Executive summary

The United States (US) is a major source of global innovation, with a strong history of record-breaking patent activity and technological development. Yet innovation is not equally distributed across the country. It occurs differently in rural and urban places and often with a different emphasis. In rural counties, for example, many innovations are developed to overcome barriers in accessing basic services or in managing resources used in local supply chains.

At the same time, innovation in rural areas is a significant driver of growth: nearly two-thirds of all productivity growth in US non-metropolitan counties from 2010 to 2020 was associated with innovation absorption. Boosting innovation in rural areas, including through better understanding the nature of rural innovations, can help to further narrow gaps in spatial inequalities in income and well-being. Indeed, although GDP per capita growth in rural counties (1.5% per annum) between 2010 to 2020 outpaced metropolitan (urban) counties' growth (0.9%), the gap remained significant: 70% of regions in the top 20% of all regions with the highest GDP per capita were metropolitan regions, whilst 61% of the bottom 20% were rural regions. Moreover, the share of counties that are considered persistently poor is five times higher in rural counties than in metropolitan ones.

Productivity gains, associated with innovation adoption, is stronger in rural areas

Not surprisingly, improvements in GDP per capita in recent years are also mirrored in productivity comparisons. Between 2015 and 2020, rural counties saw labour productivity grow by 1.7% per annum, compared to only 1.2% in metropolitan areas. The majority, nearly two-thirds, of productivity gains in rural areas was due to more efficient use of resources, primarily associated with innovation adoption.

Moreover, even when seen through the traditional lens of research and development, this report shows that investing in innovation (R&D spending) delivers greater relative outcomes in rural counties than in metropolitan counties. A one percent increase in R&D spending increases patent intensity by 0.7 units (or close to one more patent per 1 000 individuals with relevant occupations) in non-metropolitan counties, while it is closer to zero in metropolitan counties. At the same time, investing in workforce skills is also more positively associated with increases in innovation outcomes, such as productivity, in rural counties than in metropolitan counties.

But the scale and scope of support for innovation in rural areas needs to go beyond R&D investment

Support for innovation in rural areas in the United States comes from both direct and indirect funding mechanisms. However, the focus on direct support is often technology-based, meaning that the potential of many other forms of innovation, including through entrepreneurship, may not be fully exploited. In this context, entrepreneurship and innovation-based policies in rural counties are not always attuned to their

specificities, realities or needs, including, for example, in enabling the provision of public and private services where there are often significant gaps with metropolitan areas. In addition, often eligibility criteria for federal programmes can prove onerous, thus hindering the participation of local governments.

Ensuring quality access to public services such as digital infrastructure and education is critical

Rural counties are frequently under-served in critical public services such as access to quality education and digital infrastructure. As one of the critical enablers of building networks for innovation and the transfer of knowledge, this places rural counties at a disadvantage when it comes to innovation. For example, in terms of broadband coverage, 21% and 22% of the rural and Tribal Land population, respectively, live in areas without coverage of fixed broadband offers at 100 Mbps download speeds, compared to 1% in urban areas. Broadband adoption rates reveal even starker contrasts. In terms of experienced speeds, there was a 51-percentage point gap in download broadband speeds experienced by users between urban (metro) and rural regions by state in Q1 2021. Poorer quality digital infrastructure has a direct impact on firms in rural areas, exacerbating risks of sectoral specialisations in activities with low innovation and growth potential, and also stymying the potential for innovations in start-ups.

In terms of access to education, 57% of school districts in the United States and 32% of public schools are rural, educating about 12 million (24%) students, yet the quality and delivery of educational services is often more limited in rural regions, reflecting, in part, the impact of lower density on cost-efficiency as well as challenges in recruiting and retaining teachers. Lower education outcomes among the rural population may in part explain lower rates of entrepreneurship in rural areas, and in turn, lower innovation. In several of the case studies analysed, education providers, including traditional education providers and non-traditional providers (such as the private sector, and entrepreneurship support hubs), could be further engaged to contribute to the economic turnaround of rural areas. Yet, often innovation policies and initiatives overlook the important role private sector engagement can play in unlocking educational opportunities for innovation in rural areas. Moreover, a focus on support for innovations to help overcome these and other spatial disparities can help create a virtuous circle.

Polices to support innovation need to consider rural demographic trends

In rural counties, policies to support entrepreneurship or innovation cannot ignore demographic challenges. Close to a quarter of the working age population in non-metropolitan rural counties were over the age of 55 between 2006 and 2010, and this share grew to close to 29% over the period 2016-2020. On the other hand, in the same period, the share of the working age population in metropolitan counties above the age of 55 was lower, at 22%. This trend was primarily due to a relatively low share of primary aged workers (25-54), which stood at 59% in non-metropolitan rural counties, as compared to 65% in metropolitan counties.

Supporting rural innovation in the United States

With the recent federal Infrastructure and Investment in Jobs Act (IIJA) and the Inflation Reduction Act (IRA), rural counties have a new opportunity to access two large competitive federal grants to support innovation. Yet, the effectiveness of these packages depends on the capacities of local governments. Limited capacities (e.g., limited manpower, skills and time needed to carry out intensive contracting processes) can impede local governments from accessing or absorbing funding. More streamlined application processes, that are sensitive to capacity constraints, could increase programme uptake. Moreover, participation could be increased by incentivising joint municipal applications and partnerships

across federal government agencies, for example between the Department of Commerce and the United States Department for Agriculture, or by providing funding specifically for municipal capacity development, especially in persistently poor places and small rural municipalities.

Key Recommendations

Improving policy design and implementation for rural innovation

- Promote a broader view of innovation policy for diverse rural areas that **goes beyond a science and technology understanding of "innovation"** and gives broader criteria for programme design and eligibility requirements such as process innovation, social innovation and public sector innovation. In addition, **"boots-on-the ground" financial support initiatives,** that enable true partnerships, should be expanded.
- Implement programmes in accordance with different **scales of intervention** that: simplify eligibility criteria, consider more bundling, deliver programmes at higher levels of spatial aggregation and foster collaboration among local governments to develop economic development strategies.
- Ensure effective **co-ordination mechanisms** across levels of government that involve regular collaboration between regional EDA and USDA offices and improve co-ordination of public investment. Online one-stop shops could be considered in order to ease access to available resources.
- Build in **capacity development** support for municipalities and programme delivery partners that help them access competitive federal grants.
- Build a **culture of experimentation** in rural entrepreneurship that fosters rural development networks, supports regional hubs and networking, encourages challenge-based competitions, and fosters partnerships between universities, rural colleges and entrepreneurs.
- Better account for the **challenges of rural areas**, such as persistent poverty, demographic change, ageing workforce, migrant workers and the gender wage gap, by streamlining such concerns in the design of policies and programmes. Ensure programmes seek to encourage innovation and entrepreneurship, while working with local and community development organisations to consult on the best way to address the challenges for each category through bottom-up initiatives.

Improving access to high-quality broadband, skills and education for entrepreneurship

- Better assess the state of **broadband connectivity** by improving broadband maps and informing users on prices; ease barriers to infrastructure deployment through bottom-up approaches; and make the most of existing funding and programmes for broadband connectivity.
- Improve **skills** needed for the local labour market through direct funding and resources to reinforce basic education and vocational education and training programmes in rural communities; support programmes for skills needed by indigenous businesses; reinforce quality controls for teacher recruitment; promote consultation and joint-collaboration with local stakeholders on skills upgrading and rural market demands.
- Promote **education for entrepreneurship** through regular consultation mechanisms with state education boards and local stakeholders to develop anticipatory skills plans for students; build more local partnerships with secondary schools for entrepreneurial training; encourage more local and regional opportunities for on-the-job training, internships and summer jobs for youth.

Better track and measure innovation relevant to rural areas

- **Monitor demographic and economic changes in rural areas,** for example through a Rural Observatory or similar cross-agency initiative, with the aim of better aligning the definition of innovation in rural areas with characteristics of rural areas.
- Measure, identify and adopt **indicators that are more appropriately associated with innovation priorities of rural counties**, such as indicators of new firm activities (firm births and deaths) or via community innovation surveys that have an adequate coverage of rural firms.