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The High-Tech Rural Renaissance? Information Technology, Firm Size and Rural Employment Growth

By Jed Kolko
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Purpose

Advances in information technology (IT) have held out the possibility of a rural renaissance. If firms can communicate over the Internet with customers, suppliers, and others electronically, perhaps they can locate anywhere. The author tested the hypothesis that the spread of the Internet and inexpensive long-distance telecommunications have made it more likely that IT-intensive industries will locate and create jobs in rural areas, away from high-cost cities.

The central finding is that, at least over the 1989-1995 period, information-technology-intensive industries were less likely than low- and medium-IT industries to locate and create jobs in rural areas.

Scope and Methodology

This study uses the new Business Information Tracking Series (BITS) data base, created by the U.S. Bureau of the Census with funding from the Office of Advocacy, to test where firms of differing IT intensity locate. BITS (referred to in the study by its former name—LEEM, Longitudinal Establishment and Enterprise Microdata file) is a microdata file containing annual records for nearly every nonfarm private-sector establishment with positive payroll. Each record contains information on an establishment's employment, payroll, location, start year, and four-digit Standard Industrial Classification (SIC) code for each year that it had positive payroll, beginning in 1989. An establishment is a separate physical location at which business activity occurs. For establishments that are part of a multi-establishment firm, each record also contains information on the firm's employment, payroll, and primary SIC code and location. This linkage allows establishments to be tracked even if they are part of different enterprises over time. At the time of this research the file extended through 1995; new years are being added annually to the data base.

The firm size for each establishment was based on the size of the firm that the establishment belonged to in 1989. New establishments born during the period were assigned the size of the firm they belonged to in 1995. Thus, every establishment that existed in both 1989 and 1995 remained in the same firm size category. Firms were placed in one of four categories: smallest (1-19 employees), smaller (20-99), medium (100-499), or large (500 or more).

A second data set, the October 1989 Current Population Survey (CPS), reports on individual workers' demographic and economic characteristics. Questions include items on employee computer usage at work; workers reporting computer usage also describe the tasks they use computers to perform. By aggregating responses of workers in the same industry, a measure of industry-level technology usage is obtained. This study uses the fraction of an industry's workers that use a computer for electronic mail or other communications as the measure of IT intensity. This measure of IT intensity yields a somewhat different mix of high-, medium-, and low-IT-intensive industries than do other definitions.

An industry is deemed high-IT if the fraction was over 25 percent, medium-IT if the fraction was between 5 percent and 25 percent, and low-IT if the

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fraction was under 5 percent. Examples of high-IT industries include computer manufacturing, software and data processing, scientific research, and securities/investment companies. Low-IT industries include, among others, apparel manufacturing, beauty shops, auto repair shops, furniture manufacturing, and nursing homes.

The industry classification in the CPS fol lows the Census three-digit coding, which differs from the SIC coding used in the BITS. A "crosswalk" linking the two codes was used to classify BITS industries into IT categories, a procedure that allowed 99 percent of establishments to be assigned an IT category.

Highlights

• Rural employment growth in 1989-1995 was strong and was driven by small business. It grew 2.4 percent per year, while urban employment grew 1.4 percent per year.

• In part, the higher growth rate in rural areas was attributable to the smallest firms (under 20 employees), which accounted for 19 percent of rural employment, although they make up only 15 percent of employment overall. Employment in the smallest firms grew much faster than in the other size categories, almost 4 percent per year in both rural and urban areas versus rates of 0.3 to 2.6 percent for other sizes of firms.

• The other sizes of firms grew much faster in rural areas (1.6 percent to 2.6 percent annually) than in urban areas (0.3 percent to 1.0 percent).

• High-IT firms were overwhelmingly urban in 1989, unlike medium- and low-IT firms. Only 7 percent of high-IT employment was in rural areas versus 14 percent of medium- and 18 percent of low-IT employment. The difference in rural employment between high-IT firms (7 percent rural) and low-IT (18 percent) constitutes the "rural technology gap," which stood at 11 percent in 1989. If high- and low-IT firms were equally likely to locate in rural areas, the gap would be zero.

• This rural technology gap existed across all firm sizes but was least pronounced for the smallest firms (4 percent) and smaller firms (5 percent). The view from 1989, then, suggested that if the rural technology gap were closing, it would close first for the smallest firms.

• The gap did not close; instead, it grew from 11 percent in 1989 to nearly 13 percent in 1995. The share of high-IT employment in rural areas dipped slightly, while the rural share of low-IT employment rose a point to more than 19 percent. The gap widened the most for the smallest and smaller firms, from 4 and 5 percent, respectively, to 8 percent in each case.

• How could the gap have increased even though rural employment grew faster than urban employment? The growth in rural employment was confined almost exclusively to medium- and low-IT industries. Whereas rural growth in all industries was 2.4 percent annually, rural high-IT growth was only 0.5 percent. In contrast, high-IT employment in urban areas grew three times faster, at 1.5 percent.

Conclusions

Contrary to popular expectation, high-IT firms did not create large numbers of jobs in nonmetropolitan areas in 1989-1995. Unlike medium- and low-IT industries, which grew roughly twice as fast in rural as in urban areas, high-IT firms barely increased their rural employment at all.

There are several possible explanations. High-IT industries depend on skilled labor and good telecommunications infrastructure, which are more plentiful in urban areas. New industries generally locate first in cities. High-IT businesses also benefit from face-to-face interactions with customers and other contacts, which are easier to achieve in an urban setting.

High-IT industries, as they mature, might start to move to smaler cities and rural areas. As the infrastructure gap continues to close, the disadvantages of rural areas for high-IT firms may shrink.

Ordering Information

The full text of this report, along with summaries of other studies performed under contract to the U.S. Small Business Administration's Office of Advocacy, is available on the Internet at *www.sba.gov/advo/research.*

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