

**BROADBAND IN AMERICA:  
A POLICY OF NEGLECT IS NOT BENIGN\***

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**MARCH 2009**

**\*Forthcoming in Enrico Ferro, Yogesh K. Dwivedi, J. Ramon Gil-Garcia, and Michael D. Williams, Eds., *Overcoming Digital Divides: Constructing an Equitable and Competitive Information Society*,” IGI Global Press.**

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## Abstract

In February 2002, the newly appointed FCC Chairman Michael Powell sought to shift the debate over Internet policy from the Clinton era concern over the digital divide (“I think there’s a Mercedes Benz divide, I’d like one, but I can’t afford it”) to broadband deployment (“We have a clear vision for this migration to advanced platforms: stimulate investment in next-generation architectures, apply a light hand and let entrepreneurs bring the future to the American people”). President Bush reiterated this shift in the 2004 election (“We ought to have universal, affordable access for broadband technology by the year 2007... The role of government is to create an environment in which the entrepreneurial spirit is strong and in which people can realize their dreams”). Four years later the National Telecommunications Information Administration declared the “results have been striking... a reasonable assessment of the available data indicates that the nation has, to a very great degree, realized this objective.”

However, a careful look at the data for 2001 and 2007 contradicts the claim of success on both the digital divide and broadband deployment.

In 2001, 54 percent of households did not have the Internet. In late 2007, 49 percent of households did not have broadband. About 25 percent of households with incomes below \$25,000 per year had broadband in 2007; whereas over 80 percent of households with incomes above \$75,000 did.

In 2001 the OECD rankings on Internet penetration put the U.S. third; by 2007 it had fallen to 15<sup>th</sup> on broadband. A variety of measures of performance and econometric models that control for a wide range of economic and social variables show a dozen nations are ahead of the U.S.

The *laissez faire* policy pursued by the Bush administration let a duopoly of cable and telephone companies dribble out broadband at slow speed and high prices. In contrast, the nations that passed the U.S. implemented much more aggressive policies to promote broadband and instead of relying on weak intermodal competition, they required the dominant networks to be open to competition in Internet services. This kept the price down and stimulated adoption and innovation.

# I. A PERMANENT DIGITAL DIVIDE OR ANOTHER “MISSION ACCOMPLISHED?”

## From Digital Divide to Falling Behind on Broadband

Barely a decade after the Internet became widely, commercially available and at a moment when high-speed Internet access was just becoming widely available in the mass market, the digital Divide had already become a topic of vigorous debate in Washington policy circles. The debate over the speed of the penetration of the new communications technology became a permanent fixture of technology policy discussions.

This paper addresses three empirical questions that have been at the center of the now decade long debate over the digital divide.

Does the digital divide still exist; is there a significant difference in penetration among specific groups in the population?

Does it matter that households are not connected; does being disconnected cause households to be disadvantaged or disenfranchised?

Is the U.S. ahead of other nations or behind in the penetration of this technology and what does that mean for the policies chosen to promote the deployment of the technology?

The issue was originally framed by the Clinton administration in the late 1990s as a concern that instead of being a great leveler of opportunity, the uneven penetration of Internet service was replicating and reinforcing existing social divisions (e.g. Wilhelm, 2000; Cooper 2001). However, others argued that the normal pattern of adoption of mass market goods was for upper income households to be early adopters but, ultimately, the good would spread throughout society (Thierer, 2000; Compaine, 2001). With the rapid uptake of the Internet and broadband being faster than other consumer goods and services like telephones, televisions, and VCRs, they argued there was little cause for concern.

Reactions to a *Washington Post* (Schwartz, 1999) article summarizing the findings of a mid-1999 Clinton Administration report on the digital divide suggest how prominent the debate had become. In a front-page story the newspaper summarized the report from the National Telecommunications Information Administration (1999), entitled *Falling through the Net*, as follows, “Despite plummeting computer prices and billions of dollars spent wiring public schools and libraries, high-income Americans continue to predominate in the online world” (Schwartz, 1999, p. A-1).

This conclusion was immediately cast in highly charged public policy terms by President Clinton.

*There is a growing digital divide between those who have access to the digital economy and the Internet and those who don't, and that divide exists along the*

*lines of education, income, region, and race... If we want to unlock the potential of our workers, we have to close that gap (Schwartz, 1999, p. A-1).*

By contrast, Executive Vice President David Boaz of the ultraconservative Cato institute — dismissed the notion of the digital divide:

*We've got a new technology spreading more rapidly than any new technology has spread in history. And of course, it doesn't spread absolutely evenly. Richer people have always adopted new technology first – and that's not news. There's no such thing as information haves and have-nots, there are have-nows and have-laters. The families that don't have computers now are going to have them in a few years (Schwartz, 1999, p. A-1).*

With a change in Administrations in 2001, the alternative view became the official view in Washington, a shift made clear just weeks after the inauguration of President Bush, when Michael Powell, newly appointed Chairman of the Federal Communications Commission (FCC), declared at his first press conference that at worst there was a “Mercedes Benz divide.”

*I think the term [“digital divide”] sometimes is dangerous in the sense that it suggests that the minute a new and innovative technology is introduced in the market; there is a divide unless it is equitably distributed among every part of society, and that is just an unreal understanding of an American capitalist system... I think there's a Mercedes Benz divide, I'd like one, but I can't afford it... it shouldn't be used to justify the notion of, essentially, the socialization of deployment of infrastructure (Powell, 2001).*

Chairman Powell articulated the Bush administration's policy as a reliance on laissez faire, trickle down of technology and a rejection of policies to stimulate the spread of Internet service. “We have a clear vision for this migration to advanced platforms: stimulate investment in next-generation architectures, apply a light hand and let entrepreneurs bring the future to the American people (Powell, 2001).”

Two years later, in March of 2004, in the midst of his re-election campaign, President Bush reiterated the policy. He declared a national policy goal and an approach to achieving it, stating, “this country needs a national goal for broadband technology, for the spread of broadband technology... The role of government is to create an environment in which the entrepreneurial spirit is strong and in which people can realize their dreams” (Bush, 2004).

The justification he gave for the policy helps to establish the criteria by which its success should be measured. The primary justification was to provide a wide range of services to consumers, with market forces driving prices down and expanding choice for consumers. Ultimately, the market process would keep the U.S. at the leading edge of technology development.

*We ought to have universal, affordable access for broadband technology by the year 2007, and then we ought to make sure as soon as possible thereafter, consumers have got plenty of choices when it comes to purchasing their*

*broadband carrier. The more choices there are, the more the price will come down; and the more the price comes down, the more users there will be; and the more users there are, the more likely it is America will stay on the competitive edge of world trade. The more users there are, the more likely it is people will be able to receive doctor's advice in the home. The more affordable broadband technology is, the more innovative we can be with education. It is important that we stay on the cutting edge of technological change and one way to do so is to have a bold plan for broadband (Bush 2004).*

Perhaps inadvertently, President Bush and Michael Powell had shifted the emphasis in the public policy debate over Internet deployment and penetration. The focus of the debate changed in two respects when the framing shifted from the from a digital divide that needed to be addressed by public policy to a Mercedes Benz divide that would be addressed by market forces.

First, the Powell/Bush Mercedes Benz formulation places greatest emphasis on the supply-side production of services to be consumed, while the digital divide framing shows greater concern for the consumer use and citizen participation aspects of the communications. Bush's emphasis on services is quite different from Clinton's emphasis on unlocking the potential of workers.

Second, concern about the rate of adoption of Internet across groups within the U.S. was replaced by concern about the overall rate of U.S. adoption compared to other nations. This highlights the public policy differences between nations, based on the need to "stay on the cutting edge of world trade." Whether inadvertent or not, the digital divide debate became a "falling behind on broadband" debate.

Over the course of the 2004 presidential campaign, members of the White House staff made it clear that broadband deployment would not be the object of active policy.

*In explaining the Administration's policy on broadband, the Associate Director of the Office of Science & Technology Policy has declared that 'we have not come out with a universal service platform'" (Patrick, 2004). When pressed about whether broadband should be the target of social policy the Administration spokesman reaffirmed that it simply was not part of the program. "Asked whether the Universal Service Fund should be used for broadband, as many suggest, Russell said 'then you automatically assume that broadband pays into Universal Service. Cable, he noted, does not'" (Patrick, 2004).*

Cable does not pay into the Universal Service Fund because the Powell-led FCC has decided it should not.

This *laissez faire*, trickle down theme was reiterated by others in the Administration, as well. Undersecretary of Commerce- Technology, Phil Bond "reiterated Bush's goal of universal access to broadband by 2007... Bush's stated goal is universal access, not adoption, Russell said. As for Broadband adoption, Marburger said new services and applications will make broadband more attractive to fence sitters. But Russell said a less-quoted line of Bush's after the 2007

promise is endorsing “competition as soon as possible thereafter.” Russell predicted broadband prices will drop as more competitors enter a market (Patrick, 2004).

Four years later, in January 2008, the National Telecommunications Information Administration (2008, p. 1) declared ‘mission accomplished’ in a report entitled *Networked Nation: Broadband in America*, stating

*four years ago President Bush articulated a National vision: universal, affordable access to broadband technology... The results have been striking... Penetration continues to grow and prices continue to fall... The President has made it a priority to ensure that all Americans have affordable access to this important resource by harnessing the power of the competitive marketplace. As this report demonstrates, a reasonable assessment of the available data indicates that the nation has, to a very great degree, realized this objective.”*

As discussed below, a close look at the data casts considerable doubt on this claim. The data does not support the claim to success measured by either of the policy frames.

- The digital divide has persisted. In a space that is as dynamic as cyberspace, a decade is a long time to be disconnected, rendering the disadvantage essentially permanent.
- The U.S. has fallen behind about a dozen nations in broadband and is beginning to suffer the consequences.

An understanding of the parameters of the debate and an evaluation of the extent to which the goal has been achieved is important because the issue remained front and center in the 2008 presidential campaign. The debate over public policy was renewed in exactly the same terms in the 2008 campaign (Korver, 2008; USC Annenberg 2008). Mike Powell was a prominent spokesperson for McCain on Internet policy, frequently debating Reed Hundt, President Clinton’s first Chairman of the Federal Communications Commission, on these issues.

*The potential role of the USF in subsidizing broadband is a currently under debate in Congress and at the FCC.*

*Hundt touted Obama as a candidate well versed in technology, and well equipped to use information technology to improve the operation of government.*

*Powell said that McCain is knowledgeable of technology through his role as former chairman of the Senate Commerce Committee.*

Powell praised McCain for understanding that government must create an environment encouraging American innovation. In order to create such a model he argued, Americans must have access to risk capital, and entrepreneurs deserve “to enjoy the fruits of their labor” (Korver, 2008).

## Purpose and Outline of the Paper

Both of the threads in the debate over the adoption of Internet service focus on a very narrow set of issues – to whom is it available and which households subscribe to the service. There is a broad and valid critique of the framing of the digital divide issue to the effect that the focus on “penetration” (the calculation of the percentage of households with access) of technologies like the Internet and broadband is too narrow, ignoring a host of social, economic and psychological issues (van Dyk, 2005; Warschauer, 2003). Nevertheless, the question of penetration is **an** important issue, if not the only important issue. Moreover, even within the narrow question of who has adopted the service there are profound policy disputes.

The primary focus of this paper is the penetration issue. The paper is largely empirical, looking at survey, census and other data on the penetration of Internet access and its implications. It is also comparative, looking at the issue of the digital divide across time and space. The data comes from two points in time, late 2000/early 2001 and late 2007/early 2008. The first data point captures the exact moment when the framing of the digital divide debate shifted in Washington with the change in administrations. It also captures the moment when Internet access shifted from dial up to broadband.

The data is ideally suited to evaluate the claim made at the end of the Bush Administration that the goal ‘to ensure that all Americans have affordable access to this important resource by harnessing the power of the competitive marketplace’ has been achieved and to evaluate whether “a reasonable assessment of the available data indicates that the nation has, to a very great degree, realized this objective.’

The paper is divided into four parts. Part II provides the context for the debate by explaining the policy background as well as the social implications of the new technology.

Part III examines the status of the digital divide in terms of the adoption and use of the technology.

Part IV examines the issue of the status of the deployment of broadband technology in comparison to other nations.

Part V reviews the policy implications of the continuing digital divide and the lagging performance of the U.S. on broadband.

## II. THE GOAL OF UBIQUITOUS, AFFORDABLE ADEQUATE COMMUNICATIONS SERVICE

### The Legal Framework

The legal and policy framework in which the digital divide debate is located is important because it offers the essential rationale for carrying out the conversation and analyzing public policy. The Bush administration chose the standard by which it wanted to be measured – ubiquitous, affordable, broadband (advanced) communications. President Bush outlined some of the key reasons that achieving this goal would be important in the broadband era. In fact, the goal is nothing more than the original goal of the 1934 Communications Act restated for the twenty first century, “to make available, so far as possible, to all people of the United States a rapid, efficient, nation-wide and world-wide wired and radio communications service with adequate facilities at reasonable charges” (U.S.C.A. 1934). The goal was always implicitly progressive – encompassing the notion that as the communications network advanced, the universal service goal should advance as well. In 1934, when universal service was first articulated as national policy, two-thirds of American households did not have a telephone (Cooper, 1996).

The 1996 Telecommunications Act amendments to the 1934 Communications Act explicitly embraced the notion that the target should evolve and include access to information services:

**S. 254 (b)** Universal Service Principles – The Joint Board and the Commission shall base policies for the preservation and advancement of universal service on the following principles:

- (1) Quality and Rates – Quality services should be available at just reasonable, and affordable rates.
- (2) Access to Advanced Services – Access to advanced telecommunications and information services should be provided in all regions of the nation.
- (3) Access in Rural and High Cost Areas – Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas (U.S. Telecommunications Act, 1996).

There is one aspect of the 1996 Act, however, that is implicitly less progressive than the underlying law that it amended. While the statute does envision the evolution of universal service, it also sees universal service policies called for only after the market has delivered the service to the majority.

**S. 254 (c) (1)** *Universal service is an evolving level of telecommunications service that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services. The Joint Board in recommending, and the Commission in establishing*

*definitions of the services that are supported by Federal Universal service support mechanisms shall consider the extent to which such telecommunications services*

- (a) are essential to education, public health or public safety;*
- (b) have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;*
- (c) are being deployed to public telecommunications networks by telecommunications carriers; and*
- (d) are consistent with the public interest, convenience and necessity (Telecommunications Act of 1996).*

Thus, the goal is contingent upon adoption by a “substantial” majority of consumers of services that are being deployed by private sector companies, services that have other “social” characteristics. Progressive, or not, there is little doubt that Internet service meets the definition of a universal service today.

Moreover, as more and more commerce and political expression moves onto the Internet, and more and more applications require the capacity of a high-speed communications network to function, broadband communications become the standard for “adequate facilities.” Indeed, the expanding importance of communications in the information economy and the convergence of communications and commerce make the need to achieve the goal of universal service even more critical. The consequences of falling off “the cutting edge of technological changes” are severe for both the nation and households.

However, the supply-side view is too narrow. Internet connectivity not only delivers goods and services to consumers, it empowers consumers and, more importantly, citizens. As a potent two-way, many-to-many communications medium, not just a one-way, push consumption medium, it transforms the nature and capacity for participation in social and political activities. The importance of broadband on the supply-side, innovation front is widely recognized, but it is no more compelling as a basis for public policy to ensure ubiquitous, affordable broadband than the social and civic participation aspects. Viewing internet access as a tool for participation links it directly to the notion of equality of opportunity and equality in the political space is a much more compelling principle (Baker, 2007, pp. 7-16).

### **The Social and Economic Framework**

The intensity of the debate over the digital divide reflects more than political opportunism by administrations and candidates; it has a firm grounding in the impact of a transformative technology on the economy, society and culture, as well as politics (Cooper 2002, 2003b, 2006; Benkler 2006). Early in the spread of the technology, Manuel Castells, Professor of Sociology and Planning at the University of California, Berkeley and author of a three-volume work on *The Rise of the Network Society*, anticipated this rancorous debate. He noted that timing in the distribution and adoption of technology is a critical factor in determining economic chances, especially in a digital age.

*There are large areas of the world, and considerable segments of the population, switched off from the new technological system . . . Furthermore, speed of technological diffusion is selective, both socially and functionally. Differential timing in access to the power of technology for people, countries, and regions is a critical source of inequality in our society (Castells, 1996: p. 34).*

One does not have to be a left-leaning, academic sociologist to arrive at the conclusion that lack of access to the new technologies puts people at a severe disadvantage. Not long before he became Secretary of State, Colin Powell, Chairman Michael Powell's father, described the problem in dramatic terms.

*We hear today about the “digital divide” – the gap between those who have access to the wonders of digital technology and the Internet and those who do not. When I address this issue I use an even stronger term: digital apartheid. What is at stake is today's digital “have nots” – especially the young – and whether they may find themselves marginalized for life because they lack the skills and tools to participate in our globalized, knowledge-based economy. This is true in America and in the rest of the world (Colin Powell, 2000).*

Perhaps in the early days of the analysis of the digital divide, it was possible to downplay the importance of the penetration of the new communications medium into society, but after a decade there can be little doubt that Internet and activities in cyberspace are transforming society powerfully and rapidly (Benkler, 2006). Because the Internet has been an open and accessible place for new forms of expression, it was hoped (believed) that it would democratize society and equalize opportunity (Cooper, 2003a, pp. 92-95). The maldistribution of access to cyberspace flies in the face of that hope. In fact, because the opportunity to participate is less equally distributed in cyberspace than in physical space, the persistence of this problem may make matters worse; it may become is a new source of inequality in society.

Access to the Internet at home has been the focal point for U.S. policy debates for good reason. Because the U.S. is not a “café” culture, most personal business is conducted from the home. Searching for information, looking for a job, and entertainment activities (especially TV viewing) are typically done in the privacy of the residence. For this reason, we have measured the digital divide, as we have measured universal telephone service, by the availability of the means of communications (telephone or the Internet) in the home. Stopping by the library to use the Internet or using it at work may be transitional steps useful for creating skills in the population, or carrying out specific tasks associated with the activities of those locations, but they are not a replacement for its availability in the home.

The urgency to close the digital divide faster reflects two important characteristics of the Internet age (Cooper, 2002). First, it is well recognized that things happen much more quickly in cyberspace. If a household is cut off for a decade, its ability to participate and prosper in the new economy may be permanently impaired. If a groups is not well represented as the architecture of the Internet becomes defined and the patterns of deployment established, the needs of the group may never be well represented in cyberspace. Second, the convergence of commerce and communications in the digital information age gives this technology a special transformative power (Cooper 2003b; Benkler 2006). The Internet is not just communications or just a means

of commerce. It promises to enhance productivity in many aspects of life and to transform the production of goods and services (Cooper 2006).

According to this line of reasoning, in the digital age, waiting “a few years” for technology to trickle down may seriously impede the economic aspirations of the “have laters.” “Having later” may be almost as bad as “having not” because the good opportunities are gone and the patterns of activity are set, leaving latecomers excluded and switched off. The important point about the digital divide is not simply that some people have the technology and others do not, but that not having it puts people at a disadvantage and cuts them off from participation in important economic, social, cultural and political activities.

This leads directly to the second major point of emphasis in our analysis. It is what people can do with the Internet that makes it so important and makes closing the divide so critical. We reject the argument of some critics of the digital divide concept who claim we should not worry because Internet access is spreading as rapidly as some consumer appliances, like TVs and VCRs. Access to the Internet is much more important than access to a VCR. It may be an overstatement to say that the Internet changes everything, but it changes a lot of important things. Not having access seriously disadvantages the household. Acquisition of these new and powerful means of communications becomes the central determinant of participation in the digital information age. Routine use of these technologies makes for more efficient consumers and more effective citizens.

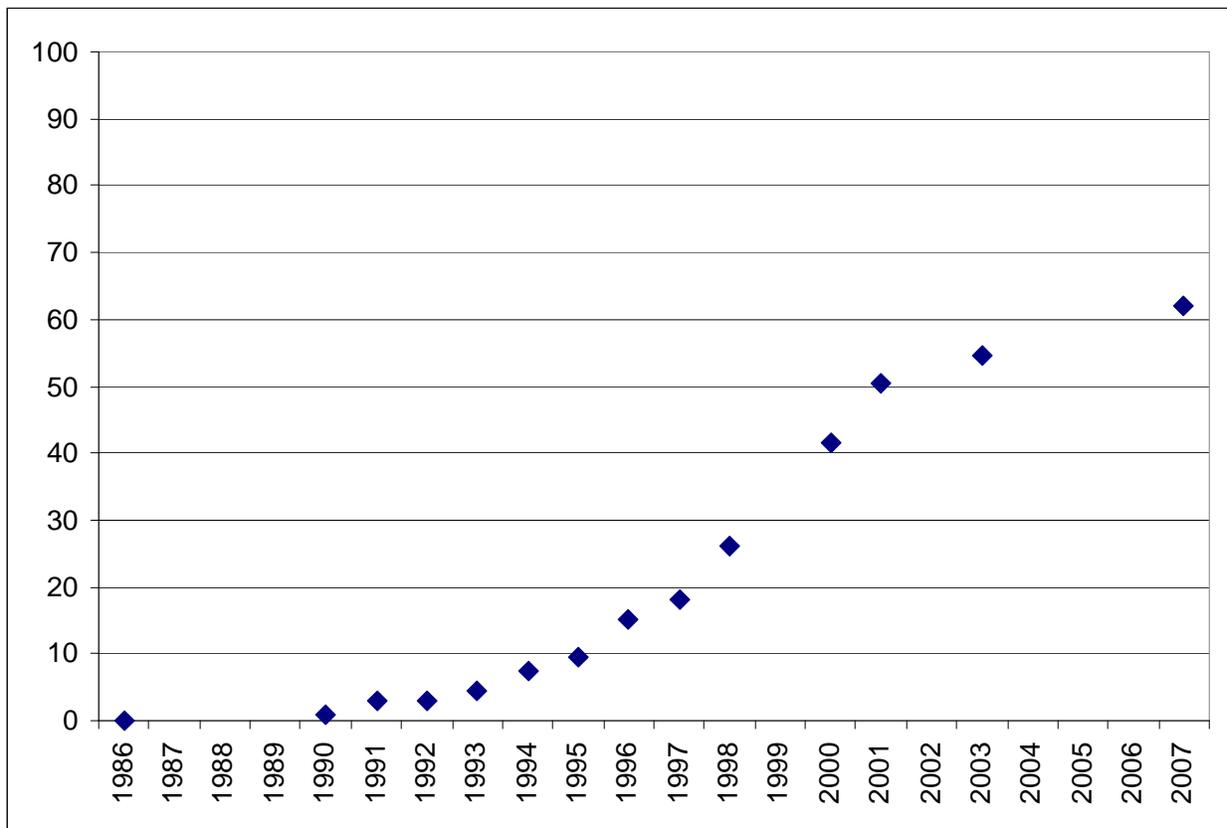
### III. THE ENDURING DIGITAL DIVIDE

Because the digital divide has been a major concern since the Internet became widely available to the public and for commercial activities, the Bureau of the Census collects and makes available the raw data on how Internet access and advanced communications facilities are spreading throughout the nation. With these data available, it is hard to gloss over the failure to close the digital divide.

#### Internet Penetration has Stalled

The overall spread of Internet service is captured in an innovation adoption curve (see Figure 10. The curve has the typical shape of a logistic or S-curves, with a slow initial period, a rapid build up, and then a leveling off. It is clear that penetration has stall at less than two-thirds of the

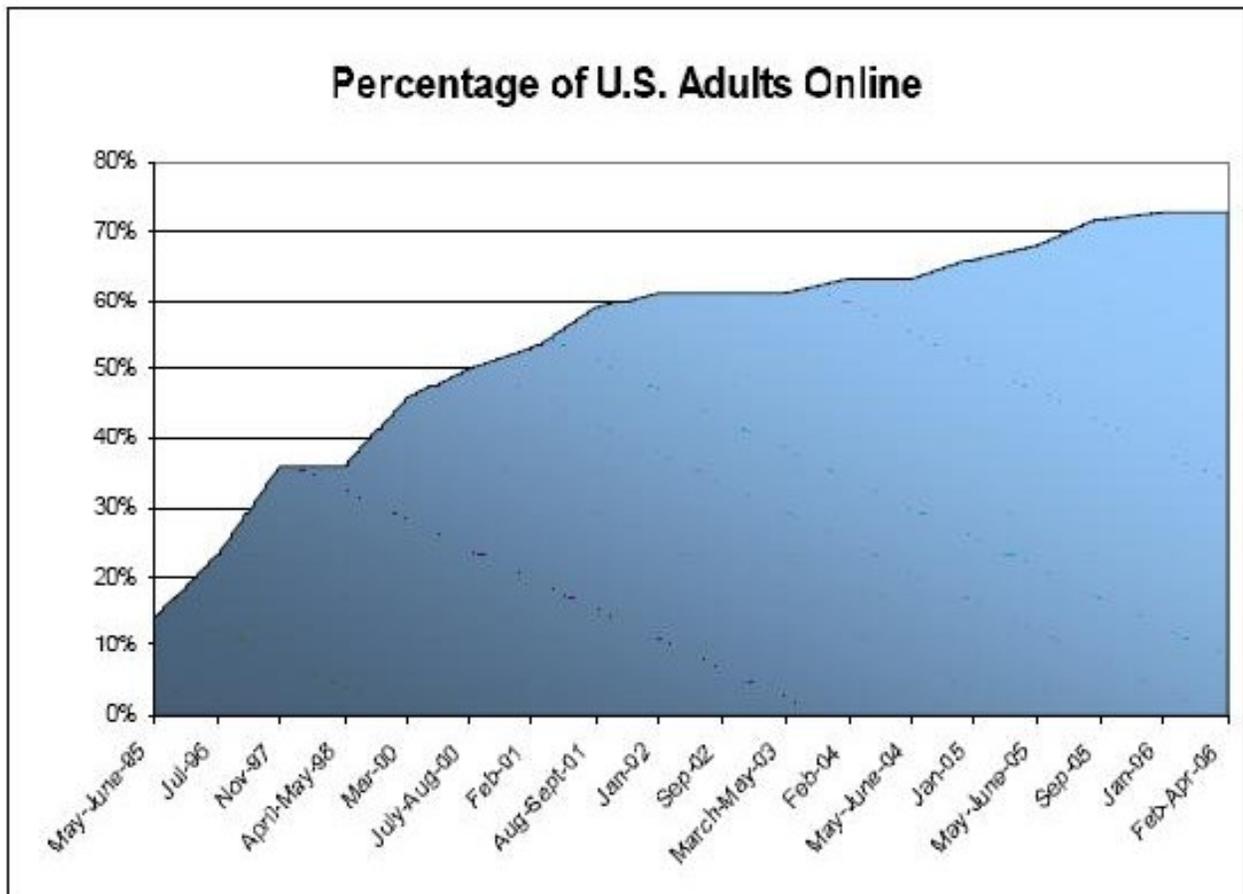
*Figure 1: Percentage of Household with Internet Service*



Source: National Telecommunications Information Administration, *Networked Nation: Broadband in America* (Washington, D.C.: January 2008) for 2007; U.S. Census Bureau, *Computer and Internet Use in the United States: 2003* (Washington D.C.: October 2005) for 1997 – 2003; Mark Cooper, *Developing the Information Age in the 1990s: A Pragmatic Consumer View*. (Washington, D.C. Consumer Federation of America, June 8, 1992).

Population. As shown in Figure 2, the percentage of households with Internet service at home (the penetration rate) has generally been about 5 to 10 percentage points behind the percentage of adults who have access to the Internet more broadly (Pew Internet and American Life Project). The difference is generally made up by access to the Internet at work. Both of the adoption curves suggest that Internet penetration is topping out at well below 100 percent. In 2007 over one-third of households did not have Internet service at home and over one-quarter did not use the Internet anywhere.

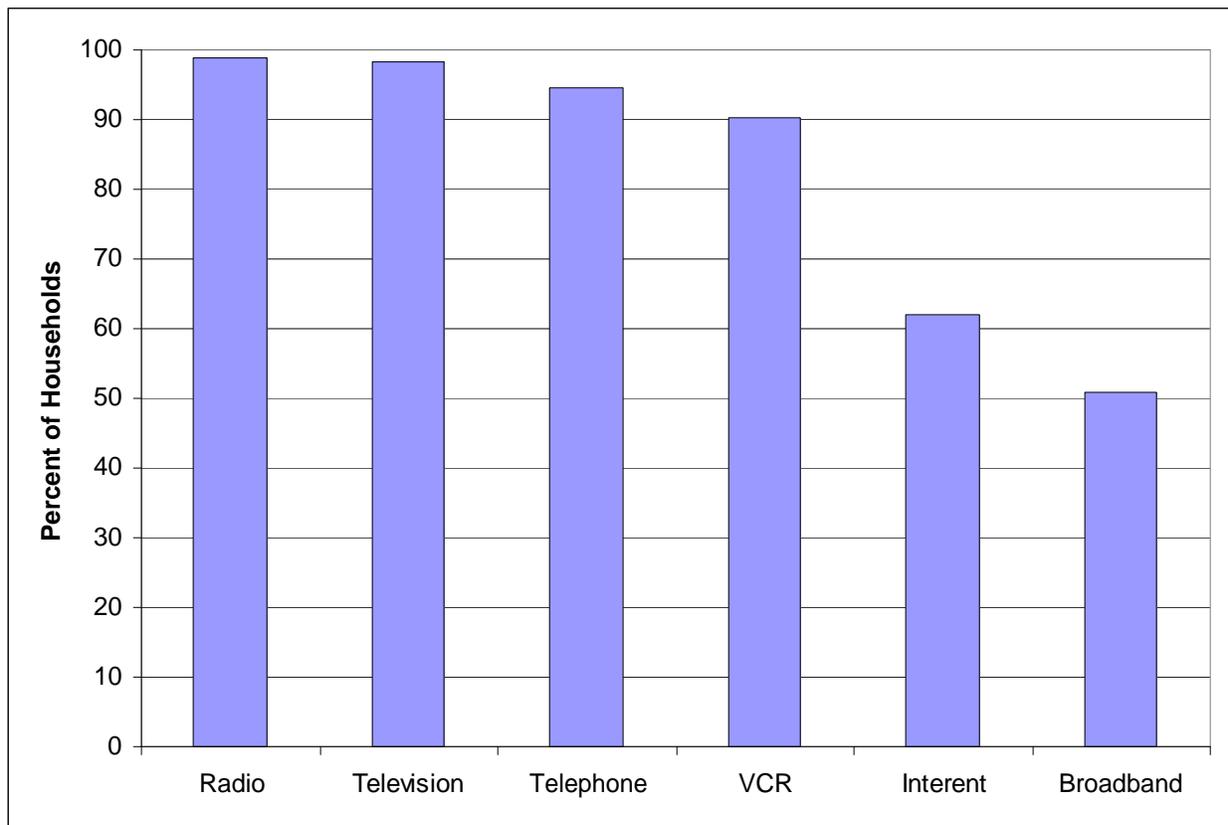
**Figure 2: Percentage of U.S. Adults Online**



Source: Pew Internet & American Life Project Surveys, March 2000-April 2006. All surveys prior to March 2000 were conducted by the Pew Research Center for People & the Press.<sup>2</sup>

Thus a substantial percentage of the population is not connected. It appears that penetration of Internet at home is not only leveling off well below 100 percent, but also well below the penetration of the dominant means of communications in the twentieth century including telephone, radio, and television (see Figure 3).

**Figure 3: Percent of Households with Various Communications Technologies**



**Sources:** U.S. Bureau of the Census, *Statistical Abstract of the United States: 2007, Table 1099, 2005* for radio, TV, VCR; National Telecommunications and Information Administration, *Networked Nation: Broadband in America* (Washington, D.C. January 2008), Appendices Federal Communications Commission, *Monitoring Report, 2007, Table 6-1, March 2007* for telephone.

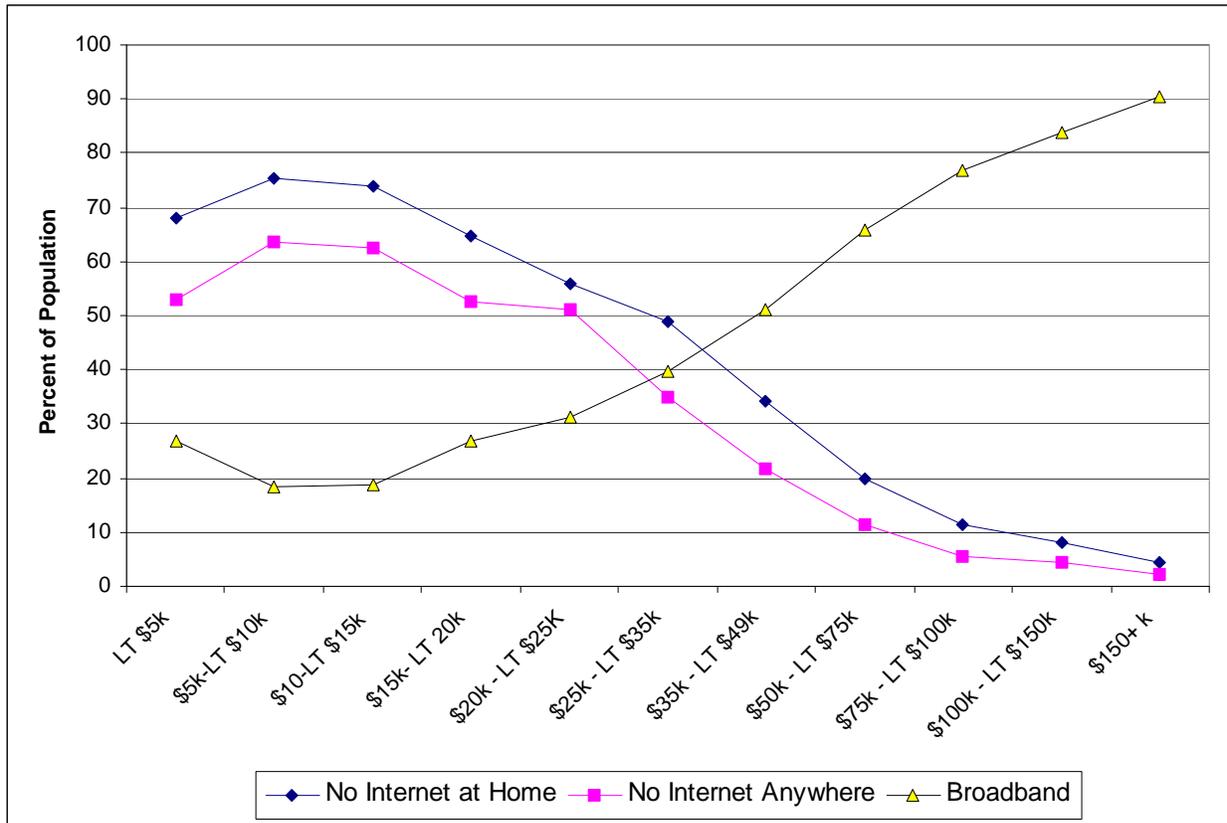
### **The Digital Divide Affects Specific Groups in Society**

The distribution of disconnectedness is not random (see Figure 4). Lower income households are much more likely to be disconnected. Households with incomes below \$25,000 per year are twice as likely to be among the disconnected. They account for 52 percent of all households without Internet at home, while they constitute only 27 percent of the total of households. They are also less likely to have broadband. Almost three quarters of households with income below \$25,000 did not have Internet service at home. In contrast, among households with incomes above \$25,000 about four-fifths had broadband. About 90 percent of households with incomes above \$75,000 have broadband at home; over 70% of households with incomes below \$25,000 do not.

The most recent data confirms a second aspect of the digital divide that was at the heart of the early identification of the problem (National Telecommunication Information Administration, 2008, Appendices). Income is associated with race and ethnicity in America, so

we find that White, non-Hispanics are much more likely to have broadband (69 percent) than Blacks and Hispanics (46 percent and 43 percent, respectively). White, non-Hispanics are less likely not to have Internet at home (23 percent) than Blacks and Hispanics (39 percent and 45 percent, respectively).

**Figure 4 Households without Internet at Home by Level of Income**

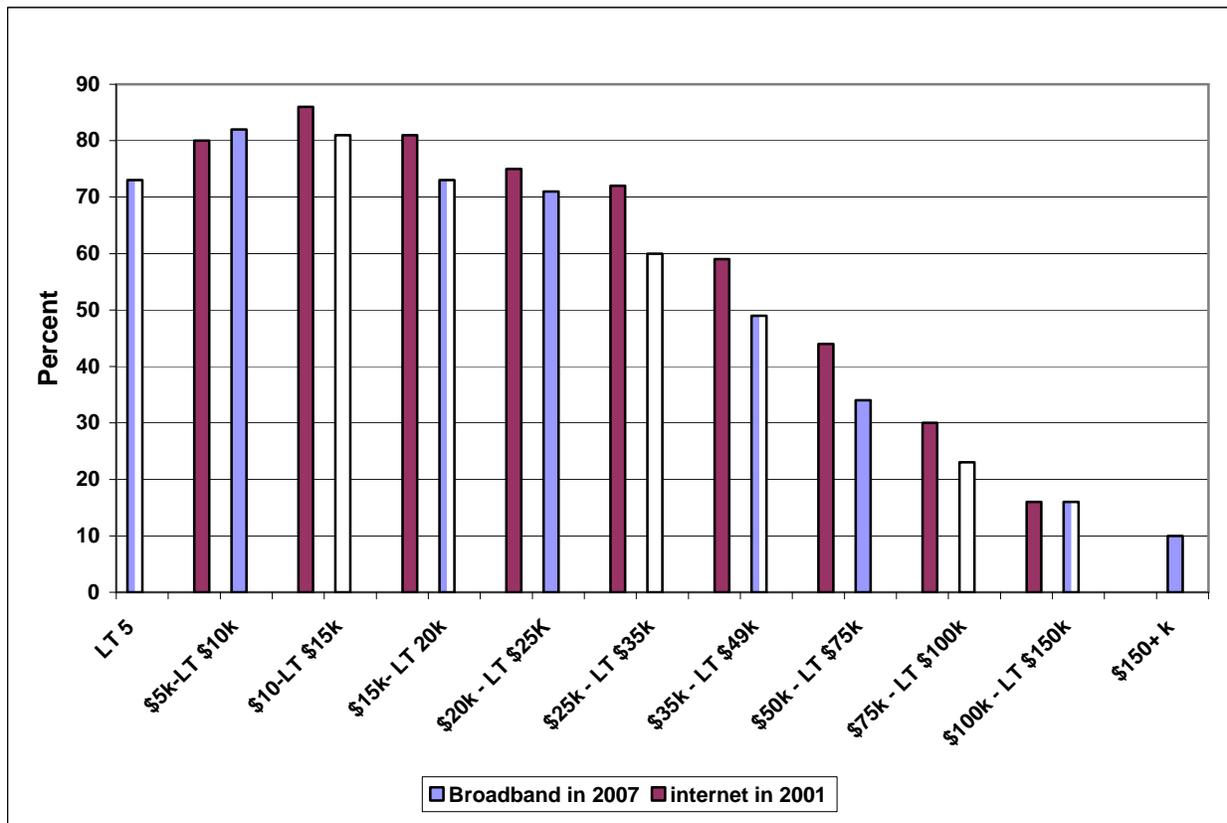


Source: National Telecommunications and Information Administration, *Networked Nation: Broadband in America* (Washington, D.C. January 2008), Appendices

The persistence of the digital divide can best be seen when we compare Internet access in 2001 to broadband access in 2007. Overall, 54 percent of households did not have the Internet in 2001; 49 percent of households did not have broadband in 2007 (see Figure 5). For households with incomes below \$25,000 per year, about 75 percent did not have broadband; the same percentage as did not have Internet in 2001. For households with incomes between \$25,000 and \$50,000, over 50 percent did not have broadband in 2007, as opposed to 60 percent who did not have Internet in 2001. In contrast, for households with incomes above \$75,000 almost 90 percent have broadband, a slightly higher percentage than had the Internet in 2001. It may not be a Mercedes Benz divide, but there is still a wide rich-poor gap in access to broadband in the home.

The most recent census data also confirm a third aspect of the digital divide, the rural - urban divide. Rural households are slightly less likely to have Internet at home (42 percent without access in rural areas compared to 38 percent without access in urban areas), but there are two other aspects of the digital divide in rural America that are notable. First, the distribution of access is somewhat more skewed across income groups in rural areas. Lower income rural households are somewhat less likely to have Internet access than urban lower income

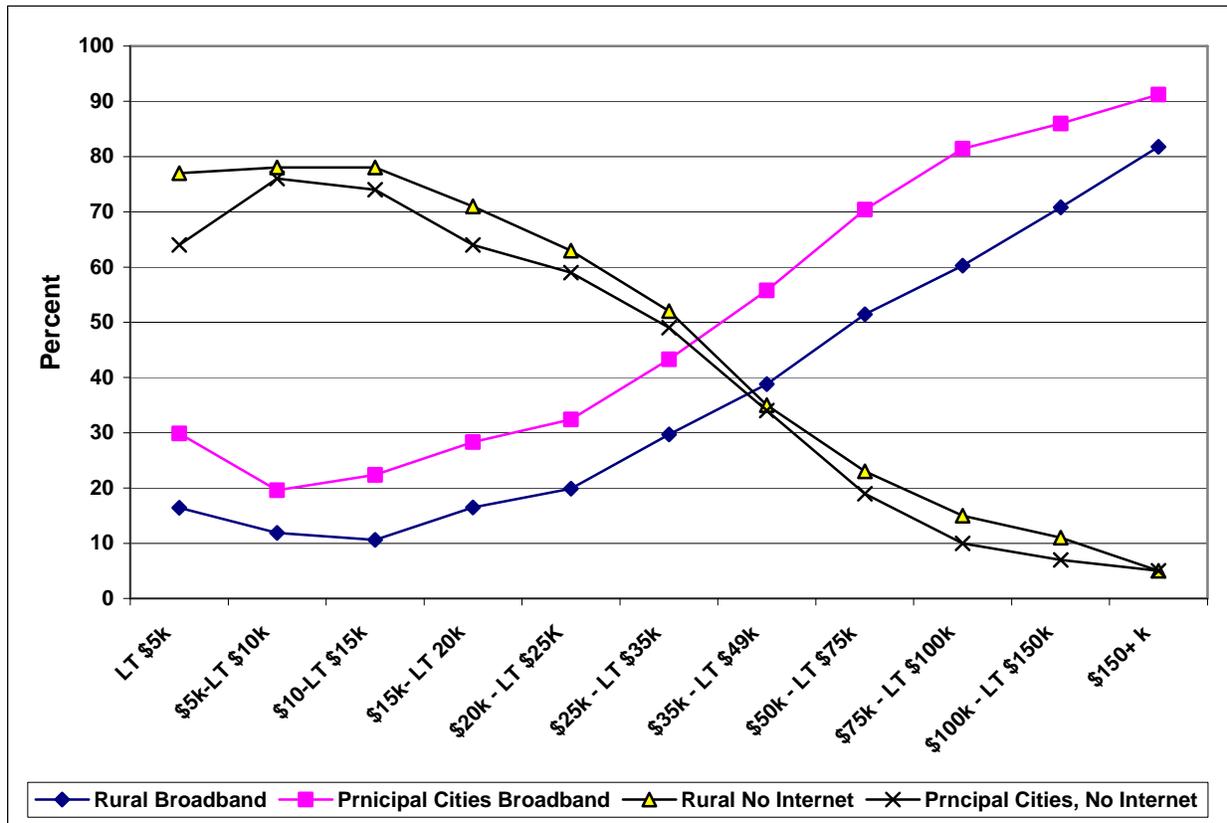
**Figure 5 The Digital Divide Persists in Broadband:  
Households without Broadband 2007 v. Households without Internet 2001**



Source: National Telecommunications and Information Administration, *Networked Nation: Broadband in America* (Washington, D.C. January 2008), Appendices

households. Second, although rural households have caught up in dial up Internet, they are lagging behind in broadband (see Figure 6). Here the problem is the high cost of getting high-speed to rural areas. We see a substantial difference in penetration of broadband, with the principal cities having penetration rates that are 10 to 20 percentage points higher. Interestingly, the larger differences are at higher income levels. This suggests that the availability of rural broadband is likely the problem. Upper income households are most able to afford broadband, but are unable to access it in rural areas.

**Figure 6 Rural v. Urban Internet and Broadband Penetration**



Source: National Telecommunications and Information Administration, *Networked Nation: Broadband in America* (Washington, D.C. January 2008), Appendices

**Empirical Evidence on the Importance of Connectedness**

In assessing the impact of the digital divide in the early years of the debate we examined the patterns of utilization of the Internet and rates of participation in various social, political and economic activities for two reasons (Cooper, 2000, 2002). First, since it was unclear what the impact of the technology would be, it was important to chart its uses. Second, if the technology became an important means of commerce, communications and expression, it was important to document what it means to be disconnected. Are those who are disconnected, really disadvantaged or disenfranchised as a result? In particular, if the disconnected did not participate in social, economic and political discourse in either physical space or cyberspace, then the digital divide would not be a unique new source of inequality, it would just replicate existing inequalities in society. If people have higher rates of participation in physical space than cyberspace, then it is a new source of inequality.

We captured the difference by matching activities. We covered a range of economic/commercial activities (job search, commercial information gathering, online purchases) as well as civic and political activities such as gathering information (e.g. read a newspaper or magazine, attend a lecture), engaging in political activity (e.g. contact a public

official, circulate a petition, attend a political rally) or engaging in civic discourse (e.g. write a letter to the editor, discuss politics with a neighbor).

In 2000 the connected respondents had dial-up at home, while the disconnected had no Internet access. The middle category included people who had some Internet access or digital devices. For 2005, we distinguish between broadband at home, on one side, and those who say they do not use the Internet on the other side. In the middle are those with dial-up and those who use the Internet but not at home. The percentage of people who are disconnected has increased somewhat because of the change in definition, but the 35 percent figure is consistent with the percentage who do not have Internet at home in 2008, as noted above.

For the economic activities, we simply identified the level of activity in cyberspace and did not include questions on physical space activities, since most households engage in basic economic activities (see Table 1).

**Table 1: Commercial Activities on the Internet Across Time**

	<b>2002</b>	<b>2007</b>
<b>Ever purchased a product</b>	<b>22%</b>	<b>49%</b>
<b>Ever made travel reservations</b>	<b>18</b>	<b>47</b>
<b>Ever done online banking</b>	<b>9</b>	<b>39</b>
<b>Sought online information daily</b>	<b>7</b>	<b>?</b>
<b>Used Internet to acquire music</b>	<b>na</b>	<b>46</b>
<b>Looked for real estate</b>	<b>na</b>	<b>49</b>

**Source: John B. Horrigan, *Online Shopping* (Washington, D.C.: Pew Internet and American Life Project, February 13, 2008), *The Internet and Consumer Choice: Online American Use Different Search and Purchase Strategies for Different Goods*, (Washington, D.C.: Pew Internet and American Life Project, May 18, 2008).**

Here the growth of the activities is what is striking. Online information seeking, purchases and banking have become common activities for those with Internet access. Half of all respondents have engaged in these activities, which suggests that two thirds or more of those with Internet access have done so. A world of economic commerce has been built in cyberspace from which those who lack access are excluded. The disconnected are placed at an increasing disadvantage.

For the social and political activities we included items to compare physical space activities and cyberspace activities. Table 2 presents the result from both surveys.

Survey research in 2000 showed that the digital divide magnified inequalities of involvement and participation (see Table 2). The disconnected in society participated much more in physical space than they do in cyberspace. Replication in 2005 confirms those earlier

findings.<sup>1</sup> The differences between those who are connected and the disconnected in key physical space activities are small or non-existent, with those who were connected being only slightly more likely to be active in some measures of civic discourse. The advantage of the connected was much greater when cyberspace activities were considered.

While physical space activities still dominate, cyberspace activities are quite extensive. Evaluating the relative magnitude of the impact requires complex econometric modeling. Such an approach has been applied to the large data set in which the 2000 measures of media usage were embedded. The conclusion was striking, even then, with lower levels of overall activity: “Online information seeking and interactive civic messaging – uses of the Web as a source and a forum – both strongly influence civic engagement, often more so than do traditional print and broadcast media and face-to-face communications... [B]oth online and offline channels culminate in actual participation (Shah, et al. pp. pp. 551...553). The disconnected do participate in physical space; they are disenfranchised in cyberspace.

**Table 2:**  
**Survey Results: Percent of Respondents Engaging in Selected Social, Civic and Political Activities in Physical Space and Cyberspace (Cyberspace activities in bold)**

**2000 Survey**

	<b>Disconnected</b>	<b>Partially Connected</b>	<b>Fully Connected</b>
Percent of population	26	38	36
<b>Information Gathering</b>			
Read a newspaper	92	95	97
<b>Obtained online news or sports results</b>	<b>24</b>	<b>43</b>	<b>65</b>
Read a news magazine	62	69	79
<b>Visit a news website</b>	<b>18</b>	<b>41</b>	<b>70</b>
Attended a lecture	29	48	55
<b>Obtained educational information</b>	<b>26</b>	<b>55</b>	<b>73</b>
<b>Political Activity</b>			
Contacted a local official	31	37	40
<b>Visited a gov’t agency website</b>	<b>13</b>	<b>26</b>	<b>40</b>
Circulated a petition for a politician	10	11	12
<b>Signed or forwarded a petition</b>	<b>5</b>	<b>7</b>	<b>14</b>
Attended a political rally	22	21	19
<b>Visited a politician’s website</b>	<b>8</b>	<b>12</b>	<b>19</b>
<b>Civic Discourse</b>			
Wrote a letter to the editor	20	21	27
<b>E-mailed a newspaper</b>	<b>8</b>	<b>10</b>	<b>16</b>
Discussed politics with a neighbor	46	51	50
<b>Discussed politics in e-mail</b>	<b>7</b>	<b>6</b>	<b>12</b>

<sup>1</sup> The primary shift between 2005, when this data was gathered, and 2008 has been a shift from dial-up to broadband, but as the title of a study from the Pew Internet and American Life Project suggests the 2005 results apply to 2008: “Adoption Stalls for Low-Income Americans even as many Broadband Users Opt for Premium Services that Give them More Speed” (Horrigan, 2008c).

**Table 2: Constinued**

**2005 Survey**

	<b>Disconnected</b>	<b>Partially Connected</b>	<b>Fully Connected</b>
	<b>Do not use</b>	<b>Dial-up</b>	<b>Broadband</b>
Percent of population	35	42	24
<b><u>Information Gathering</u></b>			
Local TV new***	96	95	92
Morning news show	70	68	63
<b>Checked news online***</b>	<b>19</b>	<b>67</b>	<b>64</b>
<b><u>Political Activity</u></b>			
Attended a political rally	10	10	10
<b>Visited political web site***</b>	<b>3</b>	<b>13</b>	<b>9</b>
Circulated a petition	7	10	9
<b>Political discussion with e-mail***</b>	<b>5</b>	<b>17</b>	<b>13</b>
<b>Sought/Expressed political opinion in blogs***</b>	<b>2</b>	<b>8</b>	<b>7</b>
<b><u>Civic Discourse</u></b>			
Wrote a letter to the editor	12	11	12
<b>E-mailed editor or politician***</b>	<b>5</b>	<b>17</b>	<b>12</b>
Participated in a community project*	25	24	29
<b>E-mailed to organize community project***</b>	<b>3</b>	<b>12</b>	<b>13</b>
Went to a club	34	39	40
<b>Participated in a chat room*</b>	<b>6</b>	<b>14</b>	<b>14</b>
<b>Forwarded a news article with e-mail***</b>	<b>10</b>	<b>36</b>	<b>33</b>
Worked for a social group or cause	23	24	28
<b>Visited we site of a social group or cause***</b>	<b>5</b>	<b>30</b>	<b>15</b>

**Source:** The data for the 2000 analysis was supported by the Digital Media Forum, a media policy consortium established by the Ford Foundation. Additional support was provided by research funding to Dhavan Shah from the School of Journalism and Mass Communications, University of Wisconsin, Madison, as well as grants to William Eveland form the Institute for Social, Behavioral, and Economic Research and the Department of Communications, University of California at Santa Barbara. Access was also provided to DDB-Chicago for some data. The for 2005 data analyzed in this report was collected with the support of grants from the Carnegie Corporation of New York, Pew Charitable Trusts through the Center for Information & Research On Civic Learning & Engagement (CIRCLE), Rockefeller Brother Fund, and Damm Fund of the Journal Foundation to Dhavan Shah (Principal Investigator) and Douglas McLeod (Co-Principal Investigator). The authors would like to thank DDB-Chicago for access to the Life Style Study, and Marty Horn and Chris Callahan, in particular, for making the survey data available and sharing methodological details. Opinions, findings, and conclusions in this report are those of the authors and do not necessarily reflect the views of the supporting sources or DDB-Chicago.

## IV. FALLING BEHIND ON BROADBAND

The fact that the Bush Administration shifted the focus of policy to “being on the cutting edge” is reason enough to examine the performance of the U.S. compared to other nations, but there is a second reason to do so. In order to reach a final conclusion on the digital divide issue, one other possibility must be considered. Maybe it is not a problem of laissez faire trickle down economics, but a real “Mercedes Benz Divide.” Maybe broadband is an expensive technology that will never reach the broad penetration of a communications platform that the telephone did. The U.S. chose a particular policy path to deployment of broadband technology and has failed to achieve the goal of ubiquitous affordable service that is adopted by almost all households. Is it the technology or the policy that is the problem?

### Falling Off the Cutting Edge

When the Bush Administration took office the U.S. ranked third in the world in the penetration of broadband (see Table 3). In the following seven years, the U.S. slipped behind more than a dozen industrial nations. By some measures, it is behind two dozen.

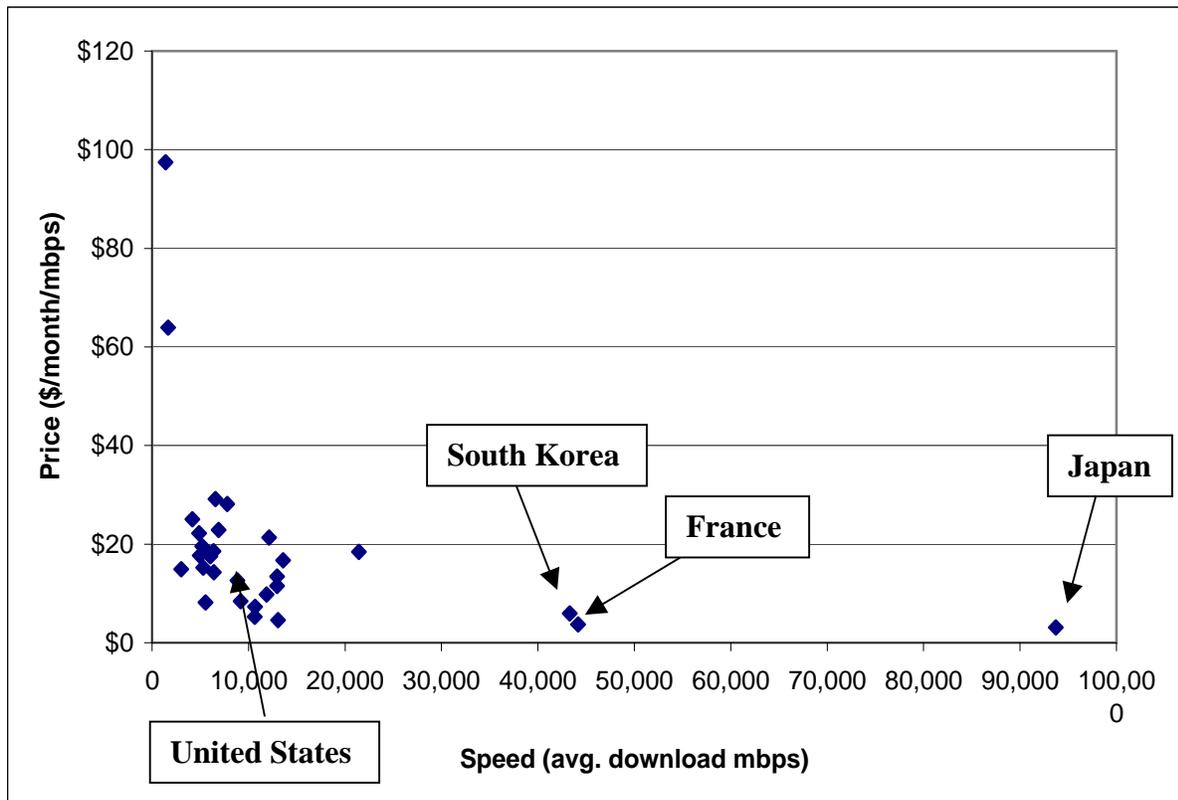
**Table 3: Falling Behind on Broadband (Subscribers per 100 population)**

Rank	2001	2007
1	Canada	Denmark
2	Sweden	Netherlands
3	*United States	Iceland
4	Belgium	Norway
5	Denmark	Switzerland
6	Netherlands	Finland
7	Iceland	Korea
8	Austria	Sweden
9	Germany	Luxembourg
10	Japan	Canada
11	Switzerland	United Kingdom
12	Korea	Belgium
13	Norway	France
14	Finland	Germany
15	Spain	*United States
16	France	Australia
17	Portugal	Japan
18	Australia	Austria
19	Italy	New Zealand
20	New Zealand	Ireland
21	United Kingdom	Spain
22	Hungary	Italy
23	Luxembourg	Czech Republic
24	Czech Republic	Portugal
25	Mexico	Hungary
26	Poland	Greece
27	Greece	Poland
28	Ireland	Slovak Republic
29	Slovak Republic	Turkey
30	Turkey	Mexico

**Source: Organization for Economic Cooperation and Development, *Broadband Statistics to December 2006, June 2007; Broadband Subscribers December 2007.***

The reason that the other nations have passed the U.S. and the reason there is still a big digital divide is that Americans pay higher prices for slower speeds service than in many other advanced industrial nations (see Figure 7). While the Administration has tried to downplay this failure, the *Economist* magazine, hardly a radical, left wing publication, took American policy to task in an editorial entitled “Open Up Those Highways,” pointing out that “A New Yorker who wants the same quality of services of broadband has to pay around \$150 more per month than a Parisian” (Anonymous, 2008). And, the French, who get, on average, three times the speed at one third the cost as Americans, are not the world leader by any stretch of the imagination, as Figure 7 shows. The Asian nations of Korea and Japan have speeds that are almost ten times faster at prices that are less than half of what U.S. consumers pay.

**Figure 7 Mediocre Speeds and Mediocre Prices Result in Mediocre Penetration**



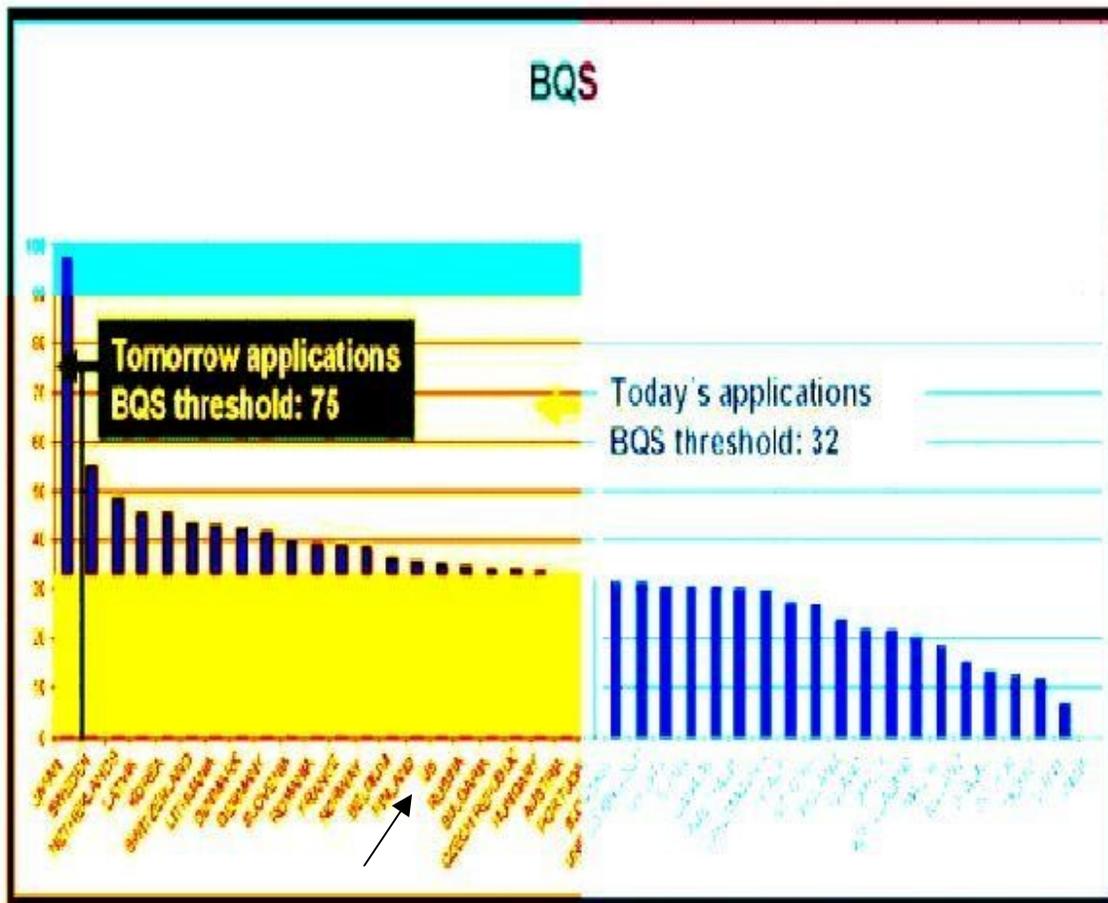
Source: OECD, Broadband Portal, Tables 4f and 5d, data for October 2007.

Exactly how *The Economist* arrived at its calculation is not clear, but there is no doubt that the U.S. lags behind on price and speed. U.S. consumers pay on average four times as much per thousand bits per second and receive services, but the French receive service that is five times as fast, on average and the Japanese receive services that are ten times as fast. The maximum speeds available are greater in France and Japan for every technology – 1.5 times as fast for cable, 2 times as fast for fiber optic network, and 5 to 15 times as fast for DSL (copper).

High prices are a major cause of the digital divide. Slow speeds are a major component of the wider problem of lagging performance on broadband.

An analysis prepared by the Said Business School at Oxford University and the University of Oveido highlighted the issue of “staying on the cutting edge” by developing a broadband quality score that measured “download and upload throughput and latency” (Said Business School 2008: 2). The logic of the approach was to move beyond the simple numbers of the penetration of broadband (see Figure 8).

**Figure 8: SAID Quality of Service Ranking**



Source: Said School of Business Oxford University and University of Oveido, 2008, *High Quality Broadband Essential to Growth of the World's Knowledge Economies*, September 12.

*A nation's leadership in broadband was typically determined by its ranking on penetration, and now we know that this will not be enough. This study gives broadband stakeholders, from governments to telecom and cable operators and vendors like Cisco, as well as consumers a better understanding of the importance of quality broadband connections. Without high-quality broadband, we will not be able to take full advantage of the next wave of productivity, collaboration and entertainment that can be gained from the web" (Said Business School 2008:2).*

The U.S. ranked 16<sup>th</sup> among the 42 nation's studied including almost all of the dozen nations ranked ahead of the U.S. based on simple penetration.

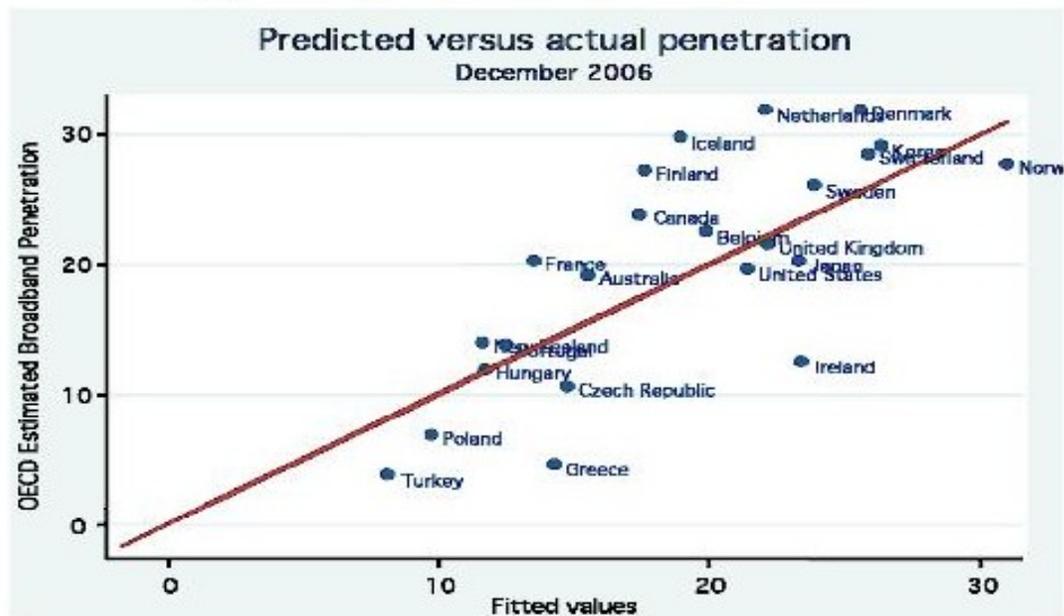
### **Efforts to Explain Away the Inconvenient Truth**

Stung by the findings that the U.S. is falling behind and the implication that the policy has failed, three general types of responses have been offered by governmental and industry spokesmen to explain away the fact that the U.S. is not doing so well.

The first approach to explaining away the declining status of the U.S. calls for more independent variables. It points to other factors that might account for differences between broadband penetration including -- population density, market concentration, household size, income levels, income inequality, education, and age, among other factors. By creating a predicted score for penetration based on these other factors, these studies tried to absolve policy as the cause of falling behind, claiming that the U.S. is doing as well as could be predicted/expected given its income, income inequality, population density, etc. Figures 9 through 12 present the results of several studies of this type (Wallenstein 2007, Atkinson, Correa, and Hedlund 2008; Ford, Koutsky and Spiwak 2008; Turner, 2005). All of these analyses tell essentially the same story. The U.S. is below the regression line that relates actual performance to predicted performance and well behind about a dozen nations. The very same nations that lead the U.S. in the simple speed, penetration, and price comparisons also outperform the U.S. in the more complex analyses.

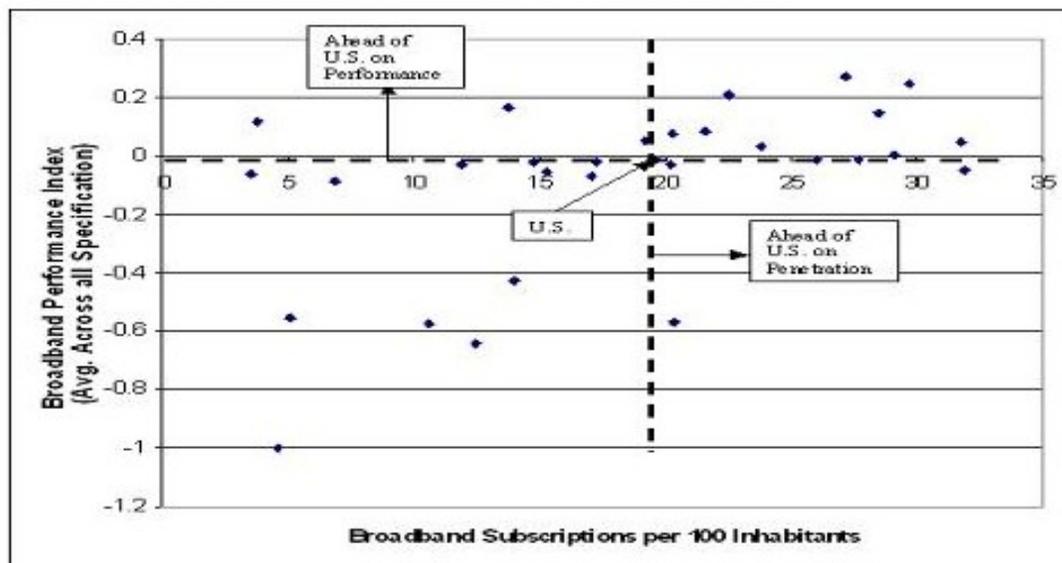
The second approach to explaining away the poor U. S. performance is to redefine the dependent variable. Here the claim is that other technologies, like G3 wireless should be included. However, these technologies do not come close to matching the speeds of wire line broadband and appear to be used as a complement for mobile communications by the very same people who have wireline broadband, not as a substitute for full service wire line broadband (Horrigan 2008c). Although Europeans have been ahead of the U.S. on wireless telephony, the wireless broadband services have fared much worse in Europe than in the U.S., suggesting that the availability of much more attractive wireline broadband speed/price options is crucial.

**Figure 9: Controlling for Urbanicity and Industry Concentration, the U.S. is Outperformed by 15 OECD Nations**



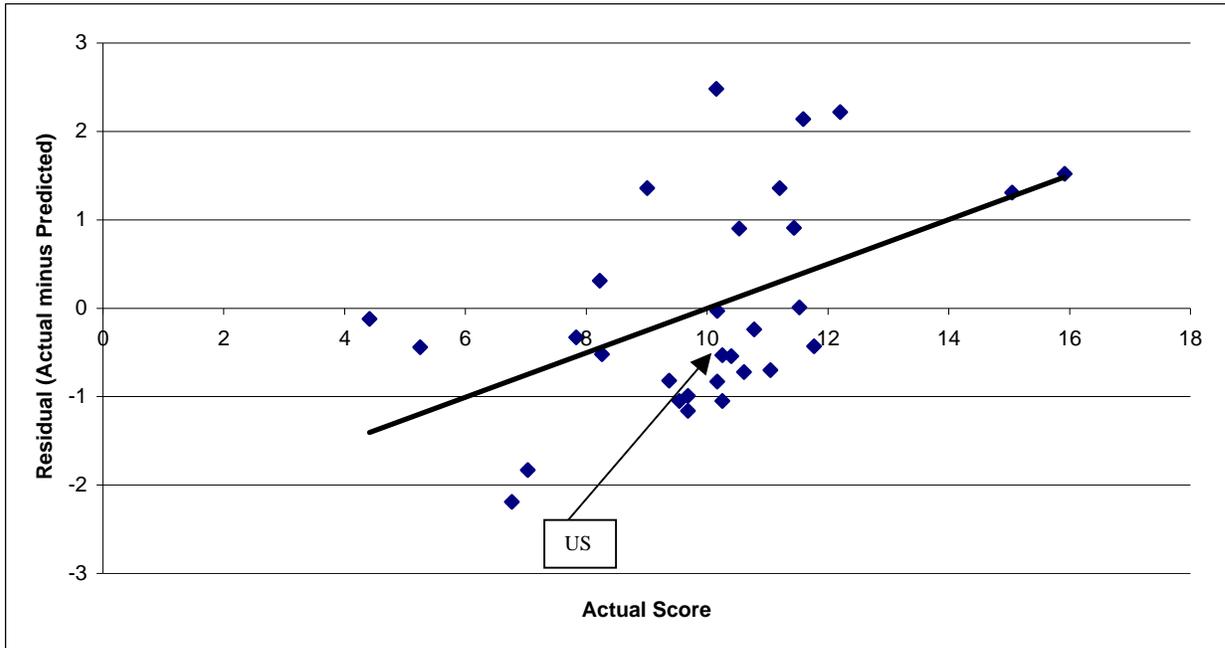
Scott Wallenstein, *Everything You Heard About Broadband in the U.S. is Wrong*, Progress and Freedom Foundation, June 2007

**Figure 10:**  
*Lowering Expectations Does not Improve the Picture: The U.S. Ranks 14<sup>th</sup> on Performance and 13 nations are Outperforming the U.S.*



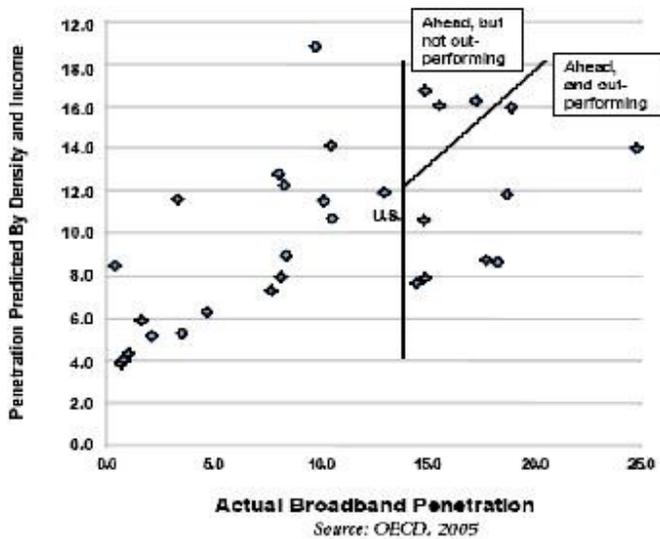
Source: Phoenix Center, *The Broadband Performance Index*, July 2007.

**Figure 10: The U.S. is Underperforming on the ITIF Index, while the Nations Ahead of It are Over performing**



Source: Robert Atkinson, Danieal K. Correa and Julie A. Hedlund, *Explaining International Broadband Leadership* (Information Technology and Innovation Foundation, May 1, 2001).

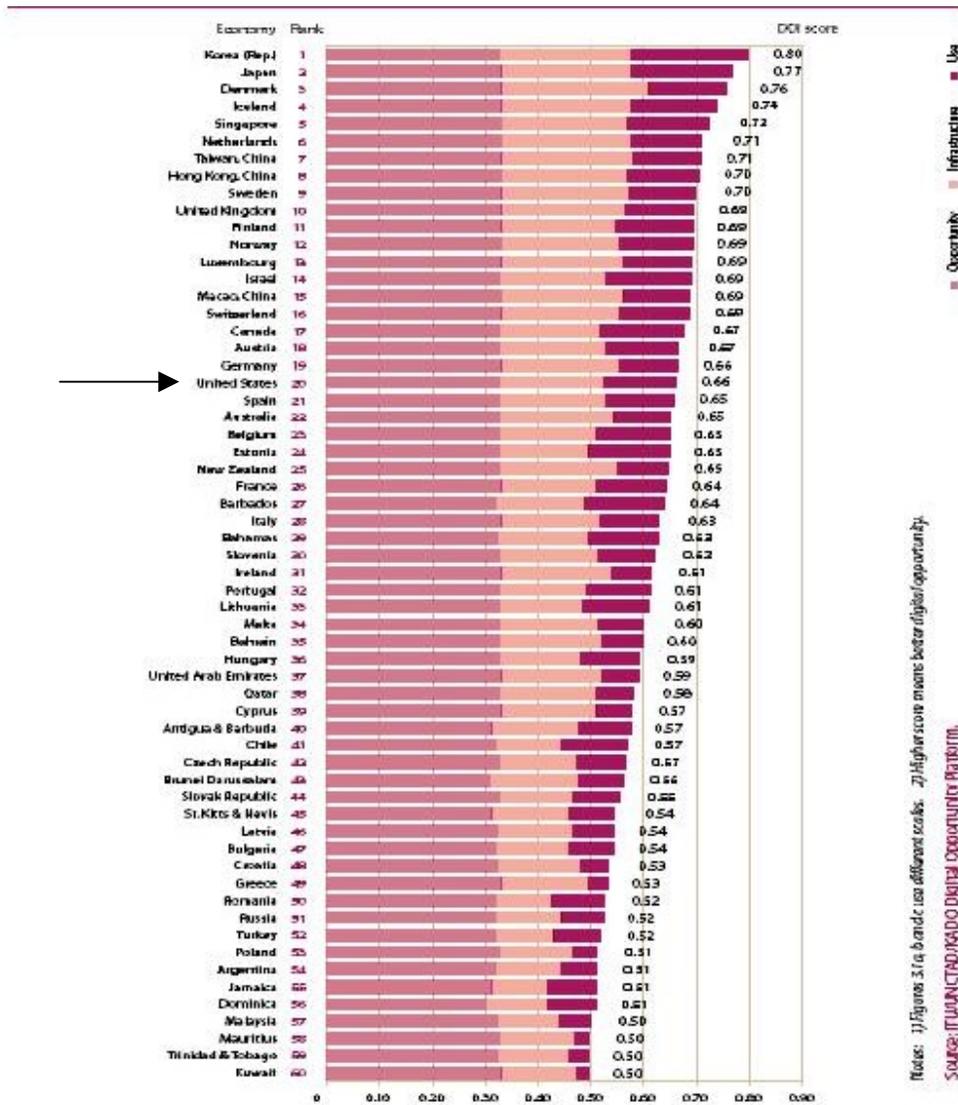
**Figure 12: U.S. v. Other Nations in Broadband Penetration**



Source: S. Derek Turner, *Broadband Reality Check*, Washington, D.C.: Free Press, August 2005), p. 7.

Ironically, a global index that includes penetration of cellular and wireless technologies with equal weight to wireline service, the Digital Opportunity Index sponsored by the World Summit on the Information Society (2008), ranks the U.S. 16<sup>th</sup> among the OECD national analyzed by the above indices (see Exhibit 13).

**Figure 13: Digital Opportunity Index**



Source: World Information Society Report 2007: Beyond WSIS, 2007, chapter 3.

Taken together, the six different rankings present a dramatic picture of the U.S. falling behind on broadband. Eleven nations of the thirty OECD nations are ranked ahead of the U.S. in a majority of the evaluation approaches (6-0: Denmark, Finland, Sweden, Switzerland; 5-1: Belgium, France, Korea, Netherlands, Iceland; 4-2 United Kingdom, Norway). Another two that were certainly behind the U.S. in 2001 now split the rankings 3 to 3 with the U.S. (Portugal, Japan). Looking back at Table 3 we find that after controlling for a variety of other factors and seeking to measure the outcome in different ways, the same set of countries has caught up to or passed the U.S. in broadband deployment.

The third approach to explaining away the poor U.S. performance is an extension of the second. It expands the dependent variable to include a whole range of factors beyond technology. This multi-attribute approach essentially skips over the basic issue as laid out by President Bush. A report from an international business school in France prepared for an anti-regulation, free trade group (Markhoff, 2008a) provides a perspective on this approach. The report glosses over the questions of infrastructure deployment and adoption by focusing on “cultural, economic and political” factors to conclude that the U.S. is fourth in Internet readiness, broadly defined. The criticism of France offered by the director of the study reveals the not-so-hidden agenda. Whereas France is well ahead of the U.S. in broadband capacity and price, as noted above,

*in the study it ranked at 21... It's not because France is lacking in technology, Professor Dutta said. 'If you look at other kinds of regulatory issues and labor conditions, you find a rigid situation that prohibits its companies from making the most effective use of technology.' In contrast, "the United States came in fourth, which is up three places from last year. It's rated highly for its research institutions, innovation – the U.S. files for the most patents of any country – and thriving marketplace (Worthen, 2008).*

While some multi-attribute approaches to measuring Internet readiness may gloss over the infrastructure problems and rank the U.S. higher, others do not. Broader measures of competitiveness suggest that President Bush was right to identify broadband deployment as a critical aspect of remaining “on the competitive edge of world trade... and the cutting edge of technological change.” With lagging broadband penetration, innovation in the applications layer and the services that use the physical connection had gone abroad. Even the multi-attribute studies suggest problems. For example, the U. S. ranks seventh on the A.T. Kearney Globalization Index (2008). Six of the seven nations are included in the OECD studies and all of them rank ahead of the U.S. on at least three of the indices of broadband performance. Singapore, Taiwan and Hong Kong, which are not included in the OECD studies, also are consistently ranked ahead of the U.S. on broadband and in some of the multi-attribute studies.

The most recent rankings of the ITU pulls many of these pieces of the argument together, including mobile broadband, households with Internet and other characteristics of the information communications technology environment (ITU, 2009). It has the U.S. falling from 11<sup>th</sup> in 2002 to 17 in 2007 on the Information Communications Technology Development Index.

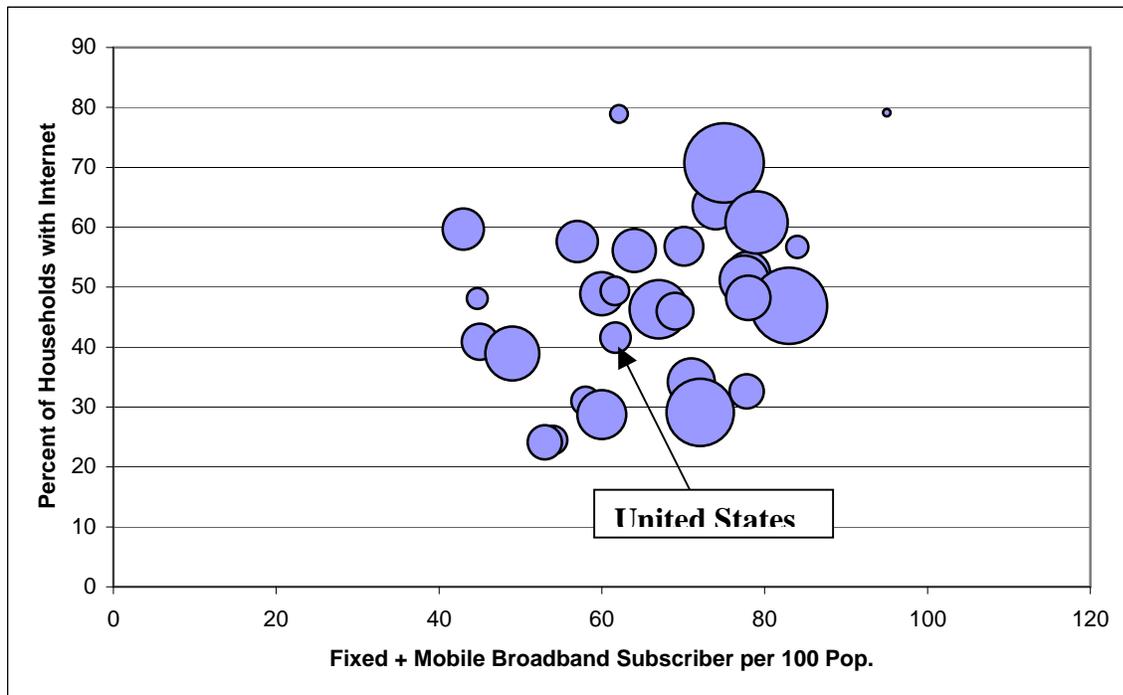
While such summary indices have been a focal point of debate, there is no doubt that the U.S. has stumbled badly in comparison to other nations on this vital measure of market performance. While the ITU index is a multi-attribute study that includes landline and wireless telecommunications, the Internet and broadband sub-indices underscore the poor performance of the U.S. The U.S. ranks even worse on several of these.

**Table 4: 2007 ITU Ranking on Various Measures of Information Communication Technology Development**

ICT Development Index	17
Fixed Broadband subs per 100 pop.	15
Mobile Broadband subs per 100 pop.	19
Total Broadband Subs per 100 pop.	21
% of Households with Internet	18
Backbone per Sub.	22

Figure 14 plots the final three of these dimensions for the top 30 national in the ITU index. It turns out that 28 of the top 30 nations exceed the U.S. on at least one of the three dimensions. Taken together, it does no present a pretty picture.

**Figure 2: ITU ICT Development Indicators (Size of Circles = Backbone/Sub)**



International Telecommunication Union, *Measuring the Information Society: the ICT Development Index*, 2009, Annex 4.

## V. THE POLICY IMPLICATIONS OF FALLING BEHIND

### A Policy of Neglect is Not Benign

Ultimately, the intent of both the “digital divide” and “falling behind on broadband” debates is to influence policy. The differences in performance between nations are correlated with sharp differences in policy. The observations on and reactions to U.S. broadband deployment and adoption stimulated by the INSEAD study are particularly revealing in the context of the long running debate over broadband policy. David J. Faber, “an Internet pioneer and professor of computer science at Carnegie Mellon University observed ‘My gut feeling is that we don’t have the type of deployment you have abroad. If you are looking at broadband, we have a lot of problems. We are slow as molasses in deploying the next generation’” (Markhoff, 2008a). Moreover, the article points out that the network that is deployed is not being taken up as fast as in other countries. “More customers have retained dial-up service than most countries, which might be explained by price or lack of attractive broadband services” (Markhoff, 2008a). Whatever the 68 variable approach to Internet readiness used by INSEAD is measuring, it cannot gloss over the basic fact that technology use and take-up have not accomplished the President’s goal.

An economist from the Organization for Economic Co-operation and Development (O.E.C.D.), commenting on the INSEAD study, attributed the problem to a policy choice made by the U.S.

*“I think we can say that a lot of the situation in the United States is a result of the lack of competition,” said Taylor Reynolds, an economist in the Internet and Telecommunications Policy section of the O.E.C.D. “In Europe we have adopted an unbundling strategy wholeheartedly.” That has led to more competition in markets outside the United States, he said, which in turn has driven Internet service providers elsewhere to offer speedier service and lower prices (Markhoff, 2008a).*

The loss of U.S. leadership can be measured in the routing of Internet traffic. Over the course of a decade, the share of global traffic routed through the U.S. declined from 70 percent to 25 percent.<sup>2</sup> While some of the decline was inevitable, as Internet usage spread, “economics also plays a role (Markhoff, 2008b).” Policies to capture the flow of traffic for economic and strategic reasons were pursued by individual nations.

*Indeed, more countries are becoming aware of how their dependence on other countries for their Internet traffic makes them vulnerable. Because of tariffs, pricing anomalies and even corporate cultures, Internet providers will often not exchange data with their local competitors. They prefer instead to send and receive traffic with larger international Internet service providers.... [T]he shift away from the United States was not limited to developing countries. The*

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<sup>2</sup> Andrew M. Odlyzko, a professor at the University of Minnesota who tracks the growth of the global Internet, added, “We discovered the Internet, but we couldn’t keep it a secret.” While the United States carried 70 percent of the world’s Internet traffic a decade ago, he estimates that portion has fallen to about 25 percent.

*Japanese “are on a rampage to build out across India and China so they have alternative routes and so they don’t have to route through the U.S... International networks that carry data into and out of the United States are still being expanded at a sharp rate, but the Internet infrastructure in many other regions of the world is growing even more quickly. (Markoff, 2008b)*

The potential harm in these shifts is loss of leadership in this critical sector. “The risk, Internet technologists say, is that upstarts like China and India are making larger investments in next-generation Internet technology that is likely to be crucial in determining the future of the network, with investment, innovation and profits going first to overseas companies (Markoff, 2008b).”

The investment pattern reflects a mix of government policies that promote the deployment of the technology and private sector investment decisions that neglect it.

*Internet technologists say that the global data network that was once a competitive advantage for the United States is now increasingly outside the control of American companies. They decided not to invest in lower-cost optical fiber lines, which have rapidly become a commodity business.*

*While there has been some concern over a looming Internet traffic jam because of the rise in Internet use worldwide, the congestion is generally not on the Internet’s main trunk lines, but on neighborhood switches, routers and the wires into a house.*

*The increasing role of new competitors has shown up in data collected annually by Renesys, a firm in Manchester, N.H., that monitors the connections between Internet providers. The Renesys rankings of Internet connections, an indirect measure of growth, show that the big winners in the last three years have been the Italian Internet provider Tiscali, China Telecom and the Japanese telecommunications operator KDDI.*

*Firms that have slipped in the rankings have all been American: Verizon, Savvis, AT&T, Qwest, Cogent and AboveNet.*

*“The U.S. telecommunications firms haven’t invested,” said Earl Zmijewski, vice president and general manager for Internet data services at Renesys. “The rest of the world has caught up. I don’t see the AT&T’s and Sprints making the investments because they see Internet service as a commodity” (Markoff 2008b).*

## **The Importance of Price**

The nations that have passed the U.S. on broadband have not relied on trickle down economics to get the job done, but have implemented much more aggressive policies to promote broadband. Instead of relying on weak competition between, at most, a couple of advanced communications service providers, they required the dominant networks to be open to competition in Internet services. This kept the price down and stimulated innovation.

Econometric analyses by the critics of the simple ranking approaches include a price variable and it is one of the most important factors affecting penetration.<sup>3</sup> Ironically, they do not consider price to be a “policy” variable, although many others do.<sup>4</sup> Price has been a policy variable in the U.S. for at least three-quarters of a century, since the Communications Act of 1934 which included the goal of making available “adequate facilities at **reasonable charges.**”

Even controlling for the large number of demographic and other factors, the importance of price can be seen if we plot the effect of price on the relative ranking of the nations. Figure 14 shows the nations arrayed by the net number of times they were ranked higher than the U.S. in six studies cited above plotted against the impact of pricing on the penetration rate. There is a strong relationship between price and performance of broadband. Nine of the thirteen nations that outperform the U.S. have a positive pricing policy. In all of these analyses, if the U.S. had the same “average” pricing policy as the nations ranked ahead of it, it would be outperforming most of them.

### **The Broad Policy Palate**

While the studies that call for more complex analysis of the broadband issue tend to reject price as a policy variable, they do not conclude that there is no room for policies to promote broadband penetration. Some explicitly accept the idea of a market failure.

*The United States can learn from the broadband policy best practices in other nations. First and foremost, America needs a national broadband strategy that focuses on both broadband supply as well as broadband demand. Some may argue that national strategy is unnecessary because the United States already has strong intermodal broadband competition. In part because of significant market failures with regard to the provision of broadband, relying on market forces alone will not meet our country’s future broadband need (Atkinson Correa and Hedlund, 2008: 40).*

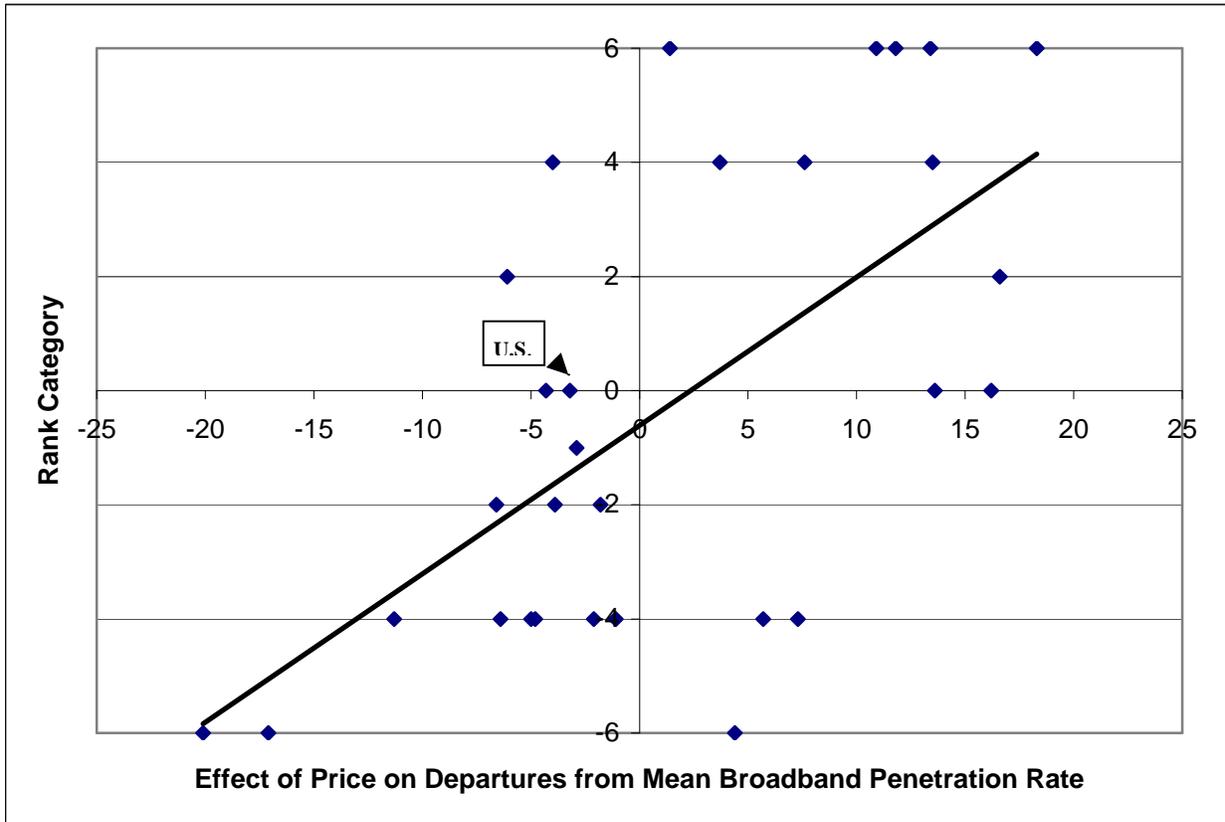
Others see the problem flowing from basic demographic factors that reduce subscription to Internet service that can be addressed by policy.

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<sup>3</sup> Atkinson, Correa and Hedlund (2008: 14) find price to be the most important factor. Ford, Koutsky and Spiwak (2008) rank income, income inequality and telephone penetration ahead of price.

<sup>4</sup> Atkinson, Correa, and Hedlund (2008: 14) include price in a model labeled, “Non-policy Variables Related to Broadband Penetration in OECD Countries.” Similarly, Ford, Koutsky and Spiwak (2008:12) state that “non-policy variables explain nearly all variations in subscription rates” and include price among the non-policy variables. When they turn to recommendations, they point to policies to influence several variables in the non-policy model, but not price, when at least some of those variables have smaller coefficients (2008: 1, 18).

**Figure 14: Nations Ranked Ahead of the U.S. on Six Indices and Effects of Price**



Source: Robert Atkinson, Daniel K. Correa and Julie A. Hedlund, *Explaining International Broadband Leadership* (Information Technology and Innovation Foundation, May 1, 2001); Organization for Economic Cooperation and Development, *Broadband Statistics to December 2006, June 2007; Broadband Subscribers December 2007*; Scott Wallenstein, *Everything You Heard About Broadband in the U.S. is Wrong*, Progress and Freedom Foundation, June 2007; George S. Ford, Thomas M. Koutsky and Lawrence J. Spiwak, *The Broadband Efficiency Index: What Really Drives Broadband Adoption Across the OECD?* (Phoenix Center Policy Paper Number 33, May 2008); S. Derek Turner, *Broadband Reality Check*, Washington, D.C.: Free Press, August 2005); World Information Society, *World Information Society Report 2007: Beyond WSIS, Digital Opportunity Index*.

*We do not mean to suggest that policymakers should be content with the current level of performance, or that broadband policy is irrelevant. Indeed, our results should encourage policymakers to focus their attention on policies that will cultivate or enhance the endowments that increase broadband adoption or that will counterbalance the adverse effect of endowments that suppress broadband adoption. For example, programs focused on overcoming the effects of income and income inequality might significantly spur broadband adoption (Ford, Koutsky and Spiwak, 2008:15)."*

Programs to address the adverse effects of income and income distribution are very much in the “digital divide” frame – suggesting universal service approaches, which are precisely the policies rejected by the Bush administration.

Contrasting the policies of the Bush and Clinton administrations is informative.

### **The Bush Administration**

The policy outlined by Chairman Powell at the start of the Bush Administration and implemented by both Chairman Powell and later Chairman Kevin Martin was essentially to let a duopoly of cable and telephone companies dribble out broadband at high prices without obligations to allow competition to flourish on their networks or policies to promote universal service.

Attempting to provide incentives to the incumbent duopolists to roll out the new technology quickly and keep the price low, the FCC abandoned one of the cornerstone of communications policy in America, the obligation that communications network be available without discrimination. It also abandoned the efforts to support vigorous service competition on advanced networks, which was the cornerstone of the success abroad.

After failing to promote competition within the telephone network, the Bush Administration allowed a merger wave to dramatically reduce the number of potential competitors who could build networks. The dominant telephone companies were rewarded for failing to compete with one another by being allowed to buy each other up. When competition floundered under the weight of decisions that made it impossible for even giants like AT&T and MCI to compete in local phone service, the FCC let the largest Baby Bells buy out their biggest actual and potential competitors.

The FCC also squelched competition in wireless communications by allowing the largest incumbent telephone companies to expand their control over wireless communications by lifting the cap on the amount of spectrum that an incumbent landline company could license. After the wireless mergers, the FCC then auctioned new spectrum, allowing the dominant Bell operating companies to buy up licenses to use more spectrum, closing out new entrants.

Having allowed the incumbent wireline companies to achieve market power over price through mergers, the FCC failed to prevent pricing abuse of key network services (like wholesale loops and special access) that were critical for new entrants (either landline or wireless) to compete.

While competition floundered, the FCC did little to promote universal service. In eight years, the FCC failed to reform the universal service fund so that it would support advanced communications facilities in rural areas or make them more affordable in urban area. The fund grew dramatically, enriching the incumbent telephone companies, without promoting the public interest in a ubiquitous broadband network.

Finally, the FCC sought to slash the power of local governments to establish the public interest obligation on cable communications companies, who were moving into the communications business, to meet the needs of local communities, without establishing public interest obligations at the federal level. This triggered a race to the bottom, restricting the ability of local governments to deploy advance communications networks for public services.

### **The Clinton Administration**

Although the Clinton Administration identified the universal service problem early, its policy was mixed. On the universal service front, the Clinton administration embraced an expansive approach to the e-rate programs that supported advanced service for schools and libraries and implemented other institutional programs to promote technology literacy and use in institutional settings, but it did not reform universal service to promote broadband penetration.

On the broader telecommunications policy front, it fully embraced platform service competition, attempting to ensure that unbundling of network elements would make the monopoly elements available to competitors, but it struggled to keep the platform open under the convoluted language of the Telecommunications Act. It repeatedly lost court cases to the Regional Bell Operating companies, cases that ultimately allowed Michael Powell to implement his full-throated hostility to platform service competition.

While the Clinton administration embraced platform service competition, it set the precedent of allowing local telephone companies to merge, undermining the possibility for vigorous head-to-head competition between telephone companies. The Bell Atlantic/NYNEX and SBC/Ameritech mergers were crucial in this regard, as they were mergers between contiguous service areas, where cross-border competition was likely and in the later case actually existed. While the Clinton Administration made it clear it would oppose mergers between local and long distance companies, the loss of the local companies as potential competitors severely limited the prospects for facilities based competition and placed much more pressure on the platform service competition model to deliver effective competition. Ironically, at the very same time that this model succeeded abroad, it was abandoned in the U.S.

In the wireless space, the Clinton Administration preserved the cap on the holding of wireless licenses in place, but it did not expand the unlicensed use of spectrum.

## VI. CONCLUSION

Neither the digital divide nor the precipitous decline in the U.S. standing in broadband was inevitable. The Clinton Administration's declaration of a digital divide problem may have seemed to come a bit early in the process of deployment of the new technology and may have been driven by a desire to exploit a political opportunity because of the constituencies that would be served by implementing policies to close the divide. However, given the immense importance that the Internet has taken on in social, economic and political life and the persistence of the digital divide, early attention given to the issues seems more like good foresight than politically motivated analysis. On the other hand, the Bush Administration's declaration of "mission accomplished" in broadband seems to play out in the opposite manner; bad analysis put forward in defense of bad policy.

Those who argued for the "have later" position have had the ground cut from under them. A decade and a half after the Internet began its powerful penetration and transformation of economic, political and social life, more than one-third of American households remain disconnected, disadvantaged and disenfranchised. TV, radios, telephone, VCRs DVD players, cell phones, have all achieved higher levels of penetration and several of them achieved it faster than Internet connectivity. The households that are disconnected are overwhelmingly low income and tend to be disproportionately, minority households; the digital divide compounds existing fault lines in the U.S.

A decade and a half of policy implementation may have closed off some policy options, like the mergers and auctioning of spectrum to the large incumbents, but others remain open.

The reliance on a cozy duopoly of facilities-based competitors to achieve the goal of universal service appears to have failed and is not likely to deliver service that will match the nations that have passed the U.S. The FCC could ensure that the dominant networks allow competition in services without discrimination. This would spur the development of applications and services that would stimulate demand. Promoting within platform competition and the deployment of the dominant platform were the keys to the success of other nations. They were also central to U.S. world leadership in telecommunications prior to the passage of the Telecommunications Act of 1996.

The FCC could make more airwaves available for unlicensed use, which would avoid the stranglehold that the deep-pocketed incumbents have on the auction of spectrum, and expand the scope of WiFi approaches to service.

The FCC could aggressively reform universal service funds to support broadband.

Ultimately, Congress could conclude that more vigorous efforts are necessary to ensure leadership in broadband, but that would require policymakers to abandon the do nothing approach that has failed over the past eight years.

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