



Innovation in the Rural Nonfarm Economy: Its Effect on Job and Earnings Growth, 2010-2014

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What Is the Issue?

Innovation—introducing new goods, services, or ways of doing business that are valued by consumers—is regarded as essential to a dynamic and sustainable economy. Empirical evidence of innovation in agriculture and closely related industries is voluminous, but much less is known about innovation in the nonfarm economy of rural America.

The economic study of innovation has mainly relied on data from the congressionally mandated collection on patents, research and development (R&D) expenditures, and the training and employment of scientists, engineers, and technicians. While this R&D-based innovation has been critical to advances in many fields, a large number of advances are made outside R&D labs without the aid of highly trained scientists or dedicated R&D budgets. Instead, these innovations arise the way they always have, by individuals confronting problems and finding creative solutions, often described as grassroots or user innovation. In contrast to the rich sources of data and analysis on R&D-based innovation, grassroots or user innovation has been thinly studied. However, it may be more important to the dynamism of rural areas, given drawbacks of supporting R&D-based innovation. This study uses the 2014 Economic Research Service Rural Establishment Innovation Survey (REIS), the first nationally representative sample of self-reported innovation in rural areas of the United States, to examine the impetus, outcomes, and prevalence of rural innovation, both grassroots and R&D based.

The report further explores whether innovation-intensive industries and the more innovative rural regions recovered faster from the Great Recession of 2007 to 2009 by examining: (1) the rural industries that tend to support the largest share of innovators; (2) the employment trends of these innovation-intensive industries; and (3) employment, earnings, and establishment-formation trends in sub-State regions, based on the prevalence of innovators. The study population was limited to nonfarm tradable industries, that is, to those whose products are conducive to regional or international trade that provides growth opportunities beyond local markets.

What Did the Study Find?

Using a comprehensive definition of innovation—both grassroots and R&D based—the authors found that establishments in nonfarm tradable industries in urban areas were more likely than rural establishments to be classified as substantive innovators in 2014. This is consistent with

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

earlier research that has found an urban innovation advantage. However, innovation rates are very similar among urban-rural establishments in manufacturing industries. Thus, the long-recognized urban innovation advantage appears partly attributable to industry distribution—innovation-intensive manufacturers make up a larger share of the urban economy. For service industries, however, innovation rates of rural establishments tend to lag their urban peers in the same service sector.

In both rural and urban areas, manufacturing makes up the bulk of the most innovative industries. Manufacturing industries with the highest share of substantive innovators in rural areas included pharmaceuticals, chemicals, computers, and plastics. Textile mills also had a high share of innovative establishments, likely because intense global competition makes it difficult for noninnovating firms to survive. The only tradable service-providing industries with a high share of substantive innovators in rural areas were telecommunications and wholesale electronic markets. In contrast, service industries in urban areas with a high share of innovators included broadcasting, data processing, web hosting and related services, air transportation, and business management establishments, among others. Innovation appears to be an increasingly broad-based phenomenon in urban areas, while in rural areas it remains centered around manufacturing.

Overall, in net employment growth, rural tradable industries described as innovation-intensive did not substantially outperform industries described as not innovation intensive. The net employment growth from innovation-intensive industries was 153,736 from 2010 to 2014 (+ 8.4 percent) compared to 130,345 (+ 5.36 percent) for noninnovation-intensive industries. Innovation-intensive industries facing severe import competition continued to lose employment in the post-recession recovery period, implying that factors other than innovation-intensity explain employment growth at the industry level. The regional analysis provides evidence, however, that innovation-intensity at the establishment level did have some positive impact on employment. Industries in all rural commuting zones dominated by substantive innovators (characterizing 648 of 2,570 commuting zone/industries, or 25.2 percent) added, on average, 100 more jobs from 2010 to 2014 than industries in all rural commuting zones characterized by noninnovators (which made up 956 of 2,570 commuting zone/industries, or 37.2 percent), while nominal innovators characterized the remaining 37.6 percent of commuting zone/industries.

How Was the Study Conducted?

This study relies on primary data collected by the REIS explicitly to examine innovation in business establishments. The REIS surveyed private businesses in nonfarm tradable industries with five or more employees in 2014.

A preliminary assessment of the importance of rural innovation to economic outcomes was based on industry and regional estimates of innovativeness derived from the survey data. These measures of innovativeness were then combined with data on employment, earnings, and establishment-formation trends from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) to examine whether innovative-intensive industries and more innovative rural regions recovered faster from the Great Recession.

The classification of industries as innovation-intensive was based on latent class analysis (LCA) of the innovation and auxiliary innovation questions in the 2014 REIS data. This allowed us to rank industries by the probability that a representative establishment was a substantive innovator, that is, demonstrating behavior consistent with both incremental and more wide-ranging innovation. The probability of being classified as a substantive innovator was also used to estimate the innovativeness of multi-county rural commuting zones. Unpublished QCEW data were used to track employment trends for innovation-intensive industries and to track employment, earnings, and establishment-formation trends for rural regions.