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FARM FAMILIES MOVING TO TOWN: AN ANALYSIS OF FARM POPULATION DECLINES

By Don E. Albrecht

ABSTRACT

Recent census data indicate that, in all regions of the country, an increasingly large proportion of individuals and families operating farms in the United States are choosing to live in urban and rural communities rather than on the farmstead. In this paper, hypotheses are developed and tested to help explain and understand this phenomenon, and the variations that exist from county to county. County-level data from the 1978 and 1987 Census of Agriculture and the 1980 and 1990 Census of Population are analyzed. It was found that counties with larger proportions of farm families living in the community include those where agriculture is less mechanized, where there are high levels of part-time farming, where the total population is smaller, and where gross farm sales are greater. Counties with the most extensive declines in farm population included those with larger farm sales and where the total county population was smaller.

INTRODUCTION

Among the most dramatic changes occurring in the United States in the past half century has been the transition of the American farm. Some of the more important historical changes include a major increase in the size of the average farm, a corresponding decrease in the number of farms (Albrecht and Murdock 1990), and changes toward dualism and farm concentration (Albrecht 1992; Stockdale 1982).

With the release of the 1990 Census of Population data, it appears that farm changes in this country have taken another twist. These data show that the U.S. farm population declined from 5.6 million in 1980...
to 3.9 million in 1990, a decline of more than 31 percent. This reduction in the farm population was much greater than expected given that the decline in the number of farms during this time was only 8 percent. Further, the increasingly smaller size of the average farm family does not account for such drastic reductions in the farm population since the size of the average farm family declined from only 3.31 in 1981 (Banks and DeAre 1982) to 3.28 in 1987 (Kalbacher and DeAre 1988). The logical conclusion is that an increasingly high proportion of the persons who operate American farms are choosing to live in rural communities and urban areas, rather than on the farm.

While recognizing and monitoring this trend is important, it is also critical that efforts be made to understand the causes and consequences of changing farm residential patterns. In this paper, these recent farm population declines are explored in an analysis of county-level data from the 48 contiguous states. Since this trend has not yet been discussed in the literature, the analysis admittedly is exploratory. The basic premise of this paper is that during previous decades most farm families lived on isolated farmsteads away from cities and towns. This isolation was a consequence of both government policy and efforts by producers to achieve farm efficiency. Some recent changes in both agriculture and the rest of society have made living on isolated farmsteads less advantageous to farmers. The result is that there are now a large number of people who continue to farm, but who are moving from the farmstead to urban areas and rural communities. In addition, other small and part-time farm operations are being purchased by persons who remain living in the community, thus resulting in additional farms where the operator does not live on the farmstead.

The census measures of the basic concepts used in this paper are the first topic to be addressed. Then the factors that led to the emergence of historical farm residential pattern are discussed, as are recent changes likely to result in adjustments to those residential patterns. This is followed by an empirical exploration of farm population declines and an exploratory analysis of the factors associated with this decline. Finally, conclusions are drawn.
The Census and Farm Population

In conducting an analysis such as this, an understanding of definitions and means of data collection is important. Farm population data are obtained from the decennial Census of Population. As defined by the Census of Population, farm population is a residence measure. To be counted as part of the farm population, an individual must live in a rural area, be the occupant of a one-family house or mobile home that is on a property of one acre or more, and that property must qualify as a farm as defined by the Census of Agriculture. Thus, not all families operating farms are counted as part of the farm population. Prior to 1960, farm population was subjectively determined. That is, a person was counted as a farm resident merely by reporting to the Census Bureau that he lived on a farm (Taylor and Jones 1964). Since that time, persons potentially qualifying as part of the farm population have been questioned to determine if they met the same farm qualifications as used in the Census of Agriculture. The Census of Population then reports on the number of people in the farm family, their gender, ages, etc.

Much of the other information we have about agriculture is obtained from the Census of Agriculture. This census reports data on every operation that qualifies as a farm, regardless of where the farm operator resides. The Census of Agriculture provides data on acreages, commodities produced, and animal inventories, but does not report the residence or the composition of the farm family. Over the years, the definition of a "farm" used by the Census of Agriculture has changed 9 times, so data from one Census of Agriculture to another may not be directly comparable. Since 1975, a farm has been defined as any place from which $1,000 or more of agricultural products were sold, or normally would have been sold, during the census year. Whether or not an operation qualifies as a farm is objectively determined through questions about acreage, farm sales, animal inventories, etc.

Of course, there has always been some discontinuity between the Census of Agriculture and the farm population numbers from the Census of Population. The two censuses are conducted during different years, and there are farm operators counted in the Census of Agriculture who live in urban areas or rural communities and thus are
not a part of the Census of Population's farm population. Historically, these differences were quite small, and there was always a close correlation between changes in the number of farms as reported in the Census of Agriculture and changes in the farm population as reported in the Census of Population. The fact that the farm population was declining more rapidly than the number of farms was considered a function of the increasingly smaller sizes of farm families.

**Historical Farm Residential Patterns**

The historical farm residential patterns that emerged in this country were a result of the technological, policy and environmental constraints that farmers faced at the time of settlement. Specifically, the primary historical patterns of farm residence in the United States was one of the farm family living on isolated farmsteads. This pattern of living on isolated farmsteads was the result of both government policy and decisions made by farmers to achieve greater economic efficiency. Relative to governmental policy, the Homestead Act of 1862 was of particular importance. This act made it possible for a settler, after paying a registration fee of $10 to $25 and working the land for five years, to gain clear title to the land. An additional requirement for ownership, however, was that the settler live on the land. Thus farm families were required to live on their land and away from the community. However, even when not required by policy, living on the farm made sense from an efficiency standpoint. With the limited transportation of the day, traveling from the community to the farm would have been very time consuming and the ability to respond to emergencies would be reduced.

Of course, there were considerable variations in the proportion of farm operators living on the farmstead from one part of the country to another. In some parts of the country, the commodities being produced made living on the farm less advantageous than in other areas. The norms and social structures of various groups also had an effect. In the Mormon villages of the West, for example, farm families were encouraged to live in town and commute to their farms that surrounded the town (Nelson 1955).
Agricultural Change and Farm Residential Patterns

Recent changes in agriculture, as well as changes in the rest of society, have resulted in circumstances that have major consequences for farm families. Where farmers reside is one example. Many of the changes that have occurred have made living on isolated farmsteads less advantageous and, in some cases, less appealing than in the past. Since changes in farm residence patterns have not occurred uniformly from county to county, it is maintained that a reason for these differences is that there are variations from county to county in the factors causing residential changes. In the paragraphs that follow, some of the factors causing changes in farm residential patterns are described and hypotheses are developed about the likely relationship between these factors and farm residential patterns. Since there is no literature on this phenomenon, it is necessary to use logical inferences from a knowledge of farm structure and rural population to generate the hypotheses.

Farm residential patterns are the dependent variable for this paper. Since neither census provides a direct measure of farm residential patterns, this paper uses two different dimensions of the phenomenon. The first is an examination of the extent to which the farm population lives on farms as opposed to living in town. This is measured by determining the ratio of the farm population from the Census of Population to the number of farms as measured by the Census of Agriculture. Where the ratio of the farm population to the number of farms is small, there is evidence that high proportions of the farm families are choosing not to live on the farm. In contrast, if the ratio is large it indicates a high proportion of the farm families retains an on-farm residence.

The second measure of farm residential patterns is the percent change in the farm population from 1980 to 1990. This measure provides an indicator of counties that had varying levels of farm population retention during the 1980s. A positive value on this measure would indicate that the farm population in a county increased, while larger negative numbers indicate greater levels of farm population decline. Of course, a direct measure of whether the family operating the farm lives on the farm or in a community would be ideal, but such measures are not available. While there are obvious
weaknesses with these measures, they should be sufficient to provide insights for this exploratory analysis.

Technological developments are the first factor to be considered in understanding changing farm residential patterns. Better vehicles and roads make it possible for the farm family to now live in town and enjoy the benefits of community life, and yet still be able to travel to the farm quickly. In addition, technological advances in agriculture have also drastically altered farming and farm life as they have reduced the amount of human labor needed in agriculture (Berardi and Geisler 1984). Reduced labor needs have several consequences, including making the contributions of women and children less important to the operation of the farm. (Garkovich and Bokemeier 1988). This has often freed these other family members to seek off-farm employment (Godwin and Marlowe 1990), especially since technological advances have also reduced the time required for home tasks (Fink 1987). In many respects, technology has made farm work more similar to employment in other industries, and the image of the family working together on the farm is increasingly less relevant. As farming become more industrialized and commercialized, one would expect greater separation of residence and the farm operation.

For this paper, it is hypothesized that in counties where agriculture is more mechanized, the proportion of the farm population living on the farm will be smaller, and farm population declines will be greater. The basis of this hypothesis is that in counties that produce commodities where human labor can be replaced by technology, producers and their families will likely have more time for off-farm employment and other interests off the farm. Such employment and interests are expected to lead to having more ties in the community, and thus to residences in the community, and fewer on the farmstead.

Hypothesis 1.

a. The extent to which the farm population lives on farms will be less in counties where there is a more intensive use of technology in agriculture.

b. Farm population declines will be greatest in counties where there is a more intensive use of technology in agriculture.
Another consequence of the technological developments that have reduced labor needs is that more and more farmers and their spouses have obtained off-farm employment (Albrecht and Murdock 1984; Coughenour and Swanson 1983; Paarlberg 1980; Singh 1983; Wimberly 1983). With more farm families being dependent on non-farm employment, living in the community that is often the source of such employment, rather than on the farm, increasingly makes sense. It is therefore hypothesized that counties with higher levels of part-time farming will have a lower proportion of the farm population living on the farm and also will have greater declines in the farm population.

Hypothesis 2.

a. The extent to which the farm population lives on farms will be less in counties where the proportion of part-time farmers is greater.

b. Farm population declines will be greater in counties with higher proportions of part-time farmers.

It is also hypothesized that the proportion of the farm population living on the farm will be smaller, and the decline in the farm population will be greater, in counties where the total population is larger. Counties with large populations are more likely to provide employment opportunities for the farm operator as well as other family members. Further, such counties may provide other advantages and opportunities that would be attractive to the farm family that would enhance them to move to town.

Hypothesis 3.

a. The extent to which the farm population lives on farms will be less in counties where the total population is larger.

b. Farm population declines will be greatest in counties where the total population is larger.

The emergence of multiple-parcel farms is another factor that has
made living on the farm less advantageous. The movement toward larger farm sizes has occurred largely through a process of farm consolidation where one farmer will take over the operation of another person when that person retires or otherwise leaves agriculture (Albrecht and Murdock 1990). Also, many farm operators today lease farmland from others. This leased land is then farmed in addition to the land in the existing operation. Often these added units are not connected; the result is a multiple-parcel farm. On such a farm, the advantages of farm living are again diminished, since the other parts of the farm may be miles away. In such cases, moving to town may even result in the farmer achieving greater centrality for his farm operation. Since many added parcels may be rented, the proportion of the agricultural acreage in tenant and part-owner farms may be one viable indicator of multi-parcel farms. Thus, we would expect that the proportion of the farm population living on the farm will be less, and farm population declines will be greater in counties where the proportion of farmland in tenant and part-owner farms is greater.

Hypothesis 4.

a. The extent to which the farm population lives on farms will be less in counties where there are higher proportions of farmland in tenant and part-owner farms.

b. Farm population declines will be greatest in counties where there are higher proportions of farmland in tenant and part-owner farms.

Finally, it is expected that the relative importance of agriculture in a county is another factor that may influence the location of the farm residence. Where farm families are few, or where agriculture is but a minor factor in the local economy, it is expected that farm families will be more likely to choose to live in the community. Thus, the ratio of the farm population to the number of farms is expected to be greater, and farm population declines less extensive where agriculture is more important. In such areas, lower numbers of farm people would make it more difficult to have the critical mass needed for social, occupational or other types of interest groups to emerge, and thus farmers will seek these needs in the community.
Hypothesis 5.

a. The extent to which the farm population lives on farms will be less in counties where agriculture is a less important factor in the economy.

b. Farm population declines will be greatest in counties where agriculture is a less important factor in the economy.

METHODS

Data

The analysis is based on county-level data from all counties in the 48 contiguous states. The county is the unit of analysis. County-level data has the advantages of being convenient, easily accessible, and consistent from the Census of Agriculture to the Census of Population. County-level data are also consistent from one time period to another. This allows for comparisons across time and across regions. On the other hand, the geographic unit is somewhat arbitrary, and we can only indirectly infer what has occurred in the county. For this analysis, Alaska and Hawaii are eliminated because the agriculture in these states is so unique.

The data are obtained from both the Census of Population and the Census of Agriculture. Census of Population data are obtained from the STF3C files for both the 1990 and the 1980 censuses, while Census of Agriculture data are obtained from the 1978 and 1987 censuses. For several of the measures, the 1978 Census of Agriculture data are used in conjunction with the 1980 Census of Population data, while 1987 Census of Agriculture data are used in conjunction with the 1990 Census of Population data. A total of 3,109 counties with farms were used in the analysis. In the regression analysis, counties with data missing on any of the variables were deleted. Consequently, 2,927 counties were used in the regression analysis.

Measurement of Variables

The dependent variable is the residential patterns of the farm
population. Two different measures are utilized. The first is the farm population as a ratio to the number of farms in the county. For this measure, farm population numbers are taken from both the 1980 and 1990 Censuses of Population, while the numbers of farms are taken from the 1978 and 1987 Censuses of Agriculture. Then the farm population in the county is divided by the number of farms in the county for each year.

The second measure of the dependent variable is the percent change in the farm population from 1980 to 1990. For this measure, farm population numbers are obtained from the Census of Population for both 1980 and 1990, and then the percent change between the two years is determined.

Several independent variables are used to allow the hypotheses of this study to be tested. The first hypothesis is concerned with the relationship between use of technology and the residential patterns of the farm population. Our measure of technology is the value of machinery and equipment per dollar value of sales. By controlling for farm sales, this measure determines those counties where agricultural production is the most dependent and the least dependent on technology. Measures for this variable are taken from the 1978 and 1987 Censuses of Agriculture. In 1978, the mean score on this measure for the average county was .94, while the median score was .90. By 1987, the mean score had declined to .92, while the median score was .82. For the two years, scores ranged from .07 to 4.79.

For the second hypothesis, a part-time farmer is operationally defined as a producer with 100 or more days of off-farm employment, and the measure will determine the proportion of all farms in the county where the operator is a part-time farmer. This measure will be derived from both the 1978 and 1987 Censuses of Agriculture. In 1978, 43 percent of the producers in the average county were part-time farmers, while by 1987 this proportion had increased to 47 percent.

The total population is the total number of people living in the county as determined by the 1980 and 1990 Censuses of Population. To avoid problems of heteroscedasticity, the log of county population is used in the analysis. This measure is used to test the third hypothesis. The fourth hypothesis deals with the proportion of farmland in tenant and part-owner farms. A tenant farm is defined as a farm where the operator rents all of the land in the operation, while a
part-owner farm consists of a farm where the operator owns part of the land that is being farmed and rents the remainder. Measures are derived from the 1978 and 1987 Censuses of Agriculture to determine the proportion of all farmland in the county that is either in tenant farms and part-owner farms. In both 1978 and 1987, about 60 percent of this farmland in the typical county was in part-owner or tenant farms.

The final hypothesis concerns the relationship between farm population residential patterns and the importance of agriculture in the county. The amount of gross agricultural sales per county is used as the indicator of this concept. In 1987, gross farm sales were more than $22 million in the median county; this figure increased to nearly $27 million in 1987. Again a log transformation of this variable is used in the analysis. This measure is taken from the 1978 and 1987 Censuses of Agriculture. It should be noted that the independent variables were all carefully examined and there are no inter-item correlations that raise concerns about multicollinearity.

The effects of two control variables are also considered. The first of these are region of the country, with the four census regions (South, West, Midwest, and Northeast) being used. Because the structure of agriculture and the commodities produced vary so extensively from one part of the country to another, it is important to control for these differences. Otherwise, effects may be contributed to the independent variables when in reality they are a function of variations in the independent variables from region to region. In the regression analysis, three dummy variables will be created and used. For the first, counties in the South region are coded 1, while other counties are coded 0; for the second variable, counties in the West region are coded 1, while other counties are coded 0; and for the third variable, counties in the Midwest region are coded 1, while other counties are coded 0. The creation of a fourth dummy variable would have resulted in all coefficients being uniquely estimated because collinearity is present. The second control variable is the utilization of the percent change in the number of farms when the dependent variable is the percent change in farm population. Since counties with more extensive declines in the number of farms are likely to have greater farm population declines, it is essential to control for this factor when attempting to understand the effects of the independent variables.
Analysis

Three regression models are computed to test the hypotheses. The first is with the ratio of the farm population to the number of farms in 1980 as the dependent variable, the second is with the ratio of the farm population to the number of farms in 1990 as the dependent variable, and the third is with the percent change in the farm population as the dependent variable. The independent variables for each regression model include the variables developed to test each of the hypotheses, as well as the control variables. The control variables include region for all three models and percent change in the number of farms when the percent change in the farm population is the dependent variable. Independent variables are taken from the 1978 Census of Agriculture and the 1980 Census of Population when the ratio of the farm population to the number of farms in 1980 and the percent change in the farm population are dependent variables. Likewise, independent variables are taken from the 1987 Census of Agriculture and the 1990 Census of Population when the ratio of the farm population to the number of farms in 1990 is the dependent variable.

The significance and magnitude of the regression coefficients (beta) are used to test the hypotheses. This shows the relationship between each independent variable and the dependent variable when controlling for the other independent variables as well as the control variables. The regression analysis allows us to determine the extent to which the entire model is able to explain variations in the dependent variables, and the relative importance of the various independent variables. All the regression models are weighted by the number of farms in the county so that counties where agriculture is but a minor endeavor will not carry as much importance in the analysis as counties where agriculture plays a more central role.

FINDINGS

Table 1 presents data showing an overview of farm population changes by region in the continental United States from 1980 to 1990. This Table shows that the phenomenon of farm population declines occurred extensively during the 1980s, and these declines were very widespread. Declines ranged from about 22 percent in the West region
Table 1: Data showing changes in the farm population, number of farms and ratio of the farm population to the number of farms by region from 1980 to 1990.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1980</th>
<th>1990</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Farm Population</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South (N=1,425)</td>
<td>1,776,962</td>
<td>1,216,751</td>
<td>-31.5</td>
</tr>
<tr>
<td>West (N=412)</td>
<td>600,021</td>
<td>469,704</td>
<td>-21.7</td>
</tr>
<tr>
<td>Midwest (N=1,055)</td>
<td>2,878,280</td>
<td>1,916,923</td>
<td>-33.4</td>
</tr>
<tr>
<td>Northeast (N=217)</td>
<td>357,295</td>
<td>260,768</td>
<td>-27.0</td>
</tr>
<tr>
<td>Total (N=3,109)</td>
<td>5,612,558</td>
<td>3,864,146</td>
<td>-31.2</td>
</tr>
<tr>
<td><strong>Number of Farms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>897,046</td>
<td>823,851</td>
<td>-8.2</td>
</tr>
<tr>
<td>West</td>
<td>249,185</td>
<td>273,000</td>
<td>9.6</td>
</tr>
<tr>
<td>Midwest</td>
<td>975,225</td>
<td>861,982</td>
<td>-11.6</td>
</tr>
<tr>
<td>Northeast</td>
<td>131,505</td>
<td>123,482</td>
<td>-6.1</td>
</tr>
<tr>
<td>Total</td>
<td>2,252,961</td>
<td>2,082,315</td>
<td>-7.6</td>
</tr>
<tr>
<td><strong>Mean Ratio of the Farm Population to the Number of Farms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>1.94</td>
<td>1.63</td>
<td>-16.0</td>
</tr>
<tr>
<td>West</td>
<td>2.16</td>
<td>1.54</td>
<td>-28.7</td>
</tr>
<tr>
<td>Midwest</td>
<td>2.77</td>
<td>2.09</td>
<td>-24.5</td>
</tr>
<tr>
<td>Northeast</td>
<td>2.39</td>
<td>1.88</td>
<td>-21.3</td>
</tr>
<tr>
<td>Total</td>
<td>2.29</td>
<td>1.79</td>
<td>-21.8</td>
</tr>
</tbody>
</table>

to more than 33 percent in the Midwest region. Overall, the farm population declined by 31 percent during the decade of the 1980s. In 13 percent of the study counties, the farm population declined by more than 50 percent, 44 percent of the counties had a farm population decline of 33 percent or more, and 64 percent of the counties had a farm population decline of 25 percent or more. In total, 88 percent of the study counties had farm populations that were smaller in 1990.
than in 1980. In comparison, the number of farms declined by less than 8 percent, and there was an increase in the number of farms in the West region. Table 1 also shows that in the average county the ratio of the farm population to the number of farms declined from 2.29 in 1980 to 1.79 in 1990, a decline of about 22 percent. While there were substantial variations in this ratio from region to region, every region did show a significant decline.

In Table 2, the results of the three regression models are presented. Overall, the models were able to explain a relatively large share of the variation in the dependent variables, especially for the ratio of the farm population to the number of farms. For the 1980 model, the independent variables were able to explain 49 percent of the variation, while this proportion was reduced to 31 percent in 1990. The variables used were able to explain only 16 percent of the variation in the percent change in the farm population. Using the region variables contributed significantly to understanding variations in the ratio of the farm population to the number of farms. With the region variables removed, the other independent variables were able to explain 35 percent of the variation in the ratio of the farm population to the number of farms in 1980, and 18 percent of the variation in this variable in 1990. The region variables were less important for the percent change in the farm population, as none of them were statistically significant. However, as expected, the percent change in the number of farms was significantly and positively related to the percent change in the farm population. If all of the control variables were removed, the remaining independent variables were able to explain 8 percent of the variation in the percent change in the farm population.

Tests of the hypotheses are provided by examining the regression coefficients for each independent variable. The first hypothesis explored the relationship between agricultural mechanization and farm population residential patterns. It was expected that greater levels of agricultural mechanization would result in lower proportions of the farm population living on the farm and greater reductions of the farm population. For all three regression models, relationships with this variable were weak, and in the case of the ratio of the farm population to the number of farms in 1990, the relationship was not statistically significant. Contrary to expectations, counties where agriculture was
Table 2: Regression Analysis Showing Regression Coefficients (Betas) Between the Ratio of the Farm Population to the Number of Farms and Percent Change in the Farm Population to Independent Variables (N=2,927).

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mechanization</td>
<td>.15*</td>
<td>.03</td>
<td>-.07*</td>
</tr>
<tr>
<td>Percent of part-time farmers</td>
<td>-.21*</td>
<td>-.16*</td>
<td>-.00*</td>
</tr>
<tr>
<td>Total county population</td>
<td>-.02</td>
<td>.11*</td>
<td>.17*</td>
</tr>
<tr>
<td>Percent of acreage in part-owner and tenant farms</td>
<td>-.11*</td>
<td>-.04</td>
<td>-.05</td>
</tr>
<tr>
<td>Gross farm sales</td>
<td>.42*</td>
<td>.19*</td>
<td>-.24*</td>
</tr>
<tr>
<td>Percent change in number of farms</td>
<td>---</td>
<td>---</td>
<td>.24*</td>
</tr>
<tr>
<td>Region Dummy (South)</td>
<td>-.35*</td>
<td>-.29*</td>
<td>-.02</td>
</tr>
<tr>
<td>Region Dummy (West)</td>
<td>-.16*</td>
<td>-.18*</td>
<td>.07</td>
</tr>
<tr>
<td>Region Dummy (Midwest)</td>
<td>.03</td>
<td>.11*</td>
<td>.02</td>
</tr>
<tr>
<td>F-Value</td>
<td>343.7*</td>
<td>161.2*</td>
<td>60.2*</td>
</tr>
<tr>
<td>R-Square</td>
<td>.49</td>
<td>.31</td>
<td>.16</td>
</tr>
</tbody>
</table>

*Statistically significant at the .01 level.

more mechanized were found to have a higher ratio of the farm population to the number of farms in 1980. As expected, farm population declines were greatest in counties where agriculture was the most mechanized.

The second hypothesis predicted that where the proportion of part-
time farmers was greater, the ratio of the farm population to the number of farms would be smaller, and farm population declines would be greater. The data provided only partial support for this hypothesis. As expected, counties with high proportions of part-time farmers had a low ratio of the farm population to the number of farms in both 1980 and 1990. However, the relationship between the level of part-time farming and the percent change in the farm population was not statistically significant.

The third hypothesis posited that the extent to which the farm population lived on farms would be less, and farm population declines would be greater, in counties where the total population was larger. The data did not support this hypothesis. The relationship between the ratio of the farm population to the number of farms was not statistically significant in 1980, while for 1990 and for the percent change in the farm population, the relationships were opposite of what was predicted by the hypothesis.

The relationship between the proportion of farmland in part-owner and tenant farms and the residential patterns of the farm population was the basis of the fourth hypothesis, where it was predicted that where there were higher proportions of tenant and part-owner farmland there would be a lower ratio of the farm population to the number of farms and farm population declines would be greater. Again, the data provided only weak support for this hypothesis. Table 2 shows that the relationship between the proportion of land in part-owner and tenant farms and the ratio of the farm population to the number of farms was significant but weak in 1980, while the other two relationships were not statistically significant.

The final hypothesis predicted that the ratio of the farm population to the number of farms would be smaller, and farm population declines would be greater, in counties where agriculture sales are comparatively low. The data again revealed only partial support for this hypothesis. As expected, the ratio of the farm population to the number of farms was greatest in counties where gross farm sales were more extensive for both 1980 and 1990. In 1980, this was the strongest relationship in the model. However, contrary to expectations, counties with more extensive farm sales had greater declines in farm population.
SUMMARY AND CONCLUSIONS

Between 1980 and 1990, there was a dramatic decline in the farm population in the United States. This decline occurred throughout the country. In this paper, hypotheses were developed to help explain the variations from county to county in the extent to which the farm population lives on the farm, and the rate of decline in the farm population. Those counties where the ratio of the farm population to the number of farms was low included those counties where agriculture is less mechanized, those counties with a large proportion of part-time farms, where the total county population was smaller, and where gross farm sales were greater. Counties with the most extensive declines in their farm population included those with larger farm sales and where the total county population was smaller.

The results of this analysis leave numerous questions unanswered. The hypotheses were not strongly supported, leaving us with only a limited understanding of where farm population declines are most extensive and the factors causing these declines. This analysis was exploratory, and only a few of the many potentially important variables were analyzed. Perhaps the use of various theoretical perspectives could be used to gain insights and to suggest relevant variables for future analyses. Also, an effort to develop and use variables that better measure the concepts should be pursued. The "broad-brush" used in a national analysis such as this may miss details and insights that could be obtained from studies of more narrow geographic regions. Also, tremendous insights could be gained from analysis at the individual level. Individual-level research could provide an understanding about which farm families are choosing to move and the specific reasons they are making this decision.

Change in the residential patterns of farm operators could have far reaching consequences for those involved in all aspects of the agricultural community. For example, Cooperative Extension and other educational programs may have to adjust in order to reach those producers who now live in town. Likewise, those aspects of farm policy that are based on farm families living on isolated farmsteads may need to be changed.

It appears that these changing residential patterns are another step in agriculture becoming less unique. The historic picture of the family
working together on the farm is becoming less relevant and is being replaced by a picture that resembles non-farm families in many ways. In some cases, the farm family today lives in town, and while one spouse drives to work on the farm, the other goes to a non-farm job. In other cases, the spouse that is working on the farm may also have a nonfarm job. Agriculture is changing, and it is critical that scientists keep abreast of such changes.

REFERENCES


Paarlberg, Don. Farm and Food Policy: Issues of the 1980s. Lincoln, Nebraska: University of Nebraska Press.


