G. Andrew Bernat, Jr.

An Update on Rural Manufacturing

Rural Capital Expenditures Lagged Urban in 1992

Rural manufacturing employment was less severely affected by the 1990-91 recession and recovered more strongly than did urban employment. However, the gap between rural and urban manufacturing wages did not narrow and rural labor productivity growth lagged. In addition, capital expenditures per worker in rural areas declined relative to urban, possibly foreshadowing further widening of the differences between rural and urban labor productivity and wages.

In the June 1994 issue of *Rural Development Perspectives*, I reported on rural manufacturing trends during the 1970's and 1980's. According to more recent data from the Annual Survey of Manufactures (ASM), many of the trends established during the 1980's have continued into the early 1990's. Manufacturing jobs continued to shift to rural areas and rural wages and productivity continued to lag urban wages and productivity in 1992. The newer data, however, show how rural and urban manufacturing faired during the 1990-91 recession and the first full year of recovery. A gap also opened between capital expenditures by rural and urban manufacturing firms in 1992, a departure from earlier years.

Early 1990's Trends in Manufacturing Activity Favor Rural Areas

Rural manufacturing industries lost 86,000 jobs between 1989 and 1991, due in large part to the recession that began in July 1990 and extended through March 1991 (table 1). These losses were more than made up during 1992, the first full year of recovery, as rural manufacturers added 116,600 jobs. Urban manufacturers also added jobs during 1992, but the urban gain of 259,800 jobs was less than a third the number of urban manufacturing jobs lost between 1989 and 1991. In other words, rural areas accounted for less than 9 percent of total manufacturing job losses during the recession but accounted for 31 percent of job gains in 1992. The rural share of U.S. manufacturing jobs thus rose from 21.7 percent in 1989 to 22.6 percent in 1992.

The rural share of manufacturing output also rose in each of the 3 years from 1989 to 1992, but these increases were slightly less than the increase in the rural share of manufacturing jobs (fig. 1). In 1989, rural manufacturing establishments accounted for 19.6 percent of the value of shipments from all U.S. manufacturing establishments. By 1992, the rural share had risen slightly to 20.0 percent. This 0.4-percentage-point increase was less than half the 0.9-percentage-point increase in the rural share of manufacturing employment. The increase in share of value added was even smaller. In 1992, the rural share of manufacturing value added was 18.3 percent, up only 0.3 percentage point from 1989.

The increasing rural share of U.S. manufacturing activity implies that rural areas have a competitive advantage of some sort over urban areas. At first glance this may be seen as a good thing for rural areas. But, if the competitive advantage is based primarily on low cost inputs—of which labor is the most important—rather than on higher productivity or higher quality products, the benefits are likely to be fleeting. Unfortunately, the ASM data point to low-cost labor as a significant source of rural manufacturing growth.

Rural Manufacturing Wages Decline Between 1989 and 1992

While the 1990-91 recession affected rural manufacturing jobs less severely than urban jobs and the subsequent recovery has been stronger in rural areas, the reverse was true for wages. Measured in 1992 dollars, rural manufacturing wages declined 2.8 percent during the recession years of 1990 and 1991. As the economy recovered during 1992, rural wages also improved, growing by 1.8 percent.

Andy Bernat is an economist with the Rural Economy Division, ERS.

Table 1

Change in manufacturing jobs by industry, 1989-92

More than half of all nonmetro manufacturing industries added jobs in 1992

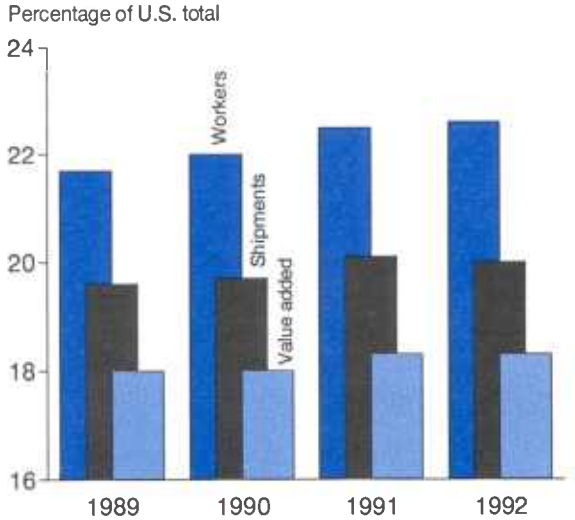
	Nonmetro		Metro	
	1989-1991	1991-1992	1989-1991	1991-1992
	Change in jobs (1,000)			
Total	-86.0	116.6	-915.6	259.8
Lumber and wood products	-24.0	53.4	-31.1	-7.5
Food and kindred products	28.9	21.7	-12.8	19.3
Rubber and miscellaneous plastics products	-1.5	19.6	-35.8	55.1
Transportation equipment	-3.8	10.9	-167.9	8.1
Industrial machinery and equipment	-19.2	10.5	-120.2	-15.9
Fabricated metal products	-14.6	9.8	-95.4	27.2
Instruments and related products	-2.9	7.1	-63.0	3.8
Miscellaneous manufacturing industries	2.9	5.2	-25.7	15.2
Electronic and other electric equipment	-19.4	4.8	-104.4	34.2
Paper and allied products	7.1	3.2	-16.0	5.6
Primary metal industries	-8.4	2.0	-41.5	-9.2
Printing and publishing	8.2	1.3	-23.9	44.8
Textile mill products	-21.9	0.8	-32.8	16.2
Stone, clay, and glass products	-2.8	0.4	-41.4	-4.5
Petroleum and coal products	2.0	0.0	-0.2	0.9
Tobacco products	-0.2	-0.7	-3.1	-0.2
Leather and leather products	-4.5	-2.7	-9.6	-5.9
Furniture and fixtures	-6.5	-6.8	-36.0	23.0
Apparel and other textile products	-9.6	-9.8	-48.7	30.5
Chemicals and allied products	4.3	-14.0	-6.2	19.0

Source: Special tabulations for ERS from the Annual Survey of Manufactures.

Figure 1

Nonmetro share of manufacturing activities

Manufacturing workers, shipments, and value added continued to shift to nonmetro areas



Source: Special tabulations for ERS from the Annual Survey of Manufactures.

Despite the fairly strong growth in 1992, rural wages were still 1 percent below their 1989 level. Like rural wages, urban wage growth during 1992 recovered some of the decline that occurred during the recession, but urban manufacturing wages also remained almost 1 percent lower in 1992 than in 1989. Among the 20 manufacturing industries, real wages in rural areas rose in only 4 (tobacco, apparel, petroleum, and miscellaneous manufacturing). In contrast, real wages rose in six urban industries.

Clearly, the recent growth in manufacturing jobs has benefited many rural communities. However, the fact that wages have not kept up with inflation takes some of the glitter off the job growth. The ASM provides information on two important factors influencing wages: occupational mix and labor productivity. Other factors, such as skill and education, also affect wages, but the ASM does not provide information on them.

Production Workers Concentrated in Rural Areas

Differences in the occupational distribution of manufacturing establishments could obviously contribute a rural-urban wage gap. The only information on occupation available from the ASM data are the number of production workers and the number of nonproduction workers. While this is a relatively crude measure of occupational mix within industries, it nevertheless points to the spatial division of labor within manufacturing as an important factor in the rural-urban wage gap. Because nonproduction workers have higher wages than production workers, the mix of production workers and nonproduction workers has a strong effect on overall average wages. Wages of nonproduction workers in rural manufacturing industries are 70 percent higher than the wages of production work-

ers whereas urban nonproduction workers are paid 64 percent more than urban production workers.

Even though the rural share of nonproduction workers increased between 1989 and 1992, nonproduction workers remain much more concentrated in urban areas than are production workers. In 1992, 25.9 percent of all production workers, but only 15.5 percent of all nonproduction workers, were in rural manufacturing establishments (fig. 2). Like the overall shift of manufacturing activity into rural areas, this relative concentration is not a recent phenomena but represents a longrun trend. In 1992, there were almost 27.3 nonproduction workers for every 100 production workers in rural manufacturing establishments, up from 26.5 in 1989. In urban manufacturing, the number of nonproduction workers per 100 production workers grew from 50.2 in 1989 to over 52.2 in 1992.

A significant wage gap would still exist, however, even with identical proportions of production and nonproduction workers because both groups of rural workers received lower wages than their urban counterparts. Rural nonproduction workers received only 82 percent of what their counterparts received in urban manufacturing establishments, and rural production workers received 80 percent of similar urban workers' wages (fig. 3). With identical occupational mixes, rural manufacturing wages would be 81 percent of urban wages. In actuality, the larger share of production workers in rural manufacturing establishments pushes overall rural manufacturing wages down to 75.4 percent of urban wages.

Rural Labor Productivity Growth Lower Than Urban

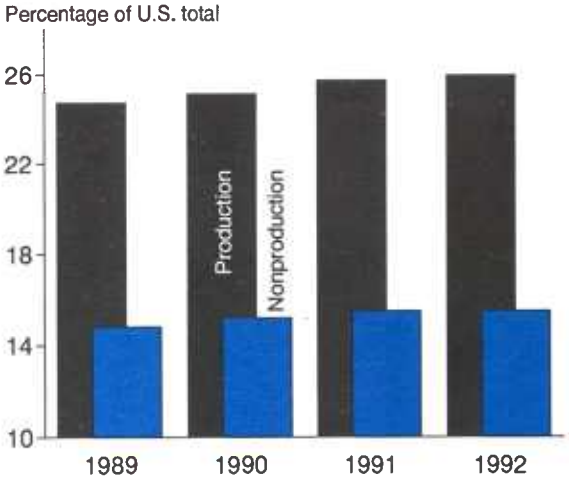
Labor productivity is perhaps the fundamental measure of industry performance because, over the long run, it determines the upper limit of the returns to labor. Consequently, firms and industries with high labor productivity will, in general, be able to pay higher wages than those with lower productivity. Over relatively short periods, higher productivity may not always result in higher wages. In a highly competitive environment such as today's global economy, however, high wages cannot be maintained for very long with low output per worker. Also, to the extent that high labor productivity makes a firm more competitive, firms with high labor productivity will stay in business longer than firms with low labor productivity, tending to be more dependable sources of jobs. However, high labor productivity is not the only indicator of competitiveness because low wages can offset the competitive disadvantage of low labor productivity. According to the ASM data, this appears to be just what is happening in rural areas.

The ASM data indicate that the gap between output per worker in rural and urban manufacturing widened slightly in 1992, continuing a trend going back at least to 1977. Output per worker (as measured by value-added per worker) in rural manufacturing was 76.8 percent of the urban ratio in 1992, down from 79.6 percent in 1989 (fig. 4). Rural labor productivity was at least 5 percent higher than urban in 2 rural industries (lumber and paper), within 5 percent in 5 industries, and less then 95 percent in the remaining 13 industries. More importantly, rural labor

Figure 2

Nonmetro share of manufacturing workers by occupation

Nonmetro manufacturing workers continued to be concentrated in production jobs

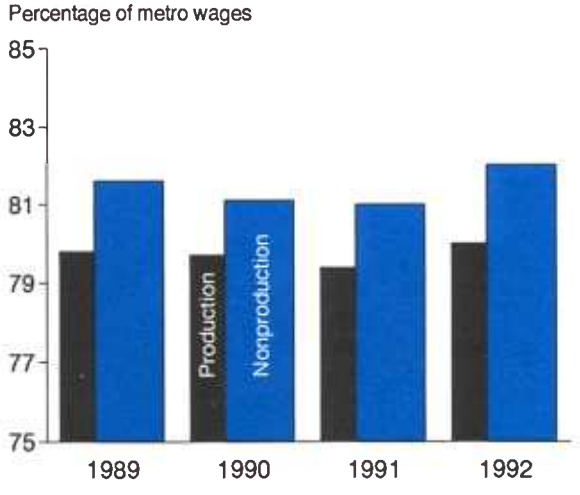


Source: Special tabulations for ERS from the Annual Survey of Manufactures.

Figure 3

Nonmetro manufacturing wages relative to metro wages by occupation

Nonmetro manufacturing wages continued to lag metro wages, especially in production jobs



Source: Special tabulations for ERS from the Annual Survey of Manufactures.

productivity was 20 percent or more below urban labor productivity in food and kindred products, tobacco, apparel, and printing and publishing. Relatively low labor productivity in food and kindred products and apparel industries is of potential concern because these are two of the most important sources of manufacturing jobs in rural areas, together accounting for 21 percent of all rural manufacturing jobs. The relatively low productivity in printing and publishing is also of concern because this industry is among the fastest growing industries, both nationally and in rural areas. Lagging productivity in these industries may thus imply lagging wages, future job loss, or both for many rural communities.

In a number of industries, rural industries have apparently compensated for lagging labor productivity with lower wage growth. When output per worker is calculated after accounting for the lower wages paid in rural manufacturing, the rural-urban productivity gap is smaller in all industries except food processing and tobacco and disappears entirely in three industries (stone, clay, glass products; fabricated metals; and instruments). However, the overall effect is small because even after adjusting for wages, a substantial productivity gap remains. Wage-adjusted output per worker in rural manufacturing was 77.5 percent of urban productivity, only slightly higher than the unadjusted ratio, 76.8 percent of urban productivity.

Capital Expenditures per Worker Lower in Rural Manufacturing

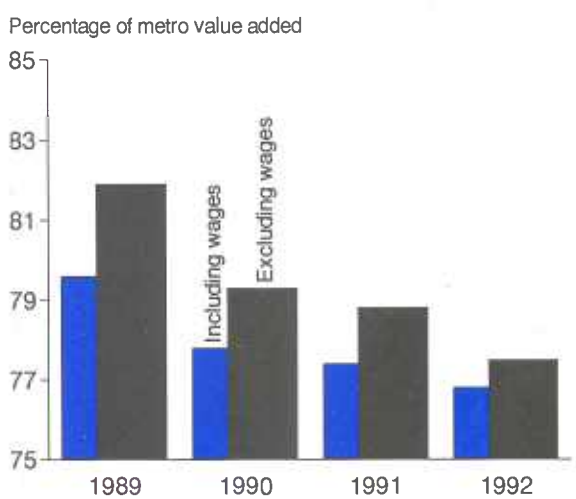
Because the amount of capital per worker is one of the most important factors associated with labor productivity and economic growth, the rate of capital investment can be an indicator of future growth in labor productivity. According to the 1992 ASM data, rural capital expenditures per worker were 85.9 percent of urban expenditures, down from near equality just 3 years before (fig. 5). Paper and allied products accounted for 19 percent of rural capital expenditures but only 5 percent of rural manufacturing workers. Excluding this industry, capital expenditures per worker were even lower—only 73 percent of the urban figure in 1992.

It is important to view the capital expenditures numbers with a little care, particularly as they relate to future changes in labor productivity. First of all, capital expenditures are fairly volatile from year to year, being highly sensitive to cyclical conditions. Second, the ASM capital expenditure data combines expenditures for plant, which includes land costs, and expenditures for equipment. Higher land costs in urban areas may bias the comparison as it would take a higher level of capital expenditures per worker in urban areas than in rural areas to achieve a given increase in productive capacity. Third, a portion of capital expenditures in a given year may be for mandated pollution abatement equipment or safety equipment which does not directly increase labor productivity. Fourth, capital may replace skilled labor rather than augment it. In that case, higher levels of capital investment might not result in increasing wages and could even lead to lower wages. In general, however, there appears to be a strong case for capital-skills complementarity (Bergstrom and Pana and Delong and Sommers). So one would expect high rates of capital investment to be most often associated with higher wages. It also seems clear

Figure 4

Nonmetro value added per manufacturing worker relative to metro value added

Value added per nonmetro manufacturing worker fell farther behind metro value added

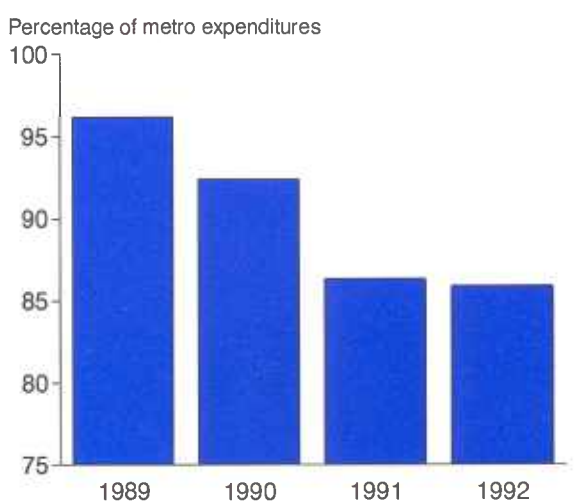


Source: Special tabulations for ERS from the Annual Survey of Manufactures.

Figure 5

Nonmetro capital expenditures per manufacturing worker relative to metro

Nonmetro capital expenditures fell from near parity with metro expenditures to 86 percent by 1992



Source: Special tabulations for ERS from the Annual Survey of Manufactures.

that a low rate of capital investment cannot lead to rapidly rising labor productivity and real wages. If the gap between rural and urban rates of capital investment persists, a narrowing of the rural-urban wage gap in the near future is unlikely.

Conclusions

Manufacturing continued to decentralize from urban to rural areas in the early 1990's. While many rural areas benefited from this job growth, the spatial division of production workers and lagging rural productivity and capital expenditures may foreshadow a widening gap between rural and urban wages. These trends, tentative as trends based on a relatively short period may be, imply that low-cost labor continues to be an important factor in the competitive advantage of rural communities. Thus, while the recent job growth may have provided a very welcome boost for many rural communities, it may be relatively short lived as global competition intensifies. Rural manufacturers cannot depend solely upon low-wage labor as a basis for competing in the increasingly global economy if they are to form the basis for stable, thriving rural communities.

For Further Reading

G. A. Bernat, "Manufacturing Restructuring and Rural Economies: Job Growth But Lagging Wages," *Rural Development Perspectives*, Vol. 9, No. 3, June 1994, pp. 2-8.

W. Baumol, S. A. B. Blackman, and E. N. Wolff, *Productivity and American Leadership*, MIT Press, Cambridge, MA, 1989.

V. Bergstrom and E. E. Pana, "How Robust is the Capital-Skill Complementarity Hypothesis?" *Review of Economics and Statistics*, Vol. 74, No. 3, 1992, pp. 540-46.

J. B. Delong and L. H. Sommers, "Equipment Investment and Economic Growth: How Strong the Nexus?" *Brookings Papers on Economic Activity*, No. 2, 1992, pp. 157-211.

B. M. Moriarty, "The Manufacturing Employment Longitudinal Density Distribution in the U.S.A." *Review of Regional Studies*, Vol. 22, No. 1, 1992, pp. 1-24.

The Annual Survey of Manufactures

Data used in this article are drawn from special tabulations from the Annual Survey of Manufactures (ASM) by the Industry Division, Bureau of the Census, U.S. Department of Commerce, for the Economic Research Service. The ASM is a survey of manufacturing establishments conducted by the Bureau of the Census. The sample includes approximately 56,000 establishments. Like many surveys, the ASM has relatively better coverage of larger firms and establishments than of smaller. Because rural manufacturing establishments are, on average, larger than urban, the under-sampling of small establishments may actually be more of a problem in metro than nonmetro areas. In addition, the 1989-1991 ASM data were adjusted to reflect the current definition of metro areas used in the 1992 data set. Please note that this change in definition causes the numbers reported in this article to differ somewhat from those I reported in my previous *RDP* article (Bernat, in "For Further Reading").

Definitions

Value of shipments: the value of products sold or shipped from a manufacturing establishment.

Value added: the difference between the value of shipments and the cost of purchased inputs, adjusted for changes in the value of work in progress and inventories. Value added is the most commonly used measure of industry output. Included in value added are wages, salaries, profits, interest payments, and taxes. In the Annual Survey of Manufactures, value added also includes the value of purchased business services.

Capital expenditures: the value of machinery and buildings purchased during a year to expand production or to replace worn-out and obsolete equipment or buildings.

Rural and urban: For simplicity, the terms rural and urban are used in the text to refer to nonmetro and metro areas. The table and graphs use nonmetro and metro, the accurate geographical definitions of the areas represented by the ASM data.