Society & Natural Resources, 13: 185-202, 2000

0894-1920/00 $12.00 +.00

Tourism Dependence in Rural America: Estimates and Effects

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reshaping rural America. Efforts to evaluate the effects of such development are complicated because residents and nonrecreation visitors also use the businesses that are affected by recreation and tourism visitors. We present a method for estimating in nonmetropolitan counties jobs and income that are generated by recreation and tourism visitors from outside the county. Several different techniques are used to (1) cluster similar counties, (2) account for the portion of tourism sector employment that serves local residents, and (3) account for the portion of export activity that serves nonrecreation visitors. Finally, we address the consequences of recreation dependence in rural counties. The counties most dependent on nonlocal tourism activity are compared to other rural counties on income, population, economic structure, and housing variables.

Keywords economic structure, minimum requirements, nonmetropolitan counties, recreation dependence, rural development, tourism dependence

Natural resources provide the amenity base for a rising level of tourism in rural America. Over the past 50 years, many amenity-based rural communities have shifted from an economy based on manufacturing to one driven by retail and service sectors. Tourists seeking natural resource-based settings, tranquility, and adventure have affected rural economies by injecting new dollars into local businesses, supporting local tax bases, and creating increased demands for locally available land, labor, and capital. With regard to recreational use of natural resources, tourist expenditures create local demands for traded goods and services, thus creating jobs

Received 12 May 1998; accepted 29 March 1999.
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and income for local residents (Johnson and Moore 1993; English and Bergstrom 1994).

However, the quality of life in such rural communities is often a point of contention between long-time residents and newcomers, especially as communities become very dependent on tourism (Rothman 1998; Green et al. 1996). Whether the change to increased dependence on recreation and tourism has been beneficial is a tricky empirical question. Many key socioeconomic issues related to tourism development remain unanswered. For example, what is the relation between recreational land use and local tourism business activity? How does tourism affect the level or distribution of residents' income in heavily impacted communities? Such questions are the basis for discussing public policy effectiveness in land management and community development.

Public agencies at all governmental levels are concerned with the answers to these and similar questions. An outgrowth of this concern is that the effects of land management decisions on resource-dependent rural communities are incorporated explicitly in the planning processes of these agencies (USDA-Forest Service 1995). Unfortunately, evaluating the rural development consequences of management efforts related to natural resource-based tourism can be somewhat difficult. Many of the businesses that cater to tourists also serve local residents, thus making it difficult to determine how much economic activity is directly due to nonresident visitors.

Although tourism is rather ill-defined from an industrial perspective (Leiper 1979, 1990; Smith 1987), geographers and regional economists have developed workable definitions that allow secondary data to be used in assessing tourism dependence (Johnson and Thomas 1990; Brown and Connelly 1986; Leatherman and Marcouiller 1996a). Most expenditures made by tourists fall into one of four economic sectors: lodging (including hotels, motels, campgrounds, and inns), eating/drinking (restaurants and bars), retail (grocery stores, gas stations, and gift shops), and recreation services (ski areas, golf courses, and amusement parks). In rural areas near large public land holdings, it is not uncommon for a large portion of the economic activity in these sectors to be caused by tourists and other visitors to the area. Given that recreation-based nonmetropolitan counties have experienced three times the rate of net migration as compared to nonmetropolitan areas as a whole (Beale and Johnson 1998), rural communities endowed with natural amenities will likely experience growing local demands on service and retail businesses.

A key difficulty with defining the level of dependence on resource-based tourism is that standard sector aggregates combine receipts from residents with those originating from nonlocal (or export-base) visitors. Certainly, some of the jobs and income in these sectors result from spending by local residents. Some also result from spending by visitors on trips for purposes other than resource-based tourism, such as for business, or for family matters. It is not always easy to determine what proportion is due to tourism, since visitation figures are typically unavailable or unreliable. Separating amenity-based (or recreational) travel from resident spending or business travel is a critical step in estimating usable causal relationships between local natural amenities and tourism dependence.

Also, the type of tourism in rural areas across the United States exhibits wide variation. Activities range from nature-based tourism characterized by guides and outfitters (such as that surrounding the Boundary Waters Canoe Area) to highly developed recreational services and amusements (such as around the Wisconsin Dells). The economic characteristics of tourism along this spectrum need to be incorporated into analyses of tourism dependence.

In this article, we test some sociodemographic hypotheses with respect to nonmetropolitan counties that are generally more dependent on resource-based tourism. We present estimates of the amount of economic activity caused by nonresident recreation and tourism visitors to rural counties in the United States, and compare counties that are most dependent on these visitors to counties that are not for several measures of income, economic structure, housing, and population characteristics. In defining recreation and tourism dependence, we extend traditional methods to focus only on the amount of economic activity in recreation and tourism sectors that is due to nonresident tourism demand. That is, we discount the economic activity generated both by local residents and by nonresidents who travel for purposes other than resource-based tourism. Further, we link this tourism dependence with components of economic structure relevant to discussions of local community development.

Defining Recreation Dependence

Researchers at the U.S. Department of Agriculture (USDA) Economic Research Service (ERS) developed a typology of nonmetropolitan counties in the United States for use in policy analysis, and described their economic dependencies (Bender et al. 1985; Hady and Ross 1990). Initially, the typology used included eight classes of rural policy counties: agriculture, federal lands, government, manufacturing, mining, poverty, recreation, and retirement. However, because only 63 counties were classified as recreation dependent, this category was dropped from further analysis (Ross and Green 1985). In these efforts, recreation dependence was defined as having at least 10% of total employment or labor/proprietor income in eating/drinking places, hotels and other lodging, and amusement establishments.

More recently, Beale and Johnson (1998) used another method to define recreation-dependent nonmetropolitan counties. This work confirmed earlier research (Johnson and Beale 1994) that suggested population growth was noticeably higher in areas with greater levels of recreation resources. Several indicators were used to define dependence. The first was if a county was at least two-thirds of a standard deviation above the national mean on any two of three measures: (1) percentage of employment in 1980 in entertainment, recreation, and personal services; (2) percentage of earnings income in 1980 in amusement, recreation, and lodging; or (3) percentage of housing units in 1980 that were vacant and held for recreation, seasonal, or occasional use. The second measure was if per capita spending on hotels, motels, trailer parks, and camps exceeded $100 in 1982. Individual examination of counties that qualified on either measure ensured that only those with documented recreation resources were retained. This process identified 285 counties as recreation dependent, with geographic concentrations in New England and upstate New York, near the Ozarks, the southern Appalachians, and in the West. Other concentrations occurred in nonmetropolitan coastal counties and the upper Great Lakes.

Beale and Johnson's approach improved on the ERS method by broadening the array of structural economic components, and including a more flexible set of criteria for determining the dependence threshold. However, neither method distinguished among various sources of demand that generated the levels of economic activity which classified a county as recreation dependent. Other USDA initiatives have attempted to develop local indices of amenity presence (Kusmin et al. 1996) and explain amenity migration (Nord and Cromartie 1997). In those two efforts,

amenity indices were constructed based on climate, topography, water resources, and other amenities.

The approach reported in this article builds directly upon these previous efforts, but extends them to more closely estimate the effects of nonlocal recreational spending. Extensions include identifying like resource-based regions and applying an export-base estimator known as minimum requirements. Cluster analysis on primary resource-based factors allows more clear specification of tourism type. Applying minimum requirements leads to a more specific estimate of the nonresident component of service and retail sector activity than is found in either the Beale and Johnson or the Kusmin et al./Nord et al. approaches. To clarify the relation of our approach to previous work, it is useful to review the conceptual framework for this type of research.

Conceptual Model

Rural development research treats recreation and tourism as export activities (Dawson et al. 1993; English and Bergstrom 1994). That is, economic growth and development comes from increases in "exporting" goods and services to nonresident visitors. The effects of local demand are generally discounted as representing only transfers of money within the economy. Thus, tourism dependence should be defined with reference to export employment. Therefore, total employment (E) in a county in a tourism-related sector equals employment that serves local demand (E_L) plus employment that serves export demand (E_X). However, visitors to the county on nontourism trips also spend money in tourism-related businesses such as for hotels and food. Many such nontourism trips are for either family purposes or for business travel. Dwyer and Forsyth (1997) refer to travel for meetings, incentives, conventions, and exhibitions-or "MICE" travel. Thus, E_X can be subdivided into a tourism demand component (E_T), and a nontourism demand component (E_N).

Since E_T is employment that serves only tourism-related demand, we assume that E_T depends exclusively on the total number of nonresident tourist trips taken to the county. The number of tourist trips to a county or other destinations is explainable primarily by the set of natural and cultural amenities located there (Stynes and Peterson 1984). On the other hand, nontourism employment (E_N) depends solely on nontourism trips, and so must be explained by characteristics other than resource amenities. In this study, we assume that county population is the primary determinant of the volume of family-related trips. Some research has shown a direct link between population and employment for nonmetropolitan counties (Duffy-Deno 1998). We extend this link and posit a direct relationship between business-related trips and population. Measures of tourism dependence should be based on E_T. Removing the effects of both residents (E_L) and nontourism travel (E_N) allows the identification of the true relationship between tourism dependence and the social, economic, and quality-of-life issues that are important to policy makers and researchers.

Therefore our conceptual model is :

$$E = E_L + E_X$$

$$E_X = E_T + E_N$$

$$E_T = f(\mathrm{REC})$$

$$E_N = g(\mathrm{POP})$$

where POP is the county population and REC is a vector of recreation/tourism attributes for the county.

Methods

This study was limited to the 2261 nonmetropolitan counties in the contiguous United States. To account for structural differences in county size, climate, and other factors, some regional grouping for counties was desired. Because this research was designed to serve the Forest Service's Resource Planning Act (RPA) Assessment process, rural counties were divided into administrative regions used in the RPA Assessment reporting. Three regions were defined: South (VA to OK), North (MD, MN, and IA to New England), and West. Separate but identical analyses were carried out for each region to determine E_i. The South region contained 955 rural counties, the North region contained 686, and the West region contained 620.

Total employment and income data for four tourism-related sectors were extracted from sectoral data in the 1993 Micro-IMPLAN data set, developed by the Minnesota IMPLAN Group. These sectors included (1) hotels and other lodging, (2) eating and drinking places, (3) recreation and amusement services, and (4) other retail trade. Visitor spending in these sectors typically accounts for the majority of expenditures used in studies of the impacts of recreation and tourism (Dawson et al. 1993; Johnson and Moore 1993).

Estimating Export Employment in Tourism-Sensitive Sectors

The minimum requirements technique was used to separate E_L from E_X for each sector. Minimum requirements assume that local production serving local demands occurs prior to producing for exports (Pratt 1968; Isserman 1980), so a sector develops first to meet the needs of the local populace. Other assumptions are that counties can be divided into homogeneous groups, and that counties in the same group will have similar economic structures, in that the proportion of activity that serves local demand will be fairly constant within the group.

Cluster analysis was used to group counties in each region that were similar with respect to population density, distance from metropolitan areas, and the proportion of county acres in each cropland, forests, pasture/range, and mountains. Eight clusters were retained for each region, Within each cluster of counties, the minimum percentage of economic activity in each tourism-related sector was identified. Under minimum requirements, it was assumed that this is the percentage of employment needed to meet local demand. Thus, in the county with the minimum employment percentage, there is no "export" to support demand by nonresidents. In all other counties in the cluster, the excess above the minimum percentage serves export (out-of-county) demand. The calculation to determine export employment' for county i and sector j was:

$$\mathrm{EX}_{ij} = \left[\frac{\mathrm{ec}_{ij}}{\mathrm{ec}_{iT}} - \min\left(\frac{\mathrm{ec}_{ij}}{\mathrm{ec}_{iT}}\right)\right]\mathrm{ec}_{iT}$$

where EX_{ij} is the export employment share for county i and sector j; ec_{ij} is economic activity (employment or income) for sector j in county i; ec_{iT} is economic activity for county i, summed over all sectors; and $\min(\cdot)$ is the minimum function, identifying the minimum value for all counties in the cluster of county i.

Estimating the Recreation Component of Tourism-Sector Exports

Results from minimum requirements calculations yielded estimates of E_i. Established techniques do not exist to separate E_T from E_N. Nor are data on the volumes of tourism and non-tourism' trips to rural counties readily available. Consequently, we used results from a regression analysis to separate tourism-related export employment from nontourism export employment. The model estimated was:

$$EX_{ij} = \alpha_j + \beta_{POPj} POP_i + \beta_{RECj} REC_i$$

where POP is the population of county *i;* REC_i the vector of recreation/tourism attributes for county *i;* and α_j, β_{POPj}, and β_{RECj} the parameters to be estimated for sector j.

The equation represents the position that total export employment in tourism-related sectors is a function of tourism and nontourism (family and MICE) visitation. County population served as a proxy for the amount of nonresident nontourism trips. A wide array of recreation and tourism attributes was identified as having the potential to explain tourism visitation and hence employment.

There were too many resource attributes to include all of them in the regression analysis, and it was not known a priori which attributes would be most important. We used principal components analysis (PCA) to reduce the resource array into a smaller set of resource factors. To impose an initial structure on the array of resource attributes, each was assigned to one of four groups that represent specific types of opportunities for recreation and tourism (Table 1). Urban resources include developed opportunities that grow with population, such as golf courses, museums, and amusement parks. Land resources include resources that support traditional outdoor recreation activities, such as hiking or camping. Water resources are those that support water-based activities, such as boating, fishing, and swimming. Winter resources are those that support winter activities such as skiing and snowmobiling. PCA factors with eigenvalues greater than 1.0 were retained. In each region, 16 factors were retained, 4 that described urban resources, 6 for land resources, 4 for water resources, and 2 for winter resources.[2] Factors were nearly identical across the three regions.

The principal component factor scores served as the vector of recreation/tourism variables for the regression model. In turn, these scores would be used to predict the level of tourism-dependent employment in each nonmetropolitan county. A log-linear specification for the regression model had the conceptual advantage that predicted values would all be positive. It turned out to provide superior fit to the data as well.

Results of the regression model were used to estimate the amount of export employment that was due to recreation and tourism. The total expected amount of export employment, E_X, was given by:

$$E[E_X] = \exp (a + \hat{\beta}_{POP} POP + \hat{\beta}_{REC} REC)$$

That is, the total expected amount of export employment in a tourism-related sector was assumed to be a function of the population and recreation resources in a county and of the estimated parameters. All of the recreation resource factors were assumed to contribute only to tourism-related trips, and therefore tourism-dependent employment. Population was used to account for nontourism trips.

Hence, the expected amount of employment caused by nontourism trips was given by:

$$E[E_N] = \exp(\hat{\alpha} + \hat{\beta}_{POP} POP)$$

The proportion of export employment due to nontourism-generated trips would be $E[E_N]/E[E_X]$. Therefore, $1 - (E[E_N]/E[E_X])$ would be the proportion of export employment that is dependent on recreation and tourism. That is,

$$E[E_T] = E_X\left(1 - \frac{E[E_N]}{E[E_X]}\right)$$

Characteristics of Counties Dependent on Resource-Based Tourism

How do the rural counties that are most dependent on tourism compare with other rural counties? This question was examined through a series of simple (OLS) regression models. Independent variables in the models included an indicator variable for dependence on recreation, one for adjacency to a metropolitan area, and two more that indicated location in either the Southern or Western portions of the country. Initially, region-dependence interactions were included, but these were nonsignificant and were therefore deleted. Several variables related to population, income, age, education, housing, and economic structure were examined to evaluate the effect of tourism dependence on local residents and their quality of life.

Empirical Results

Regression Results

In total, 12 regression models (4 sectors for 3 regions) were estimated. Table 2 summarizes the results and indicates which resource factors had significant coefficients in predicting export employment by region and economic sector. All of the resource factors were significant in at least 2 of the 12 models. In the West region, at least 3 of the urban-related resource factors were significantly related to export employment in each of the 4 sector models. At least 2 urban resource factors were significant for each sector in the North region models, and for all but the lodging sector in the South region. Most of the land resource factors were tied to export employment in the lodging and retail trade sectors in the North and to the eating/drinking sector in the South and West. Water resource factors were significant in all 4 sectors in the North, all but lodging in the South, but to none of the sectors in the West. Both winter resource factors were significantly related all 4 sectors in the North, and to eating/drinking and recreation services in the West.

Local Jobs and Income Dependent on Resource-Based Tourism

Across all four tourism-related sectors, we estimated that 767,000 jobs result from nonresident recreation and tourism trips to nonmetropolitan counties (Table 2). These jobs account for $11.8 billion in income to employees and business owners. Over $4 billion in income accrues to people in rural counties in both the North and West regions, and about $2.6 billion in the South. Across all rural counties, about

TABLE 1 Definitions of Variables Used in Principal Comnonents Analvsis

Urban facilities :
Number of parks and recreation departments
Number of tour operators + sightseeing tour operators
Number of playgrounds + number of recreation centers
Number of private + public swimming pools
Number of private + public tennis courts
Number of organized camps
Number of tourist attractions + number of historical places
Number of amusement places
Number of fairgrounds
Number of local or county parks
Number of private + public golf courses
Number of ISTEA funded greenway trails
Estimate of acres of urban/built up land from 1995 National Resources Inventory (NRI)

Land resources :
Number of guides services
Number of hunting/fishing preserves, clubs, lodges
BLM public domain acres
Acres of mountains
Acres of cropland, pasture, rangeland
USDA-Forest Service National Forest and Grassland acres
FWS refuge acres open for recreation
Woodalls number of private campground sites
Woodalls number of public campground sites
NPS federal acres
NRI estimate of forest acres

Water resources :
Number of marinas
Number of canoe outfitters + rental firms + raft trip firms
Number of diving instruction or tours + snorkel outfitters
Number of guides services
Number of fish camps + private/fish lakes, piers, ponds
American Whitewater Association total whitewater river miles
Designated Wild and Scenic River miles: total 1993
National Resources Inventory (NRI) acres in water bodies 2-40 acres, <2 acres, ≥ 40 acres (lake or reservoir)
NRI acres in streams <66 ft wide + 66-660 ft wide + $\geq 1/8$ mi wide
NRI water body ≥ 40 acres (bay, gulf, estuary)
NRI wetland acres
Nationwide Rivers Inventory total river miles, any outstanding value

Winter resources :
Cross-country Ski Areas Association number of XC ski firms + public XC centers
International Ski Service skiable acreage
Federal land acres in counties with >24 in snowfall
Agricultural acres in counties with >24 in annual snowfall

TABLE 1 Continued

Acres managed by Bureau of Reclamation, Tennessee Valley Authority, Corps of Engineers	Acres of mountains in counties with >24 in annual snowfall
Total rail-trail miles	Acres of forestland in counties with >24 in annual snowfall
State park acres	
The Nature Conservancy acres with public access	
National Wilderness Preservation System acreage: total 1993	

Note. BLM, Bureau of Land Management; FWS, Fish and Wildlife Service; NPS, National Parks Service; NRI, National Resources Inventory; XC, cross-country. From USDA-Forest Service (1997).

TABLE 2 Summary of Regression Results Predicting Export Employment in Tourism-Related Sectors: Resource Factors With Significant Unstandardized Regression Coefficients, by Region and Economic Sector

General resource factor description	Sector			
	Lodging	Eat/drink	Retail trade	Recreation services
Urban :				
1. Tennis, golf, museums		N, S, W	S	S, W
2. Amusement parks, cultural attractions	N, W	N, W	N, W	N, W
3. Swimming pools, urban trails	W	N, W	W	S, W
4. Local parks, camps, fairgrounds	N, S, W	S, W	N, S, W	N, S, W
Land :				
1. Forest Service lands, wilderness	N, S	S, W	N, S, W	N, S
2. Private forest land	N	S	N	N
3. National Park Service, Fish and Wildlife Service	N	S, W	N	
4. Public campgrounds, other federal lands	S	S, W	S	
5. State parks and forests	W	W		
6. Hunting clubs, agricultural lands	N	W	N	N
Water :				
1. Fishing opportunities, river guides			S	N, S
2. Whitewater rivers	N	N	N	N, S
3. Marinas, lakes		N, S		
4. Ocean, wetlands		S	N	
Winter :				
1. Downhill and cross-country skiing	N	N, W	N	N, W
2. Forest and agricultural land with snow	N	N, S, W	N, W	N, W

Note. N, coefficient significantly different from zero for regression model for the Northern region. S, coefficient significantly different from zero for regression model for the Southern region. W, coefficient significantly different from zero for regression model for the Western region.

300,000 jobs and $3.455 billion in income in the eating/drinking sector are attributable to resource-based tourism. That equals about one-fourth of the total economic activity in that sector in nonmetropolitan counties. Likewise, the 171,000 jobs and $2.366 billion in income in retail trade caused by resource-based tourism comprise about 25% of all jobs in that sector in nonmetropolitan counties. Clearly, resource-based recreation is important to these sectors. For these two sectors, each job

generates about $12,000 in income. The level of income per job is low most likely because a significant proportion of these types of jobs are part-time. In the accommodation and recreation services sectors, tourism "exports" account for almost twice as high a proportion of the total activity, over 40%. In addition, income per job is over $20,000 in these sectors.

In some rural counties, there was no economic effect from nonresident recreation. In others, over half of all jobs and income are tied to the tourist industry. Across the country, jobs and income generated by recreation "exports" make up about 3.1% and 1.5%, respectively, of all jobs and income in nomnetropolitan counties. However, these percentages are not the same for all regions. In the South, less than 2% of all. jobs and under 1% of income in nonmetropolitan counties are due to nonresident tourism. Rural counties in the West are far more dependent on tourism. Jobs serving nonresident recreation and tourism visitors make up over 5% of all jobs in rural counties in this region. That is nearly twice the national percentage, and three times the proportion for the South. Over 3% of income comes from serving these visitors, also more than twice the national average and over 4 times the proportion found in the South.

Relative Importance of Resource-Based Tourism

There were 472 rural counties (about 21% of the total) wherein over 6% (double the national average) of the total number of jobs were due to nonresident recreation visitation. In 372 counties (about 16% of the total) the percentage of income due to nonresident recreation visitation was at least 3% of the total income, or at least double the national average. In total, 338 counties had more than double the national percentage for both jobs and income. These are the counties that we define as most dependent on tourism. The majority of these dependent counties are located in mountainous portions of the West. Other concentrations occur in coastal areas, and near Forest Service, National Park Service, or other large public land holdings in the eastern half of the country.

Our estimates reflect only the jobs and income directly related to nonresident tourism visitation in the sectors most closely tied to that activity. Visitors may also affect other types of businesses, such as gas stations, travel agents, real estate services, and grocery stores. In addition, some other businesses are indirectly linked to recreation by supporting those businesses directly tied to recreation. Examples could include laundry or cleaning services for hotels or restaurants, insurance services, or wholesale suppliers. Some of these jobs could also be partly due to recreation visitors. As a result, the figures presented here may be a slightly conservative estimate of the economic effects of recreation in rural counties in the United States.

Characteristics of Counties Dependent on Resource-Based Tourism

Income

Counties dependent on tourism had significantly higher per capita income levels in 1990 than did nondependent counties (Table 3). Dependent counties also showed greater percentage increases in per capita income between 1980 and 1990 than did nondependent counties. However, the average household income in tourism dependent counties was not significantly greater than in nondependent counties. Despite differences in income level and growth, there was no difference in the proportion of

TABLE 3 Jobs and Income Attributable to Resource-Based Tourism, by Region and Sector

Sector	North	South	West	U.S. total
Eating/drinking				
Jobs (1000s)	126	78	*96*	300
Income (million $)	1333	981	1041	3455
Accommodations				
Jobs (1000s)	61	24	86	171
Income (million $)	1098	484	1896	3478
Retail trade				
Jobs (1000s)	65	53	53	171
Income (million $)	944	781	641	2366
Recreation services				
Jobs (1000s)	51	23	51	125
Income (million $)	833	404	1274	2511
Total				
Jobs (1000s)	303	178	286	767
Income (million $)	4208	2650	4952	11810
Importance of resource-based tourism[a]				
Jobs (in percent)	3.0%	1.8%	5.4%	3.1%
Income (in percent)	1.3%	0.8%	3.0%	1.5%

[a] This is simply the proportion of all jobs and income (from all sectors) that is attributable to resource-based tourism (from the three identified sectors) in selected nonmetropolitan counties.

the population that live in poverty. Other studies have uncovered empirical evidence identifying inequities and distributional issues tied to tourism development (Smith 1986; Leatherman and Marcouiller 1996b). Although inconclusive, our results do not indicate statistical differences between tourism-dependent and other rural counties with respect to income distribution as measured by Gini coefficients. Further work is required to more closely examine potential equity disparities in counties with significant tourism development.

Economic Structure

In general, the economic structure in tourism dependent rural counties was less diverse than in nondependent rural counties (Table 4). This indicates that tourism-dependent rural counties have less activity in manufacturing and production sectors, and a higher concentration in services and related sectors. In particular, there was significantly less economic activity in both the forestry and wood products manufacturing sectors in dependent counties. However, this pattern may be changing. From 1980 to 1990, dependent counties had a greater proportional increase in economic diversity than did nondependent counties.

Housing

Housing in tourism-dependent areas was more expensive than in other rural areas. The average house value was nearly $13,000 higher in 1990 in tourism-

TABLE 4 Regression Results (Unstandardized Regression Coefficients, t-Values in Parentheses) for Models Comparing Recreation and Other Rural Counties on Income-Related Dependent Variables

Independent variable	1990 Per capita income	1990 Average household income	Gini coefficient	1990 Percent poor	Percent PCI change, 1980-1990
Constant	10,366	26,826	.4021	15.44	3.80
	(134.90)	(142.21)	(365.9)	(50.03)	(7.55)
Recreation dependent	477.74	480.16	.0019	− 0.260	2.43
	(4.56)	(1.87)	(1.25)	(-0.61)	(3.53)
West	− 102.02	-3.19	.0006	1.03	− 2.05
	(− 1.05)	(-0.01)	(0.46)	(2.64)	(-3.20)
South	− 1153.47	− 2418.40	.0342	8.00	2.15
	(− 13.47)	(-11.51)	(28.16)	(23.26)	(3.83)
Metro adjacent	691.41	2375.80	− .0101	− 2.75	2.46
	(9.25)	(12.97)	(-9.39)	(-9.15)	(5.03)
Model *F*	81.67	79.50	268.31	176.15	22.99
R^2	.13	.12	.32	.24	.04

Note. PCI, per capita income.

dependent rural counties, compared to nondependent counties (Table 5). Proximity to metropolitan areas accounted for a difference in house value of about $8700. As could be expected, the proportion of housing units that were seasonally vacant was much higher (12.6%) in dependent counties. The proportion that were rented was nearly 4% lower compared to nonmetropolitan counties that were not dependent.

TABLE 5 Regression Results (Unstandardized Regression Coefficients, t-Values in Parentheses) for Models Comparing Recreation and Other Rural Counties on Housing-Related Dependent Variables

Independent variable	1990 Mean value	1990 Percent seasonally vacant	Percent change in value, 1980-1990	1990 Percent rented	Change in units, 1980-1990
Constant	46,005	16.16	− 15.67	21.23	1006.8
	(45.41)	(36.25)	(− 19.70)	(50.03)	(176.68)
Recreation dependent	12,797	12.63	7.43	− 3.67	58.8
	(9.25)	(20.76)	(6.84)	(-9.91)	(3.53)
West	271.7	0.15	− 8.01	3.05	4.6
	(0.21)	(0.27)	(-7.92)	(8.84)	(0.52)
South	− 2604	-0.64	8.43	0.35	47.1
	(-2.37)	(− 1.28)	(9.51)	(1.17)	(7.41)
Metro adjacent	8672	-2.04	6.20	0.07	59.4
	(8.80)	(-4.71)	(8.00)	(0.27)	(10.72)
Model *F*	41.62	136.68	108.51	39.07	57.53
R^2	.07	.20	.16	.06	.09

TABLE 6 Regression Results (Unstandardized Regression Coefficients, t-Values in Parentheses) for Models Comparing Recreation and Other Rural Counties on Economic Structure-Dependent Variables

Independent variable	1990 Diversity index	1990 Forestry value added	1990 Wood products value added	Percent diversity index change, 1982-1992
Constant	0.6053	392.1	4833.7	115.81
	(290.91)	(1.73)	(7.97)	(208.39)
Recreation dependent	-0.0127	-781.2	- 3433.7	2.07
	(-4.47)	(-2.54)	(-4.14)	(2.73)
West	- 0.0352	1972.3	1027.5	5.40
	(-13.33)	(6.84)	(1.33)	(7.67)
South	-0.0353	736.2	- 670.0	2.40
	(- 15.23)	(2.92)	(-0.99)	(3.86)
Metro adjacent	0.0133	219.33	1787.7	- 0.45
	(6.57)	(3.18)	(3.03)	(-0.82)
Model *F*	94.35	13.47	7.16	20.75
R^2	.14	.02	.02	.04

From 1980 to 1990, tourism-dependent counties had higher growth in number of housing units and in the percentage increase in average housing value. That is, in these counties both the quantity and price of housing increased faster than in counties that are not so dependent on recreation.

Population

Our results confirm the findings of Beale and Johnson (1998) regarding population growth. The counties we defined as dependent on tourism are growing faster than other rural counties. From 1980 to 1990, after accounting for regional differences and proximity to metropolitan areas, population in recreation dependent counties grew about 5.36% more than did other rural counties (Table 6). From 1990 to 1995, these counties' population grew another 3.81% faster, compared to nondependent rural counties (Table 7). The populace in the recreation/tourism dependent counties tends to be better educated, and less tied to farming than in other rural counties. Nearly 1.5% more of the population members in the dependent counties have college degrees, and almost 3% fewer live on farms.

Discussion

Dependence on recreation and tourism in rural areas is clearly tied to proximity to certain types of natural resources, including beaches, large lakes, forests, and mountainous terrain. In areas where these resources are owned by public agencies, recreation and tourism seem to be especially important parts of the rural economy. Because of the link between public recreation resources and local economic structure, our results would seem to affirm the prominence that public land-managing agencies place on the local economic consequences of their policy decisions.

Resource-based tourism-dependent rural counties are experiencing greater increases in population growth and housing construction than are other rural

TABLE 7 Regression Results (Unstandardized Regression Coefficients, t-Values in Parentheses) for Models Comparing Recreation and Other Rural Counties on Selected Population-Dependent Variables

Independent variable	Percent increase in total population		1990 Percent college educated	1990 Percent female-headed households	1990 Percent living on farms
	1980-1990	1990-1995			
Constant	– 5.352	1.101	7.490	10.44	10.063
	(-9.40)	(330.76)	(55.92)	(48.66)	(30.92)
Recreation dependent	5.355	3.813	1.442	-0.180	– 2.846
	(6.90)	(9.14)	(7.89)	(-0.62)	(-6.41)
West	1.674	1.817	2.480	– 1.379	3.260
	(2.31)	(4.68)	(14.57)	(-4.18)	(7.89)
South	3.822	1.698	-0.916	4.686	– 3.856
	(6.03)	(4.99)	(-6.14)	(19.60)	(– 10.63)
Metro adjacent	6.356	2.900	-0.071	0.261	– 1.618
	(11.48)	(9.77)	(-0.55)	(1.25)	(-5.11)
Model *F*	51.18	48.12	170.24	177.15	103.53
R^2	.08	.08	.23	.24	.15

counties. Higher housing prices may reflect greater housing demand or more valuable private land close to recreation infrastructure. Such findings lend some support to observations made by Howe et al. (1997) that Americans are moving to rural areas for natural resource amenities and improved quality of life.

In-migration can lead to pivotal changes in the social structure and patterns in rural areas and communities, particularly if migrants are noticeably different from residents. Differences in education level, income level, regional background, and age structure may be among the salient characteristics of demographic structure in rural amenity-rich communities. We echo the concerns voiced by Beale and Johnson (1998) that new residents may demand different levels of social and community services, altering traditional patterns of local government spending. Although some evidence suggests that recreational homeowners are positive net contributors to local fiscal conditions (Deller et al. 1997), more work is needed to assess the effect of aging among in-migrating residents on locally available public services. Recent studies (Green et al. 1996) suggest that it also seems likely that such migrants would hold different values for the natural resource base and development options than do long-time residents, particularly in the desired mix of amenity and commodity outputs.

Our findings do not seem to support contentions that recreation and tourism jobs are necessarily lower with respect to aggregate local income generation, since mean incomes were higher in the more recreation-dependent counties. However, other phenomena may cloud the issue. For example, it is possible that mean incomes could be influenced by amenity-seeking migrants who bring with them higher incomes. That might explain why average incomes are higher in dependent counties, but the percent of population in poverty is not different from nondependent counties. Further research is needed to track changes in the tourism-sensitive sectors in the more dependent counties and control for the effect of migration, to examine how workers in those businesses are faring. In addition, research can concurrently track changes in income distribution in the dependent counties and can compare these to analogous changes in nondependent counties.

Clearly, identification of tourism-dependence counties depends on the methods used. Our choices in defining regions, clustering variables, and tourism resource variables were driven by a combination of administrative needs, previous research, and our own intuition. Further research is needed to develop guidelines for these types of decisions and to tie such guidelines to existing theoretical and conceptual models. For example, most research has noted that part of the difficulty in establishing the level of dependence on tourism is that the sectors affected by tourists are also affected by local residents and by visitors on nonrecreation trips. Our work has focused on highlighting one means to separate export employment that serves recreation and tourism visitation from export employment that serves visitors who come for other reasons. Future research is needed to examine the effect of assumptions inherent in our methods. For example, although we examined each of the four sectors independently, the nature of demand for these types of service may indicate the need for simultaneous equations. In addition, alternatives to minimum requirements could lead to different results on the overall level of export employment in tourism-related sectors.

Methods used by other researchers have led to a different set of counties being identified as tourism dependent. Beale and Johnson (1998) identified 285 nonmetropolitan recreational counties. We identified 338 such counties. Although the classification procedures and the thresholds for dependency differ between the two

methods, there are 156 counties that both methods define as tourism dependent. According to our estimates, about 10% of all income and about 15% of jobs in these counties are due to nonresident tourism activity. Selection of those 156 counties is robust to divergent methods, so it seems that those counties might well be the ones most dependent on recreation and tourism. Other rural counties that have been classified by only one method or the other might represent a second and somewhat lower tier of tourism dependency.

An economy's dependence on recreation and tourism is difficult to characterize, due to how that "industry" affects the local economy. Further research is needed on how to identify and address the relation between tourism activity and the economic or social structure in rural counties. Separating activity that serves local versus export demand is a critical component targeted here. Migration and housing demand is another, as shown by Beale and Johnson (1998). Because projections for outdoor recreation and tourism show increases for most activities, such research may well play a vital part in forming public land management and local development policies. Further, as demands for tourism-related uses of natural resources increase, there will be trade-offs with commodity production. Thus, it will be important to coordinate research on commodity dependencies with tourism dependency, to accurately evaluate the effects of various options that face rural areas in the United States.

Notes

1. Pratt (1968) has criticized the minimum requirements approach on its assumption that each region within the peer set, except for the minimum peer, produces for export. In this critique, Pratt was looking at manufacturing sectors. Tourism, however, is a unique case of the export base concept. Nonresident visitors that provide tourism demands can be considered as purely basic. Unlike manufacturing sectors, tourism has no contrasting "import" demands. Tourism represents a purely export-driven activity. Thus the minimum requirements approach is conceptually a more valid approach to apply to tourism-sensitive sectors. In our case, we assume that all counties within a peer group have some level of tourism activity (except the minimum peer, which is assumed to have no export tourism demand) and that the minimum peer represents the basis for assessment. We further extend this to account for local population to control for nonrecreational tourism demands.

2. Factor score tables and tabular results from cluster analyses are available upon request from the primary author.

References

Beale, C. L., and K. M. Johnson. 1998. The identification of recreational counties in nonmetropolitan areas of the United States. 17:37–53.

Bender, L. D., B. L. Green, T. F. Hady, J. A. Kuehn, M. K. Nelson, L. B. Perkinson, and P. J. Ross. 1985. The diverse social and economic structure of nonmetropolitan America. Washington, DC : USDA-Economic Research Service, Report RDRR-49.

Brown, T. L. and N. A. Connelly. 1986. Tourism and employment in the Adirondack Park. *Ann. of Tourism Res.* 13(3):481–489.

Dawson, S. A., D. J. Blahna, and J. E. Keith. 1993. Expected and actual regional economic impacts of Great Basin National Park. *J. Park Recreation Admin.* 11:45–59.

Deller, S. C., D. W. Marcouiller, and G. P. Green. 1997. Recreational housing and local government finance. Ann. of Tourism *Res.* 24(3):687–705.

Duffy-Deno, K. 1998. The effect of federal wilderness on county growth in the intermountain western United States. *J. Regional Sci.* 38:109–136.

Dwyer, L., and P. Forsyth. 1997. Impacts and benefits of MICE tourism: A framework for analysis. *Tourism Econ.* 3(1):21–38.

English, D. B. K., and J. C. Bergstrom. 1994. The conceptual links between recreation site development and regional economic impacts. *J. Regional Sci.* 34:599–611.

Green, G. P., D. W. Marcouiller, S. C. Deller, D. K. Erkkila, and N. R. Sumabhi. 1996. Local dependency, land use attitudes, and economic development: Comparisons between seasonal and permanent residents. *Rural Sociol.* 61(3):427–445.

Hady, T. H., and P. J. Ross. 1990. ***An update: The diverse social and economic structure of nonmetropolitan America.*** Washington, DC: Agriculture and Rural Economy Division, USDA-Economic Research Service, Staff Report AGES 9036.

Howe, J., E. McMahon, and L. Propst. 1997. ***Balancing nature and commerce in gateway communities.*** Washington, DC: Island Press.

Isserman, A. 1980. Estimating export activity in a regional economy: A theoretical and empirical analysis of alternative methods. *International Regional Science Review. 5:655-667.*

Johnson, K. M., and C. L. Beale. 1994. The recent revival of widespread population growth in nonmetropolitan areas of the United States. *Rural Sociol.* 59:655–667.

Johnson, P., and B. Thomas. 1990. Employment in tourism: A review. *Znd. Relations J.* 21:36-48.

Johnson, R. L., and E. Moore. 1993. Tourism impact estimation. *Ann. Tourism Res.* 20:279–288.

Kusmin, L., J. M. Redman, and D. W. Sears. 1996. ***Factors associated with rural economic growth.*** Washington, DC: USDA Economic Research Service, Tech. Bull. 1850.

Leatherman, J. C. and D. W. Marcouiller. 1996a. Estimating tourism's share of local income from secondary data sources. *Rev. Regional Stud.* 26:317–341.

Leatherman, J. C. and D. W. Marcouiller. 1996b. Income distribution characteristics of rural economic sectors: Implications on local development policy. ***Growth and Change*** 27(4):434–459.

Leiper, N. 1979. The framework of tourism: Toward a definition of tourism, tourist, and the tourist industry. *Ann. Tourism Res.* 6(4):398.

Leiper, N. 1990. Partial industrialization of tourism systems. ***Ann. Tourism Res.*** 17(4):600-605.

Nord, M., and J. B. Cromartie. 1997. Migration: The increasing importance of rural natural amenities. *Choices* 3:22–23.

Pratt, R. 1968. An appraisal of the minimum requirements technique. *Econ. Geogr.* 44:177–224.

Ross, P. J., and B. L. Green. 1985. ***Procedures for developing a policy-oriented classification of nonmetropolitan counties.*** Washington, DC: USDA Economic Research Service, Staff Report AGES850308, August.

Rothman, H. K. 1998. ***Devil's bargains: Tourism in the twentieth century American West.*** Lawrence : University Press of Kansas.

Smith, M. 1986. ***Behind the glitter: The impact of tourism on rural women in the Southeast.*** Lexington, KY: Southeast Women's Employment Coalition.

Smith, S. L. J. 1987. Defining tourism: A supply-side *view. Ann. Tourism Res.* 14(1):179–190.

Stynes, D. J., and G. L. Peterson. 1984. A review of logit models with implications for modeling recreation choice. *J. Leisure Res.* 16:295–310.

USDA-Forest Service. 1995. ***The Forest Service Program for Forest and Rangeland Resources: A long-term strategic plan.*** Draft 1995 RPA Program. Washington, DC.

USDA-Forest Service. 1997. ***National Outdoor Recreation Supply Information System (NORSZS).*** Resource data set compiled by USDA-Forest Service, Reereation, Wilderness, and Urban/Wildland Research Unit (SRS-4901), Athens, GA.