HOW FREE COMPUTERS ARE FILLING THE DIGITAL DIVIDE

ADAM D. THIERER

As the public policy debate over America's "digital divide" intensifies, federal, state, and local policymakers are considering what steps should be taken to solve the apparent gap between the technological "haves" and "have nots." The issue has two components: the wiring of classrooms for educational purposes and the wiring of homes to ensure that all Americans have personal computers (PCs) and are connected to the Internet. The implications of the latter are considerable. Using heated rhetoric, some policymakers in Washington are calling for the creation of a new entitlement to address what they perceive as a national civil rights crisis—the fact that many low-income Americans do not yet own a computer. As Eric Cohen, managing editor of *The Public Interest,* recently noted in *The Weekly Standard*, "The digital divide is now the hottest social policy issue in Washington. It's the 'new new thing' in civil rights politics."

Dozens of solutions to this supposed crisis are being advanced. The Clinton Administration's fiscal year (FY) 2001 budget proposes a variety of new federal programs and over $2 billion in new spending initiatives. Vice President Al Gore has floated a package of proposals, and Members of Congress continue to debate legislation ranging from tax credits for the donation of computers to needy schools or individuals to the creation of new federal programs. One proposal would give low-income families a tax credit of up to $500 to subsidize the cost of a new PC system. Another would create a New Deal–type program resembling the Rural Electrification Administration to provide $3 billion in low-interest loans to companies to deploy high-speed broadband networks to rural or remote sections of America.

Yet today's dynamic market for personal computers and the availability of access to the Internet is generating a virtual digital deluge of opportunity for every American to be connected. For example:

- **PC's are becoming very affordable.** Internet-ready PCs are available from major retailers, catalogue companies, and online vendors for

This paper, in its entirety, can be found at: *www.heritage.org/library/ backgrounder/bg1361es.html*

less than $400 and, in some cases, even under $300, because of heavy market competition.

- **PC systems are being given away.** Some companies are giving away PCs almost free of charge in exchange for nominal monthly fees and/or long-term service agreements.

- **Some PCs are cheaper to buy than TVs.** Entry-level computer systems are now cheaper than new television sets. This begs an obvious question: If Americans can purchase an Internet-ready PC for less than the cost of many TVs, just how real is the digital divide? After all, 98.7 percent of all Americans—including 97.3 percent of all poor households—now own a television set.

- **Internet access is cheap, and often free.** Free access to the Internet is offered by advertising-supported Internet service providers. This means consumers who own a PC can sign up for Internet service for no additional monthly fee.

- **Many companies offer free computing services.** There has been an explosion in the number of other free computing and Internet services, which include free e-mail, free file storage sites, free technical support, and free software.

- **Emerging hybrid computing systems may soon make PCs irrelevant.** Hybrid systems known as "Internet appliances" or "dumb terminals," often costing less than $99, can offer consumers instantaneous Internet access without having to purchase a hard drive.

- **Companies are rushing to deploy state-of-the-art broadband networks into the home.** Telecommunications network providers— including telephone, cable, fiber optic, electrical, and wireless satellite companies—offer consumers a variety of technological options for accessing the Internet and online networks.

- **Employers are increasingly offering free or subsidized PCs to employees.** Many large private-sector employers, such as Ford Motor Co., Delta Air Lines Inc., American Airlines, and Intel Corp., offer their employees subsidized PCs and free Internet access. This new workplace benefit is likely to become more prevalent as employers compete for quality workers.

- **Free markets are spreading new technologies more quickly than subsidies.** Personal computers and Internet services have spread quite rapidly throughout society. In fact, roughly half of all American households gained access to the Internet in far less time than it took them to be serviced by radio, television, cable, telephones, and electricity.

Is there a "digital divide" in America, or at least a pressing public policy concern that demands a national solution and an expensive federal entitlement program? Clearly, the vibrant PC market is doing more than an adequate job of providing computing technologies to all Americans. Free computers and inexpensive computing technologies are filling any digital divide that remains. Washington should be patient and not interfere with this well-functioning process.

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HOW FREE COMPUTERS ARE FILLING THE DIGITAL DIVIDE

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As the public policy debate over America's "digital divide" intensifies, federal, state and local policymakers are considering steps to solve this apparent gap between the technological "haves" and "have-nots." The issue has two major policy components. The first deals with the "wiring" of classrooms for educational purposes and the role of technology in educating children in general. The second deals with the wiring of American homes to ensure that all citizens have personal computers (PCs) and are connected to the Internet. It is the latter that is creating the most debate.

Using heated rhetoric, policymakers in the Clinton Administration and in Congress are calling for the creation of new federal entitlements to address what some perceive as a national civil rights crisis. As Eric Cohen, managing editor of *The Public Interest*, noted in a recent issue of *The Weekly Standard*, "The digital divide is now the hottest social policy issue in Washington, It's the 'new new thing' in civil rights politics."[2] Dozens of national solutions to this supposed crisis have been proposed in recent months.

For example, the Clinton Administration has proposed a wide variety of new federal programs and over $2 billion in new spending initiatives in its fiscal year (FY) 2001 budget.[3] Vice President Al Gore has floated a package of proposals,[4] while Members of Congress debate a variety of proposals ranging from tax

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2. Eric Cohen, "United We Surf," *The Weekly Standard*, February 28, 2000, p. 26.

3. See Adam D. Thierer and Gregg VanHelmond, "The President's Budget Proposes a High-Tech Pork Barrel," Heritage Foundation *Executive Memorandum* No. 652, February 14, 2000.

4. See Susan Page, "Gore Proposal Could Narrow 'Digital Divide,'" *USA Today*, February 15, 2000, p. 7A; Bara Vaida, "Gore Touts Closing Digital Divide," *National Journal's Technology Daily P.M. Edition*, February 25, 2000.

credits for the donation of computers to needy schools or individuals to the creation of new federal programs. One proposal would provide direct tax credits of up to $500 to subsidize the purchase of a new PC system by low-income families.[5] Another would create a New Deal–type program resembling the Rural Electrification Administration, providing $3 billion in low-interest loans to companies to deploy high-speed broadband networks to rural or remote sections of America.[6]

Before policymakers make rash decisions on these proposals or create an expensive new government program to address America's supposed digital divide, they would be wise to take a closer look at the current market for personal computers and Internet access. Americans live in an age of technological abundance, with a virtual digital deluge of opportunity.[7] Free computers and free Internet access are helping to filling the digital gap. Clearly, the vibrant PC market is doing more than an adequate job of speeding computing technology to every American.

IS THERE A DIGITAL DIVIDE?

Proponents of new programs and spending initiatives to address America's supposed digital divide have articulated their concerns in divisive and quite extreme terms. NAACP President Kweisi Mfume, for example, has referred to the issue as "technological segregation,"[8] and the Reverend Jesse Jackson has said the digital divide represents "classic apartheid."[9] Not surprisingly, politically charged claims such as these led President Bill Clinton to hold a recent digital divide summit, at which he called for over 400 companies and non-profit organizations to sign a "National Call to Action to Bring Digital Opportunity to Youth, Families, and Communities."[10]

Regrettably, these claims and actions assume that a genuine "digital divide" crisis exists in America that demands a national solution and expensive federal entitlement programs. Before policymakers make rash decisions on this issue, they should consider the following evidence:

- **PCs are becoming more affordable**. PC prices have fallen steadily over the past 15 years. In fact, Internet-ready PCs are available from major retailers, catalogue companies, and online vendors for less than $400 and, in some cases, under $300. More important, the quality-adjusted price of these systems—their real cost adjusted for technological improvements and increased service options—has fallen even more.

- **PC systems are being given away**. Many companies are giving away PCs virtually free of charge in exchange for nominal monthly fees and/or long-term service agreements. Today, these systems—which typically include a monitor, keyboard, speakers, a modem, and Internet access—cost consumers only between $21 and $29 a month.

- **Some PCs are cheaper to buy than televisions.** Prices in the PC market have fallen so rapidly, in fact, that it is not uncommon to find new computer systems that are cheaper than new TVs. This begs an obvious question: If Americans can purchase an Internet-ready PC for less than the cost of a new television set, just

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5. See Rebecca S. Weiner, "Bridging the Digital Divide One House at a Time," *National Journal's Technology Daily P.M. Edition*, March 22, 2000.

6. "Dorgan's Digital Divide Effort," *National Journal's Technology Daily A.M. Edition*, March 28, 2000; David Kaut, "Senators Voice Concern, But No Consensus On Rural Broadband Deployment Measures," *BNA Daily Report for Executives*, No. 61, March 29, 2000, p. A-35.

7. Adam D. Thierer, "A 'Digital Divide' or a Digital Deluge of Opportunity?" Heritage Foundation *Executive Memorandum* No. 646, February 1, 2000.

8. Quoted in "NAACP, AT&T Take on 'Digital Divide'," *Associated Press*, July 13, 1999.

9. Quoted in "Wrassling Dinosaurs Scare Teleco Beasts," *Communication Today*, Vol. 6, No. 65 (April 6, 2000).

10. The White House, Office of the Press Secretary, "A National Call to Action to Close the Digital Divide," April 4, 2000.

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how real is the digital divide? After all, according to the U.S. Department of Energy, 98.7 percent of all Americans—including 97.3 percent of all poor households—own a television set. If virtually every American household can own a TV, which usually is more expensive than an entry-level PC system, then the need to create an expensive new entitlement program for PCs is dubious.

- **Internet access is cheap, and often free.** Free Internet access regularly is offered by advertising-supported Internet service providers (ISPs), which means consumers who already own a PC can sign up for Internet service for no additional monthly fee.

- **Many companies offer free computing services.** Other free computing and Internet services are becoming available. For example, free e-mail services are ubiquitous on the World Wide Web. Additionally, consumers have access to free storage sites on the Internet to save large amounts of information or files on independent company servers and hard drives. This means consumers do not necessarily need to purchase a hard drive of their own to store their files. Also consumers can access many free software and technical support sites.

- **Emerging hybrid computing systems may soon make PCs irrelevant.** Thanks to the existence of so many free Internet services, consumers increasingly are obtaining new hybrid systems known as "Internet appliances" or "dumb terminals" that offer instantaneous Internet access without requiring the purchase of a hard drive. For as little as $99, consumers can purchase a keyboard and monitor with built-in Internet software for direct access to the Web. Finally, hand-held PC devices are becoming increasingly popular, offering another inexpensive technology that could one day be as ubiquitous as cellular phones.

- **Companies are rushing to deploy state-of-the-art broadband networks to the home.** Telecom-

munications network providers are rushing to provide consumers a variety of technological options for accessing the Internet and online networks in general. For example, high-speed digital subscriber line (DSL) systems are being rolled out by telephone companies, and cable firms are deploying modems to offer fast Internet access through their cable systems. More important, "wireless Internet" technologies are emerging that offer access without a physical wire running into the home, which will make Internet access more available to many more Americans in the very near future.

- **Employers increasingly offer free or subsidized PCs to their employees.** Many large private-sector companies are now offering their employees subsidized PCs and free Internet access. Ford Motor Company, Delta Air Lines, American Airlines, and Intel Corporation, for example, recently announced plans to offer these services to their combined 604,000 employees. This new workplace benefit is likely to become more prevalent as employers compete for quality workers.

- **Free markets are spreading new technologies more quickly than subsidies.** Personal computers and Internet services have spread quite rapidly throughout society. As Helen Chaney of the Pacific Research Institute notes,

  > Internet access has spread to 50 million people in only four years. That's about nine times faster than radio, four times faster than the personal computer and three times faster than television. At this rate, it won't be long until all of those who desire Internet access will have it.[11]

Such facts clearly call into question the presence of a significant digital divide in America and the extent to which it demands any national solution or federal entitlement. The marketplace is doing more than an adequate job of providing computing technolo-

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11. Helen Chaney, "The U.S. 'Digital Divide' Is Not Even a Virtual Reality," *Bridge News*, March 12, 2000.

![The Heritage Foundation] **Backgrounder**

gies to Americans. Federal policymakers should be wary of interfering with this spontaneous and vibrant process.

COMPUTER PRICES AND PROCESSING POWER

The history of the computer industry and the Internet in America is one of the most exciting stories of free-market opportunity and entrepreneurial success. It is filled with cases of rapidly falling prices and rapidly improving innovation. Year after year, the prices of personal computers fall. In fact, according to PC Data, Inc., a research firm based in Reston, Virginia, the average cost of a new PC fell from $1,434 in 1997 to $916 in 1999. Moreover, as the information in Table 1 illustrates, any consumer in America can find an inexpensive

Average Price of "Base Model" PCs Has Dropped Steadily		
	Price	Annual Change
1996	$1,747	—
1997	$1,434	$3l3
1998	$1,139	$295
1999	$ 916	$223
Source: PC Data, Inc., 2000.		

PC or laptop computer today by searching online, visiting an electronics retailer, or picking up a catalogue and ordering over the phone.

But what this snapshot of the market also illustrates is that, over time, the quality-adjusted price

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Table 1   B1361

Budget PC Cost Comparison

| Vendor	Brand/Model	Processor	Memory	Storage	CD	Modem	Operating System	Warranty	Cost
Under $300									
Egghead	Royal	Celeron 466	32 MB	none	50X	56K	none	60 days	$299
Under $400									
Egghead	TPI	K6-2 450	64 MB	8.4 GB	44X	56K	Win 98	6 months	399
Egghead	Cumetrix	K6-2 450	64 MB	6.4 GB	50X	56K	none	l year	399
CompUSA	CompUSA HomePC	Celeron 400	64 MB	4.3 GB	40X	56K	Win 98	n/s	399
Under $500									
Best Buy	Avavtar A475KI	K6-2 475	32 MB	8.4 GB	52X	56K	Win 98	l year	459
CompUSA	Emachines eTower	Celeron 466	32 MB	4.3 GB	40X	56K	Win 98	n/s	474
Best Buy	Emachines 466IS	Celeron 466	32 MB	4.3 GB	40X	56K	n/s	n/s	474
Sherlock Systems	HP Brio	Celeron 433	32 MB	n/s	40X	56K	Win 98	n/s	495
CompUSA	Compaq Presario	K6-2 475	64 MB	8 GB	32X	56K	Win 98	n/s	499
CompUSA	HP Pavillion	Celeron 466	64 MB	8.4 GB	40X	56K	Win 98	n/s	499
CDW	HP Brio BA200	Celeron 433	32 MB	4.3 GB	n/s	n/s	Win 98	n/s	499
Under $600									
Yahoo Shopping	Vitality BareBones	K6-2 500	32 MB	8.4 GB	48X	56K	none	n/s	527
CDW	Compaq Deskpro EP	Celeron 433	32 MB	4.3 GB	n/s	n/s	Win 98	n/s	579
CompUSA	Compaq Presario	K6-2 500	64 MB	10 GB	40X	56K	Win 98	n/s	599
CompUSA	Emachines eTower	Celeron 500	64 MB	10 GB	40X	56K	Win 98	n/s	599
Under $800									
Dell	Dimension L	Celeron 433	32 MB	4.3 GB	40X	56K	Win 98	3 years	7l9

Note: n/s = not specified. Monitors cost an additional $149, except on the Dell Dimension L and Yahoo's Vitality BareBones systems, where a 15" monitor is included.
Source: Heritage Foundation survey, March 2000.

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of personal computers (their actual costs adjusted for technological improvements and increased service options) plummeted even faster than the list prices suggest. That is, not only has the average cost for a PC dropped dramatically over the past 10 to 15 years, but in each of these years, the processing power of these systems grew exponentially, making their quality-adjusted price even less.

This phenomenon is known in the computer industry as Moore's Law. Named after Intel Corporation co-founder Gordon Moore, this principle holds that the computing power

Chart 1 B1361

Cost Per Unit of Computing Power Continues to Decline

Cost per MIPS — Computing Power in MIPS

- Cost Per Unit of Computing Power
- Computing Power

Note: MIPS=Millions of Instructions Per Second a transistor can execute.
Source: Industry estimates provided to author.

of a microprocessor doubles roughly every 18 months. As Chart 1 shows, processing power—traditionally measured in how many millions of instructions per second (MIPS) a transistor chip can execute—has grown dramatically over the past 10 years. Meanwhile, the price of the average transistor, measured in terms of cost per unit of computing power, has fallen by an equally dramatic margin.

The result of this market process has been the rapid deployment of less expensive but more technologically sophisticated personal computer systems. The powerful relationship expressed by Moore's Law means that yesterday's premium system quickly becomes today's run-of-the-mill system. Likewise, today's cutting-edge PC will become tomorrow's "bare bones" entry-level system.

In fact, to the extent computer consumers bemoan the current state of the PC market, it is not that they cannot purchase the PC they want at a good price; it is the fact that a cheaper but more
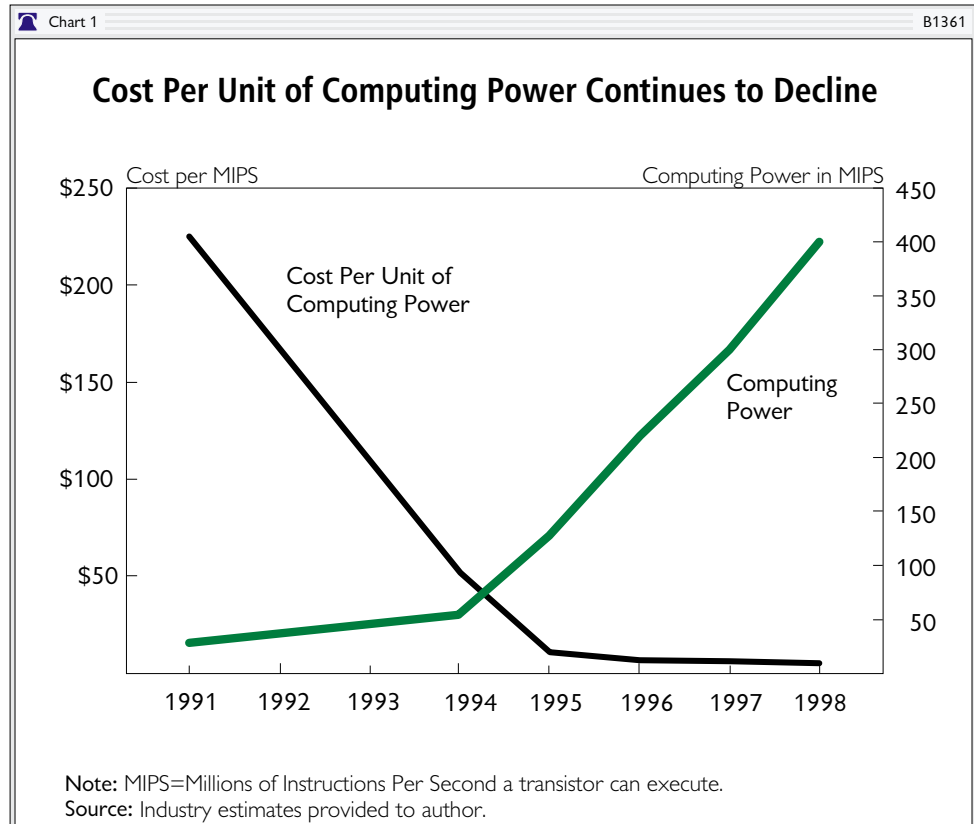
powerful system came along that makes their newly purchased system appear outdated. Despite these consumer complaints, it is clear that PC prices continue to fall rapidly while the quality of the systems is increasing. This is the sign of a healthy, competitive, and consumer-friendly market at work.

Free PCs and Disposable Computing

With PC prices falling so rapidly throughout the 1990s, it was only a matter of time until the "free PC" era dawned. That is, as the quality-adjusted price of PCs plummeted each year, companies became more competitive and eventually began giving away their PC systems to consumers for little or no up-front charge, in return for monthly service contracts. The existence of this trend was perhaps most fittingly captured by a headline on the cover of the March 2000 edition of *Computer Shopper* magazine: "FREE PCs: How to Choose the Best Deal!" The feature story compared six different Internet-ready PC systems that consumers

Table 2						B1361
"Free" PCs Currently Available						
	Compaq Presario 5440	eMachines eTower 466id	ePDdirect System	Gobi System	interSquid.com Basic Model	People PC Toshiba V3100
Processor	450MHz AMD K6-2	466MHz Celeron	466MHz Celeron	366MHz Celeron	433MHz Celeron	366MHZ Celeron
Memory	64MB	64MB	64MB	32MB	64MB	64MB
ISP Contract	36 months	36 months	36 months	36 months	30 months	36 months
Monthly Contract	$21.95	$21.95	$21.08	$25.99	$29.99	$24.95
Shipping	NA (direct retail)	NA (direct retail)	$69.99	$89.99	$100	$48

Note: Each system also includes a monitor, keyboard, mouse, CD-ROM or DVD-ROM drive, speakers, sound card, and a 56K modem.
Source: _Computer Shopper_, March 2000.

without spending much money. Some critics claim, however, that free PCs really are not free; consumers might pay less (or nothing) up front for these systems, but they are required to enter into a long-term contract with a computer company or ISP, and pay a low monthly fixed fee for continued service to amortize the complete cost of the system.

could order directly through the mail or purchase from a retail electronics store.[12]

Table 2 compares these six PCs. Each system includes a monitor, keyboard, a CD-ROM drive, speakers, and a modem for accessing the Internet. Technical support is included with each system, often free of charge. Finally, a package of software, such as Microsoft Works Suite 99 or Corel Word-Perfect Suite 8, comes bundled in each system.

These "free PCs" are not entirely free, of course. Consumers must pay a shipping charge for delivery to their homes or a small charge if the system is purchased at a retail store, and then use the manufacturers' rebates or other special offers to bring the cost back down. Once they have the systems in their homes, consumers are charged a small monthly fee ranging between $21.08 to $29.99 for the ISP contract. The length of the contract is typically three years.

With the "free PC" era now in full swing, it would seem that there is little reason to create a national computer entitlement program. Americans can own an entry-level, Internet-ready PC

There is some truth to this contention. Even if the government promised free computers to every American, someone would end up footing the bill for the program in the form of higher taxes or cross-subsidies within the industry.

The fact is, even if obtaining the "free PCs" requires some minimal fee to lease a system for an extended period of time, Americans would still be able to afford these systems. Skeptics who argue otherwise should consider: How is it that the average television set today costs more than an entry-level PC, yet according to the federal government's own data, almost every American home has a television?

According to the 1997 Residential Energy Consumption Survey, conducted by the Energy Information Administration of the U.S. Department of Energy, 98.7 percent of all Americans households own a television set. It is not just wealthy or middle-class Americans who are lucky enough to have a television in their home. According to the survey,

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12. "The Bottom Line on Free PCs," _Computer Shopper_, March 2000, pp. 155–164.

97.3 percent of all poor households have a color television set.[13]

A simple comparison helps make the point. A March 2000 Heritage Foundation survey of the Web sites of three popular national retail chains—Best Buy, Circuit City, and Wal-Mart—found that a new 25"–27" television set cost an average of approximately $332, while a new 32"–36" set cost an average of about $774. (See Table 3.) Meanwhile, as the data in Table 1 show, a budget, entry-level personal computer purchased at a retail chain or through a catalogue or Internet vendor is generally comparable in cost, or even less expensive, than a new television. Consumers have had little problem purchasing television sets. And no federal assistance programs exists to help poor households to do so.

Often, consumers will defer the up-front cost of a new television by signing a monthly installment plan to amortize the cost of the set over several years. This is essentially the payment arrangement many "free PC" suppliers provide. The monthly charge for a new PC typically is less than the monthly fee to finance the cost of a new TV. Moreover, consumers who choose the monthly repayment option on the purchase of a television through a major retail outlet often must use the company's store credit card to do so, adding interest charges to their cost. This is not typically the case with "free PCs."

Thus, as the cost of the average entry-level personal computer continues to fall well below that of the average television set, American households should have fewer problems affording new computers.

Table 3		B1361

Average Price of New Television Sets, by Retailer

	25–27 inch set	32–36 inch set
Best Buy	$307	$690
Circuit City	$402	$983
Wal-Mart	$288	$650
Average Price	$332	$774

Source: Heritage Foundation survey of retail Web sites during week of March 13, 2000.

What About Internet Access?

Even after considering the many amazing bargains available for consumers who want to buy a personal computer, a skeptic still could ask: What good is a computer without access to the Internet? After all, a good part of the debate over the "digital divide" has to do with use of the Internet as a means of societal empowerment.

Fortunately, this is not a problem. Americans already enjoy flat rate access and very inexpensive buffet-style pricing for Internet access. For example, monthly Internet access plans run as little as $9.99 to $19.99 a month. And some free-PC packages include Internet access for a flat monthly charge.

Increasingly, Internet access is being offered free-of-charge by advertiser-supported Web sites. In fact, one Internet Web site, "The Free ISP Internet Access Network" (at *http://www.free-isp-internet-access.net/isp.shtml*) compiles and critiques many of the existing free Internet access service providers. And, a quick Internet search for free Internet access reveals many companies and Web sites that are willing to provide consumers with free monthly Internet access. (See Table 4.) Most of these ISPs are able to provide free access because they are advertiser-supported.

One of these free ISPs is the San Francisco-based "BlueLight.com," a partnership between

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13. U.S. Department of Energy, Energy Information Administration, "Appliances by Household Income," *1997 Residential Energy Consumption Survey*, Table HC5-3b, at *http://www.eia.doe.gov/emeu/recs/recs97_hc/97tblhp.html*.

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Table 4   B1361

Sample of Free Internet Access Providers

1st Up	www.1stup.com
Address.com	www.address.com
AltaVista	microav.com
BlueLight	www.bluelight.com
Broadband Digital Group	www.freedsl.com
dotNow!	www.dotnow.com
Excite	freelane.excite.com/freelane/
Freei.net	www.freei.net
Free-N-Safe	www.freensafe.com
FreeWWWeb	www.freewwweb.com
iFreedom	www.ifreedom.com
Internet 4 Free	www.internet4free.net
Juno	www.juno.com
Lycos	free.lycos.com
Net Zero	www.netzero.com
Spinway	www.spinway.com
Start Free	www.startfree.com
Web Combo	www.webcombo.net
World Spy	www.worldspy.com

Note: List current as of March 2000.
Source: Heritage Foundation Web survey conducted week of
March 13, 2000.

Other Freebies

It is not just PCs and Internet access that are being given away free to consumers. The cover story in the April 2000 edition of *PC World* magazine, entitled "Best Free Stuff Online," featured dozens of computing services that are offered to the public free-of-charge.[15] For example, free technical support sites are growing in number on the Internet, and offer assistance to computer users who are having hardware or software problems. (See Table 5.)

In addition, free file storage space and file backup technologies are offered on various sites, which allow consumers to store data or share it with others online and provide an easy way to back up or archive data without consuming disk space on a PC's hard drive.

The *PC World* survey also features a variety of other free services available on the Web, including e-mail services; personal information managers (PIMs), and scheduling services; Web hosting or Web site construction sites;

popular retailer Kmart and Softbank Venture Capital. It took its name from Kmart's famous "blue light specials" that offer in-store customers instant bargains in a specific aisle of the store, which are found under a blue flashing light. Another, "NetZero," with over 3 million users, ranks in the top tier of national ISPs. Finally, the "Free-N-Safe" site bills itself as "family friendly," because in addition to free access, it blocks objectionable material, such as pornography, hate sites, and violent sites.

As *New York Times* reporter Laurie J. Flynn notes, "it [is] clear that the free-access movement is a trend."[14] And just as the free PC movement has benefited consumers, the free-access trend will do the same.

Table 5   B1361

Free Services for Computer Users

Technical Support	Storage
www.32bit.com	freediskspace.com
www.about.com	www.idrive.com
www.computing.net	www.xdrive.com
www.Ehow.com	www.driveway.com
www.GoofyGuys.com	
www.MyHelpDesk.com	
www.NoWonder.com	
www.PCSupport.com	
www.VirtualDr.com	

Sources: "Best Free Stuff Online," *PC World*, April 2000, and other sources.

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14. Laurie J. Flynn, "Internet Providers Look for Profit in Free Access," *The New York Times*, March 6, 2000, p. C3.

15. "(5th Annual) Best Free Stuff Online," *PC World*, April 2000, pp. 105–175.

business services, such as free tools to build Internet "storefronts"; and even free telephone services via the Internet.

Free software (i.e., Web browsers, word processors, graphics programs, and games) is prevalent on the web as well. And Internet users can even find comprehensive inventories of many free services that are available on the Internet (see Table 6).

As freelance authors and Internet watchers Jeff Bertolucci and Matt Lake note, the dynamic nature of competition and entrepreneurialism in this vibrant virtual marketplace means the future will remain bright for access:

> [T]today's free Web services may be too expensive tomorrow. Fortunately, competition in the free online service market is fierce, so if you favorite site suddenly starts asking for money, feel free to go elsewhere.[16]

Hybrid Systems and the Post-PC Era

Of importance to this debate on the digital divide is the rise of hybrid computing systems that offer unique ways to access the Internet. The market for "Internet appliances" or "information appliances"—virtually unheard of even a few years ago—is booming. Internet appliances essentially are PCs that have no hard drive, memory storage, or operating system. For as little as $99 (though usually $200 to $400), consumers receive a keyboard and monitor with prepackaged software that permits instantaneous Internet and e-mail access. Sony Corporation's "Web TV" was a precursor of this technology, although that system uses standard television sets as the monitor.

Table 6	B1361
Free Services Available on the Web	

Free Software	Catalogs of Free Services
www.freeprograms.com	www.totallyfreestuff.com
www.free-programs.com	www.4free.net
www.programfiles.com	www.freestuffcenter.com
web.public-software.org	www.thefreesite.com
www.freewarehome.com	free-n-cool.com
www.free.com	www.1freesite.com
	www.totallyfreebies.com
	www.top20free.com

Source: Heritage Foundation Web survey, March 2000.

Also known as "dumb terminals," these Internet or information appliances "are aimed squarely at getting consumers cheaply, quickly, and almost effortlessly onto the Internet," notes *New York Times* reporter Michel Marriott.[17] Companies offering such systems include Netpliance ("i-opener"), Acer America ("I-station"), Qubit Technology ("Qubit Web Tablet"), and Compaq ("MSN Web Companion"). As prices continue to fall and these systems gain in popularity, they could become home fixtures as common as a toaster or a microwave oven. Lamar Potts, vice president of marketing for Be Inc., based in Menlo Park, California, believes that "you are going to have one literally in every room of your house."[18]

Although some critics may bemoan the absence of a hard drive with storage capacity as part of these systems, consumers need not be concerned. The free storage sites available online make a hard drive unnecessary for storing files or documents. Savvy consumers could attach an inexpensive external hard drive to these dumb terminals, download operating system software such as "LINUX" or "BeOS 5," and create an inexpensive, homemade PC system for under $200.[19]

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16. Jeff Bertolucci and Matt Lake, "Beyond Free-Mail," *PC World*, April 2000, pp. 151–164.

17. Michel Marriott, "For Extra Cheese, Ctrl + Pizza," *The New York Times*, February 10, 2000, p. E1.

18. Quoted in *ibid.*, p. E8. Also see Walter S. Mossberg, "A Better, Cheaper Way to Bring Your TV Set Into the Digital Age," *The Wall Street Journal*, March 23, 2000, p. B1.

Likewise, handheld devices or Personal Digital Assistants (PDAs) offer consumers a portable computer that can perform many of the same tasks as a desktop PC. As they become increasingly sophisticated and fall in price, such handheld devices likely will become as ubiquitous as cellular phones.

Finally, new video game consoles by Sega, Sony, Nintendo, and even Microsoft are likely to include modems and other integrated features (such as a CD/DVD player) to allow consumers to benefit from the gaming platforms they purchase for their children. For example, the new Sega Enterprises Ltd. "Dreamcast" system includes a 56kbs modem and Web-browsing software. Although it originally sold for $199, Sega recently announced that it will give the Dreamcast systems away for free to any consumer who agrees to sign up for two years of Sega Web Internet access service for $21.95 a month. Consumers already owning a Sega system can sign up for monthly Internet access and receive a $200 rebate check as well as a free keyboard.[20]

These hybrid and emerging computing systems offer consumers a continuously expanding array of options at affordable prices. While desktop PCs remain quite popular, the newer systems or those on the drawing board could become the technology of choice in the near future. In fact, market research firm International Data Corp. estimates that shipments of Internet appliances will surpass shipments of personal computers by as early as 2002.[21]

In other words, many industry watchers argue that a "post-PC" era is set to dawn that will be characterized by numerous computing and communications alternatives. In such a rapidly changing environment, policymakers should be wary of subsiding any one technology in particular, as this would be tantamount to picking winners and losers in a dynamic marketplace. America does not need an industrial policy for the computer sector.

IS GOVERNMENT INTERVENTION NEEDED?

The "Pipe into the Home" Concern

If all Americans can gain access to a computer and to the Internet for free or for a very small fee, there is only one potential problem left to worry the "digital divide" proponents: the lack of a conduit or "pipe into the home" through which the "have nots" could access the Internet, the World Wide Web, and interactive communications networks.

This is a legitimate concern, because the size of the "pipe" (the conduit's bandwidth capacity) will determine how fast a consumer can access the Internet or whether access will be available at all. The good news is that almost every American home is "wired." Telephone, cable, and electrical utility companies all wire American homes for service. (See Chart 2.) The bad news is that these companies only recently have taken steps to make the wires Internet-capable. This has been an expensive and difficult process, and it will take some time to complete. Nevertheless, many of these companies are rapidly upgrading their systems and developing and deploying new networks to satisfy demand for high-speed Internet access. Cable companies are deploying cable modems and upgrading their systems to make them Internet-capable.[22] Telephone companies are meeting this challenge by deploying digital subscriber line (DSL) services in many communities for high-speed access. SBC Communications Inc., for example, recently announced plans to spend $6 billion over the next three years to deploy more advanced broadband network technologies to its

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19. See "An I-Opening Hack: $200 PC," *Wired News*, March 16, 2000, at *http://www.wired.com/news/print/0,1294,34977,00.html*.

20. Dean Takahashi, "Sega Will Give Away Dreamcast Players to Lure Subscribers to the Web," *The Wall Street Journal*, April 4, 2000, p. B1.

21. Martin Stone, "Be to Launch BEAI OS For Web Devices," *Newsbytes*, February 7, 2000.

22. Reinhardt Krause, "While Bells Talk Up DSL, Cable Signs Up Customers," *Investor's Business Daily*, February 7, 2000, p. A6.

customers.[23] Similarly, fiber optic communications network providers "are in the midst of a fiber-building frenzy," according to Toni Mack of *Forbes* magazine.[24]

Many utility companies are also getting into the Internet business by modifying their electrical and natural gas networks to offer customers Internet access.[25] Montana Power Company announced in late March, for example, that it plans to sell its electricity and natural gas businesses and focus instead on providing communications services to its rural customers. It already has invested more than $250 million in its "Touch America" telecommunications subsidiary and deployed 12,000 miles of fiber optic cable throughout the state. It plans to double that total to over 26,000 miles of fiber optic cable by the end of 2001.[26]

"Private and public power companies have been laying fiber-optic lines inside their own networks for years, with the aim of communication between substations, and creating a more efficient way to read customers' power meters," notes John Borland of *CNET News.com*. "Slowly, those companies are beginning to realize that the fiber optic also

Chart 2   B1361

Wire to the Home Options

Telephone Providers
Local Carriers
Long Distance
Resellers
Fiber-Optic

Cable Companies

Electric/Natural Gas Utilities

Wireless/Satellite Providers

puts them in the catbird's seat for digital communications. Some of the large private companies, such as Enron, Reliant Energy, and Southern California Edison are already offering data services over their communications lines, and others are beginning to follow suit," Borland reports.[27] Since almost every residence in America has an electrical or natural gas wire running into it, consumers will soon gain access to yet another broadband provider of Internet access.

More exciting than these developments, however, are the efforts of wireless/satellite companies
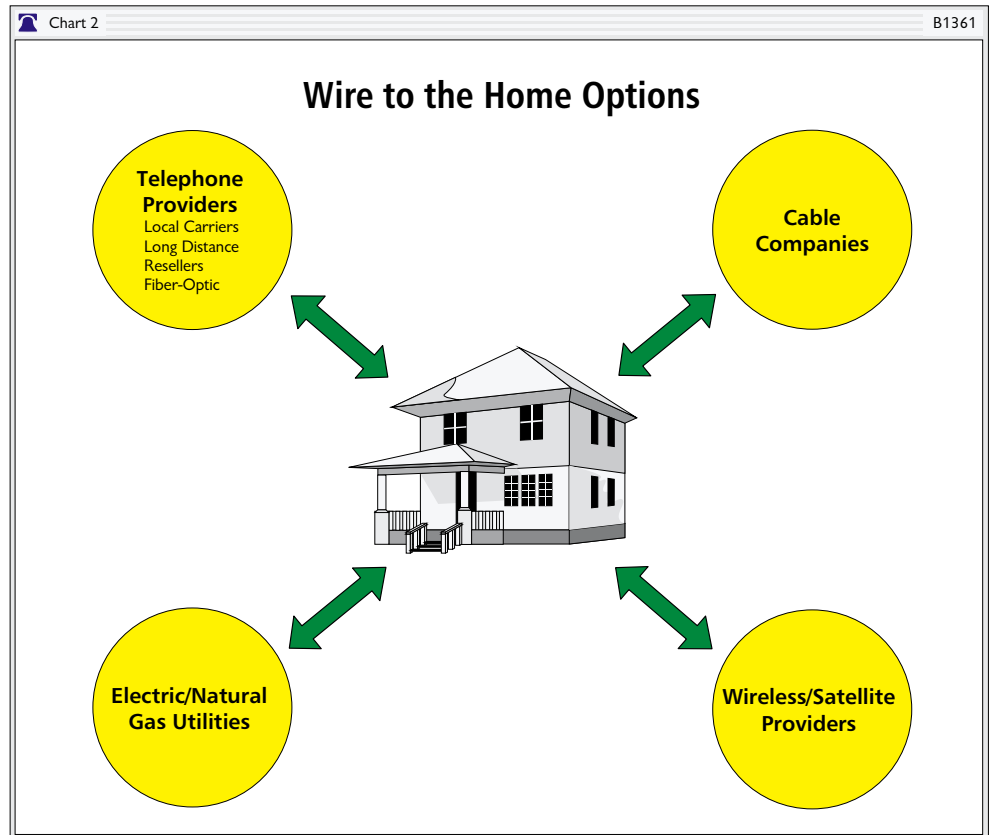
23. Stephanie N. Metha, "SBC Communications Plans to Speed Up DSL Service Rollout," *The Wall Street Journal*, October 18, 1999, p. B6; Reinhardt Krause, "To Fight Top Dog AT&T, SBC Spending Top Dollar," *Investor's Business Daily*, November 18, 1999, p. A6.

24. Toni Mack, "Fiber Frenzy," *Forbes*, April 19, 1999, p. 252.

25. See Corey Grice, "Electric, Gas Companies Light Up Communications," *CNET News.com*, March 16, 2000, at *http://news.cnet.com/news/0-1004-200-1575035.html*.

26. James P. Miller, "Montana Power Plan Divestiture for Telecom Focus," *The Wall Street Journal*, March 29, 2000, p. A6.

27. John Borland, "State Looks to Power Companies for Rural Broadband," *CNET News.com*, March 28, 2000, at *http://news.cnet.com/news/0-1004-200-1595782.html?tag=st.*

to develop and deploy set-top technologies that will provide consumers Internet access through satellite dishes. America Online recently invested $1.5 billion in Hughes Electronics Corporation's "DirecPC" venture, which is a satellite-based broadband Internet delivery system.[28] And more ambitious efforts are being undertaken by firms such as Teledesic LLC and SkyBridge LLC, which would provide high speed, satellite-based, broadband access to consumers anywhere in the world at speeds comparable to a fiber optic communications system. Such efforts to deploy wireless broadband services to consumers have the obvious advantage of lessening geographic concerns or making cost concerns less relevant. This would make it easier for firms to deliver Internet and communications services to rural America and other pockets of the country that are more difficult to wire.

Finally, it is important that policymakers understand that many burdensome regulations and taxes exist at the federal, state, and local level that discourage or prohibit the deployment of broadband technologies to the home.[29] Federal laws prohibit local telephone companies from deploying data networks across random geographic lines. Municipal government mandates on cable companies that attempt to regulate access to their networks could also slow broadband deployment.[30] Local zoning ordinances can interfere with the timely rollout of new broadband services. And the telecommunications sector in general faces a stunning myriad of industry-specific taxes at all levels that impede the development of new services.[31] Removing these impediments would greatly facilitate the deployment of high speed broadband services to homes.

PCs as Workplace Benefit

Many private employers are experimenting with PC-giveaway programs, offering their employees an inexpensive PC and Internet access as a benefit. Several major U.S. corporations recently announced plans to give their employees a computer, a monitor, speakers, a printer, and Internet access for as little as $5 to $12 per month.

Among the major companies now offering this new type of employee work benefit are: Ford Motor Company (350,000 employees); Delta Air Lines (72,000 employees); American Airlines (112,000 employees); and Intel Corporation (70,000 employees).[32] These efforts are likely to be imitated by other corporations.

How the Market Delivers

For decisionmaking purposes, it is worth examining whether government subsidies and central planning can ensure, better than the marketplace, that all Americans have access to personal computers and the Internet. In fact, as data from the U.S.

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28. See Andy Pasztor, "Hughes Aims to Expand AOL Satellite Venture," *The Wall Street Journal*, January 14, 2000, p. B2; "America Online and Hughes Electronics Form Strategic Alliance to Market Unparalleled Digital Entertainment and Internet Services," DirecPC.com, at *http://www.direcpc.com/consumer/scoop/pr11.html*.

29. For a summary of these regulatory restrictions, see Adam D. Thierer, "Broadband Telecommunications in the 21st Century: Five Principles for Reform," Heritage Foundation *Backgrounder* No. 1317, September 2, 1999, and "Broadband Telecommunications in the 21st Century: A Legislative Report Card," Heritage Foundation *Backgrounder* No. 1318, September 7, 1999.

30. See Adam D. Thierer, "Dark Day for the Internet?" *The Washington Times*, November 19, 1999, p. A18.

31. See Adam D. Thierer, "The NGA's Misguided Plan to Tax the Internet and Create a New National Sales Tax," Heritage Foundation *Backgrounder* No. 1343, February 14, 2000, pp. 22–23.
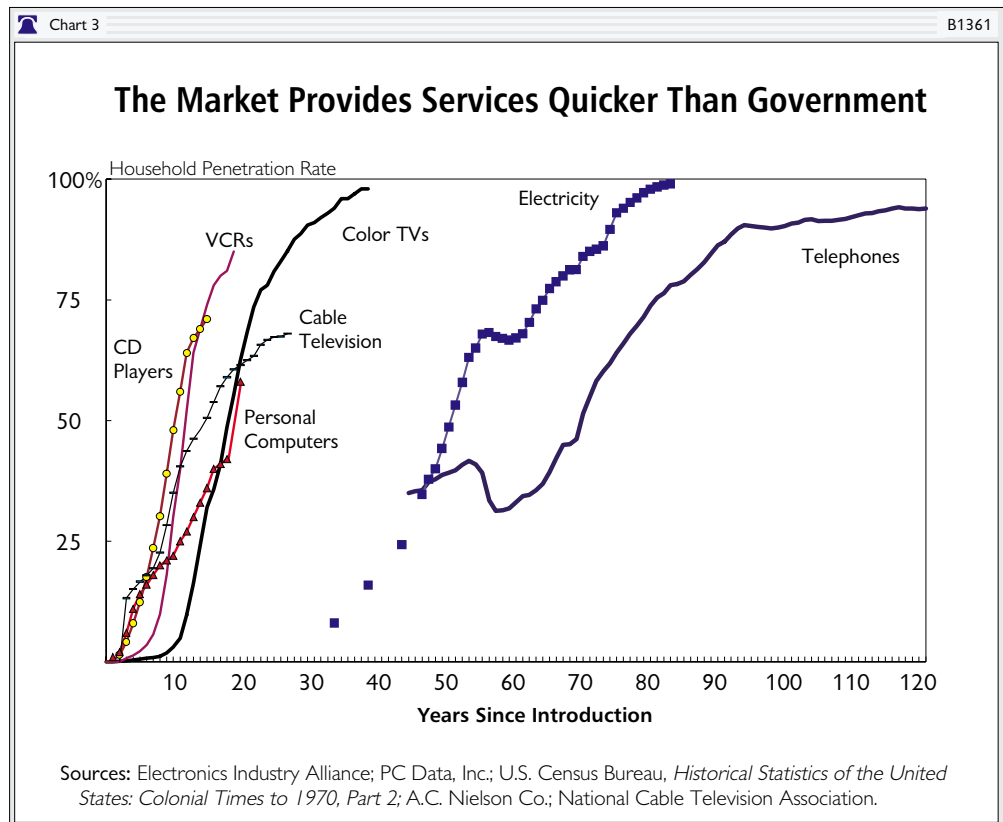
32. See Warren Brown and Frank Swoboda, "Ford Offers Home PC to Every Employee," *The Washington Post*, February 4, 2000, p. A1; Frank Swoboda, "Delta Joins Ford, Offers Home PCs to Workers," *The Washington Post*, February 5, 2000, p. E1; David P. Hamilton and Martha Brannigan, "Fledgling PeoplePC Lands Deals With Ford and Delta," *The Wall Street Journal*, February 7, 2000, p. B4; Cliff Edwards, "Cos. Often Offer Free Employee PCs," *The Associated Press Online*, March 7, 2000; Jon Katz, "Ford's Get-Wired Drive Accelerates a Better Future," *The Freedom Forum Online*, February 10, 2000, at *http://www.freedomforum.org/technology/2000/2/10katz.asp*.

Census Bureau, the Electronic Industries Alliance, and other sources on household penetration rates for major technologies indicate, Americans are gaining access to PCs and the Internet at a rate much faster than for previous technologies.

For example, consider how long it took other technologies to reach 50 percent penetration of U.S. households. As Chart 3 and Chart 4 illustrate, it took television 18 years to break the 50 percent threshold; radios, 28 years; VCRs, 12 years; electrical service, 52 years; and telephones, 70 years. By comparison, Forrester Research, Inc., estimates that the Internet, which has existed as a commercial service for less than 10 years, will be available to over half of all American households by 2001. PC Data Inc. currently estimates that 47.6 percent of all households already have Internet access. And a very optimistic survey by market research firm Cahners In-Stat Group estimates that over 60 percent of all American homes would have Internet access by the end of this year.[33] Moreover, although estimates vary, Forrester, PC Data Inc., and other sources estimate that roughly 55 to 60 percent of American homes already possess a personal computer.

As Helen Chaney of the Pacific Research Institute notes,

> Internet access has spread to 50 million people in only four years. That's about

Chart 3 B1361

The Market Provides Services Quicker Than Government

Household Penetration Rate

Years Since Introduction

Sources: Electronics Industry Alliance; PC Data, Inc.; U.S. Census Bureau, *Historical Statistics of the United States: Colonial Times to 1970, Part 2;* A.C. Nielson Co.; National Cable Television Association.
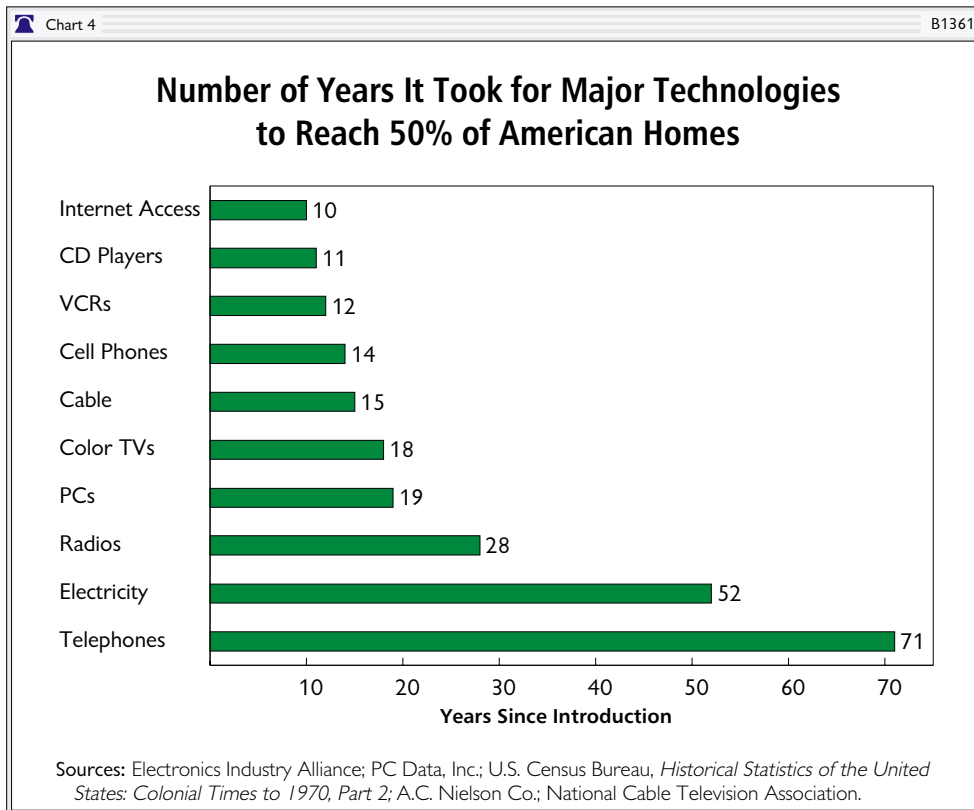
nine times faster than radio, four times faster than the personal computer and three times faster than television. At this rate, it won't be long until all of those who desire Internet access will have it. If the government wants to spread Internet access, they should leave the Internet unregulated and ease up on the taxes individuals pay.[34]

The Slippery Subsidy Slope

Subsidizing PCs and the Internet today could become a slippery slope leading to increased government regulation tomorrow. All too often, industries that government sought to promote, such as telephony, electricity, and railroads, became heavily regulated over time. This led to decreased competition, inferior goods and services, less innovation and entrepreneurialism, and a general lack of price competition.

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33. See *http://www.instat.com/pr/2000/is0001sp_pr.htm.*

34. Chaney, "The U.S. 'Digital Divide' Is Not Even a Virtual Reality."

Number of Years It Took for Major Technologies to Reach 50% of American Homes

Chart 4   B1361

Technology	Years Since Introduction
Internet Access	10
CD Players	11
VCRs	12
Cell Phones	14
Cable	15
Color TVs	18
PCs	19
Radios	28
Electricity	52
Telephones	71

Sources: Electronics Industry Alliance; PC Data, Inc.; U.S. Census Bureau, *Historical Statistics of the United States: Colonial Times to 1970, Part 2;* A.C. Nielson Co.; National Cable Television Association.

If millions of Americans choose to utilize computing technologies in the workplace and not have a home computer, should they be counted among those who lack access? If a significant segment of the population continues to rely on workplace access instead of personal ownership of computing technologies, then household penetration rates for PCs and Internet access may never break 80 percent. Clearly, this does not mean those households without PCs or Internet access are falling into a "digital divide."

With PC and Internet penetration occurring more rapidly than previous technologies had, there appears to be little need for government intervention. As Chaney aptly summarizes, "This all goes to show the private sector has it covered. What is required from the government now is not money, but patience."[35]

Choosing Not to be Connected Is a Personal Option

Many individuals or families choose not to have a personal computer and Internet access in the home. Some Americans, in fact, shun the presence of computing technologies in the home altogether, the same way others decide not to have cable television or other technologies in their homes. Moreover, many citizens have access to a computer in the workplace, and feel little need to have one in the home.

How the Market Targets Low-Income Homes and Minorities

Politicians should not allow this debate to turn into a race or civil rights dispute since, by most accounts, the fastest growth in computer use may be occurring among minorities and low-income households. As Scott Mills, Chief Operating Officer of Black Entertainment Television Inc.'s "BET.Com" noted recently in testimony before the House Committee on Small Business Subcommittee on Empowerment,

> African Americans currently underutilize the Internet relative to other ethnic segments. However, African Americans are projected to be the fastest growing online ethnic population in 2000. Forrester Research projects that 40% of the 34 million person African American community will be online by the end of 2000.[36]

35. *Ibid.*

Cato Institute Executive Vice President David Boaz agrees with this assessment, noting that, "From 1994 to 1998, computer ownership by whites increased 72%, while ownership by blacks increased 125%."[37]

Moreover, low-income households are increasingly seen as the most popular segment of the market to target by computer firms. "PC ownership has reached a near-saturation point among middle- and upper-income families," notes John Simons, Markle Fellow at the New America Foundation in Washington, D.C.[38] "If computer makers wish to maintain the extraordinary revenue growth they've seen over the last half-decade, they will soon be forced to seek out new first-time buyers," he argues. Moreover,

> Some PC companies no doubt will push hard to find willing buyers among the 13.5 million U.S. households with annual incomes less than $25,000, 90 percent of which do not own a computer.[39]

This expectation helps explain the recent rise of free and low-priced PCs.

CONCLUSION

Is there a digital divide crisis in America? No, there is not. If Americans really want a personal computer and access to the Internet, they can obtain them at very little cost. Moreover, this trend to lower-cost PCs and more access is likely only to increase. Expensive federal entitlement programs will not facilitate this process; in fact, they might actually make things worse by putting pressure on computer prices to hold steady or increase.

To the extent government involvement is needed, it is to remove any tax and regulatory roadblocks that discourage private companies in the free market from offering new products and services that consumers demand. There is no constitutional or economic justification for federal intervention.

As the data presented above illustrate, policymakers at all levels need not fear that some Americans may be left behind in this profoundly dynamic Information Age. Proposals to offer consumers $500 vouchers for computer systems are particularly unwise when consumers can obtain them for hundreds of dollars less. It would be tantamount to giving every American a $20,000 subsidy for a new automobile when models are available for less than half that price. Furthermore, if indications are right that the world is entering a "post PC" era in which various types of technologies will be used to communicate and access the Internet, then current efforts to subsidize the diffusion of personal computers will limit many people to technology that quickly becomes outdated.

Clearly, the personal computer industry is not in crisis. As the recent *Computer Shopper* magazine article on the rise of the free-PC market fittingly concludes:

> [I]t's becoming increasingly clear that the free-PC movement has come a long way in a relatively short time, and it obviously benefits consumers who wouldn't otherwise be able to afford a Net-connected computer. And that's a very good thing indeed.[40]

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36. Scott Mills, "Bridging the Technological Gap: Initiatives to Combat the Digital Divide," Testimony Before the House Committee on Small Business Subcommittee on Empowerment, U.S. House of Representatives, 106th Cong., March 28, 2000.

37. David Boaz, "A Snapshot View of a Complex World," *Intellectualcapital.com*, July 15, 1999.

38. John Simons, "Cheap Computers Bridge Digital Divide," *The Wall Street Journal*, January 27, 2000, p. A22.

39. *Ibid.*

40. "The Bottom Line on Free PCs," *Computer Shopper*, March 2000, p. 164.