

Understanding Rural Population Loss

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Strong national economic growth in the 1990s included much of the rural U.S., in sharp contrast with the previous decade. Poverty rates declined in 85 percent of nonmetro counties between 1989 and 1999. In the previous decade, only 35 percent of these counties had decreases in poverty. Nevertheless, over 1 in 4 nonmetro counties lost population in 1990-2000, often exceeding 5 percent. Many of these counties are agricultural and many have been losing population for decades, with no solution in sight.

This article identifies three characteristics of counties that were likely to lose population in 1990-2000: location away from metro areas, low population density, and a low level of natural amenities (as measured by climate, topography, and the presence of lakes and ponds). We argue that these qualities explain why many agricultural areas have been losing population. We then turn the question of population loss on its head, and ask why some of the counties with

Despite a widespread decline in rural poverty in the 1990s, a quarter of nonmetro counties lost population over the decade. Poverty rates were no higher in these counties than in counties without population loss. We identify remote (from metro areas), thinly settled counties as “frontier” counties, arguing that the lack of access to services and the small labor market sizes in these counties inhibits the immigration of people and businesses, particularly in the absence of compensating natural amenities. In two of every three low-amenity frontier counties, population loss exceeded 5 percent in 1990-2000. Most of these counties are farming-dependent, less because of their abundance of agriculture than because of their dearth of other economic activities. Some low-amenity frontier counties did gain population in the past decade. We look at these exceptions to see if there are rural development lessons to be learned.

these characteristics did not lose population in the 1990s. Industrial agriculture, casinos, prisons, and idiosyncratic events such as the creation of a lake helped some counties maintain their populations. In no case did small business entrepreneurship alone appear to be the critical factor.

Population Loss Is More Than a Question of Job Availability

Economic models of regional growth and decline suggest that areas of high poverty should also be areas of population loss. As opportunities decline in an area, poverty rates rise and people move to other areas in search of better opportunities. Outmigration subsequently reduces the poverty rate, such that poverty rates should ultimately equalize across areas.

But two facts about rural distress in the U.S. refute this model.

First, areas with poverty rates of over 20 percent and areas with population loss have usually had these conditions for decades. Second, these are quite distinct areas. High poverty is concentrated in the South and scattered across the Midwest, particularly where populations are largely Native American (fig. 1). Population loss, meanwhile, was most pronounced in the center of the country and in scattered areas of the Northeast and South. Rural counties with high poverty in 1990 were no more likely to have population loss in 1990-2000 than were other rural counties.

It is not difficult to explain why counties with high poverty do not always have population loss. High-poverty areas are almost inevitably areas where the rates of high school completion among young adults are relatively low. Over the

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past 25 years, inflation-adjusted earnings have fallen nationally for workers lacking high school degrees. In part, this reflects an industrial shift. Jobs have declined in urban manufacturing, which has historically paid low-skill workers relatively well, but expanded in the low-paying services sector. Thus, rural workers lacking a high school degree can no longer expect to better their wages in urban areas and the motivation for outmigration is diminished. Rural low-education areas do have population

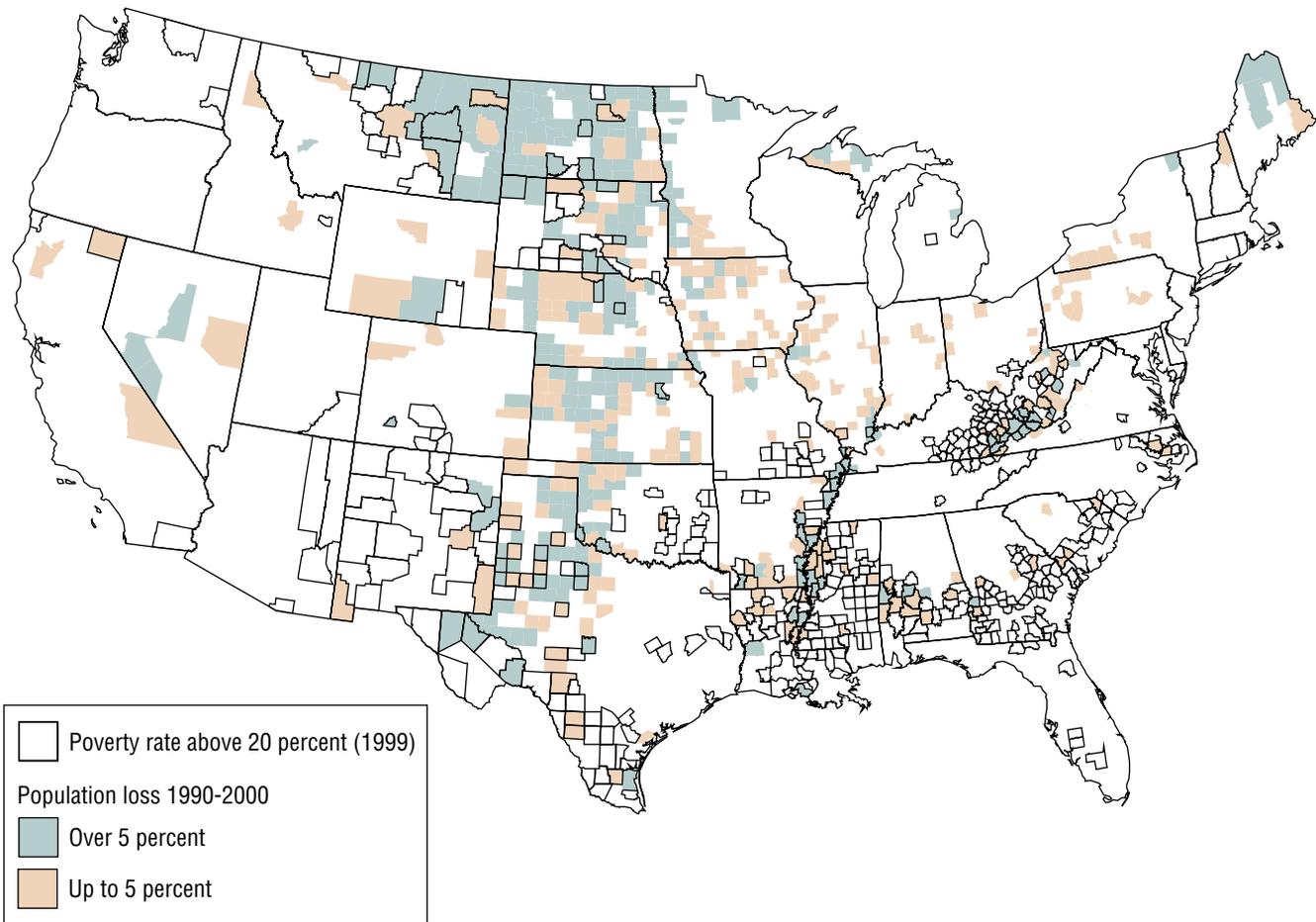
loss, but only when the poverty rates are extremely high.

Why population loss occurs in counties with low poverty is a less tractable problem. National surveys of residential preferences have consistently shown that, while most people prefer the size of place in which they currently reside, the second choice tends to be a “less dense” location (Brown et al.). This has led to an implicit assumption that population loss stems from a decline in economic opportunities in traditional rural industries

(Albrecht). Since many of the areas with population loss have an economic base dependent on agriculture, and agriculture employs fewer and fewer people, this assumption is not unreasonable.

But a recent survey of rural Nebraska raises questions as to whether a decline in economic opportunities in agriculture, mining, and forestry is the only or even major reason for population loss. When these residents were asked what type of place they would prefer, they tended to favor not their

Figure 1
Poverty and population loss in nonmetro counties
High poverty and population loss are unrelated



Sources: Censuses of Population, 1990 and 2000.

own type of setting but a more densely populated setting (Allen and Filkins). When people in a national survey report that they would prefer a less dense setting, they may be envisioning rural Vermont, not rural Nebraska.

Moreover, why have some areas remained agricultural while others have attracted manufacturing, recreation, and other industries? Agriculture in particular does not compete with most other economic activities. Many rural counties dependent on manufacturing, for instance, have just as much cropland as counties dependent on farming (where farming accounted for at least 20 percent of personal earnings in 1987-89—see Cook and Mizer for ERS's county economic classification). What distinguishes areas of population growth from areas of decline is not the absence of agriculture in the former as much as the lack of other industry in the latter.

Settlement Patterns and the Problem of Access

Although some people prefer a life of self-reliance, rural quality of life is enhanced for most people by ready access to services, including doctors, schools, stores, and restaurants. Access to services is not a problem for people living near metro areas. Except for people needing specialized services, residence in or near larger nonmetro towns is probably sufficient for most needs. But for people living in remote, very thinly settled areas, access to services can be a major problem. Not surprisingly, surveys of residential preferences indicate that, aside from current residence, the most frequently selected alternative is an open country setting within 30 miles of a major city (Brown et al.).

The problem of access to services has increased over time as health, education, and retail services have consolidated into larger units and people have come to expect greater specialization and choice. Moreover, with smaller families and more dual-earner households, households are wealthier and more reliant on services.

The problems associated with residence in remote, sparsely settled areas extend to employment. Low-wage jobs are much more prevalent in these areas than in more urban locations (Gibbs and Cromartie). Employers in low-density areas are likely to be smaller and less specialized than urban employers and therefore less likely to seek skilled workers. Moreover, manufacturers and others who may seek more highly skilled labor are likely to avoid very small labor markets where the pool of specialized skills is very small and where it is difficult to attract new employees.

To measure county remoteness and population sparseness, we have used a 4-category settlement scale for nonmetro counties: (1) adjacent to a metro area of 1 million or more people; (2) adjacent to a smaller metro area; (3) not adjacent, but with a density of over 10.1 people per square mile; (4) not adjacent, with a density of 10.1 or fewer people per square mile. The distinction between the first two categories stems from the finding that large metro areas generally have a greater effect on their immediate hinterlands than do small metro areas (Ghelfi and Parker).

Ghelfi and Parker distinguish among nonadjacent counties by size of largest place in the county. Others have used the size of the urban population. However, there are several reasons to expect that

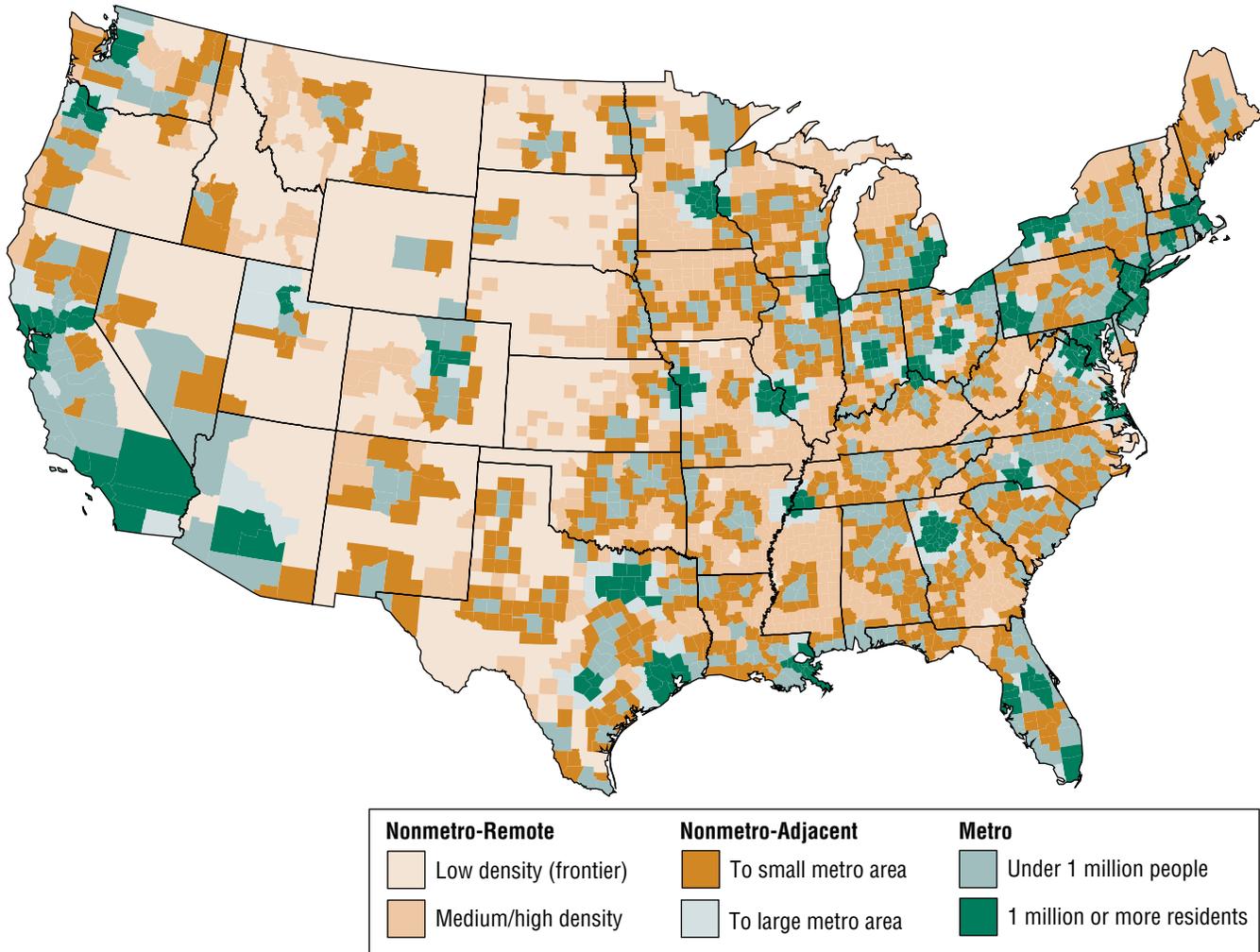
density may be more important than size of place. First, community boundaries are increasingly diffuse in rural areas. In what some are calling "rural sprawl," many people have moved from towns to open country areas even though their livelihood does not depend on agriculture, forestry, or any other resource-based activity. People often shop in one town, work in another, and live in neither. Second, service areas often extend beyond particular communities. Health services, schools, and other public sector activities often span several towns. Retailers such as Wal-Mart look to the population within shopping range rather than town size in choosing their locations. Finally, manufacturers and employers look to the local labor market area rather than any particular town when considering labor quality and availability. In this context, it is area population density rather than town size that constrains the number and types of services and jobs that are available to residents. The 10.1 persons-per-square-mile cutoff is the lowest density quartile of nonmetro counties. As shorthand, we henceforth refer to remote, low-density counties as "frontier counties" (category 4). The term "frontier" was originally used by the U.S. Census Bureau to refer to counties with under 2 persons per square mile (see Duncan).

A map of the settlement typology shows that, except for a few counties along Lake Superior and in some of the more mountainous regions, the eastern half of the U.S. has few frontier counties (fig. 2). In contrast, the Great Plains and Rocky Mountain areas in the center-West of the country are composed largely of this type of county. One characteristic of a

Figure 2

Settlement patterns, 1993

Frontier counties dominate the western half of the contiguous States



Sources: Censuses of Population, 1990 and 2000.

frontier county is that it is likely to be next to other frontier counties.

Figure 3 illustrates that rural county dependence on agriculture reflects less the presence of agriculture than the absence of other industries. Settlement has little bearing on the proportion of land in crops. An average of roughly a third of county land is in crops, no matter whether the county is adjacent to a large metro area or remote and low density. But frontier counties were much more likely than other counties to be “farming-dependent.” Nearly 60 percent

of the frontier counties had an agricultural economic base in 1989, compared with fewer than 20 percent of counties in the other settlement categories. Frontier counties are more likely to be farming-dependent because they rarely attract manufacturing-or, presumably, other employers seeking low-cost rural areas. Only 3 percent were “manufacturing-dependent,” compared with 23-30 percent of the other settlement categories.

Frontier counties were much more likely to lose population in the 1990s than were other counties

(fig. 4). Over half had fewer people in 2000 than 10 years earlier, and over a third had a population loss of over 5 percent. Thus, it is the counties with the fewest people that have been most likely to lose population, putting further strain on services in counties least able to bear it.

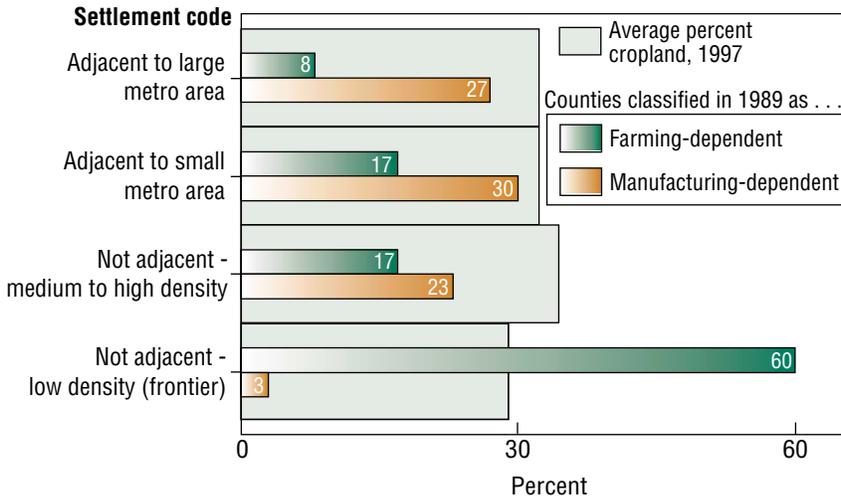
Natural Amenities

People move to or stay in rural areas not only to enjoy a slower paced, less congested, community-centered life, but also to enjoy the outdoors. Temperate climate, ponds

Figure 3

Cropland and economic type, by settlement code

Frontier counties have less cropland, but are more likely to be farming-dependent than other counties



Sources: 1997 Census of Agriculture (cropland); Cook and Mizer (farming- and manufacturing-dependent).

and lakes, and hills and mountains enhance this enjoyment. To measure natural amenities, we use a scale of natural amenities using six items: average January temperature, January days of sun, temperate summer, low July humidity, percent of county that is surface water, and topological variation—which ranged from flat to mountainous (McGranahan). The scale, composed by adding the standardized scores of each measure, is very simple, but nonetheless highly associated with a county’s change in population and employment over the past 25 years. Areas scoring highest on the scale tended to be in the Mountain West and Florida, while the lowest scoring areas were in the North Central region (fig. 5).

One of the problems facing areas with extensive farming is that the best cropland tends to be the lowest in natural amenities—where the land is flattest and least broken up by ponds and lakes, where the winters are wettest (although not necessarily coldest), and where the summers are hottest and most humid. In general, the lower a

county’s score on the natural amenities scale, the higher the proportion of land in crops and the less likely Johnson and Beale were to classify it as a recreation county (fig. 6).

Three of every four frontier counties with below-average natural amenities are classified as farm-dependent (fig. 7). Despite having

the same amount of cropland, relatively few of the other low-amenity nonmetro counties were classified as farm-dependent. They had enough other types of economic activity in 1987-89 so that the proportion of earnings from farming seldom exceeded the 20-percent threshold used to define farm-dependent counties.

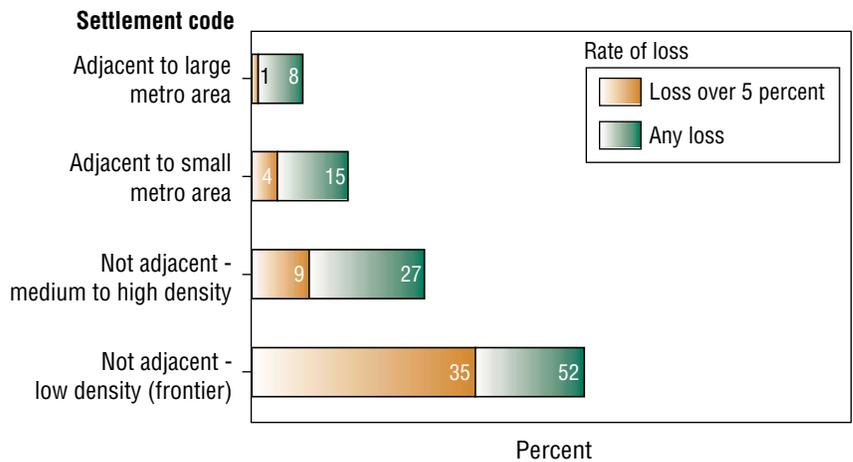
Population loss in the 1990s was strongly related to both natural amenities and frontier status. Nearly 70 percent of the frontier counties scoring very low in natural amenities lost at least 5 percent of their population between 1990 and 2000 (fig. 8). In contrast, none of the very high-amenity counties that were either adjacent to a metro area or had a density of over 10.1 persons per square mile lost 5 percent of their population.

Some of the loss in the very high-amenity frontier counties can be ascribed to mine closures. If mining-dependent counties are excluded from the analysis, the proportion of these counties with population loss in the 1990s drops

Figure 4

Proportion of nonmetro counties with population loss, 1990-2000, by settlement code

Over half the frontier counties lost population between 1990 and 2000

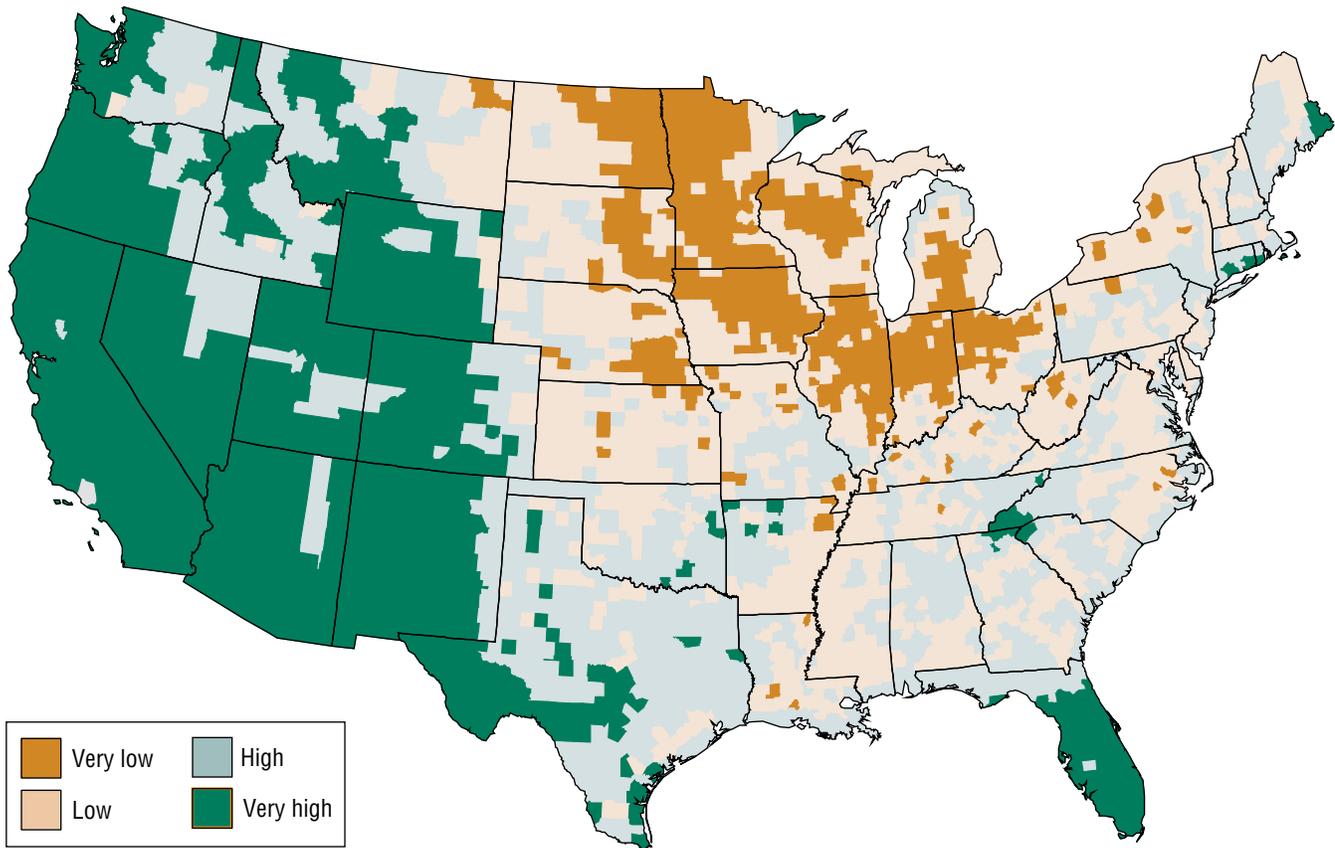


Source: U.S. Censuses of Population, 1990 and 2000.

Figure 5

Natural amenities scale

The North Central scores low in natural amenities, while the mountainous West scores high



Note: Low is within 1 standard deviation below the mean and High is up to 1 standard deviation above the mean. Other categories are more extreme.

from 20 percent to 14 percent. Similarly, the proportion with a population loss of 5 percent or more falls from 10 percent to 6 percent.

Even for farm-dependent counties, location matters. Frontier status and low natural amenities meant substantial population loss in 1990-2000 for over half of these counties (fig. 9). In contrast, only 4 percent of the farm-dependent counties above average in natural amenities and without frontier status incurred a loss of over 5 percent. Only 94, or 17 percent, of all farm-dependent counties are so situated, however.

Sources of Population Loss

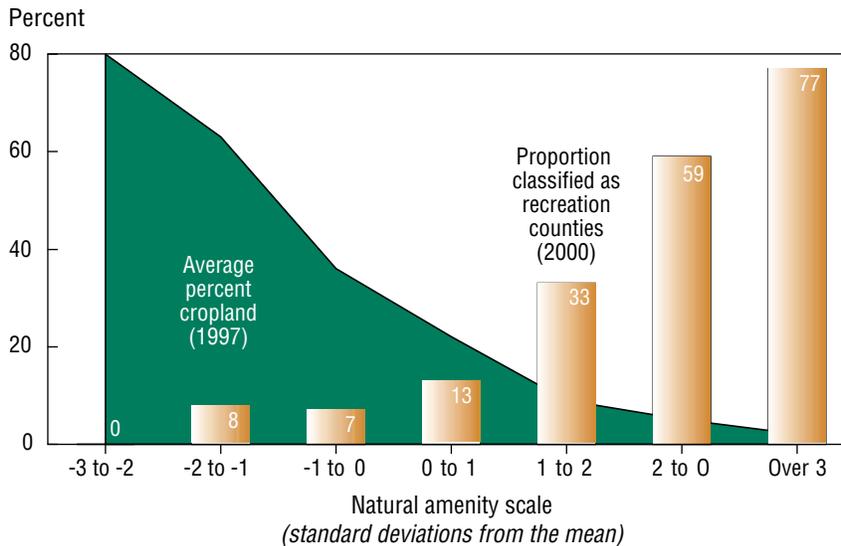
We have considered the association of population loss with several county characteristics, including high poverty, remoteness and sparse settlement, low natural amenities, and dependence on farming. Frontier counties in areas with few natural amenities were especially likely to lose population during the 1990s. One reason, we argue, is the quality of life afforded by these locations. Life in remote, thinly settled areas is not easy, and people who are considering moving to rural areas may choose frontier areas only if there are compensations such as natural amenities or family ties.

But economics also plays a role. As noted earlier, frontier counties, at least those without high amenities, have not attracted manufacturing or other activities. Labor markets are small in these areas and jobs tend to be low-pay. The average poverty rate in low-amenity frontier counties does not differ from the overall nonmetro average, but levels of schooling tend to be relatively high. Thus, although the poverty rates do not tend to be high, there may be a substantial gap between workforce qualifications and jobs available in many of these counties. Compounding the problem in farm-dependent areas

Figure 6

Land in crops and recreation counties, by level of natural amenities

Counties scoring low in natural amenities tend to have a lot of agriculture and not much recreation



Sources: 1997 Census of Agriculture (cropland); Johnson and Beale (recreation); and McGranahan (natural amenities).

is the slow growth or decline in agricultural jobs.

Finally, demographics may contribute to population loss in low-amenity frontier counties. Because of previous outmigration and declining birth rates, many rural counties have increasingly older populations, with the number of deaths now exceeding the number of births. Nonmetro counties where the population age 65 and over exceeded 20 percent of the total population in 1990 were more likely than other counties to lose population between 1990 and 2000.

Logistic regression was used to explore the relative importance of geography (remoteness, population density, natural amenities), natural resources base (mining-dependent, farm-dependent), socioeconomic measures (young adult high school completion, poverty rate), and demography (percent age 65 and over) in understanding which nonmetro counties lost population in 1990-2000 (see box, p.10). Each of these four factors contributes to

understanding where population loss occurred, with geography the most salient factor.

As the charts in this article have demonstrated, much of the

association between farm dependence and population loss is attributable to the geographic characteristics of farm counties. Mining counties, in contrast, lost population despite their relatively favorable geographic situation. Many of these counties are in high-amenity areas in the West, where population loss was otherwise relatively infrequent.

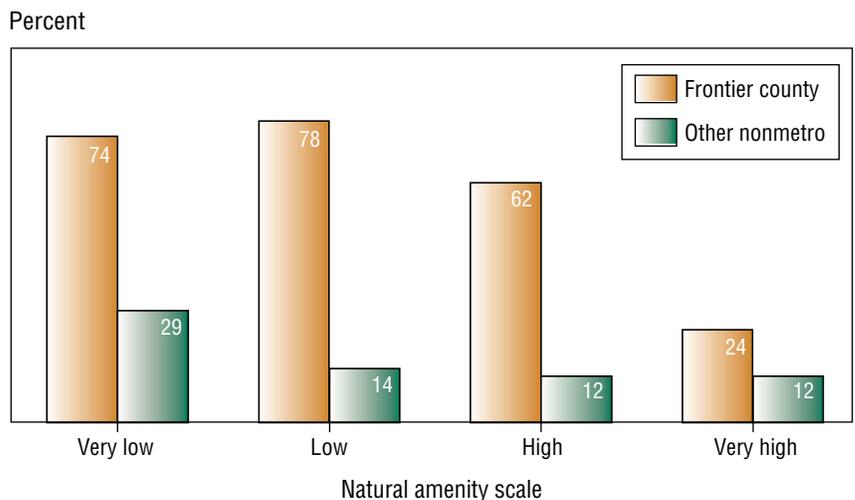
Some have expressed concern that promoting education in rural areas leads to outmigration and population loss. Areas with greater young adult high school completion rates than others did have a somewhat greater likelihood of population loss in 1990-2000. However, this appears to be entirely because these areas, many of them in the upper Midwest, were also areas low in natural amenities.

County poverty rates are highly related to young adult high school completion rates (the correlation coefficient between the two mea-

Figure 7

Proportion of counties classified as farm-dependent, by settlement type and natural amenities score

Dependence on farming is much higher for frontier counties than for other nonmetro counties, except in high-amenity counties

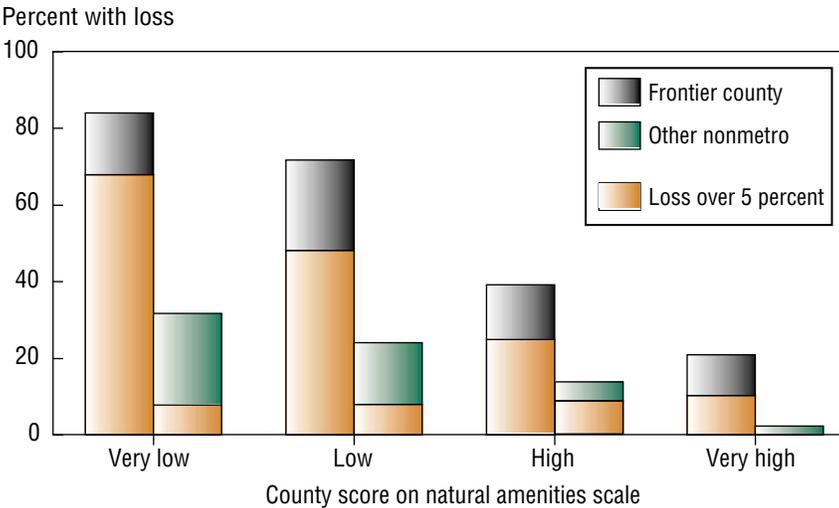


Note: Amenity scale categories "low" and "high" are within a standard deviation of the mean. Sources: Cook and Mizer (farm dependent); McGranahan (natural amenities).

Figure 8

Nonmetro county population loss, 1990-2000, by settlement type and natural amenities score

Two-thirds of the frontier counties with few natural amenities had high population loss in the 1990s



Note: Amenity scale categories "low" and "high" are within a standard deviation of the mean. Sources: McGranahan (natural amenities); U.S. Censuses of Population, 1990 and 2000 (population).

tures is -0.67 for nonmetro counties). As noted earlier, there was no overall relationship between poverty and population loss in 1990-2000. However, we created a measure of the difference between a county's poverty rate and the poverty rate predicted for the county based on its young adult high school completion rate. This measure was highly associated with population loss, indicating that the more a county's poverty rate exceeded the norm for counties with similar levels of young adult schooling, the greater the likelihood of population loss. While this is consistent with the economic model, the measure was much less predictive of population loss than were the geography measures.

Finally, the relationship between the proportion of elderly in the population in 1990 and subsequent population loss was strong in this analysis, stronger than the socioeconomic measure. However, it is not clear to what extent the

presence of a relatively elderly population creates conditions for population loss (such as an excess of

deaths over births) and to what extent it reflects conditions that produced population loss in the past and will continue to do so in future.

Why Some Low-Amenity Frontier Counties Gained Population

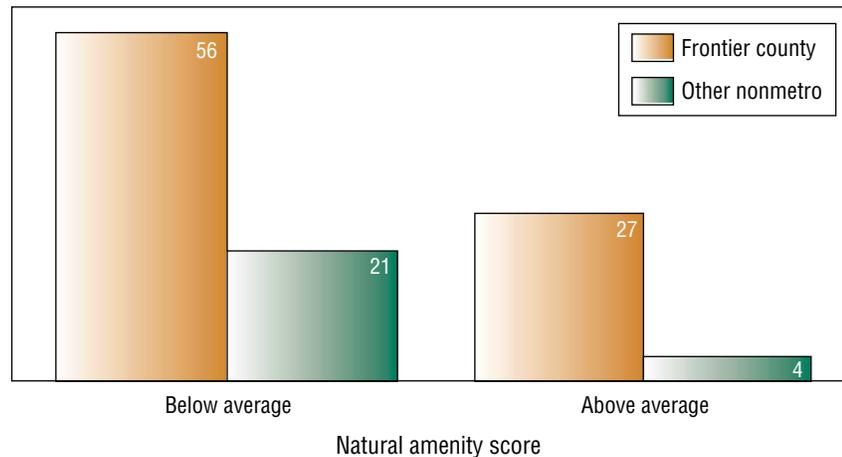
Counter to the prevailing trend, 56 (a quarter) of the low-amenity frontier counties gained population in the 1990s. For all but 12 of these counties, growth in the 1990s represented a turnaround from population loss in the 1980s. In fact, two out of every three of these counties lost over 5 percent of their population in 1980-90, so the turnaround represented a major shift. Are there lessons to be learned from these counties that might be applied to other low-amenity frontier counties? To answer this question, we examined various statistical sources and talked to many county extension agents.

Figure 9

Proportion of farm-dependent counties with high population loss, 1990-2000, by natural amenities and settlement type

Absent low amenities and frontier status, few farm-dependent counties had high population loss

Share of counties with loss over 5%



Sources: Cook and Mizer (farm-dependent); McGranahan (natural amenities); U.S. Censuses of Population, 1990 and 2000 (population loss).

While rural development experts emphasize local initiative and entrepreneurship, and these factors may have contributed to growth in some areas, there are virtually no examples where growth in low-amenity frontier counties cannot be attributed to an external agent or new condition. Nine of the counties, mostly in North Dakota, have substantial Native American populations and during the 1990s, new casinos opened in eight of these counties. In four low-amenity frontier counties, new jails or prisons added to the population, both through new jobs and because inmates are counted as part of the population. New meatpacking plants and auxiliary operations such as feed lots were instrumental in 14 counties. More often than not, their recent population growth was Hispanic, and the non-Hispanic population continued to decline. In one county, locally developed industrial agriculture—a new large hog farm—resulted in a rise in the Hispanic population only. In two low-amenity frontier counties that gained population, the influence of industrial agriculture was indirect: new meatpacking operations in neighboring counties prompted the movement of non-Hispanics out of those counties and into the counties in question.

In 11 of the 56 counties, mostly in Minnesota and Wisconsin, lake- or river-based seasonal recreation and second-home development played an important role. These areas do not attract national attention, but serve people living in the region. They are forested, with very little agriculture. The natural amenities scale did not pick up on the appeal of areas with many scattered lakes and ponds but little overall water surface area.

Measures in Logistic Regression of County Population Loss, 1990-2000

Measures	Source
Economic base	
Farming-dependent county (yes/no)	Cook and Mizer
Mining-dependent county (yes/no)	Cook and Mizer
Socioeconomic measures	
Average poverty rate, 1989 and 1999	1990 and 2000 Censuses of Population
Percent of young adults (ages 25-44) with high school diploma (1990)	1990 Census of Population
Geography	
Population density and its square Nonadjacent (yes/no)	1990 Census of Population Gelfi and Parker
Natural amenities scale score	McGranahan
Demography	
Percent of population age 65 and over	1990 Census of Population

Another nine counties, on Interstates or within commuting distance of a regional city, have gained population through rural sprawl. Others are special cases, such as religious migration, the damming of a river to form a new lake, or the expansion of a manufacturing plant. Thus, except where second-home development and recreation is concerned, virtually all cases of population growth in low-amenity frontier counties involved some situation external to the county or the creation of a major new employer such as a casino or prison.

The jobs created in these counties tended to be low-skill jobs—in meatpacking/feedlots, prisons, or casinos. This is probably part of the reason that, in over a third of the counties that gained population, the growth was confined to either Hispanic or Native American populations, while the non-Hispanic White population declined.

This is not to say that growth based on local enterprise development involving well-paying jobs is impossible. Roseau County, Minnesota (population 16,000), was the birthplace of the snowmobile industry in 1954 and now has over 5,000 manufacturing jobs. But this type of growth is clearly a very rare event.

In general, an examination of the low-amenity frontier counties that gained population during the 1990s reinforces rather than weakens the finding that thinly populated areas are difficult to live or do business in, absent compensating natural amenities. In many cases, county growth could be attributed to either proximity to a city or natural amenities not captured by our scale. In some cases, simply having a small lake has been enough to stem or even reverse population decline. For almost all other cases, industrial agriculture, casinos, or prisons were responsible for the growth. These have limited applica-

bility to other areas. Industrial agriculture usually needs to be embedded in an area where corn or other feed grain can be raised, casinos are largely confined to Native American locations, and prisons, one hopes, are now less of a growth industry.

Summary and Conclusion

U.S. national prosperity in the 1990s did not extend to many of its rural areas. Poverty remained high in many rural (nonmetro) counties and roughly a quarter lost population over the decade. For about half of the counties losing population, the loss exceeded 5 percent.

Poor economic conditions are clearly not the central factor: rural counties with high poverty were no more likely to lose population in 1990-2000 than were other rural counties. An argument can be made that declining employment in agriculture and other resource-based industries is a major cause of rural population loss. Counties largely dependent on farming have been much more likely to lose population than other counties. But what distinguishes farm-dependent counties from other rural counties is less the presence of farming than the absence of nonfarm activities. Farm-dependent counties are more likely to be remote from metro areas, to have low population density, and to lack natural amenities. These characteristics, which discourage other types of development, account for much of the population loss in farm-dependent counties.

Low-amenity frontier counties are not the only ones to undergo high population loss in the 1990s. Some high-poverty counties along the Mississippi and in Appalachia lost population, as well as a few scattered counties in the North

where poverty rates are high, given the relatively high education levels. Also, some farm counties in western Iowa and southwestern Minnesota had high population loss. These farm counties all score low on the natural amenities scale, but either had enough residents to be above the low-density threshold used here or are adjacent to small metro areas.

The analysis presented here suggests that low-amenity frontier counties are facing difficult choices. Unless they can find a means to develop a recreation industry, they

must deal with either industrial agriculture or continued population loss. Either of the last two courses would put pressure on services, the first through the need to serve an immigrant population, and the second through further declines in the number of people served. While the Internet and other information technologies can help reduce the problems of isolation, it seems unlikely that the preference rural Nebraskans expressed for living in a more densely settled location will go away.^{RA}

For Further Reading . . .

Don E. Albrecht, "The Renewal of Population Loss in the Nonmetropolitan Great Plains," *Rural Sociology*, Vol. 58, No. 2 (Summer), 1993, pp. 233-246.

John C. Allen and Rebecca Filkens, "Optimum Rural Community Size: Relationships Between Community Attributes and Residential Preference." Department of Agricultural Economics and Center for Rural Community Revitalization and Development, University of Nebraska-Lincoln, unpublished manuscript, 2000.

Calvin L. Beale, "Nonmetro Population Growth Rate Recedes in a Time of Unprecedented National Prosperity," *Rural Conditions and Trends*, Vol. 11, No. 2, 2000, pp. 27-31.

David L. Brown, Glenn V. Fuguitt, Tim B. Heaton, and Sabra Waseem, "Continuities in the Size of Place Preference in the United States, 1972-1992," *Rural Sociology*, Vol. 62, No. 4 (Winter), 2000, pp. 408-428.

Peggy J. Cook and Karen L. Mizer, *The Revised ERS County Typology*, Rural Development Research Report No. 89, Economic Research Service, U.S. Department of Agriculture, 1994.

Dayton Duncan, *Miles from Nowhere: Tales from America's Contemporary Frontier*, New York: Penguin Books USA, 1993.

Linda M. Ghelfi and Timothy S. Parker, "A County-Level Measure of Urban Influence," *Rural Development Perspectives*, Vol. 12, No. 2, 1997, pp. 31-41.

Robert Gibbs and John B. Cromartie, "Low-Wage Counties Face Locational Disadvantage," *Rural Conditions and Trends*, Vol. 11, No. 2, 2000, pp.18-26.

Kenneth M. Johnson, *The Rural Rebound*, Washington, DC: Population Reference Bureau, 1999.

David A. McGranahan, *Natural Amenities Drive Rural Population Change*. AER-781, Economic Research Service, U.S. Department of Agriculture, 1999.