

New Research on Broadband and the Economy

Universal broadband can power the economy, help the United States weather its current crises, and provide a key to recovery from today's recession.

By Masha Zager / *Broadband Communities*

Lack of Broadband Impedes Job Productivity

Broadband impacts employment, wages, household income, population growth, business revenues and many other measures of economic growth and vitality. One important outcome is job productivity (gross domestic product per employee), a determinant of long-term economic growth and development. Broadband can affect productivity in any of several ways: It enables existing businesses to function more efficiently, gives them opportunities to enter more profitable markets, and ensures a digitally literate workforce; in addition, it attracts highly productive, knowledge-based businesses that cannot operate in poorly served areas.

Which broadband levers should policymakers push if they want to increase job productivity in their localities? What's more important – faster broadband, universal broadband, or more reliable broadband? Roberto Gallardo, an economist at Purdue University, and three colleagues examined 10 measures of broadband quality to discover which had the most impact on job productivity. Except for one measure, the analysis compared 2017 data across all U.S. counties. In general, the researchers found that adoption measures were more important than availability measures.

The 10 measures of broadband quality were

- Percent of homes without internet access
- Percent of population not using internet at 25 Mbps

- Digital divide overall
- Digital divide for infrastructure and adoption
- Digital divide for socioeconomic characteristics
- Digital distress indicator (yes/no)
- Percent of population with access to advertised fixed broadband of 25 Mbps/3 Mbps
- Percent of population with access to advertised fixed broadband of 25 Mbps/25 Mbps
- Percent of population with access to advertised fixed broadband of 50 Mbps/50 Mbps
- Percent of population with access to advertised fixed broadband of 1 Gbps / 1 Gbps.

The researchers introduced these measures into the model one at a time, rather than trying to measure their impacts all at once. They also controlled for a number of non-broadband variables, including population size, distance from the nearest metropolitan center, ethnic diversity, education levels, unemployment rate, industrial diversity and mining dependence.

RESULTS

Overall, four broadband-related variables proved to have a statistically significant impact on job productivity: the percent of population not using internet at 25 Mbps, the digital divide

index, the socioeconomic component of the digital divide index, and the digital distress index.

These are all measures of internet use and adoption. The percent of population not using internet at 25 Mbps was measured directly by Microsoft in 2018 by examining internet traffic. The socioeconomic component of the digital divide index measures the proportion of the population in categories with low broadband adoption rates (based on age, education, poverty and disability). The overall digital divide index takes into account, in addition, how many people have 100 Mbps/20 Mbps access, how many have computing devices, and how many have no internet access at all, as well as local median advertised

internet speeds. The digital distress index is based on the percent of homes without fixed broadband or computers.

The authors also considered which factors were significant in non-metropolitan areas in particular; these results were slightly different. In non-metro counties, the variables impacting job productivity were the percentage of homes without internet access (as measured by the U.S. Census Bureau's American Community Survey), the digital divide index, and both components of the digital divide index.

The availability of symmetrical gigabit service either was insignificant or, in the non-metro sample, actually had a negative impact. The authors speculate that the FCC's data on gigabit speeds may be too unreliable

to draw any conclusions about the importance of gigabit speeds being broadly available. (Large businesses that need these speeds can now obtain such connections in most places.)

The authors conclude that "broadband access, advertised or actual speeds, has a limited effect on labor productivity at the county level. More robust and holistic variables, such as the digital divide index or digital distress, suggest that broadband is embedded in a more complex social and economic context."

They add that "digital exclusion, which notably includes more than just broadband availability, affects both urban and rural productivity. Future broadband policies should address this issue."

Digital Divide Keeps People From Following Stay-at-Home Orders

In the pre-pandemic era, people living in high-income areas were more likely than people in low-income areas to go out to shop, socialize or engage in other activities. However, after the stay-at-home orders of March 2020, the pattern reversed: People in high-income areas self-isolated more. Two researchers at the National Bureau of Economic Research found that this disparity was driven more by the presence of better broadband in the high-income areas than by actual income differences, though both factors played a role.

According to the researchers, these results suggest that policymakers

should worry about the likely lack of success of self-isolation policies in regions where there is low internet penetration and in regions where people have low incomes. The results show that the uneven deployment of high-speed internet potentially exacerbates the effects of income inequality in the ability to self-isolate.

In a pandemic, therefore, the lack of broadband access impacts both individual and public health. In addition, although the study does not directly address this issue, it could have economic impacts: If the lack of residential broadband affects the ability of businesses to operate in a safe manner,

it could affect the viability of those businesses and the economic fortunes of poorly served regions as a whole.

The data in the study was based on location records from 20 million mobile devices provided by a company named Safegraph, combined with data on income levels and internet use from the Census Bureau's American Community Survey. Safegraph tracks the location of devices whose owners have consented to be tracked. The authors assume that if a device stays at home all day, its owner is probably at home with it.

Read the full report at www.nber.org/papers/w26982.pdf.

Digital Divide Affects the Pandemic's Economic Impact

Another attempt to quantify broadband's importance in the pandemic comes from the Federal Reserve Bank of Atlanta, where four researchers studied the ability of employees to work from home. They started with a 2006 study by the Congressional Budget Office that forecast the impact of a hypothetical pandemic on labor demand in various industries and then applied those

forecasts to the number of workers in each industry in 2019, by state and metropolitan area.

Based on industry composition alone, states and metro areas would differ greatly in terms of the pandemic's economic impact. For example, regions specializing in finance, insurance, technology and professional services would be least affected, while tourist meccas, agricultural areas and

industrial centers would be most severely affected.

In addition to the direct impact of the pandemic, workers are affected by the quality of internet access available (and affordable) to them. Knowledge-industry workers who cannot work from home may not be able to stay employed even if labor demand in their industries is high. The authors used one-year estimates from the 2018

State and Metro Comparisons on Impacted Employment, Ability to Work from Home, and Internet Access

	Least Vulnerable (State)	Most Vulnerable (State)	Least Vulnerable (Metro)	Most Vulnerable (Metro)
Impacted Employment Share	50.0%	57.6%	46.7%	60.6%
Could Work From Home Share	28.8%	27.1%	29.8%	25.9%
No Internet Share	14%	18%	12.0%	20.3%

Sources: Congressional Budget Office 2006. A Potential Influenza Pandemic: Possible Macroeconomic and Policy Issues; U.S. Bureau of Labor Statistics' Quarterly Census of Employment and Wages, 2019 Q1 – Q3 data; and U.S. Bureau of Labor Statistics' American Time Use Survey: 2018 Results

Figure 1

American Community Survey to estimate households without internet access in each state and metro area. They find that “even in communities that are very well positioned to prosper in a remote working environment, 12 percent of households have no internet access.” Some of these households are constrained by

broadband availability and others by affordability. In some metropolitan areas, as many as 20 percent of households have no internet access.

Figure 1 shows the differences between the most and least vulnerable states and metro areas in terms of the percentage of employees who could work from home, based on both industrial

composition and internet access.

The authors conclude, “Ensuring that we have a system that provides widespread broadband services and lowers barriers to internet access is critical for our economic recovery and the mobility of our workforce.”

Read the full report at <https://tinyurl.com/yy87yrhj>.

How Broadband Can Help the Economic Recovery

Public infrastructure programs are a time-tested method for lifting economies out of the doldrums, and it’s fair to assume the federal government will apply the same remedy to the current recession. The CARES Act already has supplied some funding for infrastructure, and several states have allocated discretionary CARES funding toward broadband and other economic development projects. More funding will likely be available in 2021, no matter the results of November’s election.

Adie Tomer and colleagues from the Metropolitan Policy Program at the Brookings Institution issued a report in July calling for a massive infrastructure project in response to the COVID-19 recession. They note, “The mix of short-term employment and long-term investment makes infrastructure an attractive area for federal stimulus.” Stimulus funds, they add, offer an opportunity to launch workforce development programs and innovative capital programs, immediately

benefit disadvantaged households and address environmental injustices that disproportionately impact the most vulnerable communities.

In general, the authors’ recommendation is to design any infrastructure stimulus based on structural patterns, not temporary deviations. For example, electricity usage is below normal today, but policymakers should plan funding for the electrical grid based on the assumption that normal usage patterns will resume after

the current disruptions.

The major exception to this rule is telework, which is proving popular with both workers and managers. Because of this, the authors say, “It’s vital that policymakers begin planning for scenarios in which significant chunks of the workforce stop commuting, while other trips – such as a doctor’s appointment – similarly shift to remote alternatives.” In other words, policymakers should assume that the demand for universal broadband will accelerate.

FOUR PROGRAMS

The authors call for four approaches to infrastructure funding, each of which has a broadband component.

Boost Program: Deliver direct household aid to help people pay for essential transportation, water, energy and broadband services. Low-income households would receive a fluid, monthly budget to cover

transportation, broadband, and basic utilities as recipients see fit, using the same mechanism now used to deliver SNAP benefits. States could supplement the benefits or negotiate discounted broadband rates with private ISPs.

Keep America Moving Program: Provide direct grants to keep public infrastructure in good repair and keep the current infrastructure workforce employed. This would help maintain publicly owned broadband networks and avoid long-term higher costs to repair degraded infrastructure.

InfraCorps Program: Launch a multiyear program to develop a diverse workforce in the skilled trades. This apprenticeship-based program would provide flexible learning and career opportunities in the skilled trades, especially for underrepresented, disadvantaged and disconnected workers.

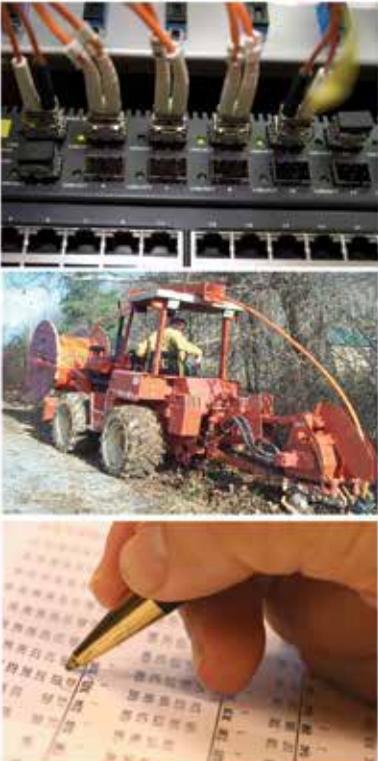
ASCEND (Affordable, Sustainable, Career Engaged,

Dynamic) Program: Launch four complementary capital spending programs to modernize water infrastructure, accelerate clean energy adoption, expand broadband networks and digital skills development, and eliminate environmental injustices in transportation and land use. The broadband portion of ASCEND would expand both broadband networks and digital skills development. It would address the broadband marketplace’s core failures – namely, that it has been unable to bring networks to neighborhoods without service, make service and devices affordable for all, or provide skills training for those in need. ❖

Read the full report at <https://tinyurl.com/y5ewn5wy>.

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