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Net Migration in the Great Plains Increasingly Linked to Natural Amenities and Suburbanization

Over 90 percent of counties in the Great Plains experienced an upward trend in net migration from the mid-1980's to the mid-1990's, in the form of lower net outmigration, higher net inmigration, or a switch from out- to inmigration. Net outmigration persisted in sparsely settled, isolated areas and in areas where jobs depended on the extraction of energy resources. However, migration in the mid-1990's was associated less with rural-urban location and employment and more with increased commuting from suburban fringe counties and movement to the few areas in the region with high natural amenities.

Net migration—the difference in the number of people moving to and from a given area in a given time period—added population to the Great Plains region in recent years, following several years of losing population. More people are moving into the region than leaving, but since migration rates vary considerably from county to county, the potential benefits of population and job growth associated with net inmigration are not spread evenly over the landscape. A majority of counties, especially those far from metro areas and those with little or no urban population of their own, continually lost population from net outmigration during 1994-96.

County-level net migration is increasing in the Great Plains in response to changes taking place within and outside the region, but in ways distinctly different from the rest of the country. Several factors account for the recent upturn. First, unlike other U.S. regions, urbanization continues to explain much of the overall net migration pattern in the Great Plains, although the strength of the association weakened between the 1980's and 1990's. Sparsely settled sections in the Great Plains continue to lose population to nearby cities and larger cities outside the region. Second, a small number of counties with high natural amenities, such as warm climates and varied topography, have attracted larger numbers of new residents, whether rural or urban. Third, to a degree not found elsewhere, large portions of the Great Plains remain dependent on place-specific natural resources, having never developed a manufacturing base other than one related to agriculture. Direct, nonproprietor employment in farming is now so low as to have minimal effect on migration patterns, even in the Great Plains, but the latest round of downsizing in the oil and gas industries explains much of the continued net outmigration. Fourth, nonmetro counties within commuting distance to large urban centers increased their net migration share considerably between the 1980's and 1990's as suburbanization expanded.

Widespread population growth is underway in much of nonmetro America, mostly as a result of favorable net migration. In many fast-growing sections of the country, emerging migration patterns coincide with economic growth, which is associated with the residential and recreational attractiveness of natural amenities rather than with the extractive value of natural resources or production-related advantages. Owing to the diversity of nonmetro America, it is important for regional policymakers to understand the causes of demographic changes in such settings as the Great Plains. The Great Plains is unique because of its long history of net outmigration, especially from rural, isolated districts, its continued concentration of population into metro areas and moderately sized non-

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metro cities, its continued economic dependence on agriculture and mining, and its limited natural amenities.

Areas in the Great Plains have traditionally built their economies on advantages in natural resources important to agriculture and mining (including oil and gas). Long-term productivity increases in agriculture, and more recently in mining, have caused these industries to require fewer workers over time, as reflected in employment declines and six decades of almost continous population loss. New economic activities evolved in parts of the Great Plains based on production factors important to manufacturing, such as low wages and abundant land, but never as strongly as in other parts of the country. Many communities in the Great Plains failed to develop a manufacturing base as an alternative to agriculture during the rural manufacturing growth spurt of the 1960's and 1970's. Additionally, natural amenities—the basis for tourism and recreation—have always been important to rural growth, but their role is increasing as a result of increasing locational flexibility on the part of firms and households. The effect of urban concentration on migration is decreasing and that of natural amenities is increasing, as more and more people are able to act upon their preferences for high-amenity, rural settings. Challenges to building and maintaining sustainable economic growth are formidable in the large number of rural communities in the Great Plains that have not attracted manufacturing industries and cannot serve as bedroom communities or tourist destinations.

The following section begins with an overview of metro and nonmetro net migration trends in the Great Plains, 1970-96, followed by a more detailed comparison of two 3-year periods, 1984-86 and 1994-96. (See "Measuring Net Migration" for a summary of data sources.) Separate analysis of the mid-1980's and mid-1990's shows the changing importance of urbanization, natural amenities, employment, and commuting in explaining patterns of net migration in this region.

Great Plains Net Migration Rebounded in the 1990's

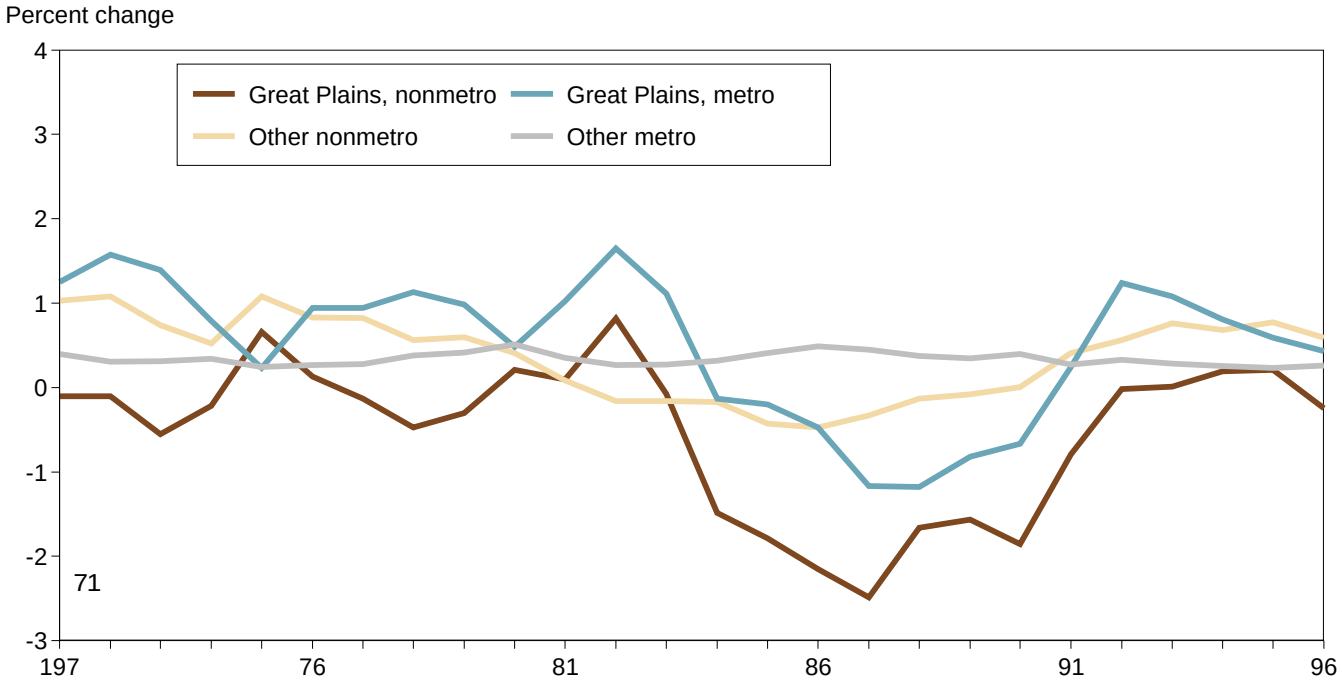
The Great Plains is home to 10.8 million people spread across nearly one-fifth of the Nation's continental territory (see fig. 2, p. 4). The region contains only one metro area with more than 1 million people (Denver) and one-quarter of the region's population lives in nonadjacent nonmetro areas compared with one-twelfth for the rest of the Nation. Metro residents in the Great Plains are much more likely to reside in cities below 250,000 (such as Bismarck, Casper, and Amarillo) than is true for metro residents elsewhere.

In the 1970's, net migration for the nonmetro Plains as a whole hovered around zero (fig. 1), as movement into

Figure 1

Annual net migration rates by region and county type, 1970-96

Population loss from net migration in the nonmetro Great Plains exceeded 2 percent in mid-1980's and has since recovered



Note: Metro areas defined as of June 1993.

Source: Calculated by ERS using data from the Bureau of the Census and the University of Wisconsin-Madison.

Table 1

Net migration rates by rural-urban category, Great Plains and rest of United States, 1984-86 and 1994-96

Most categories switched to positive population growth in the Great Plains during the 1990's

Rural-urban category	1984-86 Great Plains	1984-86 Other United States	1994-96 Great Plains	1994-96 Other United States
	Percent			
Metro area with population > 1,000,000	-0.20	0.52	1.07	0.14
Metro area with population 250,000-1,000,000	-.34	.41	.52	.46
Metro area with population 50,000-250,000	-1.16	.04	.28	.39
Nonmetro, adjacent to metro	-1.96	-.15	.37	.78
Nonmetro, not adjacent to metro, urban population > 20,000	-1.74	-.46	-.46	.28
Nonmetro, not adjacent to metro, urban population 2,500-19,999	-2.50	-.90	.19	.59
Nonmetro, not adjacent to metro, completely rural	-2.19	-.77	-.06	1.00

Source: U.S. Bureau of the Census.

mining and some irrigated farming areas tended to offset losses from dry farming and ranching areas. In the 1980's, though, net outmigration developed and deepened to more than 2 percent annually by 1987. The rest of the nonmetro United States lost population from net outmigration as well, but at much more modest levels. Only at the beginning of the 1990's did net outmigration from the Great Plains moderate significantly. This happened quickly, and in the early 1990's net outmigration reversed to net inmigration until 1996. Thus, the Great Plains region has participated in the general rebound of U.S. rural and small town population growth since 1990, albeit at a lower rate than is true elsewhere.

Metro areas in the Great Plains showed consistently higher population growth from migration than the nonmetro areas during 1970-96, but even they experienced net outmigration in the 1980's. They recovered during the 1990's, although net inmigration rates peaked in 1992 with lower increments since then. This falloff is at least partly caused by accelerated outmigration from the many metro areas in the region with military bases.

Rural-urban migration patterns are changing in the Great Plains, in ways distinctly different from the rest of the country, as seen in comparisons of average annual rates of net migration for 1984-86 and 1994-96 (table 1). (See "Measuring Net Migration" for a discussion of the rural-urban categories used here.) Rural-urban net migration in the Great Plains followed a pattern similar to that of the rest of the country during the 1980's. In both cases, migration rates were highest in the most urban category (metro areas with 1,000,000 or more people) and generally decreased with urban size. All types of counties were losing population through net outmigration in the Great Plains, and losses in nonmetro categories were especially high compared with other parts of the country.

In the 1990's, the Great Plains continued to show concentrating tendencies, especially into the Denver metro area from the more sparsely settled parts of the region, while the rest of the Nation saw widespread movement from big cities to rural territory. Nonadjacent, completely rural nonmetro locations were the fastest growing rural-urban category elsewhere during 1994-96, but in the Great Plains, these areas continued to lose residents. However, within all rural-urban categories in the Great Plains, growth was higher in the 1990's and differences among categories diminished. Migrants still favor large urban areas in the Great Plains, but the rural-urban movement has weakened somewhat.

Net outmigration is still the pattern in most Great Plains counties, especially in very rural and/or agriculturally dominated areas (fig. 2). Where losses continue, they have typically been smaller than was true of the 1980's. Exceptions include counties in southwest Kansas where the meatpacking industry grew rapidly in the 1980's and has since leveled off and oil and gas areas in western Texas. Much of the nonmetro net inmigration during the 1990's is accounted for by counties along the western edge of the region, a mixture of areas growing from commuting to larger centers or from proximity to outlying mountainous enclaves that have attracted newcomers, such as the Black Hills in southwestern South Dakota or the Big Horn Mountains in north-central Wyoming.

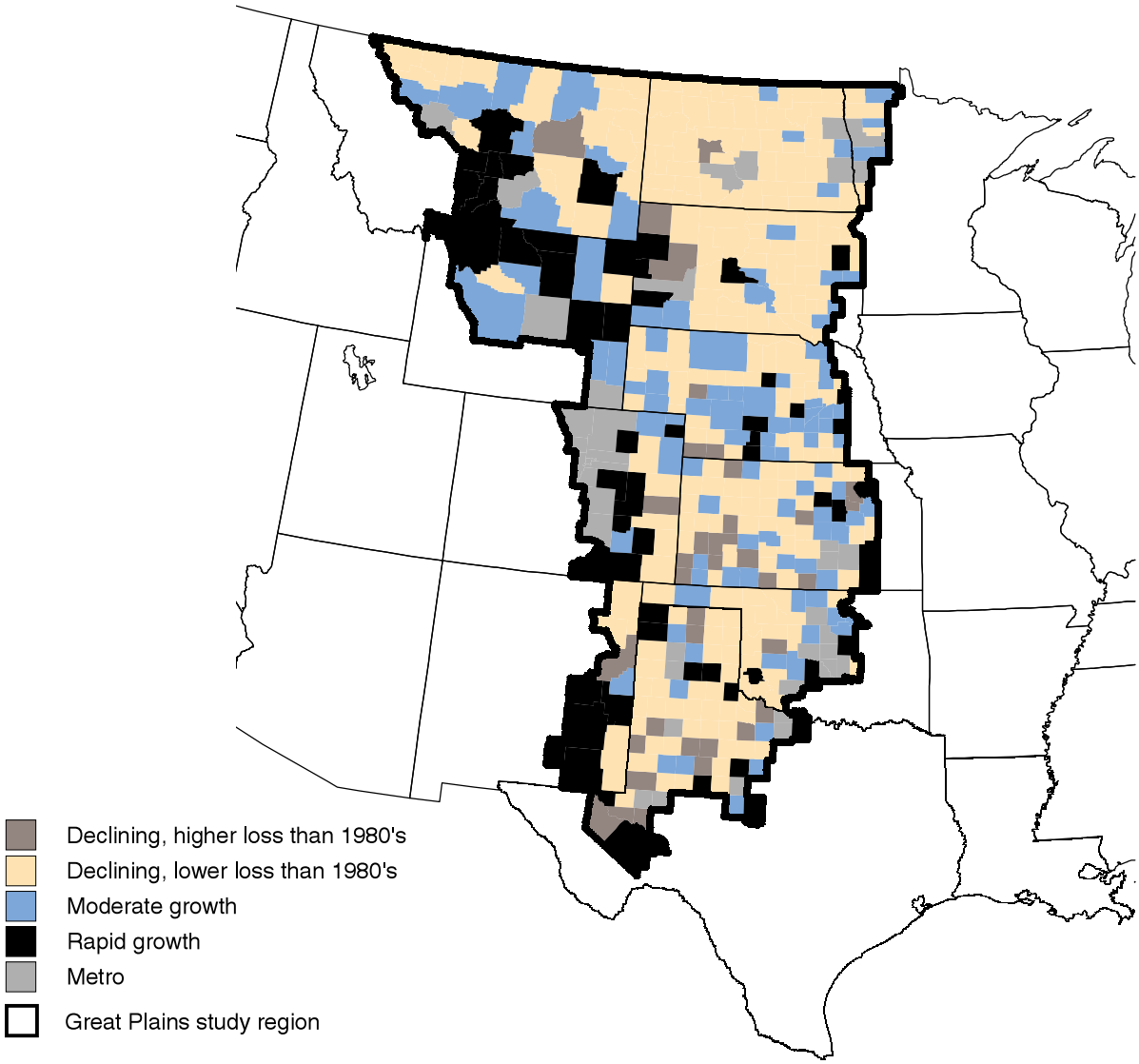
Natural Amenities and Commuting Account for an Increasing Share of Net Migration Growth in the Great Plains

Although net migration levels continue to be lower in the Great Plains than elsewhere, with sparsely settled, outlying districts still losing more residents than they gain, a distinct and widespread upturn in net migration rates

Figure 2

Nonmetro population change from net migration, 1990-96

Most Great Plains counties continue to lose residents, but not as many as in 1980's



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

Measuring Net Migration

The basic units of analysis were 478 metro and nonmetro counties comprising the Great Plains (see "What is the Great Plains?"on p. 5 for a delineation of the Great Plains). Annual estimates of county net migration were obtained from the Bureau of the Census for 1990-96 and from a special file created from Census Bureau data by Glenn Fuguitt at the University of Wisconsin-Madison for 1970-89. Annual net migration rates were expressed as the percentage change in population from net migration during the given year. Migration was measured from July to July except in the decennial census years (1970, 1980, and 1990) when migration was measured from April to July of the following year; rates were adjusted to account for the extended time period. To compare trends over time, average annual net migration rates were calculated for two 3-year periods: 1983-84, 1984-85, and 1985-86 (referred to as 1984-86, for short) and 1993-94, 1994-95, and 1995-96 (1994-96).

Rural-urban location within the Great Plain's settlement system was measured using the Economic Research Service's Rural-Urban Continuum Code, a 10-level refinement of the 1993 Metro Area system. Some categories were combined for this analysis, resulting in three metro and four nonmetro levels. Metro areas are distinguished on the basis of population size, while nonmetro categories are based on adjacency to metro areas and size of the urban population. A series of dummy variables was created for the regression analysis, with the largest metro category serving as the reference.

Natural amenities are measured using a single index, also created at the Economic Research Service, combining normalized measures of climate, topography, and the presence of bodies of water. The index of climate attractiveness is defined using January temperature, number of days with sun in January, July temperature (expressed as a residual when regressed against January temperature), and July humidity. Topography is defined as the difference between an index of mountainous or rugged terrain and average elevation. The presence of bodies of water is measured using the percentage of land area covered by water.

Employment structure is measured using four-digit Standard Industrial Classification (SIC) of employment by county, provided by the Bureau of Labor Statistics in a data series known as ES-202. Data include only workers covered by State unemployment insurance and Federal unemployment compensation. Sole proprietors are not included. Data for Wyoming were not available so it was excluded from the regression analysis (but included in the descriptions of migration trends).

The advantage of ES-202 data compared with other employment and earnings series is the four-digit detail. In comparison with the 10 sectors derived from 1-digit SIC codes, this breakdown more accurately divides industries along lines in which current economic restructuring is taking place. The variables measure the average annual number of employees in each of the economic sectors as a percentage of total employment in the county. Employment data for 1984 were used for modeling 1984-86 migration, while data for 1993 (the latest available at the time of the analysis) were used for modeling 1994-96 migration.

Counties with high levels of commuters were distinguished by measuring the percentage of the working population who worked outside their county of residence in 1990.

occurred between the mid-1980's and mid-1990's. Several possible explanations account for this upward trend:

Urbanization. Migration appears to be strongly associated with continued urbanization in the Great Plains, at a time when other parts of the country are decentralizing. The Denver metro area is growing from migration at twice the rate of other metro categories in the region, which in turn are growing at twice the rate of nonmetro categories (table 1). Nonmetro counties with large cities attract or retain far fewer migrants than larger metro centers. Sparsely settled counties with at least a small urban center have net inmigration on average, while those without a center are still losing residents.

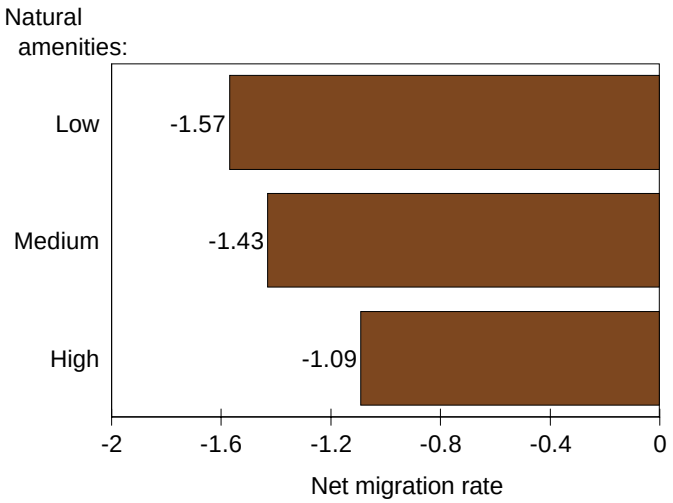
Natural Amenities. Despite the lack of extensive territory with high natural amenity endowments, the physical qualities of the landscape associated with recreation and tourism may be assuming greater importance in explaining net migration patterns in certain sections of the Great Plains. A relatively small number of counties with attractive physical qualities, as measured by climate, topography, and presence of lakes or streams, captured a larger share of net migration in the 1990's than in the 1980's (figs. 3 and 4). High-amenity counties are typically found where the Great Plains meet the Rocky Mountains along the western edge of the region, and in Southern States with warmer climates. Many of the fastest growing metro centers are located along the front range of the Rocky Mountains, thus urbanization and high-amenity growth are to some extent overlapping.

Jobs. Changing employment patterns may also alter net migration rates. In the past, the reduced demand for agricultural labor and the lack of alternative employment provided the primary impetus for outmigration from the Great Plains. Many counties in the Plains depend on agriculture, where increases in productivity and land retirement have reduced manpower needs. Where an alternative industry exists, it is usually mining, as seen in the oil and gas fields of Texas, Kansas, or the Williston Basin in North Dakota, or the low-sulphur coal operations in the northern Plains. But collectively, jobs in mining were also retreating since 1982. Portions of the Plains thus took a double economic hit. If these industries are contributing as much to outmigration in the 1990's as in the 1980's, then other factors would have to account for the increase in net migration between decades, such as manufacturing

Figure 3

Average annual net migration rates in the Great Plains by level of natural amenities, 1984-86

Low-amenity counties lost more residents in the 1980's...



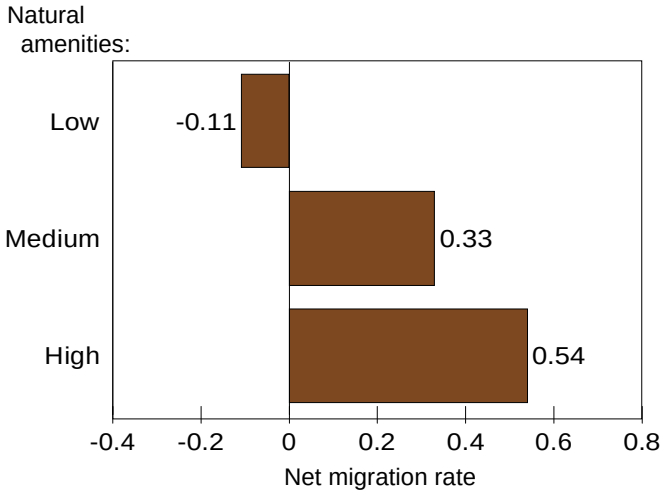
Note: Natural amenities are measured using the ERS natural amenities index. See p. 31 for a definition. The high and low categories measure the net migration rate for the 25 percent of counties with the highest and lowest natural amenities, respectively.

Source: Calculated by ERS using data from the Bureau of the Census and the University of Wisconsin-Madison.

Figure 4

Average annual net migration rates in the Great Plains by level of natural amenities, 1994-96

...and continued to decline as higher amenity areas switched to net inmigration in the 1990's



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and service jobs, which have been increasing in certain areas of the Great Plains and may be exerting a positive effect on net migration.

Commuting. Anecdotal evidence suggests that an increasing number of urban workers in the Great Plains are choosing to live and raise families outside city environments to take advantage of real or perceived rural amenities, such as cheaper land and housing, better school systems, lower crime, and a less hurried, more personal social atmosphere. Increased long-distance commuting between the 1980's and 1990's would increase net migration rates in sparsely settled, newly suburbanizing territory on the fringes of the region's cities.

The Changing Importance of Factors Explaining Migration. The relative importance of urbanization, natural amenities, and commuting on net migration changed considerably between the 1980's and 1990's while job-related factors did not (figs. 5 and 6). These statistics are calculated using ordinary least squares regression, a technique that includes several possible explanatory variables at the same time in measuring their influence on the dependent variable. In this case, the dependent variable is the average annual rate of net migration in the Great Plains, analyzed separately for 1984-86 and 1994-96, and the explanatory variables are a set of county characteristics measuring rural-urban location, natural amenities, employment patterns, and commuting (see "Measuring Net Migration").

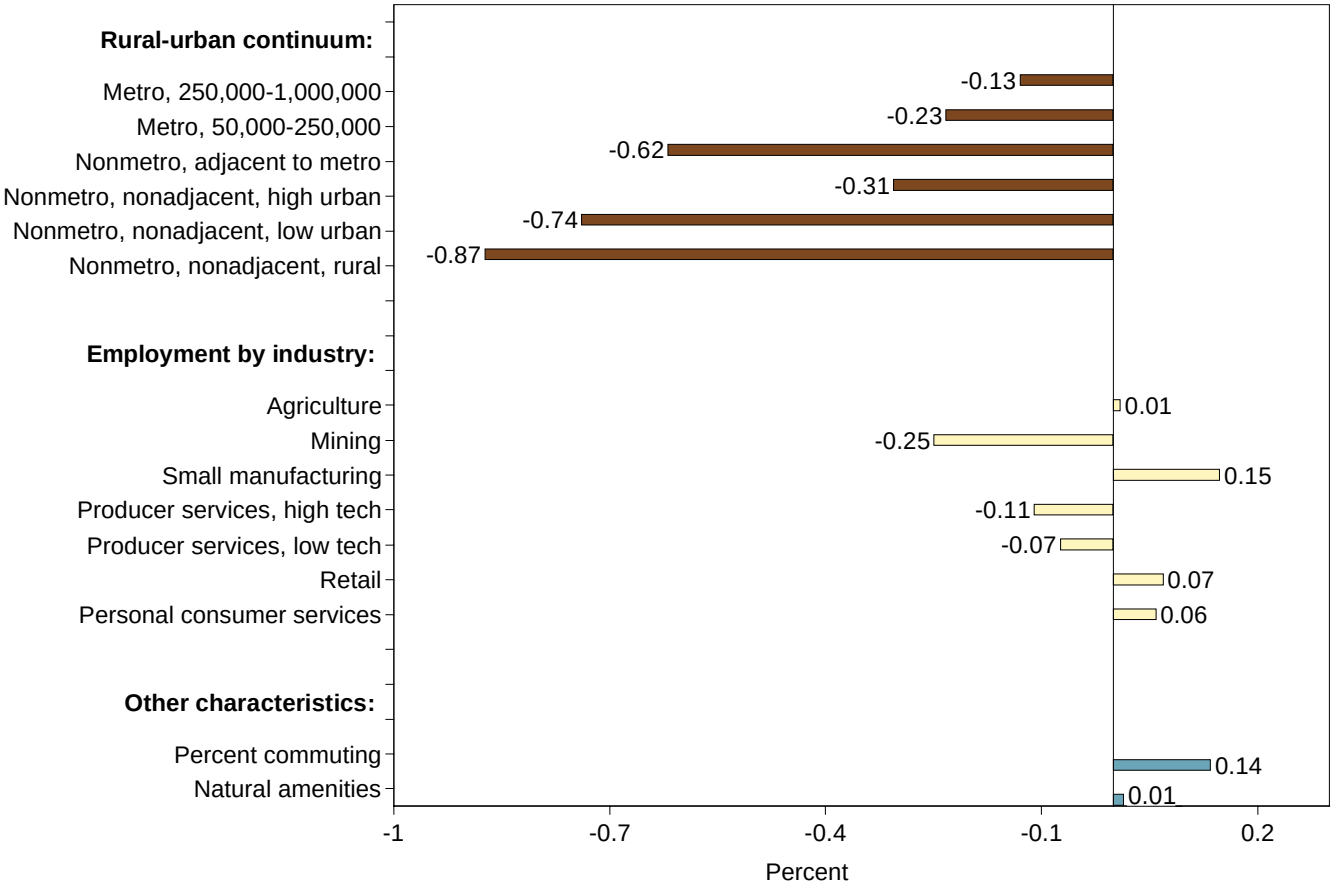
Net migration was strongly associated with concentration along the rural-urban continuum in the 1980's (fig. 5). The fact that all values for the rural-urban continuum fell below the zero line means that every type of area was losing residents relative to the region's largest metro area, Denver, which serves as a reference category. Not only were places losing out to Denver, but the amount of loss increased from the most urban to the most rural places. During the 1980's, the choices migrants made contributed to the relocation of population toward the higher end of the urban spectrum. The effects of other factors were small compared with urban concentration. The next strongest effect came from the push factors associated with areas dependent on mining and the pull factors in areas with high levels of small-scale manufacturing and high levels of commuting. Employment on farms had reached such low levels that its effect on net migration was almost nonexistent, even at the height of the 1980's farm crisis.

In the 1990's, the relative importance of rural-urban location in explaining net migration fell off while the influence of natural amenities and commuting increased dramatically (fig. 6). Denver still outperformed the rest of the region, as indicated by the negative values for the

Figure 5

Effect of county characteristics on average annual net migration rates in the Great Plains, 1984-86

Net migration decreased with urban influence and mining, increased with small-scale manufacturing in the mid-1980's



Source: Produced by ERS using data from the Bureau of the Census, the University of Wisconsin-Madison, and the Bureau of Economic Analysis.

rural-urban continuum categories. However, the effect of urbanization relative to other factors dropped considerably, and there was no longer a clear hierarchical pattern from most to least urban as was apparent in the 1980's. The most rural, isolated areas remained as the only part of the Great Plains still losing a significant share of migrants relative to Denver in the mid-1990's. The combination of low population density and physical isolation still appears to create a set of conditions conducive to high outmigration, independent of other explanatory factors, such as the negative effect of a strong dependence on mining.

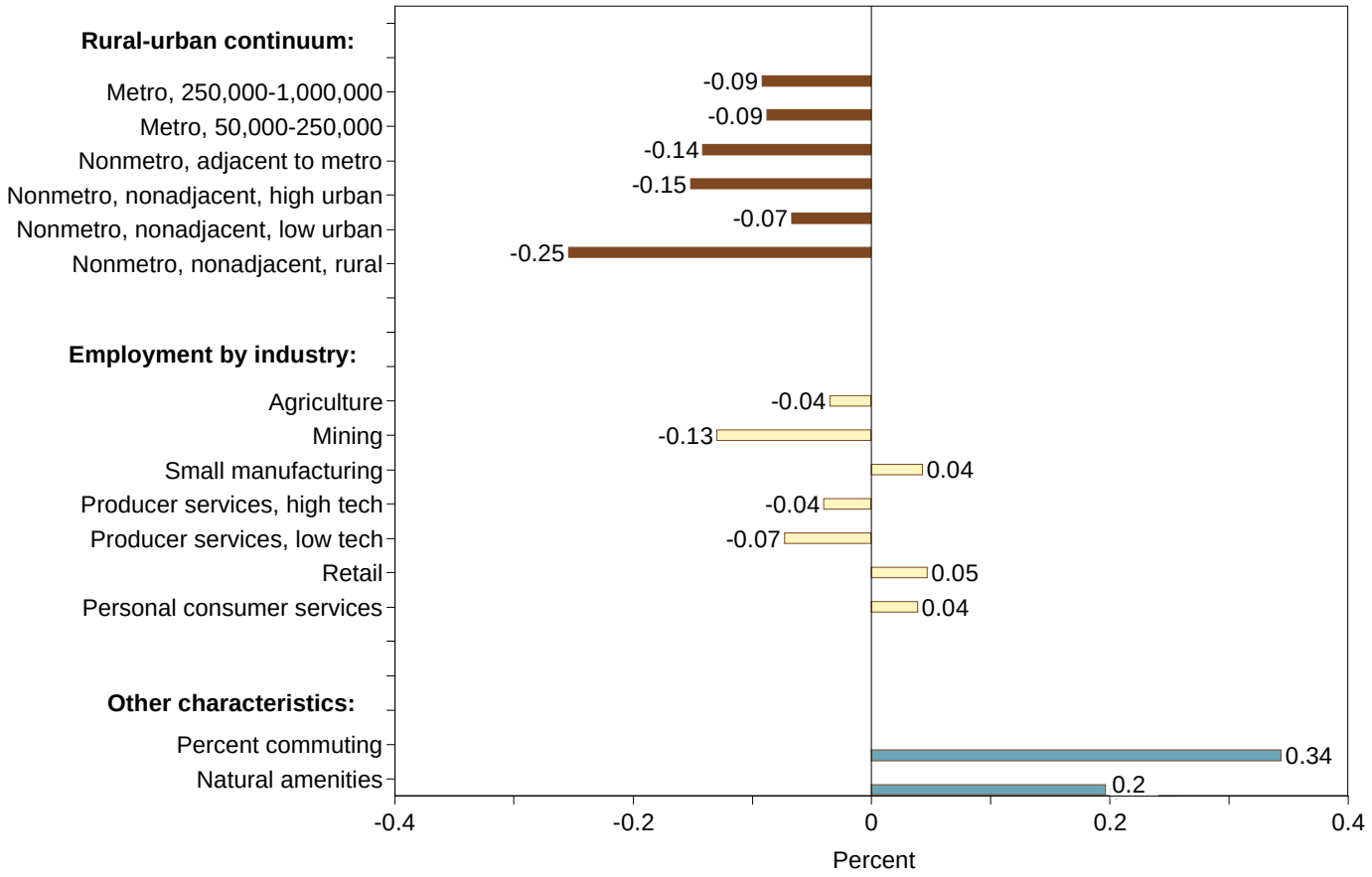
The most notable changes between decades were the dramatic increases in the relative effects of both commuting and natural amenities in explaining net migration. Long-distance commuting in the Great Plains increased to the point where the location of bedroom communities was the most important factor explaining net migration patterns in the mid-1990's. The fastest-growing places in the region can be found on the urban fringes. Physical qualities conducive to recreation are limited in the Great Plains relative to other regions of the country, such as the Rocky Mountains. Nonetheless, more migrants were attracted to the region's natural amenities in the 1990's than previously; the index used to measure natural amenities shifted from having no effect on net migration in the 1980's to having the second largest positive effect on net migration after the effect of commuting.

The effect of nonproprietor agricultural employment on net migration switched from positive in the 1980's to negative in the 1990's, but both were so small that it would be more accurate to interpret the relationship as zero in both time periods. The same could be said for the other employment sectors, with the exception of small-scale manufacturing, which encouraged net inmigration in the 1980's but had little effect in the 1990's, and mining, which had an equally negative effect on migration in both decades. High employment in the retail and personal

Figure 6

Effect of county characteristics on average annual net migration rates in the Great Plains, 1994-96

Migration moved into scenic areas and bedroom communities in the 1990's



Source: Produced by ERS using data from the Bureau of the Census, the University of Wisconsin-Madison, and the Bureau of Economic Analysis.

consumer services sectors are often associated with areas with high natural amenities, but the amenities themselves and not the jobs seem to be attracting migrants to these areas at the moment. As these areas grow, more of the migrants will probably be attracted by the jobs opening up to serve the growing population base as well as the nice scenery and recreational opportunities. If so, employment in amenity-related service sectors may become increasingly associated with net migration in the Great Plains, mitigating to some degree the effect of the natural amenities themselves.

For Further Reading . . .

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