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Editor's Notebook

This issue of *Rural Development Perspectives* examines a number of areas that are of current interest in rural America, including poverty, telecommunications, industrial crops, commuting, labor markets, industry clusters, and the experience of a Black farming community facing population loss.

Mark Nord opens the issue by asking what has happened to persistent-poverty counties in recent years? These counties make up nearly a quarter of all rural counties. Per capita income growth there increased at over twice the rate of other rural counties between 1989-94, especially in the East. Yet income has declined in many high-poverty counties with high concentrations of Hispanics and Native Americans, high birth rates, and remote from urban centers.

Karen S. Hamrick's article shows how rural labor markets respond faster to recessions and expansions than urban labor markets, probably because a greater proportion of nonmetro workers are employed in goods-producing industries. On the other hand, because those working part-time for economic reasons and discouraged workers do not respond as quickly to business cycle movements, macroeconomic policies are less helpful in pulling nonmetro areas out of recessions than more targeted policies would be. One strategy that promises to raise earnings for nonmetro workers is the clustering of related businesses in particular areas. Robert M. Gibbs and G. Andrew Bernat, Jr., demonstrate in their article that industry clusters raise earnings within those industries by about 13 percent over earnings of similar workers not in clusters.

Commuting to work has become a fact of life for people living in both non-metro and metro areas. The article by Lorna Aldrich, Calvin Beale, and Kathy Kassel explains how important commuting within nonmetro areas has become for small towns and places, especially east of the Mississippi. The separation of work and residence and the tendency of high- or low-income workers to cluster in certain areas has changed the social and demographic composition of many communities and created special problems for local governments. One development which may give workers even more freedom to decide where they will live is telecommunications.

Peter L. Stenberg, Sania Rahman, M. Bree Perrin, and Erica Johnson discuss the Telecommunications Act of 1996, the first major revision of telecommunications laws since 1934. The most important provisions guarantee that universal service requirements will continue to apply to high-cost service areas. Because all rural areas are considered high-cost areas, even those in metro counties, rural telephone service will continue to get subsidies to keep costs to customers reasonable. All rural schools, libraries, and health care providers will be eligible for discounts in hooking up to the telecommunications network.

One possible strategy for assisting community development in farm-dependent areas is switching to crops grown for industrial processing within the region. Jacqueline Salsgiver examines the projected effects of switching to crambe, an oilseed crop, in central North Dakota. She estimates that the new plant being built to process the crambe crop along with higher farm income from growing crambe will add 174 jobs in the community, including both direct and indirect impacts.

Valerie Grim and Anne B. W. Effland use the small farming community of Brooks Farm, Mississippi, as a case study of how Black communities in the South have coped with the loss of population since World War II from migration and the technological revolution in agriculture. Residents of Brooks Farm struggled against poverty and limited opportunities by working to strengthen traditional institutions such as the church. They have also learned how to organize to secure otherwise inaccessible government services.

Overcoming Persistent Poverty—And Sinking Into It

Income Trends in Persistent-Poverty and Other High-Poverty Rural Counties, 1989-94

Post-1990 income and population trends in persistent-poverty and other high-poverty rural counties suggest that, in general, economic conditions are improving in those counties. Recent per capita income growth in the persistent-poverty counties was more than twice that in other rural counties. Improvements are concentrated in the East, while trends are mixed in the Southwest, the Ozarks, and the upper Midwest. Most high-poverty counties with predominantly Black poor experienced substantial income growth, while income declined in a substantial minority of high-poverty counties with high proportions of Hispanic and Native American poverty.

The poor are not spread evenly across the landscape with the nonpoor, but are disproportionately concentrated in the centers of large cities and in remote rural areas. In some rural areas, very high poverty rates have persisted over many decades. In 535 rural counties (almost one-fourth of all rural counties), poverty rates have exceeded 20 percent in each decennial census year since 1960. In addition to these “persistent-poverty” counties, 232 “new high-poverty” nonmetro counties had poverty rates in excess of 20 percent in 1989, although they had poverty rates lower than 20 percent in at least one of the earlier census years.

The high-poverty rural counties (including both persistent-poverty counties and new high-poverty counties) are home to 44 percent of the rural poor, and are of particular concern to policymakers for several reasons. Where poverty rates are very high, resources of local government, local business, and local social networks are often inadequate to provide public services such as health and

education, and to support families and individuals with serious income inadequacies. Also, high concentrations of poverty can result in economic, social, and cultural milieus that depress aspirations and expectations of young people, making it difficult for them to develop to their full potential. For these reasons, a number of Federal programs are targeted to high-poverty counties, and several federally supported regional commissions focus resources and efforts on multicounty areas of concentrated poverty.

After two decades of substantial reduction in rural poverty in the 1960's and 1970's, progress in rural poverty reduction virtually stopped during the 1980's. In fact, more counties reverted to high-poverty status (above 20 percent poverty rate) during the 1980's than escaped from high poverty. It is of considerable interest, therefore, to know whether economic well-being in the high-poverty rural counties has improved, deteriorated, or remained unchanged since the 1990 census. Reliable county-level poverty data are available only once every 10 years, from the decennial census. However, annual county income and population data are available, and I draw on those data to provide a picture of household economic trends in the persistent-poverty and new high-poverty counties during the 5 years following the 1990 census.

Mark Nord is a research associate of the Department of Rural Sociology at the University of Wisconsin-Madison. The research was supported through a cooperative agreement (43-3AEN-4-80098) between the U.S. Department of Agriculture's Economic Research Service and the University of Wisconsin College of Agriculture.

Per capita income trends in the persistent-poverty and new high-poverty counties during the 5 years since the 1990 census are generally quite encouraging. Per capita income grew 10.7 percent (adjusted for inflation) in the persistent-poverty counties, well above the all-nonmetro growth rate of 6.15 percent. As in the 1970's, income rose more rapidly in the higher poverty counties. It is likely that poverty rates have declined in a majority of the persistent-poverty counties. If these trends continue through the rest of the 1990's, a substantial number of these counties will have poverty rates below 20 percent by the 2000 census, thus escaping persistent-poverty status.

In 26 of the 535 persistent-poverty counties, however, real per capita income declined during 1989-94. Income also declined in 31 of the 232 new high-poverty counties. Some of these counties are probably becoming the persistent-poverty counties of the future. Many of the high-poverty counties with declining per capita income have the following characteristics: remoteness from urban centers, high proportions of Hispanic or Native American population, high rates of natural increase, and high employment share in agriculture, forestry, and fisheries. Very few of the high-poverty, declining-income counties had substantial population loss or substantial international immigration.

Income trends in the high-poverty counties followed a regional pattern. The persistent-poverty counties with high rates of per capita income growth are located disproportionately in the Appalachian Mountains and the Southeast, while those with deteriorating economic conditions are almost all west of the Mississippi River. The pattern of spatially concentrated poverty appears to be shifting westward and away from predominantly Black areas toward areas with high proportions of Hispanics and Native Americans. (See box on "New Intercensal Poverty Estimates" for comparison with newly available county poverty statistics.)

High-Poverty Rural Counties—Background

Persistent-poverty counties are concentrated in geographic clusters, and each cluster has a distinctive racial or ethnic character. In the Black Belt (across the Southeast from the Carolinas to Alabama) and the lower Mississippi River Valley, Blacks predominate in the poor population. In the Southern Highlands—the Appalachian, Ozark, and Ouachita mountains—Whites predominate among the poor. In the Rio Grande Valley and the high plains of the Southwest, Hispanics predominate. And in the persistent-poverty counties of the central Southwest, the northern Great Plains, and western Alaska, it is predominantly Native Americans who are poor. Most of the "new" high-poverty counties are located in or near the persistent-poverty clusters.

Changes in economic well-being in the high-poverty rural counties during the 1980's differed markedly from those of the previous two decades. During the 1960's and 1970's, rural poverty rates declined substantially (fig. 1). Of the 2,249 rural counties with poverty rates above 20 percent in 1959, only 1,220 persisted in the rural high-poverty category through 1969. (An additional 75 counties retained high poverty rates, but were reclassified as metro.) The number of persistent-poverty rural counties declined further to 646 by 1979. However, this trend did not continue into the 1980's. In general, rural poverty rates remained more or less unchanged during the 1980's, and the number of persistently poor counties declined more slowly, falling only to 535 by 1989. This decline in the 1980's was more than offset by the 171 rural counties that reverted to high poverty in 1989 after having escaped from persistent-poverty status in 1979. The discontinuity of economic trends in the 1980's raises important questions about how the high-poverty counties have fared during the 1990's:

- Are the persistent-poverty counties falling further behind other nonmetro counties, or are they holding their own or gaining ground?

New Intercensal Poverty Estimates (1993)

The Census Bureau recently released county poverty estimates for 1993, the first intercensal county poverty estimates in its new Small Area Income and Poverty Estimates series. These estimates are based on rather complex weighted regression techniques using a wide range of data sources, including decennial census data, Current Population Survey data, annual population estimates, Bureau of Economic Analysis income data, and administrative data from tax returns and welfare programs. The reliability of the estimates is uncertain. Confidence intervals (as published by the Census Bureau) are quite large, and the poverty estimates are not directly comparable with those produced by the decennial census because they are based on slightly different populations and concepts of income. This makes comparisons of *changes* in poverty rates from 1989-93 particularly problematic. In spite of these limitations, I used the 1993 poverty estimates to verify trends observed in the income data.

The poverty trends in rural high-poverty counties, as indicated by the intercensal poverty estimates, are broadly consistent with the income trends described in the article. However, the regional patterns are less pronounced. Both data sources point to some improvement in economic well-being in the lower Mississippi River Valley and to worsening economic conditions in a number of high-poverty counties in the Southwest, especially in New Mexico and western Texas. In the Appalachians and the Black Belt, on the other hand, the intercensal poverty estimates do not reflect the improving economic conditions suggested by the income trends.

- Are the new high-poverty counties falling further behind other nonmetro counties, perhaps to become additional persistent-poverty counties, or were their high poverty rates in 1989 temporary?
- Do the spatial patterns of change in rural economic well-being resemble those of the 1960's and 1970's or those of the 1980's?
- Are there regional differences in the post-1990 income trends in the persistent-poverty and new high-poverty counties?
- Are there persistent-poverty or new high-poverty counties where income trends point to serious economic deterioration that may indicate a need for special policy attention?

Income Growth Well Above National Average in High-Poverty Counties

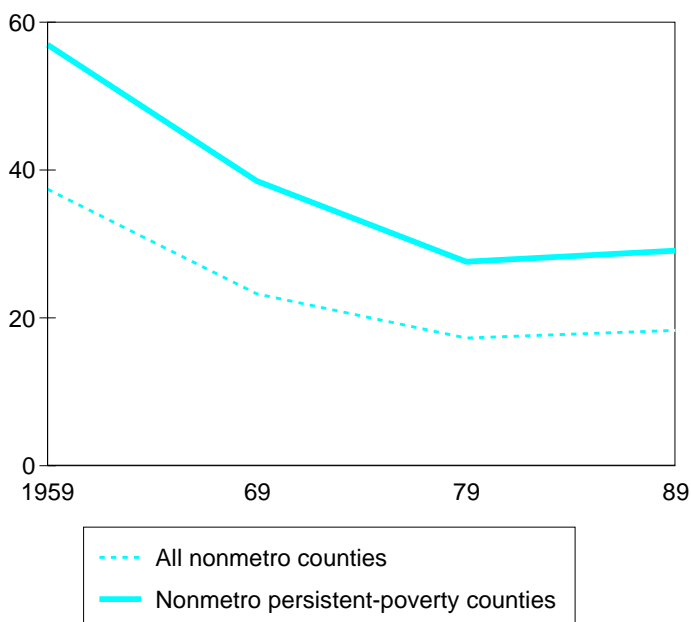
To provide a general picture of income trends from 1989 to 1994 in the high-poverty counties, I calculated per capita income change (adjusting for inflation) in three cate-

Figure 1

Poverty rates in nonmetro and persistent-poverty counties, 1959-89

Nonmetro poverty rates declined in the 1960's and 1970's but increased slightly in the 1980's

Mean poverty rate (percent)



Note: County categories are held constant for all years based on metropolitan status in 1993 and persistent-poverty status in 1989. Source: Prepared by ERS using decennial census data, 1960, 1970, 1980, 1990, from the Bureau of the Census.

gories of rural counties: persistent-poverty counties, new high-poverty counties, and other nonmetro counties. I also calculated the proportion of counties in each category that had declining per capita income, the proportion with income growing but more slowly than the national nonmetro average, the proportion with income growing at one to two times the national nonmetro average, and the proportion with income growing more than twice as rapidly as the national nonmetro average (table 1). The results indicate that the persistent-poverty counties as a group have done rather well. Per capita income (adjusted for inflation) grew 10.7 percent in the persistent-poverty counties, more than twice the growth rate in the "other" nonmetro counties. Of the 535 persistent-poverty counties, 77 percent experienced per capita income growth higher than the national nonmetro average, and 40 percent had income growth greater than twice the national nonmetro average.

In the new high-poverty counties, income growth was only moderately higher than that in the "other" nonmetro category (6.7 percent compared with 5.1 percent). This was reflected in a modest overrepresentation of new high-poverty counties with income growth more than twice the national nonmetro average.

Per capita income adjusted for inflation declined in 26 (4.9 percent) of the persistent-poverty counties and in 31 (13.4 percent) of the new high-poverty counties. In most of these counties, the declines were not large, and the income trends would perhaps be better characterized as stagnant than declining. Nevertheless, it seems likely that the high poverty rates in almost all of these counties have at least persisted, if not increased. Many of the new high-poverty counties with declining income will become the persistent-poverty counties of the future unless their economies are revitalized.

Per capita income grew, but at less than the national nonmetro average, in 18 percent of the persistent-poverty counties and in 30 percent of the new high-poverty counties. The implications for poverty rates in these counties depend on the rate of income growth and on how the distribution of income has changed.

The large proportion of persistent-poverty counties in the two highest income-growth categories suggests that poverty rates have declined in a substantial majority of the persistent-poverty counties. This is true for almost all those with income growth more than twice the national nonmetro average, for most of those with income growth between one and two times the national nonmetro average, and for at least some of those with income growth less than the national average. If these trends continue through the rest of the decade, many of these counties will escape persistent-poverty status.

Personal income in a county can be broken down into three sources: income from earnings, income from property (dividends, interest, and rent), and income from government transfers (such as social security and welfare assistance). From 1989 to 1994, the growth in per capita income in the persistent-poverty counties resulted from increases in earnings and transfers, while income from dividends, interest, and rent declined substantially. This pattern strengthens the conclusion that poverty rates declined in the persistent-poverty counties, because income from earnings and transfers tends to benefit lower income households more than does property income.

Income Grew in Most Southeastern High-Poverty Counties; Trends Mixed in West

Income change in the persistent-poverty counties during the first half of the 1990's followed a regional pattern (fig. 2). With only a few exceptions, real per capita income increased in the persistent-poverty counties of Appalachia, the Black Belt, the lower Mississippi River Valley, and in the predominantly Native American persistent-poverty counties of the Southwest, the northern Great Plains, and Alaska. Further, income growth in a substantial majority of these counties exceeded the national nonmetro average. On the other hand, in the persistent-poverty counties of the Ozark-Ouachita Plateau, the Rio Grande Valley, and the high plains of the Southwest, per capita income growth was less robust and many counties experienced income declines. Farther west and north,

per capita income declined in two counties in northern Montana, and one southwestern Idaho county.

The same general pattern characterized the new high-poverty counties (fig. 3). Of the 31 new high-poverty counties with declining real per capita income in the early 1990's, only 4 were east of the Mississippi River. With the exception of one county in Ohio, all the new high-poverty counties in Appalachia experienced increasing per capita income, most at rates higher than the national nonmetro average. There were only a few new high-poverty counties in the Black Belt and the lower Mississippi River Valley, and almost all of them recorded income growth higher than the national nonmetro rate. Across the Ozark-Ouachita Plateau and on the high plains of the Southwest, the pattern was mixed, with a number of declining-income counties. Finally, per capita income declined in a dozen or so new high-poverty counties scattered across the upper Midwest and the intermountain West.

It appears, then, that the pattern of spatially concentrated poverty may be shifting westward. The counties that are likely to escape from high-poverty status are disproportionately in the Appalachian Mountains and the Southeast, while the persistent-poverty and new high-poverty counties with deteriorating economic conditions are almost all west of the Mississippi River.

Table 1

Income and poverty characteristics of nonmetro counties

Income growth in most persistent-poverty counties was well above the national nonmetro mean

County characteristics	Persistent-poverty(a)	New high-poverty(b)	Other nonmetro
Number of counties	535	232	1,519
Poverty rate, 1989 (percent)	28.7	22.7	13.3
Per capita income, 1989 (in 1994 dollars)	12,879	14,497	17,022
Per capita income, 1994 (in 1994 dollars)	14,253	15,464	17,892
Per capita income growth, 1989-94 (percent)	10.7	6.7	5.1
Per capita income (PCI) change categories, 1989-94	----- Percent of counties -----		
PCI declined	4.9	13.4	14.9
PCI increased 0 to 6.15 percent(c)	17.9	29.7	35.3
PCI increased 6.15 to 12.30 percent(c)	37.0	35.8	34.7
PCI increased more than 12.30 percent(c)	40.2	21.1	15.1
Total	100.0	100.0	100.0

Notes: Poverty rate, income, and income growth statistics in the top panel were calculated by aggregating data within each category of counties (that is, they are equivalent to county means weighted by county population).

(a) Persistent-poverty counties had poverty rates higher than 20 percent in each decennial census: 1960, 1970, 1980, and 1990.

(b) New high-poverty counties had poverty rates higher than 20 percent in 1990, but lower than 20 percent in at least one of the previous three censuses.

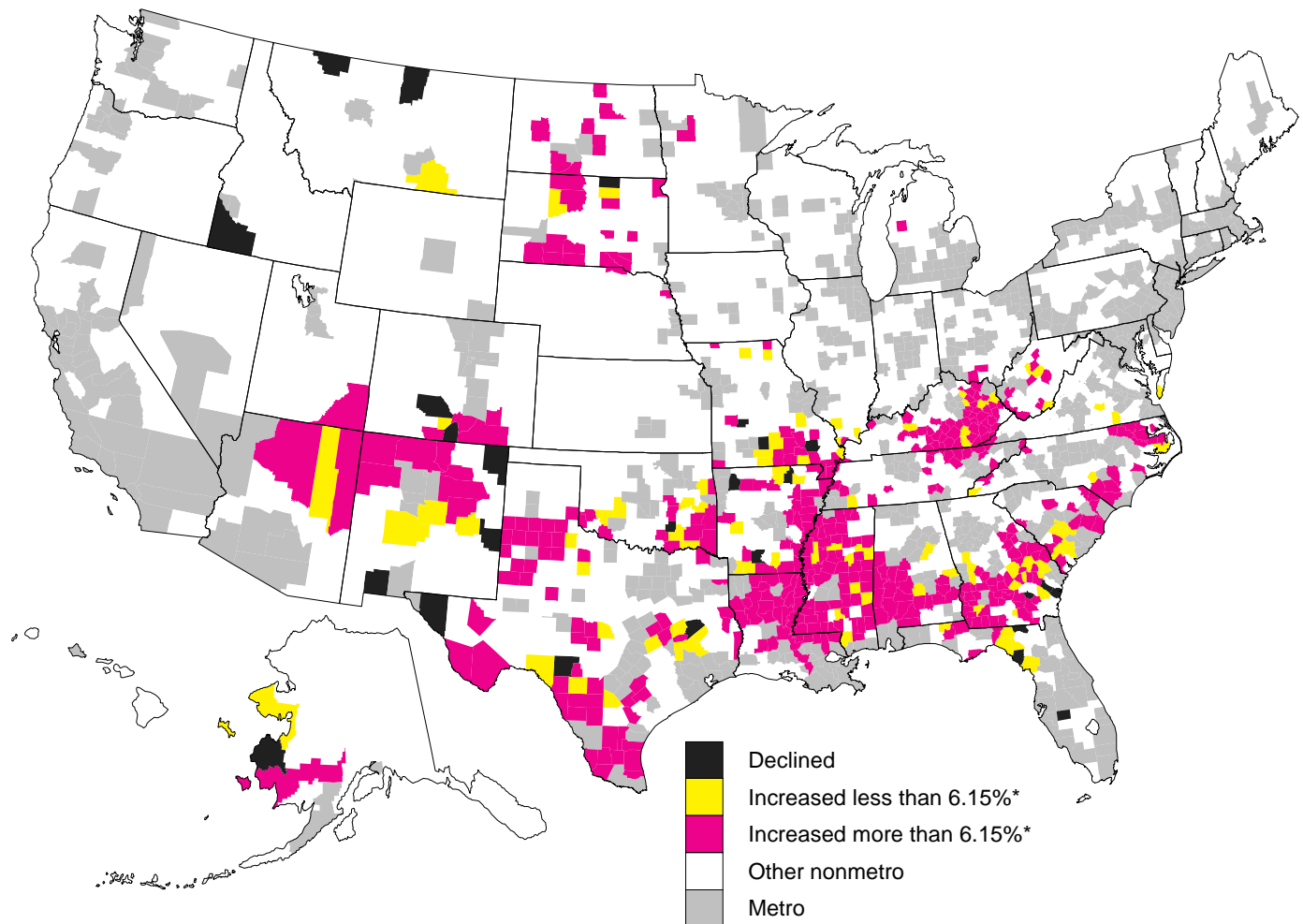
(c) Nationally, nonmetro per capita income grew 6.15 percent from 1989 to 1994.

Source: Calculated by ERS using data from the Bureau of the Census Summary Tape File 3C, 1990, and the Bureau of Economic Analysis Regional Economic Information System 1969-94 Income File.

Figure 2

Change in per capita income, 1989-94, in persistent-poverty nonmetro counties

Income increased in almost all the persistent-poverty counties in Appalachia, the Black Belt, and the lower Mississippi River Valley; trends in other areas were mixed



*U.S. nonmetro per capita income increased 6.15 percent during this period.

Source: Prepared by ERS using data from the Bureau of the Census STF3C, 1990, and the Bureau of Economic Analysis Regional Economic Information System 1969-94 Income File.

Spatial Patterns of Poverty and Income Change, 1959-94

To assess current spatial patterns of change in the high-poverty counties, it is helpful to relate them to patterns of change over the previous decades. Do changes in the early 1990's follow the spatial pattern of the 1960's and 1970's, or that of the 1980's?

In the 1960's and 1970's, two patterns are notable: first, overall rural poverty declined substantially, and second, economic conditions improved more in the higher poverty areas than in other rural areas. The average poverty rate of nonmetro counties declined from 37.4 percent in 1959 to 23.2 percent in 1969, and declined further to 17.3 percent in 1979 (fig. 1). (These averages are for counties that were still classified as nonmetro in 1993, but the averages are nearly the same if all counties that were non-

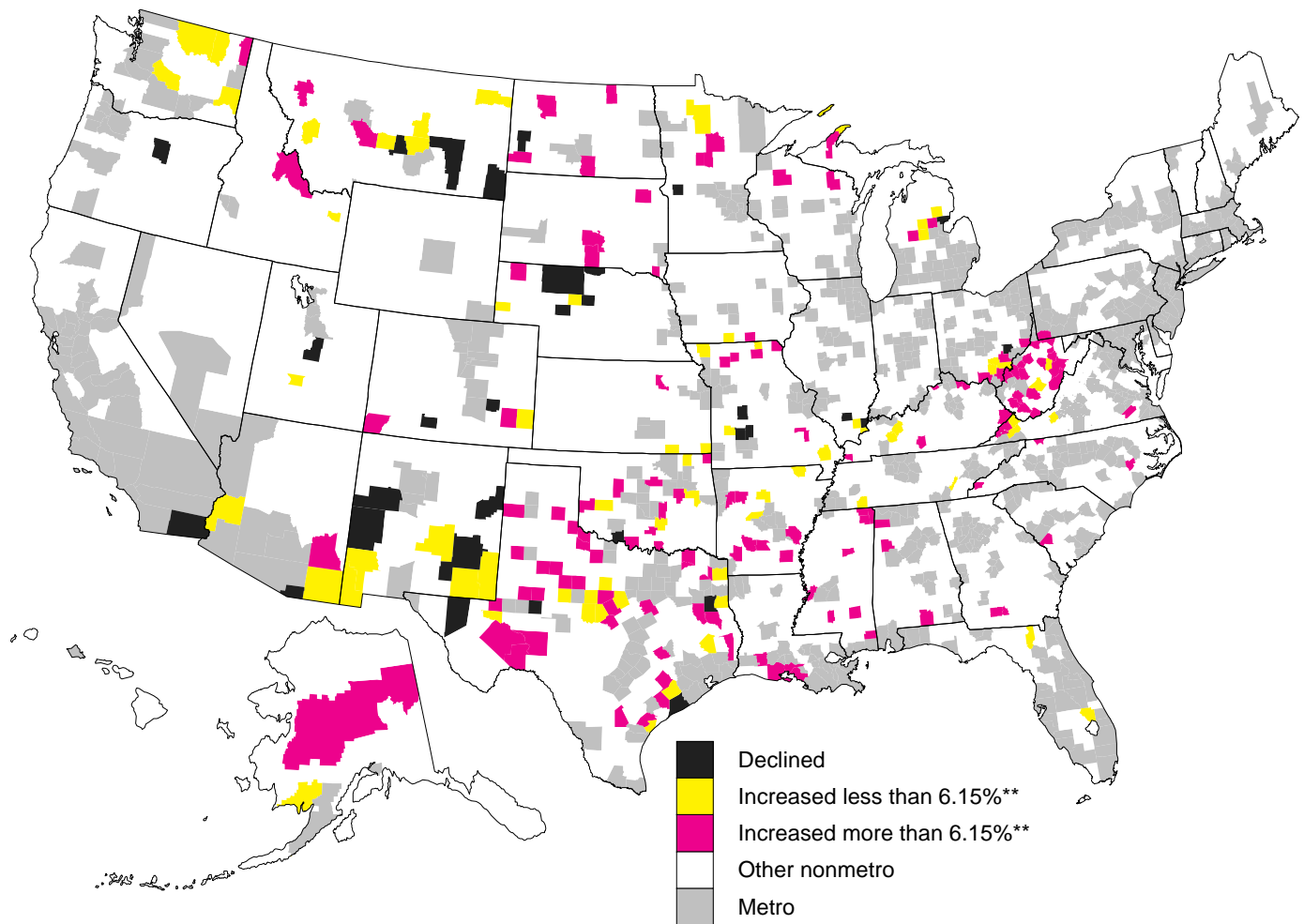
metro in 1963 are included.) Most of the counties that escaped from persistent poverty in those two decades did so as a result of the general improvement in rural economic well-being, not because their own improvement was outstanding. For example, poverty rates in the counties that escaped from persistent-poverty status during the 1960's declined an average of 13.5 percentage points—substantially less than the 17.9-percentage-point decline in the counties that remained in persistent poverty (table 2). What distinguished the escapees were their much lower poverty rates at the beginning of the decade. The same pattern is apparent in the 1970's.

This general rural economic improvement was good news for high-poverty rural areas in the 1960's and 1970's, and the second pattern—the more rapid improvement in eco-

Figure 3

Change in per capita income, 1989-94, in new high-poverty nonmetro counties*

Per capita income increased in most of the new high-poverty counties, but declined in a few, mostly located in the West



*New high-poverty counties had poverty rates above 20 percent in 1989 but below 20 percent in at least one of the previous three decades.

**U.S. nonmetro per capita income increased 6.15 percent during this period.

Source: Prepared by ERS using data from the Bureau of the Census STF3C, 1990; and the Bureau of Economic Analysis Regional Economic Information System 1969-94 Income File.

conomic conditions in the higher poverty areas—was even better news. This second pattern is apparent in the greater declines in poverty rates in the higher poverty counties (table 2). Statistical analysis using correlation techniques confirmed that this pattern was pervasive and quite strong both in the 1960's and 1970's. The same pattern is reflected in the income statistics for the 1970's (comparable income statistics are not available for the 1960's). Real per capita income during 1969-79 grew more rapidly in counties with higher poverty rates at the beginning of the decade, and this association was moderately strong both for all nonmetro counties and among persistent-poverty counties.

In the 1980's, both of these patterns disappeared or were greatly attenuated. The average poverty rate of nonmetro counties actually increased by about 1 percentage point from 1979 to 1989, and that of persistent-poverty counties increased about 1.5 percentage points. Only 104 counties escaped from persistent-poverty status during the 1980's—a much smaller proportion of persistent-poverty counties than in the previous two decades—and that was more than offset by the 223 counties that either reverted to high-poverty status or entered high-poverty status for the first time in 1989. By way of comparison, only 5 counties entered high poverty in 1969, and only 32 entered or re-entered high poverty in 1979. The counties escaping from persistent-poverty status in the 1980's, unlike those in the previous two decades, were distinguished from

counties that remained in persistent poverty by their greater declines in poverty rates as much as by their lower pre-decade poverty rates (table 2). Further, the negative association of poverty change with the poverty rate at the beginning of the decade that had been strong in the 1960's and 1970's all but disappeared in the 1980's. Similarly, the association of change in per capita income with pre-decade poverty rate weakened substantially.

Now, what is the spatial pattern of economic change in rural areas in the early 1990's? National-level Current Population Survey data indicate that the nonmetro poverty rate increased somewhat from 1989 to 1993, then declined in 1994 to about the 1989 level. However, nonmetro real per capita income grew by over 6 percent from 1989 to 1994, and it grew more rapidly in counties with higher 1989 poverty rates. The association was much stronger than it was in the 1980's and nearly as strong as it was in the 1970's. Taken in combination, this general spatial pattern and the income changes in the high-poverty counties outlined earlier suggest that recent spatial trends in economic well-being resemble those of the 1960's and 1970's rather than those of the 1980's, even though overall rural poverty has not declined as it did in the 1960's and 1970's. This provides grounds for at least cautious optimism that poverty rates are falling in the high- and persistent-poverty rural areas.

Remote Agricultural Counties with Large Share of Hispanics or Native Americans More Likely to Experience Declining Income

Although most of the high-poverty counties appear to be experiencing improving economic conditions, some continue to face serious economic challenges. To understand these counties and their economic challenges better, I focus attention in this final section on the 26 persistent-poverty counties and 31 new high-poverty counties in which real per capita income declined from 1989 to 1994.

The high-poverty counties that experienced declining per capita income during 1989-94 do not fit the popular stereotype of rural regions in general decline. Population declined during the period in only 10 of these counties (out of a total of 57), and the decline was substantial in only 4. Average population growth was 7.0 percent in the persistent-poverty counties with declining per capita income and 10.2 percent in the new high-poverty counties with declining per capita income—population growth rates well above the national nonmetro average of 4.2 percent.

Most, but not all, of the declining-income high- and persistent-poverty counties have one or more of the following characteristics:

Table 2

Characteristics of nonmetro counties by persistent-poverty status over three decades

In the 1960's and 1970's, counties that escaped from persistent poverty differed from those that remained in persistent poverty primarily in their lower poverty rates at the beginning of the decade; in the 1980's, change in poverty rate during the decade was the more important difference between the two categories of counties

County poverty characteristics	1959-69	1969-79	1979-89
<i>Counties that remained in persistent-poverty status through the end of the decade:</i>			
Number of counties	1,295	652	542
Poverty rate at beginning of decade (percent)	49.3	37.0	27.6
Change in poverty rate during decade (percent)	-17.9	-10.2	+1.5
<i>Counties that escaped from persistent-poverty status during decade:</i>			
Number of counties	954	568	104
Poverty rate at beginning of decade (percent)	28.5	25.4	22.7
Change in poverty rate during decade (percent)	-13.5	-9.1	-4.9
<i>Counties that were not in persistent-poverty status at beginning of decade:</i>			
Number of counties	427	1239	1727
Poverty rate at beginning of decade (percent)	16.0	14.0	13.6
Change in poverty rate during decade (percent)	-4.7	-1.9	+1.2

Notes: All counties that were nonmetro at the beginning of each decade are included in the analysis for that decade; persistent-poverty counties are those that had poverty rates of 20 percent or more in 1959 and in each succeeding decennial census up until the time of measurement.

Source: Calculated by ERS using data from the Bureau of the Census decennial censuses of population and housing, 1960, 1970, 1980, and 1990.

(1) They are remote from urban centers

Of the 26 persistent-poverty counties with declining per capita income, none includes an urban area with population of 20,000 or more, and only 3 are adjacent to metropolitan counties. More than half are fully rural, with no population center of 2,500 or more persons. The new high-poverty counties with declining per capita income are less remote than the persistent-poverty counties but are, nonetheless, disproportionately remote compared with nonmetro counties in general. In contrast, the high-poverty counties with per capita income growth higher than the national nonmetro mean were distributed across the rural-urban continuum similarly to all nonmetro counties.

(2) They have a high proportion of Hispanics and Native Americans

In about two-thirds of all persistent-poverty counties, a majority of the poor are either Black, Hispanic, or Native American. The declining-income persistent-poverty counties include a disproportionate share of counties in which Hispanics or Native Americans predominate, but relatively few counties in which Blacks predominate. Among the persistent-poverty counties, predominantly Hispanic counties comprise 34.6 percent of those with declining income but only 12.6 percent of those with increasing income; predominantly Native American counties comprise 11.5 percent of those with declining income but only 5.9 percent of those with increasing income; while predominantly Black counties comprise 23.1 percent of those with declining income, compared with 47.9 percent of those with increasing income. Among the new high-poverty counties with declining per capita income, the predominance of Hispanics and Native Americans also is notable, although somewhat less so than in the persistent-poverty counties. In about one-third of these counties (10 out of 31), Hispanics or Native Americans make up 40 percent or more of the poor, whereas only 1 county has a similarly high proportion of Blacks among its poor.

In spite of the predominance of Hispanic counties in the high-poverty, declining-income categories, only four of these counties recorded substantial rates of international immigration. Just two persistent-poverty counties and two new high-poverty counties had 4-year international immigration rates in excess of 3 percent.

(3) They have high rates of net natural increase (excess of births over deaths)

A high rate of natural increase, with the resulting large young population, tends to lower per capita income. It is not surprising, then, to find that many of the persistent-poverty counties with declining per capita income had

high rates of natural increase. Over 1990-94, the aggregate nonmetro rate of natural increase was 1.6 percent. In the persistent-poverty counties with declining per capita income, the rate was 2.1 percent, and in the new high-poverty counties with declining per capita income it was 3.2 percent. In 12 of the 26 persistent-poverty counties with declining per capita income, the rate of natural increase exceeded twice the nonmetro average, and this was true in 12 of the 31 new high-poverty counties with declining per capita income. Most of these very high natural-increase counties (18 of 24) had predominantly Hispanic or Native American populations.

(4) They are disproportionately agricultural

Many, though by no means all, of the high-poverty, declining-income counties had higher proportions of their workforce employed in agriculture, forestry, and fisheries than did the average nonmetro county. This is not surprising because these sectors employ a disproportionate share of persons with relatively low levels of education and work experience, and wage rates are generally low in these sectors. In the average nonmetro county in 1990, 10.8 percent of employment was in the agriculture, forestry, and fisheries sectors. In 62 percent of the persistent-poverty counties with declining per capita income, the employment share in agriculture, forestry, and fisheries exceeded the nonmetro average, and 31 percent had employment shares in that sector higher than twice the national nonmetro average. The corresponding proportions were similar in the new high-poverty counties with declining per capita income.

For the persistent-poverty counties with the highest rates of per capita income decline, the four characteristics described above predominate and coincide. Of the 10 persistent-poverty counties with the most precipitous income declines, all 10 had net natural increase rates higher than twice the national nonmetro mean, all 10 had Hispanic or Native American population shares among the poor in excess of 35 percent (8 in excess of 50 percent), and 9 had employment shares in agriculture, forestry, and fisheries higher than the national nonmetro mean.

Characteristics commonly adduced to explain declines in household economic well-being provide only a partial explanation of the declining per capita income in the high-poverty, declining-income counties. Nearly half of the counties had neither very high rates of net natural increase, nor very high shares of employment in agriculture, forestry, and fisheries, nor substantial population decline, nor substantial international immigration. The income decline in many of these counties may well be associated with characteristics, events, or processes (or measurement errors) more or less unique to the county, and not consistent with a general pattern.

Increasing Per Capita Income Does Not Always Mean Declining Poverty

I have been cautious in inferring that increasing per capita income has translated into declining poverty rates. County poverty rates depend on family structure and on the distribution of income among families as well as on average income. Further, not all income recorded by the Bureau of Economic Analysis (BEA) is included in the income used to calculate poverty rates. In particular, part of government outlays for medicare, medicaid, and food stamps are included in BEA income, but not in poverty income.

During the decade from 1979 to 1989, the last period for which we have reliable county poverty data, the nonmetro poverty rate increased 1.3 percentage points in spite of an increase in real per capita income of 11.3 percent. For the period under study here, 1989-94, county-level poverty data are not available, but national nonmetro poverty statistics from the Current Population Survey indicate that the nonmetro poverty rate increased 0.7 percentage points from 1989 to 1994. During the same period, nonmetro per capita income, based on the the BEA data, increased 6.15 percent. Only part of this disparity reflects an increase in income inequality. Other factors include:

- (1) Poverty thresholds are adjusted by the Census Bureau using the consumer price index, whereas I have used the personal consumption expenditure index to adjust for inflation in calculating per capita income growth (see box on Data and Methods). Using the CPI to adjust for per capita income growth would lower the 1979-89 per capita income growth rates by about 2.2 percentage points and those for 1989-94 by about 0.5 percentage points.
- (2) Government transfers for medicare, medicaid, and food stamps increased as a proportion of total income. These are included in income as reported by BEA, but are not included as income in calculating the poverty rate.
- (3) Average household size decreased from 2.8 persons in 1979 to 2.6 persons in 1989. From 1989 to 1994 it remained about constant at 2.6 persons. Because of assumed economies of scale, more income is required to keep the same number of persons above the poverty line if they are in smaller households.

For these reasons, I have not assumed that poverty rates have gone down in all counties with increasing income. Nevertheless, in the counties with income growth much higher than the national nonmetro mean, it is likely that poverty is, in fact, declining. On the other hand, the national-level associations of poverty change and income change are grounds for concern that poverty rates may be increasing substantially in those counties with declining per capita income, even in counties where the decline is not large.

For Further Reading . . .

Calvin Beale, "Poverty Is Persistent in Some Rural Areas," *Agricultural Outlook*, AO-200, USDA-ERS, Sept. 1993, pp. 22-27.

Peggy J. Cook and Karen L. Mizer, "The Revised ERS County Typology: An Overview," *RDRR 89*, USDA-ERS, 1994.

John B. Cromartie, "Higher Inmigration, Lower Outmigration Contribute to Nonmetro Population Growth," *Rural Conditions and Trends*, Vol. 7, No. 3, USDA-ERS, 1996, pp. 13-17.

Glenn V. Fuguitt and Calvin L. Beale, "Recent Trends in Nonmetropolitan Migration: Toward a New Turnaround?" *Growth and Change*, Vol. 27, 1996, pp. 156-174.

Mark Nord, "Rural Poverty Rate Stabilizes," *Rural Conditions and Trends*, Vol. 7, No. 3, USDA-ERS, 1996, pp. 37-39.

Data and Methods

Income and population data for 1969, 1979, 1989, and 1994 are from the Bureau of Economic Analysis Regional Economic Information System 1969-94 Personal Income File. Income statistics were adjusted for inflation to 1994 dollars using the personal consumption expenditure (PCE) index. The PCE index handles housing costs somewhat differently than does the more familiar consumer price index (CPI), and yields slightly lower inflation estimates, especially for periods prior to 1990. The CPI has been criticized recently for overstating inflation in cost of living, and the PCE is less problematic in this regard. Poverty data are from the decennial censuses of 1960, 1970, 1980, and 1990. These data refer to poverty status in the calendar year prior to the respective census, thus 1959, 1969, 1979, and 1989. Natural increase rates and international immigration rates for July 1990-July 1994 are based on the U.S. Bureau of the Census Population estimates 1990-95 data file. These are 4-year rates since 1989-90 data were not on that file. Data to calculate the proportion of employment in agriculture, forestry, and fisheries are from the Bureau of the Census Summary Tape File 3C, 1990.

Virginia independent cities were combined with their surrounding counties, and a small number of counties in other States were combined with neighboring counties to provide consistent units among the three data sources and among the years of analysis. All data were aggregated within the multicounty units.

Rural Labor Markets Often Lead Urban Markets in Recessions and Expansions

Rural labor markets respond quickly to business cycle movements, and appear to show signs of recession and expansion before urban labor markets. The rural and urban unemployment rates, on the other hand, show about the same degree of response to changes in gross domestic product. Some rural labor market groups—part-time for economic reasons workers and discouraged workers—respond less to business cycle movements, so that an expansion is less likely to benefit these individuals than those in urban areas.

In the 1970's, rural areas experienced economic prosperity and population growth. Rural areas did not fare as well in the 1980's, and the 1980 and 1981-82 recessions appear to have hit rural areas harder than urban areas. The rural unemployment rate reached a high of 10.9 percent at the end of 1982, and did not decline to its prerecessionary level until 1988 (fig. 1). With the recession of 1990-91, some analysts expected that the rural unemployment rate would again soar above the urban rate. Instead, while both urban and rural areas were affected by the recession, the rural unemployment rate rose less and declined more rapidly after the recession than did the urban rate. In 1991, the rural unemployment rate dropped below the urban rate. Rural economic improvement is thought to be largely responsible for the net inflow of population to nonmetro counties in the first half of the 1990's.

This article analyzes the response of the rural labor market over the course of the business cycle. It uses the National Bureau of Economic Research dates for business cycle peaks—the end of the expansion and the beginning of recession—and troughs—the last period of recession and the beginning of expansion. Business cycle contractions—the recessions—are of particular interest, especially the last two recessions. Why was the rural labor market experience different after the recession of 1990-91 than

after the recessions of 1980-82? Was the observed phenomenon a normal part of the business cycle, or was something else causing the high rural unemployment of the mid-1980's? Is the rural labor market more or less sensitive to the business cycle than the urban labor market?

Four Important Indicators Measure Labor Market Health

This article examines four labor market measures that can be analyzed specifically for nonmetro areas: unemployment rate, employment level, underemployment rate, and part-time for economic reasons rate. The unemployment rate is one of the aggregated indicators often used to characterize the economy. The unemployment rate and the employment level are considered coincident indicators; that is, they move in sync with the business cycle.

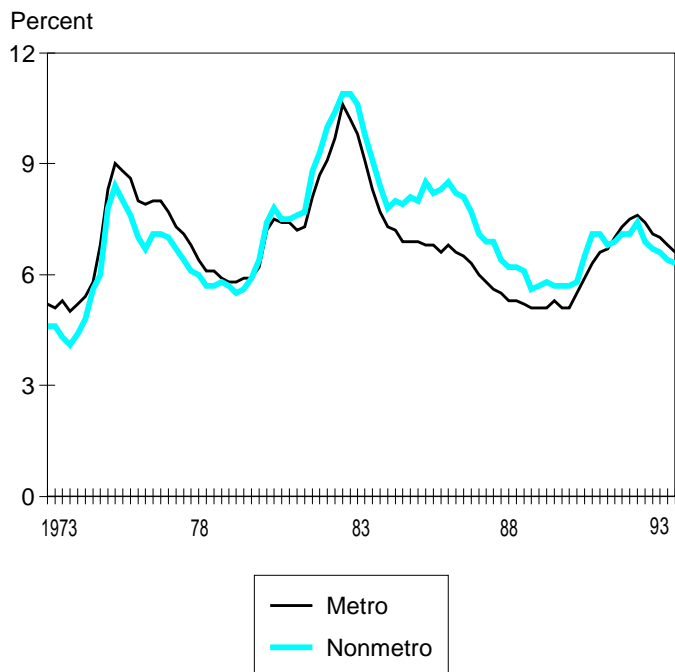
One leading indicator of a recession is average workweek length in the manufacturing sector. This is a leading indicator because employers frequently adjust current employees' workweek hours before they hire new workers or layoff employees. At the beginning of an expansion, employers may lengthen the workweek before they incur the cost of hiring new employees. The category part-time for economic reasons serves as a proxy to average workweek. In a recession, employers may cut employees' hours from full-time to part-time in order to avoid laying anyone off.

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The underemployment rate is of interest because nonmetro areas have disproportionately more underemployed individuals. The underemployment rate measures labor market distress better than the unemployment rate. For our purposes, underemployment includes only (1) the group part-time for economic reasons (PTE) workers, who wish to work full-time but only part-time work is available, and hence are underemployed by low hours of work; and (2) the group of discouraged workers, those who are out of work and available for work, but are no longer looking for a job because they believe none are available. These workers are not counted as in the labor force or as unemployed. PTE and discouraged workers were analyzed separately from the unemployed in order to see if the observed labor market behavior of these groups differs from the unemployed.

These four indicators were observed for the last three recessions. As might be expected, employment levels increased before recessions (except for nonmetro areas before the 1990-91 recession), decreased during the recession, and increased in the post-recession period. Unemployment and underemployment rates increased during recessions and declined afterwards in expansions. The PTE rate behaved like a leading indicator; that is, it increased before each recession. Perhaps employers cut employees' hours from full-time to part-time as orders started to level off or decline, which may have occurred before the national economy reached the business cycle peak.

Figure 1
Nonmetro and metro unemployment rate, 1973-93
 Nonmetro unemployment rate was greater than the metro rate during the 1980's



Source: Calculated by ERS using data from the Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor.

Nonmetro Labor Market Often Takes the Lead in Business Cycle Movements

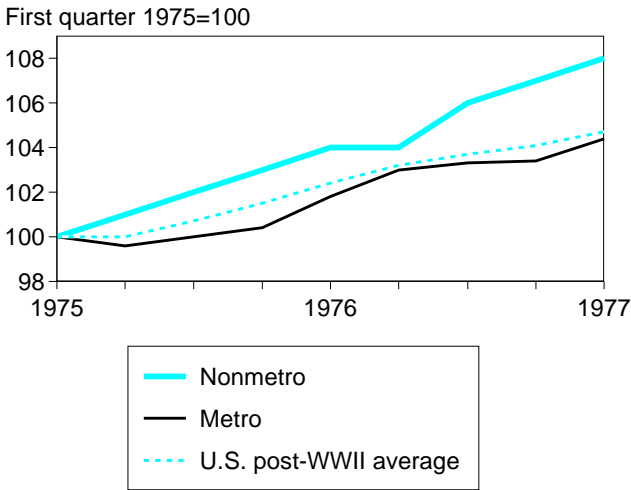
Nonmetro areas appear to lead metro areas both into and out of recessions. Nonmetro labor market behavior was quicker or stronger than metro behavior in most cases during the last three business cycles at the various phases of the cycle for the four indicators discussed above.

To illustrate, nonmetro employment growth led or matched metro in the last three expansions. By indexing employment levels, metro and nonmetro employment growth can be easily compared. Also included in the comparison is the U.S. average over the last 8 business cycles—the post-World War II (WWII) experience—which is a standard comparison when looking at business cycles. After the recession of 1973-75, nonmetro employment growth surpassed metro and the U.S. post-WWII average during the first 2 years of the expansion (fig. 2). Indeed, nonmetro employment growth was just under 8 percent over 1975-77, compared with the 4-percent growth of metro areas and the U.S. post-WWII average. In the first 2 years of the expansion following the 1980-82 recessions, nonmetro areas matched metro areas in terms of employment growth, about 7 percent, and both did better than the U.S. post-WWII average (fig. 3). After the last recession, neither metro areas nor nonmetro areas were able to generate enough jobs to match the U.S. post-WWII average experience. However, nonmetro areas did increase employment by about 4 percent over the first 2 years of the expansion while metro employment levels were stagnant (fig. 4).

Although national labor series data tends to be coincident to or lag business cycle movements, nonmetro labor series may be a leading indicator for metro, and consequently U.S., labor market behavior. Why would the nonmetro labor market respond more quickly to business cycle movements than the metro labor market? Probably because nonmetro areas have disproportionately more people employed in the goods-producing industries—agriculture, mining, manufacturing, and construction. For nonmetro areas in 1993, about 32 percent of the labor force was employed in the goods-producing sector, versus about 18 percent for metro areas. Similarly, a larger share of the nonmetro labor force was in occupations that would be expected to be more sensitive to business cycle movements. In 1993, about 54 percent of the nonmetro labor force was in service; agricultural; precision production, craft, and repair; or operators, fabricator, and laborer occupations. This compares with only 39 percent in the metro labor force. These are occupations where employees are likely to be paid hourly wages rather than salaries, and employees typically incur reductions in hours or layoffs when demand is slack. Consequently, nonmetro labor statistics form a composite of leading industries and occupations.

Figure 2
Index of employment over the first 2 years of the expansion following the 1973-75 recession

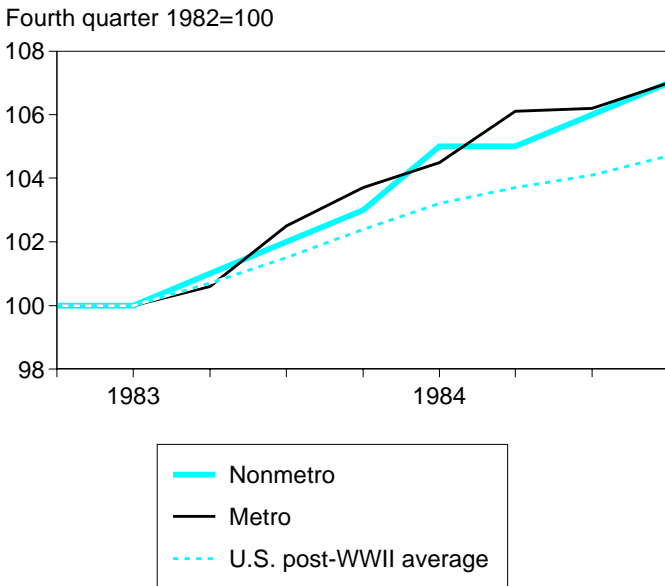
Nonmetro employment growth surpassed metro, attaining almost 8-percent growth in the first 2 years of the expansion



Source: Calculated by ERS using data from the Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor.

Figure 3
Index of employment over the first 2 years of the expansion following the 1980-82 recessions

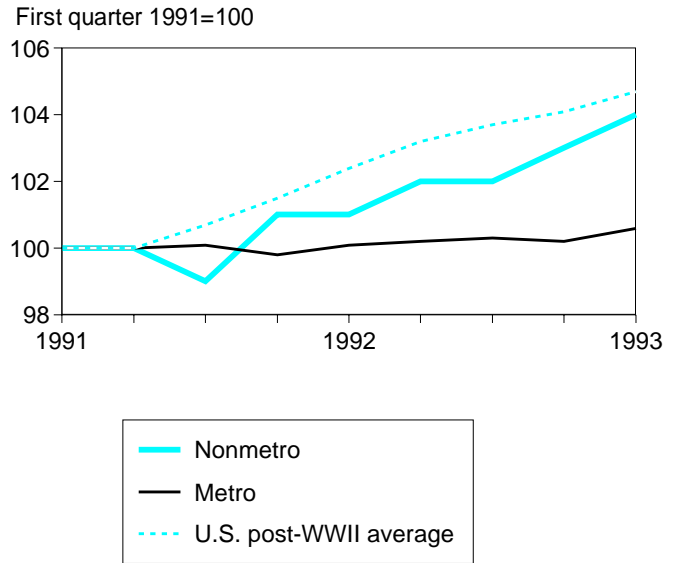
Nonmetro employment growth matched that of metro in the first 2 years of the expansion



Source: Calculated by ERS using data from the Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor.

Figure 4
Index of employment over the first 2 years of the expansion following the 1990-91 recession

Nonmetro growth was about 4 percent after the first 2 years of the expansion, while metro employment grew little



Source: Calculated by ERS using data from the Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor.

After a Quick Start, Rural Recovery in the 1980's Was Slowed by the Rising Dollar and High Interest Rates

If the nonmetro labor market responds so quickly to the business cycle, why did the nonmetro unemployment rate remain at about 8 percent for so long during the expansion of the 1980's? One explanation is found by looking at the exchange rate. The nonmetro labor market is more sensitive to exchange rate movements and appears more export-dependent than metro areas. Figure 5 shows the nonmetro unemployment rate against the exchange rate as measured by the Federal Reserve Board's index of the value of the U.S. dollar (nominal). As the nonmetro unemployment rate was declining, the value of the dollar increased and peaked in the first quarter of 1985. When the dollar attained its highest values, the nonmetro unemployment rate still remained around 8 percent. In 1986, six quarters after the value of the dollar fell, the nonmetro unemployment rate started to decline again. This lag is expected because the effect of a change in the exchange rate is not felt immediately. An exchange rate movement takes about 2 years to fully work its way through the rural economy, although most of the effect occurs within 12 to 18 months. Therefore, the rising value of the U.S. dollar from 1982 to 1984, and the declining, but still high, U.S. dollar value through 1986 helped keep the nonmetro unemployment rate high relative to the metro rate until 1988.

A second possible explanation for the nonmetro unemployment rate remaining at a high 8 percent during an expansion is that the credit crunch of the early 1980's affected nonmetro areas disproportionately more than metro areas. In particular, the tight credit markets were an important contributing factor to the depressed farmland values seen in the early- to mid-1980's. Before the third quarter of 1985, the nonmetro unemployment rate was more sensitive than the metro unemployment rate to the real prime interest rate. Figure 6 shows the real prime rate and the nonmetro unemployment rate, and indeed, the real prime was fairly high during the nonmetro unemployment rate's plateau.

Metro and Nonmetro Unemployment Rates Show Similar Response to Changes in the GDP

Unlike the timing of business cycle responses, the degree of response in unemployment rates is similar in metro and nonmetro areas. To understand why this is so, it is first necessary to look at what makes the unemployment rate change. The unemployment rate moves over the business cycle as employment increases during an expansion and decreases in a recession. Additionally, the unemployment rate changes as individuals move into and out of the labor force. In a recession, some individuals may want jobs, but believing no jobs are available, stop searching for a job; hence, they are no longer counted as part of the labor force. They are classified as discouraged workers. When the economy picks up and employers start hiring again, many of these people will rejoin the labor force by searching for a job. The initial surge in the unemployment rate at the beginning of an expansion is due to this phenomenon—more people in the labor force—and is considered a sign of workers' confidence in the labor market.

The cyclical movement of the unemployment rate is due, then, to two factors: employment changes and labor force participation changes. Understanding how much of the cyclical variation is due to each is useful in understanding the dynamic of the labor market.

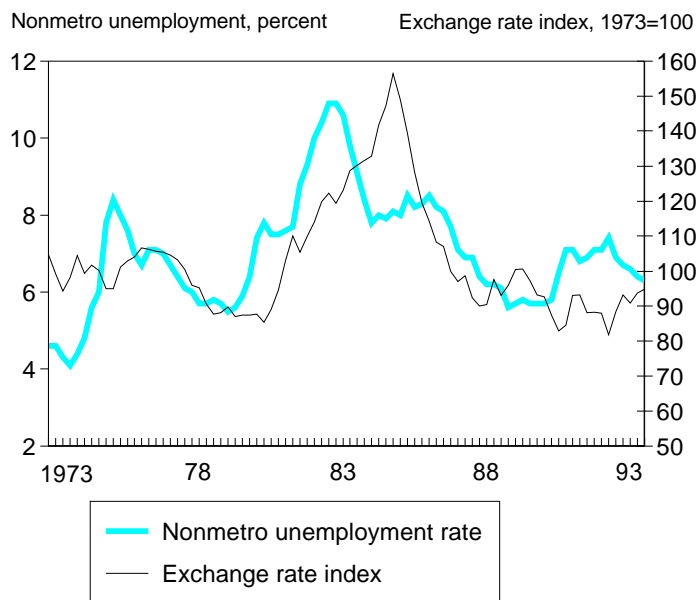
An analysis of labor market behavior over the last three business cycles (1973-93) found that a 1-percentage point increase in real Gross Domestic Product (GDP) (1992 dollars) increased the nonmetro employment rate—the percentage of the labor force employed—by 1.61 percent (see table 1). The employment rate is the mirror of the unemployment rate since the number of workers employed plus those unemployed equals the total labor force. The response is about the same when looking at the earlier years versus the more recent years. The metro response is about the same as the nonmetro response.

For the 1985-93 period, with an average 93.2 percent of the nonmetro labor force employed, a 1-percentage-point increase in GDP increased the employment rate by 1.72

percent, to 94.8 percent. Since the number employed plus the number unemployed equal the total labor force, the unemployment rate is derived by subtracting the employ-

Figure 5
Nonmetro unemployment rate and the value of the dollar as measured by the exchange rate index

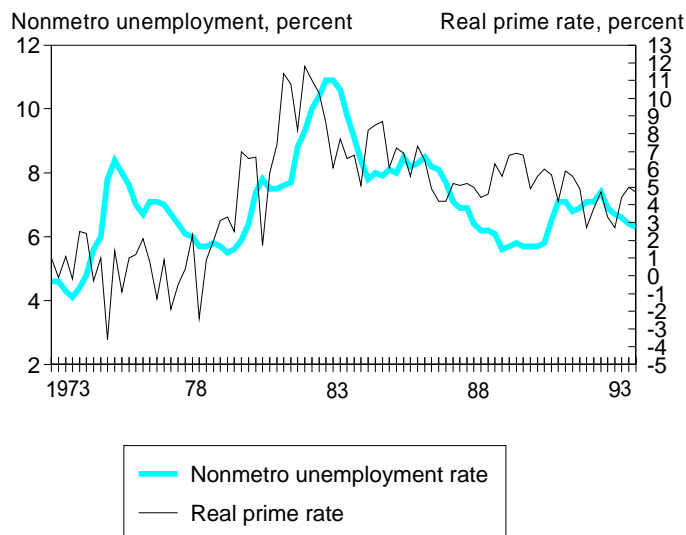
Nonmetro unemployment rate declined in 1986 following the decline of the U.S. dollar



Source: Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor and the Federal Reserve Board.

Figure 6
Nonmetro unemployment rate and the real prime rate

The high real prime rate of the mid-1980's may have kept the nonmetro unemployment rate high



Source: Current Population Survey, Bureau of Labor Statistics, U.S. Department of Labor, and the Federal Reserve Board.

ment rate from 100. Thus, the result of a 1-percentage-point increase in GDP is a lowering of the nonmetro unemployment rate from 6.8 percent to 5.2 percent, a considerable improvement.

The nonmetro labor force participation rate was found to increase by about 0.66 percent as a result of a 1-percentage-point increase in GDP for the entire period. This response is about the same for the earlier years as for the more recent years. For the more recent period, a 1-percentage-point increase in GDP increased the nonmetro labor force participation rate from an average of 62.6 percent to 63.0 percent. This represents an increase of about 167,000 people joining or rejoining the nonmetro labor force due to improved economic conditions.

The cyclical response of the employment/unemployment rate was consistently larger than that of the labor force participation rate. This is as expected since a change in aggregate demand would be expected to result mainly in a change in employment.

Nonmetro Underemployment Benefits Less from an Expansion Than Metro Underemployment

During a cyclical downturn, the involuntary part-time work force (referred to as part-time for economic reasons, or PTE) usually increases, as employers cut back on hours instead of, or in addition to, laying off workers. The number of discouraged workers (those who want jobs but believe none are available, and have quit looking) also grows in a slack labor market.

The cyclical response for PTE and discouraged workers was analyzed by looking at movement in the unemployment rate (see table 2). The nonmetro estimates are smaller than the metro estimates, indicating less of a response to aggregate demand movements. An expansion would

then be expected to benefit the PTE and discouraged worker groups in metro areas more than in nonmetro areas. Consequently, nonmetro areas would see less of a reduction in these underemployment groups than metro areas.

A decrease in aggregate demand that results in a 1-percentage-point increase in the nonmetro unemployment rate raised the level of part-time for economic reasons relative to the labor force by an estimated 7.57 percent for the 1985-93 period. With an average of 1,485,200 PTE in nonmetro areas, this translated into an increase of 112,400 people "bumped" from full-time work to part-time work. Therefore, in an economic downturn, not only does the unemployment rate increase, but the number of individuals underemployed, as measured by PTE, increases as well. Likewise, a 1-percentage-point increase in the nonmetro unemployment rate would bring about an expected increase of 14.31 percent in the discouraged worker share of the nonmetro labor force. With an average of 300,500 nonmetro discouraged workers in the 1985-93 period, this would represent an increase of about 43,000 individuals who wanted a job but stopped looking because they believed no job was available.

Rural Labor Market Behavior Has Implications for Policy

The nonmetro labor market leads metro areas in responding quickly to business cycle movements. Indeed, the nonmetro labor series may be a leading indicator for the metro labor series. At the onset of a recession, nonmetro areas can expect to see the unemployment rate rise more rapidly than that of metro areas. On the up side, during an expansion, the nonmetro labor market situation would be expected to improve more quickly than that of the metro market.

Table 1

Cyclical response of the labor force participation rate and the employment rate, using a 1-percentage-point change in real GDP (1992 dollars)

Nonmetro response to changes in real GDP about the same as metro response

Time period	Labor force participation rate	Employment rate
Nonmetro:		
1973-93	0.66	1.61
1973-85	0.62	1.77
1985-93	0.69	1.72
Metro:		
1973-93	0.49	1.57
1973-85	0.46	1.70
1985-93	0.16	1.38

Note: In 1983, the classification of counties as nonmetropolitan was changed by the U.S. Office of Management and Budget as a result of the 1980 census. The reclassification was incorporated into the Current Population Survey data starting in the third quarter of 1985.

Source: Estimates made from Current Population Survey data.

Table 2

Estimates of how much a 1-percentage point change to the unemployment rate affected the rate of underemployment

Nonmetro PTE and discouraged workers benefited less from an expansion than corresponding metro workers

Time period	PTE as a share of labor force	Discouraged workers as a share of labor force
Nonmetro:		
1973-93	8.07	14.98
1973-85	7.68	12.79
1985-93	7.57	14.31
Metro:		
1973-93	9.21	15.10
1973-85	8.94	14.64
1985-93	10.86	15.38

Note: In 1983, the classification of counties as nonmetropolitan was changed by the U.S. Office of Management and Budget as a result of the 1980 census. The reclassification was incorporated into the Current Population Survey data starting in the third quarter of 1985.

Source: Estimates made from Current Population Survey data.

The nonmetro experience of the 1980's—the high unemployment rates though the expansion—was a result of the particular financial market conditions of the mid-1980's—the high value of the dollar and high interest rates—and not a business cycle phenomenon. Likewise, the financial market situation was more favorable for nonmetro areas in the early 1990's, with a low valued dollar and strong exports, so they were not hit as hard as metro areas in this last recession. However, there does not appear to be anything inherent in business cycle movements that affects nonmetro areas in either a negative or a beneficial way. There was some concern in the early 1990's that nonmetro areas would be affected more by the recession because of the previous recession experience.

Although nonmetro areas respond faster to business cycles movements, the nonmetro unemployment rate is about equally responsive to changes in aggregate demand—gross domestic product—as the metro unemployment rate. This means that an increase in aggregate demand will decrease the nonmetro unemployment rate by about the same percentage as the metro rate. This result accounts for both the increase in employment and increase in the labor force that occurs as individuals join or rejoin the labor force by searching for a job at a time of increased optimism in the economy. The importance of this result is that general macroeconomic policies, such as deficit spending that does not result in increased interest rates, or increasing the rate or growth of the money supply, cannot be expected to affect metro and nonmetro employment or unemployment differently. Nonmetro areas would be expected to see the benefits of a reduced unemployment rate as a result of an expansionary fiscal or monetary policy just as metro areas would.

Finally, some underemployed nonmetro groups are less responsive to business cycles movements than the corre-

sponding metro groups. These groups are part-time for economic reasons workers and discouraged workers. Labor market distress is more persistent for these groups. They would see less of a benefit during an expansion than the same groups in metro areas. Therefore, macroeconomic policies would be less effective in reducing nonmetro underemployment than policies targeted to regions or to particular demographic or income groups.

For Further Reading . . .

Michael T. Belongia and Michelle R. Garfinkel, *The Business Cycle: Theories and Evidence: Proceedings of the Sixteenth Annual Economic Policy Conference of the Federal Reserve Bank of St. Louis*, Boston: Kluwer Academic Publishers, 1991.

Karen S. Hamrick, *Macroeconomic Impacts on Nonmetro Unemployment: Preliminary Research*, Staff Report No. AGES 9141, USDA-ERS, August 1991.

_____, "Rural Unemployment Sensitive to Exchange Rates," *Rural Conditions and Trends*, Vol. 3, No. 2, USDA-ERS, 1992, pp. 10-11.

George L. Perry and Charles L. Schultz, "Was This Recession Different? Are They All Different?," *Brookings Papers on Economic Activity*, No. 1, 1993, pp. 145-211.

Lawrence H. Summers, *Understanding Unemployment*, Cambridge, MA: The MIT Press, 1990.

Victor Zarnowitz, *Business Cycles: Theory, History, Indicators, and Forecasting*, Chicago: University of Chicago Press, 1992.

Data and Methodology

Labor force data used are from the Current Population Survey (CPS). The CPS is a monthly survey of households, which is conducted by the Bureau of the Census for the U.S. Department of Labor (DOL). Labor force information collected is based on respondents' work activity during 1 week each month. The CPS is monthly; however the metro/nonmetro data are quarterly, covering the period from 1973 to 1993.

The *labor force* is, by definition, the sum of the employed and the unemployed. The *unemployment rate* used here corresponds to the DOL Bureau of Labor Statistics (BLS) official unemployment rate: the total unemployed as a percent of the civilian labor force.

The group *part-time for economic reasons (PTE)* are workers who wish to work full-time where only part-time work is available. Although these workers are counted as employed, they are partially unemployed, or more accurately underemployed, since they are working fewer hours than they wish. Employers frequently cut back on workers' hours when general economic conditions are unfavorable. This group is to be distinguished from part-time workers, who are working part-time by choice. One-half of PTE workers was used in order to calculate a full-time equivalent measure of unemployment.

Discouraged workers are those who desire a job, believe that none are available, and thus have quit job hunting. Since, at the time of the survey, they had not looked for a job during the previous 4 weeks, they are not counted as part of the labor force and so are not classified as unemployed.

BLS does not seasonally adjust the CPS data. The U.S. Department of Agriculture seasonally adjusts the data using the multiplicative X-11 ARIMA method. The nonmetro series appear to be more seasonal than the metro or the total U.S. series, partly due to the agriculture industry, but also because of recreational areas in nonmetro counties.

In the text, "nonmetro" and "metro" are used interchangeably with "rural" and "urban." *Metro* areas are defined by the Office of Management and Budget as core counties containing a city of 50,000 or more people or an urbanized population of at least 50,000 with a total area population of at least 100,000. Additional contiguous counties are included in the Metropolitan Statistical Area if they are economically and socially integrated with the core county. *Nonmetro* areas are counties outside metro area boundaries. In 1983, the classification of counties as nonmetropolitan was changed by the U.S. Office of Management and Budget as a result of the 1980 census. The reclassification was incorporated into the CPS data starting in the third quarter of 1985. The reclassification reduced the nonmetro labor force by about 30 percent as 149 counties changed from nonmetro to metro status. (Forty-eight counties changed from metro to nonmetro at that time.) This large change in counties' classification was due to both population movements in the 1970's and a change in the metro definition. Since county-level CPS data are not available, constructing a series using a consistent nonmetro definition is not possible.

The National Bureau of Economic Research (NBER) dated business cycle peaks—the end of the expansion and the beginning of recession—and troughs—the last period of recession and the beginning of expansion. NBER identifies the recessions since 1973 as the fourth quarter of 1973 to the third quarter of 1975, the first quarter of 1980 to the third quarter of 1980, the third quarter of 1981 to the fourth quarter of 1982, and the third quarter of 1990 to the first quarter of 1991. However, here the 1980-82 recessions will be counted as one recessionary period. A good definition of *business cycle* is the Burns and Mitchell one:

Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own. (Belongia and Garfinkel.)

Descriptive analysis was done to analyze the timing of the metro/nonmetro labor market response to business cycle movements. Each series was analyzed at all phases of the business cycle. The methodology used follows Perry and Schultz and standard practice in the business cycle literature.

For estimating the cyclical response of employment and the labor force participation rate, the methodology follows that of Summers. The cyclical movement of the unemployment rate is decomposed into the movement of employment and the labor force movement. Ordinary least squares (OLS) regressions were run on the resulting equations, using the Cochrane-Orcutt first-order autocorrelation correction. Gross domestic product was used as a measure of aggregate demand. In addition, the seemingly unrelated regression estimation technique was used. Estimates were also done using the unemployment rate of males aged 35-44 as a proxy for aggregate demand. These estimates on GDP are presented here.

For the cyclical responses of part-time for economic reasons and discouraged workers, OLS regressions were run using the unemployment rate as a measure of aggregate demand. The metro unemployment rate was used for the metro estimates; the nonmetro rate was used for the nonmetro estimates. The Cochrane-Orcutt first-order autocorrelation correction was used.

Rural Industry Clusters Raise Local Earnings

Industry clusters have become a popular strategy for rural economic development, yet their benefits to the local areas have not been fully examined. Labor is expected to be more productive within clusters, which should translate into higher wages. Our analysis confirms this, showing that workers' earnings in rural industry clusters are about 13 percent higher than those of comparable workers outside clusters. The wage boost is similar for workers regardless of age or education level.

The poor performance of the rural economy in the 1980's led economic development experts to search for new ways to stimulate local growth. One promising avenue for development was to encourage the location and expansion of business establishments that are linked by their interdependence as customer and supplier, or by their use of common local resources. Such spatial concentrations of activity, or industry clusters, were expected to raise productivity for all establishments in the cluster, thus encouraging other firms to locate there, and raising local income.

The idea that spatial clustering can raise the productivity of establishments is hardly new, having its antecedents in economic writings over a century ago. Not surprisingly, clusters have traditionally been equated with cities, as cities are by nature relatively large clusters of economic activity. Yet clusters can also benefit rural economies. Although prospects for the rural economy as a whole have improved significantly since the 1980's, competition for new firms among many local areas remains keen. The industry cluster appears to be a durable component in the development specialist's arsenal.

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Some of the local area benefits from industry clusters have been measured, but the potential effect of raising workers' earnings has gone relatively unexamined. In this article, we report findings from an analysis of manufacturing establishments showing that workers in rural industry clusters earn about 13 percent more, on average, than other rural workers with the same education and experience. The boost from cluster employment appears to be about the same in rural and urban areas, once industry mix is taken into account. And although one might think that the best educated and most highly skilled workers should benefit the most, we find that the wage premium from cluster employment is about the same regardless of age or education level. This is good news for less educated and younger rural workers in a period of rising wage inequality in the United States.

We will first describe in greater detail what industry clusters are, and why they are a desirable development strategy. Next, we introduce our method for identifying clusters and for measuring their effects on workers' earnings. Finally, we present the results of our analyses of earnings in both rural and urban labor markets and discuss the implications of our findings for the success of rural development efforts.

What Is an Industry Cluster?

A variety of definitions for industry clusters has been used, partly because there are several kinds of clustering

and partly because the characteristics associated with clusters are often difficult to measure. We define industry cluster as a group of establishments located within close geographic proximity of one another, which either share a common set of input needs, or rely on each other as supplier or customer.

Clusters may be as simple as a collection of manufacturing plants that locate in an area to take advantage of natural resources, or to be near a large market or labor pool. In these cases, transportation costs or labor costs to these firms will be lower than if they were located elsewhere. But the classic industry cluster implies a more sophisticated relationship among establishments. For example, the production of computer components may require a wide variety of specialized parts. As the specifications and characteristics of its products change, the factory will need a different set of material inputs. The more quickly these newly designed inputs can be acquired, the more quickly new components can be produced and the more competitive the factory will be in national and international markets. A factory that is located near its principal suppliers will be able to obtain redesigned parts more quickly, as engineers from the computer component factory and the input suppliers work closely together on the new designs. A similar, but isolated, factory would have much more difficulty acquiring inputs to meet its changing needs. The increase in the variety and availability of inputs and the reduction in their costs reflect *external economies of scale*. Once a group of establishments begins to rely on one another in this manner, and input costs fall, these clusters attract additional firms, and the process becomes self-sustaining.

Defined in this manner, clusters imply a mix of industries linked together both geographically and functionally. An important subset of clusters, though, is identified primarily as a cluster of similar establishments that draw upon common suppliers. Sometimes called *sectoral* clusters because they consist mostly of one industrial sector, these groups are probably much more common in rural areas than the broader, more complex type of cluster. Several clusters of this type have become well-known in the rural development literature, including the carpet industry in northwest Georgia, furniture manufacturing in the Piedmont region of North Carolina and Tupelo, Mississippi, and manufactured housing in Indiana.

The size of the area within a cluster depends on the type of cluster under consideration. A typical assumption is that suppliers and customers can communicate with each other face-to-face on a regular basis, and that goods can move quickly from one to the other on short notice. Some clusters may cover several counties, as in the North Carolina furniture cluster, while others can be contained wholly within a single town, as was true for many years

with the cluster of carpet-making establishments in Dalton, Georgia.

Manufacturing Clusters Are Well-Distributed Across Rural America

In this article, we focus our attention on sectoral clusters among manufacturing establishments. Services may sometimes form clusters in and of themselves, as in the clustering of the insurance industry in Hartford, Connecticut, or banking in New York and San Francisco. Most service industries, however, serve either consumers directly or as input suppliers to goods production. Service clusters are also less common in rural areas and less important to the rural economy.

Our method for identifying clusters for each industry separates counties into four groups: (1) counties without establishments in a given industry, (2) those with non-clustered establishments, (3) peripheral counties of clusters, and (4) central counties in clusters, those with the highest concentration of establishments relative to their neighbors (see "How We Identify Industry Clusters" for more information). Our analysis of industry clusters includes all counties in the last two groups, unless otherwise noted. Using a classification of industries based on two-digit SIC codes (with slight alterations), we found that all of the 18 resulting manufacturing industries have clusters that include nonmetro counties. The heaviest incidence of rural clustering appears in the Northwest (including much of Idaho), the industrial Northeast and Great Lakes regions, and the Southeast. With a few exceptions, clustering is noticeably absent from much of the Great Plains and the Rocky Mountain States, as well as scattered pockets in the East (fig. 1). For mapping purposes, areas without establishments are combined with areas containing nonclustered establishments.

Every industry had at least one cluster center in a nonmetro county, with printing and publishing having exactly one nonmetro center, and lumber and wood products having the most at 183 (table 1). A large proportion of all nonmetro counties are included in at least one cluster. Lumber and wood product clusters include 848 nonmetro counties, for instance, and over 300 nonmetro counties form parts of the stone, clay, and glass clusters.

The importance of industry clusters in the rural economy is also evident by comparing the number of establishments in clusters with the number of counties. In most manufacturing industries (15 of the 18 we studied), at least one-third of establishments are located in clusters, and the average share of an industry's establishments in clusters is 48 percent. Yet, clusters typically comprise just 26 percent of the counties with establishments in that industry. That is, a large proportion of establishments are clustered, but these clusters include a relatively small pro-

How We Identify Industry Clusters

The local Moran statistic measures whether the “neighboring” counties of a county with a high value of a particular variable have either high or low values for that variable. Three steps are involved in calculating the local Moran.

First, a spatial weights matrix defining which counties are considered neighbors is constructed. The form of the spatial weights matrix depends on the context. For this study, counties are considered neighbors if their centroids (the geographic centers) are no more than 100 miles apart. This criterion was chosen because it is about as far as most round-trip truck deliveries occur. According to the 1993 Commodity Flow Survey, 41 percent of the value of single-mode truck shipments were to destinations of 99 miles or less.

Second, the values are expressed as deviations from the overall average. For example, if the overall average of the variable of interest is 10, the deviation from the mean for a county with a value of 20 is 10, the deviation from the mean for a county with a value of 5 is -5, and the deviation from the mean for a county with exactly the overall average is 0.

Third, the local Moran statistic is calculated for a given county by multiplying the county's value, expressed as the deviation from the mean, by the average of all neighboring counties, also expressed as a deviation from the mean. If a county and the average of its neighbors are both either above-average values or below-average the local Moran for the county will be positive. In contrast, the local Moran will be negative if the deviation from the mean for the county and for its neighbors have opposite signs. For example, if the county has an above-average value and the average of its neighbors is below-average, the local Moran will be negative.

Fourth, the resulting local Moran statistic is compared to a critical value which indicates the largest (in absolute value) local Moran that would be expected to occur simply by chance. In this study, a county with both an above-average value for the variable and a local Moran that exceeds the critical value is considered to be a central county in a cluster. All neighboring counties, as defined by the spatial weights matrix, are considered to be peripheral parts of the cluster.

portion of counties. This contrast is a mark of the degree of geographic concentration present. Geographic concentration varies by industry, but tends to be unrelated to the degree of technological advance or demand for high-skill labor.

These results challenge the view that clusters of industrial activity are strictly an urban phenomenon. The majority of national cluster employment is located in metro counties, as is true for employment overall. Yet industry clusters and urbanization are clearly not synonymous. Moreover, the range of manufacturing industries with rural clusters, and their wide geographic coverage, suggest that the clusters identified with our method are not merely concentrations around sources of raw material or low-wage labor. If indeed rural clusters behave as urban clusters, dependent upon and sustaining external economies of scale, then we may expect similar economic benefits to flow to the local rural economy.

Why Should Wages Be Higher in Industry Clusters?

As we noted earlier, firms in clusters can lower production costs and obtain access to specialized goods and services. Another way of stating this is that output will be higher for a given dollar amount of input—that is, establishments will be more productive. Higher productivity will encourage additional plants to locate in the cluster, or existing plants to expand, thereby raising employment growth in the area.

Industry clusters may induce other positive changes in the local economy, including changes in the local work-

force. As the density of employment and the number of employers rise, the division of labor and job specialization increase as well. Many jobs will require more advanced or specialized knowledge and may become more task-specific. Skill levels, in turn, will increase among the local work force, and more specialized workers become more proficient at their tasks. In addition, workers are more likely to find a job whose requirements match their particular skills and abilities. Average wages in the local labor market should rise both because of higher skill levels and because those skills are being put to better use.

Along with increased specialization, ease of information sharing also contributes to higher productivity in industry clusters. Flows of high-value information among entrepreneurs and workers in close physical proximity make good job-skill matches easier because workers are more aware of employment options. Information sharing, especially among more skilled workers, increases the transfer of new skills and techniques and leads to faster rates of “skill accumulation.” At least one recent study suggests that the faster rate of human capital growth in areas of concentrated economic activity is the key factor in explaining higher labor productivity and higher wages in clusters (Glaeser and Maré, 1994).

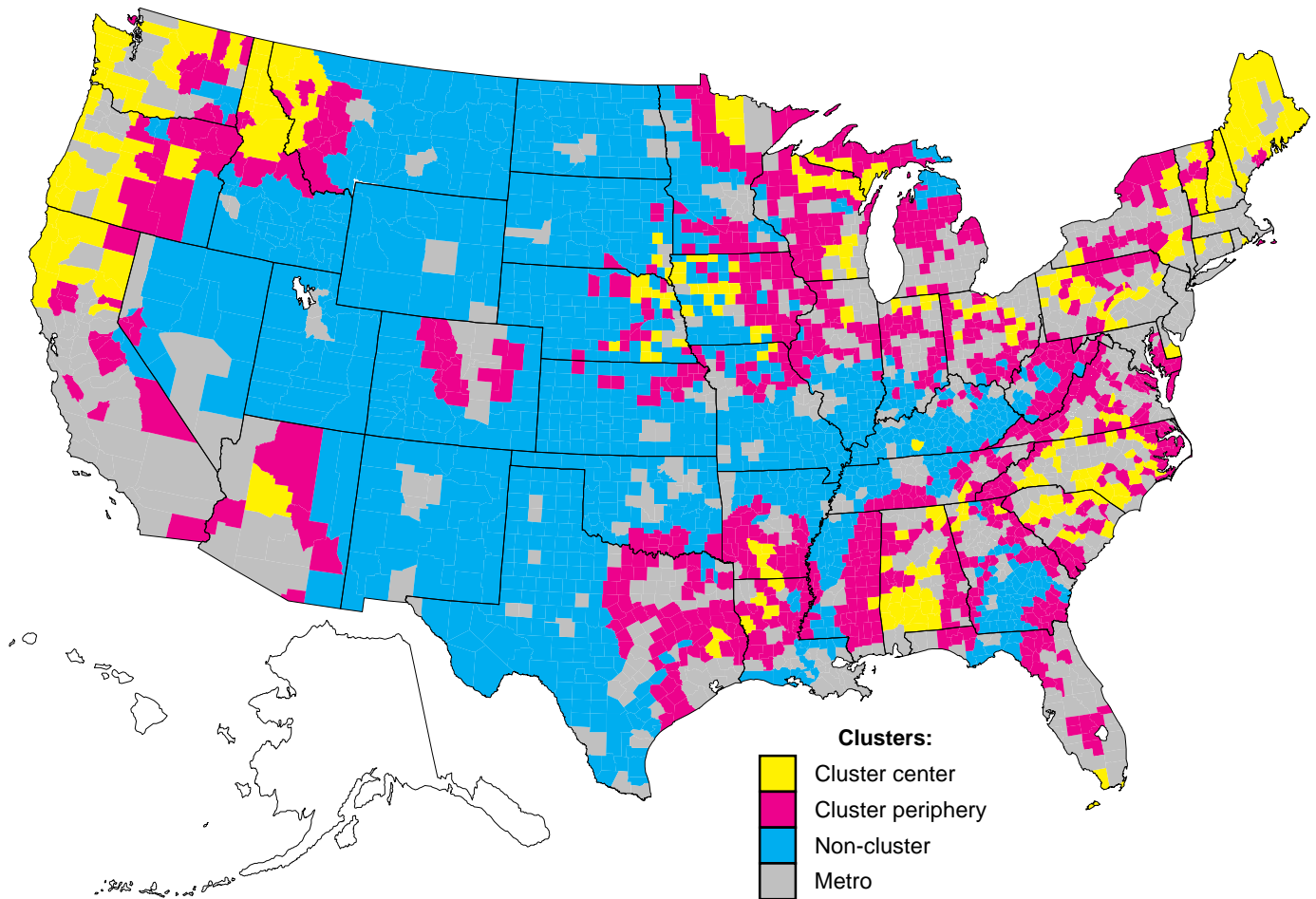
Industry Clusters Raise Local Earnings

Previous research has measured the effects of economic concentration on raising wage rates and has tested competing hypotheses about why higher wages are observed (Rauch, 1993; Glaeser and Maré, 1994). Without exception, these studies equate cities with such concentration,

Figure 1

Nonmetro manufacturing industry clusters

Nonmetro clusters are less common in the Great Plains and Rocky Mountains



Note: Industry clusters were not identified in Alaska and Hawaii.
Source: Calculated by ERS using data from County Business Patterns.

even though many of the productivity-enhancing characteristics of large urban labor markets are present in smaller labor markets with sectoral clusters.

A critical difficulty in measuring the impact of sectoral cluster employment on earnings is that clusters are often associated with other characteristics of the local area. If we simply compare wages in clusters to wages in non-clusters, then, we may overstate or understate the true effect of sectoral clusters *per se*. For example, a portion of the higher wages observed in cities can be explained by higher costs, particularly land costs, associated with urban living. Since industry clusters are correlated with urbanization, we need to separate the effects of each on wages to correctly measure the effects of sectoral clustering. Establishments are also larger, on average, where they are clustered, and wage rates are higher in large

plants due to higher unionization rates and higher output per worker.

Since we want to measure the impact of cluster employment on individuals' wages, we also want to hold constant those personal characteristics that help determine earnings. Key characteristics include education, experience, occupation, health status, gender, and ethnicity. Finally, wages vary by region, and our analysis accounts for residence by the four major Census regions. (See "About the Data" for the way we constructed these variables in the econometric model.)

Using ordinary least squares regression analysis, we estimated the additional wages received by those employed in an industry cluster compared with workers who were not, holding all other characteristics constant. At the national level, when all 18 manufacturing industries are

Table 1

Selected characteristics of rural industry clusters*All manufacturing industries have at least one cluster centered in a rural county*

Industry	Counties in clusters		Clusters as a share of all counties with establishments		Share of establishments in clusters	
	Center	Total	Center	Total	Center	Total
	Number		-----Percent-----			
Food	10	227	0.7	14.9	10.0	38.3
Tobacco	12	13	63.2	68.4	87.8	92.2
Textiles and apparel	46	239	10.8	45.8	66.5	95.1
Lumber and wood	183	848	11.1	51.3	45.9	94.2
Furniture	3	146	4	18.7	5.2	33.0
Paper	6	157	1.2	32.0	11.4	51.1
Printing/publishing	1	207	0	10.1	3.8	27.1
Chemicals	4	149	.5	18.3	6.5	33.1
Petroleum refining	18	113	5.5	34.7	19.5	48.8
Rubber and plastics	10	215	1.1	23.8	12.8	47.7
Leather products	11	51	3.5	16.3	22.6	38.5
Stone, clay, and glass	14	319	.9	20.2	9.7	42.7
Primary metals	13	163	2.3	28.3	15.7	49.1
Fabricated metal	4	208	.3	16.5	8.2	41.6
Machinery and computing equipment	2	213	1	13.1	6.1	35.7
Electronic equipment	2	115	3	15.0	6.9	34.4
Transportation equipment	7	162	8	17.7	11.1	37.8
Professional equipment	2	81	.4	17.1	6.1	31.4

Source: Calculated by ERS using data from County Business Patterns.

considered together, the average cluster-employed worker earns about 7 percent more than other comparable workers, holding other factors constant (fig. 2). Thus, independent of all other characteristics of the worker and his or her job, cluster employment raises worker earnings. The wage premium associated with cluster employment exceeds even that of urbanization.

Earnings Are Higher in More Rural Labor Markets

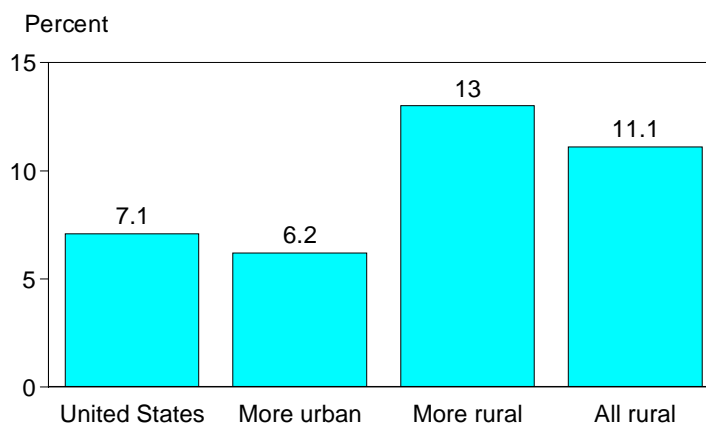
We might expect the wage benefits of cluster employment to differ significantly in rural and urban labor markets for several reasons. Probably the most important reason is that cluster effects in urban markets are a part of the general benefit of working in an urbanized area—more frequent contacts with more highly skilled workers, the possibility of better worker-job matches, and so forth. Thus, once we control for urbanization, the residual effect of working in a cluster may be small for urban residents. However, rural clusters may be smaller on average than their urban counterparts, with fewer of the advantages associated with cluster employment. These competing forces make it difficult to form a firm expectation of urban and rural cluster differences in earnings.

We divided the 395 labor market areas delineated by Tolbert and Sizer into “more urban” areas, those with

Figure 2

Wage premiums in industry cluster employment

The wage premium for workers in clusters is about twice as high in more rural labor markets as in urban markets



Note: Values shown are the percentages by which cluster-employment wages exceed noncluster-employment wages.

Source: Calculated by ERS using the 1990 Public Use Microsample from the Census of Population.

more than 70 percent of their population in metro counties, and “more rural” areas, those with less than 30 percent of the population in metro counties. The wage effects of industry clusters in the “more rural” group is twice that of the “more urban” group—13 vs. 6 percent higher earnings (fig. 2). The two groups showed other differences as well. Average establishment size, for instance, has a larger influence on more rural wages, indicating that *internal scale economies* are important in these labor market areas. In more urban labor market areas, wages are more strongly affected by the proportion of the population that is officially metro.

We also isolated the relatively small group of labor market areas that had no metro counties within their borders and estimated wage premiums associated with clusters in that group. Cluster wages in the no-metro group are 11 percent higher than wages outside clusters—lower than for the “more rural” areas, but still significantly above both the national and more urban wage premiums.

Wage Premiums Vary Significantly by Industry

So far we have treated industry clusters as a whole, but we should expect the wage gains from cluster employment to vary by industry. Wage premiums should be greater, for example, in industry clusters where close contact among skilled workers is more likely to increase the diffusion of technical knowledge or where the characteristics of the local labor pool are decisive for determining the best plant location. Thirteen of the 18 manufacturing industries we analyzed at the national level exhibited positive wage premiums, ranging from a 4.1-percent wage premium in food processing to almost 12 percent in the stone, clay, and glass industry (table 2). However, contrary to our expectations, the size of the wage premium appears to be unrelated to production technology levels or average skill requirements.

Although rural cluster wage premiums as a whole are larger than urban wage premiums, few rural industries *individually* exhibit positive wage effects. That is, combining all rural industries into a single analysis masks the fact that cluster wages are no higher than noncluster wages in most rural industries. This can be explained in part by the fact that just six industries account for most of the rural cluster employment in our data, but also by differences in the industrial composition of rural and urban clusters. Three rural industries—food processing, textiles and apparel, and lumber and wood products—showed sizable gains to employment in clusters.

The Size of Cluster Premiums Depends on Age, but not Education

As we noted earlier, economic concentration is usually thought to be most advantageous to the best educated and most highly skilled workers. Yet our analysis fails to

find much evidence of an educational advantage. Economic concentration should also benefit workers most when their knowledge and skills are accumulating the fastest, typically in their 20’s and 30’s. Here, the evidence supports that contention, with younger workers gaining the most from cluster employment.

Education and age are powerful predictors of earnings. For example, college graduates earn over twice as much, on average, as do high school dropouts, all other attributes held constant. Older workers also bring home larger paychecks than young labor force entrants. The effect of industry cluster employment on wage inequality, however, is uncertain. Cluster employment is believed to increase wage disparities between the most and least educated workers, but may actually mitigate the gap between younger and older workers.

As before, we calculated the wage premium for employment in industry clusters. This time, a separate premium is calculated for each education and age group in each type of labor market area. At every education level, workers earn significantly more money in clusters, both in

Table 2

Industry cluster wage premiums by industry

Wage premiums for cluster employment vary significantly by industry; few industries show large premiums in rural clusters

Industry	National premium	Rural premium
	Percent	
Food	4.1*	9.3*
Tobacco	-10.6	—
Textiles and apparel	8.2*	8.8*
Lumber and wood	4.3*	7.4*
Furniture	7.7*	—
Printing and publishing	6.3*	—
Chemicals	6.0*	—
Petroleum refining	-6.9*	-19.5
Rubber and plastics	1.4	—
Leather products	1.5	-6.0
Stone, clay, and glass	11.9*	11.5
Primary metals	5.9*	—
Fabricated metal	6.5*	—
Machinery and computing equipment	6.7*	—
Electronic equipment	5.3*	—
Transportation equipment	4.3*	—
Professional equipment	8.7*	—

Notes: Premiums are expressed as the percent by which earnings in clusters exceed earnings outside of clusters, all other worker attributes held constant. Asterisk indicates that the premium is different from zero at the 10-percent level of significance. Dash indicates that sample sizes are too small for estimation.

Source: Calculated by ERS using data from 1990 Census Public Use Microsample files.

more rural and more urban labor market areas (fig. 2). Yet in more rural areas, *relative premiums* (the percent by which cluster wages exceed noncluster wages) are similar for three of four education categories. Most importantly, high school dropouts and graduates seem to gain about as much from cluster employment, as a proportion of earnings, as do workers with college or advanced degrees, indicating that industry clusters do not give an advantage to the most highly educated. In more urban labor market areas, cluster-related gains are smaller than in more rural areas (except for those with some college experience) but similar for all four education groups. The smaller urban premiums for education groups are consistent with the smaller overall cluster-employment boost in urban areas.

The wage premiums for the three age groups show greater variation. In more rural labor markets, the youngest group, ages 35 and under, experiences the largest relative wage gains from cluster employment (7.7 percent), while the cluster premium for workers 55 and older is slight (1.7 percent). The findings are broadly supportive of the contention that cluster employment especially benefits up-and-coming workers.

The largest relative wage premiums for more urban workers occur in the middle group, 35-54, but otherwise agree with the more rural pattern. The rural-urban difference is understandable, in part, as a result of differences in rural-urban job structures. Even within industry clusters, rural job opportunities are unlikely to carry workers as far up their career ladders as is possible in urban areas. Hence, rapid skill and knowledge accumulation continues for a longer period of time in more-urban labor markets, and may even intensify.

The reader should be cautioned, of course, that ours is not a direct measure of individuals' increase in earnings over time, but rather a comparison of workers at different ages. Our data do not allow us to distinguish the direct effect of aging on wages from the effect of entering the labor force during a particular historical period, which also influences workers' long-term earnings. Nevertheless these results suggest that wage inequality between groups, based either on education or age, is not exacerbated by cluster employment. These findings should be welcomed by rural development specialists concerned about the effects of economic development on the local social fabric.

There Is Much More to Be Learned about the Benefits of Industry Clusters

This study has shown that industry clusters, far from being an exclusively urban phenomenon, exist across the rural United States, and are associated with higher wages after accounting for worker characteristics and industry composition. The results provide support for a cluster-based development strategy that will not only support

jobs but jobs that tend to pay higher wages than in the absence of a cluster. However, the benefits of higher wages are conditional on the success of the community in attracting and sustaining an industry cluster. As Barkley and Henry (1997) point out, a cluster-based industrial strategy "is not the industrial development solution for all rural communities."

Indeed, even where a cluster-based strategy is appropriate, higher wages may not necessarily follow. As we have shown, only a few rural industries actually exhibit higher wages in clusters. Moreover, research has only just begun to examine the factors that lead to successful labor market outcomes where clusters are present. The key determinants of a cluster's success in generating higher earnings may have less to do with the industry than with the specific production technology used, or with its ability to attract a strong research and development component as well as production. The research community doesn't know enough at this point to answer these kinds of questions with precision. The early returns, however, are promising enough to encourage much closer scrutiny of this emerging issue.

For Further Reading . . .

L. Anselin, "Local Indicators of Spatial Association - LISA," Regional Science Research Institute Research Paper 9331, Morgantown, WV, June 1994.

D.L. Barkley and M.S. Henry, "Rural Industrial Development: To Cluster or Not to Cluster?" paper presented at the 36th Annual Meeting of the Southern Regional Science Association, Memphis, TN, April 1997.

A. Ciccone and R.E. Hall, "Productivity and the Density of Economic Activity," *American Economic Review*, Vol. 86, No. 1, 1996, pp. 54-70.

E.L. Glaeser and D.C. Maré, "Cities and Skills," NBER Working Paper No. 4728, 1994.

B. Harrison, "Industrial Districts: Old Wine in New Bottles?" *Regional Studies*, Vol. 26, 1992, pp. 121-136.

B. Jovanovic and R. Rob, "The Growth and Diffusion of Knowledge," *Review of Economic Studies*, Vol. 56, 1989, pp. 569-582.

J.E. Rauch, "Productivity Gains from Geographic Concentration of Human Capital: Evidence from the Cities," *Journal of Urban Economics*, Vol. 34, 1993, pp. 380-400.

S.A. Rosenfeld, "Bringing Business Clusters into the Mainstream of Economic Development," *European Planning Studies*, Vol. 5, No. 1, 1997, pp. 3-23.

C.M. Tolbert and M. Sizer, *U.S. Commuting Zones and Labor Market Areas: A 1990 Update*, Staff Paper No. AGES 9614, USDA-ERS, 1996.

E. Sternberg, "The Sectoral Cluster in Economic Development Policy: Lessons from Rochester and Buffalo, New York," *Economic Development Quarterly*, Vol. 5, No. 4, 1991, pp. 342-356.

About the Data

Most of the data used in the multiple regression analyses were drawn from the Public Use Microsample, Labor Market Area file, of the 1990 Census of Population. Below is a list of the variables included in the model, along with a description of their construction.

<u>Variable</u>	<u>Categories or Definition</u>
Age	(Continuous)
Age squared	(Continuous)
Gender	Female, Male
Race	Asian/Pacific Islander, Black, White
Spanish origin	Hispanic, non-Hispanic
Education	High school dropout, high school graduate, some college, college graduate, graduate or professional degree
Occupation	Managers; professionals; technical, clerical, and sales; craft workers; operators and transportation operators; service workers; farmers and laborers
Disability status	Disability limits work, no limits due to disability
Weekly hours	Usual weekly hours worked in 1989
Cluster employment	No/Yes (see box on method for identifying industry clusters)
Population of labor market area (LMA)	(Continuous)
Metro status	Percent of LMA population in metro counties
Average establishment size in industry/LMA	(Continuous)
Census region	Northeast, Midwest, South, West
Usual weekly earnings in 1989	(Continuous)

A Word About Labor Market Areas

Labor market areas are derived from commuting zones, which are collections of one or more counties exhibiting relatively large intercounty commuting flows. The zones are mutually exclusive and include all U.S. counties. Commuting zones were first constructed in 1986 by Charles Tolbert and Molly Sizer using journey-to-work data from the 1980 Census of Population. Tolbert and Sizer replicated their method, based on cluster analysis, with 1990 data. In cooperation with the Census Bureau, they linked commuting zone geography with a 0.45 percent Public Use Microsample known as PUMS-L. Because the Census Bureau prohibits geographic identifiers with fewer than 100,000 persons, some commuting zones were combined and the new geography named labor market areas. For more information, please see Tolbert and Sizer, 1996.

Commuting and the Economic Functions of Small Towns and Places

Fully three out of four nonmetro counties have average out-commuting rates from their towns and places of more than 35 percent. Commuting is one way to take advantage of housing and job options in nearby communities; hence, commuting rates are higher in parts of the country where places are closer together, mainly east of the Mississippi. Commuting rates are higher from smaller towns and places. Commuting implies that creating job opportunities for a community's residents may not require bringing jobs into that community. Conversely, bringing jobs into a community will not necessarily mean jobs for residents. Separation of work and residence could result in need for social services, housing, and water and sewer facilities that do not decline when jobs do. This separation may also separate sources of tax revenues from the needs.

Commuting from a residence in one jurisdiction to a job in another is such a commonplace facet of American life that it arouses little notice. Three important trends in the 1970's contributed to commuting: a boom in workers fed by the baby boom and the movement of women into the labor force, a growing shift to the suburbs for job locations, and increased use of the automobile. In the 1980's, the boom in workers diminished, but the dispersal of job locations continued as did the emphasis on the private automobile (Pisarski, 1996).

Commuting is not limited to metro areas. A small town or place, whether an incorporated town or a densely settled unincorporated area, can serve as either a residence or a place of work. This means that bringing jobs into a community may result in either residents or nonresidents seeking and getting the jobs. Economic development is often couched in terms of adding jobs to a community, rather than in terms of finding access to jobs in nearby communities. The residential and employment pattern of the town or place has important implications for community and economic development.

This paper uses "out-commuting" across jurisdictional lines to examine the extent to which residents of nonmetro towns and places work elsewhere (see box for definitions). It also discusses implications for local governments and development policy of the separation of residences in small towns and places from work elsewhere.

Nonmetro Commuting Goes Predominantly to Nonmetro Destinations

Commuting has become an integral part of nonmetro life, most of it to other nonmetro destinations. The ratio of jobs to workers gives an indication of commuting for specific areas. (The measure is not precise because some workers have more than one job.) In 1990, the index for nonmetro areas was 92, compared with 83 for the suburbs and 136 for central cities (at 100, the number of jobs equal the number of workers). For all metro areas, it was 102. These numbers imply that about 90 percent of nonmetro commutes were to nonmetro destinations. Nearly 90 percent of nonmetro commutes were in private vehicles, with over 70 percent consisting of people driving alone. Over 30 percent of nonmetro commutes from households which did not own vehicles consisted of persons driving alone, presumably in vehicles belonging to relatives or friends (Pisarski, 1996).

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The importance of commuting to rural areas can be seen in the commuting patterns among cities, towns, and places of different sizes (Fuguitt). A study based on the 1980 census shows how community size affects commuting patterns. As table 1 illustrates, more workers commuted out of places of less than 2,500 population than into them, although commuting into even these small places was noticeable. The middle category represented considerable exchange with other size categories, while places of over 10,000 population had a fairly large balance of in-commuting. These results include only commuting between size categories, excluding commuting within them. Even with this limitation, the results show that separation of work and residence was common in non-metro small towns nearly two decades ago.

Jobs and Housing Costs Contribute to the High Levels of Commuting

The motives behind commuting become clearer when commuting is examined at the State and local levels. In a study of inter-county flows in North Carolina, Renkow, Hoover, and Yoder focus on the reasons people commute between counties. The study represents 3,730 inter-county flows of commuters, accounting for commuting by workers in each of 12 industries. It models the proportion of workers commuting as the result of simultaneous selection of a job from possibilities of different wages at different locations and of a residence from possibilities of different costs at different locations. The worker/consumer's decision is constrained by the cost of commuting between job and residence, represented by distance. With the proportion of recent migrants included, the researchers found that commuting into metro counties from other metro and nonmetro counties in North Carolina produced the expected relationships of more commuting to higher wage, higher housing-cost areas, with an inverse relationship to distance. Nonmetro to metro flows are only 10 percent of commuting flows originating in nonmetro areas, but the study confirms the importance of wages, housing costs, and distance as determinants of commuting flows.

Table 1

Aggregate rate of commuting in and out of nonmetro towns and places to other size categories, 1980

Medium-sized places exchange large proportions of workers with larger and smaller places

Size of community	Commuting out Commuting in	
	Percent	
Less than 2,500 (small)	44	18
2,500-10,000 (medium)	41	62
Over 10,000 (large)	25	63

Source: Fuguitt. Base is resident population of workers.

Nonmetro Residents East of the Mississippi and in Small Towns Commute Most

We use the census-defined place (see box for definition) to examine the proportion of workers commuting out of one place to other jurisdictions, and thus using the small town as a bedroom community. As table 2 indicates, around half of the nonmetro population lives in places, the remainder live in open country. Average out-commuting rates from the 1990 census were calculated for all places within counties and in particular size categories within regions of the country (see table 2 for distribution of the nonmetro population by region and size of places). Previous studies (Pisarski and Fuguitt) were based on nationwide averages by metro and nonmetro areas or by size categories of places. In contrast, we average places

Census-Defined Places Are Statistical Equivalents of Incorporated Municipalities

As defined in the 1990 decennial census, places include incorporated places and census-designated places (CDP's). Incorporated places are legally defined incorporated municipalities (cities, towns, villages, and boroughs); census-designated places are the statistical counterparts of incorporated places, used to define densely settled concentrations of population that are identifiable by name, but are not legally incorporated places. In all, we have data for 23,434 places in the Nation, representing 182.5 million people.

The metro/nonmetro status of a place is determined by the county in which it is located. In some instances, a place extends across county boundaries. In these cases, the multi-county parts of the place were consolidated into the county with the place's largest share of population. We then assigned each place a metro or nonmetro status based on the rural-urban continuum code of its county. By this method, we define 12,667 nonmetro places, representing 25.6 million people.

Several caveats concerning the data on places should be noted. The data shown for nonmetro places are for all incorporated places and for CDP's (unincorporated places) of 1,000 persons or more. The Census Bureau has not had the resources to extend its identification of places to those with fewer than 1,000 that lack incorporation, with the exception of Alaska and Hawaii.

Also, States are not uniform in their incorporation of small places as municipalities. For example, some States in the Midwest and the western South have anywhere from 300 to 600 incorporated small towns of fewer than 1,000 residents. At the other extreme, it has not been the custom to incorporate such small places in New England (with the exception of Vermont)—where township-sized "towns" are the basic unit of local government—nor in the three Western States of Arizona, California, and Nevada. Thus, for places of fewer than 1,000 people, the data for both the United States as a whole and for the four regions exclude most places in New England and the three other States mentioned.

Table 2

Percent of the nonmetro population living in census-defined places, by region and place population, 1990*About half the nonmetro population lives in places; the rest live in the open country*

Region	Living in places	Place population				
		Under 1,000	1,000-2,499	2,500-4,999	5,000-9,999	Over 10,000
Total nonmetro	50.3	5.6	8.5	7.9	9.5	18.7
Northeast	41.9	2.6	9.4	7.1	9.9	13.0
Midwest	55.9	9.0	9.6	7.4	9.4	20.5
South	43.9	4.0	7.2	7.7	8.9	16.1
West	63.4	5.5	9.1	10.5	11.3	27.0

Source: Calculated by ERS using data from the Bureau of the Census.

within counties and by size categories of places within the four census regions. These numbers show the spatial variation in out-commuting from places across the country.

The map (fig. 1) strikingly reveals how pervasive job commuting is for nonmetro workers. Fully three out of four nonmetro counties have average out-commuting rates from their towns and places of more than 35 percent. Most of the area east of the Mississippi reveals a predominance of counties whose towns and places are counties in the top two quartiles of commuting percentages. Conversely the central and Western counties more often fall in the bottom two quartiles, especially in the thinly settled agricultural Great Plains. However, these rates are not low, ranging up to nearly half of all workers. Commuting is one way to take advantage of housing and job options in nearby communities; hence, commuting rates are higher in parts of the country where places are closer together.

Some exceptions to these broad characterizations are found in Mississippi, Alabama, the Appalachian States, and the northernmost parts of New England. Workers in these places do not appear to be able to find opportunities to improve their wage/consumption options through commuting as readily as in the rest of the area east of the Mississippi. Parts of the West do contain counties with very high out-commuting rates from towns and places, suggesting greater opportunities in neighboring places.

Commuting can include exchanges of residential and working populations. An example is a nonmetro county seat in Michigan. The residents, mostly middle- and low-income, commute out to industrial and service employment. Business owners and professionals commute into the town from their residences outside town. To the extent that certain types of employment, such as high-skilled professional employment, are concentrated in places with fewer attractive residential options, those workers are more likely to commute to their jobs and choose from a wide range of residential options outside their place of work.

Examining out-commuting by region and size of nonmetro places provides further insight into the pattern of commuting (fig. 2). In the Northeast, residents of places of under 2,500 commonly work elsewhere: out-commuting rates are 76 percent for places under 1,000 and 73 percent for places between 1,000 and 2,500 population. Fuguitt's results on in-commuting in the size categories suggest that in-commuting rates would be small for places less than 2,500 population. In the Northeast, however, out-commuting rates are still 50 percent for places between 5,000 and 9,999 population.

In the South, as in the Northeast, the smallest size of place categories display large out-commuting rates: 77 for places under 1,000 and 65 percent for those between 1,000 and 2,500 population. In the Midwest and the West, the out-commuting rates from these small places are somewhat lower, reflecting the longer distance between places, although the rates are still quite high: 70 and 55 for the Midwest and 59 and 62 for the West.

Some important observations follow from these findings. Offering a satisfactory residential environment can be an important small town and rural economic attraction, analogous to offering manufacturing sites, retail sites, or favored retirement areas. Multi-community development strategies can consider specialization among towns and places. A middle ground between moving people to jobs through migration or jobs to people through economic development might be to make commuting accessible to more people (Fuguitt).

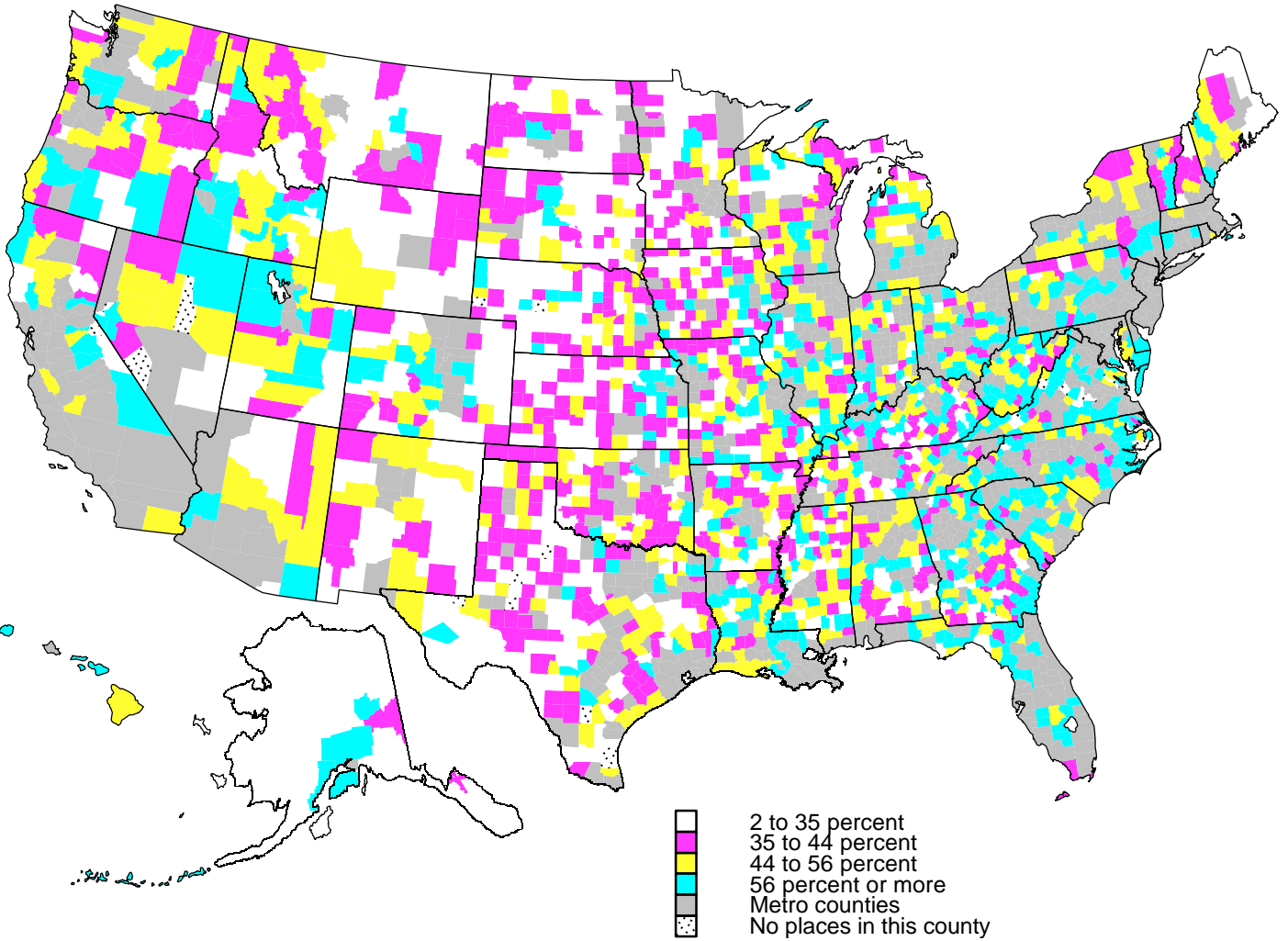
Residential Specialization Challenges Long-Term Residents and Local Governments

Commuting to obtain higher wages and/or lower housing costs can change the social and demographic composition of places. The meaning of out-commuting and residential specialization varies by the affluence of the population. In high-income places, residential specialization is primarily a matter of people choosing the most attractive of many options. However, some have suggested that low-income residents can represent a "filling-in" phenom-

Figure 1

Percent of workers commuting outside place of residence, nonmetro counties, 1990

Commuting out of rural towns and densely settled places is common across the country, but more usual east of the Mississippi



Source: Calculated by ERS using data from the Bureau of the Census.

enon as those with fewer financial resources occupy less expensive housing units left available by out-migration of the more affluent.

In New York State, lower income residents pushed out of high-cost larger places have concentrated in some rural villages.

...Today, as a result of recent decades of rural population loss, houses and store buildings in some rural villages have become vacant. Absentee landlords...have cut them up into apartments, which they now rent at rates that are considerably lower than rents in the larger towns or nearby cities.... Thus, some small villages have become de facto low-income housing sites (Fitchen, p. 123).

Even thriving communities may develop commuting strains as long-time residents expand their horizons and newcomers arrive. A thriving agriculturally oriented community in Washington State highlights the dynamics of the shift from business center for surrounding agriculture to residential settlement:

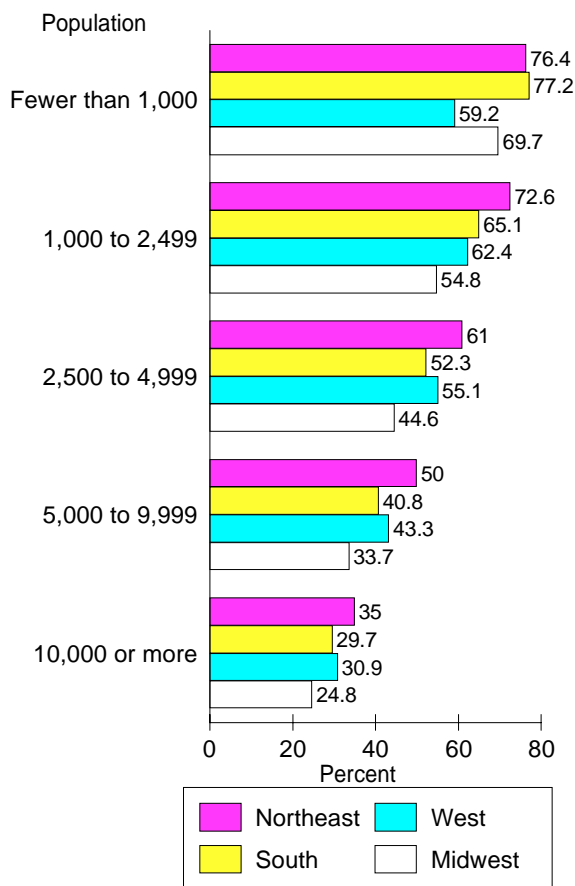
The stress between farmers and non-farmers has increased in some ways as the availability of transportation has allowed farmers to go outside of the community to spend their money. In addition, more people are working outside the community...

Increased out-of-community employment isn't the only change that has influenced the community of Bremer [a pseudonym]. As housing prices have fall-

Figure 2

Out-commuting rates by size of place and region, 1990

Commuting varies inversely with size of place



Source: Calculated by ERS using data from the Bureau of the Census.

en, the residents have felt that outsiders have moved in who have no regard for the good of the community (Allen and Dillman, p. 185).

In Illinois, both “down scale” and “gentrified” forms of bedroom communities have developed in what had previously been agricultural communities.

In communities such as Splitville [a pseudonym], where the newcomer influx is by families less well-off or less well-educated than old-timers (or perhaps perceived as of lower status), a “down scale” form emerges. There are potentially many other variants of post-agricultural communities. Where post-agricultural communities have become bedroom communities for well-off, well-educated commuters to adjacent metro centers, an “exurban,” “upscale,” or “gentrified” form emerges. Another variant has a changing population that is demographically stabilized due to

an in-migration of newcomers racially or ethnically distinct from old-timers (Salamon, p. 637).

It is not known how extensive this phenomenon of low-income residential enclaves in small towns and places is and whether there are regional differences in its extent. It seems likely that the phenomenon is more common in areas experiencing declining nonmetro populations. It also seems likely that low-income housing specialization was more common in the 1980’s, when many rural areas experienced low or negative population growth, than in the 1990’s, when there has been a turn-around in many, but not all, nonmetro areas. To the extent that places become low-income housing enclaves, they pose severe challenges with respect to the provision of social and economic services. This could influence planning for government programs in nonmetro areas, human service programs as well as physical infrastructure programs providing housing and community facilities. For example, towns that previously may have needed fewer services for younger people and less housing and water assistance because of declining populations may in fact need more if they become low-income residential “neighborhoods,” with younger residents and a stable population. Furthermore, the tax base of the employment center based outside the residential area may not be available to the residential town to supply needed services.

Nebraska illustrates this process. In developing priorities for assisting small communities with water and sewer needs to meet Federal and State environmental and safety mandates, the Governor’s Office examined around 100 communities to determine future needs for services. Although it was expected that some small communities would face reduced needs in the future, many communities were, in fact, low- and middle-income “neighborhoods” for distant employment centers and, as such, would have continuing needs for services. The consequential potential strain on State and local financial sources, even supplemented with Federal grants and loans, means that the State must develop strategies for providing adequate services at low cost to prevent future health and safety problems. These strategies include fiscal capacity analyses and research to examine alternative, less-costly technologies for water treatment, for example (Yost).

The separation of work and residence may require a concept of residential and economic areas that encompass several towns or places for any particular community or economic development effort. The concept of small towns as providers of residences, as well as other economic services, in a regional network of employment and housing options offers a useful perspective and the possibility of expanding approaches for community and economic development.

For Further Reading . . .

John C. Allen and Don A. Dillman, *Against All Odds: Rural Community in the Information Age*, Boulder, CO: Westview Press, 1994.

Janet M. Fitchen, *Endangered Spaces, Enduring Places: Change, Identity, and Survival in Rural America*, Boulder, CO: Westview Press, 1991.

Glenn V. Fuguitt, "Commuting and the Rural-Urban Hierarchy," *Journal of Rural Studies*, Vol. 7, No. 4, 1991, pp. 459-466.

Alan E. Pisarski, *Commuting in America*, Eno Foundation for Transportation, Inc., 1987.

Alan E. Pisarski, *Commuting in America, II*, Eno Foundation for Transportation, Inc., 1996.

Mitch Renkow, Dale M. Hoover, and Jon Yoder, "Commuting and Migration in North Carolina: Does Suburbanization Explain the Trends?" AER No. 13, Department of Agricultural and Resource Economics, North Carolina State University, January 1997.

Sonya Salamon, "Territory Contested Through Property in a Midwestern Post-Agricultural Community," *Rural Sociology*, Vol. 59, No. 4, 1994, pp. 636-654.

Jeffrey D. Yost, Project Coordinator, "Nebraska Mandates Management Initiative, State of Nebraska," presentation at the National Rural Development Partnership Annual National Conference, Arlington, VA, March 25-27, 1996, and telephone conversation.

Rural Areas in the New Telecommunications Era

The new Telecommunications Act, enacted in 1996, was the first comprehensive rewrite of the Communications Act of 1934 that had ushered in an era of universal phone service for rural areas. The 1996 Act's provisions fall into five major areas: telephone service, telecommunications equipment manufacturing, cable television, radio and television broadcasting, and the Internet and online computer services. All these provisions will affect rural areas, but universal service is the most critical. Without the universal service provision rural areas may rapidly fall behind urban areas. In May 1997, the Federal Communications Commission enacted regulatory provisions for universal service.

Telecommunications are essential for rural areas: the availability of telecommunication services reduces isolation, increases business viability, improves farming productivity, and improves access to educational and medical services. The quality of telecommunication services can encourage business activity to remain or develop in rural areas. On the other hand, some business activities, such as banking, may lessen their presence in rural communities as they take advantage of better telecommunications to consolidate more of their operations.

Telecommunication services, however, have been changing rapidly due to transformations in technology and the regulatory environment. These changes are having profound effects on the cost, type, and availability of telecommunications. New technology and regulatory provisions are also creating a great deal of uncertainty. The new era in telecommunications will offer rural communities many new challenges and opportunities.

Changing Telecommunication Technology Leads to New Legislation

Telecommunication technology has changed rapidly in the last decade, with new developments in computers, switching devices, digital signal processing, wireless communication, satellite technology, and Internet services.

Peter Stenberg is an economist, Sania Rahman, M. Bree Perrin, and Erica Johnson were interns, in the Rural Business and Development Policy Branch of the Food and Rural Economics Division, ERS.

These changes have blurred the line between what had been discrete services. Local telephone companies now have the technology to offer long-distance phone service. Cable TV corporations now have the technical capabilities to deliver voice and Internet services. Similarly, technology has improved so greatly for wireless service that high-end services, such as the Internet, can be offered to many subscribers.

Demand for telecommunications services has increased rapidly, generated in part by new technology, and by lower costs from increased competition among major companies, such as AT&T, MCI, and Sprint. This created economic pressure to thoroughly revise the existing telecommunication laws. After 4 years of serious negotiations, a new comprehensive telecommunications bill was passed by Congress and enacted into law in 1996. The Act addresses three important issues dealt with here: universal service, media ownership, and phone service.

Universal service, section 254 in the Act, is defined as “an evolving level of telecommunications services that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services.” It guarantees the availability of quality phone service to households at affordable rates. Section 254 also aims to give schools, hospitals, libraries, and clinics equal access to the information superhighway by the year 2000. As a conse-

Provisions of the Telecommunications Act of 1996

The Telecommunications Act of 1996 is the first comprehensive rewrite of the Communications Act of 1934. The Act modifies previous legislation, such as the Cable Act of 1992, and judicial actions, such as the early 1980's consent decree in the breakup of Ma Bell (American Telephone and Telegraph).

The provisions of the Act fall into five major areas:

- furnishing telephone service
- manufacturing telecommunications equipment
- supplying cable television
- supplying radio and television broadcasting
- supplying Internet and online computer services

In each of these areas the Act relaxes concentration and merger rules for telecommunication companies, eliminates cross-market entry barriers, and assigns new implementation obligations to the Federal Communications Commission (FCC).

The Telecommunications Act of 1996 was created to achieve the following goals:

- carrying out the transition of the telecommunications industry from a heavily regulated market
- improving the telecommunications network so that consumers are able to send and receive voice, data, images, and video at affordable rates
- promoting economic growth, creating jobs, and increasing productivity
- further advancing universal service to help deliver educational, health care, and other social services

quence, people in rural and low-income areas will have access to information that can open up new opportunities.

Another provision relaxes previous rules on media ownership, although it still limits the concentration of television and radio ownership in order to maintain a diversity of viewpoints. A company may own a limited number of stations that reach up to 35 percent of all national viewers. Also, a company may not own two television stations in one market, or a newspaper and television station in the same market, or a newspaper and cable TV system in the same market.

The last principal provision of the Act, phone services, allows the Baby Bells to provide long-distance telephone services and to manufacture telecommunications equipment. The Baby Bells—the seven Bell Regional Holding Companies—are the major local phone companies that were created when AT&T (Ma Bell) was split up in the early 1980's. The Baby Bells have about 136 million access lines. GTE, a large holding company and the other major provider of local telephone service, grew from the purchase of independent telephone companies and has nearly 17 million access lines. Most of these independents were in rural areas and hence, GTE became a major provider of local telephone service in rural areas. GTE was providing long-distance service before the Baby Bells were allowed to (with passage of the 1996 Act). In addition, there are nearly 1,300 smaller local telephone companies, most serving only rural communities. They account for over 24 million access lines.

The Act reduces direct government involvement in sectors of the telecommunications industry; nevertheless, a legal framework still must exist. Many new and revised regulations resulted from the Act. The Federal Communications Commission's (FCC) responsibility is to write these new regulations, as it has recently done for universal service.

While many of the Act's provisions will take years to come to fruition, some cross-industry and intra-industry mergers have already occurred because of it. US West's purchase of Continental Cablevision is the first major restructuring in the telecommunications industry to result from the legislation. Two sets of Baby Bells are also merging; Southwestern Bell and Pacific Telesis became SBC, and NYNEX and Bell Atlantic merged to become the new Bell Atlantic. AT&T has recently been in merger talks with one of the newly combined Baby Bells (SBC) to create a new telecommunications colossus; if the merger were carried out, the combined company would have over half the long-distance subscribers and one-third of the local phone subscribers in the Nation. Many more profound results of the Act are expected.

Will Deregulation Mean Better Rural Economic Growth?

Proponents of the Act have made several claims about the benefits that will accrue to national and rural economies. A deregulated industry would promote innovation and the development of new services, thus increasing efficiency and lowering prices of telecommunication services. Even under the old Act, innovation had occurred in the

form of cellular phones, paging systems, and other products. The breakup of AT&T led to a host of innovations and new products because the breakup allowed independent companies to sell to the Baby Bells for the first time. Prior to this, Bell Labs, a wholly owned subsidiary of AT&T, had the "sole right" to sell telecommunications equipment to AT&T.

With the 1996 Act, fewer regulatory hurdles and delays postpone a product's entry into the marketplace. Consequently, more profits will accrue to the innovators and less to the imitators (who offer products similar to the innovators) than under the previous regulatory climate, spurring further innovation. Increased innovation, in turn, may lead more quickly to new technology that reduces the cost of telecommunication services in rural areas, with the consequence that these services would more likely be offered in rural areas.

Under the old regulatory system, people did not have a choice of providers for local telephone service. With competition, consumers will now be able to choose among several services, and competition in the retail market will, in turn, lead to a reduction in the cost of telephone services for consumers. In fact, in the last decade, profits for telephone companies have risen significantly because their costs fell faster than the prices they charged. Innovations that had reduced costs for telephone companies had already been spurred by the breakup of AT&T. Prices paid by consumers, however, tended to be "sticky" due to the lack of competition in retail markets. Regulations by State public utility commissions, though, kept the charges in check.

The existence of monopolies, however, makes the entry of competition into markets difficult, and in some cases expensive and risky. The transitional rules are intended to encourage investment opportunities without protecting certain industry segments. The Act's proponents argue that opening up the markets will lead to an increase in job opportunities, national competitiveness, and economic development.

New entrants in local markets could include cable companies, electric utilities, wireless communication services, and satellite companies. Two years ago, industry analysts felt that cable companies were going to enter the local phone service market very quickly, offering service superior to the existing phone service. The technical hurdles turned out to be more difficult to surmount than expected, so cable's entry apparently will not happen, at least not as fast as it had earlier been thought. Rural communities, however, may benefit if some companies find that it is cheaper to deliver combined phone and cable TV service than each separately. US West, a Baby Bell with its large rural service area, may have already decided to try

this. The company recently purchased a large cable TV company, Continental Cablevision.

Another new telecommunication entrant may be the electric utility companies. MCI Communications Corp., for example, announced in March 1997 that it was teaming up with local power and telephone companies in Iowa to provide new competitive services to rural communities. Other power companies may also offer local phone service because they already have fiberoptic cables alongside their powerlines into communities. Other technologies also have the potential to offer cheap and efficient services to rural areas. A study done by Hatfield Associates showed that in low-density areas (under 100 persons per square kilometer), it is cheaper to use wireless technology than wire-line technology. In the future, satellite technology may become cheap enough to become a viable alternative for standard local phone service.

Rural areas, however, will have greater telecommunication challenges to overcome than urban areas and, in some ways, greater challenges than poor urban areas. Because of low population density, competition in the industry will likely come more slowly in rural areas or may not come at all.

Moreover, prices of telecommunication services will likely fall more slowly in rural areas. Rural areas have special challenges in natural barriers, such as mountainous terrain, that add to the cost of communication lines between communities. The present universal service program requirement (essentially the 1996 Act's universal service provisions have not yet taken effect), however, has meant that, on average, rural households have spent less than urban households for phone service; in 1991, rural households spent \$601, on average, while urban households spent \$621 for telephone service. The difference is largely due to the advanced (and costly) calling services available to urban residents, but usually not available to rural residents. Rural households, however, have lower average incomes, so they spend a larger proportion of their income on telephone service, 2.4 percent versus 2.0 percent. Without the universal service regulations rural households would have spent more than urban households on telephone service while receiving less service.

After the Telecommunications Act was enacted in February 1996, the Federal Communications Commission began the process of drafting regulations for the new law. The new Act mandated an expanded universal service and gave the Federal-State Joint Board the responsibility of making recommendations to the FCC. The Joint Board made its recommendations in November 1996; the FCC regulations came out in May 1997.

These universal service regulations are the telecommunication provisions most critical for rural regions. Ultimately, the universal service provisions in the Act will determine what telecommunications services will be available in rural areas, at what cost, and for whom. This will, in turn, help determine what economic growth and quality of life potential will exist for any given rural area.

Universal Service Has Meant Greater Access

Two diametrically opposed views (with many views in between) exist on the need for providing universal service. One would allow market forces to determine the supply of and demand for telecommunications services. In this view, because the cost of phone service has fallen a great deal over time and competition has increased through new technologies, such as wireless phone service, concern over high prices is misplaced. Thus, universal service support for rural areas would subsidize the more well-to-do rural residents. The other side holds that extensive changes in prices and competition have not yet reached rural or poor areas. Any too rapid move away from universal service would create inequity and inefficiency in the economy.

Universal telecommunication service historically has meant that telephone rates were set so that they were affordable to all but the poorest in America, even for residents of remote, expensive-to-service areas. The Communications Act of 1934 established universal service and defined it as making available, "so far as possible, to all the people of the United States a rapid, efficient, nationwide, and worldwide wire and radio communication service with adequate facilities at reasonable charges. . ." Until recently, universal service was defined as basic phone service (old party-line, rotary phone service) with later national and individual State legislation enlarging the definition to include such services as 911 emergency service. The 1996 Act, however, will allow (without new legislation) an evolving definition of universal service to encompass future changes in technology and markets.

Service costs for telephone service providers in high-cost areas were defrayed under the existing universal service provisions (based on the 1934 Act and minor revisions). Since the breakup of AT&T in the early 1980's, the Federal Universal Service High Cost Fund has transferred funds from long-distance providers to local exchange carriers in high-cost (often rural) areas.

Two other mechanisms for universal service come from the State level: geographic rate averaging and subsidizing residential lines via business lines. Within States, geographic averaging allows a State's public utility commission to set rates (for a phone company serving both rural and urban areas) in a way that rural households pay less

than the market conditions would indicate. Likewise, businesses pay more than households within States.

As a result of the universal service funding mechanisms, rural and poor urban areas were subsidized to some extent by richer urban areas; private businesses subsidized all households, including richer households. The new Act requires all telecommunication providers to contribute to a fund that will subsidize universal service. Given the evolving definition of universal service, future Internet access may become part of what is considered universal service and Internet access providers may be required to contribute to the universal service fund.

According to the FCC, seven principles of universal service are to be implemented:

- Quality services should be available at just, reasonable, and affordable rates.
- All regions of the country should have access to advanced telecommunication and information services.
- Low-income, rural, insular, and high-cost areas should have access to telecommunication and information services reasonably comparable to urban areas at similar prices.
- All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the universal fund.
- Federal and State support mechanisms will be established to guarantee universal service.
- All elementary and secondary school classrooms, health care providers, and libraries should have access to advanced telecommunication services.
- Other steps should be taken that are necessary and appropriate for the public interest.

The legislation requires that the FCC implement these principles in a manner consistent with the pro-competition purposes of the 1996 Act.

Universal service is currently measured by telephone penetration, which is the percentage of all U.S. households having a telephone on the premises. The FCC reports that, in 1996, 94.2 percent of all U.S. households owned a telephone. The pre-1996 law governing the universal service program has kept the rate nearly as high for rural areas.

The share of rural households with phones, however, varies greatly by income, from 81.6 percent for rural households with incomes less than \$10,000 to 99 percent for rural and urban households with incomes greater than \$50,000 (U.S. Dept. of Commerce). Again, the success of the current universal service program is apparent here: the percentage at each income level is nearly the same for rural and urban areas. Divergence in telephone ownership between urban and rural areas, however, does occur for racial groups. While non-Hispanic White households have nearly the same ownership rates in rural and urban areas, Black, Hispanic, and Native American households are much less likely to have telephones in rural areas than in urban areas.

Rural communities vary considerably with respect to quality of telecommunication service. One measure is the percentage of digital access lines (older lines are analog). No data directly measure rural versus urban communities, but data for the independent telephone companies and the Baby Bells give some indication. The data, however, can also easily be misinterpreted. A 1992 study indicates that, in the aggregate, over 80 percent of the access lines for independents are digital, while, for example, only 63 percent of Bell Atlantic's heavily urban system of access lines are digital. Rural communities on average do not have better service than the highly urbanized Bell Atlantic service region as this simple comparison might indicate (it is much more complicated than this). Many rural communities, for instance, still have old mechanical central offices and party lines while no major urban area still does. Overall it can be concluded, however, that the universal service policy has helped many rural communities afford relatively modern telecommunication systems.

The FCC Adopts the Joint Board Recommendations

The FCC adopted nearly all of the Federal-State Joint Board's November 1996 recommendations. For rural households, this means that a full range of telephone services will be covered in the universal service program. States still determine the phone rates. The funding mechanism has not yet been determined, but is expected to take effect on January 1, 1999. States may either adopt a funding mechanism that the FCC has determined or establish their own based on State cost studies.

The new funding method will be designed to have a neutral effect on telecommunication service providers. For example, under the old funding system, some telephone companies were not eligible to receive universal service funds, so they had an incentive to sell off high-cost regions of their service areas to companies eligible to receive the funds. Hence, the cost of the service was transferred to some extent from the phone company and the State to the Federal Government. The new Federal funding method, however, does not affect current

intrastate mechanisms for the delivery of universal service. Believing that economic forces will compel States to adopt explicit intrastate support for universal service that is consistent with the 1996 Act, the FCC will make no attempt to convert intrastate support into the Federal program.

Provisions concerning school, library, and health care providers are crucial to rural communities. Eligible public and private elementary and secondary schools as well as libraries will be able to buy any telecommunication service, including the Internet, at a discount. Discounts range from 20 to 90 percent of the provider's rate, based on need and high-cost factors. Universal support expenditures for schools and libraries are capped at \$2.25 billion per year, though unspent funds can be carried forward to subsequent years.

The \$2.25-billion universal support package would average \$21,000 per school if all schools were eligible. It would be no more than \$19,000 if all libraries were included. Only schools and libraries in high-cost delivery or poor areas are eligible for a 90-percent discount. The FCC determined that all nonmetropolitan counties (as defined by the Office of Management and Budget) qualify as high-cost areas. Also, rural areas in metropolitan counties are considered high-cost areas.

Universal support funds can be used to hook up schools and libraries to the telecommunication network, including the Internet. According to QED, a private consulting firm, 64 percent of schools were hooked up to the Internet in March 1997. The rate varied considerably across the States, ranging from 100 percent of schools in Delaware, Hawaii, Nebraska, New Mexico, and South Carolina to less than 15 percent for California, Illinois, Oklahoma, and Texas. More recent information, though, indicates States like Texas have been rapidly hooking up more schools. The percent of classrooms, however, is much lower than the 64 percent rate would indicate. Funding support from the universal service fund covers installation of services within eligible schools. Computers, software, training, and maintenance are not supported, and these additional resources constitute over 80 percent of the cost of connecting schools to the Internet, according to the FCC.

The Joint Board estimated that 9,600 health care providers would be eligible to receive telecommunication services supported by the universal service mechanism. All health care providers that serve rural residents are eligible. Total support is capped at \$400 million per year. Health care providers include teaching hospitals, medical schools, various health centers, other hospitals, and health departments.

Conclusion

The new Telecommunications Act was enacted in 1996. The Act was the first comprehensive rewrite of the Communications Act of 1934, which had ushered in an era of universal phone service for rural areas. The 1996 Act's provisions fall into five major areas: telephone service, telecommunications equipment manufacturing, cable television, radio and television broadcasting, and the Internet and on-line computer services. All these categories will affect rural areas, but the issue of universal service is the most critical. The 1934 Act's universal service provisions largely succeeded in making phone service affordable in even the most remote locations.

The universal service provisions of the 1996 Act ensure that quality telecommunication and information services are available at reasonable rates for people in all regions of the country. The regulations coming about as a result of the Act are meant to address this in a manner that is efficient for the national economy, while recognizing the rapid ongoing improvements in telecommunication services. The provisions also provide for advanced telecommunication services to rural educational facilities, health care providers, and libraries. Without the provisions, rural areas may rapidly fall behind urban areas in our increasingly competitive economy.

For Further Reading . . .

Robert M. Entman, "Introduction" in *Universal Telephone Service: Ready for the 21st Century?*, Queenstown, MD: Institute for Information Studies, 1991.

David Kaserman, John W. Mayo, and Joseph E. Flynn "Cross-Subsidization in Telecommunications: Beyond the Universal Service Fairy Tale," *Journal of Regulatory Economics*, Vol. 2, No. 3, 1990, pp. 231-49.

B. Edwin Parker and Heather E. Hudson, *Electronic Byways: State Policies for Rural Development Through Telecommunications*, Boulder, CO: West View Press, 1992.

Harvey M. Sapolsky, Rhonda J. Crane, W. Russell Neuman, and Eli Noam, editors, *The Telecommunications Revolution: Past, Present and Future*, London: Routledge, 1992.

U.S. Department of Commerce, *Falling Through the Net: A Survey of the "Have Nots" in Rural and Urban America*, Washington: GPO, July 1995.

Montana Adapts to the Telecommunication Act of 1996

Montana is one of the most rural States in the country and has the third smallest population. As a consequence of the State's vast distances and many mountainous regions, telecommunication networks are costly to install and maintain. Yet, in order to compete in today's markets, rural firms must either keep up with technological change or cease to exist. The Telecommunications Act of 1996 addresses the growing need for interconnection between rural and urban areas.

The Montana Public Services Commission (PSC) believes that the areas of legislation that will provide the greatest changes are universal service and the introduction of a competitive local phone service. The Act will also affect the regulatory power of the PSC. Previously, the PSC had no jurisdiction over wireless and cooperatively owned local phone companies. Recently, the Montana legislature gave the PSC jurisdiction over resellers, arbitrations, and interconnections. With the telecommunications field growing, the PSC is devoting two full-time employees and an attorney solely to telecommunications and telecommunication legislation.

Many Montanans are concerned with the changes in the pricing structure and the overall support mechanism that the Act will bring during the next few years. The Montana Telephone Association, an association of local phone companies, feels that small businesses are getting pushed aside during the considerations by the FCC until standards for large businesses can be set. The standards for the large companies, they fear, may be too harsh for smaller businesses to handle. By not allowing second-line (multiple phone lines) exemptions (used by the majority of schools and small businesses), the basic rates for these services could triple. The Association believes that even with the proposed 50 percent discount, both schools and small businesses will be worse off in the long run. Ironically, it is precisely the schools and small businesses that the Act sets out to help through universal service.

Funding has been allotted for schools and other centers where access to the Internet and other resources can be made public. The FCC regulations allow for all schools and health centers that hook up to the Internet to be funded through the universal service provision. Problems may arise, however, according to the Association, from using the universal service for purposes beyond the fund's original intent to ensure basic telecommunications infrastructure capable of supporting advanced equipment and services at reasonable prices to rural and urban areas.

Although access to adequate financing for telecommunications-related equipment and services should be available, the Montana Telephone Association (MTA) feels that the funding should not be the responsibility of universal service. Also, in allowing exemptions for small telephone companies but none for the bigger Bell companies, the incentive for the Bell companies to continue providing high-cost services to rural areas decreases. This could be particularly harmful to such rural States as Montana whose Bell company, in this case US West, is responsible for 57 percent of the telecommunications coverage. US West may have been given further economic incentive to disinvest. The solution to providing schools and health centers with the basic supportive telecommunications infrastructure, Internet access, and more advanced equipment and services, MTA argues, is found in government and private money instead.

Montana educational and health centers are succeeding through government and private funding. The Burns Telecommunications Center and Virtual Medical Center receive financial support from Montana State University, the Federal Government, private contributions, and earned revenues, such as tuition. The Burns Telecommunications Center concentrates on distance learning projects that transmit the educational curriculum from the university throughout the State, to other States, and even internationally via two-way interactive video and the Internet. The Virtual Medical Center allows rural health care workers to access medical information without having to travel long distances. Both centers are hindered by rural Montana's limited telecommunication infrastructure.

Industrial Uses of Agricultural Products Such as Crambe Play a Role in Rural Community Development

Growing public concern about pollution and the environment has sparked interest in industrial uses of agricultural products. Industrial uses of these products can provide farmers with new market opportunities. Expanding industrial demand for farm products may boost farm income and can restore economic opportunity in rural communities by attracting value-added industries. For example, increased crambe production and the construction of a new oilseed processing plant may bring employment and income growth to rural North Dakota.

Agriculture is most often associated with food production, but many agricultural products can also be used as inputs into the manufacture of industrial products and consumer goods. Nonfood and nonfeed applications of agricultural products include printing inks made from soybeans and biodegradable plastics made from corn starch. New industrial crops, hereafter referred to as new crops, are those not traditionally grown in the United States and include crambe, an oilseed crop used in the manufacture of plastic bags and transmission fluid; jojoba, a perennial crop native to Arizona, California, and Mexico, used mostly by the cosmetics industry; and kenaf, an annual fiber crop used to make pulp and paper products.

Over the past century, interest in developing new crops and new ways to use traditional crops has intensified. Finding substitutes for commodities currently in use can cut U.S. dependence on foreign imports, replace critical materials in short supply during wartime, and replace products that harm the environment with environmentally sound ones. Technological advances have expanded the ability to derive new, innovative products from raw materials.

One of the issues facing the development and commercialization of industrial crops and products is competition with less expensive petroleum-based products.

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Petroleum-based products are almost always less expensive than agricultural products, but their market price may not completely reflect their true cost to society. Air pollution from fossil fuels, and the increasing cost to dispose of nondegradable products, are not captured in the price of the goods. On the other hand, agricultural products, which are renewable, offer nonmonetary benefits to society that are often undervalued. This type of market failure justifies a further look into the benefits of industrial uses of agriculture.

Research on Industrial Crops Reveals Potential Benefits to Producers, Society

The development, commercialization, and adoption of new crops can provide more planting alternatives to farmers, increase commodity prices and farm income, and lead to local employment and income growth. Most studies of industrial crops and products conclude that these benefits are currently small, but the impact may be larger if the returns from production of new crops approximate those of traditional crops, or if manufacturers substitute agricultural commodities for traditional inputs. Finally, the addition of new crops to the farmers' rotation can minimize the risk of adverse weather conditions and uncertain markets.

Proponents of new crops also tout environmental benefits, such as the development of crops that are better suited to certain environments. For example, guayule, a desert-adapted shrub containing natural rubber, and jojoba are both drought-tolerant and could reduce the amount of

irrigation needed in production. This is particularly important to the Southwest and Plains States, where competing demands for water use are of growing concern (OTA, 1991; USDA, 1992). Some new crops also fit well in rotation with traditional crops, such as industrial rapeseed in rotation with corn and soybeans, which can minimize soil erosion and naturally control weeds and pests.

Environmental benefits may also be realized from industrial uses of traditional crops. Alternative fuel use, such as ethanol and biodiesel (a diesel-type fuel made from oils extracted from animal fats or from oilseeds and plants), offers air quality advantages over fossil fuels. In addition, the use of biodegradable plastics made from corn starch could alleviate waste disposal problems. However, these benefits may be outweighed by the environmental costs of increased crop production and new manufacturing processes.

Industrial crops and products may substitute for goods currently imported, potentially adding \$15-\$20 billion to U.S. farm income (USDA, 1992). In addition, high-value industrial exports could replace some low-value bulk commodity exports (OTA, 1991). Finally, industrial crops and products can reduce the Nation's reliance on foreign supply of strategic and essential materials, such as petroleum and natural rubber (OTA, 1991; USDA, 1992). These domestic substitutes include alternative fuels and starch-based materials in plastics production, and guayule as a source of natural rubber.

Industrial Crops and Products Could Have Greatest Impact on Rural America

Despite the potential benefits of industrial crops and products for society, they may bring about only marginal changes in farm income and agricultural output at the national level, particularly in the early stages of crop production. However, there may be greater impacts at the local level and in rural communities.

The development and commercialization of new industrial crops and uses for traditional crops can affect rural economies in several ways. First, farm income could rise as a result of new crop opportunities and/or increased demand for existing crops. Second, if farm production increases, the level of inputs, transportation, and storage will also increase. Jobs in farm-related industries, such as in the processing of raw commodities and the production of new products, could be created. Finally, rural employment may also rise because of the multiplier effects of enhanced farm income, increased demand for agricultural inputs, and the establishment or expansion of processing and manufacturing facilities that use agricultural commodities.

The benefits to rural communities from the development or enhancement of industrial crops and products depend

in part on the industrial mix of the community. Rural areas with a large agricultural base are likely to experience a greater impact due to changes in farm employment, income, and land value than are rural areas that specialize in nonagricultural activities (OTA, 1991). Approximately 24 percent of all nonmetropolitan counties are classified by ERS as farming-dependent, deriving at least 20 percent of their total labor and proprietor income from farming. These counties are primarily concentrated in the Great Plains, spanning North Dakota to the Texas Panhandle, and may best accommodate industrial crops and products development.

However, even when nonmetro areas show potential for success in the development of industrial crops and products, not all of the potential income and job benefits will be realized. For instance, expansion in agricultural production is often attributed to technological change and increased productivity, and does not always translate into more jobs on the farm. Therefore, even when more crops are produced, because industrial uses have caused an increased demand for traditional crops or if farmers begin growing new crops, employment in farm production will not necessarily rise. And, when gains from the expansion of industrial crops and products are realized, the higher valued benefits may not all be captured on site. A firm's location decision is based on a region's resource base, transportation costs of the raw commodity relative to the processed product, and the availability of skilled labor. Rural areas generally have an advantage over urban areas in availability of natural resources, lower tax rates, and less expensive land and labor costs. However, some commodity processing plants, particularly for those crops that cost less to transport and store, are located in metro areas. And some industries targeted as potential users of new agro-industrial commodities, such as the chemical and rubber industries, are also located in metro regions because they rely on highly skilled labor and technicians. In these situations, metro areas may receive more benefits from industrial crops and products than nonmetro areas (OTA).

If the development of new industrial crops is to be used as a rural development growth strategy, it may be useful to develop criteria for which new crops or enhancement of traditional crops for industrial uses would likely cause the greatest net gain for a region. A new crop should provide some benefit to farmers in the region by fitting into a crop rotation, having the ability to be grown on otherwise unproductive land, or replacing a lower valued crop. Ideally, the region should also capture some of the forward linkages of the new agricultural products, such as processing and marketing. Below is a case study that illustrates how a rural area is affected by the creation or enhancement of industrial crops and products.

An Increase in Crambe Production and Processing Boosts Income in Rural North Dakota

Crambe is an annual oilseed crop first introduced in the United States in 1940. Sustained commercial production began in 1990 in central North Dakota. The crop is grown for its inedible oil, which contains high amounts of erucic acid, a 22-carbon fatty acid. Erucic acid is used to make intermediate chemicals, such as slip and antiblock agents, emollients, and surfactants, that are used in the manufacture of such items as plastic bags, cosmetics, personal care products, and laundry detergents (Glaser, 1996). Crambe oil could potentially be used in paints and coatings, nylon-1313, plastics, and hard waxes (USDA, 1993).

Industrial rapeseed is the traditional source of erucic acid for the world market, but in the United States, crambe has begun to tap into this market. Industrial rapeseed and crambe are the only commercial sources of erucic acid (Glaser). The United States currently imports about 40 million pounds of rapeseed oil, primarily from Canada and Eastern Europe, worth about \$10 million annually. A small amount of rapeseed is also grown in the Pacific Northwest. It is estimated that an increase in domestic production of crambe from 22,000 acres in 1996 to about 50,000 acres would replace rapeseed oil imports (USDA, 1993).

The American Renewable Oil Association, an association of crambe growers, contracted with 435 producers to grow crambe on 50,000 acres in 1997, an increase of 28,000 acres from the previous year. The number of acres contracted is the estimated amount required to meet the domestic demand for crambe oil. All of the acreage is in North Dakota, with much of the production concentrated in the center of the State. In addition to crambe production, AgGrow Oils, a grower-owned company, has begun construction of an \$8-million oilseed crushing plant in Foster County. The plant is a full-press, mechanical processing facility and is scheduled to begin operation in November 1997, processing this year's crambe crop. John Gardner, an agronomist at AgGrow Oils, estimates production at 200 tons of seed per day at startup. The plant will process other novel oilseeds, such as high-oleic sunflower and safflower, flax, and possibly specialty canolas, as well as crambe. AgGrow Oils plans to double the plant's capacity in 1998 and expects to process 250,000 acres of oilseed crops from North Dakota. The firm also anticipates adding a refining system to the plant in subsequent years.

To analyze the regional effects of crambe production and processing, a study area of 15 nonmetro counties was defined. The study area encompasses the major crambe-growing areas and the related oilseed crushing plant (fig. 1). Total population in the region is 149,700, with income of \$40,382 per household (table 1). Nearly 24 percent of the 86,538 jobs are in the services sector, the region's largest employer. Although agricultural employment

makes up only 15 percent of regional employment, 8 out of the 15 counties are considered farming-dependent. The region produces 11 percent of the Nation's barley crop and more than 26 percent of all sunflower seeds (table 2).

The effects of crambe production and its related enterprises on the overall economy of the central North Dakota study area are estimated using a regional input-output model. An input-output model was chosen for its ability to estimate the importance of agriculture to a region by estimating regional multipliers (see box "What is Input-Output Analysis?").

The value of the 1997 crambe crop was estimated at \$6.1 million, up \$2.5 million from the 1996 crop-year value of \$3.6 million (see box "Estimating the Value of Crambe Production and Processing" for details on estimating this year's yield and price). The difference of \$2.5 million was used to estimate the economic impacts of the expansion of crambe production on the North Dakota study area (table 3). The growth in crambe output alone translates into direct economic impacts of \$1.2 million value-added and the creation of 29 new wage and salary jobs. Value-added, which includes employee compensation, proprietary income, and indirect business taxes, is a measure of the value of goods and services produced by the crambe growers. When indirect and induced effects are calculated and added on to direct effects, the total economic impacts of increased crambe production are \$3.6 million in total sales, \$1.8 million in value-added, and 48 new jobs.

Table 1
Economic characteristics of North Dakota study region
Nearly 24 percent of all jobs in the 15-county North Dakota study region are in the services sector

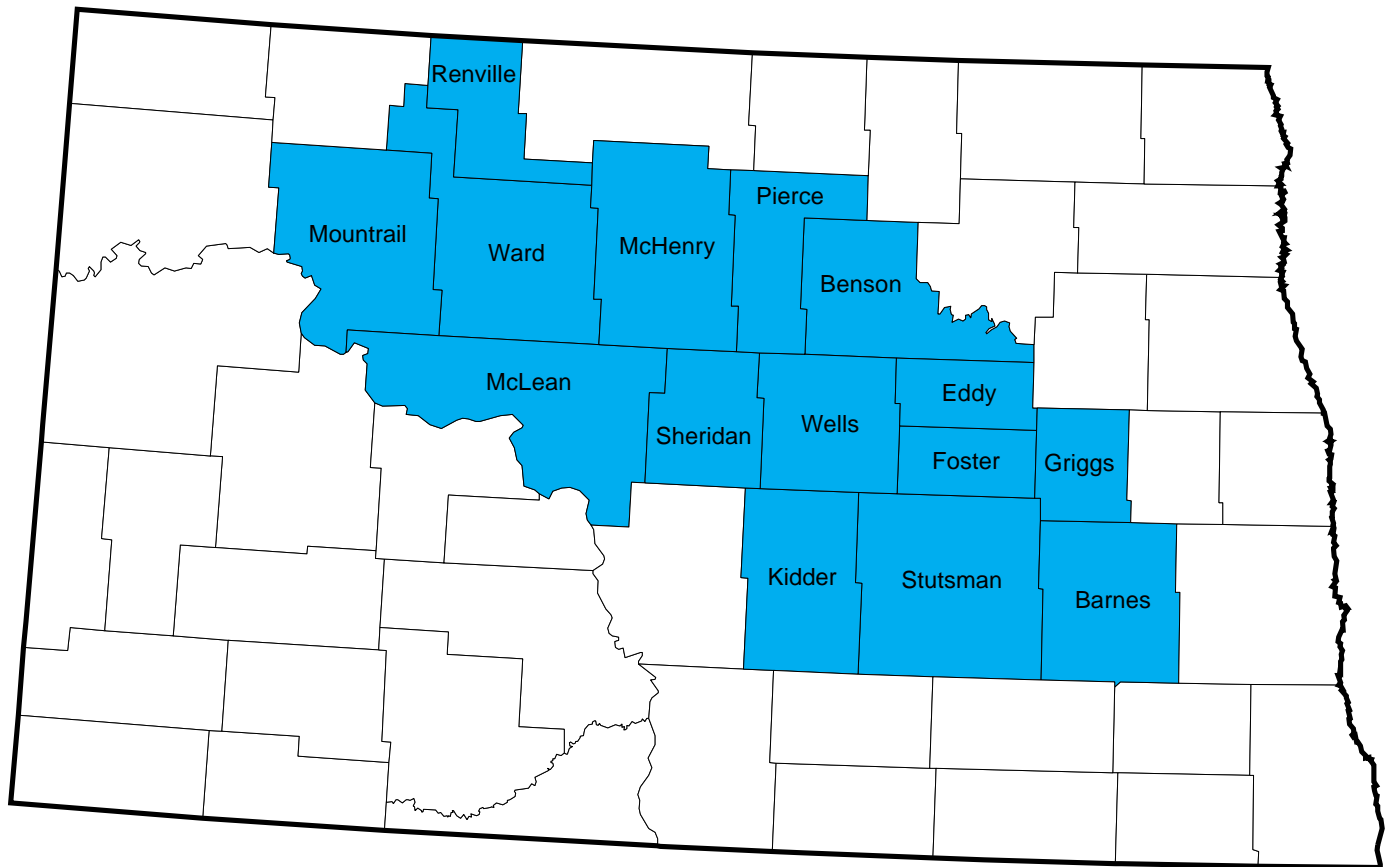
Item	Number
Population	149,700
Income per household (dollars) ¹	40,382
Total employment:	86,538
Agriculture	12,893
Mining	446
Construction	4,287
Manufacturing	3,414
Transportation, communication, and public utilities	4,048
Trade	17,929
Finance, insurance, and real estate	3,822
Services	20,741
Government services	18,636

¹Includes noncash benefits.
Source: Minnesota IMPLAN Group.

Figure 1

North Dakota study region

Most of the crambe production is concentrated in this 15-county region



Source: Economic Research Service, USDA.

What is Input-Output Analysis?

Input-output provides a framework in which to collect, categorize, and analyze data on the interindustry structure and interdependencies of a region's economy. Input-output models estimate the direct, indirect, and induced impacts from a final demand change on a region. In this case study, the direct effects are the sales, employment, and value added generated directly by crambe production and the construction and operation of an oilseed processing plant in Foster County, North Dakota. Indirect impacts are the sales, employment, and value added that result from other firms in the local economy selling to the crambe enterprises, such as the agricultural input industries, agricultural services, and wholesalers. Induced effects or impacts are the sales, employment, and value added generated from the earnings of the workers in the newly created jobs as they are spent in the North Dakota study region.

The input-output model used in this analysis is called IMPLAN (Input-Output Model for Planning and Analysis). The 1993 IMPLAN Pro version was used to estimate economic impacts in this report. The model provides for county-level analysis from 528 industry sectors, similar in detail to the 3-digit SIC level for most industries. The ability to assess a change in the overall economic activity of a region as a result of some change in one or several economic activities is the appeal of using a model like IMPLAN.

Using the \$2.5-million figure implicitly assumes that the planting of crambe on 28,000 additional acres in 1997 was on unproductive land, which may overestimate crambe's value to the North Dakota study region by not accounting for the opportunity costs associated with growing crambe. However, the per-acre return from crambe production of

\$83.04 far exceeds that of other crops grown in the region (table 4). By comparison, an increase in canola production by 28,000 acres would generate only \$1.8 million in additional sales, \$900,000 in total value-added, and 24 jobs, including induced and indirect effects. These impacts from canola are roughly half the size of those from

Table 2

Agriculture of the North Dakota study region

The study region produces over 26 percent of U.S. sunflower seeds

Item	Regional value	Share of national total
	1,000 acres	Percent
Acreage:		
Land in farms	11,462	1.2
Total cropland	8,837	2.0
Harvested cropland	6,062	2.1
Irrigated land	37	0.1
	\$1,000	
Value:		
Agricultural production	715,074	0.4
Crops sold	523,719	0.7
Livestock sold	191,326	0.2
	1,000 bushels	
Production:		
Barley	43,259	10.9
Corn	2,739	**
Wheat	126,631	5.7
Oats	10,676	4.3
	1,000 tons	
Hay	992	0.8
	1,000 pounds	
Sunflower	589,288	26.3

**=Less than 0.1 percent.

Source: 1992 Census of Agriculture.

crambe production (table 3). Therefore, the *net* gain from crambe in this case may be viewed as the difference between the region's impact from increased crambe production and the region's impact from increased production of canola, the next best alternative crop. The difference would be even greater if crambe were substituted for crops less profitable than canola. Aside from the outstanding profitability of crambe, the grower also benefits by having another crop to put into the crop rotation, a benefit that is not captured in this analysis.

A similar impact analysis was performed on the oilseed processing plant (table 5). Of the \$8 million outlay for the plant, \$3.5 million is to be spent on processing machinery, \$4 million on construction materials and labor, and \$0.5 million on engineering and technical services. The total output effect is estimated at over \$10 million and 86 full- and part-time jobs. Because building the plant is a one-time shock to the region, these effects are not expected to be permanent.

The last phase of the crambe analysis is to examine the impacts associated with the oilseed crushing plant (table 6). In the first year of operation, the plant will process the 1997 crambe crop, which is estimated to be nearly 60.1

Estimating the Value of Crambe Production and Processing

The first task in estimating the impacts of crambe on the North Dakota study region was to estimate the size of the crop, its value to the growers, and the value of the processed oil and meal. First, assume that 90 percent of the 50,000 contracted acres in 1997 will be harvested, that is, a 10-percent loss due to hazardous weather conditions, which leaves 45,000 harvested acres. Multiplying 45,000 by the estimated average yield of 1,350 pounds per acre results in a total crambe crop of 60.75 million pounds. Given the contracted price of 10.1 cents per hundred-weight, the value of the crambe crop is estimated to be \$6.136 million.

To estimate the value of production at the processing plant, industry sources suggest an 82.6-percent recovery rate for crambe oil and a 98-percent recovery rate for the meal at a mechanical processing plant. Crambe seeds contain 35-percent oil; therefore, there are 21.26 million pounds of oil in 60.75 million pounds of crambe. However, only an estimated 82.6 percent, or 17.56 million pounds of oil, is recovered. Subtracting the pounds of extracted oil from the total amount of crambe yields 43.19 million pounds of crambe meal. Using the estimated 98 percent recovery rate, the output of crambe meal is about 42.32 million pounds. The total loss rate for crambe processing at this plant is anticipated to be 1.4 percent.

Prices for crambe oil and meal are not available, so price ranges of 28 to 35 cents per pound of oil and \$75 to \$100 per ton of meal are used as best estimates, based on industry analysts' forecasts of supply and demand of crambe and industrial rapeseed. Crambe oil competes with industrial (high-erucic acid) rapeseed oil in national and international markets. If supplies are adequate, prices may be in the low end of the range. However, if supplies tighten, prices may rise to the upper end of the range. The price of crambe meal is probably about one-third the price of soybean meal. Crambe meal can be fed only in limited quantities to beef cattle, per FDA regulation, and feed formulators may not be familiar with it, but the residual oil in meal gives it a higher value than it would from solvent extraction. Given the volumes cited above, the value of the crambe oil is estimated at \$4.9 to \$6.1 million and the meal at \$1.6 to \$2.1 million. The total value of the two products is \$6.5 to \$8.3 million.

million pounds. The value of production from the plant is difficult to determine because prices for crambe oil and meal are proprietary. Direct sales are estimated at \$7.4 million (see box "Estimating the Value of Crambe Production and Processing"). Including indirect and induced effects, the total value-added from crambe processing is estimated at \$2.2 million, with a possible increase of 40 new jobs.

The combined direct effect from crambe production, the construction of the processing plant, and the crushing of

Table 3

Economic impacts of expanded crambe and canola production, 1997-98*The 28,000 gain in acres planted of crambe translates into a value-added increase of \$1.8 million to the region*

Impacts	Crambe production			Canola production		
	Sales	Value added	Number of jobs	Sales	Value added	Number of jobs
	- - - -Million dollars- - - -			- - - -Million dollars- - - -		
Direct	2.5	1.2	29	1.2	0.6	14
Indirect and induced	1.1	0.6	19	0.6	0.3	10
Total	3.6	1.8	48	1.8	0.9	24

Source: Generated by USDA's Economic Research Service using IMPLAN-Pro.

Table 4

Profitability of selected crops in North Central North Dakota*Crambe exceeds all other major crops in North Central North Dakota in profitability*

Crop	Returns to land, labor, and management
	Dollars per acre
Crambe	83.04
Canola	44.21
Alfalfa (established)	42.94
Buckwheat	41.16
Sunflower (confectionary)	39.61
Winter wheat	31.12
Barley	15.51
Sunflower (oil)	11.93
Oats	(6.99)

Source: North Dakota State University Extension Service, 1997.

Table 5

Economic impacts of constructing a new oilseed crushing plant, 1997-98*Although the impacts from the plant construction will be temporary, the region will gain \$3 million in value added*

Impacts	Sales	Value added	Number of jobs
	- - - -Million dollars- - - -		
Direct	8.0	1.7	46
Indirect and induced	2.2	1.3	40
Total	10.2	3.0	86

Source: Generated by USDA's Economic Research Service using IMPLAN-Pro.

Table 6

Economic impacts of new plant operation, 1997-98*During the first year of operation, the new oilseed crushing plant will be responsible for the creation of 35 to 45 new jobs*

Impacts	Sales	Value added	Number of jobs
	- - - -Million dollars- - - -		
Direct	7.4	1.2	13
Indirect and induced	1.7	1.0	27
Total	9.1	2.2	40

Source: Generated by USDA's Economic Research Service using IMPLAN-Pro.

Table 7

Combined economic impacts of crambe production and plant construction and operation, 1997-98*Nearly \$7 million in value added will be generated by the expansion of crambe production, oilseed crushing plant construction, and the sale of the crambe oil and meal in 1997*

Impacts	Sales	Value added	Number of jobs
	- - - -Million dollars- - - -		
Direct	17.9	4.1	88
Indirect and induced	5.0	2.9	86
Total	22.9	7.0	174

Source: Generated by USDA's Economic Research Service using IMPLAN-Pro.

Table 8

Combined employment impacts of crambe enterprises, 1997-98*Most of the new jobs created are in agriculture*

Category	Direct job impact		Indirect and induced job impact		Total job impact	
	Number	Percent	Number	Percent	Number	Percent
Agriculture	29	33	3	4	32	18
Mining	0	0	0	0	0	0
Construction	36	41	2	2	38	22
Manufacturing	13	15	3	4	16	9
TCPU ¹	0	0	8	9	8	5
Trade	0	0	30	35	30	17
FIRE ²	0	0	9	10	9	5
Services	10	11	30	36	41	24
Government services	0	0	1	0	0	0
Total	88	100	86	100	174	100

¹Transportation, communications, and public utilities.²Finance, insurance, and real estate.

Source: Generated by USDA's Economic Research Service using IMPLAN-Pro.

the 1997 crambe crop is estimated at \$17.9 million and 88 new jobs in the North Dakota study region (table 7). Indirect and induced effects bring the total to nearly \$23 million in total output and 174 new jobs.

Job gains are disaggregated into nine major economic sectors (table 8). Direct job impacts occur in the agriculture, construction, manufacturing, and services sectors. Indirect and induced effects allow for job gains mainly in the trade and services sectors. Most of the new trade jobs are in wholesale trade and eating and drinking establishments, while hospitals accounted for most of the new service jobs. Of total jobs created, 24 percent are in services and 22 percent are in construction.

The employment and income impacts from crambe production will be sustainable for the North Dakota study region if the demand for crambe does not fluctuate significantly. Industry sources estimate that about 50,000 acres of crambe production will be able to supply market clearing levels of crambe oil. In addition to the employment and income growth estimated in this study, expansion of the processing plant in Foster County is anticipated. Once the plant reaches full-scale operation, employment in this higher valued industry will likely increase.

Conclusion

The development of new industrial crops may result in modest rural employment growth in agriculturally related industries. Choosing new crops that can attract related industries to a region, such as oilseed crushing, is key to using agro-industrial demand as a tool for rural development.

The results of this study demonstrate the importance of crambe to a farming-dependent region of North Dakota. A full 42 wage and salary jobs were added to this area as a

direct result of the increase in the production and processing of crambe. Through local purchases of supplies and the spending of crambe-related income, the industry generates another 46 wage and salary jobs. The region will enjoy the added benefit of the construction activity while the plant is being built, temporarily adding 46 new positions and generating another 40 jobs in related industries and in other industries as the new workers spend their wages.

The crambe case study also underscores the importance of value-added industries to the economy. These higher wage jobs provide opportunities for nonmetro residents, thereby retaining population in rural areas.

For Further Reading . . .

Lewrene K. Glaser, "Crambe: An Economic Assessment of the Feasibility of Providing Multiple-Peril Crop Insurance," USDA-ERS, November 1996.

U.S. Congress, Office of Technology Assessment (OTA), "Agricultural Commodities as Industrial Raw Materials," OTA-F-476, May 1991.

U.S. Department of Agriculture, *1992 Yearbook of Agriculture: New Crops, New Uses, New Markets*, 1992.

U.S. Department of Agriculture, Cooperative State Research Service, "New Industrial Uses, New Markets for U.S. Crops: Status of Technology and Commercial Adoption," prepared by Jonathan Harsch, August 1993.

Donald L. Van Dyne, Melvin G. Blase, and Kenneth D. Carlson, "Industrial Feedstocks and Products from High Erucic Acid Oil: Crambe and Industrial Rapeseed," University of Missouri-Columbia, March 1990.

Sustaining A Rural Black Farming Community in the South

A Portrait of Brooks Farm, Mississippi

The rural South has long been, for Blacks especially, a place characterized by declining agricultural opportunities, diminishing numbers of land owners, limited education and employment, few government services, continuous outmigration, and persistent poverty for many who remain. Nevertheless, not all communities suffering from these conditions have abandoned hope. Some have drawn on the strength of their own traditional institutions to sustain and even rebuild community life. Members of the Brooks Farm community, in the face of declining population and resources, have continued to provide services from within the community. At the same time, they have learned new ways to organize to secure services the community cannot provide for itself.

Blacks have a long history of struggle and survival. To cope, Blacks have developed, in the words of Cornel West, “cultural structures of meaning and feeling that created and sustained communities . . . ways of life and struggle that embodied values of service and sacrifice, love, and care, discipline and excellence” (p. 15). In Brooks Farm, a Black farming community in the Mississippi Delta, those “cultural structures” and “ways of life and struggle” have translated into the leadership and community commitment identified by sociologists and rural development professionals as critical to building sustainable communities. Out of the traditional institutions of the Brooks Farm community—families, churches, schools, civic organizations, and small businesses—has come a variety of grass-roots strategies for supporting individual and community well-being.

Based primarily on a series of oral interviews with current and former residents of Brooks Farm (see box for discussion of data sources), this article describes some of the

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ways in which the strength of these institutions has helped the community face change. Although these institutions have themselves changed over time, they continue to define the community’s approach to providing its members with the resources and support they need to cope with such challenges as the decline of agricultural employment, outmigration, and a changing family structure in Brooks Farm and surrounding communities.

Origins of the Brooks Farm Community Are Unique

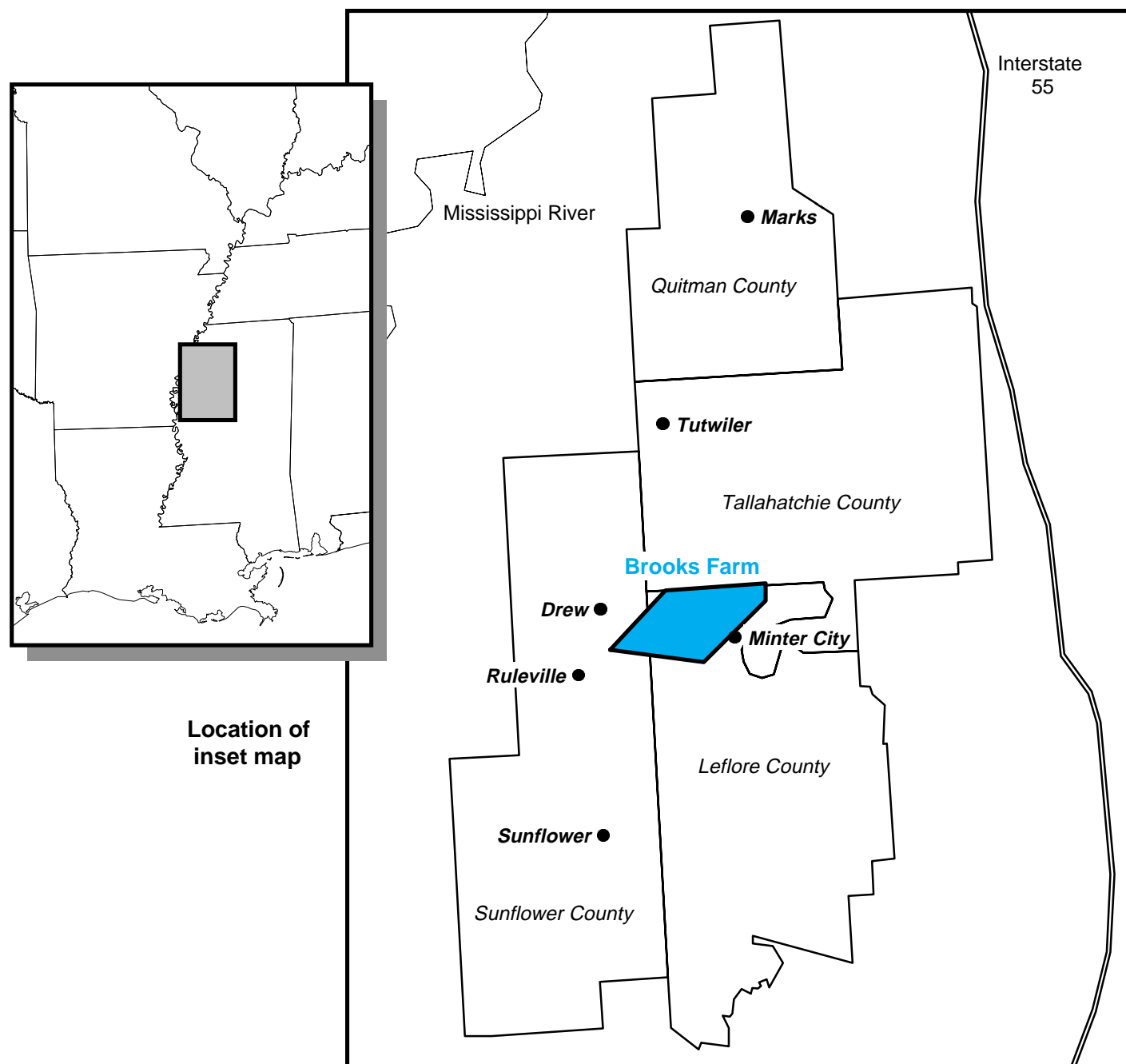
Brooks Farm is a Black rural community located in the Yazoo-Mississippi Delta in Sunflower County, Mississippi, near the small town of Drew (fig. 1). Brooks Farm’s origins and development as an independent Black farming community are unique in the Delta. Begun as a White-owned plantation in the 1920’s, its founder, Palmer H. Brooks, intended from the beginning to build the plantation into a community of independent Black farmers. The original settlers, about 60 Black families, worked as day laborers or tenant farmers on the land or as skilled craftsmen in the plantation businesses owned by Brooks and other investors. The first 10 families became landowners in 1945 with the purchase of 40- to 80-acre farms.

More farm purchases followed in the next few decades, while other Black residents eventually established independent businesses such as cotton gins, mills, wholesale

Figure 1

Location of Brooks Farm community

The Brooks Farm community encompasses 4,000 acres of farmland in the Yazoo-Mississippi Delta region of Mississippi



Source: Economic Research Service, USDA.

supply operations, and lodging houses. Thus, Brooks Farm, surrounded by hundreds of White-owned plantations, developed as an independent community of Blacks in control of their own economic and social development. The more common pattern of Black settlement, either widely dispersed as sharecroppers on White-owned land,

or concentrated in segregated neighborhoods within larger mixed-race towns working for White employers, did not lead to the kind of community self-direction experienced in Brooks Farm.

Brooks Farm Developed Strong Institutions During Its Early Years

While the origins of Brooks Farm's institutions are unique, its institutions themselves—the family, schools and churches, and civic groups—are not. The same techniques of adaptation and survival have been used to sustain community in the Black sections of other Delta towns. With the migration of rural Blacks to urban neighborhoods, these same institutions have been central to efforts to sustain community in dramatically different settings. In Brooks Farm, as in other Black communities, these institutions together constructed a community of shared values and provided a safety net that supported community members in need.

During the 1950's and 1960's, the Brooks Farm community consisted of about 175 families. Nuclear families formed the core of the community. Most families were large, averaging eight children, close-knit, and generally economically self-sufficient, providing all the labor to meet their own household needs and to run their farming and other businesses.

Despite such self-sufficiency, however, family and community ties in the small community were closely intertwined. Kinship had an extended meaning in Brooks Farm, where the "kinship network" included not only nuclear and extended families, but also other community members. People in Brooks Farm expected each other, family or not, to contribute when the need arose. Family life, in turn, sustained this community ethic, by teaching children the values of cooperation, honesty, respect, trust, love, and hard work.

Families worked cooperatively as well, to build the institutions that drew the families of the community together. Founder P. H. Brooks built one school and one church when he established the community in 1923, but by 1947, Brooks Farm residents had added three schools and eight churches.

Both churches and schools explicitly encouraged community participation. Church teachings included civic responsibility, leadership, community development, and adult literacy. Specific lessons focused on community responsibility for road improvement and community beautification, as well as the importance of choosing effective spokespersons for the community. Schools emphasized basic instruction in reading, writing, and mathematics. Following the ideas of Booker T. Washington and others on teaching literacy and skills for economic independence to sustain self-sufficient, independent Black communities within the larger American society, the schools also taught practical work skills including homemaking, agriculture, trades, and household and mechanical repairs.

Brooks Farm families have invested to an unusually high degree in the higher education of their children, sending nearly 100 children to college over the years. The investment has paid off, literally, through the contributions of these children, many of whom have migrated to well-paid jobs in urban areas, to their own families, and to the local churches to support educational and social programs.

By the 1940's, Brooks Farm residents embraced such national fraternal orders as the Masons and Order of the Eastern Star, offering experiences in leadership and connections to other communities. Local clubs, the Brooks Farm Homemakers Club for women, the Farmers' Club for men, and the 4-H Club for children, also became important in the community around the same time. During the peak years of the community, 1940-60, the women's club averaged 120 members, the men's club about 75, and 4-H in the hundreds.

Brooks Farm Is Smaller and Less Dependent on Agriculture in the 1990's

As the structure of agriculture has changed in the last 50 years, so has the structure and landscape of Brooks Farm community. As elsewhere in the Delta, the number of farms, especially those owned by Blacks, has dramatically declined and those that remain are considerably larger than the 40 to 80 acres with which Brooks Farms' operators began. As opportunities for employment in cities have multiplied, and opportunities for employment on farms have shrunk in the face of modern agricultural technologies, large numbers of Delta residents, particularly Blacks, have migrated away from their home communities.

Outmigration from Brooks Farm has been the rule since the community's founding during the 1920's, when the first major Black northward migration was in full swing. However, during those early years, as some residents left, others arrived from nearby communities, usually within about a 60-mile radius. New arrivals were drawn to Brooks Farm by family connections and by the economic opportunity and social independence of the new community. Not until the 1960's did outmigration surpass immigration, beginning the population decline common to most Black communities in the South.

Outmigration has stressed Brooks Farm by enticing many of the skilled and likely leaders of the community to leave for urban centers. Nearly all of the community's college graduates have left for careers in other places. And as the population has declined, the community's ability to sustain or create economic opportunity for others who might wish to remain has been weakened.

The number of families in Brooks Farm has dwindled to 41, who now have smaller households, fewer than half (41 percent) are headed by a married couple. The average

number of children per family is still relatively high (3-5), but most of these children are grown and have left Brooks Farm. The majority of children still living in Brooks Farm reside in households headed by never-married single parents, who are the youngest group of household heads, ranging in age from 20 to 40. In contrast, married couples ranged in age from 21 to 80.

Of the 63 current adult residents of Brooks Farm, only 20 are employed. The remainder, primarily retired elderly and young single mothers, survive on a combination of pensions, personal savings and assets (including rental income from land, primarily to cover property taxes), and government transfer payments.

Only nine households continue to be supported primarily by farming. Of those nine, most grow cotton and soybeans, but about half have diversified their operations, adding vegetable, hog, and catfish production. Farm sizes range from 150 to 400 acres, consolidated both by purchase of farms from families no longer in the community and by rental of land from retired community members and from absent community members not willing to permanently part with family land. In some cases, these landowners plan to retire to their family land in Brooks Farm. About half of the full-time farmers in Brooks Farm have participated regularly in Federal farm programs since the 1960's.

Eleven other households are supported by a combination of part-time farming and off-farm jobs. Brooks Farm residents work in State government, the State prison, insurance sales, public school teaching, auto mechanics, welding, factories, seasonal day labor, and as self-employed business people in trucking, retail, and personal services.

Families with earned income, both farm and nonfarm, estimate their average annual incomes at around \$25,000, although farm income can vary dramatically from year to year. In the last few years, several of these families have had negative farm income and survived through savings, loans, and the assistance of absent family members. Those families receiving government income assistance payments, who may also do occasional part-time work or receive assistance from family members, estimate their average annual incomes at about \$5,000.

Educational levels varied among Brooks Farm households. Among the households headed by never-married women, fewer than half completed high school and none attended college. All had become mothers as teenagers. Of the households headed by never-married men, half did not finish high school and had only intermittent employment. The other never-married men had completed either high school or college and held full-time jobs. Among all households with earned income, 35 percent had complet-

ed college and an additional 9 percent had attended at least 2 years. An additional 35 percent had completed high school, and only 22 percent had 8 years of schooling or less.

Community Institutions, Though Fewer, Have Adapted to Change

As the community has faced economic and demographic change, the community's institutions have changed as well, adapting both to the reality of a smaller number of residents and to a demanding set of new challenges. Desegregation and consolidation have closed the schools in Brooks Farm, the number of churches has dwindled to two, and the only remaining civic organization is a much smaller women's club. At the same time, the large families available to meet each other's needs have disappeared with the outmigration that followed the decline of self-sufficient family farms. The current institutions of Brooks Farm, though fewer and smaller, have become more focused on providing the personal and economic support systems formerly provided by these extended families. These remaining institutions of Brooks Farm have also reoriented their vision of service to include a more explicit reaching out to nearby communities, sharing the strength of their surviving community with nonresidents who are in need of such support.

The Merry Grove and East Mount Olive Baptist churches and the Brooks Farm Women's Club continue to meet some of the same needs as they did in the past. The churches continue to advocate civic responsibility, leadership, and adult literacy. The women's club continues to emphasize dissemination of information on health care, food and nutrition, and child-rearing. Yet new social and economic conditions have brought all three groups together to support programs and services aimed primarily at the elderly, young children, teenagers, and the poor, whose needs the current family structure can no longer meet effectively.

Caring for the Elderly and Poor. The community of Brooks Farm has always looked after the elderly with its own resources. At one time a traditional family responsibility, the daily care of aging parents fell to others in the community as adult children began to migrate to cities. Most of the elderly cannot afford home care and even when they can, few home care workers want to drive into the countryside. In some instances, children of the elderly will hire someone in the community to look after their parents until they have recovered; in other cases young women in the community take on the responsibility themselves, communicating regularly with absent family members. These women make frequent visits to the homes of the elderly, perform domestic chores to make the elders comfortable, monitor their health, make arrangements to get them to the doctor when necessary, and make sure

their prescriptions are filled. When elderly residents have to be hospitalized, these young women visit and often stay overnight, then stay with the elderly patients in their homes after they are discharged. Women in the community rotate their schedules to assure continuous service for the elderly needing such attention.

Through the organized efforts of the women of the community churches, elderly community members also receive daily hot meals—"hot plates" filled with meat, vegetables, bread, and dessert and delivered to their homes. In the past, 25 to 30 elderly Brooks Farm residents received these meals. Today, only about 5 or 6 elderly women in Brooks Farm receive this service, still organized by the women of Brooks Farm's remaining churches. Now, however, these church women serve an additional 10 to 15 elderly women in nearby communities.

As members of a traditional farming community, the members of the Brooks Farm Women's Club often look to their own family operations to provide for the needy in their community. Many of these women and their families continue to tend large gardens and raise extra livestock to provide fresh produce and meat to the elderly and poor in Brooks Farm and surrounding communities. Club members deliver these items directly to the elderly, while inviting young families to the gardens to gather produce according to their needs.

Both Merry Grove and East Mount Olive churches also maintain food banks, from which church members deliver to the elderly and young single mothers in surrounding communities. Merry Grove hosts Sunday dinners to help feed the elderly and children from the nearby towns, whom they believe may not be eating properly, and support thrift shops and clothing banks that provide inexpensive used clothing for families with little income.

Caring for Young Children. Just as the community cares for its elderly members when they are in need, those older community members—retired parents, grandparents, and others—make themselves available to young mothers for child care. The lack of adequate, affordable day care continues to interfere with employment for many young mothers in the rural South. Although Brooks Farm is no longer home to many young children, parents from surrounding communities look to older Brooks Farm residents for such services. These elderly women may help support themselves by charging to care for children not of their own families, but the fees are low—usually \$25-\$50 per week.

The church also functions periodically as a babysitting facility, especially on weekends, although this practice was more common in the past when Brooks Farm had many more families. Children are brought to the church

on Saturday and the elderly women in the community, typically called the mothers, care for the children for much of the day, giving the parents some time away from child-care responsibilities.

Caring for Teenagers. Adults in the Brooks Farm community have become concerned about violence, drug use, gang participation, homicide, and theft by young Black men, which have risen to the highest level ever in the Delta. Community members believe these problems stem from unstable families, poor education, and lack of preparation for employment. To address these problems, men of Brooks Farm, especially those who are active in Merry Grove Baptist Church, have created a mentoring program. They identify young men from small Delta communities—Marks, Drew, Ruleville, Minter City, Tutwiler, and others—who have no fathers in their lives and who tend to get in trouble. Pairing themselves with two or more such preteen and teenage boys, the men offer support and guidance through discussions that focus on education, job preparation, morality, sex, disease, and fatherhood, as well as avoiding drug use and gang participation.

The pairs arrange activities—Saturday outings at the bowling lanes, basketball teams, picnics, and holiday dinners at the rural churches—as a way of placing the young men in a different environment, hoping to expose them to different modes of behavior. Monday nights are defined as the "spiritual" night when the pairs meet at church to engage in prayer, as well as an "open rap" about their feelings and situations that they confront daily. The men believe they are having some success, as the number of boys who want to be involved in the program continues to increase.

Teenage pregnancies in the Delta are also at their highest level ever. Members of the Brooks Farm community, in conjunction with members of the Merry Grove Missionary Baptist Church, have taken on the task of mentoring teenage mothers from surrounding communities to help them understand how to care for themselves and their children. Through the women's club, the girls are taught about proper food and nutrition, health care, child development, and nurturing skills.

Some of the club women are also concerned that girls continue their own education and learn to value education for their children. Book discussions with these teenage mothers have been added to the mentoring program, to encourage them to read so that they will encourage their children to read and value learning. Familiarly called the Women's Reading Group, the leaders of this group ultimately hope to show teenage mothers how to make the transition from public assistance to employment to provide for their children.

Two women of the Brooks Farm Women's Club have also invested in a domestic cleaning business. The idea is to build a clientele in the nearby community of Drew and establish a stable business that can offer jobs to teenagers. While the business is in its infancy, the women believe in its potential and are committed to making it work, in part as an example to young teenage mothers of how to create opportunities for themselves.

Supplementing the efforts of the community's churches and women's club, economically successful individuals and families in the community have made efforts, not always successful, to address the need for jobs for young people in nearby towns who face severely limited employment opportunities. Few factories hire teenagers. There are no fast food restaurants, malls or department stores, no gas stations or mechanic shops. The only place for most to find work is on the farms. Farmers from the Brooks Farm community try to offer day labor to young people in nearby towns. Most cannot pay more than minimum wage, but they also help the workers save money by providing their lunch. Although the farmers of Brooks Farm cannot hire a large number of people, they believe that providing employment to at least a few individuals has prevented some from being hungry.

Teenagers have yet to take advantage of offers to try their hand at farming on their own. Farmers are willing to let teenagers rent, at a very small fee, plots of land to raise produce which they can sell to individuals and grocers. The farmers are willing to spend the time teaching them how to plant, cultivate, harvest, and market their produce. The churches have agreed to allow their grounds to be used on Saturdays as a market place. The churches will help the teenagers fill orders and will participate in the delivery, as long as the young people are willing to work. Other farmers are willing to help young people invest in raising hogs for the market. They need the help, because most of their own children have migrated, and they have the desire to pass on the love of farming and working on the land. Much to the disappointment of these farmers, however, despite the opportunities for earning fairly good returns over a summer of farming, most teenagers from nearby towns have shown little interest in learning agriculture.

To bring jobs to Brooks Farm and surrounding communities on a larger scale than most Brooks Farm individuals or families can attempt, successful farmer Edward Scott built the first Black-owned catfish farm and processing plant. Reacting to employment discrimination against poor rural Blacks at local factories, Scott established his catfish operation as a way of helping to alleviate some of the economic devastation he saw among his rural neighbors. He has employed over 50 people, adults and teenagers, in his plant, and he continues to distribute fish nationwide.

Brooks Farm Organized to Secure Needed Government Service

Sustaining Brooks Farm has sometimes required learning how to secure outside support to help with needed improvements which are too expensive for individuals or community groups to provide. The traditional institutions of Brooks Farm, particularly the churches, have always emphasized the importance of community development and promoting effective leadership to ensure the community's success. As members of an unincorporated community, without its own government, Brooks Farm residents have found it necessary to approach their county government to obtain the infrastructure development they believe is necessary for the well-being of their community.

Brooks Farm residents joined with other nearby communities in a petition campaign for a public water system in 1994. The joint effort was crafted and led by Robert Lindsey, a former school principal and current member of the Leflore County Board of Education, who recognized both a widespread need in the area and the greater likelihood for success from a coordinated approach.

Members of the communities wrote letters and made phone calls to county government offices to request help in developing a public water system. The county government initially ignored the requests. Public protests, however, secured the cooperation of county government in certifying the need for such a system, allowing Lindsey and a group of community leaders to win a \$1.3-million grant from the U.S. Department of Agriculture (USDA) to install a rural water system. Community leaders employed the same methods to secure a sewer system and trash removal services, and they are currently working to secure improved road access for their community.

An earlier experience in organized community political action had brought the Head Start program to nearby Ruleville in 1965. Members of the Brooks Farm community worked closely with well-known grassroots civil rights leader Fannie Lou Hamer and others in petitioning Congress to fund the program. Part of the Federal War on Poverty, the Head Start program provided education and early intervention for disadvantaged preschool children to help them be prepared to learn effectively when they reached elementary school age. Brooks Farm sent more than 25 children to the Ruleville center in 1965, where they joined about 200 other 3- to 6-year-olds from Drew, Ruleville, Sunflower, and rural areas throughout surrounding Leflore and Sunflower counties. Brooks Farm now sends only two to three preschoolers to the current center in Minter City, a small town in Leflore County, although as many as seven children may attend in the next 2-3 years.

Head Start established a stronger connection between Brooks Farm and the nearby communities and surrounding rural areas and brought a greater understanding of how a community can work collectively to bring about change. To ensure that the Head Start program survived, parents in Brooks Farm, Drew, and Ruleville regularly held fundraisers and donated food, school supplies, and equipment to upgrade the facility. Because Brooks Farm children had to travel 5-7 miles to attend the center, Brooks Farm families worked with Head Start administrators to arrange for free transportation. As a result, the Head Start program paid local community members to provide the needed rides, simultaneously resolving the needs of parents and contributing employment to the community.

Hope for the Future in Brooks Farm Lies with Expanding Community, Returning Outmigrants

The community service commitments of the churches and the experiences gained by community members through campaigns to secure infrastructure improvements and economic development have led many Brooks Farm residents to an enlarged vision of community. Many believe their community's future lies partly in redefining community to include not only Brooks Farm but surrounding small communities and rural areas. That connection occasionally brings new permanent residents to Brooks Farm, although most often new residents are joining extended family members already in the community.

But the community's greatest hope for the future is focused on the permanent return of former community members. Most of Brooks Farm's outmigrants continue to identify themselves with the community and its remaining institutions, particularly church and family. They return regularly for reunions and help support relatives in Brooks Farm by sending money home when needed. Their continuing commitment to sustaining Brooks Farm as a place to come home to has, over the years, supported continued land ownership and farming in Brooks Farm, and has led to the influx of new ideas, new money, and new energy for community development, especially in the 1990's.

As the generations born in the 1950's and 1960's reach middle age, they have begun to consider ways to reconnect more directly with their home community. A group of former community members has plans to build a retirement center and health facility in the community, both to provide for current community members who may wish to remain in Brooks Farm as they retire and for return migrants who wish to spend their later years in the place they still consider home. Other former community members have already returned home, using money they have saved from years of working at good jobs in the cities to buy land, start small businesses, and help revitalize their

childhood community. One couple brought back to Brooks Farm the wealth they accumulated through a successful business, built a home on repurchased family land, and started a successful tailoring shop in town. Others have returned to become farmers again, carrying on the family tradition and supporting their aging parents.

Permanent return migration remains an occasional event, but outmigrants home for reunions often inquire about purchasing land and have shown a rising interest in community investments, suggesting that larger numbers of return migrants may be likely in the not-too-distant future. The pattern of return is slow, generally reflecting a preparation for retirement. The potential effect on the community's economic and social future may be dramatic, however. The accumulated urban earnings these outmigrants will bring with them, even in the form of pensions, should help the Brooks Farm economy, even providing additional employment and business opportunities for younger families with children. Their broad range of career and civic experiences may also strengthen the community's capacity to take advantage of economic development opportunities, both government and private.

Will Brooks Farm's Traditional Institutions Be Enough To Sustain It?

Evaluating the contribution of Brooks Farm's institutions to its long-term survival as a community is not easy. The community has suffered the same loss of working age population and loss of economic base as other rural communities, both in the South and in other parts of the Nation. Although the future looks more promising, it is not certain that outmigrants will return in numbers that will revitalize the economy, or that they will be able to support the kinds of jobs needed to keep young and middle-aged adults in the community.

Moreover, a relatively small group of Brooks Farm residents who have adequate incomes have been able to provide for most of the unmet needs of the high percentage of elderly and poor young families in their own community and at the same time reach out to those groups in nearby communities as individuals and through their churches and women's club. Some fear the effects of welfare reform may tax their capacity to meet such needs, as church contributions and business incomes dwindle in the face of lost government transfer payments to members and customers and the scale of unmet needs increases.

Yet, the residents of Brooks Farm remain positive. Relying on the community's experience in securing grants for infrastructure development, the churches plan to find grants to help them meet the anticipated need for assistance for the poor and young children. Individuals continue to work on economic development strategies, investing their own funds to provide jobs for the unem-

ployed. Brooks Farm residents do not behave as though they believe their community has no future. They continue to look ahead and search for solutions, committed to the idea that Brooks Farm, with its unique history, will endure.

This commitment to continuing effort and investment may be what defines the contribution of the community's institutions to its sustainability. Whether such a contribution will be enough to assure the community's survival remains to be seen. And whether such a model, if ultimately successful, might also work in other communities will likely depend on the unique patterns of their own traditional institutions.

For Further Reading . . .

James Cobb, *The Most Southern Place on Earth: The Mississippi Delta and the Roots of Regional Identity*, New York: Oxford, 1992.

Valerie Grim, "Connecting the Rural with the Urban: Migration of Black Families from the Brooks Farm Community to Selected Midwestern Cities, 1950-1992," *Monographs of the Black Heartland Project*. African-American Studies Division, Washington Univ., St. Louis, forthcoming.

Valerie Grim, "From Plantation to Society: P.H. Brooks and the Establishment of an African American Community in the Rural South, 1920-1950," *Locus: An Historical Journal of Regional Perspectives on National Topics*, Vol. 7, No. 1, Fall 1994, pp. 1-31.

Valerie Grim, "The Impact of Mechanized Farming on Black Farm Families in the Rural South: A Study of Life in the Brooks Farm Community, 1940-1970," *Agricultural History*, Vol. 68, No. 2, Spring 1994, pp. 169-84.

Valerie Grim, "'Tryin' to Make Ends Meet': African American Women's Work in Brooks Farm, 1920-1970," *Unrelated Kin: Race and Gender in Women's Personal Narratives*, edited by Gwendolyn Etter-Lewis and Michele Foster, New York: Routledge, 1995, pp. 124-140.

Nicholas Lemann, *The Promised Land: The Great Black Migration and How It Changed America*, New York: Knopf, 1991.

Thomas A. Lyson and William W. Falk, eds., *Forgotten Places: Uneven Development in Rural America*, Lawrence, KS: University Press of Kansas, 1993.

A Note on Sources and Methodology

This article draws on a group of 50 personal and telephone interviews with current and former residents of Brooks Farm. Since 1986, Grim, a native of Brooks Farm, has been recording open-ended conversations with community members to support research on the Brooks Farm community as a case study of the history and development of conditions for rural Blacks in the Mississippi Delta. The interviews combine prepared questions with an openness to direction by the interviewees. Prepared questions focus on gathering objective data on the subjects and their household and family members, as well as recollections of specific community events, institutions, and traditions. The open-ended nature of the interview process allows these prepared questions to lead to spontaneous discussions of other events and topics of interest to community members, including attitudes toward the community and its traditions, assessments of the role various events, institutions, and traditions play in the community's past and present, and expectations for the community's future.

Information gathered through the interview process is corroborated by comparing responses among interviewees, and by research in the records of public and private institutions, including governments, schools, churches, businesses, civic organizations, and households.

Much current research on community sustainability has been focused on identifying indicators by which to measure a community's ability to cope well with change and survive, with the ultimate goal of determining how best to support community efforts to sustain themselves. The methodology employed in this article plays a role in reaching that goal. By allowing a broad range of community members to identify the key strengths of their community, we gain an expanded local perspective on the formula for sustainability. Moreover, individual community "portraits" highlight the diversity of local needs and abilities, reminding us of the need to wed the particularities of individual places with the regional and national context afforded by other, more aggregated studies.

Carol Stack, *Call to Home: African Americans Reclaim the Rural South*, New York: Basic Books, 1996.

Cornel West, *Race Matters*, Boston: Beacon Press, 1993.

Beyond the Amber Waves of Grain: An Examination of Social and Economic Restructuring in the Heartland

Paul F. Lasley, F. Larry Leistritz, Linda M. Lobao, and Katherine Meyers, editors. Boulder, CO: Westview Press, 1995. 256 pages. ISBN 0-8133-8903-5 (cloth) \$39.95. To order, call 1-800-456-1995.

The financial "crisis" of the 1980s rocked public complacency about farm restructuring. Americans were confronted with the fact that bucolic notions of farm life did not match the actual hardships and that the Jeffersonian ideal of family farming was shattered. Policy makers discovered that long-standing policies and programs were insufficient and that a massive government bailout of the farm sector would be necessary. Academic and other researchers became aware of their limitations in anticipating the crisis and assessing its magnitude.... Some observers raised more fundamental issues about the trajectory of farm change in the postwar era, including its environmental and social sustainability. Traditional farm organizations were forced to reconsider their platforms and to compete for public attention with newly emerging grass-roots groups. For farmers the crisis called into question a valued way of life and possible career path for their children. At the extreme, it meant loss of household savings, the violation of intergenerational trust whereby farmland passed down through generations, and sometimes the loss of human life. (Linda Lobao & Paul Lasley, Chapter 1, p.2)

This book purports to be "the first systematic account portraying how the crisis period shaped the lives and enterprises of farm people in the grain-producing heartland of the Midwest." Economists and sociologists collaborated in this book, which emerged from a North Central Regional Research Project (NC 184), with the support of the North Central Regional Center for Rural Development at Iowa State University. The study is based on a 1989 survey of more than 7,000 farm men and women in 12 Midwestern States, the area hardest hit by the crisis. It focused on changes from 1984 to 1988 in three arenas of rural life: the farm enterprise, the farm household, and the farm community. In its focus, the book is partially successful, although like the paragraph quoted above, it promises more than it ultimately delivers. Two shortcomings of the approach of the study have been noted by this reviewer and others: (1) the focus is on the people who remained in farming after the crisis had passed, excluding those for whom the crisis resulted in exiting farming, and (2) the survey methods employed did not allow any longitudinal comparisons to establish whether the relationships found had been significantly influenced by the crisis. Both of these limitations result in difficulties in drawing strong conclu-

sions regarding causality or association of the phenomena with the farm crisis. No benchmark with which to compare survey findings exists. Farm financial performance data from ERS's Farm Costs and Returns Surveys indicate that proportions of farms having marginal solvency, marginal income, or both have remained elevated even in the "post-crisis" period, indicating the background level of these relationships may be higher than anticipated.

In Chapter 1, Lobao and Lasley set the stage with a review of some previous descriptions of the crisis and provide a map to the remainder of the book. In a section entitled "Perspectives on the Meaning and Significance of the Crisis" they discuss four differing views of the crisis, varying from blaming it on farmer greed and mismanagement, to seeing it as an aberration in an otherwise well-functioning agricultural system, to seeing it as an indictment of government involvement in agriculture, to finally a wake-up call to address the inequality, concentration, and sustainability of the trajectory of agricultural change. There are varying quantities of truth in each of the viewpoints; but as stated, each is inadequate. Unfortunately, the authors do not attempt to sort out the substance from the rhetoric in these somewhat self-servingly stated viewpoints.

In Chapter 2, Daryl Hobbs and Robert Weagley provide a descriptive and historical perspective on the 12-State study area in which they document some of the macro and trade factors that resulted in a build-up then collapse of farmland prices. The role of proximity to metropolitan areas in conditioning the responses of the farm sector and farm communities is well developed. F. Larry Leistritz and Freddie Barnard provide as clear a picture of the financial underpinning of the crisis as can be gleaned from a single-time survey. These two chapters could have been strengthened by a discussion of the contribution of government support payments to net farm (or household) incomes over the study period. Had this been attempted, it would have confirmed that the crisis was very selective in who was affected and how. Since the cost pressures were mostly from interest costs, the financial pressures from declining collateral values of land, and the government policy response was to continue to rely primarily on direct commodity payments, farmers with little debt frequently saw their incomes increased by the crisis. It can be argued that the brunt of the crisis fell not upon the greedy or poor managers, but upon those farmers who were most completely adjusted to the expectations of the 1970's when the macro policy regime changed at the beginning of the 1980's. Further, such an analysis would likely have illuminated why reliance on traditional policies failed to deal adequately with the crisis, and measures to ease the derivative burden on financial institutions had to be adopted.

Bruce Johnson and Raymond Vlasin's discussion of farmers' adjustments and reactions to the crisis cries out for longitudinal comparison and testing of statistical significance of findings. Interpretation of their results is difficult without knowing what background levels of response for "normal" or "good" periods would have been. The differences among regions, age groups, and gross sales categories do not appear to be statistically significant. Perhaps they would be significant across good times versus bad times.

The Kent Olson and William Saupe chapter on plans for changing the farm business and needs for training has many of the same problems of apparent lack of statistical significance across groups. However, by presenting only the extreme categories in their tables, it is less noticeable. Again proper tests of significance and longitudinal comparisons or comparisons to benchmarks are needed to fully interpret the data.

In Part II, focusing on the farm family, Jackie Fellows and Lasley investigated the changing division of labor on family farms. Many of the comparisons were interesting, especially division of farm and household tasks by off-farm employment status of operators and spouses; but were disappointing in their widespread lack of statistical significance. The study, therefore has to be regarded as exploratory, providing more finely tuned hypotheses for future surveys and analyses. Lasley's chapter on the impacts of financial hardship on familial well-being is especially insightful, linking perceptions of well-being, familial adjustments, and causal factors (age, family net income, and debt/asset ratio). The Katherine Meyer chapter on perceiving hardship and managing life contained a great deal of new information, well analyzed and presented. The author was careful to draw valid conclusions about the pressures and coping strategies of the women who were surviving the crisis, without generalizing to those not included in the study.

In the final section concerning community and social interaction, Arlo Biere analyzes respondents' perceptions of improvement or worsening of community conditions in job opportunities, health care, child care, shopping, fire/safety services, and entertainment, using the ERS County Typology and Rural-Urban Continuum codes. The analysis is solid and concludes that not all community changes were correlated with changes in farming, although many changes started first in the farming and manufacturing dependent counties. Lobao, in a chapter on organizational, community and political involvement, finds little evidence of militancy or involvement in protests among respondents. She correctly notes that by focusing on survivors, the groups most likely to have been radicalized over the period were excluded from the survey.

Two wrap-up chapters by Leistriz and Meyer and by Lasley summarize implications and methodology of the study. My assessment is that the study has made a contribution to our knowledge of the household and community aspects of the farm crisis, but the farm enterprise analysis was limited by its reliance solely on one cross-sectional survey. After a mixed start in Chapter 1, it generally settled into competent analysis within the limitations of the data. Serious students will find the reference lists in many of the chapters extremely helpful.

Reviewed by David H. Harrington, a senior economist with ERS-RED.

Development, Geography, and Economic Theory

Paul Krugman. Cambridge, MA: The MIT Press, 1995. 117 pages. ISBN 0-262-11203-5 (cloth) \$20.00. To order, call 1-800-356-0343.

The work of Paul Romer on increasing returns to scale has created strong ferment in development economics, with spillovers into international trade theory and economic geography. The basic thrust is that the capitalist economy exhibits increasing returns to scale in the long run under a regime of imperfect competition. To the neoclassically trained economist, models incorporating these two economic processes together have appeared strikingly original. Romer's work has reopened the inquiry into the sources of economic growth, technological change, and the possibility of multiple equilibria. On the other hand, students of the classics—Smith, Ricardo, and Marx to Marshall, Young, and Schumpeter—ask what is new? After all, many of the original insights into the dynamic processes of the competitive economy had been vindicated by this new body of work.

Enter Paul Krugman. *Development, Geography, and Economic Theory* is a readable, but provocative book consisting of revisions of Krugman's lectures at the Stockholm School of Economics given in 1992. The first two chapters tell simple parables to show how neoclassical theory can contribute to fields of economic development *circa* the 1950's and economic geography—fields long ago abandoned, but newly 'discovered' by neoclassical theory. In the third chapter, Krugman presents an ambivalent defense of the use of mathematical models in economics and argues that these models are reviving these fields within the economics discipline. Although his intended audience is the academician, it behooves the rural development policy analyst to mull over a number of the insights and observations offered by Professor Krugman.

The first chapter, entitled "The Rise and Fall of Development Economics," presents a simple model illustrating how explicitly incorporating economies of scale and imperfect competition can capture the spirit of Rosenstein-Rodan's "Big Push" theory of economic development. Krugman locates the necessary conditions for a high growth equilibrium in the economies of scale at the firm level interacting with elastic supplies of labor and capital. This is followed by a discussion on which of the insights offered by Hirschman, Lewis, Nurkse, and other 'high development' theorists still remain robust.

The second chapter, entitled "Geography Lost and Found," opens with Krugman discussing the five traditions in economic geography. He presents a model that synthesizes the core ideas of central-place theory, localized external economies, market potential, and cumulative causation. Krugman shows how these theories view different aspects of the same thing—a regional economy with increasing returns to scale under a regime of imperfect competition. In addition, Krugman finds that the theory with the longest tradition in economics, von Thünen's theory of place, is the most wanting because it assumes the very thing most important to explain—why there should exist a city in a regional economy. For rural development specialists, the primary implication of this body of work is to shift the research focus from the rural economy *in situ* to its links to the urban economy.

The third chapter, entitled "Models and Metaphors," picks up on observations made in passing in the previous chapters. This

chapter appears to be both an apology for the failure of economic theorists to tackle difficult, but 'sensible' grand ideas, and a call for the central role of mathematical modeling in economics. Krugman argues that he has rehabilitated through his modeling efforts the grand themes of the economics of development and geography. For this reviewer, this perspective is more of a testament to the fact that, for the last 25 years, graduate training in economics has failed to provide a sufficient grounding in the intellectual history of its own discipline.

In this book and elsewhere, Krugman's work on economic geography has generated controversy more for his opinions about the significance of his efforts and about the role of mathematical modeling than for the work itself. Certainly, the policy analyst cannot countenance Krugman's implied argument that the neo-classically-trained economic theorist presumes the right to define the research agenda of the discipline. Nevertheless, Krugman is correct in arguing for the positive role for rigorous modeling in thinking about regional development policy. Models add precision to thinking explicitly about implicit causal mechanisms embedded in policy and help us understand under what conditions a policy yields its intended or perverse results. With the publication of *Development, Geography, and Economic Theory*, Paul Krugman has hung up his shingle and is open for business.

Reviewed by Stephen Vogel, an economist with ERS-FRED.

Multiple Conflicts Over Multiple Uses

Terry L. Anderson (editor). Bozeman, MT: Political Economy Research Center, 1994. 103 pages. ISBN 0-8191-9748-3 (paper) \$9.95. To order, call (406) 587-9591.

Few resource policy issues are as complicated or as susceptible to controversy as the Federal Government's role in the use of public and private land. While land use is primarily the responsibility of landowners and State and local governments, the Federal Government typically plays a role in either of two situations: (1) when the use of non-Federal land affects people far away (for example, those living in a floodplain downstream) or resources in which the Nation as a whole is deemed to have an interest (for example, endangered species), or (2) when the land in question is owned by the Federal Government. In both cases the extent of the Federal Government's role is the subject of considerable debate, characterized in recent years by calls for reform of private property rights and "wise use" of Federal lands.

Multiple Conflicts Over Multiple Uses is a collection of five papers addressing the latter issue. Each focuses on a different Federal land resource: recreation, timber, mining, grazing, and energy resources. The papers were commissioned and published by the Political Economy Research Center—a self-described proponent of "free-market environmentalism" located in Bozeman, Montana—with support from the American Forest and Paper Association, the American Farm Bureau Federation, the Independence Mining Company, Inc., and the Newmont Gold Company. As such, it presents one perspective in the ongoing debate over management of Federal lands.

Specifically, the authors argue that incentives matter in determining how Federal land resources are used, and that current management practices create incentives for individuals and corporations to use Federal land resources in ways that are economically inefficient and environmentally damaging. Low entrance fees for national parks, restrictions on the transferability of grazing permits, and requirements that successful bidders on timber sales actually harvest timber are cited as examples of practices that inhibit both efficiency and environmental protection. The authors conclude that management of Federal land resources would be improved if property rights were clarified and made transferable.

Such arguments are familiar to most economists, and similar proposals have been made by various environmental groups. Examples endorsed by the authors as well as by environmental groups include proposals to allow wider competition for grazing permits or timber sales contracts. If rangeland or forest resources are valued for their environmental benefits at a level higher than their value as resources to be consumed or extracted, proponents argue, environmental groups should be permitted—or even required—to bid against ranchers or timber companies for the rights to those resources.

Nevertheless, such arguments are made less compelling in this case by the book's polemic tone—sharper in some chapters than in others—which leaves little doubt as to the authors' preferences. In terms of subsidies, for example, "well-heeled recreationists" are described as "the biggest pigs at the Federal trough."

A more substantive criticism applies to the important issue of how the various rights to Federal land resources should be allocated initially once they are clarified and made transferable. For example, should grazing permits be given to current permit holders? Should they be sold to current permit holders at the capitalized value of the current grazing fee? Or should they be auctioned to the highest bidder? The eventual distribution of such rights—and thus the ultimate economic and environmental outcomes—will depend on alternative users' willingness to pay, and may not depend on how the transferable rights are allocated initially, *as long as markets are made to work efficiently and the costs of achieving such transfers are low.*

Even if this is the case, however, initial distributional considerations are important and are certain to be controversial. This means that the political and bureaucratic costs the authors trace to the existing management practices will not be eliminated, as argued, but simply moved forward to the first stage of the management reform process. On the other hand, if transactions costs remain high, as seems likely given the complex legal and economic nature of the rights involved, the initial distribution of rights will also be important in terms of its ultimate effect on economic and environmental outcomes.

In light of these considerations, readers who are willing to think critically will find interesting arguments in this book against which to compare other perspectives on Federal land management. Those seeking a balanced overview of the complex political, economic, and environmental issues involved will need to look elsewhere.

Reviewed by Keith Wiebe, an economist with ERS-RED.

The Farm Family Business

Ruth Gasson and Andrew Errington. Oxon, UK: Cab International, 1993. 290 pages. ISBN 0-85198-859-8 (paper) \$40.50. To order, call Wallingford 0491-832111 or Fax 0491-833508.

No new analysis or material is presented in this book. Rather, the authors have compiled summaries of work done by others to illustrate farm family issues. The book's scope is limited to family farms in the developed countries in the western world. While most examples are drawn from the United Kingdom, work from the United States, Europe, Sweden, Australia, and New Zealand are included. The authors have thoughtfully included an introduction to their book, and well-written introductions and conclusions to each chapter.

What constitutes a farm family business? Developing a working definition is surprisingly difficult. Numerous definitions have been used in farm family studies. The authors examined these definitions then developed their own definition that consists of six components. First, business ownership and managerial control belong in the farm family. Second, farm family members are defined by kinship or marriage. Third, family members provide capital. Fourth, family members contribute to farm work. Fifth, ownership and control are transferred between generations. Finally, the family lives on the farm.

After defining farm family businesses, the authors reviewed studies to determine the importance of farm family businesses. However, the question of importance to whom or what remained unanswered. The authors conclude that farm families are important because farm families operate the majority of farms and they supply farm labor and farm capital. This struck me as a weak conclusion. To examine the importance of farm families one might ask what would happen if the percentage of farms operated by farm families declined? Would agricultural production be more or less efficient or remain the same? Would the environment suffer or improve? Would the allocation of agricultural resources change? How would a change affect rural communities and businesses? I was disappointed that none of these questions were addressed.

In chapter three, the authors introduce a reoccurring theme in their book. The authors assert that farmers lose some independence and control over their farm operations as their level of borrowing increases. Farmers without debt can accept lower rates of return on capital and remain in business. With debt, farmers need to earn sufficient returns to repay interest on borrowed capital while maintaining sufficient returns on their own capital. Increasing debt levels force farmers to focus more on the financial aspects of farming rather than the intrinsic aspects.

The authors argue that advances in farm technology have led to the increased use of borrowed funds. Adopting new technology frequently requires large capital investments financed by borrowed funds. Application of a new farming technology increases profit for those who first embrace it. Farmers who are reluctant to adopt the technology find themselves at a disadvantage with stagnant or falling incomes. Eventually they must start the new technology or leave farming.

The next chapter opens with a discussion on the objectives, goals, and values held by farm families. Not surprisingly, farmers consistently value job independence and love of nature. Operators of small farms place a higher value on independence

and working with the land than operators of large farms who value achievement and creativity. Many farm families rank the continuation of the farm business as a major objective. This objective may encourage farmers to borrow funds for farm expansion with the hope that one of their children will inherit a viable farm operation. Again, the authors emphasize that farmers' use of borrowed funds results in some loss of the intrinsic satisfaction of farming. Profit maximization was rarely mentioned as a primary objective of farm families. The authors conclude with a short discussion on the objectives of other farm family members.

The application of labor and managerial skills in farm family businesses is emphasized next. Farm labor demand has seasonal and ad hoc components and varies with the growth and development of farm businesses. Farm families are uniquely suited to meet the labor demands of agricultural production due to the flexible nature of labor they can supply to meet seasonal or emergency needs. The authors recognize that managerial skills are increasingly important to the success of farm businesses. Although farm family members' still supply much of the labor needed for the farm operation, farm businesses are increasingly using contractors, accountants, consultants, and hired labor. This rise in the use of nonfamily labor occurs because farm family members do not possess all the specialized skills to manage a viable farm operation today. The authors continue with other interesting topics related to labor use in farm family businesses.

The authors explore the implications of marriage and the spouses' roles in farm family businesses. Farmers are increasingly marrying spouses with nonfarm backgrounds. This may have serious implications for farm businesses and farm families. Usually on large farms, where the bulk of the net income is generated through farming, both the husband and wife had parents who farmed. Presumably, both husband and wife received some farm assets from their parents through gifts, inheritance, succession, or other means. When a farmer marries a nonfarm spouse, the farmer's parents are reluctant to accept the nonfarm spouse as a partner in the farming business because they fear that the marriage may not last and any farm assets given to the farming couple may be lost in a divorce settlement. Spouses with nonfarm backgrounds frequently lack farm experience and knowledge; however, they may bring specialized skills that can be applied to farming businesses.

In the next two chapters the authors review the patterns and processes of succession, retirement, and inheritance. The authors emphasize that the goals held by farm families have important consequences for future of farm families and farm businesses. Some farm families feel it is important for one of their children to farm the land that has been in their family for years. This goal places constraints on the farm family business. Other farm families wish to retain the farm family business but they are not tied to a particular piece of farmland. This goal places fewer constraints on the farm business and farm family.

The authors outline the series of progressive steps taken by farm successors as they assume control of farm family businesses. The control and transfer of farm assets create stress and tension between generations in a farm family since the older generation has different goals than the younger generation. Farm families have dealt with this conflict in various ways. The authors note that there is some agreement that the most successful transitions

between generations occur through a planned process of transferring managerial responsibilities over a long period.

The future of farm family businesses is explored in the final chapter. Farm family businesses will remain. They can survive recessions since they can accept lower rates of return on family labor and capital in exchange for nonfinancial compensation. In contrast, nonfamily farm businesses must focus on financial aspects to remain in business. Some farm family businesses are likely to evolve into partnerships and vertically integrated businesses, while others will slowly exit farming due to a lack of a successor or lack of sufficient net income. Many farm families will remain in farming but depend on off-farm income sources.

Anyone interested in the dynamics of farm family businesses will benefit from reading this book. The authors are comprehensive in their treatment of each topic and include statistics, tables, graphs, and boxed material. One downside to the book is the authors' wordiness. The authors provide references and an index.

Reviewed by Linda F. Foreman, an agricultural economist with ERS-RED.