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Don E. Albrecht
Utah State University

Carol Mulford Albrecht
Utah State University

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ECONOMIC RESTRUCTURING AND EDUCATION IN THE NONMETROPOLITAN UNITED STATES

DON E. ALBRECHT

UTAH STATE UNIVERSITY

and

CAROL MULFORD ALBRECHT

UTAH STATE UNIVERSITY

ABSTRACT

Nonmetropolitan communities in the United States have historically depended on natural resources industries and manufacturing for their employment and sustenance. In recent decades, the number of jobs in these goods-producing industries has steadily declined, and this trend is likely to continue. The loss of goods-producing jobs has been offset by increased employment in the service sector. A prominent concern resulting from this economic structure transformation is the impending mismatch in the education and skills of nonmetro workers and the education and skills needed to obtain high quality employment in the service sector. The data presented in this manuscript show that most nonmetro workers in the goods-producing industries have a high school education or less. Further, goods-producing workers with a high school degree or less, who are employed in the expanding service sector, earn considerably lower wages than can similarly educated workers in the contracting, goods-producing sector. On the other hand, the growth of service sector employment is resulting in increasing numbers of high quality jobs that generally require a college education. Unfortunately, the proportion of nonmetro workers with such education is relatively small. The implications of this mismatch are discussed.

Nonmetropolitan (nonmetro) communities have historically been heavily dependent on natural resource industries (such as fishing, forestry, mining and especially agriculture) and manufacturing (the goods-producing industries) for their employment and sustenance (Albrecht 2004). In recent decades, millions of these jobs have been lost. In some areas, the loss of goods-producing jobs has resulted in extensive outmigration and population loss (Johnson 1989), while in other areas jobs in the goods-producing sector have largely been replaced by increased employment in the service sector (Bluestone and Harrison 1982; Harrison and Bluestone 1988; Morris and Western 1999; Sassen 1990). The transformation from employment in the goods-producing sector to employment in the service sector is having a number of major impacts on the communities and residents of nonmetro America (Albrecht 1998). Of special significance is the impending mismatch in the education and skills of nonmetro workers and the education and skills needed to obtain high quality employment in the emerging service sector.

The primary reason for the looming education and skills mismatch is that the goods-producing industries have traditionally provided livable wages to many workers with only a high school degree, and at times even less (Danziger and Gottschalk 1995). In contrast, service sector jobs are much more diverse (Sassen 1990). While there are many high quality service jobs, these jobs generally require advanced education or training. As a result of the growing number of high quality service jobs, opportunities and incomes for the college educated have increased (Kane 2004). On the other hand, the service jobs available to workers with lower levels of education are largely low-pay, low-skill, temporary and seasonal (Albrecht 2004; Kassab and Luloff 1993) and generally pay significantly lower wages than do jobs in the goods-producing industries for equally educated workers. In effect, less-skilled jobs in the primary sector have been replaced by less-skilled jobs in the secondary sector, and lower wages are the consequence (e.g., Barefield and Beaulieu 1999). Thus, economic restructuring is resulting in circumstances wherein many nonmetro workers who have been employed in the goods-producing sector may lack the education and skills necessary to obtain employment that would provide a livable income in the new service-based economy. Specifically, it appears that current economic restructuring trends are likely to result in lower incomes for workers with less than a college education and a growing gap between the incomes of college-educated and non-college-educated individuals (McCall 2000; Mishel, Bernstein, and Schmitt 1997).

Urban scholars have described the process by which a decline in manufacturing employment and an increase in jobs in the low-wage service sector have resulted in fewer jobs that provided a livable income for less-skilled workers. The consequences of this process are high rates of family dissolution, increased poverty levels, and a decline in basic community institutions (e.g., Wilson 1987; 1996). Empirical tests of the Wilson model indicate that these processes are also occurring in rural areas (Albrecht, Albrecht, and Albrecht 2000). These trends will perhaps be even more problematic in rural areas than in urban areas because of the high dependence on employment in the natural resource industries and manufacturing in rural areas and the low levels of education possessed by high proportions of rural workers.

Although lower wages for less educated workers and a growing gap between the incomes of the college educated and those without a college education are well-documented trends (e.g. Elman and O’Rand 2004; McCall 2000; Morris and Western 1999; Neckerman and Torche 2007; Reich 2000), there is no study of these issues with a specific focus on nonmetro areas. This study attempts to fill this void.

In this study, we have sought to improve our understanding of this critical issue

by exploring the relationship among household income, industry of employment, level of education, and residence. We conducted analyses for both metropolitan (metro) and nonmetro residents. To achieve study objectives, we first describe the economic structure transformations, especially those occurring in nonmetro America. We then develop research issues regarding to the likely relationships between these changes and household incomes, the value of an education and potential variations by residence. Next, we describe the analysis conducted to empirically test the research issues that have been developed. Finally, based on the empirical findings, we discuss the implications of economic restructuring for education and schools in nonmetro communities and provide suggestions for preparing young people for the job markets of the future.

LITERATURE REVIEW

Economic Restructuring and Education

As the 20th century began, most nonmetro workers in the United States were employed in the natural resource industries of fishing, forestry, mining, and especially agriculture. The need for an advanced education was limited and most workers in those fields had a high school degree or less. In the decades since, nonmetro communities have been dramatically altered by two major economic structure transformations which have greatly altered the relationship between educational attainment and income. Both of these transformations began during the 20th century, and continue into the early 21st century.

The First Economic Structure Transformation

Historically, nonmetropolitan America was economically dominated by the agricultural and the natural resources sectors. Even into the middle decades of the 20th century, farmers were by far the most numerous occupational group in the country. Through the middle decades of the 20th century, in particular, rapid technological developments in agriculture resulted in machines replacing human labor in the production process. Those new technologies allowed individual farmers to operate progressively larger farms, which led to an increase in average farm size and a corresponding decline in the number of farms (Albrecht and Murdock 1990; Dorner 1983; Paarlberg 1980). Agricultural change led to what Beale (1993) described as the largest peacetime movement of people in U.S. history as millions left the farm and many of them moved to metro areas to obtain employment in the emerging manufacturing sector (Johnson 1989). To a large extent, this transformation resulted in the U.S. moving from a rural to a primarily urban,

industrial society. As the number of farm workers plummeted, the booming manufacturing sector began moving to nonmetro areas where industry could employ displaced farm workers while avoiding unionization and thus keep labor costs lower (Fuguitt, Brown, and Beale 1989). Eventually manufacturing employment far exceeded agricultural employment even in nonmetro areas. By the year 2000, only five percent of the nonmetro labor force was employed in agriculture.

An economic structure based on manufacturing provided the historically unique role of allowing relatively high levels of affluence for workers without advanced educations. This was possible because advanced industrialization resulted in high productivity (Reich 2000). Further, the world domination by American industry following World War II resulted in high demand for American manufactured products (Chevan and Stokes 2000). With high productivity and high demand, workers were able to seek and attain relatively high wages. With a large manufacturing sector, many workers with a high school degree, and at times even less, could earn solid middle-income wages in industry in both metro and nonmetro areas.

The Second Economic Structure Transformation

Following World War II, the American manufacturing sector began a period of spectacular growth and was the dominant industry in both nonmetro and metro areas from shortly after World War II until the late 1970s. At that time it became apparent that another major economic structure transformation was occurring in the United States as the number and proportion of manufacturing jobs began an initial decline (Bluestone and Harrison 1982; Sassen 1990) that has since increased in scope and magnitude (Morris and Western 1999). Some of the manufacturing jobs were lost as a result of technological advancements where machines replaced human labor in the production process. Many other manufacturing jobs have been outsourced to foreign countries by multi-national corporations to take advantage of lower wage rates in these countries (Morris and Western 1999). The loss of manufacturing jobs has been offset by extensive growth in service sector employment.

In comparison to the largely middle-income manufacturing sector, service jobs are much more diverse. The service sector could be somewhat crudely divided into a high-pay sector and a low-pay sector. Growth in high-pay service jobs in sectors such as information, finance, health, and education is often referred to as skill-based technological change (SBTC) (Card and DiNardo 2002; Neckerman and Torche

2007). The result is the emergence of numerous jobs that provide high wages and good working conditions. These jobs, however, generally require advanced education or training to obtain. With growth in the number of high quality jobs in the high-pay service sector, average incomes for individuals with college degrees have increased (Kane 2004). In contrast, there has also been extensive growth in the low-pay service sector that includes jobs in retail trade, and personal, household and entertainment services. Many of these jobs could be described as low-pay, low-skill, temporary and seasonal (Albrecht 2004; Kassab and Luloff 1993; Sassen 1990). Wages in the low-pay service sector are likely to remain low because skill levels are low and because these jobs are not conducive to unionization. Economic restructuring has resulted in lower incomes for individuals with a high school degree or less because these individuals are often forced to take low-pay service jobs because many middle-income jobs in the goods-producing sectors no longer exist (Elman and O'Rand 2004; Morris and Western 1999). While the second economic structure transformation has been unfolding in both metro and nonmetro areas, trends toward lower wages for less educated workers are likely to be especially problematic in nonmetro areas where the number of low-skill workers is disproportionately high.

Research Expectations

In this study, we empirically analyzed three research issues derived from the preceding discussion. Each is briefly discussed below.

(1) We expected to find a strong relationship between industry of employment and household income. Specifically, we expected that workers with lower levels of education who were employed in the goods-producing industries would have significantly higher incomes than similarly educated workers employed in either high-pay or low-pay services. Further, we expected that workers with a college education who were employed in the high-pay service sector would have higher incomes than similarly educated workers who were employed in the goods-producing sector or in low-pay service industries. Empirical support for these research expectations would indicate that, as economic restructuring processes unfold, it is likely to result in lower incomes for the numerous nonmetro workers who do not have an advanced education.

(2) We expected level of education to be strongly related to household income. While this is rather obvious, we further expected the relationship between education and income to be stronger in the service sector than in the goods-producing industries. Thus, we expected the gap between the incomes of the college

educated and the non-college educated to be greater in service sector industries than in the goods-producing industries. This means that, all else being equal, the transition from an economy based on the goods-producing industries to one based on the service industries will increase both the value of having and the cost of not having an advanced degree. Again, this may be problematic for nonmetro workers without a college education as the number of goods-producing jobs declines and the number of service sector jobs requiring a college education increases since relatively few of them have college degrees.

(3) We expected that residence would continue to be related to household income. Specifically, we expected that the residents of metro areas would have higher incomes than the residents of nonmetro areas with similar levels of education who were employed in the same industry. Further, we expected the differences in income by residence to be greater at the highest education levels and in the high-pay service industries. This would mean that most workers with an advanced education are likely to benefit economically by residing in metro areas and nonmetro to metro migration of the more skilled and educated workers is likely to remain extensive.

Implications of Control Variables

Concurrent with economic restructuring are many other changes that are also likely to impact employment, household incomes and the value of an education. Most significantly, major social changes are dramatically impacting all aspects of life. Among the more prominent of these social changes are rapidly increasing minority populations and changing family structures. With respect to minority populations, between 1973 and 2003, the white population of the United States increased by 14 percent, the black population by 53 percent, and the Hispanic population by an incredible 273 percent (DeNavas-Walt, Proctor, and Mills 2004). Since there is a strong relationship between ethnicity and household income, industry of employment, education levels and residence, we expected the effects of rapidly growing minority populations on the relationships of interest in this study to be extensive. Thus, minority status was statistically controlled in this analysis.

The second social change to be considered is the transition of the American family. Among the more prominent family structure changes of recent decades are much higher divorce rates (Cherlin 1992), more nonmarital births (Wu, Bumpass, and Musick 2001), and an increase in nonmarital cohabitation (Bianchi and Casper 2000; Bumpass and Lu 2000). As a result of these changes, a significant proportion of Americans are spending a larger share of their lives in nontraditional families.

Whether or not one lives in a traditional family is strongly related to household income, education levels and residence (Esping-Anderson 2007) and thus was statistically controlled in this analysis. Although there are certainly other variables that could be statistically controlled, these two were used to help accomplish the objectives of this study. Remaining significant effects for the relationships of interest, after controlling for ethnicity and family structure, provide support for the existence of those relationships.

METHODS

The five percent PUMS (Public Use Microdata Sample) data from the 2000 Census of Population and Housing are used for this study. A household-level analysis was conducted, which seems appropriate since people live in and make decisions at this level. In effect, the use of 2000 PUMS data provides a snap-shot at one point in time of processes unfolding throughout the 20th century. The PUMS data are nationally representative and provide information on all of the relevant variables and are thus suitable for this study. A further advantage of the PUMS data is that geographic residence can be determined, which in most cases allows us to identify whether respondents live in metro or nonmetro areas. The geographic areas used in the PUMS files are called PUMAs (Public Use Microdata Areas). These Census Bureau defined geographic areas have a minimum of 100,000 people and fall entirely within state boundaries. In the 2000 Census, there were 2,071 PUMAs. Of these, 1,581 were entirely in metro areas (based on the 2000 definition), 349 were entirely in nonmetro areas, and the remaining 141 included both metro and nonmetro residents.

Since our concern was with the implications of economic structure, households where no one was employed are excluded. A total of about 3.9 million households were used in this analysis. Household income was the dependent variable for this analysis and was determined by the total earnings from all sources by all household members. The three major independent variables included industry of employment, level of education and residence. For industry of employment, respondents were categorized into one of four industrial sectors based on the employment of the household head. These sectors included: (1) the goods-producing industries that include manufacturing, construction, transportation and the natural resource industries of agriculture, forestry, fisheries and mining; (2) the low-pay service industries that include retail trade and personal, household, entertainment and other services; (3) the high-pay service industries that include wholesale trade,

information, finance and professional, education and health services; and (4) other industries that include utilities and public administration.

Education was determined by the education level of the household head, and respondents were placed into one of five categories that were coded as follows: (1) less than high school; (2) high school graduate; (3) some college; (4) college graduate; and (5) post-graduate degree. Residence was determined by the PUMA where the household resided, and respondents were placed into one of three categories that included: (1) persons who live in nonmetro areas; (2) persons who live in metro areas; and (3) persons who live in a mixed area that includes both metro and nonmetro residents. Since we could not accurately determine whether households in the mixed areas are metro or nonmetro, they were placed in a separate category.

Two control variables were utilized in the analysis. Minority status was operationalized as a dummy variable where Blacks and Hispanics were defined as minorities and were given a code of 0, whereas Whites were given a code of 1. Respondents from all other racial or ethnic groups were dropped from the analysis. Using only Whites, Blacks and Hispanics allowed for a comparison of the White majority with the two most numerous of the historically oppressed minorities. Family structure was also used as a dummy variable where married-couple households were coded 1 and all other household types were coded 0.

The data analysis for each of the three research questions was conducted in two parts. We initially present a categorical overview of the data, which makes the nature of the relationships clearly evident (Table 1). Following this overview, we present the results of a series of regression models. These models allow for a determination of whether relationships remain significant after accounting for the effects of the other independent variables and the control variables. Household income was used as the dependent variable for all of the regression models. This variable was used both in its raw form and where it was transformed by computing the log of household income. The raw form shows the magnitude of the relationships, whereas the log transformation of the variable provides better fitting models by reducing the effects of outliers.

Initially, separate regression models for both dependent variables (raw and transformed) were computed for workers in each of the four industrial sectors (Table 2). For Model 1 regressions, the raw form of household income was used as the dependent variable and the independent variables included education (measured from 1 to 5) and residence. For residence, two dummy variables were used. First, nonmetro residents (score of 1) were compared with the residents of metro and

mixed areas (score of 0), and second, metro residents (score of 1) were compared with residents of nonmetro and mixed areas (score of 0). Mixed-area residents were used as the reference category in models in which the residence variables were included. Model 2 regressions are identical to Model 1 regressions except that log transformation of household income was used as the dependent variable. For Model 3 regressions, the raw form of household income was used as the dependent variable and the control variables of minority status and family structure were included with the variables from Model 1 as independent variables. Model 4 regressions are identical to Model 3 regressions except that the log of household income was used as the dependent variable.

A similar format was used for the second set of regression models where separate models were computed for each education level (Table 3). For Model 1 regressions, the raw form of household income was used as the dependent variable and industry of employment and residence were included as the independent variables. Three dummy variables were used to determine industry of employment. For the goods-producing industries variable, individuals employed in the goods-producing industries were given a score of 1 and everyone else was given a score of 0. A similar process was used to operationalize employment in low-pay services and high-pay services. Thus, employees of each industry were given a score of 1 and everyone else was given a score of 0. Employees in 'other' industries were used as the reference category. Model 2 is identical to Model 1 except that the log of household income was used as the dependent variable. Again, the same independent variables were combined with the control variables for the Model 3 and 4 regressions. Model 3 regressions used the raw form of household income as the dependent variable, whereas Model 4 used the transformed household income variable.

For the third set of regressions, separate models were computed for each of the three residence categories; nonmetropolitan, mixed and metropolitan (Table 4). The independent variables for the Model 1 and 2 regressions included the three dummy variables representing industry of employment and education. Again, Model 1 used the raw form of household income as the dependent variable and Model 2 used the transformed household income variable. The control variables were included with industry of employment and education as independent variables for the Model 3 and 4 regressions. Again, the difference between these two models was the form of the dependent variable. Finally, a total model was computed where all of the independent variables were used to predict household income for the total population (Table 5). For the total model, the industry of employment, education

and residence variables were used as the independent variables for the Model 1 and 2 regressions, whereas Model 3 and 4 regressions included the control variables along with the previously mentioned independent variables. Models 1 and 3 used the raw form of the household income variable, whereas Models 2 and 4 utilized the transformed household income variable.

FINDINGS

Table 1 provides a categorical overview of the data and allows insights on all three research issues. The first research issue concerns the relationship between industry of employment and household income. The data make it apparent that there were significant income differences by industry of employment. The mean income for households employed in the goods-producing industries was \$59,674, compared to \$48,902 in the low-pay services, \$72,199 in the high-pay services and \$66,412 in other industries. Median incomes were higher in “other” industries than in any other sector, including high-pay services. The data in Table 1 also show that workers in the goods-producing industries with a high school education or less earned significantly more than similarly educated workers in either the high-pay or low-pay service industries. It is also relevant to note that the proportion of workers in the high-pay service sector that had a college education was much greater than in either the goods-producing industries or the low-pay services. Whereas 45.9 percent of the high-pay service sector workers had at least a college education, only 14.5 percent of the goods-producing industry workers and 18.6 percent of the low-pay service workers had a college education. Thus, economic restructuring has resulted in fewer well-paying jobs for individuals with less than a college education as jobs in the goods-producing sector diminish. However, the growth in the high-pay service sector is resulting in more opportunities for the college educated since the goods-producing sector provides relatively few jobs for those with an advanced degree.

The second research issue concerns the economic value of education. Fundamentally, Table 1 shows that the economic value of an education is extensive. While the average household with less than a high school degree earned \$39,346, in households with a post-graduate degree the average income was \$111,225. Table 1 also shows that the economic gap between the college educated and the non-college educated was larger in the high-pay service industries, indicating that the returns on education were greater in the service industries than in the goods-producing industries. Again, it is apparent that the economic structure transformation resulting in increased service-sector employment means improved

TABLE 1. HOUSEHOLD INCOME (\$) BY INDUSTRY OF EMPLOYMENT, LEVEL OF EDUCATION AND RESIDENCE (PERCENT IN PARENTHESES) (N=3,880,825)

INDUSTRY AND RESIDENCE	LEVEL OF EDUCATION						TOTAL	PERCENT BY RESIDENCE	PERCENT BY INDUSTRY
	LESS THAN HS	HS GRAD	SOME COLLEGE	COLLEGE GRAD	POST- GRAD				
<u>GOODS-PRODUCING</u>									
Nonmetro.....								46.8	27.5
Mean (\$)....	38,096	46,767	52,818	70,020	83,822	48,611			
Median (\$).	31,200	41,000	46,680	59,380	68,000	41,530			
S.D.....	36,770	35,111	40,180	57,263	73,178	40,307			
(Percent)..	(20.5)	(45.3)	(26.2)	(6.6)	(1.4)	(100.0)			
Mixed.....								43.4	10.0
Mean (\$)....	40,763	49,897	57,017	78,022	99,261	53,603			
Median (\$).	34,100	44,000	50,400	66,000	81,000	46,000			
S.D.....	36,391	36,477	40,348	60,761	81,117	42,980			
(Percent)..	(17.9)	(43.6)	(28.3)	(8.1)	(2.1)	(100.0)			
Metro.....								31.2	62.5
Mean (\$)....	45,380	56,148	65,965	95,684	121,812	65,506			
Median (\$).	37,000	49,330	57,200	78,200	98,000	53,680			
S.D.....	41,734	41,703	49,013	75,956	95,321	56,604			
(Percent)..	(18.8)	(32.7)	(30.5)	(13.3)	(4.7)	(100.0)			
Total.....								35.4	100.0
Mean (\$)....	42,804	52,281	61,833	90,153	116,416	59,674			
Median (\$).	35,000	45,600	53,600	74,000	93,000	49,200			
S.D.....	39,987	39,256	46,533	72,845	93,239	51,893			
(Percent)..	(19.2)	(37.2)	(29.1)	(10.9)	(3.6)	(100.0)			

ECONOMIC RESTRUCTURING AND EDUCATION

71

TABLE 1. CONTINUED.

INDUSTRY AND RESIDENCE	LEVEL OF EDUCATION					TOTAL	PERCENT BY RESIDENCE	PERCENT BY INDUSTRY
	LESS THAN HS	HS GRAD	SOME COLLEGE	COLLEGE GRAD	POST- GRAD			
<u>LOW-PAY SERVICES</u>								
Nonmetro.....							20.5	20.1
Mean (\$)...	29,299	36,869	40,830	59,069	61,521	39,880		
Median (\$).	22,000	30,000	33,000	46,600	48,200	31,200		
S.D.....	33,644	34,622	38,748	54,458	47,808	40,096		
(Percent)..	(17.0)	(38.1)	(31.6)	(9.4)	(3.9)	(100.0)		
Mixed.....							20.5	8.0
Mean (\$)...	31,366	39,559	44,322	63,565	67,326	43,502		
Median (\$).	23,800	32,000	36,000	51,000	53,350	34,000		
S.D.....	36,497	37,477	40,878	56,769	60,811	43,162		
(Percent)..	(15.8)	(37.2)	(32.2)	(10.6)	(4.2)	(100.0)		
Metro.....							21.6	100.0
Mean (\$)...	35,869	44,312	51,070	75,057	86,208	52,023		
Median (\$).	36,400	35,100	40,060	57,300	65,000	39,300		
S.D.....	39,783	41,865	48,586	71,941	81,998	54,056		
(Percent)..	(17.4)	(28.8)	(33.3)	(14.8)	(5.7)	(100.0)		
Total.....							21.3	100.0
Mean (\$)...	34,234	42,043	48,559	72,081	81,277	48,902		
Median (\$).	25,000	33,600	38,500	55,000	60,800	37,000		
S.D.....	38,499	39,935	46,452	69,115	78,168	50,981		
(Percent)..	(17.2)	(31.3)	(32.9)	(13.4)	(5.2)	(100.0)		

TABLE 1. CONTINUED.

INDUSTRY AND RESIDENCE	LEVEL OF EDUCATION						TOTAL	PERCENT BY RESIDENCE	PERCENT BY INDUSTRY
	LESS THAN HS	HS GRAD	SOME COLLEGE	COLLEGE GRAD	POST- GRAD				
<u>HIGH-PAY SERVICES</u>									
Nonmetro.....								25.6	14.7
Mean (\$)...	31,316	40,091	46,552	64,721	89,406	53,780			
Median (\$).	24,200	33,000	38,700	52,920	69,000	41,865			
S.D.....	34,521	35,755	41,248	56,192	78,797	53,602			
(Percent)..	(9.3)	(25.2)	(30.4)	(19.3)	(15.8)	(100.0)			
Mixed.....								28.7	6.5
Mean (\$)...	34,325	43,851	51,761	72,935	96,732	60,368			
Median (\$).	26,500	36,595	43,000	59,000	75,100	47,000			
S.D.....	37,049	37,267	43,075	62,980	81,272	57,691			
(Percent)..	(8.1)	(23.7)	(30.6)	(21.1)	(16.5)	(100.0)			
Metro.....								40.3	78.8
Mean (\$)...	38,752	49,163	59,843	89,507	122,237	76,618			
Median (\$).	29,700	40,000	48,000	68,030	88,685	55,120			
S.D.....	41,843	44,559	54,400	81,901	108,115	78,723			
(Percent)..	(7.6)	(16.7)	(29.8)	(26.0)	(19.9)	(100.0)			
Total.....								36.3	100.0
Mean (\$)...	37,168	46,891	57,307	85,747	116,806	72,199			
Median (\$).	28,270	38,000	46,000	65,140	84,700	52,102			
S.D.....	40,461	42,509	52,165	78,870	104,279	74,805			
(Percent)..	(7.9)	(18.4)	(29.9)	(24.7)	(19.1)	(100.0)			

ECONOMIC RESTRUCTURING AND EDUCATION

TABLE 1. CONTINUED.

INDUSTRY AND RESIDENCE	LEVEL OF EDUCATION					TOTAL	PERCENT BY RESIDENCE	PERCENT BY INDUSTRY
	LESS THAN HS	HS GRAD	SOME COLLEGE	COLLEGE GRAD	POST-GRAD			
<u>OTHER INDUSTRIES</u>								
Nonmetro.....							7.1	21.4
Mean (\$)...	38,533	48,157	53,603	62,820	76,954	54,099		
Median (\$).	33,000	44,000	49,500	57,800	67,000	49,000		
S.D.....	31,942	29,768	31,824	37,312	48,120	34,433		
(Percent)..	(5.2)	(31.1)	(41.1)	(16.4)	(6.2)	(100.0)		
Mixed.....							7.4	8.7
Mean (\$)...	42,703	51,446	57,979	69,510	85,263	59,613		
Median (\$).	36,000	47,695	53,200	63,700	76,300	54,000		
S.D.....	35,266	31,006	33,733	43,440	50,564	37,989		
(Percent)..	(4.8)	(28.7)	(40.2)	(18.7)	(7.6)	(100.0)		
Metro.....							6.9	69.9
Mean (\$)...	47,113	57,290	65,441	79,610	99,077	71,024		
Median (\$).	39,800	51,600	59,500	71,500	86,400	62,500		
S.D.....	40,046	36,427	39,712	48,933	65,196	47,666		
(Percent)..	(3.6)	(19.5)	(39.9)	(23.6)	(13.4)	(100.0)		
Total.....							7.0	100.0
Mean (\$)...	44,332	53,983	62,201	76,126	95,671	66,412		
Median (\$).	37,000	48,835	56,030	68,240	83,505	58,320		
S.D.....	37,715	34,284	37,952	47,274	63,096	44,933		
(Percent)..	(4.1)	(22.8)	(40.1)	(21.7)	(11.3)	(100.0)		

TABLE 1. CONTINUED.

INDUSTRY AND RESIDENCE	LEVEL OF EDUCATION					TOTAL	PERCENT BY RESIDENCE	PERCENT BY INDUSTRY
	LESS THAN HS	HS GRAD	SOME COLLEGE	COLLEGE GRAD	POST- GRAD			
<u>TOTAL</u>								
Nonmetro.....							21.2	
Mean (\$)...	31,325	41,887	47,480	64,324	82,930	48,536		
Median (\$).	24,300	36,000	40,840	53,300	64,700	40,000		
S.D.....	34,357	34,915	39,517	54,685	73,806	43,984		
(Percent)..	(18.2)	(37.2)	(28.5)	(10.5)	(5.6)	(100.0)		
Mixed.....							8.3	
Mean (\$)...	33,617	44,860	51,683	71,654	91,448	53,915		
Median (\$).	26,200	39,000	45,000	59,440	72,300	44,600		
S.D.....	35,423	36,651	40,904	59,788	77,271	47,781		
(Percent)..	(15.7)	(35.4)	(29.8)	(12.4)	(6.7)	(100.0)		
Metro.....							70.5	
Mean (\$)...	37,468	49,237	58,850	86,763	115,092	67,459		
Median (\$).	28,600	41,000	49,040	68,100	85,900	51,800		
S.D.....	40,175	42,394	50,564	77,027	101,410	66,133		
(Percent)..	(14.5)	(24.9)	(30.9)	(18.6)	(11.1)	(100.0)		
Overall Total								
Mean (\$)...	39,346	48,673	57,282	83,636	111,225	62,401		
Median (\$).	31,000	41,200	48,010	66,000	82,800	48,300		
S.D.....	39,829	40,190	48,160	73,927	98,405	61,298		
(Percent)..	(13.6)	(28.1)	(31.0)	(17.2)	(10.1)	(100.0)		

opportunities for the college educated and reduced opportunities for individuals without a college degree.

For the third research issue, it is obvious that in all industries and at all levels of education, the earnings of metro households exceed the earnings of nonmetro households. The differences are most pronounced at the higher education levels. Overall, the average nonmetro household earned \$48,536 while the average metro household earned \$67,459. It is also relevant to note that about 47 percent of the nonmetro workers were employed in the goods-producing sector, compared to about 31 percent of the metro workers. In contrast, 26 percent of the nonmetro workers were employed in the high-pay service sector, compared to 40 percent of the metro workers. Also, whereas nearly 30 percent of the metro workers had at least a college degree, only 16.1 percent of nonmetro workers were college educated.

Table 2 presents regression models to further explore the first research issue regarding the relationship between industry of employment and income. From these models it is apparent that education is strongly related to household income, regardless of industry. The importance of education, however, is greater for persons employed in the high-pay services. For Model 1 regressions, each unit increase in education resulted in a \$20,705 income increase for those employed in the high-pay services. By comparison, each unit increase in education for goods-producing industry workers resulted in an income increase of \$14,917, whereas this value was \$11,196 for low-pay service workers and \$12,359 for employees in 'other' industries. It is also apparent that the economic benefits of residing in a metro area are extensive, and there are significant economic costs associated with nonmetro residence. For Model 3 regressions, the data show that there are major economic benefits for being White and married. The relationships between education and residence and household income remain largely unchanged after the effects of the control variables are considered. Model 2 and 4 regressions, which used the log of household income as the dependent variable, provide better fitting models and explain greater proportions of the variation in the dependent variable. Models 1 and 3 explain from 7 to 21 percent of the variation in household income, while Models 2 and 4 explain from 8 to 31 percent of the variation in the log of household income.

Table 3 presents regression models to further test the second research issue concerning the relationship between level of education and household income. These models demonstrate that the economic benefits of employment in the goods-producing and high-pay service industries increased as the level of education increased. At the lower levels of education, Table 3 shows that it was best to be

TABLE 2. REGRESSION MODELS SHOWING UNSTANDARDIZED AND STANDARDIZED (IN PARENTHESES) COEFFICIENTS OF THE RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND HOUSEHOLD INCOME BY INDUSTRY OF EMPLOYMENT.

INDEPENDENT VARIABLES	INDUSTRY OF EMPLOYMENT							
	GOODS-PRODUCING (N=1,270,562)				LOW-PAY SERVICES (N=757,917)			
	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED
Education.	14,917 (.29)	.235 (.30)	13,281 (.27)	.207 (.26)	11,196 (.24)	.235 (.26)	9,612 (.21)	.191 (.21)
Residence								
Nonmetro.....	-3,348 (-.03)	-.080 (-.04)	-3,077 (-.03)	-.073 (-.04)	-2,863 (-.02)	-.071 (-.03)	-2,817 (-.02)	-.070 (-.03)
Metro.	9,090 (.08)	.122 (.07)	11,707 (.11)	.186 (.11)	7,133 (.06)	.125 (.06)	10,251 (.09)	.215 (.10)
Marital Status.			8,541 (.06)	.227 (.11)			8,496 (.07)	.249 (.11)
Family Structure .			24,438 (.22)	.526 (.30)			28,888 (.28)	.748 (.38)
Intercept.	18,618	10.104	-4,242	9.583	15,425	9.735	-3,831	9.212
F-Value.	54,556	52,970	51,521	70,574	20,413	21,026	30,860	47,361
Model R ². ....	.11	.11	.16	.22	.07	.08	.15	.24

TABLE 2. CONTINUED.

INDEPENDENT VARIABLES	INDUSTRY OF EMPLOYMENT							
	HIGH-PAY SERVICES (N=1,302,106)				OTHER INDUSTRIES (N=250,487)			
	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED
Education.	20,705 (.33)	.298 (.38)	17,729 (.29)	.246 (.31)	12,359 (.28)	.186 (.27)	11,715 (.27)	.175 (.26)
Residence								
Nonmetro.....	-4,799 (-.02)	-.102 (-.04)	-4.114 (-.02)	-.090 (-.03)	-4.322 (-.04)	-.082 (-.05)	-4.155 (-.04)	-.078 (-.05)
Metro.	12,173 (.07)	.134 (.06)	17,070 (.10)	.225 (.10)	8,140 (.08)	-.107 (.07)	11,678 (.12)	.180 (.12)
Marital Status.			12,847 (.07)	.225 (.11)			5,943 (.05)	.141 (.08)
Family Structure.			41,948 (.28)	.684 (.37)			29,396 (.31)	.553 (.38)
Intercept.	-4,754	9.738	-31,538	9.269	22,397	10.263	-1.489	9.779
F-Value.	67,332	82,134	74,992	116,259	10,279	8,798	13,929	17,001
Model R ². ....	.12	.16	.21	.31	.10	.10	.21	.25

TABLE 3. REGRESSION MODELS SHOWING UNSTANDARDIZED AND STANDARDIZED (IN PARENTHESES) COEFFICIENTS OF THE RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND HOUSEHOLD INCOME BY LEVEL OF EDUCATION.

INDEPENDENT VARIABLES	LEVEL OF EDUCATION							
	LESS THAN HIGH SCHOOL (N=586,503)				HIGH SCHOOL GRADUATE (N=1,098,070)			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	HOUSEHOLD INCOME	INCOME LOGGED	HOUSEHOLD INCOME	INCOME LOGGED	HOUSEHOLD INCOME	INCOME LOGGED	HOUSEHOLD INCOME	INCOME LOGGED
Industry of Employment								
Goods-producing.....	-293 (.00)	.866 (.41)	-1,487 (-.02)	.689 (.33)	-516 (-.01)	.514 (.29)	-1,916 (-.02)	.403 (.23)
Low-Pay Services.....	-9,090 (-.10)	.505 (.20)	-6,619 (-.07)	.464 (.18)	-11,576 (-.12)	.165 (.08)	-8,343 (-.09)	.184 (.09)
High-Pay Services.....	-6,459 (-.07)	.617 (.22)	-4,044 (-.04)	.572 (.21)	-7,271 (-.08)	.298 (.14)	-3,668 (-.04)	.328 (.15)
Residence								
Nonmetro.....	-2,356 (-.03)	-.073 (-.03)	-2,051 (-.02)	-.061 (-.03)	-3,030 (-.03)	-.076 (-.04)	-2,857 (-.03)	-.068 (-.03)
Metro.....	4,915 (.06)	.093 (.04)	7,392 (.08)	.190 (.09)	5,826 (.07)	.094 (.05)	8,490 (.10)	.180 (.10)
Marital Status.....			6,334 (.08)	.227 (.11)			8,588 (.08)	.281 (.13)
Family Structure .			16,955 (.21)	.640 (.30)			23,099 (.28)	.647 (.36)
Intercept.....	40,478	9.471	24,620	9.012	50,324	10.108	27,088	9.488
F-Value.....	1,585	12,542	5,232	20,527	4,610	11,682	18,750	40,086
Model R ².....	.01	.10	.06	.20	.02	.05	.11	.20

TABLE 3. CONTINUED.

INDEPENDENT VARIABLES	LEVEL OF EDUCATION							
	SOME COLLEGE (N=1,179,869)				COLLEGE GRADUATE (N=640,829)			
	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED
Industry of Employment								
Goods-producing.....	628 (.01)	.268 (.15)	-1,585 (-.02)	.191 (.10)	14,371 (.08)	.242 (.12)	9,432 (.05)	.166 (.08)
Low-Pay Services.....	-13,471 (-.12)	-.112 (-.05)	-9,535 (-.08)	-.051 (-.02)	-4,590 (-.02)	-.079 (-.03)	-1,898 (-.01)	-.043 (-.02)
High-Pay Services.....	-5,443 (-.05)	.083 (.05)	-1,059 (-.01)	.154 (.08)	8,570 (.06)	.111 (.08)	10,853 (.07)	.142 (.08)
Residence								
Nonmetro.....	-4,128 (-.03)	-.094 (-.04)	-3,707 (-.03)	-.084 (-.04)	-7,154 (-.03)	-.109 (-.04)	-6,445 (-.03)	-.098 (-.04)
Metro.....	8,215 (.08)	.124 (.07)	11,816 (.11)	.205 (.11)	15,483 (.08)	.158 (.08)	20,878 (.11)	.235 (.11)
Marital Status.....			10,306 (.08)	.215 (.10)			18,089 (.08)	.210 (.08)
Family Structure.....			30,612 (.31)	.690 (.40)			45,343 (.30)	.672 (.39)
Intercept.....	56,770	10,489	26,867	9,857	62,226	10,820	16,901	10,163
F-Value.....	5,282	8,726	24,530	43,935	2,612	3,716	12,293	21,832
Model R ².....	.02	.04	.13	.21	.02	.03	.12	.19

TABLE 3. CONTINUED.

INDEPENDENT VARIABLES	LEVEL OF EDUCATION			
	POST GRADUATE (N=375,554)			
	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED
Industry of Employment				
Goods- producing.....	19,511 (.07)	.270 (.10)	11,783 (.04)	.179 (.07)
Low-Pay Services.....	-14,347 (-.05)	-.148 (-.05)	-12,481 (-.04)	-.131 (-.05)
High-Pay Services.....	20,438 (.10)	.223 (.12)	20,384 (.10)	.219 (.12)
Residence				
Nonmetro.....	-8,126 (-.03)	-.105 (-.05)	-7,626 (-.03)	-.098 (-.04)
Metro.	23,316 (.09)	.178 (.08)	28,553 (.11)	.237 (.11)
Marital Status.			23,192 (.07)	.237 (.08)
Family Structure.			60,206 (.29)	.679 (.38)
Intercept.....	77,658	10,990	14,071	10,299
F-Value.	2,331	2,911	7,862	12,732
Model R ².....	.03	.04	.12	.19

ECONOMIC RESTRUCTURING AND EDUCATION

81

employed in the goods-producing sector. For the other variables in the models, the benefits of metro residence and of being White and married also increased as the level of education increased. The implications of utilizing the transformed household income variable are very apparent in Table 3, which shows that relationships between industry of employment and household income were much stronger for the logged dependent variable than for the raw form of household income. The importance of the education variable in explaining household income is obvious because when this variable is removed from the regression models the amount of variance explained is much smaller, ranging from 1 to 13 percent for Models 1 and 3 and from 2 to 21 percent for Models 2 and 4.

Table 4 presents data that provide additional insights on the implications of residence for household income, the third research issue. This table shows that the economic benefits of employment in the high-pay service sector were greater for metro residents than for nonmetro residents. Additionally, the economic returns on education were substantially greater in metro areas than in nonmetro areas. Further, the economic benefits of being White and married were substantially greater in metro areas. Table 4 regression models explain between 8 and 19 percent of the variation in the dependent variable for Models 1 and 3 and from 13 to 30 percent for Models 2 and 4.

Finally, Table 5 presents total data for all of the independent variables and all of the households in the study. Model 1 and 2 regressions show that while controlling for the other independent variables, education is by far the most important of the independent variables. Each unit increase in education resulted in an increase in household income of \$16,479. Thus, with all else equal, a household with an advanced degree would earn \$65,916 more than a household with less than a high school education. Further, while controlling for the other independent variables, the data show, especially with the transformed models, that there are economic benefits for employment in the goods-producing and high-pay service sector. Households receive economic advantages for living in metro areas, whereas there are costs associated with living in nonmetro areas. Model 3 and 4 regressions show that there were significant economic advantages for being White and married, and the inclusion of the control variables did not greatly alter the relationships between the independent variables and household income. Regression Model 1 explains 12 percent of the variation in household income, whereas the addition of the control variables increases the amount of variance explained to 20 percent. Model 2 and 4 regressions explain from 17 to 30 percent of the variation in the dependent variable.

TABLE 4. REGRESSION MODELS SHOWING UNSTANDARDIZED AND STANDARDIZED (IN PARENTHESES) COEFFICIENTS OF THE RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND HOUSEHOLD INCOME BY RESIDENCE.

INDEPENDENT VARIABLES	RESIDENCE							
	NONMETRO (N=822,211)				MIXED (N=321,206)			
	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED	MODEL 1 HOUSEHOLD INCOME	MODEL 2 INCOME LOGGED	MODEL 3 HOUSEHOLD INCOME	MODEL 4 INCOME LOGGED
Industry of Employment								
Goods-producing.....	1,919 (.02)	.473 (.26)	702 (.01)	.367 (.20)	2,358 (.02)	.445 (.24)	927 (.01)	.350 (.19)
Low-Pay Services.....	-8,944 (-.08)	.106 (.04)	-5,689 (-.05)	.126 (.05)	-9,662 (-.08)	.069 (.03)	-6,004 (-.05)	.104 (.04)
High-Pay Services.....	-2,032 (-.02)	.255 (.12)	1,168 (.01)	.279 (.13)	-1,267 (-.01)	.249 (.12)	1,921 (.02)	.275 (.13)
Education.....	10,920 (.27)	.263 (.31)	9,882 (.24)	.225 (.26)	12,747 (.29)	.270 (.33)	11,621 (.27)	.234 (.28)
Marital Status.....			5,823 (.04)	.235 (.08)			5,650 (.03)	.223 (.07)
Family Structure.			24,078 (.26)	.685 (.36)			26,419 (.26)	.681 (.36)
Intercept.....	22,172	9.488	3,344	8.982	21,261	9.576	1,116	9.062
F-Value.....	16,933	29,562	23,400	49,433	8,213	12,560	10,395	19,791
Model R ².....	.08	.13	.14	.27	.09	.14	.16	.27

TABLE 4. CONTINUED.

INDEPENDENT VARIABLES	RESIDENCE			
	METRO (N=2,734,408)			
	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	HOUSEHOLD INCOME	INCOME LOGGED	HOUSEHOLD INCOME	INCOME LOGGED
Industry of Employment				
Goods-producing.....	7,696 (.05)	.468 (.22)	3,858 (.03)	.348 (.16)
Low-Pay Services.....	-7,435 (-.05)	.096 (.04)	-4,004 (-.02)	.114 (.05)
High-Pay Services.....	3,987 (.03)	.277 (.14)	7,240 (.05)	.296 (.15)
Education.	18,188 (.33)	.295 (.37)	16,124 (.29)	.248 (.31)
Marital Status.			10,238 (.07)	.241 (.11)
Family Structure.			35,883 (.27)	.670 (.35)
Intercept.....	11,797	9.604	-11,200	9.209
F-Value.	91,282	132,986	109,840	191,682
Model R ².....	.12	.16	.19	.30

TABLE 5. REGRESSION MODELS SHOWING UNSTANDARDIZED AND STANDARDIZED (IN PARENTHESES) COEFFICIENTS OF THE RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND HOUSEHOLD INCOME (N=3,880,825)^a

INDEPENDENT VARIABLES	MODEL 1	MODEL 2	MODEL 3	MODEL 4
	HOUSEHOLD INCOME	INCOME LOGGED	HOUSEHOLD INCOME	INCOME LOGGED
Industry of Employment				
Goods-	6,194	.468	3,210	.345
producing	(.05)	(.23)	(.02)	(.17)
Low-Pay	-8,079	.094	-4,572	.115
Services	(-.05)	(.04)	(-.03)	(.05)
High-Pay	2,482	.271	5,833	.292
Services	(.02)	(.13)	(.05)	(.14)
Education	16,479	.288	14,642	.243
	(.32)	(.35)	(.28)	(.30)
Residence				
Nonmetro	-3,533	-.084	-3,219	-.075
	(-.02)	(-.04)	(-.02)	(-.03)
Metro	9,533	.118	13,160	.202
	(.07)	(.06)	(.10)	(.10)
Minority Status				
			10,033	.241
			(.07)	(.10)
Family Structure				
			32,662	.674
			(.26)	(.35)
Intercept	8,444	9.511	-17,177	9.020
F-Value	91,309	129,433	118,473	207,062
Model R ²	.12	.17	.20	.30

DISCUSSION AND CONCLUSIONS

According to the 2000 Census, nearly one-half (46.8 percent) of the household heads in the nonmetropolitan United States were employed in the goods-producing sector. Two-thirds of these workers had a high school degree or less. While earning less than similarly educated metro workers employed in the goods-producing industries, non-college educated nonmetro workers in the goods-producing industries were generally able to earn a livable income. However, for the past couple of decades, the number of workers in the goods-producing industries has steadily declined, and this trend is likely to continue. At the national level, jobs in the goods-producing sector have largely been replaced by increased employment in the service

sector. The implications of these economic restructuring processes have been, and will continue to be, profound.

A prominent concern to nonmetro community leaders and researchers is the impending mismatch in the education and skills of nonmetro workers and the education and skills needed to obtain high-quality employment in the service sector. Wages for workers employed in either the high-pay or low-pay services with a high school degree or less are considerably lower than what similarly educated workers can earn in the goods-producing sector. On the other hand, the growth of the high-pay service sector has resulted in increased numbers of high quality jobs. To obtain one of these jobs generally requires a college education. Unfortunately, the proportion of nonmetro workers with such education is relatively small.

We feel that two especially relevant conclusions can be drawn. First, it is essential that the education and skill levels of nonmetro workers improve. In this analysis, level of education was by far the best predictor of household income. Thus, the quality of many rural schools must improve and these schools must do a better job of teaching a curriculum that prepares rural youth for college. In many cases, the emphasis of rural schools must change as well. Rural youth, parents, teachers, administrators, councilors, community leaders and others need to understand that the job market students are entering is vastly different than the job market of the past (Israel, Beaulieu, and Hartless 2001). Rural youth need to recognize that advanced education and training are increasingly essential to earn a livable income. A second conclusion is that many nonmetro communities may be in a better position than ever before to attract some of the newly developing jobs in the high-pay service sector. In the past, most of the better paying jobs, especially in the service sector, were located in metro communities. Metro communities, by definition, had the advantage of being near markets and customers. Thus, nonmetro communities have consistently been economically disadvantaged. Now, because of computers and improved information and communication technology, many high quality jobs have a greater degree of geographic flexibility than in the past. Many individuals, families and firms can now establish their homes and businesses where they wish and still be connected to the necessary markets and customers. During the industrialization era, there was a tendency for industries to agglomerate (Sassen 1990) to take advantage of the need for similar inputs, markets and workers. In a global, post-industrial economy with improved communication and transportation, the advantages of agglomeration may be reduced. Thus some scholars believe that nonmetro areas, especially those with high quality amenity resources, have the potential to attract a relatively high proportion of the emerging high-quality

service-based jobs (Albrecht 2007; Allen and Dillman 1994). In many cases, rural communities can improve their odds of attracting some of these high quality jobs by having a skilled and educated labor force.

Obviously, the challenges faced by community leaders and development specialists to prepare their residents for a changing world are extensive. Many research questions remain unanswered. Specifically, we recognize that the PUMS data used in this study represent a snapshot of one point in time. We encourage other researchers to explore these trends over time. In addition, this analysis explored national level data. Circumstances with respect to employment, education and other factors vary widely from one local area to another. We encourage researchers to conduct studies exploring these relationships in a variety of local communities. Development specialists must be creative and flexible in adapting these broad relationships and trends to their local situations. Our hope is that researchers and leaders will meet these challenges by working together and seeking carefully planned and innovative solutions.

AUTHOR BIOGRAPHIES

Don E. Albrecht is the Director of the Western Rural Development Center. Prior to this he served on the faculty at Texas A&M University. His research has focused on the issues confronting the communities and residents of rural America. Among the issues explored are natural resource concerns, economic restructuring, demographic trends, poverty, inequality and education. (Email: don.albrecht@usu.edu)

Carol Mulford Albrecht is on the faculty of the Department of Sociology, Social Work and Anthropology at Utah State University. She received her Ph.D. and then worked on the faculty at Texas A&M University prior to moving to Utah. Her research and teaching focuses on research methods, inequality and education.

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ECONOMIC RESTRUCTURING AND EDUCATION

89

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