

The Failure of Cyber-Libertarianism

The Case for a National E-Commerce Strategy

by Robert D. Atkinson

As recently as a year ago, cyber-pundits confidently proclaimed that the Internet changed everything, and investors believed them. And because the Internet was “the biggest thing since the printing press” and presumably going to automatically continue its meteoric rise, there wasn’t much for policymakers to do except stay out of the way and “do no harm.”

The reality was and is different. Make no mistake about it, the Internet and associated digital technologies represent a significant new technology system that provides a powerful force for social and economic transformation. But developing breakthrough technology is quite different from ensuring its ubiquitous use. The net may change everything -- everything except people and existing institutions, many of which resist change. The relevant question is not why the information technology (IT) revolution has penetrated so fast, but rather why it is taking so long to reach its full promise.

Enabling the IT revolution to reach its full promise -- significantly boosting productivity and incomes, enabling a more customized society and economy, providing people with new tools to control their own lives, and dramatically expanding access to all kinds of information -- will require the pervasive use of digital technologies in all aspects of the economy and society. That in turn will require policymakers doing more than simply doing no harm. It will require concerted and strategic government policies for digitizing the U.S. economy. Let us be clear, we are not advocating an industrial policy that “picks winners and losers.” But we are advocating the development and implementation of a national strategy, with a particular focus on the areas where government is in a position to play a key role.

Yet, achieving a broad political consensus for this new policy focus will not be easy. For cyber-conservatives, the main thing government needs to do to boost the growth of the Internet and the digital economy is to stay out of the way and let market forces work their magic. Their agenda is limited to extending the moratorium on Internet taxes, repealing excise taxes on telecommunications, preempting state Internet privacy laws, and further deregulating telecommunications. Anything else, they believe, will simply get in the way of the digital economy. The conservative Progress and Freedom Foundation’s *Cyberspace and the American Dream: A Magna Carta for the Knowledge Age* sums up the view: “If there is to be an ‘industrial policy for the knowledge age,’ it should focus on removing barriers to competition and massively deregulating the fast-growing telecommunications and computing industries.”¹ The

libertarian Cato Institute is even more blunt: “The technology and telecommunications sectors of the American economy are increasingly under assault by politicians and regulators at all levels of government.”²

While cyber-conservatives resist government action, cyber-liberals focus principally on regulation and redistribution, rather than on fostering the growth of e-commerce.³ They advocate immediate taxation of e-commerce sales, strict regulations on privacy and consumer protection, and limited intellectual property protection on digital content. Moreover, for the left, government’s most important role is addressing the digital divide.

Ensuring that we don’t apply an old economy tax and regulatory framework to the Internet and extending the benefits of IT to all people -- are both important to foster growth of the digital economy, and PPI has been a strong supporter of these measures. But limiting an Internet and digital agenda to simply a no-tax and deregulatory regime, as the right would advocate, or to a digital divide agenda, as the left proposes, will not take us far enough or fast enough toward the goal of a society and an economy where digital technologies are widely and extensively used. Neither the conservative nor liberal approach addresses the real market and political failures that continue to slow and limit the growth of the digital economy.

There are at least three kinds of market failures in play:

First, as in other areas of the economy, market forces left alone will lead to an under-investment in research in information technology in general and in the Internet specifically. Because public and private rates of return on investment research are different, there are a host of areas where government investment in IT research can make a significant difference.

Second, unlike many industries where a firm’s strategies and investments are contingent only on its direct competitors and on customer wants, in e-commerce the success of actions taken by firms is contingent on actions taken by other firms (and sometimes governments), often in other sectors. If General Motors wants to introduce a new model or a new type of air bag, it has to worry only about what Ford, Toyota, and other carmakers are doing. In contrast, many aspects of e-commerce exhibit what economists call network externalities, and in these cases the marketplace acting alone will be slow to move to an optimal solution.

One type of this system dependency relates to so-called chicken or egg issues where the adoption of an individual technology (e.g., smart cards, digital certificates) is dependent upon the use of it by sellers, but sellers’ use of it is also dependent upon consumers’ use. For example, enabling the use of personal health information smart cards requires that PCs come with smart card encoders, that doctors’ offices and other health providers have smart card readers, that all smart cards have a comparable standard, that medical information codes are standardized, that the millions of public and private health providers agree to use the system, that privacy issues be dealt with, etc. In short, these are issues no one company acting alone in the marketplace can resolve.

Third, while the following is not strictly a pure market failure, it is a mistake to assume that just because the digitization of the economy improves efficiency that firms

will embrace it. In fact, many firms have a vested interest in slowing the adoption of new technologies, since they challenge their business models. Because resisters are incumbent firms that have more money and power than innovating upstarts, they can slow change or hinder competitors. For example, one reason why some kinds of online financial services, such as online bond issuance and online foreign currency trading, have been slow to take off is that financial services companies have used their market power to reinforce existing technologies and slow the adoption of new ones. In other cases, resisters adopt technology that is not as efficient as the newest technology. Because the market “locks in” the less efficient technology, the introduction of the superior technology is dramatically slowed.

But market failures are not the only factors slowing the transition; there are at least three kinds of political failures. First, not only do incumbent firms threatened by the digital economy use their power in the marketplace to resist change, they also enlist the aid of government to protect them. In case after case, vested interests have pressured legislators and regulators to pass laws and rules protecting them against e-commerce competitors. Second, because e-commerce is by its nature borderless, conflicting rules and regulations can impede the rise of global e-commerce. And just as trade in general is restricted by protectionist impulses, so too will e-commerce trade be restricted. Finally, because government constitutes 17 percent of the economy, inertia by government in adopting digital technologies slows the overall transition.

For all these reasons, policymakers need to develop a proactive strategy for overcoming these barriers. This paper first discusses the benefits of the digital economy, then lays out seven areas where a more strategic and activist government role can help foster the digital revolution:

- ▶ **boosting IT research;**
- ▶ **helping to jump-start “chicken or egg” issues;**
- ▶ **developing and implementing out-sector strategies;**
- ▶ **overcoming middleman resistance;**
- ▶ **promoting international e-commerce;**
- ▶ **fostering digital government; and**
- ▶ **boosting digital opportunity.**

What Is the Digital Economy and Why Is It a Good Thing?

The same pundits who wrongly thought that the personal computer was synonymous with the tech revolution of the early ‘90s are the ones who think that e-retailing and advertising-supported Web sites are the be-all and end-all of the tech revolution at the beginning of the ‘00s. Nothing could be further from the truth. No matter how much they grow, Internet retailing and Web sites built on banner ad revenues will be a modest part of the digital economy.

The IT revolution is about how consumers use the Internet to get services (e.g., insurance, banking, airline tickets, government services). For instance, long distance

providers MCI and AT&T will reduce the customer's long distance bill every month if they agree to sign up and pay bills by email. It's also about transforming how companies are run internally. The database company Oracle claims to have cut its costs by \$1 billion in 2000 by using the Web to eliminate internal paper processes. Finally, it's about how companies interact with each other. Business-to-business trade is expected to reach \$6 trillion by 2005, with annual savings of more than \$480 billion by 2003.

Thus, the digital economy is not simply an electronic version of catalog selling that sites like Amazon.com represent, although this is certainly part of the digital economy. Rather, it represents the pervasive use of information technology in all aspects of the economy, including the internal operations of organizations, transactions between organizations, and transactions between consumers/citizens and organizations.

Why is the digital economy a good thing? In the old economy, the key driver of economic growth was mechanization of production, particularly in manufacturing and agriculture. In the New Economy, the key driver is digitization (using digital information technologies to produce and distribute goods and services), particularly using the Internet and other information technologies (smart cards, voice-based computing, wireless devices, advanced database systems, ubiquitous broadband telecommunications, and expert software systems) in the service sector, where 80 percent of the jobs are. The IT revolution is transforming virtually all industries and is central to increased economic efficiency and productivity, higher standards of living, greater customization of products and services to suit individual wants and desires, and greater personal empowerment. Ensuring that government policy supports this transition will be the most important economic policy goal for the next decade.

The Framework for a Strategic National E-Commerce Policy

In formulating and carrying out a strategic growth policy for the Internet and the digital economy, government should act in a number of areas. But this should not be mistaken for a call for government ownership, picking winners and losers, expanded regulation, industry subsidies, or any other of the strawmen claims that conservatives often erect in response to a more strategic role for government. Rather, government needs to intervene in areas where market failures and other limitations lead to less than optimal outcomes. Embracing this agenda will mean faster growth of the digital economy and the attendant benefits in the form of better jobs and higher wages. As a result we propose that government needs to act in the following areas:

Research and Development

It is remarkable that, 11 short years after the creation of the World Wide Web and 35 years after the advent of the Internet, most cyber-libertarians have forgotten an important fact. Both developments, plus a host of others that underpin the IT revolution (including the Web browser, Internet routers, and even computing itself) did not come from industry. They came from government-funded researchers (or private companies

under government contract) tinkering and working on problems in the public domain. It's not a stretch to say that if the Internet did not exist, industry would not build it.

But the government role in IT research was not limited to the early stages of the IT revolution. There are numerous areas where publicly funded IT research has been critical. According to the President's Information Technology Advisory Committee, "The state of the Nation's economy and security in the early decades of [this] century will be in a very real sense driven by the federal investments made now in long term research in IT."⁴ Likewise, the National Research Council argues, "The potential of IT will not be harnessed to meet society's needs automatically. ... Research is needed to enable progress along all these fronts." They state that it is incumbent on the federal government to increase its research investments in IT.

One key part of this research initiative will be Internet2, a consortium being led by more than 180 universities working in partnership with industry and government to develop and deploy advanced network applications and technologies, accelerating the creation of tomorrow's faster and more powerful Internet. But research in a wide array of IT areas is needed, not just on the Internet. A recent National Institute of Standards and Technology report on the technology and service sector articulated a number of cross-cutting generic technology needs in areas such as monitoring and control of large networks, distributed databases, data management, systems management, and systems integration.⁵

Yet, funding for such efforts has been limited. President Clinton's Information Technology Advisory Committee recommended, and PPI's New Economy Task Force supported, roughly doubling the federal government's annual investment in information technology research. To meet the goals set by the committee, IT research and development funding needs to increase by \$274 million each year for five years. President Bush's budget proposal for FY 2002, on the other hand, increases IT research by only \$40 million, to roughly \$1.97 billion. This proposal has seriously derailed the commitment to double federal investment in IT research, which up until FY 2001 had been on track to meet the Advisory Committee's target. As a result, **Congress should increase information technology research funding by at least \$275 million this year.**

Chicken or Egg Issues

In case after case, the IT industry has developed cutting-edge technologies. When both the user and the "seller" have to adopt a technology simultaneously for it to work, however getting widespread use in the marketplace is another thing.

A case in point is online authentication. The full benefits of the digital era will not be realized until individuals can easily and securely authenticate themselves over the Internet. Currently, few Americans can do this; that is, they are unable to fully represent themselves over the Internet in a way that securely tells other people and companies that they are who they claim to be and that allows them to be taken seriously when they state their intentions. As a result, few companies or governments have developed applications that could use online authentication and, consequently, consumers have little reason to obtain the means to sign documents digitally, since few

online applications require authentication.

But digital authentication is not the only chicken or egg issue. There are a host of others. Smart cards (cards with chips on them to collect, store, and transmit money) have diffused slowly through society, in large part because consumer value is limited as long as few merchants accept them, and few merchants accept them as long as few consumers have them. Likewise, few computers have smart card readers that would let people download or upload cash or information from the computer to the card. Yet the productivity benefits of smart cards could be dramatic. For example, people could check into hotels on the Internet, choose the room they want, and download the key code information directly to their smart card, allowing them to check into the hotel without physically checking in (enabling the hotel to employ fewer front desk clerks).

New Web surfer empowering technologies like P3P and ICRA could fall into this chicken or egg trap. The Platform for Privacy Preferences (P3P) standard and the Internet Content Rating Association standard lets Web sites rate themselves on their privacy policies and content, and lets consumers set their privacy and content preferences (e.g., regarding sex, violence, hate speech) in their Internet browsers. The software then filters (ICRA) or gives notice (P3P) to consumers of sites that do not meet with stated preferences. But unless enough companies make their sites P3P and ICRA compatible, users will not set their browsers to reject sites that are not compliant, and if users do not set their browsers, sites will be less likely to become compliant.

Broadband telecommunications also exhibits these characteristics. Demand for broadband is inhibited by the fact that some applications, such as voice-over-Internet (using the Internet to make calls) and video downloads (e.g., buying movies and old TV shows online) are limited. However, these and other applications are slow to develop because few people have the bandwidth they need to fully use them.

Markets usually resolve these chicken or egg issues, but it can take a long time and be costly. It is appropriate for government to help jump-start these chicken-or-egg technologies by adopting them first. For example, the Bush administration should require that all federal government Web sites are P3P and ICRA compliant. Similarly, all federal smart card projects should be interoperable with private sector standards and applications so that government workers can use their cards in the private sector and help build the supply of smart card applications. In addition, as PPI has proposed, to jump-start the digital authentication market, state motor vehicle agencies should issue digital certificates as part of the process of issuing driver's licenses, and encourage the use of digital authentication through e-government.

Sector Strategies

The application of IT to information-intensive sectors or processes (such as health care, real estate, education, and transportation) that still rely largely on paper and person-to-person interactions holds the potential for the largest productivity payoffs. Yet there are a number of barriers to digital transformation, including the interrelated systems nature of the applications, which requires the development and adoption of IT by all parts of the industry at once.

Take health care, for example. Using IT to streamline much of the information processes in the health care system could save tens of billions of dollars per year. Yet, as evidenced by the widespread use of paper forms, handwritten prescriptions, manila file records, and limited use of email and online transactions, the health care sector has been surprisingly resistant to making these changes. The President's Information Technology Committee writes that "health care organizations are not well prepared to adopt information technology and applications effectively. Health care is largely a decentralized industry populated by diverse organizations with different motives, resources and incentives."⁶ Fiscal constraints, coupled with a lack of reimbursement for many IT applications, limit the ability of some parts of the industry to make the investments needed to adopt new technologies. Lack of standards and protocols linking all information together in an interoperable way hinders progress. Moreover, the craft nature of the clinical practice of medicine, with over half of doctors practicing solo or in small groups, makes change more difficult. And in the face of high levels of uncertainty about future directions of technology and the supporting technical infrastructure, or about whether changes will even happen, technology developers and providers of solutions are hard pressed to justify investments.

Similar barriers exist in other industries, such as the real estate industry. Buying a house is nothing if not an exercise in filling out numerous forms and paying endless fees for things like title searches, filing deeds, etc. No one has tried to streamline the process. On top of this, realtors have resisted development of direct seller-to-buyer e-commerce sites.

In these and other cases, it's not clear that left to its own, the market will succeed in transforming these industries from paper and face-to-face to digital any time soon. **Government should do several things to move the process forward. First, the Bush administration should issue an executive order to all government agencies calling on them to examine how their procurement, regulatory, and other actions can speed the digitization of sectors that they influence. In addition, the agencies should be required to work with both technology developers and users to help develop technology reinvention road maps.** For example, Housing and Urban Development and Fannie Mae should convene such a group in the housing industry, with an eye toward using IT to automate and streamline home-buying. The Department of Transportation could do the same with standards and funding for universal transponders to collect tolls and for other "intelligent transportation systems." Health and Human Services and the Securities and Exchange Commission could make similar efforts in their sectors.

The federal government also should use its regulatory and purchasing power to move the industries in the direction of full digitization. Consider health care. As purchaser of about half of the nation's health care (through Medicare, Medicaid, Veterans Affairs, etc.), the government is in a unique position to prompt the entire health care system to adopt information technology. Indeed, in the Information Age, affecting the change outside an organization is as important as making the change inside it. And nowhere is this more apparent than in the health care system. The Department of Veterans' Affairs (VA) has taken the lead in pushing for adoption of

information technology for health records. The leaders of the VA have come to realize that any information system that works only in its own system won't do them any good. Even VA patients do not stay in the VA system, so if they are to track their patients, they need a system that everyone can use. But more should be done. The President's Information Technology Advisory Committee recommends establishing pilot projects and Enabling Technology Centers to extend practical use of IT to health care systems.

Similarly, the Federal Reserve Bank has created the Payments System Development Committee to identify strategies for enhancing the long-term efficiency of the retail payment systems and barriers to innovation. The panel is working to reduce legal and regulatory barriers to payment innovation, examine future clearing and settlement systems to support electronic commerce, assess the bank's role in helping to set standards, and find ways to use new technologies to collect checks more efficiently. Fannie Mae has begun similar efforts with respect to the real estate industry, for example, through its development of expert system loan approval software that cuts the time and expense of loan approval. These and similar efforts should be supported and expanded to other areas and applications.

In addition, both Congress and the administration should focus on removing regulatory roadblocks to further digitization in particular sectors. For example, the Department of Education has rules requiring students getting financial aid to put in a certain amount of "seat time" in classes. Since students enrolled in online courses put in little or no "seat time," it is difficult if not impossible for them to get aid.

Middleman Resistance

A central aspect of the e-commerce revolution is economic "disintermediation," where the Internet enables consumers to bypass middlemen. However, those threatened with disintermediation are not sitting by idly; they are using all the judicial, regulatory, and legislative means at their disposal to thwart competitors who seek to use the net to sell a product or service. For example, car dealers have succeeded in getting 49 states to pass laws preventing auto manufacturers from selling cars online. Wine wholesalers have lobbied Congress and the states to prevent wineries from selling wine over the net. These and many other cases of the revenge of the disintermediated represent perhaps the biggest threat to the rapid and widespread digitization of the U.S. economy.⁷

While some direct-to-consumer business models can succeed if restrictive laws and rules are changed, in other cases the middleman will have gained enough of a first move advantage to make it very difficult for alternative, more pro-consumer models to succeed. Online real estate illustrates this well. When Microsoft's HomeAdvisor.com set out to establish a real estate Web site where agents would accept lower commissions, the National Association of Realtors not only lobbied against Microsoft in its antitrust battle, but also required brokerage firms to list exclusively with its own Web site, Realtor.com. The result is that even if a site were able to bypass realtors and provide low or no commission sites, it would be difficult to gain enough market share to counter the lead and market "lock-in" that Realtor.com has.⁸

Government has to do more than hope that the marketplace will solve these problems. Given that resisters often enlist government to protect them, **policymakers should ignore protectionist pleadings and oppose actions designed to protect the status quo against e-commerce competition.** But government also needs to be proactive. We have called upon the Bush administration to create the position of e-commerce ombudsman to identify cases of political opposition to e-commerce and serve as an advocate in government for e-commerce competitors.

Policymakers also need to rethink anti-trust doctrine. Current doctrine reflexively raises red flags anytime a venture among previous competitors is proposed. Yet collaborating to sell online may not only be the most efficient way, it may be the only way to overcome the market power of e-commerce resisters. For example, in a host of industries, including bicycles, perfume, golf equipment, and computers, bricks and mortar retailers have threatened to treat less favorably the products of producers who sell direct. As a result, the Federal Trade Commission and the Department of Justice should increase their efforts to prevent retailers and other businesses from colluding to retaliate against companies attempting to sell directly to consumers, while at the same time taking a more tolerant position if producers act collectively to sell goods or services online, as long as they are not colluding on price or keeping out entrants who want to provide lower prices or higher quality.

Finally, Congress should allow e-commerce companies that are currently in industries regulated by states to obtain national licenses, allowing them to bypass contradictory and protectionist state rules. For example, most non-bank financial service providers are subject to state laws and are not eligible for national licensing. In this case, Congress should consider developing a national standard based on best-in-class requirements that states currently impose. E-commerce financial service companies would then have only one law to follow.

International Trade Promotion

E-commerce is not just domestic, it's international. In fact, the Internet is dramatically expanding opportunities for business-to-business (B2B) and business-to-consumer (B2C) e-commerce transactions across borders. But for all the potential of global e-commerce, there are countless vexing policy questions to be worked out, any one of which can threaten the viability of this nascent form of trade. All of the Internet issues being debated in the United States -- consumer protection, data privacy, taxation, content regulation, copyright, spam, technology deployment, and many more -- need to be resolved at the international level as well. Global e-commerce also faces two additional serious complications: It lacks both a central international authority to set rules and a uniform commitment among nations for free trade. Moreover, conducting electronic commerce across national borders adds many more policy issues to the mix -- jurisdiction, customs duties, import and export restrictions, intellectual property licensing, and more -- that are only now being examined.

But unless industry and policymakers can come to grips with these pressing policy issues, Web consumers may lose the confidence to venture beyond their national

borders. And with a mish-mash of confusing and conflicting laws of nearly 200 nations, many erected by countries seeking to protect their domestic industries from global e-commerce competitors, e-commerce sellers may find it easier not to conduct business with foreign buyers. **Making sure that e-commerce trade grows and reaches its potential will require the government's crafting a framework to promote global e-commerce.**

E-Government

Because government employs more than 17 percent of the workforce, applying information technology in government will significantly boost the productivity of the economy. But digital government will do more than save citizens and businesses money, it will speed the transition to a digital economy as it helps address "chicken or egg issues." Yet progress at the federal, state, and local levels has by and large been uneven. Governments need to be leading-edge users of information technologies to reinvent themselves and cut costs.

To foster digital government at the federal level, the government needs a chief information officer (CIO) who is empowered with funds to make digital government happen. Accordingly, PPI has proposed that the president appoint a CIO for the federal government and create a \$500 million cross-agency digital fund. The CIO also would consult with an advisory council of private sector CIOs. Sen. Joe Lieberman's (D-Conn.) E-Government Act of 2001 bill includes a proposal to create a CIO, as well as a host of other positive steps that promise to create a more digital and accessible government.

But there is another key role for digital government, and that is the creation of a digital library. A great deal of valuable information in the public domain -- including texts, movies, and scientific displays such as digital models of the human body -- are not available online because doing so would not make money. Government should work to ensure that such works and others are available online.

Internet Access

To date, the adoption of the Internet has tended to follow the traditional pattern for new technologies: It was adopted first by middle- and upper-income Americans and as prices of access devices and online access fees fell, more Americans of all incomes got online. However, there are a range of barriers to technology adoption in low-income areas, and cost may be one of the least significant. It is essential that individuals in these communities see the relevance of technology to their daily lives -- and this enlightenment is best done experientially. Public policy must work to ensure that all Americans have access to the tools provided by the emerging information technology revolution. It needs to stimulate the creation, dissemination, and support of programs that will build the organizational capacity of community-based organizations, enable them to integrate the Internet and related technologies into their operations, and allow them to create Internet-enabled enriched environments and learning programs.

Congress and the administration should create a digital brigade of AmeriCorps and a new program that funds nonprofit efforts that leverage private sector leadership and funding to provide disadvantaged communities and individuals access to computers and the Internet.⁹

Conclusion

The digital transformation of the economy holds the potential to continue the high rate of productivity and income growth the nation has enjoyed in the last five years. In fact, given that manufacturing and agriculture now account for less than 20 percent of the economy, the use of information technology in the other 80 percent of the economy will be the source of the largest share of productivity over the next two decades. Both liberals and conservatives assume that this digitally powered growth will just happen. But it will not happen unless government takes a strategic role. Government must do more than simply do no harm, as many conservatives would tell policymakers. But government also must do more than simply help spread access to digital technologies, as liberals claim.

Certainly, the choices and investments industry makes will drive digital transformation. But government can and should play a key supporting role. Playing that role effectively requires the government to think strategically and sector-by-sector, aligning its regulatory, trade, tax, and fiscal policies to speed and widen this transformation. In short, it requires a national e-commerce strategy.

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Endnotes

¹ <http://www.pff.org/position.html>.

² Adam Thierer and Wayne Crews, "Cato Techknowledge #1: A Libertarian Vision." *Cato Techknowledge Newsletter*, April 2001.

³ Rob Atkinson and Shane Ham, "Digital Politics: A Field Guide to the Camps and Contours of the Internet Policy Debates," *The New Democrat*, May/June 2000.

⁴ http://www.ccic.gov/ac/pitac_it2_review.pdf.

⁵ David P. Leech, Albert N. Link, John T. Scott, Leon S. Reed, *The Economics of a Technology-Based Service Sector*. Prepared by TASC Inc. for NIST Strategic Planning and Economic Analysis Group. (Planning Report 98-2), (Washington, D.C., 1998) <http://www.nist.gov/director/prog-ofc/report98-2.pdf/>

⁶ *Transforming Health Care Through Information Technology*, Report from the President's Information Technology Advisory Committee (Washington, DC: 2001).

⁷ Robert Atkinson, *Revenge of the Disintermediated: How the Middleman is Fighting E-Commerce and Hurting Consumers*, (Washington, D.C.: Progressive Policy Institute, 2001).

⁸ E-realty.com is such a discount model that is trying to penetrate the online market.

⁹ Andrew Leigh and Rob Atkinson, *Clear Thinking On the Digital Divide* (Washington, D.C.: Progressive Policy Institute, forthcoming, June, 2001).