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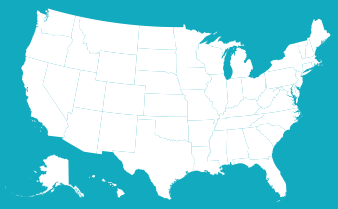

Unlocking the Digital Potential of Rural America

A U.S. Chamber Technology Engagement Center (C_TEC) study commissioned by Amazon

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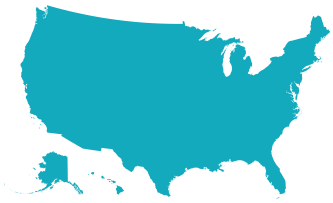

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Highlights of the Report

Unlocking the digital potential of rural America is vital to economic growth. Rural America comprises over 18 million households and over 37 million adults. While accounting for nearly 15% of the adult population and covering over 72% of the land, annual revenues of businesses located in rural areas make up less than 10% of the U.S. economy (approximately $3.1 trillion). Due to lack of opportunities, a large portion of rural residents have been migrating to urban areas for new or better jobs. Currently, about 17.5 million rural adults (over 47%) are either unemployed or are not actively looking for jobs.

The use of digital technologies, including access to high-speed internet and online tools, is gaining popularity in rural areas because they create opportunities for small businesses in rural America. We collaborated with Ipsos, a global market research firm, to conduct a survey to complement official statistics to estimate the economic impact of digital technologies on rural small businesses. The survey asked 5,300 small business owners in rural America about the economic impact of online tools and technology on their businesses. Several key findings are as follows:

- **Digital technology boosts sales and reduces costs for rural small businesses:** Online tools and technology help rural small businesses expand their customer base in their own community, neighboring states, and, in some cases, outside of the country as well. Online tools boost sales for nearly 55% of rural small businesses across America. In addition, online tools reduce purchasing costs of products and materials for nearly 29% of rural small businesses.

- **Small businesses in rural areas are slowly adopting digital tools and technology:** Nearly 20% of rural small businesses in America generate the vast majority of their revenue (at least 80%) by selling their products and services online. A slightly larger share of rural small businesses, 22%, purchased at least 80% of their goods and services online.

- **Rural small businesses utilize digital tools and technology for sales, marketing, and operations:** About one-third of rural small businesses sell their products and services through their own websites and nearly 13% sell their products and services through third-party websites. Over 58% of rural small businesses have social media accounts and nearly 36% use online advertising services. Rural small businesses also use online tools for operational tasks such as business banking, accounting, virtual meetings and conference calls, and cloud computing.

Greater use of digital tools and technology could unlock potential in rural small businesses across the country. Manufacturing and services industries are replacing agriculture and mining as the dominant industries in rural areas. Small businesses in rural areas generate approximately $1.2 trillion in sales per year—the equivalent of 3.7% of the U.S. economy. Combining the market research survey and official statistics, we estimated the economic impact of online tools and technology on the rural economy in the past three years and the next three years and calculated the potential growth of U.S. gross domestic product (GDP) if there was greater adoption of digital technology by rural businesses in America. Several key findings are as follows:

- **Digital technology created opportunities for rural small businesses in the past three years:** Digital tools and technology boosted gross sales of rural small businesses by 17.2% during the past three years, the equivalent of $69.8 billion per year. The additional gross sales contributed $38.7 billion to U.S. GDP per year and created 296,288 jobs (full-time equivalent) with $12.1 billion in wages per year. The magnitude of the economic benefits is equivalent to the size of the economy of Vermont or Wyoming.

- **The economic benefits of digital technologies have not been fully realized in rural areas:** If rural small businesses had better adopted online tools and technology, their gross sales would have increased by an additional 18.3% in the past three years, the equivalent of $74.4 billion per year. Consequently, rural small businesses would have added another $41.3 billion to U.S. GDP per year and created an additional 316,605 jobs with $13.0 billion wages per year. These unrealized economic benefits are equivalent to 0.2% of GDP and over 5% of the number of unemployed people in the U.S. labor force.

- **With greater adoption of digital tools and technology, the potential economic benefits in rural areas are far reaching:** If rural small businesses better adopt online tools and technology, their gross sales could increase by an additional 20.8% during the next three years, the equivalent of $84.5 billion per year. This increase in sales could contribute an additional $46.9 billion value added to U.S. GDP per year and create 360,054 jobs with $14.8 billion wages per year. By unlocking the digital potential of rural small businesses, the U.S. GDP would gain an additional 0.2% per year and reduce the number of unemployed people by nearly 6%.

Summary Table.

Past, unrealized, and potential economic benefits of online tools and technology for small businesses in rural America

	Benefits in the Past 3 Years	Unrealized Benefits in the Past 3 Years	Potential Benefits in the Next 3 Years
Percentage change in 3-year revenue	17.2%	18.3%	20.8%
Additional sales per year	$69.8 billion	$74.4 billion	$84.5 billion
Additional GDP per year	$38.7 billion	$41.3 billion	$46.9 billion
Additional jobs	296,288	316,605	360,054
Additional wage paid per year	$12.1 billion	$13.0 billion	$14.8 billion

Online tools and technology empower rural small businesses. High-speed internet access and mobile phone connectivity are crucial for rural small businesses. While nearly all residents in metropolitan areas have high-speed internet access, about 27% of rural residents still do not have access to a high-speed internet connection. In addition to the lack of infrastructure, rural areas lack skilled IT professionals to assist small businesses. Finally, courses focused on digital skills (cloud and digital marketing) would help bridge the digital skills gap facing rural small businesses. The economic potential of small businesses in rural America is far reaching and has the potential to be a significant contributor to the country's sustained economic growth. Supportive policies adopted at the state and federal levels will help unlock the economic potential of rural small businesses across America.

Unlocking the Digital Potential of Rural America

In recognizing the importance of rural America to economic growth, efforts to unlock its economic potential while maintaining the value of living in rural areas are under way. Over the years, rural economies have become more diverse. Manufacturing and services industries are challenging the dominant role of the agriculture and mining industries. With the growing digital economy, digital technology has integrated into daily life, benefiting both rural businesses and residents. Rural small businesses utilize online tools and technology to generate sales, to make purchases, and to operate business. With the growth of online tools, rural small businesses are able to expand their reach within and outside of their communities to sell their products and services to a broader customer base and to make purchases from a larger vendor network. In addition, small businesses use online tools and technology to improve their back-office operations. The benefits realized by rural small businesses create value for rural consumers—providing more choices of product and services at better prices.

This study uses official statistics and a proprietary market survey to measure the economic impact of digital tools on rural small businesses across America. We collaborated with Ipsos, a global market research firm, to conduct a market survey of rural small businesses exclusively for this study. The survey asked 5,300 rural small businesses across industries and states about the impact of online tools and technology on their business, focusing on realized and unrealized sales. The survey first asked to what extent online tools and technology affected sales of rural small businesses in the past three years. The survey then asked about the volume of unrealized sales for rural small businesses in the past three years if they had better adopted digital technologies. Finally, the survey asked how much potential sales that rural small businesses could make in the next three years if they better adopt digital technologies. We then applied the survey results to official statistics to calculate the economic impact of digital tools and technology on rural small businesses by state. The economic activities in this study include sales, value added contribution to gross domestic product (GDP), jobs, and wages.

This report has three sections and three appendices. The first section describes the current landscape, characteristics, and vital role of rural America. The second section provides findings of the rural small business survey and the role of digital tools and technology in business operations. The third section estimates the economic impact of digital tools and technology on rural small business sales and, consequently, other economic activities in the past three years and the next three years. Based on our findings, we provide policy recommendations to unlock the digital potential of rural America. Technical notes on the survey methodology, definitions of economic indicators, and state-level data are included in the appendices.

1. Characteristics of Rural America

Population and Labor Force

Rural America comprises more than 37 million working-age adults (16 years and older) and 18 million households.[1] While accounting for 14.6% of the adult population and covering over 72% of the country's land, annual sales of rural areas account for only 9.5% of the economy. Per capita GDP in rural areas is only about 40% of the national average—$23,389 per person in rural areas compared with $57,797 per person nationwide in 2016. Due to lack of opportunities, a large share of rural residents has either migrated to urban areas to seek jobs or dropped out of the labor force. Consequently, the labor force participation rate (number of people working or looking for work divided by the working-age population) in rural areas has continuously declined during the past years. Only 57.3% of the rural population participated in the labor force compared with 63.5% of the overall economy during 2012-16 (Table 1).

Table 1.

More than 37 million adults live in rural areas across America[2]

Panel A. Rural adult population (16 years and older), 2012-16

	Rural	U.S. Total	Rural as % of Total
United States	**37,042,120**	**253,323,709**	**14.6%**
Northeast	3,827,048	45,530,573	8.4%
Midwest	12,133,792	53,768,969	22.6%
South	15,791,129	94,792,032	16.7%
West	5,290,151	59,232,135	8.9%

1. Rural areas in this report are non-metropolitan counties (U.S. Department of Agriculture 2013 Rural-urban Continuum Codes of 4-9); https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UYJuVEpZRvY
2. Census American Community Survey, 2012-16

Panel B. Rural labor force, 2012-16

	Rural	U.S. Total	Rural as % of U.S.
United States	**21,232,530**	**160,821,120**	**13.2%**
Northeast	2,274,126	29,380,207	7.7%
Midwest	7,420,170	34,949,565	21.2%
South	8,473,631	58,811,303	14.4%
West	3,064,603	37,680,046	8.1%

Panel C. Labor force participation rate, 2012-16

	Rural	Urban	U.S. Total
United States	**57.3%**	**64.5%**	**63.5%**
Northeast	59.4%	65.0%	64.5%
Midwest	61.2%	66.1%	65.0%
South	53.7%	63.7%	62.0%
West	57.9%	64.2%	63.6%

Business Activities

The latest Census Survey of Business Owners and Self-Employed Persons (SBO) estimated rural counties generated over $3.1 trillion annual sales in 2012, accounting for approximately 9.5% of $33.1 trillion sales in all areas in the United States. We applied sales of small business by industry in the United States to estimate small business sales in rural areas by state.[3] We estimated that rural small business annual sales accounted for 3.7% of gross sales of the U.S. economy ($1.2 trillion / $33.1 trillion) and less than 38.9% of rural sales ($1.2 billion/$3.1 billion). The Southern states are estimated to have the highest share of sales of small businesses in rural areas, while the Northeastern states have the lowest (Table 2).

3. Kobe, Kathryn, and Richard Schwinn. 2017. "Small Business GDP 1998-2014." Small Business Administration Office of Advocacy.

Table 2.

Rural small businesses generate over $1.2 trillion in sales, accounting for 3.7% of U.S. sales[4]

	Sales of All Rural and Urban Firms ($ billion)	Sales of All Rural Firms ($ billion)	Sales of Rural Small Businesses ($ billion)	Rural Small Business Sales as % of Rural and Urban Firms
United States	**$33,148.0**	**$3,134.4**	**$1,218.6**	**3.7%**
Northeast	$6,591.4	$299.1	$120.7	1.8%
Midwest	$7,639.2	$1,250.8	$467.5	6.1%
South	$11,937.7	$1,201.1	$460.6	3.9%
West	$6,979.8	$383.4	$169.8	2.4%

The economic contributions of rural businesses vary across regions. Overall, small and large firms in the Northeastern states contributed nearly 20% of total U.S. sales ($6.6 trillion/$33.1 trillion); however, rural small businesses in Northeastern states contributed less than 10% of the total U.S. rural small business sales ($120.7 billion/$1.2 trillion). In contrast, all firms in Midwestern states contributed 23% of total U.S. sales ($7.6 trillion/$33.1 trillion), while rural small businesses in the Midwestern states contributed over 38% of total rural small business sales across the country ($467.5 billion/$1.2 trillion) (Table 3).

Table 3.

Over 76% of rural small business sales are in the Midwest and the South[5]

	Contribution to Sales by All Firms in Rural and Urban Areas	Contribution to Sales by All Firms in Rural Areas	Contribution to Sales by Small Businesses
United States	**100.0%**	**100.0%**	**100.0%**
Northeast	19.9%	9.5%	9.9%
Midwest	23.0%	39.9%	38.4%
South	36.0%	38.3%	37.8%
West	21.1%	12.2%	13.9%

4. Census Survey of Business Owners and Self-Employed Persons.
5. Census Survey of Business Owners and Self-Employed Persons.

Broadband Access

Despite improvements over the years, rural areas still have substantially less access to the internet compared with urban areas. The Federal Communications Commission (FCC) set its broadband benchmark for fixed service of 25 megabits per second (Mbps) for downloads and 3 Mbps for uploads and analyzed the mobile wireless speeds of 5 Mbps downloads and 1 Mbps uploads. By the end of 2016, over 92.2% of all Americans had access to fixed service at 25 Mbps/3 Mbps and mobile LTE with a speed of 5 Mbps/1 Mbps, an increase from 77% in 2012. However, rural areas still lag behind urban areas. In its 2018 broadband deployment report, the FCC found that far too many Americans lack access to high-speed internet service. Nearly 27% of rural areas do not have access to advanced telecommunications capability, defined as fixed services of 25 Mbps/3 Mbps. The report concluded that the FCC must continue its work to encourage deployment of broadband to all Americans, including those in rural areas, on tribal lands, and in the nation's schools and libraries (Table 4).[6]

Table 4.

Nearly 27% of the rural population does not have access to broadband[7]

Panel A. Rural population with internet access, 2016

Speed	Rural Population With Internet Access	As % of Total Rural Population
Fixed connection with 25 Mbps /3 Mbps	**33.7 million**	**73.1%**
Mobile connection with 5 Mbps/1 Mbps	45.2 million	98.0%
With both fixed and mobile connection	33.4 million	72.4%
No fixed connection	12.4 million	26.9%

6. Federal Communications Commission . 2018. "2018 Broadband Deployment Report."
7. Federal Communications Commission . 2018. "2018 Broadband Deployment Report."

Panel B. Share of population with and without access to broadband, 2016

	Population With Access to Broadband	Urban Population Without Access to Broadband	Rural Population Without Access to Broadband
United States	**92.3%**	**4.5%**	**26.9%**
Northeast	97.1%	1.6%	17.4%
Midwest	90.3%	5.1%	25.8%
South	90.7%	5.4%	29.4%
West	93.2%	4.8%	28.3%

Panel C. Share of rural population with access to broadband, 2014 versus 2016[8]

	2014	2016	Change
United States	**66.1%**	**73.1%**	**7.1%**
Northeast	80.0%	82.6%	2.6%
Midwest	67.4%	74.2%	6.8%
South	62.2%	70.6%	8.4%
West	64.9%	71.7%	6.8%

8. Federal Communications Commission. 2018. "2018 Broadband Deployment Report."

2. Online Business Opportunities for Small Businesses in Rural Areas—A Survey

Official statistics of economic activities of small businesses in rural areas are limited and dated. We therefore worked with Ipsos, a global market research firm, to conduct a proprietary market survey exclusively for this study to complement official statistics to assess the impact of digital tools and technology on rural small businesses. Ipsos conducted the survey from July 23 to August 20, 2018, of small businesses in rural America. The survey defined rural small businesses as firms with fewer than 500 employees located in non-metropolitan counties based on the U.S. Department of Agriculture (USDA) Continuum Codes 4-9.[9] The survey asked rural small businesses about how their use of digital technologies has affected their businesses. The survey was conducted online and by phone and collected responses from 5,300 small business owners and decision makers in 47 states. Delaware, New Jersey, Rhode Island, and Washington, D.C., are excluded from the survey because they do not have non-metropolitan counties based on the USDA definition. The characteristics (firm size, revenue size, and industry) of rural small businesses in this survey reflect the characteristics of all rural small businesses in the United States. Detailed survey data and comparisons between survey and official statistics are provided in Appendix 1.

Results From Rural Small Businesses

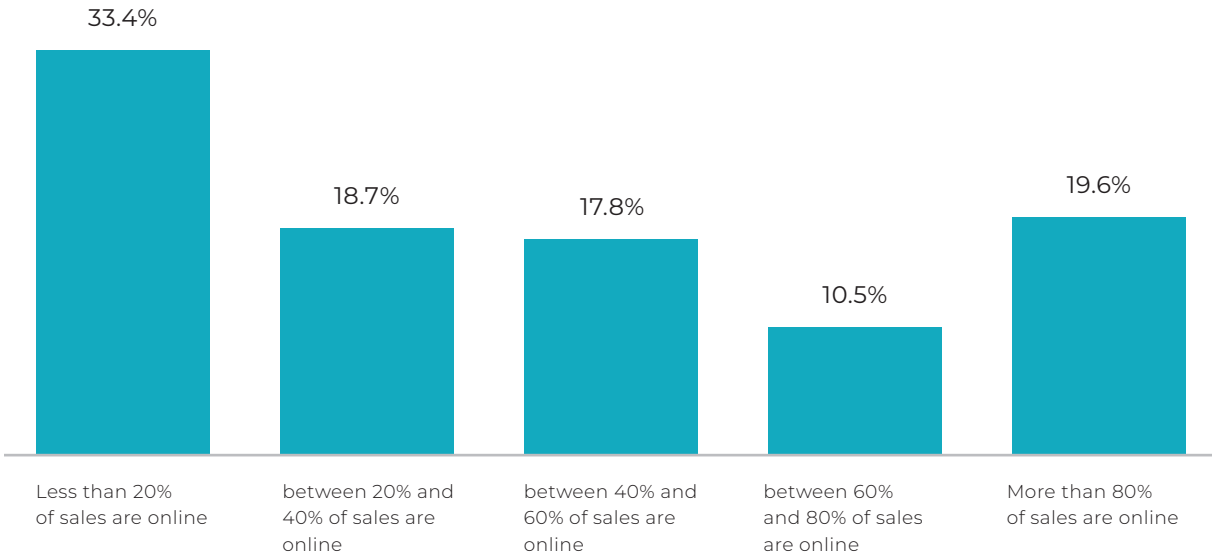
Digital technology has become popular in rural areas. Despite differences in magnitude, the adoption of online tools and technology is seen across demographics, industries, and regions of rural small businesses. About 40% of total sales for all rural small businesses came from online sources. Nearly 20% of rural small businesses rely heavily on computers, tablets, and smartphones for sales; over

9. USDA 2013 Rural-Urban Continuum Codes; https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UYJuVEpZRvY

80% of their sales are online. However, many small businesses in rural areas still have not fully adopted digital technologies. One-third of rural small businesses still rely heavily on in-person or telephone sales; less than 20% of their sales are online. As expected, baby boomers and older generations—who own approximately 43% of small businesses in rural areas—have not fully utilized online tools in their businesses. In fact, more than half of the small businesses that rely almost entirely on in-person or telephone sales (less than 20% of sales generated online) are owned by baby boomers or older. In contrast, this demographic owns only 34% of businesses that rely almost entirely on online sales (more than 80% of their sales online) (Figure 1).

Figure 1.

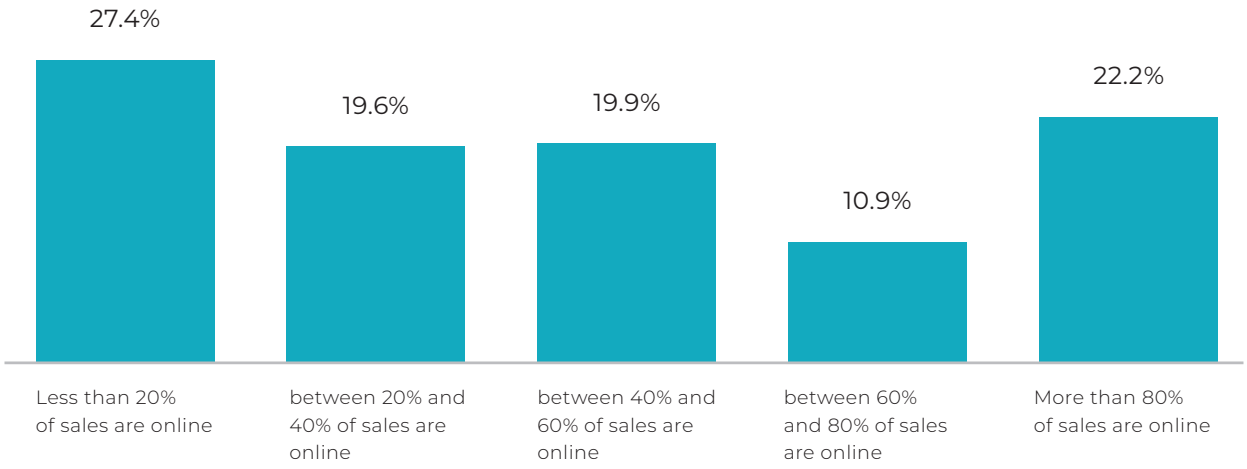
Nearly 20% of rural small businesses rely almost entirely on online sales, while over 33% of rural small businesses still rely on in-person sales



More than 22% of rural small businesses purchase almost all (more than 80%) of their goods and services online and less than 20% do so in person or via phone. Over 27% of other rural small businesses do the opposite and purchase almost all (more than 80%) of their goods and services in person or via phone. Baby boomers and older—who account for 43% of rural small business owners—own more than half (52%) of those rural small businesses that purchase nearly all their goods and services in person or via phone. In contrast, baby boomers and older own only 37% of small businesses that purchase almost all their goods and services online (Figure 2).

Figure 2.

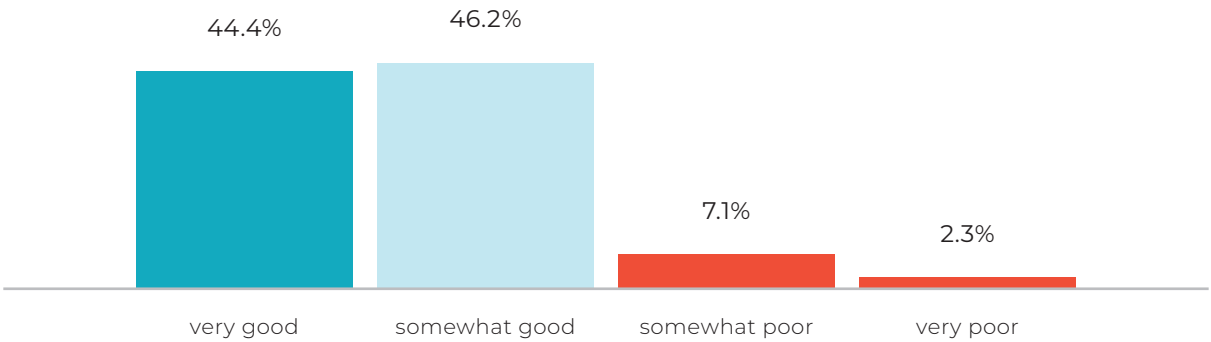
Over 22% of rural small businesses purchase online, while over 27% still purchase in person or via phone



Access to digital technology could be improved for rural small businesses. Currently, less than 45% of rural small businesses have very good access to digital technology. More than 46% of rural small businesses have only somewhat good access and more than 9% have poor access to digital technology. While 43% of rural small businesses are owned by baby boomers and older, only 33% of rural small businesses that have good access to the digital technology are owned by baby boomers. About half of those rural small businesses that do not have good access to digital technology are owned by baby boomers and older (Figure 3).

Figure 3.

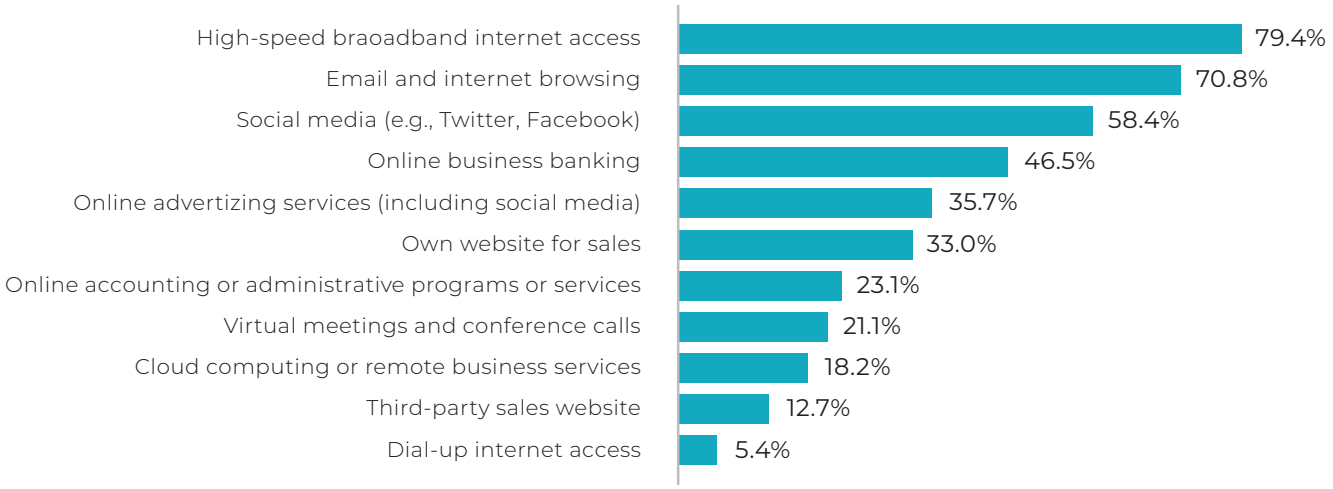
Less than 45% of rural small businesses have very good access to digital technology



Greater use of online tools and technology empowers small businesses to expand operations and sales efforts. By the end of 2018, 79.4% of rural small businesses were using high-speed broadband internet, while only 5.4% still used dial-up access. The survey data show that businesses in rural areas use the internet mainly for emailing and internet browsing (70.8%), with some use for social media such as Facebook and Twitter (58.4%). However, rural small businesses, especially those owned by baby boomers and older, have not fully utilized online services and technologies for sales and operations. About one in every three rural small businesses uses online advertising (35.7%). While some small businesses use their own website to sell their products and services (33.0%), few have utilized third-party websites for sales (12.7%). Fewer than half of rural small businesses adopted online operational services such as online banking (46.5%) and even fewer have adopted online accounting (23.1%) and cloud computing (18.2%). About one-third of these rural small businesses that use online technologies for sales and operations are owned by baby boomers and older (Figure 4).

Figure 4.

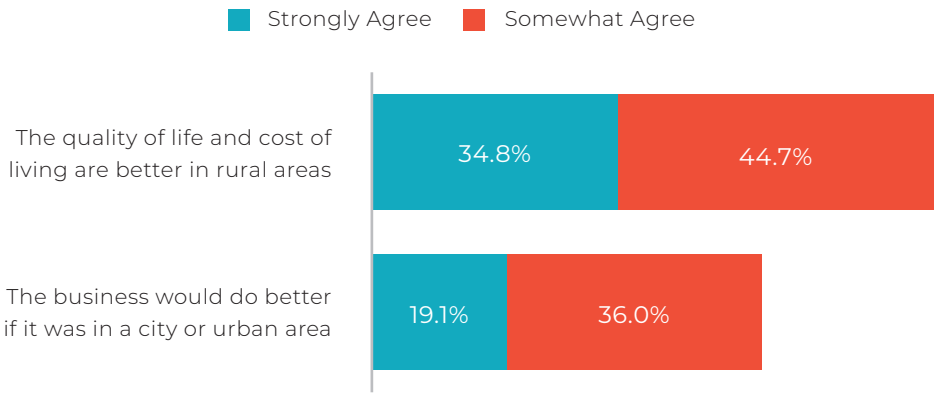
Utilization of online tools and technology for sales, marketing, and operation by rural small businesses



While there are more physical business opportunities in urban areas, small business owners and employees in rural areas value the quality of life in rural locations. Nearly 56% of rural small businesses agree that their businesses would do better if they were living in a city or urban area. Meanwhile, nearly 80% of rural small businesses agree that the quality of life and cost of living are much better in rural areas (Figure 5).

Figure 5.

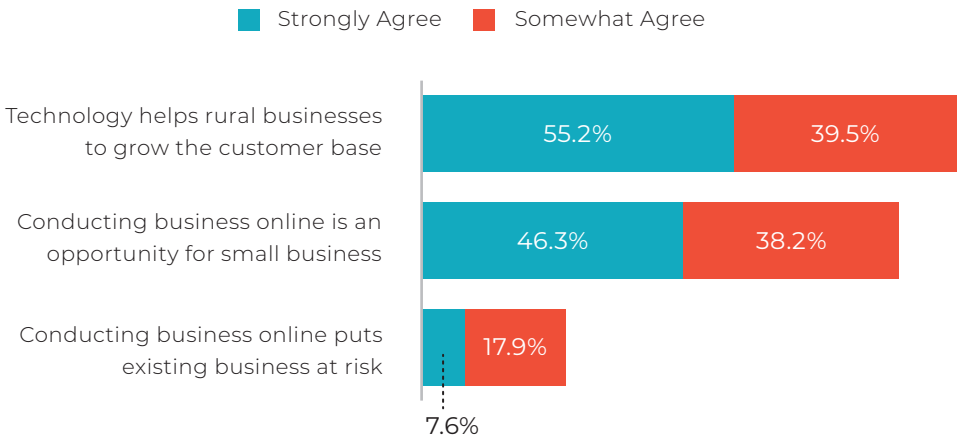
Business opportunities and quality of life in rural areas



Online tools and technology allow small businesses in rural America to reach new customers or vendors and expand their operations while maintaining their preference to live in rural areas. The majority of rural small businesses agree that online technology helps them grow their customer base and create business opportunities rather than putting their business at risk. A large share of those rural small business owners who see online tools and technology as an opportunity are millennials and gen X-ers (Figure 6).

Figure 6.

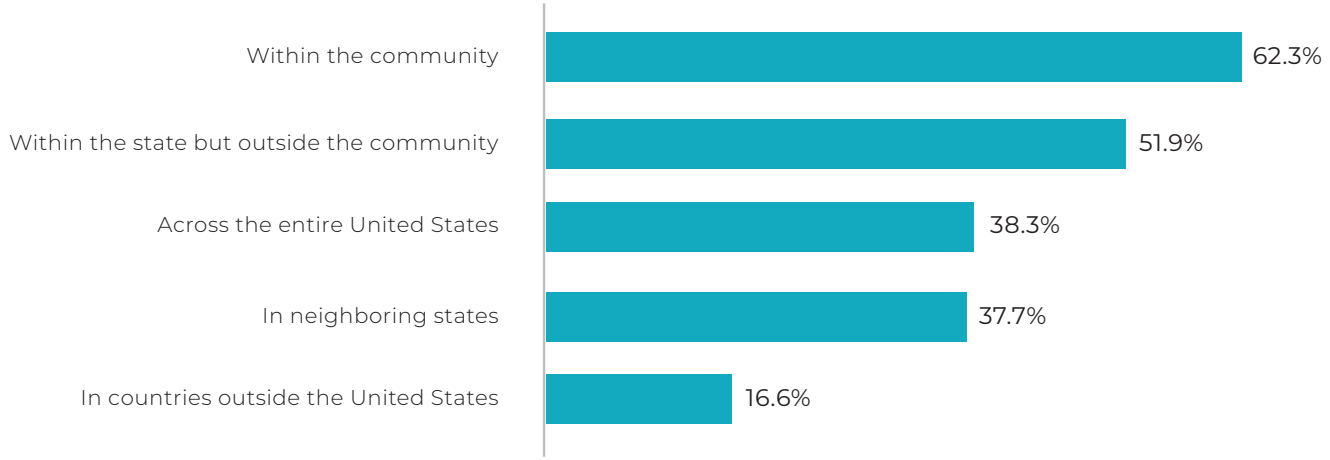
Online tools and technology create opportunities for small businesses in rural areas



The advancement of digital technology and high-speed internet access helps rural small businesses expand their services to a larger customer base within their own community, across the state, and, in some cases, even outside of the country. Digital technologies have allowed more than half of rural small businesses to expand their customer base within their community and to other communities within their state. More than one-third of rural small businesses have reached customers in neighboring states and across the country. A small group of rural small businesses (16%) has used digital tools and technology to expand its business internationally. There is no difference in age groups among those rural small businesses that utilize online tools and services to reach customers within their communities. However, millennial and gen X rural small business owners tend to be more proactive in using online tools and technology to expand their customers base outside of their communities to other states and even overseas (Figure 7).

Figure 7.

Digital tools and technology help small businesses reach customers outside their community



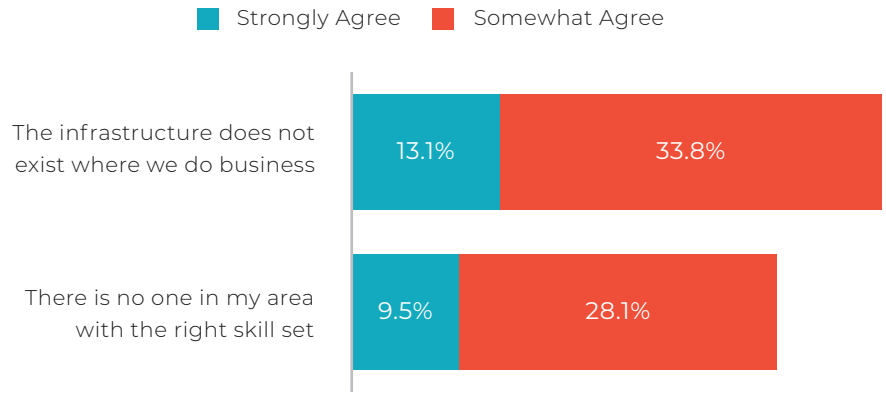
Rural small businesses recognize the value of online tools and technology to connect with customers and vendors. Regardless of their current level of accessibility, two-thirds of rural small businesses agree that poor internet and mobile phone service have negative impacts on their businesses. Among them, over 44% have very good access to digital technology.

Nearly 41% of rural small businesses agree that policymakers should create incentive programs that make it easier for rural small businesses to incorporate digital technology into their daily operations. About 13% of rural small businesses strongly

agree that the infrastructure does not exist where they do business and nearly 10% of rural small businesses strongly agree that their communities do not have workers with the right digital technology skills. About 69% of those who have concerns about the lack of infrastructure, and especially skilled labor, in their communities are owned by millennials or gen X-ers (Figure 8).

Figure 8.

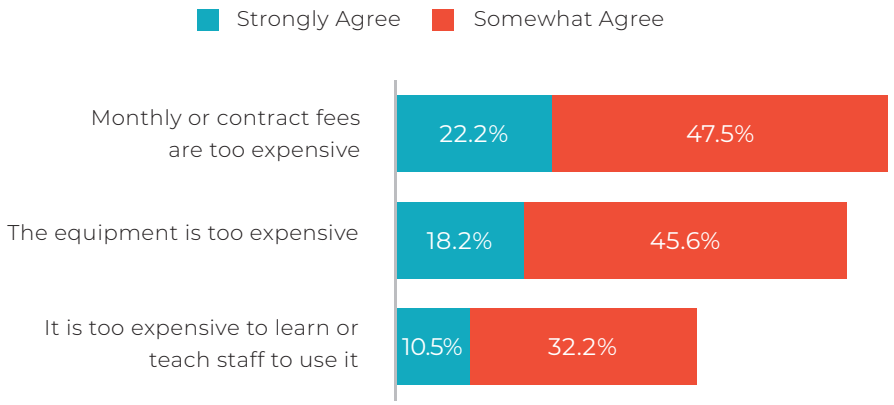
Infrastructure and skilled workers are lacking in rural areas



The cost of digital tools and technology is a concern for rural small businesses. Over 22% of rural small businesses strongly agree that monthly or contract fees for the internet and digital services are too expensive. Over 18% of rural small businesses strongly agree that the equipment is too expensive and over 10% strongly agree that it is too expensive to learn or teach staff to use the technology. Among those who strongly agree, about two-thirds are owned by millennials or gen X-ers (Figure 9).

Figure 9.

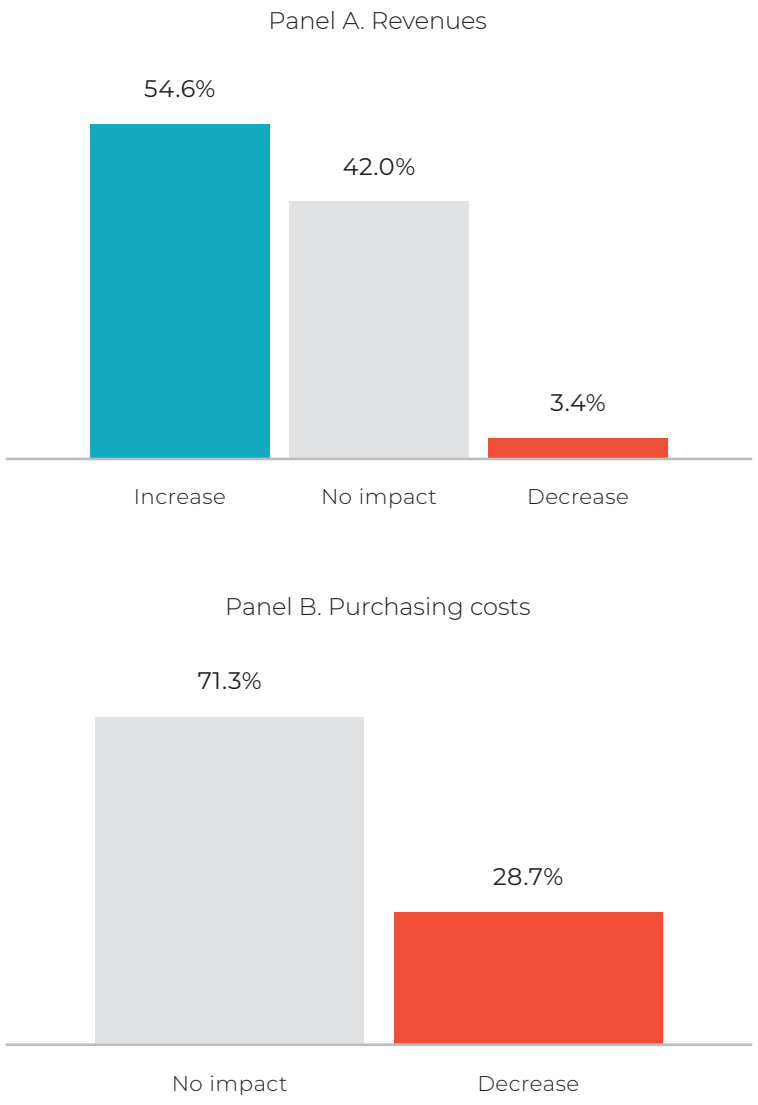
Rural small businesses say digital technology is expensive



Online tools and technology empower rural small businesses to sell their products and services to a broader customer base and purchase supplies at lower costs. Regardless of their ability to utilize digital technologies, about 54.6% of rural small businesses said that online tools and technology had positive impacts on their revenues in the past three years, while 42% said they had no impact on their revenue and 3.4% said they reduced their revenue. When asked about the impact of online tools and technology on their costs to purchase supplies, 28.7% said their costs are lower while 71.3% said there is no impact on their costs (Figure 10).

Figure 10.

Online tools and technology boost sales while reducing costs for rural small business



3. Economic Impact of Online Tools and Technology on Small Businesses in Rural America

We estimated the economic impact of online tools and technology on small businesses in rural America based on the survey conducted by Ipsos in July and August 2018. The survey asked 5,300 small business owners and decision makers in rural areas three questions about the economic impact of online tools and technology on their annual sales:

1. What was the impact of digital technologies on business sales during the past three years (2014-17)?

2. If the business had better access to digital technologies, how much additional sales (if any) would the business have made during the past three years (2014-17)?

3. If the business has better access to digital technologies, how much additional sales (if any) could the business make in the next three years (2018-21)?

The survey asked rural small businesses for sales growth in terms of percentage change. Based on each response, we estimated the dollar impact of online tools and technology on the business sales of each respondent. We then aggregated the impact of online tools and technology on the sales of small businesses in rural areas by state. In addition, we aggregated the impact by the U.S. Census' geographical regions and divisions.

In sum, 5,300 small businesses in rural America that participated in the July/August 2018 survey responded that online tools and technology raised their sales by 17.2% from 2014 to 2017. If these small businesses had better utilized digital technologies, their sales would have increased by an additional 18.3% in the past three years and could gain an additional 20.8% during the next three years.

The survey results show that digital technology has the highest impact on small businesses in rural areas in South Atlantic states, where the rural unemployment rate is higher than the national average. The impact of online tools and technology is lower for small businesses in rural areas in New England and Mountain states, where the rural unemployment rate is lower than the national average. Table 5 summarizes the impacts by region and division. The impacts in individual states are in Appendix 3.

Table 5.

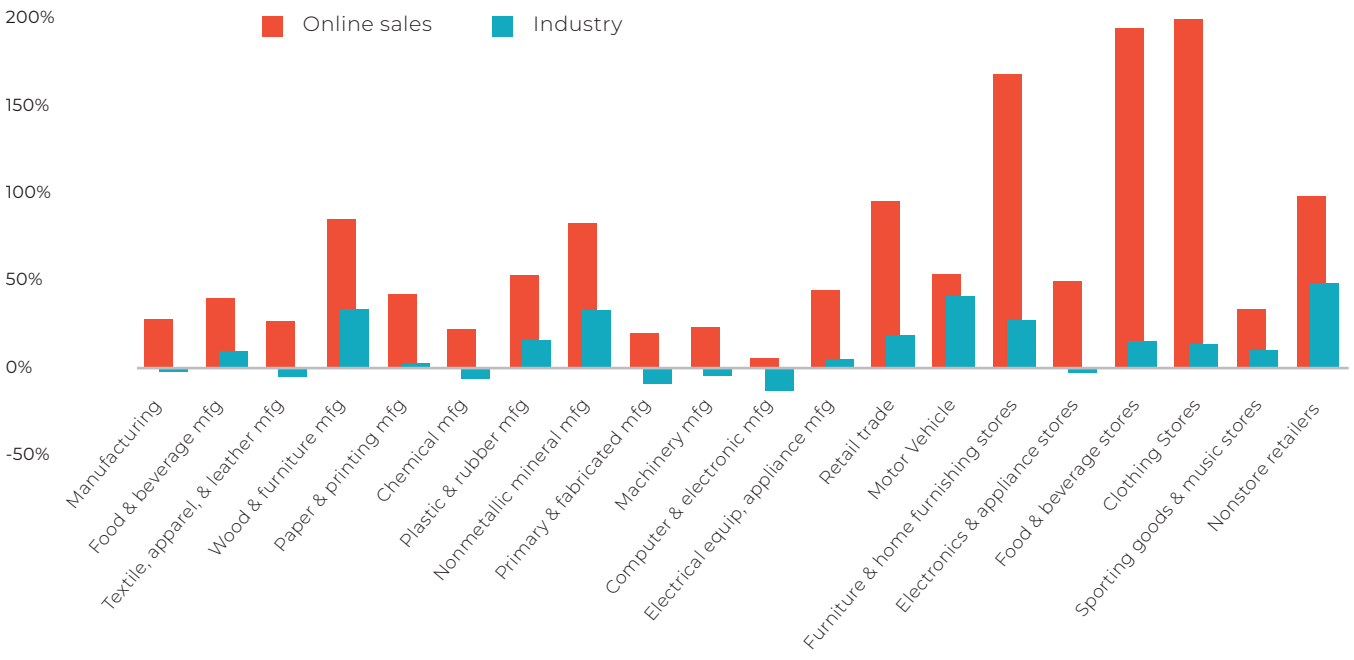
Online tools and technology have a positive economic impact on rural small businesses

	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
United States	**17.2%**	**18.3%**	**20.8%**
Northeast	15.0%	18.0%	20.9%
New England (CT, ME, MA, NH, VT)	13.5%	13.8%	15.5%
Middle Atlantic (NY, PA)	16.2%	21.2%	25.1%
Midwest	15.6%	14.0%	15.9%
East-North Central (IL, IN, MI, OH, WI)	18.9%	16.1%	19.8%
West-North Central (IA, KS, MN, MO, NE, ND, SD)	12.2%	11.8%	11.9%
South	20.0%	23.5%	26.4%
South Atlantic (FL, GA, MD, NC, SC, VA, WV)	22.2%	23.9%	28.1%
East-South Central (AL, KY, MS, TN)	21.6%	27.9%	29.3%
West-South Central (AR, LA, OK, TX)	16.6%	19.4%	22.5%
West	15.4%	16.4%	18.9%
Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	14.0%	13.1%	15.2%
Pacific (AK, CA, HI, OR, WA)	18.5%	23.5%	26.8%

According to the Census data, online sales have been growing faster than overall industry sales in all key sectors in recent years. During 2011-16, online sales of U.S. retailers almost doubled compared with an 18.4% growth of their overall sales. Online sales of clothing stores, food and beverage stores, and furniture and home furnishing stores nearly tripled during 2011-16. Similarly, online sales of manufacturing sectors grew by 28.3%, while the industry declined by 2.3% (Figure 11).[10]

Figure 11.

Online sales grew faster than overall industry growth during 2011-16



We broke down the impact of online tools and technology on the sales of small businesses in rural America by company size. In the past three years, digital tools and technology had the highest impact on businesses with annual sales between $100,000 and $1 million. As noted earlier, digital technologies are still expensive and skilled workers are lacking in rural areas. If digital technologies and skilled workers become more available in rural areas, ultra-small businesses with less than $100,000 annual revenue might be able to afford online tools and technology. We estimated digital technologies could raise sales of ultra-small businesses by more than 20% in the next three years if those businesses could better adopt online tools and technology (Table 6).

10. Online sales are defined by the Census as sales of goods and services in which the buyer places an order, or the price and terms of the sale are negotiated, via an internet, mobile device, extranet, Electronic Data Interchange network, electronic mail, or other comparable online system; payment may or may not be made online. Census Online Multiple Sector Data Tables.

Table 6.

Online tools and technology have highest potential impact on small businesses with revenue under $100,000 in rural areas

Revenue Bracket	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
All Rural Small Businesses	**17.2%**	**18.3%**	**20.8%**
< $100,000	17.6%	25.1%	28.1%
$100,000-$500,000	19.9%	20.0%	24.7%
$500,000-$1.0 million	20.0%	23.1%	25.1%
$1.0-$5.0 million	19.1%	16.7%	19.2%
> $5.0 million	13.4%	14.6%	16.0%

We estimated the impact of online tools and technology on rural small businesses by industry. Rural small businesses in the transportation, warehousing, and wholesale industries had the highest benefit in the past three years (25.5% sales growth) and also have the highest potential for growth in the next three years (28.4% sales growth) if they better utilize online tools and technology. Similarly, rural small businesses that offer IT and business professional services had above-average benefit in the past three years (22.2% sales growth) and have the highest potential for growth in the next three years (23.0% sales growth) if they better utilize online tools and technology. Other rural small businesses that highly benefited from online tools and technology in the past three years are in education, arts, entertainment, and recreation (18.3% sales growth) industries. Although having a smaller benefit in the past three years (16.2% sales growth), rural small businesses in the construction industry could be one of the highest-growth industries (23.9% sales growth) if these small businesses better utilize online tools and technology (Table 7).

Table 7.

Transportation, warehousing, and wholesale industries have substantial benefits from online tools and technology

Industry	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
All Rural Small Businesses	**17.2%**	**18.3%**	**20.8%**
Agriculture, mining, and utilities	8.2%	9.8%	13.7%
Construction	16.2%	18.4%	23.9%
Manufacturing	14.8%	14.0%	16.8%
Transportation, warehousing, and wholesale	25.5%	27.1%	28.4%
Education, arts, entertainment, and recreation	18.3%	19.0%	20.4%
Health care	13.2%	14.4%	17.6%
Retail, accommodation, and food	18.6%	16.2%	19.4%
Finance, insurance, and real estate	18.2%	20.2%	18.8%
Information, professional, mgmt., admin.	22.2%	21.1%	23.0%

The sales growth of rural small businesses with very good access to online tools and technology was 23.3% during the past three years compared with 11.3% sales growth of small businesses without very good access. Regardless of the ability to access the internet, rural small businesses realize that having better access to online tools and technology will boost their sales in the next three years. Rural small businesses that have very good access believe even better access to online tools and technology would boost their sales by 30.9% in the next three years. Similarly, those small businesses that do not have very good access to online tools and technology think better access would boost their sales by 19.2% in the next three years. The economic benefit of having very good access to online tools and technology on realized, unrealized, and potential sales of rural small business is seen across industries and across states in all regions (Table 8).

Table 8.

Good access to online tools and technology helps small business grow

Access to Online Tools and Technology	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
Very good	23.3%	25.4%	30.9%
Not very good	11.3%	16.6%	19.2%

Two-thirds of rural small businesses in all regions sell the majority of their products and services within their own community. Digital technologies provide opportunities for rural small businesses to expand their customer base inside and especially outside their community. The economic benefits of online tools and technology are higher for those rural small businesses that have customers outside their community (20.6% sales growth in the past three years) than for those that operate mostly within their community (13.7% sales growth in the past three years).

Nevertheless, the benefits of digital technology for rural small businesses are not fully realized. Since rural small businesses have a limited local customer base, digital technologies can unlock their potential by allowing access to a larger base outside of the local community. If rural small businesses better adopted online tools and technology, their sales growth could have been two times the actual sales growth in the past three years. The potential growth of rural small businesses is larger than the realized and unrealized sales growth in the past three years. We estimated sales growth of rural small businesses would be more than 20% in the next three years if they better adopt online tools and technology. Sales growth could be as high as 30% in the next three years for those rural small businesses that have higher sales outside the community (Table 9).

Table 9.

Online tools and technology help small businesses grow outside of their community

Share of Revenue From Outside of the Community	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
Equal or above average	20.6%	25.1%	29.2%
Below average	13.7%	16.5%	20.7%

During the past three years, online tools and technology created an additional $69.8 billion sales per year for small businesses in rural areas. Using the gross output and value added ratio by industry in each state, we estimated the additional annual sales created an additional $38.7 billion value added per year for rural America. Applying gross output per person in each state, we estimated the additional annual sales supported 296,288 jobs (full-time equivalent) with $12.1 billion in wages per year. The size of economic contributions of digital technologies to rural small businesses is equivalent to the economic size of Vermont or Wyoming (Table 10).

Table 10.

Online tools and technology added nearly $70 billion in sales to small businesses in rural America during the past three years

	Additional Annual Sales ($ billion)	Additional Annual Value Added ($ billion)	Additional Jobs	Additional Annual Wages ($ billion)
United States	**$69.8**	**$38.7**	**296,288**	**$12.1**
Northeast	$6.0	$3.5	27,806	$1.3
New England (CT, ME, MA, NH, VT)	$2.4	$1.4	12,097	$0.5
Middle Atlantic (NY, PA)	$3.7	$2.1	15,710	$0.8
Midwest	$24.4	$13.2	98,259	$4.0
East-North Central (IL, IN, MI, OH, WI)	$15.0	$8.0	61,531	$2.6
West-North Central (IA, KS, MN, MO, NE, ND, SD)	$9.4	$5.1	36,728	$1.4
South	$30.7	$17.1	129,016	$5.1
South Atlantic (FL, GA, MD, NC, SC, VA, WV)	$11.5	$6.5	53,514	$2.2
East-South Central (AL, KY, MS, TN)	$10.0	$5.4	41,947	$1.6
West-South Central (AR, LA, OK, TX)	$9.2	$5.2	33,555	$1.4
West	$8.7	$5.0	41,207	$1.7
Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	$5.4	$3.1	26,283	$1.0
Pacific (AK, CA, HI, OR, WA)	$3.3	$1.8	14,924	$0.7

Many rural small businesses still have not fully utilized digital technologies, and therefore their businesses have not reached their full potential. If small businesses in rural America had better adopted online tools and technology, we estimated their sales would have been $74.4 billion higher per year during the past three years. Value added to the rural

economies across the country would have been $41.3 billion higher per year during the past three years. The additional sales would have supported another 316,605 jobs (full-time equivalent) and $13 billion wages per year. These unrealized economic benefits are larger than what rural small businesses have realized in the past three years (Table 11).

Table 11.

Small businesses in rural areas could have generated an additional $74.4 billion during the past three years if they had better adopted online tools and technology

	Additional Annual Sales ($ billion)	Additional Annual Value Added ($ billion)	Additional Jobs	Additional Annual Wages ($ billion)
United States	**$74.4**	**$41.3**	**316,605**	**$13.0**
Northeast	$7.2	$4.2	33,518	$1.5
New England (CT, ME, MA, NH, VT)	$2.4	$1.4	12,904	$0.5
Middle Atlantic (NY, PA)	$4.8	$2.8	20,614	$1.0
Midwest	$21.8	$11.8	87,538	$3.6
East-North Central (IL, IN, MI, OH, WI)	$12.8	$6.9	52,150	$2.2
West-North Central (IA, KS, MN, MO, NE, ND, SD)	$9.1	$5.0	35,388	$1.4
South	$36.0	$20.0	152,111	$6.0
South Atlantic (FL, GA, MD, NC, SC, VA, WV)	$12.4	$7.0	56,853	$2.4
East-South Central (AL, KY, MS, TN)	$12.9	$7.0	55,746	$2.1
West-South Central (AR, LA, OK, TX)	$10.7	$6.0	39,512	$1.6
West	$9.3	$5.3	43,438	$1.9
Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	$5.1	$2.9	25,220	$1.0
Pacific (AK, CA, HI, OR, WA)	$4.2	$2.4	18,217	$0.9

Online sales in America have not reached their full potential, especially for small businesses in rural areas. We estimated that better adoption of online tools and technology could increase annual sales for small businesses in rural areas by approximately $84.5 billion per year in the next three years. The additional sales would raise value added to the rural economies by $46.9 billion per year and support 360,054 jobs (full-time equivalent) and $14.8 billion in wages per year (Table 12).

Table 12.

Small businesses in rural areas could add another $84.5 billion in the next three years if they better adopt online tools and technology

	Additional Annual Sales ($ billion)	Additional Annual Value Added ($ billion)	Additional Jobs	Additional Annual Wages ($ billion)
United States	**$84.5**	**$46.9**	**360,054**	**$14.8**
Northeast	$8.4	$4.8	38,662	$1.8
New England (CT, ME, MA, NH, VT)	$2.7	$1.6	14,312	$0.6
Middle Atlantic (NY, PA)	$5.7	$3.3	24,350	$1.2
Midwest	$24.8	$13.5	99,669	$4.1
East-North Central (IL, IN, MI, OH, WI)	$15.7	$8.5	64,388	$2.7
West-North Central (IA, KS, MN, MO, NE, ND, SD)	$9.1	$5.0	35,281	$1.4
South	$40.6	$22.5	171,495	$6.7
South Atlantic (FL, GA, MD, NC, SC, VA, WV)	$14.6	$8.2	67,431	$2.8
East-South Central (AL, KY, MS, TN)	$12.9	$7.0	55,746	$2.1
West-South Central (AR, LA, OK, TX)	$10.7	$6.0	39,512	$1.6

Table 12 continued.

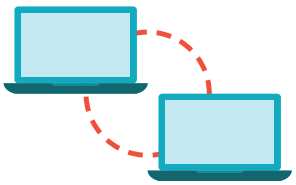
	Additional Annual Sales ($ billion)	Additional Annual Value Added ($ billion)	Additional Jobs	Additional Annual Wages ($ billion)
West	$9.3	$5.3	43,438	$1.9
Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	$5.1	$2.9	25,220	$1.0
Pacific (AK, CA, HI, OR, WA)	$4.2	$2.4	18,217	$0.9

Policy Recommendations

Digital technologies and selling online are transforming the way we live and do business. Thanks to the technological innovation during the past 20 years, online tools are widely available and more affordable among American households and businesses. With just one click, Americans can purchase virtually anything from anywhere at competitive prices. Online sales of both manufacturing and non-manufacturing industries outpaced the overall industry growth. For example, online sales of the manufacturing sector grew more than 28% compared with a 2.3% decline of the total manufacturing sector during the past five years. Online sales in the retail industry, led by clothing stores, food and beverage stores, and home furnishings stores, doubled their revenue in the past five years while the overall retail industry grew by 18.4%.

The development of online tools and technology creates a unique opportunity for rural small businesses. Greater internet connectivity will support the opportunity for greater innovation through access to the cloud. Small businesses in rural areas will have access to the best tech in the world at a fraction of the cost. Digital technology helps these entrepreneurs run their business while maintaining their lifestyle in rural areas. As shown above, online tools and technology added nearly $70 billion in sales per year for rural small businesses during the past three years, which in turn created nearly 300,000 rural jobs.

These gains underscore the economic potential of rural America, and it is important for the sustainability of the nation's economy that the progress continues. Based on the key findings of this study, the following policy recommendations are designed to incentivize entrepreneurship and prioritize growth at the state and federal levels:

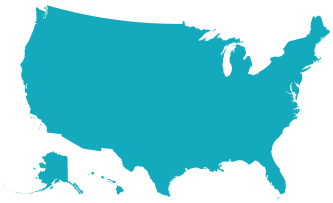


- **Increase digital connectivity in rural areas.**
  Internet and mobile phone connectivity are crucial to selling online. The connection and speed at which a consumer and vendor transact matters. While over 92% of Americans have access to high-speed internet, about 27% of rural residents still do not have access to the FCC broadband standard. The private and public sectors should continue to identify opportunities to expand connectivity, including through deploying infrastructure and expanding wireless spectrum in order to add coverage and capacity in rural areas.

- **Increase the talent pipeline of candidates trained in digital skills (cloud, digital marketing).**
  Without a skilled workforce, small businesses cannot thrive. There is a shortage of skilled IT professionals in rural areas to assist small businesses. The private and public sectors should continue to identify opportunities to partner to ensure the skills businesses need in their workforce match the local curricula preparing the American workforce for the 21st century.

- **Increase adoption of digital training and digital tools by rural small businesses so they can scale their operations.**
  This study highlights two points: the positive benefits for rural small businesses effectively utilizing digital tools to sell online and the potential for businesses currently underutilizing those digital tools to grow. Showcasing existing programs offered by the Small Business Administration and affiliated Small Business Development Centers across the country is a cost-effective way for rural small business owners to increase their digital literacy. Further, as digital tools evolve, increased opportunities for private sector companies to train small business owners on new products will help them start, scale, and compete in a global economy.

By increasing the quality of connectivity, calibrating the skills required by businesses with how we prepare the American workforce, and maximizing exposure to digital literacy programs for small business owners, small businesses in rural America could realize benefits far greater than they have in the past. Based on the survey conducted for this study, rural small businesses could add over $84 billion in sales per year in the next three years and could create another 360,000 jobs in rural areas, where 17.5 million adult residents are either unemployed or no longer actively looking for employment. Unlocking the digital potential in rural America is important for American small businesses and critical to future U.S. economic growth.



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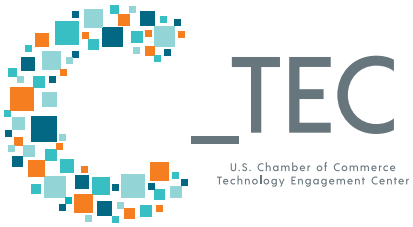


About C_TEC

The U.S. Chamber of Commerce is the world's largest business federation representing the interests of more than three million businesses of all sizes, sectors, and regions. Four years ago, the U.S. Chamber of Commerce launched the Chamber Technology Engagement Center (C_TEC) to advance technology's role in strengthening business by leveraging tech innovations that drive economic growth in the United States. C_TEC promotes policies that foster innovation and creativity and sponsors research to inform policymakers and the public.

About Amazon

Amazon is guided by four principles: customer obsession rather than competitor focus, passion for invention, commitment to operational excellence, and long-term thinking. Customer reviews, 1-Click shopping, personalized recommendations, Prime, Fulfillment by Amazon, AWS, Kindle Direct Publishing, Kindle, Fire tablets, Fire TV, Amazon Echo, and Alexa are some of the products and services pioneered by Amazon. For more information, visit amazon.com/about and follow @AmazonNews.

Half of the items purchased in Amazon sites worldwide come from small and medium size business. There are more than one million U.S. small and medium-size businesses selling their products on Amazon and In 2017 more than 300,000 U.S.-based small and medium-sized businesses started selling on Amazon, with more than one million of theses businesses using Amazon sites to sell their products. Amazon estimates that small and medium-sized businesses selling on Amazon have created more than 900,000 jobs globally.

Appendix 1. About the Survey Data

About Ipsos

Ipsos, a global market research firm, conducted a poll between July 23 and August 20, 2018, on behalf of the U.S. Chamber of Commerce and Amazon. For the survey, a sample of 5,300 small business owners and decision makers in rural areas of the United States were interviewed online (n = 5,000) and by phone (n = 300) in English. The sample includes a minimum of 50 businesses from each state, excluding Delaware, New Jersey, Rhode Island, and Washington, D.C., which do not have any rural counties per the USDA definition.

Small businesses are defined as companies with fewer than 500 employees. The sample for the poll is a listed business directory of all U.S. businesses. Ipsos used fixed-sample targets, unique to this study, in drawing the sample. The sample calibrates respondent characteristics to be representative of the U.S. small business population using standard procedures such as raking-ratio adjustments. The source of the population targets is the U.S. Census 2014 Statistics of U.S. Businesses dataset. The sample drawn for this study reflects fixed-sample targets on firmographics. Post-hoc weights were made to the population characteristics by state.

All sample surveys and polls may be subject to other sources of error, including, but not limited to, coverage error and measurement error. The poll has a margin of error of plus or minus 3.5 percentage points for all respondents. Ipsos calculates a design effect (DEFF) for each study based on the variation of the weights, following the formula of Kish (1965). The poll had a confidence interval adjusted for design effect of the following: (n = 1,000, DEFF = 1.5) adjusted confidence interval = +/-5 percentage points. Numbers may not add up to 100 due to rounding.

Core Survey Questions

Experience With Digital Technologies

- How would you rate your business's ability to access and use digital technologies?
- What type of digital technologies and services does your business have and use?

Perceptions of Using Digital Technologies

- Do digital technologies and internet connection help or hurt your business?
- Should government create incentive programs to help rural small business have better access to digital technologies?
- Does your business have access to digital technologies and skilled IT professionals?
- What do you think about the costs of digital technologies and IT professionals in your area?

Economic Impact of Using Digital Technologies

- How much did online tools and technology affect your sales during the past three years?
- If you had possessed better access to online tools and technology, how much sales would your business have made during the past three years?
- If you have better access to online tools and technology, how much sales would your business make in the next three years?

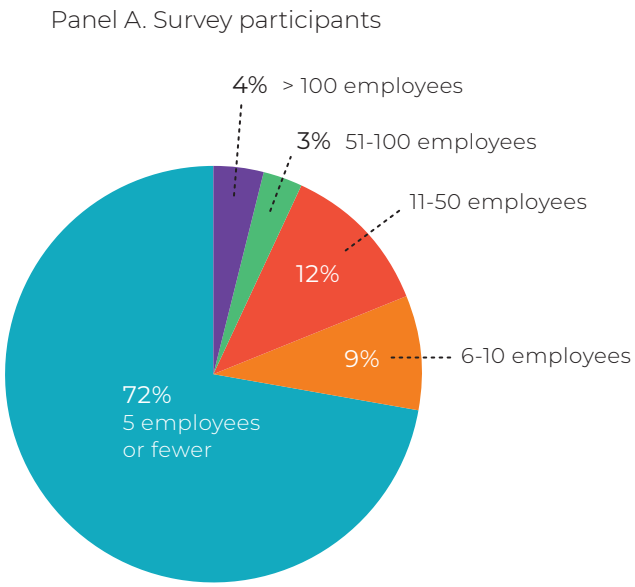
Characteristics of Survey Participants

The survey includes 5,300 small businesses with fewer than 500 employees in rural areas across the country. Rural areas are non-metropolitan counties based on the USDA Continuum Codes 4-9. Survey questionnaires were sent to small business owners and decision makers in 47 states; Delaware, New Jersey, Rhode Island, and Washington, D.C., are excluded from the survey because they do not have non-metropolitan counties based on the USDA definition. Since official statistics of rural small businesses are limited and the distribution of firm size is similar in both urban and rural areas,[11] we used Census data of firms in the urban and rural areas as proxies to compare with the survey data.

The business characteristics of the 5,300 rural small businesses in the survey well reflect the business characteristics of the population of small businesses in the United States. For example, 72% of our survey sample compared with 61% of the Census survey has five employees or fewer and 4% of our sample compared with 1% of the Census survey has more than 100 employees (Figure A.1).

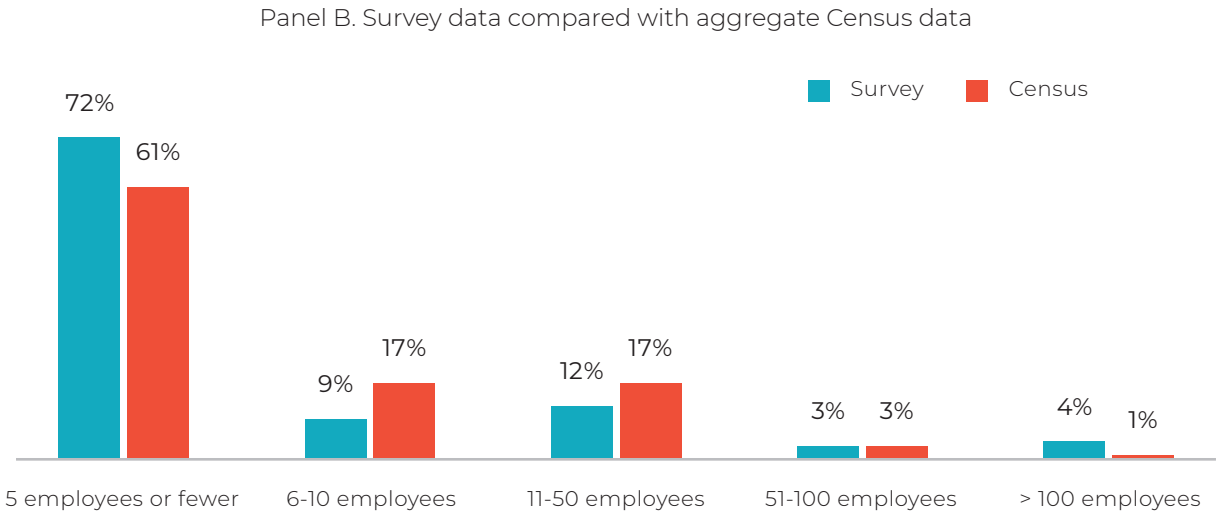
Figure A.1.

72% of survey participants are working in firms with 5 employees or less



11. For example, the Small Business Credit Survey—Report on Rural Employer Firms published by the Federal Reserve Bank of Richmond and Federal Reserve Bank of Atlanta in 2017 showed 58% of rural employer firms compared with 54% of urban employer firms have one to nine employees and 4% of employer firms in rural area compared with 5% of employer firms in urban areas have 50-499 employees. Source: Federal Reserve Bank of Richmond and Federal Reserve Bank of Atlanta. 2017. "Small Business Credit Survey—Report on Rural Employer Firms." Federal Reserve Banks.

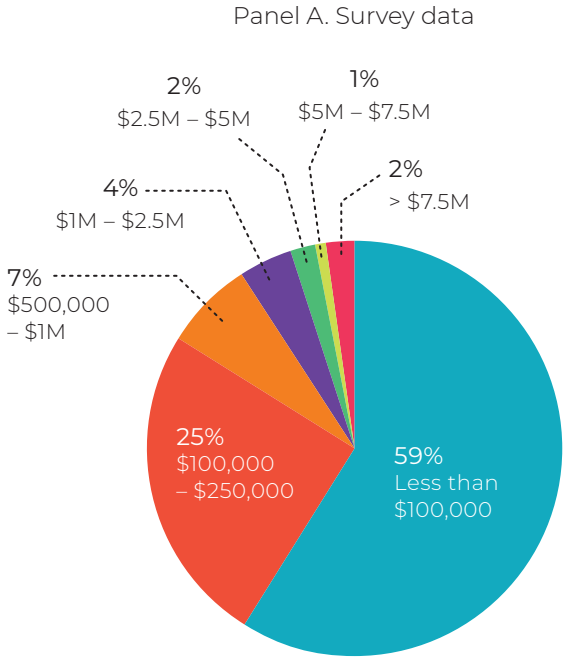
Figure A.1 continued.



About 60% of rural small businesses in the survey have less than $100,000 annual revenue and 76% have less than $250,000 annual revenue. Only 3% of the rural small businesses in the survey have more than $5 million revenue per year. The distribution of small businesses by revenue in the survey reflects the distribution of companies by revenue in the United States (Figure A.2).

Figure A.2.

59% of survey respondents are firms with less than $100,000 annual revenue



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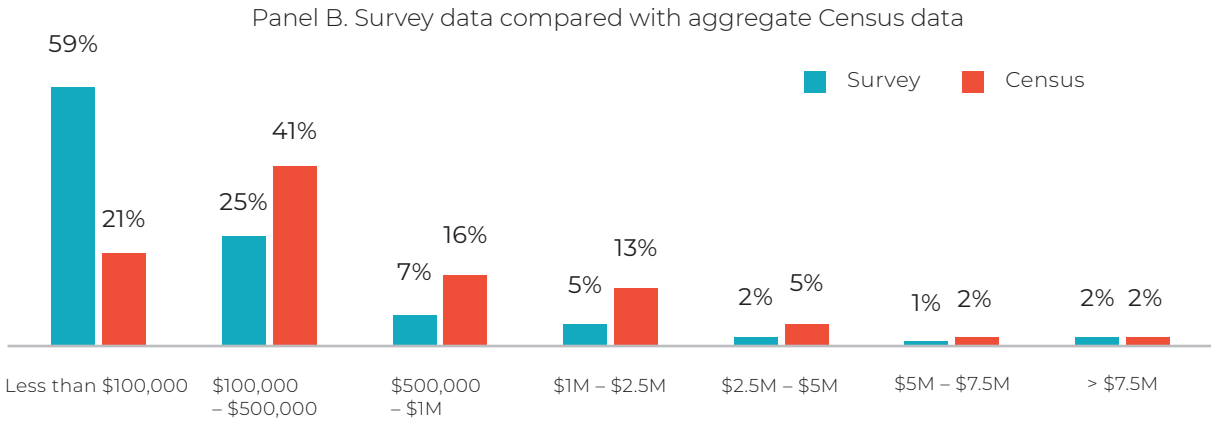


Businesses in rural areas represent a wide range of industries. Manufacturing and services industries, including professional IT services, have been growing to replace the dominant role of agriculture and mining industries in rural areas. The expansion of high-speed internet and online tools in rural areas helps develop industries such as retail, education, and professional services. The survey sample includes industries from agriculture (8%); construction (8%); manufacturing (3%); education, arts, entertainment, and recreation (12%); retail; accommodation and food services (15%); and professional services (11%). The distribution of companies by industry also reflects the distribution of companies in the United States (Figure A.3).

Figure A.3.

Survey respondents are working across all industries in rural areas

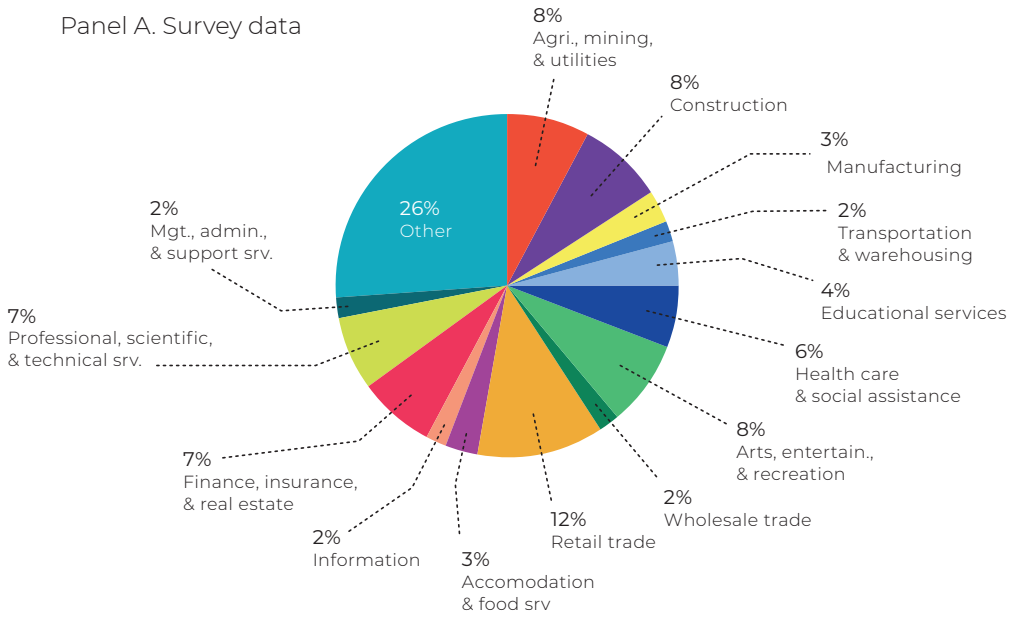
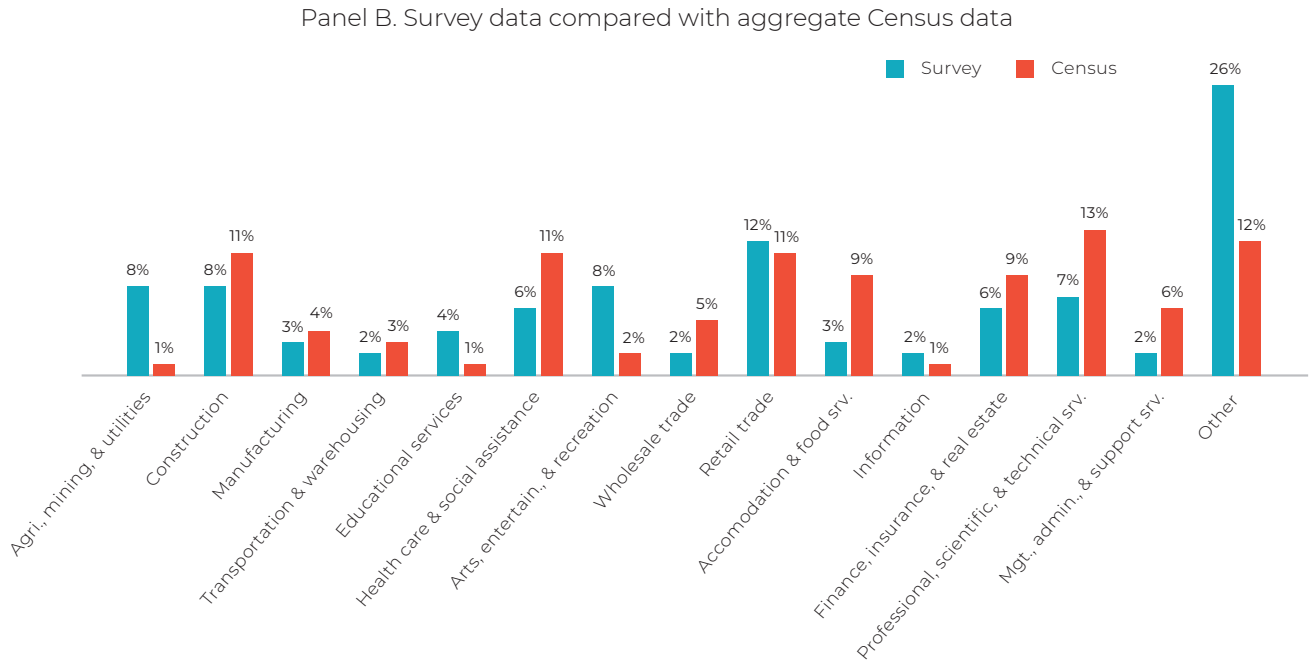


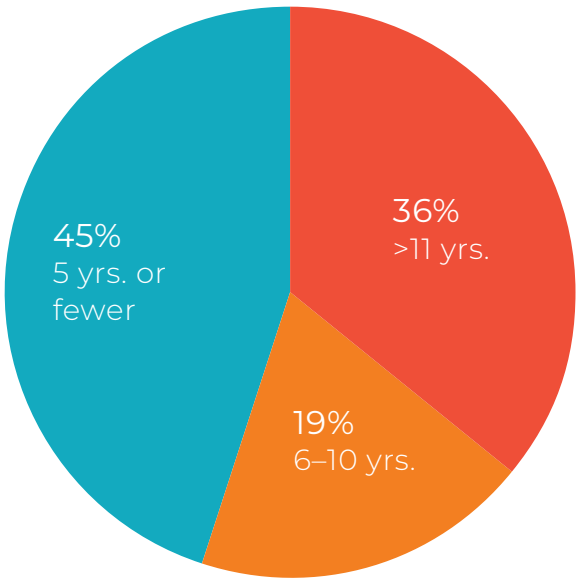
Figure A.3 continued.



Most of the rural small businesses surveyed are young companies. About 45% of rural small businesses in the survey have operated for five years or fewer, while 36% of them have operated for more than 11 years. The rest of them (19%) have operated between six and 10 years (Figure A.4).

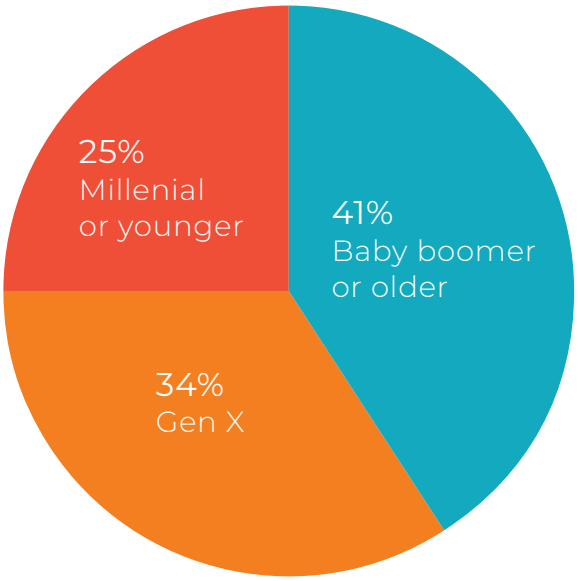
Figure A.4.

45% of rural small businesses in the survey are working for companies less than five years old



The rural small businesses in the survey are evenly distributed across generations. About 41% of them are owned by baby boomers or older. Gen X accounts for 34% while millennials or younger accounts for 25% of rural small business owners in the survey (Figure A.5).

Figure A.5.
Nearly 60% of rural small businesses in the survey are owned by gen X-ers and millennials



Small disadvantaged businesses (SDBs) are important to economic growth in both urban and rural communities. The Small Business Administration defines SDBs as those owned by women, minorities, LGBTQ individuals, veterans, and other economically or socially disadvantaged groups. In this survey, SDBs are well represented; 45.4% of businesses are women owned, 8.6% are veteran owned, 6.6% are minority owned, and 5.1% are LGBTQ owned (Figure A.6).

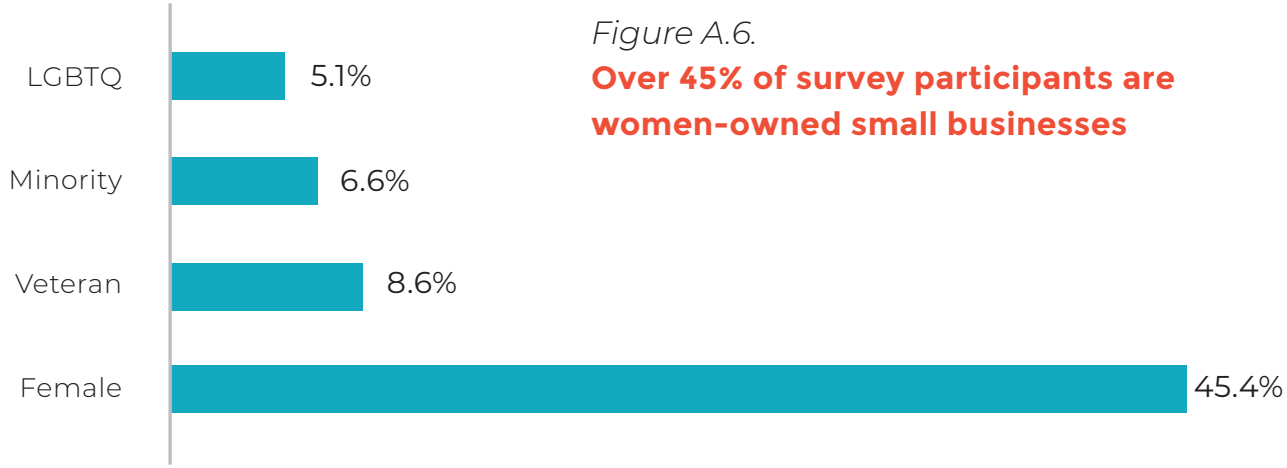


Figure A.6.
Over 45% of survey participants are women-owned small businesses

Appendix 2. Definitions, Estimations, and Data Sources

1. Rural areas

We follow the U.S. Department of Agriculture (USDA) definition to define rural areas. Our study covers all non-metropolitan counties (i.e., USDA Continuum Codes 4, 5, 6, 7, 8, and 9). Data sources: USDA. 2013 Rural-Urban Continuum Codes. Web access. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UYJuVEpZRvY

2. Small business

We follow the U.S. Small Business Administration (SBA) standard definition of small businesses with fewer than 500 employees.

3. Geography

We follow the U.S. Census definitions of regions and divisions.

4. Employment

We use U.S. Census 2012-16 American Community Survey five-year estimates.

5. Gross output/sales of small businesses in rural areas

We estimate the dollar sales of small businesses in all sectors in rural areas by state.

- We aggregate total sales for all sectors of all firms with and without paid employees in all rural counties in each state. Data sources: Census' Surveys & Programs; Survey of Business Owners and Self-Employed Persons; USDA rural definitions.

- We estimate the share of small business sales in each state by applying small business shares of private non-farm nominal gross domestic product (GDP) estimated by Kobe and Schwinn to SBO county data. Data sources: Census' Surveys & Programs; Survey of Business Owners and Self-Employed Persons; USDA rural definitions; Kobe, Kathryn, and Richard Schwinn. 2017. "Small Business GDP 1998-2014." SBA Office of Advocacy.

6. Value added of small business in rural areas

We estimate the value added of small businesses in rural areas by state.

- We use Bureau of Economic Analysis to estimate the ratio of gross output and value added of private industries by state.

- We apply the gross output/value added ratio to estimate value added of small businesses in rural areas by state.

7. Gross output per employee and wage paid per employee

We estimate gross output per employee by dividing aggregated total sales of all firms with or without paid employees in a state by total employment of all firms with or without paid employees in a state. We estimate wage paid per employee by dividing total wage paid in a state by the number of employees in firms with paid employees in a state. Data sources: Census' Surveys & Programs; Survey of Business Owners and Self-Employed Persons.

Appendix 3. State Tables

Table A.1. Population of 16 years and older, labor force, employment, and unemployment in rural areas, 2012-16

Table A.2. Labor participation rate, employment rate, and unemployment rate in rural areas, 2012-16

Table A.3. Share of population with access to broadband in all areas and rural areas, 2014 and 2016

Table A.4. Business impacts of online tools and technology on sale growth of small businesses in rural areas, survey responses

Table A.5. Economic impact of digital tools and technology on small businesses in rural America, annual average 2014-17

Table A.6. Unrealized economic impact of digital tools and technology on small businesses in rural America, annual average 2014-17

Table A.7. Potential economic impact of digital tools and technology on small businesses in rural America, annual average 2018-21

Table A.1.

Population of 16 years and older, labor force, employment, and unemployment in rural areas, 2012–16

	Population	Labor Force	Employed Persons	Unemployed Persons
Alabama	924,665	482,765	434,000	48,765
Alaska	178,991	120,136	109,567	10,569
Arizona	265,901	126,226	107,949	18,277
Arkansas	915,422	489,409	448,959	40,450
California	686,371	364,231	326,556	37,675
Colorado	562,010	350,730	328,895	21,835
Connecticut	153,872	105,485	98,430	7,055
Florida	576,838	283,161	255,063	28,098
Georgia	1,409,992	740,529	675,694	64,835
Hawaii	211,828	126,922	118,350	8,572
Idaho	422,475	252,934	237,416	15,518
Illinois	1,214,062	712,684	660,331	52,353
Indiana	1,161,527	711,657	667,268	44,389
Iowa	1,023,650	662,503	633,241	29,262
Kansas	739,949	472,320	448,829	23,491
Kentucky	1,474,785	765,533	698,157	67,376
Louisiana	600,260	308,975	279,964	29,011
Maine	454,560	268,147	249,561	18,586
Maryland	125,083	76,768	71,322	5,446
Massachusetts	82,588	55,221	52,181	3,040
Michigan	1,475,700	822,100	754,712	67,388
Minnesota	989,936	640,052	610,199	29,853
Mississippi	1,273,228	687,232	615,426	71,806
Missouri	1,242,458	685,248	634,613	50,635
Montana	531,971	328,472	308,867	19,605
Nebraska	528,018	355,052	342,314	12,738
Nevada	217,385	123,148	112,015	11,133
New Hampshire	416,113	265,628	252,477	13,151
New Mexico	539,668	289,888	263,705	26,183
New York	1,149,881	667,084	616,819	50,265
North Carolina	1,779,543	973,852	880,308	93,544
North Dakota	295,185	195,591	190,508	5,083
Ohio	1,892,379	1,128,763	1,051,701	77,062

Table A.1 continued.

	Population	Labor Force	Employed Persons	Unemployed Persons
Oklahoma	1,059,489	593,308	556,535	36,773
Oregon	533,124	286,095	259,580	26,515
Pennsylvania	1,228,611	691,193	644,619	46,574
South Carolina	605,200	322,072	288,015	34,057
South Dakota	340,474	225,958	216,454	9,504
Tennessee	1,208,295	649,609	592,920	56,689
Texas	2,384,838	1,303,776	1,213,156	90,620
Utah	232,368	144,824	136,486	8,338
Vermont	341,423	219,385	208,171	11,214
Virginia	870,925	467,964	432,794	35,170
Washington	583,726	313,674	286,281	27,393
West Virginia	582,566	292,132	267,212	24,920
Wisconsin	1,220,912	771,826	730,240	41,586
Wyoming	319,234	215,342	205,125	10,217

Source: Census American Community Survey, 2012-16.

Table A.2.

Labor participation rate, employment rate, and unemployment rate in rural areas, 2012-16

	Labor Participation Rate	Employment Rate	Unemployment Rate
Alabama	52.2%	89.9%	10.1%
Alaska	67.1%	91.2%	8.8%
Arizona	47.5%	85.5%	14.5%
Arkansas	53.5%	91.7%	8.3%
California	53.1%	89.7%	10.3%
Colorado	62.4%	93.8%	6.2%
Connecticut	68.6%	93.3%	6.7%
Florida	49.1%	90.1%	9.9%
Georgia	52.5%	91.2%	8.8%
Hawaii	59.9%	93.2%	6.8%
Idaho	59.9%	93.9%	6.1%
Illinois	58.7%	92.7%	7.3%

Table A.2 continued.

	Labor Participation Rate	Employment Rate	Unemployment Rate
Indiana	61.3%	93.8%	6.2%
Iowa	64.7%	95.6%	4.4%
Kansas	63.8%	95.0%	5.0%
Kentucky	51.9%	91.2%	8.8%
Louisiana	51.5%	90.6%	9.4%
Maine	59.0%	93.1%	6.9%
Maryland	61.4%	92.9%	7.1%
Massachusetts	66.9%	94.5%	5.5%
Michigan	55.7%	91.8%	8.2%
Minnesota	64.7%	95.3%	4.7%
Mississippi	54.0%	89.6%	10.4%
Missouri	55.2%	92.6%	7.4%
Montana	61.7%	94.0%	6.0%
Nebraska	67.2%	96.4%	3.6%
Nevada	56.6%	91.0%	9.0%
New Hampshire	63.8%	95.0%	5.0%
New Mexico	53.7%	91.0%	9.0%
New York	58.0%	92.5%	7.5%
North Carolina	54.7%	90.4%	9.6%
North Dakota	66.3%	97.4%	2.6%
Ohio	59.6%	93.2%	6.8%
Oklahoma	56.0%	93.8%	6.2%
Oregon	53.7%	90.7%	9.3%
Pennsylvania	56.3%	93.3%	6.7%
South Carolina	53.2%	89.4%	10.6%
South Dakota	66.4%	95.8%	4.2%
Tennessee	53.8%	91.3%	8.7%
Texas	54.7%	93.0%	7.0%
Utah	62.3%	94.2%	5.8%
Vermont	64.3%	94.9%	5.1%
Virginia	53.7%	92.5%	7.5%
Washington	53.7%	91.3%	8.7%
West Virginia	50.1%	91.5%	8.5%
Wisconsin	63.2%	94.6%	5.4%
Wyoming	67.5%	95.3%	4.7%

Source: Census American Community Survey, 2012-16.

Table A.3.

Share of population with access to broadband in all areas and rural areas, 2014 and 2016

	All Areas in 2014	All Areas in 2016	Rural Areas in 2014	Rural Areas in 2016
Alabama	80.2%	83.1%	62.4%	65.5%
Alaska	72.2%	78.8%	31.8%	48.4%
Arizona	86.7%	85.6%	47.5%	45.3%
Arkansas	75.0%	77.7%	54.9%	61.9%
California	94.1%	94.8%	58.7%	63.6%
Colorado	90.2%	94.9%	68.1%	74.2%
Connecticut	98.7%	99.1%	100.0%	99.7%
Florida	93.3%	95.8%	62.6%	65.8%
Georgia	91.3%	90.8%	74.7%	72.9%
Hawaii	98.1%	95.3%	90.6%	84.3%
Idaho	82.5%	88.7%	62.8%	76.7%
Illinois	90.8%	94.7%	58.3%	74.8%
Indiana	82.9%	86.9%	61.7%	68.3%
Iowa	85.1%	90.5%	75.8%	84.9%
Kansas	84.8%	89.2%	72.3%	77.6%
Kentucky	83.8%	85.8%	71.3%	74.2%
Louisiana	80.4%	84.5%	39.0%	51.8%
Maine	87.4%	89.9%	79.7%	80.7%
Maryland	95.6%	97.5%	79.1%	88.7%
Massachusetts	97.2%	97.7%	81.4%	83.0%
Michigan	88.8%	90.2%	69.7%	68.9%
Minnesota	89.3%	92.6%	71.7%	84.1%
Mississippi	65.7%	72.2%	53.5%	62.7%
Missouri	79.3%	83.5%	49.2%	59.5%
Montana	69.2%	77.1%	57.7%	67.7%
Nebraska	85.9%	88.9%	61.0%	75.2%
Nevada	90.9%	96.0%	42.6%	74.9%
New Hampshire	92.3%	94.2%	86.0%	87.8%
New Mexico	82.0%	80.6%	56.9%	60.7%
New York	97.7%	98.0%	80.4%	83.9%
North Carolina	92.3%	93.7%	76.8%	82.3%
North Dakota	85.7%	91.2%	77.4%	88.6%
Ohio	91.5%	92.4%	76.6%	78.2%

Table A.3 continued.

	All Areas in 2014	All Areas in 2016	Rural Areas in 2014	Rural Areas in 2016
Oklahoma	71.7%	77.0%	51.9%	63.6%
Oregon	89.5%	91.0%	77.9%	79.8%
Pennsylvania	94.0%	94.9%	75.5%	78.1%
South Carolina	81.6%	88.3%	48.0%	67.5%
South Dakota	88.7%	88.3%	84.1%	82.9%
Tennessee	87.3%	91.1%	69.6%	79.9%
Texas	88.7%	93.5%	55.3%	70.0%
Utah	93.5%	96.6%	73.9%	78.2%
Vermont	83.8%	86.1%	78.2%	83.2%
Virginia	88.8%	90.8%	64.9%	73.2%
Washington	97.1%	98.3%	84.1%	92.2%
West Virginia	70.4%	82.2%	54.7%	75.6%
Wisconsin	87.1%	86.4%	64.9%	68.0%
Wyoming	76.1%	78.2%	69.7%	73.2%

Source: Federal Communications Commission. 2018. "2018 Broadband Deployment Report." FCC.

Table A.4.

Business impacts of online tools and technology on sale growth of small businesses in rural areas, survey responses

	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
Alabama	27.7%	33.1%	32.9%
Alaska	6.9%	13.1%	15.0%
Arizona	25.2%	23.8%	27.4%
Arkansas	4.1%	15.0%	16.8%
California	19.7%	44.6%	49.6%
Colorado	13.1%	9.5%	12.1%
Connecticut	15.0%	3.5%	7.5%
Florida	15.2%	20.0%	16.2%
Georgia	20.3%	30.2%	31.5%
Hawaii	19.8%	12.4%	14.6%
Idaho	12.7%	16.0%	16.4%

Table A.4 continued.

	Sales Growth in the Past Three Years	Unrealized Sales Growth in the Past Three Years	Potential Sales Growth in the Next Three Years
Illinois	11.6%	12.2%	14.8%
Indiana	31.4%	22.0%	25.9%
Iowa	13.6%	9.1%	8.9%
Kansas	16.6%	15.6%	17.6%
Kentucky	26.8%	22.5%	29.4%
Louisiana	5.6%	21.5%	26.0%
Maine	21.7%	12.0%	11.5%
Maryland	19.2%	15.3%	15.4%
Massachusetts	14.3%	10.3%	14.3%
Michigan	12.8%	16.6%	17.6%
Minnesota	0.2%	8.2%	7.3%
Mississippi	15.2%	30.7%	32.8%
Missouri	23.8%	17.5%	14.2%
Montana	14.3%	20.7%	23.9%
Nebraska	16.6%	14.6%	13.1%
Nevada	19.9%	13.2%	16.8%
New Hampshire	9.5%	15.0%	16.1%
New Mexico	7.5%	10.2%	14.6%
New York	15.0%	18.3%	23.0%
North Carolina	20.9%	19.0%	22.3%
North Dakota	6.1%	8.3%	10.5%
Ohio	20.5%	14.5%	21.0%
Oklahoma	17.5%	13.9%	19.7%
Oregon	28.5%	25.5%	28.5%
Pennsylvania	17.1%	23.4%	26.7%
South Carolina	10.0%	9.8%	15.6%
South Dakota	9.3%	10.2%	14.6%
Tennessee	16.5%	27.9%	21.6%
Texas	23.1%	23.3%	25.1%
Utah	9.4%	9.5%	13.0%
Vermont	8.8%	19.1%	22.5%
Virginia	22.9%	29.2%	30.3%
Washington	14.5%	11.5%	14.8%
West Virginia	45.9%	34.6%	57.6%
Wisconsin	16.0%	16.1%	19.0%
Wyoming	15.8%	8.0%	5.4%

Table A.5.

Economic impact of digital tools and technology on small businesses in rural America, annual average 2014–17

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Alabama	$2,378.5	$1,288.3	10,504	$402.1
Alaska	$212.9	$127.4	867	$43.0
Arizona	$626.1	$362.6	3,111	$128.8
Arkansas	$382.8	$209.6	1,763	$63.8
California	$878.1	$494.1	3,541	$188.5
Colorado	$933.1	$543.2	4,292	$198.6
Connecticut	$252.9	$145.3	731	$41.3
Florida	$641.3	$377.6	3,581	$143.5
Georgia	$2,517.7	$1,420.5	10,673	$467.4
Hawaii	$400.7	$239.1	2,199	$84.7
Idaho	$522.1	$288.1	2,703	$105.4
Illinois	$1,798.1	$1,014.8	6,348	$313.5
Indiana	$4,817.3	$2,447.7	19,514	$776.1
Iowa	$2,187.5	$1,168.1	8,260	$311.2
Kansas	$2,074.2	$1,123.0	7,279	$287.4
Kentucky	$3,990.2	$2,141.2	15,137	$566.2
Louisiana	$333.9	$178.9	1,054	$43.2
Maine	$1,042.9	$594.3	5,786	$216.9
Maryland	$281.8	$165.3	1,403	$67.2
Massachusetts	$160.2	$92.2	671	$37.6
Michigan	$1,540.0	$831.3	6,252	$270.2
Minnesota	$21.5	$11.9	87	$4.1
Mississippi	$1,918.2	$1,036.0	9,122	$308.8
Missouri	$2,491.7	$1,389.2	11,002	$458.2
Montana	$889.6	$511.8	4,678	$158.6
Nebraska	$1,573.5	$866.8	6,018	$231.2
Nevada	$712.2	$419.6	3,886	$150.4
New Hampshire	$516.4	$293.7	2,743	$117.7
New Mexico	$447.9	$267.7	2,220	$83.1
New York	$1,492.1	4889.7	6,263	$358.2
North Carolina	$3,288.9	$1,765.0	15,130	$613.6
North Dakota	$511.4	$295.9	1,834	$76.2

Table A.5 continued.

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Ohio	$4,637.3	$2,549.0	19,998	$832.3
Oklahoma	$2,391.7	$1,382.4	9,239	$363.2
Oregon	$1,241.4	$659.2	5,870	$248.7
Pennsylvania	$2,179.1	$1,230.4	9,447	$419.1
South Carolina	$509.3	$276.5	2,573	$93.9
South Dakota	$519.4	$290.5	2,247	$77.4
Tennessee	$1,668.5	$910.5	7,183	$282.5
Texas	$6,107.4	$3,449.6	21,499	$883.3
Utah	$275.4	$156.2	1,354	$53.1
Vermont	$393.2	$225.5	2,166	$79.4
Virginia	$1,695.4	$975.3	7,112	$341.7
Washington	$585.6	$325.6	2,446	$114.9
West Virginia	$2,590.6	$1,495.7	13,042	$470.8
Wisconsin	$2,190.3	$1,182.1	9,419	$389.1
Wyoming	$992.0	$596.4	4,040	$168.2

Table A.6.

Unrealized economic impact of digital tools and technology on small businesses in rural America, annual average 2014–17

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Alabama	$2,844.6	$1,540.7	12,562	$480.9
Alaska	$403.2	$241.3	1,643	$81.4
Arizona	$590.6	$342.1	2,935	$121.5
Arkansas	$1,401.0	$766.9	6,450	$233.4
California	$1,986.0	$1,117.5	8,009	$426.3
Colorado	$677.0	$394.1	3,114	$144.1
Connecticut	$58.4	$33.6	169	$9.5
Florida	$841.6	$495.6	4,700	$188.4
Georgia	$3,743.0	$2,111.8	15,868	$694.8
Hawaii	$249.7	$149.0	1,370	$52.8
Idaho	$654.5	$361.2	3,389	$132.2

Table A.6 continued.

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Illinois	$1,885.1	$1,063.9	6,655	$328.6
Indiana	$3,378.5	$1,716.7	13,686	$544.3
Iowa	$1,463.7	$781.6	5,527	$208.2
Kansas	$1,949.1	$1,055.2	6,840	$270.1
Kentucky	$3,353.2	$1,799.3	12,721	$475.8
Louisiana	$1,275.8	$683.7	4,029	$164.9
Maine	$577.6	$329.1	3,204	$120.1
Maryland	$223.9	$131.3	1,115	$53.4
Massachusetts	$115.7	$66.6	484	$27.1
Michigan	$1,993.6	$1,076.2	8,093	$349.8
Minnesota	$1,171.1	$649.7	4,733	$222.2
Mississippi	$3,859.9	$2,084.8	18,356	$621.3
Missouri	$1,833.2	$1,022.1	8,094	$337.1
Montana	$1,287.0	$740.4	6,767	$229.5
Nebraska	$1,379.5	$760.0	5,276	$202.7
Nevada	$474.0	$279.3	2,586	$100.1
New Hampshire	$817.2	$464.8	4,341	$186.3
New Mexico	$607.4	$363.0	3,011	$112.7
New York	$1,820.7	$1,085.6	7,643	$437.1
North Carolina	$2,986.7	$1,602.8	13,740	$557.2
North Dakota	$687.8	$397.9	2,467	$102.4
Ohio	$3,290.4	$1,808.6	14,190	$590.6
Oklahoma	$1,905.0	$1,101.1	7,358	$289.3
Oregon	$1,110.9	$589.9	5,253	$222.6
Pennsylvania	$2,992.1	$1,689.6	12,971	$575.5
South Carolina	$497.2	$269.9	2,512	$91.7
South Dakota	$566.4	$316.8	2,451	$84.4
Tennessee	$2,812.4	$1,534.7	12,107	$476.2
Texas	$6,157.3	$3,477.8	21,675	$890.5
Utah	$276.9	$157.0	1,361	$53.3
Vermont	$854.1	$489.9	4,705	$172.5
Virginia	$2,163.6	$1,244.6	9,076	$436.1
Washington	$464.9	$258.5	1,942	$91.3
West Virginia	$1,955.1	$1,128.8	9,843	$355.3
Wisconsin	$2,215.2	$1,195.6	9,526	$393.5
Wyoming	$505.4	4303.9	2,058	$85.7

Table A.7.

Potential economic impact of digital tools and technology on small businesses in rural America, annual average 2018-21

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Alabama	$2,830.6	$1,533.2	12,500	$478.6
Alaska	$463.3	$277.2	1,888	$93.5
Arizona	$680.0	$393.9	3,379	$139.9
Arkansas	$1,564.6	$856.4	7,204	$260.6
California	$2,208.3	$1,242.6	8,906	$474.0
Colorado	$859.0	$500.1	3,952	$182.9
Connecticut	$126.4	$72.6	365	$20.6
Florida	$683.0	$402.1	3,814	$152.9
Georgia	$3,911.1	$2,206.6	16,581	$726.0
Hawaii	$295.4	$176.3	1,621	$62.5
Idaho	$671.7	$370.7	3,478	$135.6
Illinois	$2,285.0	$1,289.5	8,067	$398.3
Indiana	$3,963.3	$2,013.8	16,054	$638.5
Iowa	$1,419.8	$758.2	5,361	$202.0
Kansas	$2,210.3	$1,196.6	7,757	$306.3
Kentucky	$4,373.8	$2,347.0	16,593	$620.6
Louisiana	$1,547.9	$829.5	4,888	$200.1
Maine	$552.7	$314.9	3,066	$115.0
Maryland	$225.4	$132.2	1,122	$53.8
Massachusetts	$160.6	$92.4	672	$37.7
Michigan	$2,108.4	$1,138.1	8,559	$369.9
Minnesota	$1,039.6	$576.7	4,201	$197.2
Mississippi	$4,129.3	$2,230.3	19,637	$664.7
Missouri	$1,488.1	$829.7	6,571	$273.6
Montana	$1,485.9	$854.8	7,813	$265.0
Nebraska	$1,239.7	$683.0	4,742	$182.1
Nevada	$599.9	$353.5	3,273	$126.7
New Hampshire	$877.3	$499.0	4,660	$200.0
New Mexico	$869.8	$519.8	4,311	$161.4
New York	$2,288.1	$1,364.3	9,605	$549.3
North Carolina	$3,505.6	$1,881.3	16,127	$654.0
North Dakota	$876.6	$507.1	3,144	$130.5

Table A.7 continued.

	Additional Annual Sales ($ million)	Additional Annual Value Added ($ million)	Additional Jobs	Additional Annual Wages ($ million)
Ohio	$4,753.7	$2,612.9	20,500	$853.2
Oklahoma	$2,695.5	$1,557.9	10,412	$409.3
Oregon	$1,242.7	$659.9	5,876	$249.0
Pennsylvania	$3,401.4	$1,920.7	14,746	$654.3
South Carolina	$791.5	$429.7	3,999	$146.0
South Dakota	$810.2	$453.2	3,506	$120.7
Tennessee	$2,182.8	$1,191.2	9,397	$369.6
Texas	$6,656.9	$3,760.0	23,433	$962.7
Utah	$380.2	$215.6	1,868	$73.2
Vermont	$1,007.1	$577.6	5,549	$203.4
Virginia	$2,244.6	$1,291.2	9,415	$452.4
Washington	$594.4	$330.5	2,483	$116.7
West Virginia	$3,252.2	$1,877.7	16,373	$591.0
Wisconsin	$2,606.1	$1,406.6	11,208	$463.0
Wyoming	$339.0	$203.8	1,381	$57.5

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