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Is the United States Falling Behind in Adopting Broadband?

Some observers contend that the United States is lagging behind other industrialized nations in a race for technological leadership and prosperity in the future because by at least one measure of the prevalence of high-speed Internet access—the number of subscribers to broadband services per 100 people in the population—the United States ranks only sixth (see the table below). But the burgeoning growth of participation in the Internet documented in other countries is far more likely to enhance rather than detract from the U.S. economy's continued expansion and the nation's overall economic welfare. Businesses and consumers in the United States benefit whenever the number of connections to the Internet grows—whether those connections are here or abroad. As the number of people with high-speed Internet access rises, the prospect of increased sales and profits acts as a strong incentive for U.S. businesses to increase their Internet operations and invest in faster, more resilient connections as well as more specialized content and secure servers. For U.S. consumers who subscribe to a broadband service, additional connections offer the benefits of more people to communicate with and a thriving online marketplace. For some consumers who do not currently have high-speed Internet access, those benefits may also tip the scales in favor of subscribing.

Selected Internet-Related Measures Comparing the United States and the Other OECD Nations, 2002

	United States			Other OECD Nations	
Measure	Total	OECD Rank	Percentage of OECD Total	Total[a]	Highest Value for a Nation
Broadband Subscribers					
In millions	19.8	1	36	35.9	10.1 (Korea)
Per 100 population	6.9	6	n.a.	4.9	21.4 (Korea)
Internet Subscribers					
In millions	78	1	36	135	24.0 (Japan)
Per 100 population	27	7	n.a.	19	59.0 (Iceland)
World Wide Web Sites					
In millions	18.0	1	50	17.0	7.0 (Germany)
Per 100 population	6.4	5	n.a.	3.1	8.5 (Germany)
Secure Servers					
In thousands	107.0	1	66	54.5	10.0 (U.K.)
Per million population	3.8	2	n.a.	1.4	4.8 (Iceland)

Source: Congressional Budget Office based on data from the Organisation for Economic Co-operation and Development (OECD).

Notes: Numbers in the text and table may not sum to totals because of rounding.

n.a. = not applicable.

a. Figures relative to population are OECD averages.

By most measures, U.S. businesses and consumers make more and better use of the Internet than do their counterparts in other nations. There are more people and businesses in the United States with high-speed access to the Internet than in any other single country. (The same is true for dial-up access.) Indicators of commercial applications—for example, the number of secure servers and of connections to them—also show the United States in the forefront of Internet use. U.S. technological leadership suggests that the United States will continue in the future to reap the benefits of its participation in the Internet.

How Will Growing Internet Participation Abroad Affect U.S. Consumers and Businesses?

Currently, the majority of U.S. subscribers to an Internet access service use a dial-up connection, through their local telephone line. That kind of link is slower than the high-speed access available through a cable modem or digital subscriber line. Some analysts argue that broadband's high speeds are critical to many of the newest Internet services now being developed—such as the sharing of large graphics files. Furthermore, such analysts maintain, without widespread adoption of broadband by U.S. consumers, the economic benefits to be gained from the use and further development of the Internet will move from the United States to other nations.

That argument is not persuasive. U.S. consumers are already among the world's most active Internet users. The growth in broadband connections worldwide that is cited as evidence that the United States is falling behind in fact grants U.S. consumers more opportunity and choice. As the use of broadband spreads both domestically and abroad, it becomes easier, for example, to exchange digital photographs and other large files with people overseas. Similarly, the recent growth of Internet telephone service has reduced the cost of international calls for U.S. consumers. In short, the rapid adoption of broadband worldwide gives the average consumer both a greater incentive to pay for that kind of service and the ability to tap into many of the same resources that were previously available only to large organizations.

For U.S. businesses, growing foreign high-speed access to the Internet increases the return on their past and current investments in information technology by opening up new markets and facilitating purchases of U.S. goods and services by customers in other countries. Over the past 10 years, the Internet has increased the productivity of the millions of computers and databases used by U.S. corporations, linking them not only with one another but with the computers and databases of businesses (and consumers) in other nations. A growing body of economic research finds that U.S. firms' rapid application of information and communications technologies, particularly in the wholesale and retail trades and in the financial services sector, partly explains the strong growth of U.S. labor productivity (or workers' output per hour of labor) that characterized the second half of the 1990s. More high-speed connections, either at home or abroad, are likely to support continued productivity growth in the future.

A recent Congressional Budget Office paper (*Does the Residential Broadband Market Need Fixing?*) examined the U.S. market for broadband services to residential customers and small businesses. The paper concluded that the domestic market for broadband subscriptions was growing at such a fast rate that federal subsidies intended to boost that rate were unlikely to produce additional economic gains large enough to offset the potential costs that subsidies might impose in other parts of the economy. In contrast, an increase in the number of broadband connections in other nations provides an incentive to U.S. businesses and consumers to purchase high-speed access without giving rise to such costs.

Does the United States Have as Many Broadband Subscribers as Other Nations Have?

A broad array of indicators shows that the United States is the single most prominent national participant in the Internet economy. For example, according to Federal Communications Commission statistics, by December 2002, 19.8 million residential, business, and other institutional customers in the United States were subscribing to a broadband service, a total larger than that for any other single nation. Further data, covering the 30 industrialized countries that are members of the Organisation for Economic Co-operation and Development (OECD), show that U.S. subscribers accounted for 36 percent of the OECD nations' total broadband service subscriptions of 55.8 million.

Yet those statistics probably understate the number of people in the United States (and abroad) who have ready access to a broadband connection. In most households, a

subscription to a broadband service provides access for multiple users. In addition, many people use the Internet or e-mail at work, and much of that traffic is likely to be carried over a high-speed connection. According to data from the Bureau of the Census, use of the Internet is growing quite rapidly among U.S. workers. In 2001, 42 percent of employed people age 25 or older used the Internet or e-mail at work, up from 21 percent in 1999. When more than a few employees have to connect regularly from a single workplace, using a small number of broadband links to connect them all becomes quite economical. Similarly, a single broadband connection at a school or college will give many students high-speed Internet access.

The United States ranks lower than some other countries—but still in the highest tier—in the number of broadband subscriptions relative to the size of its population. As of the end of 2002, a half dozen other mainly small or less populous nations had higher rates of broadband subscriptions—relative to their population—than the United States had. The Republic of Korea, which had 10.1 million broadband subscribers, led the field on a per capita basis with 21.4 subscribers for every 100 people in the population (in statistical terms, per hundred population). By that measure, Canada was next; its 3.6 million subscribers equaled 11.7 subscribers per hundred population. Belgium, Denmark, and Sweden, with less than 1 million subscribers each, had roughly 8 subscribers per hundred population. The corresponding measure for the United States was 6.9 subscribers, above the average for the OECD of 4.9 per hundred population.

The large absolute number of subscribers in the United States is more important than the above rates in evaluating the benefits provided by broadband Internet connections. Internet-based services, such as the provision of specialized online content, depend on a critical mass of potential consumers and the economies of scale permitted by a large market. The U.S. broadband market is ideal in that regard because of its size, its wealth, its fast rate of growth, and its unity (it encompasses only one language and a single set of laws and customs).

The increasing size and sophistication of the U.S. online marketplace have prompted Internet retailers to seek new ways of providing services and to develop innovative, specialized content. For example, a major U.S. online bookseller recently digitized some 33 million individual pages from 120,000 different books that it offers for sale. Those pages permit would-be customers to "leaf through" a book online to help them decide whether to buy it, just as they would in a bookstore. Other online companies are beginning to respond to such innovation, investing in specialized content and services.

How Does the United States Rank on Other Internet-Related Measures?

Counting subscribers to broadband services is not the only way to measure a country's and its citizenry's involvement in, use of, and potential for benefiting from the Internet. By most other Internet-related metrics—specifically, total subscriptions to Internet services, the variety and extent of available content, and security of commercial transactions—the United States' role is large. As with rates of broadband service subscribers, the United States leads on an absolute basis but trails some countries with smaller populations on a per capita basis.

Internet Service Subscriptions

As of December 2001, the total number of Internet connections in the United States (that is, the sum of dial-up, broadband, and leased telephone or fiber-optic connections) was greater than the total for the next four countries combined. Statistics compiled by the OECD show that 213 million subscribers to an Internet service in its member countries had what it termed fixed, or nonmobile, Internet connections. Of those subscribers, over one-third (78 million) were in the United States, outnumbering subscribers in the European Union nations by 14 million. Japan, with 24 million subscribers, had the second largest subscriber base of any single nation; however, its base was still less than one-third that of the United States. (Of course, the number of subscriptions does not necessarily translate into the number of users. As with broadband connections, one Internet service subscription often serves more than one person.)

However, the prevalence of Internet service subscriptions in the United States, like the prevalence of broadband service subscriptions, was lower than that in several smaller countries. The United States had 27 subscribers per hundred population, whereas Iceland had 59 and the Republic of Korea had 49. Denmark, Sweden, Switzerland, and Norway also had higher rates than did the United States. OECD countries averaged 19 subscribers per hundred population.

The United States' lead in the number of businesses and consumers with access to the Internet is partly explained

by the Internet's origins in U.S. military and science programs and the widespread use of personal computers in the United States. In other nations, however, the absolute number of subscribers is growing, as more and more businesses and consumers recognize the benefits of owning personal computers and being connected to the Internet.

Content on the Internet

World Wide Web sites are one of the leading sources of content on the Internet and an indicator of both civic and commercial use of it. (E-mail also provides a great deal of content, but such traffic is usually private.) In July 2002, the Internet survey firm Netcraft polled 35 million individual Web sites and their associated computers in OECD countries. Roughly half of those sites (18 million) were located in the United States. Two years earlier, the United States had claimed 65 percent of the OECD total. Again, on a per capita basis, several countries exceeded the United States' rate of 6.4 Web sites per hundred population. Germany led the world with 8.5 sites, and the OECD averaged 3.1 sites per 100 population.

Secure Online Commerce

Completing a sale online usually requires a secure server—a computer running specialized software that permits encrypted transmission of credit card and other personal information over the Internet. A survey of secure servers in the OECD nations found 161,000 in July 2002, and of those, 107,000 (66 percent) were in the United States. Today, only Iceland (with 4.8 secure servers per million population) leads the United States (3.8 per million population) in the number of secure servers measured on a per capita basis.

Beyond the servers themselves, the number of connections (links) to them indicates how intensively they are used. Using the Google search engine, OECD researchers surveyed those connections in August 2002 and found 4.8 million links worldwide. Almost 45 percent of the links (2.2 million) were addresses maintained by U.S. Internet service providers.

This issue brief was prepared by Philip Webre. Most of the statistics were drawn from the following sources:

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