

THE DIGITAL DIVIDE AND ECONOMIC BENEFITS OF BROADBAND ACCESS

Introduction

This issue brief provides an overview of the state of broadband in the United States using the most recent data available from the 2014 American Community Survey and building on the Council of Economic Advisers' previous [analysis](#) of the digital divide.¹ Much progress has been made connecting Americans to broadband Internet, but a substantial digital divide remains. This brief reviews the benefits of Internet connectivity, highlighting one in particular—better labor market outcomes—that can accrue to American workers from accessing broadband Internet, especially through online job searches. Addressing the remaining digital divide will require a focus on affordability—which can be addressed by a range of measures including policies to foster more competition between broadband providers—as well as on access to devices, and digital literacy.

The main findings highlighted in the issue brief include:

- The number of U.S. households subscribing to the Internet has risen 50 percent from 2001 to 2014, and three-quarters of American households currently subscribe;
- A digital divide remains, however, with just under half of households in the bottom income quintile using the Internet at home, compared to 95 percent of households in the top quintile;
- Supply-side factors may also have an important influence on the rate of broadband subscription: areas with more wireline providers have higher Internet subscription rates;
- Broadband provides numerous socio-economic benefits to communities and individuals,

improving labor market outcomes for subscribers, increasing economic growth, providing access to better health care, and enhancing civic participation;

- Academic research shows that using online job search leads to better labor market outcomes, including faster re-employment for unemployed individuals, yet because of a digital divide, low-income households are less able to use these tools than high-income households;
- Unemployed workers in households with Internet were 4 percentage points more likely to be employed one month in the future than those in households without Internet. This difference persists over time.

State of Broadband in the United States

Since 2009, more than \$260 billion has been invested in broadband infrastructure, largely by the private sector but also by the public sector. Investments from the Federal Government alone have led to the deployment or upgrading of over 115,000 miles of network infrastructure. The President has announced concrete steps to ensure that fast and reliable broadband is available to more Americans at the lowest possible cost, and these initiatives are bearing fruit. For example, in 2013 roughly 40 million students lacked access to broadband at their schools and, in response, the President's ConnectED initiative was created to help connect 99 percent of American students to high-speed broadband in their classrooms and libraries by 2018. [Data](#) from 2015 show that since ConnectED was launched in 2013, an additional 20 million students and 1.4 million teachers now have access to fast broadband

¹The speed required for an Internet plan to be categorized as "broadband" is ever-evolving, both in terms of the official FCC definition (currently speeds of 25 Mbps download and 3 Mbps upload) and in terms of the speed required to derive maximum value from using the

Internet. In recent years studying the effect of Internet use on outcomes such as job search has essentially become equivalent to studying the effect of broadband use, again because of the speeds required to get the most out of Internet-based platforms.

Table 1: Percent of U.S. Households with Internet Access, 2001 to 2014

| | 2001 | 2003 | 2007 | 2009 | 2013 | 2014 |
|-----------------------------------------------------|------|------|------|------|------|------|
| All Households | 50.6 | 54.7 | 61.5 | 68.7 | 74.4 | 75.8 |
| <i>Race of head of household</i> | | | | | | |
| White alone | 56.0 | 59.9 | 66.7 | 73.3 | 77.4 | 77.6 |
| Black alone | 31.0 | 36.2 | 44.8 | 54.2 | 61.3 | 63.3 |
| Asian alone | N/A | 66.7 | 75.5 | 80.5 | 86.6 | 87.6 |
| Native American Alone | 38.5 | 41.6 | 41.3 | 53.4 | 58.2 | 58.3 |
| Hispanic of any Race | 34.3 | 36.0 | 43.2 | 52.7 | 66.7 | 68.5 |
| <i>Educational attainment of head of household*</i> | | | | | | |
| Less than high school | 17.5 | 19.8 | 24.0 | 32.2 | 43.8 | 46.0 |
| High school graduate | 40.4 | 43.8 | 49.5 | 57.4 | 62.9 | 64.2 |
| Some college | 57.8 | 62.6 | 68.5 | 74.8 | 79.1 | 80.3 |
| College graduate or higher | 75.3 | 78.7 | 83.6 | 88.5 | 90.1 | 90.9 |

*Internet access by educational attainment is displayed here for those households where the head of the household is aged 25 or older.

Source: Current Population Survey, Census (1998, 2000, 2001, 2003, 2007, 2009); American Community Survey, Census (2013, 2014); CEA calculations.

in the classroom, about halfway to ConnectED’s goal.² As another example, in July 2015, the U.S. Department of Housing and Urban Development unveiled [ConnectHome](#), a new initiative involving communities, the private sector, and the Federal Government, designed to expand broadband access to more families across the country. The pilot program launched in 27 cities and one tribal nation and will initially reach over 275,000 low-income households, including 200,000 children.

Analysis of recently released data from the [American Community Survey](#) (ACS)³ presented in Table 1 indicates that the percent of U.S. households who subscribe to the Internet continues to increase. In 2001, 51 percent of

U.S. households subscribed to the Internet; this number has risen to over 75 percent in 2014.⁴ Minority households saw even larger gains over this time period. For example, households with a Black or Hispanic head of household both saw their rate of Internet subscriptions double from 2001-2014 (compared to a 50 percent increase for all households).⁵

Challenges remain, however. As indicated in Table 1, Black, Native American, and Hispanic households report lower Internet subscription rates compared to national averages. Households headed by individuals with a high school education or less also report lower Internet subscription rates. These racial and educational attainment disparities are indicative of a digital divide.

²These data are available through Education Superhighway’s 2015 State of the States report.

³ The 2014 American Community Survey data, released in December 2015, are the most recent ACS data available.

⁴ The ACS defines Internet access as whether “anyone in this household uses the Internet from home.” The results and overall trends in the data are qualitatively similar even when instead analyzing the question of whether or not the individual used the Internet at all over the past year, irrespective of having a subscription. Between 2012 and 2013, Census switched from using the Current Population Survey to the American Community Survey as their

primary measure of Internet use, as the latter facilitated measurement at a higher level of geographical resolution. As a result, the magnitude of the increases in adoption rates observed between years on either side of this break may not be precisely measured. In addition, the number of observations for Native American households in these samples is so small that the exact magnitude of year-to-year increases in their adoption rates may also be imprecisely measured.

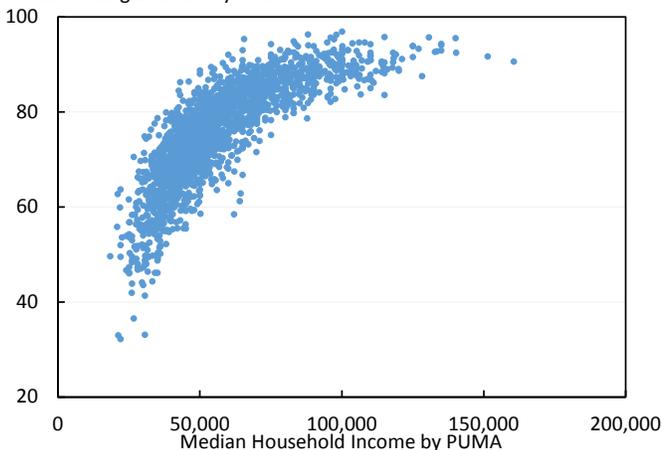
⁵ “White alone” indicates that the heads of household are white only, and similarly for the other categories.

The digital divide was explored in depth in an [issue brief](#) published by the Council of Economic Advisers (CEA) in July 2015 that used 2013 ACS data.

One way to visualize the digital divide in the U.S. is to plot how home Internet use varies by household income across different areas of the country. In Figure 1 below, each dot represents a single area (technically a Public Use Microdata Area or PUMA), containing roughly 100,000 residents. The figure uses data from the 2014 ACS data (the most current data available) to plot the median household income for each area versus the share of households in the same area that report using the Internet at home. The figure shows a strong positive correlation between income and Internet use. Areas of the country with higher household income exhibit higher home Internet use, and areas of the country with lower household income report lower home Internet use. But income is not the only factor; it only explains 64 percent of the variation in home Internet use and even when holding income constant—for example, when comparing areas around the average median household income—the percent of households using the Internet varies by plus or minus about 10 percentage points.

Figure 1: Household Income and Home Internet Use, 2014

Percent Using Internet by PUMA



Source: Census, American Community Survey; CEA Calculations.

Another dimension of the digital divide, though less stark than the divide by income, is the difference in Internet

⁶ As a result of this definition, approximately two-thirds of the areas are classified as urban, and the remaining one-third as rural.

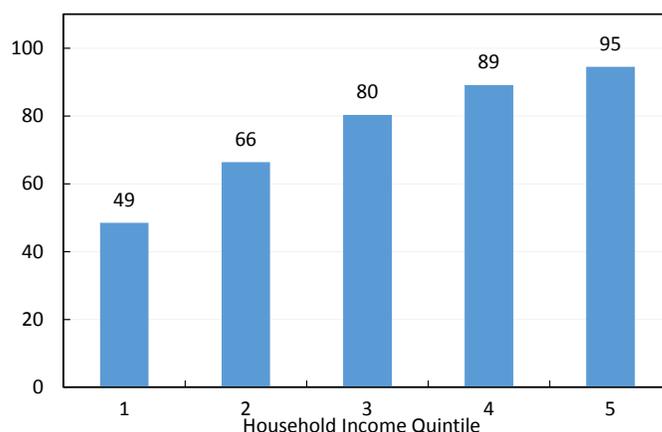
⁷ According to the [issue brief](#) published by CEA in July 2015, the spread between the lowest density quartile of areas and the highest was 9 percentage points. In contrast

use between urban and rural populations. For the purposes of this brief, areas are defined as rural when they have a density of fewer than 1,000 persons per square mile and urban when they are above that threshold.⁶ According to data from the 2014 ACS, approximately 79 percent of urban households use the Internet at home, compared to 74 percent of rural households.⁷

Figures 2a and 2b use household level data from the 2014 ACS to provide additional analysis of the ways in which Internet use varies with income. Figure 2a indicates that only about 49 percent of households with income in the bottom quintile of the household income distribution—those households that are earning less than \$21,700 per year—are using the Internet. In contrast, approximately 95 percent of households in the top quintile of the income distribution are using the Internet. Figure 2b indicates that of the estimated 62 million Americans not using Internet at home, approximately 21 million of them, about 35 percent, are in the lowest income quintile.⁸ These estimates were calculated by totaling the number of persons living in households in each household income quintile with and without internet in the home.

Figure 2a: Households Using Internet at Home by Income, 2014

Percent of Households

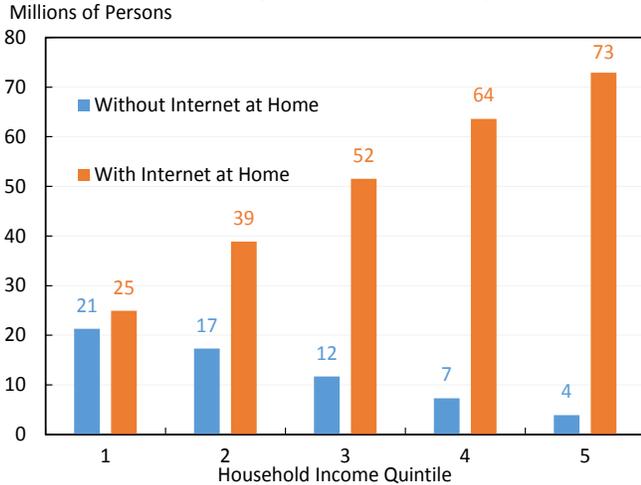


Source: Census, American Community Survey; CEA calculations.

the spread between the lowest income quartile of areas and highest was 24 percentage points (Table 2).

⁸ There are not an equal number of persons in each income quintile because the quintile boundaries are determined by household income quintiles, and higher income households tend to be larger.

Figure 2b: Persons Using Internet at Home by Income, 2014



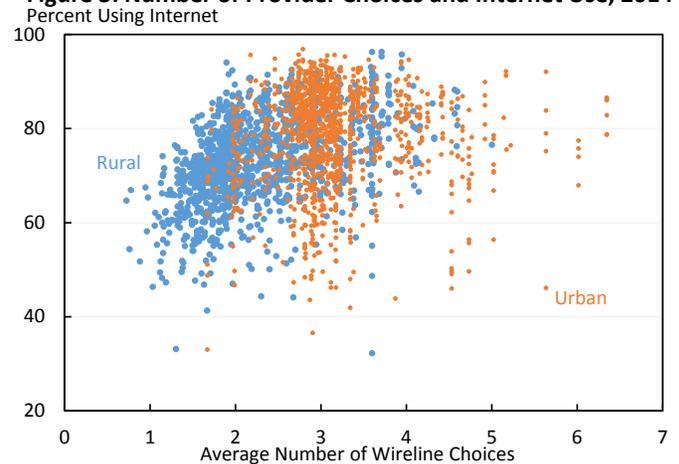
Source: Census, American Community Survey; CEA calculations.

Role of Competition

Addressing the digital divide requires effort on multiple fronts, including policies that make broadband more affordable (NTIA 2013; GAO 2015). There are substantial differences in levels of competition across different geographic areas of the United States, which are likely to correlate with both service quality (i.e. speed) and price. That is, in areas where there is more competition, all else equal, we should see higher levels of service quality and lower prices which, in turn, should lead to higher percentages of Internet usage. Figure 3 plots each area by the average number of choices for wireline Internet available in the area against the percent of households in the area that use the Internet at home.⁹ In general, there is a positive relationship between the number of providers (x-axis) and the percent of households using the Internet (y-axis).

⁹ The average number of wireline choices for a given PUMA is calculated using data from the National Broadband Map, a collaboration between FCC and NTIA. We calculate this average by taking the sum of the

Figure 3: Number of Provider Choices and Internet Use, 2014



Source: Census, American Community Survey; NTIA/FCC, Broadband Map; CEA Calculations.

It is important to point out that the relationship between the number of wireline choices and Internet use in Figure 3 is a correlation and not necessarily causal. Using regression analysis to further investigate the relationship between the number of wireline choices and Internet use, and controlling for a number of potentially relevant demographic variables like income, age, race, education, and population density, reveals a statistically significant relationship between the number of wireline choices and the share of households using Internet at home. That is, this result suggests that as the number of wireline choices increase, so too does the probability of Internet use. This positive relationship has been documented in other studies. For example, [Kolko](#) (2010) matches data from the Federal Communications Commission (FCC) on the number of broadband providers at the zip code level with data from Forrester Research on the percent of the survey respondents in the zip code using broadband. Kolko finds a strong positive correlation between the number of competing providers and the probability of broadband use.

The positive correlation between the number of providers and the probability of broadband use is likely driven by the increase in competition between providers as their number increases, which in turn leads to lower prices and/or higher quality offerings. The benefits of competition have been documented elsewhere, in both international and domestic contexts. A [2014 OECD](#)

cumulative access rates for each number of wireline choices (i.e. the sum of percent of the PUMA with at least 1 provider, the percent with at least 2 providers, the percent with at least 3 providers, etc.).

[survey](#) of eleven OECD member countries found that new entrants in wireless markets have a substantial impact on both prices and quality of service, even when a market already had several participants (i.e. the fourth entrant into a wireless market with three existing participants substantially improved costs and services). Even the threat of new competition can lead to service improvements (Seamans 2012). When Google Fiber was to be rolled out in Kansas City, speeds on existing networks in Kansas surged 86 percent, which was, at the time, the largest year-over-year jump in bandwidth observed in any state in 2012 (Talbot 2013). Likewise, when Google Fiber indicated it would begin offering extremely fast connection speeds in Austin, TX, AT&T responded by announcing its own gigabit network (Steffy 2014).

Competition can take many forms, including additional private Internet service providers, cable companies, and even city-owned systems. As envisioned by the Telecommunications Act of 1996, the Federal Government's role has been to promote competition and reduce regulation for the sake of lower prices and higher quality service in "any communications business," which explicitly includes Internet. One potentially important source of such competition is that offered by municipal providers, whose role the President [highlighted](#) in Cedar Falls, Iowa in January 2015. Several communities have made use of these services, which in some localities approaches speeds of 1 Gbps, to encourage competition, drive innovation, and save consumers money.¹⁰

Until recently, some of the communities that have relied on municipal broadband to increase competition,

namely those in North Carolina and Tennessee, were subject to state laws designed to protect private broadband providers from government competition. The FCC [ruled](#) in February 2015 that it would preempt such regulations—a move supported by the Administration.¹¹ In doing so, the FCC relied on the broad authorities it is granted by Section 706 of the Telecommunications Act of 1996 to "promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment."

Benefits of Broadband

Addressing the digital divide is critical to ensuring that all Americans can take advantage of the many well-documented socio-economic benefits afforded by Internet connections. These benefits are most evident when consumers have access to the Internet at speeds fast enough to be considered broadband; these speeds are required to facilitate full interaction with advanced online platforms.

By 2006—before the widespread availability of streaming audio and video—broadband Internet accounted for an estimated \$28 billion in U.S. GDP (Greenstein and McDevitt 2011). Nearly half of this total was due to households upgrading from dial-up to broadband service. By 2009, broadband Internet accounted for an estimated \$32 billion per year in net consumer benefits (Dutz, Orszag, and Willig 2009). These findings are broadly consistent with studies that cover other countries.¹² Broadband expansion is also associated with local economic growth in some cases.¹³

¹⁰ For more detail on the specific communities (Chattanooga, TN, Wilson, NC, Lafayette, LA, Scott County, MN, and Leverett, MA, among others) that have unveiled this service and the benefits they enjoy, see the following Executive Office of the President report: https://www.whitehouse.gov/sites/default/files/docs/community-based_broadband_report_by_executive_office_of_the_president.pdf

¹¹ North Carolina and Tennessee have since sued the FCC in the D.C. Circuit. DOJ has formally announced that it would not take a position in those cases.

¹² A study of OECD countries by Czernich, Falck, Kretschmer, and Woessmann (2011) finds that a 10 percentage point increase in broadband penetration

boosts per capita growth rates by 0.9 to 1.5 percentage points. A cross-country analysis by Najarzadeh, Rahimzadeh, and Reed (2014) finds that a one percent increase in the size of a country's Internet-using population increases GDP per employed person by 8 to 15 dollars.

¹³ DiMaggio and Bonikowski (2008) use CPS data from 2000 and 2001 and find that Internet use leads to higher wages. Forman, Goldfarb, and Greenstein (2012) show investments in broadband infrastructure are correlated with wage and employment growth in 6 percent of US counties, representing 42 percent of the U.S. population. Whitacre, Gallardo, and Strover (2014) find that rural broadband adoption in the United States was positively associated with income growth between 2001 and 2010

[Kolko](#) (2012) finds that growth is particularly concentrated in industries that are more IT-intensive and in areas with lower populations. In addition, insofar as it allows a person to participate more fully in the economy, developing Internet skills may even positively affect a person's wages (Goss and Phillips 2002).

Broadband has made medical care and medical information more convenient and more accessible. [Finkelstein, Speedie, and Potthoff](#) (2006) show that broadband-enabled virtual visits with trained medical professionals can improve patient outcomes at lower cost and with a lower risk of infection than comes with conventional care provided in person. [GAO](#) (2010) finds that telemedicine is particularly valuable for rural patients who may lack access to medical care, as telemedicine allows them to receive medical diagnoses and patient care from specialists who are located elsewhere. Broadband can also be used to more accurately track disease epidemics. Various studies have demonstrated how large datasets from search engines and social media can be exploited in this way (e.g., Ginsberg et al. 2009; Paul and Dredze 2012).

Broadband also enables access to lower-cost online education. [Deming et al.](#) (2015) find that a 10 percent increase in college students taking all their courses online is associated with a 1.4 percent decline in tuition.¹⁴ The importance of the role that the computer and broadband more specifically play in enabling students to do their homework is evidenced by the fact that nearly half of 14 to 18 year olds report that they use a library computer, commonly for homework (Becker et al. 2010). This finding suggests that library computers can provide a crucial source of access for students who would not otherwise have the ability to get online.

Research has also highlighted that the Internet has become an increasingly important source of information. A [study](#) by the Pew Research Center finds that the number of registered voters who cited the Internet as one of their primary sources of news about the presidential campaign increased from 11 to 18 percent

between 2000 and 2004 (Rainie et al. 2005). As of 2013, 50 percent of the public cited the Internet as their main source of national and international news (Caumont 2013). Access to broadband also may increase civic participation. [Tolbert and McNeal](#) (2003) find that access to the Internet was associated with an increased probability of voting by 12 percent in the 2000 election. Other studies have also found a positive association between Internet access and voting behavior, though effect sizes have been smaller (Boulianne 2009).

As noted in the FCC's National Broadband Plan (FCC 2010), broadband can provide other benefits as well, such as supporting entrepreneurship and small businesses, promoting energy efficiency and energy savings, improving government performance, and enhancing public safety, among others. In addition, broadband has become a critical tool that job seekers use to search and apply for jobs, as highlighted in more detail below.

Online Job Search & Labor Market Outcomes

Broadband can help individuals to search for jobs in a variety of ways. They can find openings on job posting websites, submit applications and resumes online, and communicate with potential employers via email. The prevalence of these search methods has increased since the early days of the Internet. For instance, from the late 1990s to 2008, the share of unemployed individuals in their 20's who used the Internet for job search increased from 24 to 74 percent (Kuhn and Mansour 2014). Furthermore, an increasing share of all job openings now advertise through online ads. One [estimate](#) suggests that in June 2013, online ads were posted for 60 to 70 percent of total job openings (Carnevale et al. 2014).¹⁵

Data from the Current Population Survey's (CPS) Computer and Internet Supplement and questions on job search (the combination of which are available in 1998, 2000, 2001, 2003, and 2011) indicate that the percent of respondents using online job search has increased over

and that growth in unemployment rates was lower than it would have been in the absence of broadband.

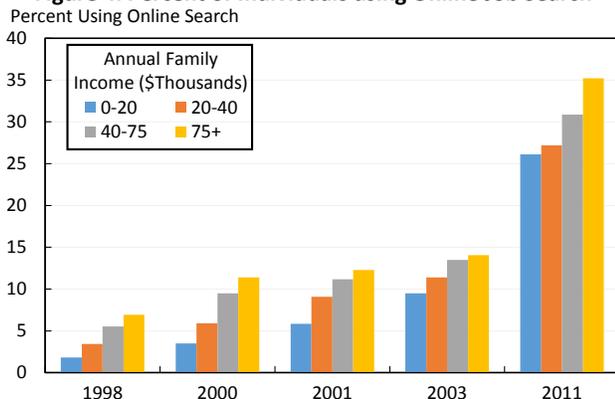
¹⁴ However, there is mixed evidence as to whether online instruction offers similar quality as off-line instruction. Bowen et al. (2014) find little difference in quality, whereas Joyce et al (2014) find that students enrolled in a

"traditional" course format scored 2.3 points higher on midterms and finals, on average, compared to those enrolled in a "hybrid" course format.

¹⁵ Online ads are, however, not representative of all job openings and disproportionately represent high-skill and high-education openings (Carnevale et al. 2014).

time (Figure 4).¹⁶ This increase is due to both expanded Internet use and an increase in the use of online job search among individuals with Internet access. However, the incidence of use varies by family income. In 2011, respondents in households making more than \$75,000 annually were nine percentage points more likely to use online search than those in households making less than \$20,000.¹⁷

Figure 4: Percent of Individuals using Online Job Search



Source: Current Population Survey Computer and Internet Supplements.
Note: The sample includes all individuals age 16+ with and without access to the internet.

There are many potential benefits to online job search, relative to traditional search. The Internet allows individuals to search a larger set of job postings and to find very specific openings. Transaction costs of submission are much reduced; clicking a mouse is less costly than printing and mailing applications. Recently, online search websites have started using algorithms to create better matches between potential employees and employers.¹⁸ Thus, potential employees as well as employers benefit from better matches. These benefits all increase the likelihood that online searchers will find a better job match while spending less time and effort searching.

¹⁶ The CPS provides some information on computer and Internet use in 2007, 2009, 2010, 2012, and 2013 as well, but items on job search were not included in those years (with the exception of 2012, which lumped job search together with job training, and 2013, where discrepancies between the questions prevent comparison).

¹⁷ Family income is defined as “combined income of all family members during the last 12 months. Includes money from jobs, net income from business, farm or rent, pensions, dividends, interest, social security payments and any other money income received by family members who are 15 years of age or older.”

On the other hand, lack of broadband access can be an obstacle to finding a job. Recent Pew [research](#) indicates that job seekers without broadband at home have a harder time contacting potential employers, filling out online job applications, creating a professional resume, and highlighting employment skills on social media (Smith 2015). Public libraries have become an important resource to help fill the need of job seekers that lack broadband at home. Becker et al. (2010) estimated that 30 million Americans used library computers and Internet access to conduct job searches, submit online job applications, and receive job-related training in 2009.

Recent academic research finds evidence that one of the potential benefits of online job search is that it decreases the duration of unemployment spells for online searchers. [Kuhn and Mansour](#) (2014) find that young unemployed individuals who used the Internet in their job search from 2005-2008 were re-employed approximately 25 percent faster than comparable individuals who used only traditional methods. Their results are robust to controlling for Internet access, cognitive ability, and individual characteristics. There is also academic [research](#) that finds that it is common for employed workers to engage in online job search and that employed individuals who use the Internet to search for jobs are more likely to transition to a new job (Stevenson 2009).¹⁹ In addition, [Atasoy](#) (2013) finds that broadband Internet is associated with higher employment rates, especially in rural counties. [Dettling](#) (2013) finds that broadband Internet is especially helpful in increasing labor force participation for married women.

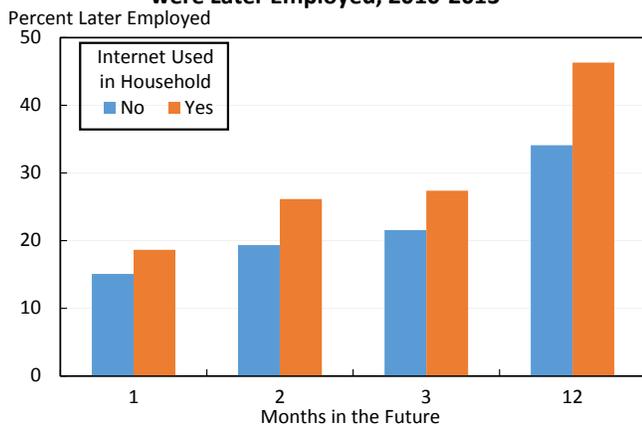
Figure 5 presents data from the 2010-2013 Current Population Surveys on the relationship between use of the Internet and the percent of unemployed individuals

¹⁸ For example, eHarmony recently launched an employment service that uses algorithms similar to its matchmaking algorithms to match potential employees and employers based on skills, background, personality, and culture (Reaney 2015).

¹⁹ Other studies on the effect of the Internet on individual labor market outcomes find positive effects (Choi 2011; Bagues and Labini 2009). However, Kroft and Pope (2014) find no evidence that the rapid introduction of *Craigslist's* job boards between 2005-2007 reduced local unemployment rates during that same time period.

who were later employed.²⁰ (If an unemployed individual does not become employed, then that individual either remains unemployed or exits the labor force.) Figure 5 shows that one month in the future, 19 percent of unemployed individuals in households where someone used the Internet are employed compared to only 15 percent of individuals in households without Internet usage.²¹ This difference persists and actually increases over the next 12 months (46 percent vs. 34 percent employed for those in households who do or do not use the Internet, respectively).

Figure 5: Share of Unemployed Individuals who were Later Employed, 2010-2013



Source: 2010, 2011, 2012, and 2013 Current Population Survey and CEA calculations.

The differences in the employment outcomes between households that do or do not use the Internet in Figure 5 are statistically significant, meaning there is a low probability that the differences are random. The basic relationship—where those households who use the Internet exhibit better employment outcomes—remains even after controlling for a number of demographic variables such as age, education, race, and family income, as well as the number of weeks that the individuals were previously unemployed for. Moreover, previously cited research (e.g., Stevenson 2009; Kuhn and Mansour 2014) has undertaken sophisticated

statistical techniques that suggest that at least part of these correlations may be causal relationships.

It is also possible that the labor market benefits of online job search have increased over time. In an earlier study, [Kuhn and Skuterud \(2004\)](#) do not find lower unemployment durations for online searchers in 1998 and 2000. However, in a more recent paper that finds lower unemployment durations, [Kuhn and Mansour \(2014\)](#) suggest that increases in the labor market benefit of online job search over time is due to the technological improvements in search websites and the increased prevalence of online search.

Social media may be another way that potential employees are connecting with employers, making online search more efficient than in the past as individuals can take better advantage of their social and professional networks. Indeed, multiple academic studies have documented the benefits of social networks on job search (e.g., Granovetter 1995; Cingano and Rosolia 2012; Kramarz and Skans 2014). However, it is not clear if job seekers who rely solely on mobile devices to use the Internet benefit as much as other online job seekers. Job seekers who rely solely on mobile devices face hurdles that are not faced by other online job seekers, including data caps on smartphone plans and the difficulty of crafting a resume or applying for a job on a device that was not built for extensive text entry (GAO 2015; Smith 2015).

Conclusion

This brief highlights that a digital divide persists in the United States, even though much progress has been made. Notably, just under half of households in the bottom income quintile use the Internet at home, compared to 95 percent of households in the top income quintile. One of the ways to help reduce the digital divide is to spur competition between providers. As indicated in

²⁰ The figure includes all unemployed individuals in the Oct. 2010 and Oct. 2012 School Enrollment and Internet Use CPS Supplements and the Jul. 2011 and Jul. 2013 Computer and Internet Use CPS Supplements. These are the last four CPS supplements that include home Internet access. The figure presents the share of all unemployed individuals (not only individuals in their first month of unemployment) that are employed in the future. The sample weights are scaled such that the sums of weights for each year are equal. Although these results are from

the post-recession labor market recovery, the effect of access is similar across all four years and the previously cited academic work finds a positive effect of online job search during the pre-recession period.

²¹ Here Internet access is defined as whether “anyone in this household uses the Internet from home.” The results are qualitatively similar when instead relying upon whether or not the individual used the Internet at all over the past year.

this issue brief, and as highlighted by prior research, more competition is correlated with higher adoption rates. This is likely due in part to competition leading to lower prices, making the Internet more affordable.

Affordability, however, is only one of the reasons for non-adoption. Research by the [National Telecommunications and Information Administration](#) (NTIA 2013) and the [Government Accountability Office](#) (GAO 2015) indicates that in addition to affordability, access to devices and digital literacy—for example, understanding how the Internet can be used to access job opportunities and engage in civic participation, among others—are also important factors driving broadband adoption. Effective digital literacy training may require place-based or demographically tailored interventions, as highlighted by recent research.²² Policies that address these three factors—affordability, access to devices and digital literacy—will likely help increase broadband adoption, ensuring that more Americans are able to take part in the digital economy, and share in its economic and social benefits.

Existing economic literature demonstrates a variety of these benefits that result from broadband, including greater economic growth, higher levels in the quality of healthcare and education, and greater civic participation, among others. This brief provides additional detail on one particular benefit: access to the Internet is correlated with better labor market outcomes. This is likely due to the ability to search more easily for jobs, complete applications online, and engage in networking via social media, although each of these underlying mechanisms requires further research. The findings on the positive effects of the Internet on job search suggest that policies that reduce the digital divide will potentially improve employment outcomes for Americans.

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²² NTIA has highlighted that reducing Internet-use barriers related to language and citizenship may help reduce the digital divide for Hispanics: <https://www.ntia.doc.gov/blog/2015/language-and-citizenship-may-contribute-low-internet-use-among->

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