.[53] Indeed, more high-speed broadband would spur the development of a whole host of new applications that are not viable now in a low-speed world.[54] While some of these can be imagined (Internet-based television, video telephony, and telemedicine), others surely will burst onto the scene as the "next new thing."

B. Prosumer Externalities

The second type of broadband externality relates to broadband's ability to increase consumer efficiency, thereby driving higher rates of productivity and economic growth. In the old economy, producers produced and consumers consumed. Producers invested in new capital equipment to produce goods and services more efficiently, and consumers in turn bought those cheaper goods and services. This dichotomy between producers and consumers is blurring in the new digital economy. A host of digital tools are enabling consumers to become, in the words of futurist Alvin Toffler, "prosumers," those who simultaneously act as both consumer and producer.[55] Whether using a self-serve checkout line at a grocery store, filling out and submitting a form online, using an airport kiosk to print a boarding pass, or paying a toll with E-ZPass, self-service accounts for a growing share of transactions, thereby helping to boost productivity and increase consumer convenience.[56] Indeed, with the service sector accounting for eighty percent of employment,[57] prosumerism must play

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[52] *See* Sean Carton, Commentary, *YouTube: Another Casualty in the Copyright Wars?*, PUBLISH, July 24, 2006, http://www.publish.com/article2/0,1759,1993529,00.asp.

[53] *See* Andrew Orlowski, *Broadband Britain Risks Life in Slow Lane,* THE REGISTER, Apr. 16, 2007, *available at* http://www.theregister.co.uk/2007/04/16/broadband_stakeholder_report.

[54] *See* FCC CONSUMER FACTS: HIGH-SPEED INTERNET ACCESS—"BROADBAND" 1 (2006), *available at* http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.pdf.

[55] ALVIN TOFFLER, THE THIRD WAVE 27, 201 (1980).

[56] *See* Self Service World, Stats & Facts, http://www.selfserviceworld.com/rc2.php?cat_id=1 (last visited Nov. 2, 2007).

[57] U.S. Trade Representative Focus on Services, http://www.ustr.gov/Trade_Sectors/Services/Section_Index.html (last visited Nov. 12,

a much larger role if the United States is to continue to boost productivity and income.

Broadband promises to be a key technology in increasing prosumer productivity. Broadband may dramatically reduce the costs of distributing digital content, for example by substituting the transport of atoms in the form of DVDs with the cheaper transport of bits in downloaded movies via a broadband connection. Broadband could reduce travel by enabling applications like telehealth and telework. Broadband can also reduce a host of transaction costs by making it easier to conduct business and commerce online. For example, in South Korea, the world broadband leader, more than sixty percent of stock trades are made online, and Internet banking has grown dramatically.[58]

Health care is one area in which broadband promises substantial benefits. Deployment of high-speed broadband is likely to enable greater use of telemedicine, not only improving health care outcomes, but also potentially lowering overall health care costs. Telecare and related assistive technologies will allow the elderly and people with disabilities to remain in their own homes—rather than in hospitals or residential care, which will save money and reduce demand for residential care space. One author found that expanding broadband deployment among seniors and persons with disabilities will result in cumulative savings and output gains of at least $927 billion by 2030.[59] Broadband, according to the author, Robert Litan, can deliver these benefits in three ways: by directly lowering health care costs, by postponing or obviating the need for institutionalized care, and by enabling increased workforce participation.[60] Policies that work toward accelerated broadband take-up could increase the payoff by another $530 to $850 billion.[61] But the benefits are not merely economic. Broadband applications such as home health monitoring can allow millions to live more active and fulfilling lives. One study of a telemedicine program for rural children with special health needs found that telemedicine techniques afforded them similar high quality care without the cost or inconvenience of driving several hours to see medical specialists.[62]

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[58] Asia-Pacific Dev. Info. Programme, ICT Profile-Republic of Korea, http://www.apdip.net/projects/dig-rev/info/kr (last visited Nov. 12, 2007).

[59] ROBERT E. LITAN, NEW MILLENNIUM RESEARCH COUNCIL, GREAT EXPECTATIONS: POTENTIAL ECONOMIC BENEFITS TO THE NATION FROM ACCELERATED BROADBAND DEPLOYMENT TO OLDER AMERICANS AND AMERICANS WITH DISABILITIES 3 (2005), *available at* http://www.newmillenniumresearch.org/archive/Litan_FINAL_120805.pdf.

[60] *Id*. at 14.

[61] *Id*. at 31.

[62] James P. Marcin, Jeff Ellis, Roland Mawis, Eule Nagrampa, Thomas S. Nesbitt & Robert J. Diamond, *Using Telemedicine to Provide Pediatric Subspecialty Care to Children with Special Health Care Needs in an Underserved Rural Community*, PEDIATRICS, Jan.

Such social benefits are not confined to health care. For example, deployment of high-speed broadband is likely to increase telecommuting by workers.[63] While the employee receives most of that benefit (in the form of reduced travel time), society also benefits in at least two ways. First, to the extent that travelers do not pay the full social cost of traveling,[64] reduced travel can boost societal welfare. The decrease in travel from telecommuting is substantial, with corresponding reductions in congestion, pollution and oil consumption. One survey of the literature concludes that telecommuters drive fifty-three to seventy-seven percent less on days they telecommute than they would otherwise.[65] The promise of broadband is that it provides a broader spectrum of applications to those who choose to work remotely; consequently, more people can work from home more often.

Second, to the extent that telecommuting boosts worker productivity, society benefits as the increases in productivity are translated into lower prices (as opposed to higher wages). To date, much of the telecommuting productivity evidence is anecdotal or from self-reported data, but there are good reasons to believe that telecommuting does allow employees in many fields to work more productively.[66] For instance, many workers report that they can accomplish more with fewer interruptions at home.[67] Further, telecommuting also allows employees to work when personal or family needs might otherwise force them to be absent from the office.[68] Finally, telecommuting frees employees from, on average, almost one hour of commuting each day.[69] If any of this time is dedicated to working, it translates into greater output. For example, by relying on technologies such as broadband, mobile e-mail, and voice, retailer Best Buy was able to give most of its corporate headquarters employees the option of

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2004, at 4–5.

[63] *See* LITAN, *supra* note 59, at 24.

[64] Press Release, Redefining Progress, Transportation Congestion Study Exposes One of Driving's Hidden Costs (June 20, 2002), *available at* http://www.rprogress.org/press/releases/020620congestion.htm. Both transit and auto users are subsidized and both impose costs on society in the form of increased pollution. Although transit users are more heavily subsidized than drivers, drivers impose more costs through pollution and other externalities.

[65] Margaret Walls & Elena Safirova, *A Review of the Literature on Telecommuting and Its Implications for Vehicle Travel and Emissions* 19 (Resources for the Future, Discussion Paper No. 04-44, 2004), *available at* http://www.rff.org/Documents/RFF-DP-04-44.pdf.

[66] *See* Ralph D. Westfall, *Does Telecommuting Really Increase Productivity?,* COMM. ACM, Aug. 2004, at 93, 94, 96 (providing a review of telecommuting productivity literature).

[67] *Id.* at 95.

[68] Edward E. Potter, *Telecommuting: The Future of Work, Corporate Culture, and American Society*, 24 J. LAB. RES. 73, 78–79 (2003).

[69] *Id.* at 78.

more flexible working hours, including working at home.[70] As a result, productivity increased by thirty-five percent in departments that implemented the program.[71] More and more Best Buy employees are working outside the office, with forty percent of all employees working remotely on any given day.[72] Similarly, airline JetBlue's entire workforce of reservation agents work from home, using a personal computer and a broadband connection.[73] Taken together, these factors make it reasonable to expect that telecommuting can make some workers more productive, yielding benefits for society.

Not only does telecommuting raise worker productivity, but it also enables more people to join in the workforce. Parents staying home to raise children, for example, could have the opportunity to work flexible hours from home rather than sacrificing the income altogether. Likewise, the deployment of high-speed broadband will make online volunteering even easier through the availability of high quality two-way video. For example, in Fort Wayne, Indiana, where Verizon has deployed extensive fiber optic broadband, the city has set up a system in which retired nurses help provide health evaluations for low income residents without health insurance over two-way broadband video.[74]

Finally, deployment of high-speed broadband is likely to spur distance learning, making it easier for more people to engage in online learning. The benefits then spill over to society as a whole. Indeed, distance learning powerfully expands educational opportunities, both for existing students and for those who may be unable to physically attend an educational institution. Research suggests that post-secondary students that utilize distance education are far more likely than other students to be employed full-time and taking classes part-time.[75] Thus the technology provides societal benefits in the form of an

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[70] Michelle Conlin, *Smashing the Clock*, BUSINESS WEEK, Dec. 11, 2006, at 60, *available at* http://www.businessweek.com/magazine/content/06_50/b4013001.htm.

[71] *Id.*

[72] *Id*.

[73] *CBS Evening News: Jet Blue's Stay-At-Home Work Force,* (CBS television broadcast Jan. 13, 2004), *available at* http://www.cbsnews.com/stories/2004/01/13/eveningnews/main593026.shtml.

[74] Based on author's personal communication with Fort Wayne Mayor Graham Richard. Not only does the Internet make it possible for people to volunteer online, it makes it easier for people to find offline volunteer opportunities. Sites such as volunteermatch.org match willing volunteers with service organizations needing their talents. In 2005, volunteermatch.org made 475,000 referrals to its 37,000 registered nonprofits. VOLUNTEER MATCH, 2005 ANNUAL REPORT 1 (2005), *available at* http://www.voulnteermatch.org/about/annual_report_05.pdf. Matching sites are particularly well suited to the Internet, since search costs are radically reduced and the community is global.

[75] Cornelia M. Ashby, Director, Education, Workforce, and Income Security Issues, GAO, On Distance Education: Growth in Distance Education Programs and Implications for Federal Education Policy, Testimony Before the Senate Committee on Health, Education,

increased—and more educated—workforce. Distance education also expands the course catalog for traditional students, giving high school students, for example, access to Advanced Placement courses not offered at their local schools. Moreover, the evidence suggests that individual learners are not the only beneficiaries of their investments in their own human capital. Rather, some of the benefits of such investments accrue to society in the form of faster economic growth.[76]

Many of these kinds of prosumer cost savings accrue to consumers. For example, Brookings scholar Robert Crandall estimates that universal broadband adoption could yield annual consumer benefits of $300 billion.[77] However, the benefits from broadband do not just accrue to the individual broadband prosumers. They also spill over to society as a whole. The reason for this is that broadband is not principally a consumer service, such as cable television. Rather, it is more like a capital investment, akin to technology such as a server or a computer network.

This is an important distinction because if broadband is principally a consumer item that allows people to play games and watch video, for example, it is unlikely to have a larger economic impact. Yet, if it is more like a producer item—or in this case a prosumer item—then it is likely to have a larger economic impact. Indeed, there is evidence that investment in new capital often produces total benefits that exceed the benefits that the companies making investments receive.[78] Left alone, the market will under-invest in new capital equipment including machines, computers, and software. One reason is that investment followers can benefit from the experience of investment leaders. As U.C. Berkeley economist Brad Delong found, investment in equipment "appears to yield social benefits to the economy in terms of higher productivity that dwarf the profits that the owners of the capital goods installed are able to privately appropriate."[79] These externalities appear considerably higher for

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Labor, and Pensions 2 (Sept. 26, 2002), *available at* http://www.gao.gov/new.items/d021125t.pdf.

[76] *See, e.g.,* Richard Blundell, Lorraine Dearden, Costas Meghir & Barbara Sianesi, *Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy*, 20 FISCAL STUDIES 1, 14 (1999).

[77] Robert W. Crandall & Charles L. Jackson, *The $500 Billion Opportunity; The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access, in* DOWN TO THE WIRE: STUDIES IN THE DIFFUSION AND REGULATION OF TELECOMMUNICATIONS TECHNOLOGY 155, 184 (Allan L. Shampine ed., 2003).

[78] *See* Christian Keuschnigg, *Business Formation and Aggregate Investment*, 2 GERMAN ECON. REV. 31 (2001); J. Bradford De Long & Lawrence H. Summers, *Equipment Investment and Economic Growth*, 106 Q.J. ECON. 445, 445–46 (1991).

[79] J. Bradford De Long, *Productivity Growth and Investment in Equipment: A Very Long Run Look*, GROWTH & EQUIPMENT, Aug. 11, 1995, at 31, *available at* http://econ161.berkeley.edu/pdf_files/JEH_Machinery.pdf.

information technology ("IT") goods and services such as broadband. IT seems to be "super capital" that has a much larger impact on productivity than other forms of capital equipment. In part, this is because IT transforms organizations and leads to innovations within other organizations, creating high positive spillovers that may be taken advantage of by other organizations. In such an environment, the societally optimal amount of broadband investment will lag behind actual investment.

C. Competitiveness Externalities

Leadership in information technologies in general, and broadband in particular, is important for maintaining high standards of living and national competitiveness for two reasons. First, experienced technology buyers (both businesses and individuals) can help IT companies gain competitive advantage over foreign competition. Secondly, broadband leadership boosts domestic IT employment.

As Michael Porter wrote in *The Competitive Advantage of Nations*, "[a] nation's firms gain competitive advantage if domestic buyers are among the world's most sophisticated and demanding buyers for a product or service."[80] Sophisticated buyers appear to play a particularly important role. As The World Economic Forum notes, "[Information and Communications Technology] readiness, and other factors related to national endogenous potential for innovation . . . are believed to be important drivers of any country's competitiveness, they become central for nations and companies that, for their stage of development, need efficient production processes and innovation to compete."[81]

There are signs that nations leading in technological applications such as broadband are translating that into an increased competitive advantage for domestic IT companies. For example, the speed and ubiquity of broadband in South Korea makes it a test bed for the next generation of Internet-based services and products, including online games, educational software, and consumer electronics.[82] Because they were a key supplier to South Korea Tele-

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[80] MICHAEL E. PORTER, THE COMPETITIVE ADVANTAGE OF NATIONS 89 (1990).

[81] SOUMITRA DUTTA & IRENE MIA, WORLD ECON. FORUM, THE GLOBAL INFORMATION TECHNOLOGY REPORT 2006-2007, at 3 (2007), *available at* http://thebrowser.files.wordpress.com/2007/03/networked-readiness-index.pdf.

[82] *See* Moon Ihlwan, *South Korea: Video Games' Crazed Capital*, BUSINESS WEEK ONLINE, Mar. 26, 2007, http://www.businessweek.com/globalbiz/content/mar2007/gb20070326_937184.htm [hereinafter *South Korea: Video Games' Crazed Capital*]; Moon Ihlwan, *Can Korea be Kingpin of Online Games?*, BUSINESS WEEK ONLINE, Apr. 19, 2004,

com, Samsung has become a world leader in the DSLAM market (technology for broadband over telephone lines).[83] Likewise, South Korea is home to some of the leading online game companies, with over fifty percent of the online games sold in China coming from South Korea.[84] By 2010, NCsoft, the leading South Korean game maker, expects that over seventy percent of its revenue will come from exports.[85]

Countries at the leading edge of IT are likely to experience more of these kinds of benefits than are laggards. The telecom markets in the United States are an example of this phenomenon. In the 1990s, telecommunications equipment makers in the United States were doing extremely well, but with the collapse of the telecom market in the late 1990s, the mantle of sector leadership has shifted overseas where telecommunications demand has grown much more quickly.[86] As a result, the trade deficit in the United States in telecommunications products grew to $27 billion dollars, as the share of the world's telecommunications products produced in the United Stated dropped from forty percent in 2000 to twenty-one percent in 2004.[87]

In addition to regaining a competitive international advantage, there is anecdotal evidence that the deployment of fiber optic broadband in the United States is helping its domestic telecom equipment companies expand employment. Corning, the leading provider of optical fiber in the United States, recently reopened its shuttered North Carolina fiber optic factory because of the increased deployment of fiber optic broadband.[88] Companies like Motorola and Tellabs are likely to expand employment in the United States as telecom companies switch to Gigabit Passive Optical Networks ("GPON") fiber networks, which is a more efficient technology architecture for fiber. Greater progress in deploying high-speed networks will help keep broadband equipment suppliers in the United States even more competitive.

Finally, to the extent that companies in the United States do not have access to affordable, high-speed broadband networks, they can be at a competitive

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http://www.businessweek.com/magazine/content/04_16/b3879080.htm [hereinafter *Can Korea be Kingpin of Online Games?*].

[83] Heejin Lee, Sangjo Oh & Yongwoon Shim, *Do We Need Broadband? Impacts of Broadband in Korea*, J. POL'Y REG. & STRATEGY TELECOMM., 2005, at 47, 51.

[84] *Can Korea Be Kingpin Of Online Games?, supra* note 82.

[85] *South Korea: Video Games' Crazed Capital*, *supra* note 82.

[86] CLYDE PRESTOWITZ, ECON. STRATEGY INST., AMERICA'S TECHNOLOGY FUTURE AT RISK: BROADBAND AND INVESTMENT STRATEGIES TO REFIRE INNOVATION, at v–vi (2006), *available at* http://www.ftthcouncil.org/documents/766498.pdf.

[87] *Id*. at vi–viii.

[88] Press Release, Corning Inc., Corning Announces Partial Reopening of its Concord, N.C., Optical Fiber Manufacturing Facility (Apr. 25, 2007), *available at* http://www.corning.com/opticalfiber/media_cent/press _releases/2007/2007042501.aspx.

disadvantage relative to competitors in nations with broadband. While most businesses, especially large firms in metropolitan areas, have access to broadband, some smaller businesses, especially in non-metro areas, do not. To the extent this raises their costs (for example, by requiring them to do more work using paper or person-to-person transactions) or limits their market access, competitiveness in the United States could suffer.

D. Regional Externalities

Regional economists have long recognized that there are significant externalities resulting from the location decisions individuals and companies make. For instance, if an individual or company moves to a metropolitan region that is expensive and crowded (high housing costs and traffic congestion), they add to those costs in that region. This is one reason many regional planners and economists advocate more balanced growth strategies, in which efforts are made to help less crowded and expensive places grow faster, thereby lowering relative growth rates in crowded, high-cost metropolitan areas. Siphoning off some growth from large, congested metropolitan areas to smaller places will reduce congestion and costs in the former.

Ensuring that these latter places have robust broadband is an important component of any national balanced growth strategy. While broadband cannot create competitive advantages for a region, a lack of broadband can retard it. For example, between 1998 and 2002, employment in communities with broadband grew one percentage point faster annually than communities without.[89] This means that a community with 50,000 jobs and broadband would have added 500 more jobs over four years than a similar community without broadband.

Broadband stimulates growth in at least two ways. First, broadband is a critical tool in business location and expansion decisions. While the presence of high-speed and affordable broadband may not be a determining factor in business location decisions, the lack of it is. Second, broadband boosts the quality of life in rural communities, making it easier for smaller locales to attract and retain residents.[90] Broadband and the applications that it enables give all those in the United States more choice, but it is an especially important tool for the 60 million people who do not live in large metropolitan areas. One of

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[89] WILLIAM H. LEHR, CARLOS A. OSORIO, SHARON E. GILLETT & MARVIN A. SIRBU, U.S. DEPT. OF COMMERCE, MEASURING BROADBAND'S ECONOMIC IMPACT 3–4 (2005), *available at* http://www.eda.gov/PDF/MITCMUBBImpactReport.pdf.

[90] USDA RURAL DEV.: BRINGING BROADBAND TO RURAL AMERICA (2007), *available at* http://www.rurdev.usda.gov/rd/pubs/RDBroadbandRpt.pdf.

the advantages of living in a place like New York City is that specialty stores of every imaginable type can find enough customers to thrive. Those who live outside New York City are potentially deprived of such diverse options. However, broadband rectifies this problem by creating a significantly larger customer base for all businesses. As a result, consumers in more rural areas, who were previously constricted in their choices of products and services, now have access to the same variety of goods as consumers living in major metropolitan cities. A rancher in the middle of Wyoming has the same selection of music and books through iTunes and Amazon as anyone in New York City. Even services once thought to be non-traded, or impossible to export beyond the immediate market—such as medical appointments and educational opportunities—are increasingly traded through IT to remote areas. Currently, many schools offer online courses, while others post course materials online. Telemedicine can provide rural patients with the same access to care as patients living in major metropolitan areas. Policymakers must keep these regional and other externalities in mind as they continue to debate and formulate a national broadband policy.

V. GOAL-ORIENTED: BALANCING TRADE-OFFS WITHIN A NATIONAL BROADBAND POLICY

The existence of significant positive externalities from broadband provides a compelling rationale for a proactive national broadband policy. The question then becomes what the priorities of that policy should be. The answer is anything but straightforward. Advocates of a more proactive broadband policy advance at least seven different goals, including: (1) expanding access to more geographic areas;[91] (2) expanding adoption rates, particularly by low-income households;[92] (3) ensuring low costs for service providers;[93] (4) ensuring low prices for consumers;[94] (5) spurring higher speeds;[95] (6) boosting competition among service providers;[96] and (7) guaranteeing an open, neutral network.[97]

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91 *See* ALLIANCE FOR PUB. TECHNOLOGY, ACHIEVING UNIVERSAL BROADBAND: POLICIES FOR STIMULATING DEPLOYMENT AND DEMAND 24 (2007), *available at* http://www.apt.org/publications/reports-studies/Final-Report-Feb2007.pdf [hereinafter UNIVERSAL BROADBAND]; *see also* ALLIANCE FOR PUB. TECHNOLOGY, A BROADBAND WORLD: THE PROMISE OF ADVANCED SERVICES 32 (2003), *available at* http://www.apt.org/publications/reports-studies/broadband-world.pdf.

92 *See* UNIVERSAL BROADBAND, *supra* note 91, at 25, 26.

93 *Id*. at 30.

94 *See* ATKINSON & WEISER, *supra* note 34, at 7.

95 *See* UNIVERSAL BROADBAND, *supra* note 91, at 25.

96 *See* ATKINSON & WEISER, *supra* note 34, at 9, 10.

97 *Id*. at 15.

Policymakers often seek to minimize conflicts and tradeoffs between different goals. In the case of broadband, progress toward one goal will often mean lack of progress toward another. The goals of expanding geographic access and ensuring low prices illustrate this difficulty. If deployment of broadband in high-cost, sparsely populated areas is subsidized through the Universal Service Fund ("USF"), the result is likely to be wider availability of broadband, but also higher prices as broadband consumers pay higher USF taxes.

Tensions between open or "neutral" networks and faster speeds may also exist. Even the most ardent proponents of net neutrality generally concede that net neutrality mandates will not spur more broadband infrastructure investments.[98] At the same time, many opponents of net neutrality regulations agree that imposing a strict net neutrality regime on carriers will reduce revenues and investment in faster networks.[99]

Cost and price are also potentially in conflict. For example, one can envision a very low-cost network with just one very fast pipe to the home. While the cost of building such a network would be low because there is only one pipe, prices might be high, especially if left unregulated. In contrast, if every home had three or more pipes running to it, prices would be lower due to competition, but overall costs from building and supporting three networks would be higher. This begs the question: which alternative is better. From a consumer perspective, a competitive structure with multiple pipes is more desirable. Yet, from a broader perspective, a single pipe is preferable because society as a whole benefits from lower costs, as the savings are passed on in the form of taxes on profits and dividends.

The reality is that any broadband policy will require tradeoffs between various goals. The question is whether the best way for the government to invest $5 billion is to: (1) expand the Universal Service Fund to ensure widespread broadband access, or (2) provide tax incentives to carriers to upgrade their existing networks to much faster speeds. The answer depends in part on what one values more: equity and access or growth and innovation. Those who place greater value on equity and access will assert that the major goal of a national broadband policy should be to help those who otherwise would not have access to broadband, including rural and low-income subscribers. In contrast, those who strongly support growth, innovation, and competitiveness will argue for a

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[98] *Network Neutrality: Competition, Innovation, and Nondiscriminatory Access: Hearing Before the Task Force on Telecom and Antitrust of the H. Comm. on the Judiciary*, 109th Cong. 53, 56 (2006) (statement of Timothy Wu, Professor of Law, Columbia Law School), *available at* http://judiciary.house.gov/media/pdfs/printers/109th/27225.pdf.

[99] Robert E. Litan & Hal J. Singer, *Unintended Consequences of Net Neutrality Regulation*, 5 J. TELECOMM. & HIGH TECH. L. 533 (2007); *cf.* ATKINSON & WEISER, *supra* note 34 at 2 (offering a "third way" perspective on the net neutrality debate).

broadband policy that seeks to upgrade broadband speeds to enable new high-bandwidth applications. Yet, these goals are not necessarily contradictory. For example, encouraging higher-speed networks will ultimately lead to increased access to broadband, as Digital Subscriber Lines ("DSL") will be more widely available due to shorter copper loop lengths as fiber is deployed deeper into the network. Helping more people get online will spur economic growth as more organizations will be able to switch from high-cost channels (in person, phone, and mail) to lower-cost Web channels.

Ultimately, given limited resources, a focus on one goal will mean less advancement toward another. Both the reality of the political process, which strives to accommodate a wide variety of interests—and the imperative to create good public policy—suggest that any broadband policy must pursue both equity and growth goals. The key is to do so in ways that minimize trade-offs and maximize efficiency and effectiveness.

A. Broadband Everywhere?

Many of the 2008 presidential candidates emphasize the importance of expanding broadband service throughout the United States.[100] In reality, broadband is already everywhere (or close to it), by virtue of satellite service.[101] Residents of a rural town may not have access to cable television, but they likely have access to satellite broadband. Granted, the service may be slower and more expensive than in urban areas, but it is still broadband.[102]

Yet, for many advocates this is not sufficient. The goal, they argue, is for all people, regardless of location, to enjoy access to the same level of broadband service.[103] While a noble goal, the reality is that providing "urban-grade" wired broadband to every rural resident would be prohibitively expensive.

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[100] *See, e.g.,* John Edwards for President—Recharging Our Commitment to Innovation to Build One America, http://johnedwards.com/issues/innovation (last visited Nov. 12, 2007) (describing 2008 presidential candidate John Edwards' campaign goal of providing all homes and businesses in the United States with access to real high-speed Internet by 2010).

[101] Satellite providers like WildBlue and HughesNet offer download speeds up to 1.5 mbps and upload speeds up to 200 kbps for less than $80 per month. About WildBlue, http://www.wildblue.com/aboutWildblue/index.jsp (last visited Nov. 12, 2007); HughesNet, Pricing, http://go.gethughesnet.com (follow "Pricing" hyperlink) (last visited Nov. 12, 2007).

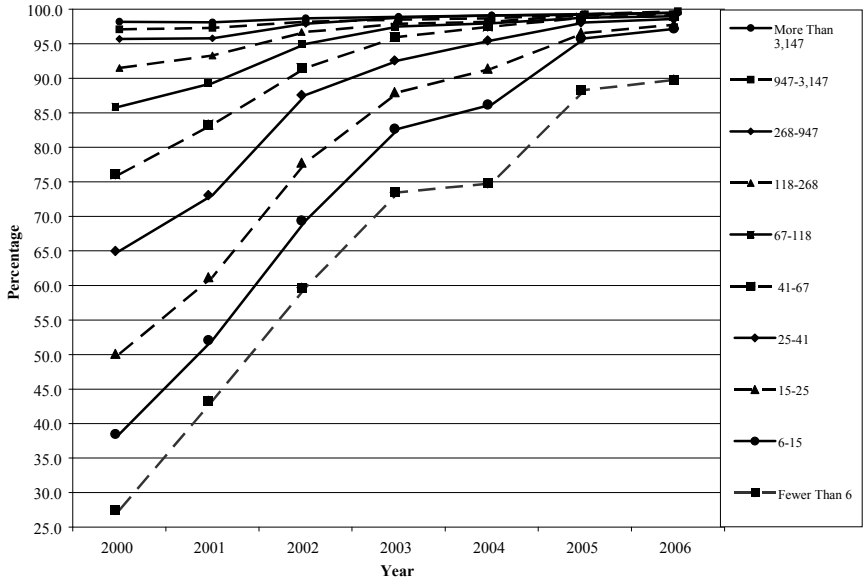
[102] The FCC defines broadband service as "data transmission speeds exceeding 200 kilobits per second (Kbps) . . . in at least one direction." FCC CONSUMER FACTS, *supra* note 54, at 1; *c.f.* NEWTON'S TELECOM DICTIONARY 180 (23d ed. 2007) (defining broadband more generally as "any circuit significantly faster than a dial-up phone line").

[103] John Edwards for President, *supra* note 100.

Reality demands that there will be a continuum of costs to provide rural broadband. Some households will have access to broadband with little or no support. Other households will be too expensive to serve with wired broadband, even under the largest imaginable subsidy program. As a result, the house on the edge of a small town center will be considerably less expensive to wire than the house halfway up a mountainside. For those on the mountainside, wired broadband is not likely ever to be an affordable option. For them, satellite, and perhaps fixed wireless will be the most affordable options.[104]

Moreover, it is clear that the gap between urban and rural America—at least in terms of access to at least one broadband provider—appears to be closing. This is demonstrated by the data provided by the FCC regarding the number of broadband providers by zip code. As seen in Figure 2, the lower the population density, the fewer providers. However, it should be noted that the gap is shrinking over time, with less densely settled places increasingly having at least one provider serving at least one person in the zip code.

Figure 2: Percentage of Zip Codes with >1 Broadband Provider by Population Density[105]



[104] George S. Ford, Thomas M. Koutsky & Lawrence J. Spiwak, *Competition After Unbundling: Entry, Industry Structure, and Convergence*, 59 FED. COMM. L.J. 331, 338–39 (2007) (noting how reduced market size reduces the number of profitable providers).

[105] Data compiled from 2000-2006 FCC Reports. FCC, HIGH-SPEED SERVICES FOR INTERNET ACCESS (2007), *available at* http://www.fcc.gov/wcb/iatd/comp.html.

Unfortunately, it is difficult to assess how much progress is being made toward closing the broadband gap. Measurement and mapping efforts, such as those undertaken by ConnectKentucky, identify not just where broadband is and is not present, but also the locations in which it is economically feasible to invest in options other than satellite service.[106] But the federal government should also take the lead in establishing a user-generated system that would create Web-enabled maps of broadband availability and cost.[107]

For the foreseeable future, business broadband will continue to be more important in fostering rural economic opportunity than is residential broadband.[108] In terms of business location decisions, affordable high-speed broadband is almost as important as water and electricity, and the absence of broadband effectively makes the community a less attractive location for new or expanding businesses.[109] This reality ultimately affects all locations. For example, Massachusetts, a state many think of as relatively urban, has thirty-two towns with no broadband access other than satellite.[110] This suggests that a broadband policy must work to ensure that all communities have reasonably-priced high-speed broadband for business. Such a policy is likely to impact residential broadband as well. Indeed, there is evidence that exposure to broadband at work is one of the factors most directly responsible for encouraging people without broadband at home to subscribe.[111]

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[106] *See* Connect Kentucky, Message From Our President, http://connectkentucky.org/about/message.htm (last visited Nov. 12, 2007). Through mapping potential customers and demand aggregation, ConnectKentucky aims to spur greater broadband deployment. *Id.*

[107] The Information Technology and Innovation Foundation has proposed creating an online user-generated mapping interface that would allow consumers to test their broadband connection speed and enter additional information, including location and monthly broadband cost. With the help of mapping technology such as that offered by Google Maps, the resulting proliferation of data points could very quickly yield a useful nationwide picture of local broadband deployment, prices, and speeds. *See In re* Development of National Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscription Data, and Development of Data on Interconnected Voice Over Internet Protocol (VoIP) Subscribership, *Comments of The Information Technology and Innovation Foundation*, WC Docket No. 07-38, at 6, 7 (May 25, 2007) (accessible via FCC Electronic Comment Filing System).

[108] Sheila S. Sager, Theodore R. Alter & William C. Shuffstall, The Role of the State in Broadband Policy for Rural Areas: A Comparative Analysis of Canada and the United States 5 (Oct. 22, 2006) (unpublished paper submitted to the 2006 Annual Rural Telecommunications Congress Meeting), *available at* http://www.ruraltelecon.org/files/Broadband_Policy_Role_of_the_State_2006.pdf.

[109] *Id*. at 15.

[110] Carolyn T. Johnson, *Towns Left Scrambling for Touch of Broadband*, BOSTON GLOBE, July 18, 2007, at A1.

[111] Robert LaRose, Jenniger L. Gregg, Sharon Strover, Joseph Straubhaar & Serena Carpenter, *Closing the Rural Broadband Gap: Promoting Adoption of the Internet in Rural*

It is also unclear what impact technological evolution will have on the task of ensuring that more places have broadband. It is not yet known how wireless broadband will develop—particularly as Wi-Max is deployed and the prime 700 MHz spectrum is auctioned. Fixed wireless and improved, affordable satellite services might, in fact, provide sufficient connectivity for most residents living in sparsely populated areas where it is too expensive to deploy fiber or coaxial cable. If these technologies provide reasonable substitutes for fast, wired broadband, then the cost of connecting rural America will be significantly reduced.

Assuming these technologies prove to be reasonable substitutes (albeit at lower speeds), it is still necessary to invest strategically to bring urban-grade broadband to as many areas as is economically feasible. There are currently a number of proposals that seek to accomplish this goal by making broadband infrastructure explicitly eligible for universal service payments, expanding Rural Utilities Service loans and grants, and providing tax incentives for rural build-out.[112] However, perhaps the most effective approach would be to conduct reverse auctions, whereby broadband carriers bid for the right to serve currently unserved households in return for government subsidies. Winning bids would be those requesting the lowest subsidy, while guaranteeing minimum speeds and quality of service. The one-time auctions would cover higher capital costs and higher capitalized operating costs.

Whatever incentives are used to spur network build-out, the focus should be on increasing broadband, not boosting competition. It is already difficult enough for a rural broadband project to achieve economic viability if there are no other providers, but it is almost impossible if there are multiple providers competing for a limited number of high-cost customers. Yet, in their zeal to promote competition as a universal good, many rural broadband advocates want the limited rural broadband funds spent on subsidizing competitive providers. If the goal is to expand high-speed connectivity to high-cost places, the "luxury" of paying to subsidize multiple competitors in the same area is simply too expensive.

America, 31 TELECOMMS POL'Y 359, 371 (2007).

[112] For example, Senators Jay Rockefeller (D-VA) and Olympia Snowe (R-ME) introduced the "Rural Telecommunications Modernization Act of 2000" with provisions offering tax credits for expenditures on rural broadband infrastructure. S. 2321, 106th Cong. (2000). More recently, Congressman John McHugh (R-NY) introduced the "Rural America Digital Accessibility Act," which would provide grants and loans to broadband providers who deploy broadband to underserved rural areas. H.R. 3428, 110th Cong. (2007).

B. Broadband for Everyone?

Even if affordable broadband were available to every household in the United States, some would continue not to subscribe to the service. The reasons include lack of interest, low levels of digital literacy, and insufficient income.[113] But exactly which factors are most important is not clear. In the United States, more than fifty percent of households currently subscribe to broadband.[114] Another fifteen percent use dial-up connections.[115] Presumably many of them could switch to broadband, particularly as broadband availability is expanded within rural areas. However, thirty-two percent of adults in the United States do not use the Internet, and most of them do not own a personal computer.[116]

Cost also appears to play some role in the take-up of broadband.[117] According to a 2007 study, just thirty percent of households in the United States with incomes of less than $30,000 per year have broadband, compared with seventy-six percent of those homes with annual incomes in excess of $75,000.[118] Regardless, it is still not clear that cost is the major factor limiting computer ownership or broadband usage.[119] Georgia Tech professors Jan Youtie, Philip Shapira, and Greg Laudeman studied a program offered by the city of La-

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[113] SUSANNAH FOX, PEW INTERNET & AM. LIFE PROJECT, DIGITAL DIVISIONS 3–4 (2007), *available at* http://www.pewinternet.org/pdfs/PIP_Digital_Divisions_Oct_5_2005.pdf.

[114] *Id*. at 5.

[115] John B. Horrigan, *Why it will Be Hard to Close the Broadband Divide*, PEW RES. CENTER PUBLICATIONS, Aug. 1, 2007, http://pewresearch.org/pubs/556/why-it-will-be-hard-to-close-the-broadband-divide.

[116] FOX, *supra* note 113, at 1. As of 2005, only seventy-three percent of adults in the United States lived in a household with an Internet connection. *Id.* at 3.

[117] Flamm and Chaudhuri found that the price elesticity of broadband is significant, but that there are other factors, such as education, that also influence take-up. Kenneth Flamm & Anindya Chaudhuri, *An Analysis of the Determinants of Broadband Access*, 31 TELECOMM. POL'Y 312, 314–15 (2007).

[118] Memorandum from John B. Horrigan, Assoc. Dir. for Research, Pew Internet & Am. Life Project, and Aaron Smith, Research Dir., Pew Internet & Am. Life Project, on Home Broadband Adoption 2007, at 3 (June 2007), *available at* http://www.pewinternet.org/pdfs/PIP_Broadband%202007.pdf.

[119] While it is true that those in the United States with lower income are less likely to own a computer or utilize the Internet, it is also true that the cost of both has fallen significantly over the last decade. It is now possible to purchase a very adequate computer with monitor—indeed one that just a few years ago would have been seen as a high-end consumer machine—for less than the cost of a 32 inch color (CRT) television. Moreover, it is possible to obtain dial-up Internet access for approximately $5 a month, with broadband costing a little more. *See, e.g.,* Basic ISP Home Page, http://www.basicisp.net (last visited Nov. 12, 2007). For example, Verizon customers can purchase 768 kbps DSL service for just $14.99 a month, which is forty percent cheaper than 56 kbps dial-up service was ten years ago. Verizon High Speed Internet, http://www22.verizon.com/content/consumerdsl (last visited Nov. 12, 2007).

Grande, Georgia, which provided free television-based broadband access to its citizens.[120] Despite the fact that the service was free, many residents without Internet access chose not to subscribe, and some who did subscribe later dropped the service. In their analysis, the authors found that overall digital literacy, and interest in computers and the Internet were larger barriers to adoption than was cost.[121] This appears to be the reason why the median age of non-Internet users (fifty-nine) is so much higher than that of Broadband users (forty).[122]

Given that lack of computer ownership and lack of digital literacy appear to be the major factors limiting broadband take-up—as opposed to unwillingness or inability to switch from dial-up—simply providing USF-like subsidies (such as Lifeline and Linkup) may not be the most effective means of expanding broadband access. When telephones were first adopted, "telephone illiteracy" was not the major barrier to deployment because phones were relatively easy to use. Notwithstanding constant improvements in usability, computers and the Internet are, in comparison, quite complicated, and difficult to use. Despite the fact that an increasing number of applications rely on broadband, many people who cannot live without a phone feel perfectly comfortable living without the Internet.[123]

This suggests that a universal service policy focusing solely on subsidizing costs will not be the most successful method of maximizing broadband adoption. Any policy to expand broadband use must begin with efforts to make non-users comfortable with, and interested in, computers and broadband. Some companies, such as Microsoft, have taken significant steps to help foster digital literacy. [124] Additionally, organizations such as One Economy, have taken steps to encourage digital adoption by low-income people in the United States.[125] And some states, including North Carolina and Kentucky, have increased efforts to expand digital literacy and broadband take-up, especially in rural

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[120] *See* Jan Youtie, Philip Shapira & Greg Laudeman, *Supply, Demand and ICT-based Services: A Local Level Perspective*, 31 TELECOMM. POL'Y 347 (2007).

[121] *Id*. at 355–57.

[122] Horrigan, *supra* note 115.

[123] *See generally*, FOX, *supra* note 113 at 8 (demonstrating that because the Pew Research Center conducts its surveys via telephone, every respondent is a telephone user).

[124] *See, e.g.*, Microsoft, About Unlimited Potential, http://www.microsoft.com/emerging/AboutUnlimitedPotential/UnlimitedPotential.mspx (last visited Nov. 12, 2007).

[125] One Economy works with municipalities, neighborhoods, and affordable housing owners to provide free or low-cost broadband access to people who cannot afford it. *See* About One-Economy Corporation, http://one-economy.com/about/default.asp (last visited Nov. 12, 2007).

areas.[126] At the local level, initiatives such as Chicago's Digital Divide Task Force work to develop and implement comprehensive strategies to address this issue.[127] Other groups focus on helping particular groups like seniors[128] and students[129] learn computer and Internet skills.

In the immediate term, the most effective strategy for expanding broadband access appears to be supporting corporate, government, and nonprofit efforts. In support of these endeavors, Congress should enact and fund a competitive, community-based broadband access grant program, focused not just on broadband connectivity, but also on digital literacy and technological device access. Such a program could catalyze the creation of even more local, nonprofit, and voluntary approaches to bringing most, if not all, of a community's residents online.

More compelling public-interest broadband applications will also play a role in encouraging broadband adoption. One programmatic tool used to spur digital adoption was the Technology Opportunity Program ("TOP"), administered by the National Telecommunications and Information Administration ("NTIA").[130] The NTIA notes that between 1994 and 2004, "TOP made 610 matching grants to state, local and tribal governments, health care providers, schools, libraries, police departments, and community-based non-profit organizations."[131] In general, TOP grants helped organizations build and deliver technology capability to local residents.[132] TOP accomplished much, but its major limitation was that it funded the development of many community-focused Internet and software projects that were used in that particular community alone. If a program similar to TOP were to be resurrected, it should focus less

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[126] *See* North Carolina's e-NC Authority, What is e-NC?, http://www.e-nc.org/Webpage.asp?page=10 (last visited Nov. 12, 2007) (describing North Carolina's program for expanding Internet and technology to rural areas); s*ee also* About Connect Kentucky, http://www.connectkentucky.org/about (last visited Nov. 12, 2007) (explaining the benefits of the Connect Kentucky program).

[127] *See* DAVID BAKER ET AL., MAYOR'S ADVISORY COUNCIL ON CLOSING THE DIGITAL DIVIDE, THE CITY THAT NETWORKS: TRANSFORMING SOCIETY AND ECONOMY THROUGH DIGITAL EXCELLENCE 3 (2007), *available at* http://egov.cityofchicago.org/webportal/CDCWebPortal/COC_EDITORIAL/DigitalDivide.pdf.

[128] *See* SeniorNet, Membership, http://www.seniornet.org (follow "Membership" hyperlink) (last visited Nov. 12, 2007) (providing computer and Internet education for older adults and seniors).

[129] *See* Computers for Youth Home Page, http://www.cfy.org (last visited Nov. 12, 2007) (providing computer education to low-income students).

[130] *See* Technology Opportunities Program, About TOP, http://www.ntia.doc.gov/top/about.html (last visited Nov. 12, 2007).

[131] *Id*.

[132] *See* Technology Opportunities Program, Grants, http://www.ntia.doc.gov/top/grants/grants.htm (last visited Nov. 12, 2007).

on community projects, and more on developing national Web-based tools that can be used in any community around the nation, or indeed the world. There are numerous applications that could be developed just once, and be made available on the Internet for all to use. For example, the Canadian Literacy Council developed a very effective online literacy training program that is used in hundreds of communities across Canada.[133] A revived TOP program should have as its primary focus the development of nationally scalable Web-based projects that address particular social needs, including law enforcement, health care, education, and access for persons with disabilities.

Finally, one often overlooked component of expanding access is limiting taxation. This is a compelling reason to extend the moratorium on Internet taxation and ensure that it covers broadband transport to the consumer as well as ISP service.[134]

C. Faster Speeds

Though becoming faster, broadband speeds in the United States remain relatively anemic compared to nations like Japan, South Korea, and Sweden.[135] Faster average broadband speeds would bring considerable benefits, such as enabling new applications, including those that rely on video.

Yet, investing in faster pipes is expensive. Verizon's strategy of deploying fiber optic cable to the curb requires considerable capital.[136] Comcast's recently announced DOCSIS 3.0 investment is estimated to cost less, but will still require billions of dollars.[137] Whether (and how quickly) such high-speed networks will be implemented remains to be seen.

For markets similar to the United States, in which the social benefits or costs differ from the private benefits or costs, it is not uncommon for public policy to respond—often with tax incentives (in the case of positive externalities) or taxes (in the case of negative externalities). Many nations, including Japan, South Korea, and Sweden, have spurred the deployment of faster networks through direct subsidies, including grants, low-interest loans, and accelerated

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[133] *See* CTR. ALPHA PLUS CTR., EVALUATION OF ALPHAROUTE 2002-2003, at 3 (2003), *available at* http://resources.alpharoute.org/pdfs/AR_evalution_report_june_2003.pdf.

[134] *See* DANIEL CASTRO, THE CASE FOR TAX-FREE INTERNET ACCESS: A PRIMER ON THE INTERNET TAX FREEDOM ACT 2 (2007), *available at* http://www.itif.org/files/ITFA.pdf.

[135] CORREA, *supra* note 3, at 7.

[136] Press Release, Verizon, Verizon Provides New Financial and Operation Details on its Fiber Network as Deployment Gains Momentum (Sept. 27, 2006), *available at* http://investor.verizon.com/news/view.aspx?NewsID=773.

[137] *See* Todd Spangler, *Advantage: DOCSIS 3.0*, MULTICHANNEL NEWS, May 14, 2007, at 35, *available at* http://www.multichannel.com/article/CA6441568.html.

depreciation on network investments. For example, the Japanese government allowed incumbent provider NTT to rapidly write off the cost of its new fiber broadband networks.[138] The South Korean government did the same for fiber investments in South Korea.[139] Austria and Sweden allowed individual consumers to deduct broadband expenses from their taxes.[140] Canada recently increased by fifty percent its tax incentives for investments in broadband, Internet, and other data network infrastructure equipment.[141]

To spur more ubiquitous high-speed broadband deployment, Congress should do the same for providers in the United States. The government should also allow companies investing in broadband networks to expense investments in new high-speed broadband networks (capable of delivering considerably faster speeds than today's average DSL or cable networks) in the first year. Currently, companies in the United States must depreciate telecommunications network investments over a period of fifteen years.[142] Allowing companies to deduct the investment in the first year reduces the costs of making these investments and spurs faster deployment of higher speed networks.[143]

Finally, to promote faster speeds, the United States needs to update the definition of broadband. The FCC should develop a definition of "robust" broadband that is faster than the current definition (at least 200 kbps in one direction).[144] This should be an evolving standard that should start at perhaps 2 mbps and increase as speed and application needs increase. A perpetually evolving definition of what constitutes broadband would be a constant impetus for providers to increase speed capabilities.

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[138] Takashi Ebihara, Senior Dir. of the Corp. Strategy Dep't of NTT East Corp., ITIF Policy Forum: Understanding the Japanese Broadband Miracle (Apr. 4, 2007), *available at* http://itif.org/index.php?id=38.

[139] *See* TIM KELLY, VANESSA GRAY & MICHAEL MINGES, INT'L TELECOMMS. UNION, BROADBAND KOREA: INTERNET CASE STUDY 33 (2003), *available at* http://www.itu.int/ITU-D/ict/cs/korea/material/CS_KOR.pdf.

[140] CORREA, *supra* note 3, at 7.

[141] *See* DEP'T OF FIN. CAN., THE BUDGET IN BRIEF 2004, at 9 (2004), *available at* http:www.cbc.ca/news/background/budget2004/pdf/budgetinbrief.pdf.

[142] 26 U.S.C. §§ 168(e)(3)(E)(ii) (2000).

[143] *See* Yorman Margalioth, *The Case for Tax Indexation of Debt*, 15 AM. J. TAX POL'Y 205, 220–22 (1998).

[144] *See* Press Release, FCC, Federal Communications Commission Releases Data on High-Speed Services for Internet Access: High-Speed Connections to the Internet Increased 27% During the First Half of 2002 for a Total of 16.2 Million Lines in Service (Dec. 17, 2002), *available at* http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-229568A1.pdf.

D. Competition

No discussion of a national broadband policy would be complete without a discussion of competition. In the last decade, the Washington Telecom Consensus ("WTC") has focused primarily on competition as the driver of all things good in the telecom space.[145] Certainly, competition is laudable. It provides consumers with choice, it motivates companies to improve service quality, and it helps keep prices down. The experiences of other industries in which regulation was reduced and competition enabled, demonstrate that the benefits of competition can indeed be profound.

When applied to the goal of achieving a universal and affordable broadband network, the WTC's focus is clear. It hopes to increase competition either by encouraging alternative "pipes" (opening up more spectrum for broadband data transmission, establishing rules to enable broadband over power lines, and fostering municipally-owned networks), or requiring incumbent providers to open up their networks for the use of competitors.[146] The question, however, should be whether telecommunications—and in particular broadband—is like banking, airlines, and trucking, or more like municipal water, electricity, and gas service. In other words, whether broadband is more like a natural monopoly or a service provided in a highly competitive markets. This question has been at the center of debates over telecommunications for many years, and should be at the center of the broadband debate as well.

The bias toward competition is misguided. It ignores the fact that there are elements of broadband infrastructure that have natural monopoly aspects, much like water, gas, and sewer pipes. For example, during the height of the electricity deregulation movement in the 1990s, few advocates proposed deregulating the local electricity delivery network because that part of the system was rightly seen as a natural monopoly.[147]

Yet, for some reason, that basic insight has not translated to broadband networks. One reason is that many, particularly those on the left, look at network costs as the responsibility of corporations—if competition drives down reve-

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[145] For example, the FCC's August 2005 policy statement laying out broadband principles included as its fourth principle that "consumers are entitled to competition among network providers, application and service providers, and content providers." Press Release, FCC, FCC Adopts Policy Statement: New Principles Preserve and Promote the Open and Interconnected Nature of the Public Internet (Aug. 5, 2005), *available at* http://fjallfoss.fcc.gov/edocs_public/attachmatch/DOC-260435A1.pdf.

[146] *See, e.g.,* Donna N. Lampert, *No Sight Like Hindsight: The 1996 Act and the View Ten Years Later*, 28 FED. COMM. L.J. 519, 521, 525 (2006); Wu, *supra* note 98, at 4–7 (explaining government's role in net neutrality).

[147] *See* Richard D. Cudahy, *Whither Deregulation: A Look at the Portents*, 58 N.Y.U. ANN. SURV. AM. L. 155, 159 (2001).

nues, it is no one's problem but their own. At least consumers, benefit from the heightened competition. The situation would be little different, however, if all telecommunications providers were state-owned. In both cases, providers who lose market share while having to support fixed cost networks have to raise prices to avoid losing money. If providers are forced to amortize the fixed costs of their networks over significantly fewer customers, prices will increase even if profits are squeezed and efficiencies maximized.

This is not to suggest that competition does not bring benefits, such as increased consumer choice, as well as pressure to innovate and cut costs. However, it is critical to realize that in the case of last-mile infrastructure, multiple networks also bring costs. The issue, then, becomes one of balancing the efficiency of fewer networks with the competitive benefits of more networks. What the public policy should *not* do is intentionally tilt the playing field toward a third (or "nth") pipe through special subsidies, including municipal provision.[148] Municipal provision of broadband networks should be a last resort, not a first. If private sector providers are unwilling to extend and upgrade networks, even after they are offered incentives to do so, then municipal provision may make sense. But public subsidies of a third (or fourth) pipe simply raise the overall costs of broadband infrastructure in an area. Therefore, at best, any national policy should be neutral toward competition. It should seek to remove any unnecessary barriers to competition—such as restrictions and high prices placed on pole access and trenching by local governments—but it should not tilt the playing field to promote more.

VI. CONCLUSION

Broadband has become a "motherhood and apple pie" issue; no one is against more of it. The real issue is not whether broadband is good and more is better, but whether the market alone will provide the proper amount in the desired time frame. For most market-oriented conservatives, the correct amount is the amount that the market provides. Yet, because of significant positive externalities from broadband, the right amount—the amount that maximizes social welfare—is in fact greater than the amount the market alone provides. This means that active public policies to spur broadband, in addition to policies to remove barriers to deployment, are critical to ensure the best possible broadband future for the United States. While it is true that proactive policies

[148] *See* Angel M. Cartagena, Jr., *Broadband Over Powerlines*, ELECTRIC PERSP. Mar./Apr. 2004, at 45, 49; s*ee generally* Craig Dingwall, *Municipal Broadband: Challenges and Perspectives*, 59 FED. COMM. L.J. 67, 81–86 (2007) (providing information on municipal provision).

and incentives for more broadband might distort the market, it is also likely that the innovation and productivity encouraged by more and faster broadband is likely to exceed any minor losses from "misallocation" of economic resources.[149] What exactly those proactive public policies should look like must be subject to significant analysis, debate, and consideration. It is time to move beyond the debate of whether the United States needs a national broadband policy. It does. The task now is to craft it and implement it.

[149] *See generally* ROBERT D. ATKINSON & ANDREW S. MCKAY, DIGITAL PROSPERITY: UNDERSTANDING THE ECONOMIC BENEFITS OF THE INFORMATION TECHNOLOGY REVOLUTION 11–26 (2007), *available at* http://www.itif.org/files/digital_prosperity.pdf.