# THE EFFECTS OF CHANGING FARM STRUCTURE ON RURAL MIGRATION IN THE UNITED STATES

By

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# CHAPTER I

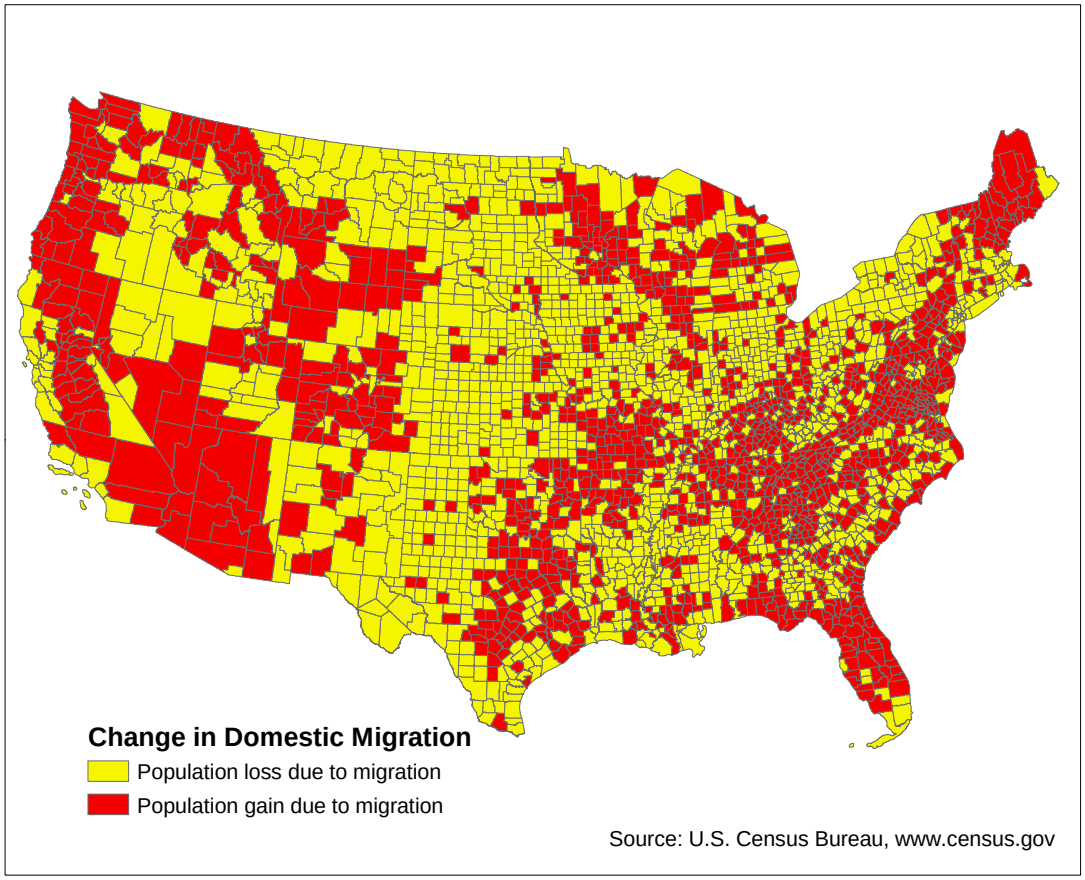
## INTRODUCTION

### *Problem Statement*

The structure of agriculture has changed markedly in the last decade. From 2002 to 2007 the number of family-owned farms has decreased in the United States from 1,909,598 to 1,906,335 for a total loss of 3,263 farms, a decline of 0.2% (USDA NASS, 2007). Over the same time period the number of other-than-family-held corporate farms increased from 7,085 to 10,237 for a total gain of 3,152, an increase of 45% (USDA NASS, 2002 and 2007). Additionally, the number of farms with more than $100,000 in market value of agricultural products sold has increased from 311,388 to 357,159, a total increase of 14.7% (USDA NASS, 2007). Also, the net cash farm income per farm increased from $19,032 to $33,827, an increase of 77.7% during the same time period (USDA NASS, 2007). These numbers imply that the structure of agriculture is changing, especially as it relates to the size of corporate farms.

As the size of farms is increasing, simultaneously, the population of rural communities is decreasing. Figure 1 shows the most recent change in net domestic migration information from the U.S. Census Bureau. The central part of the United States, also where a large number of rural counties are located, shows the largest net out-migration from 2002-2007. For a comparison, the areas that show rapid decrease in migration also show an

Figure 1. Net Domestic Change in Population due to Migration, 2002-2007

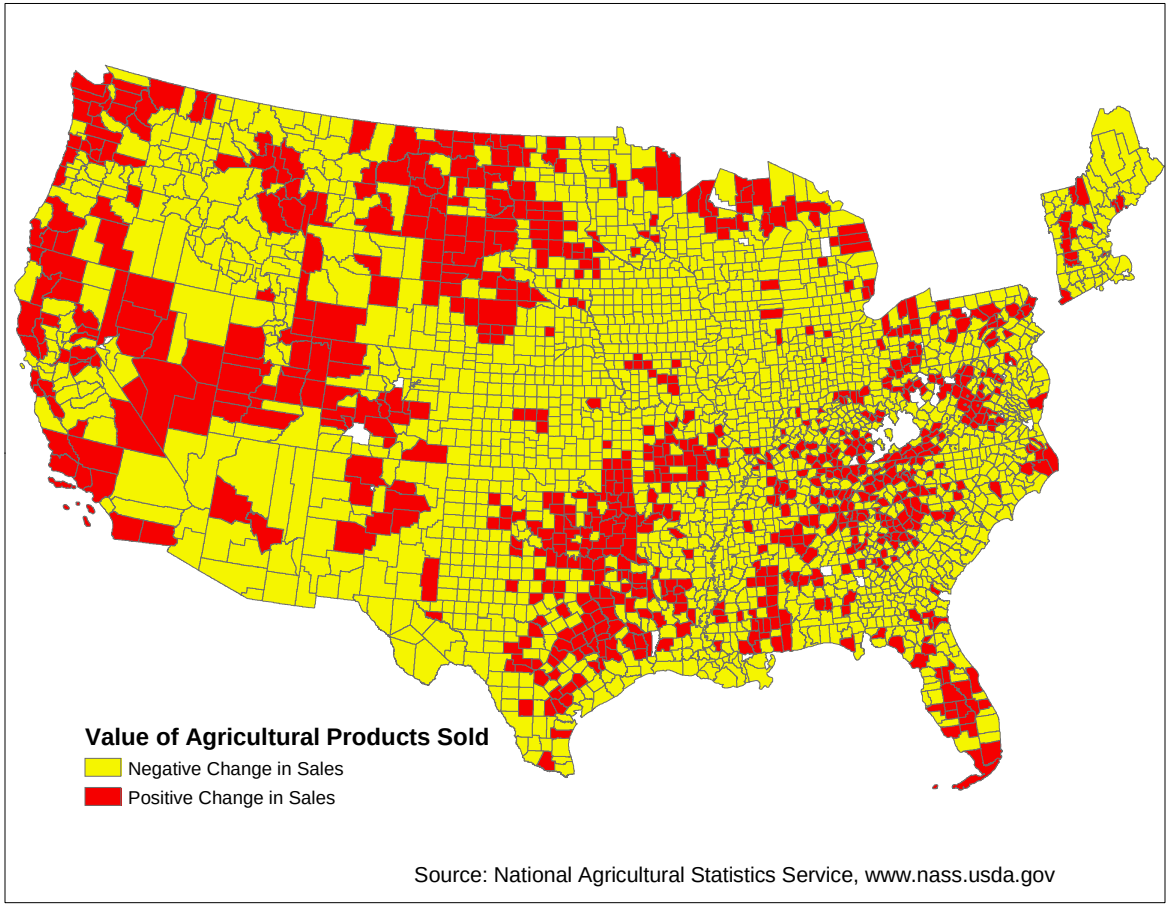


increase in the number of farms with sales of $100,000 and greater, as shown in Figure 2. Figure 2 also represents a picture of how a large number of counties are experiencing an overall increase in farms with $100,000 or more in sales; there are very few with significant negative growth. As many corporate farms are locating in rural communities in search of profit opportunities, it is important to ask, “What are the effects of these large farms on rural communities?” and “How can rural communities maximize the benefits from large farms?”

Examining the increasing farm size and decreasing rural population due to migration trends, this study will determine if there is a causal effect between the two. It is important to examine both the positive and negative effects corporate farms have on rural communities to logically determine their influence. Some positive effects of corporate farms are: lower-cost agricultural products through improved efficiency, increased funding for research due to higher profits and increased check-offs, and overall increased agricultural production. Check-offs are research and promotional programs that don’t provide reference to producers or brands (The National Agricultural Law Center). It’s also possible that corporate farms create jobs and income because they explicitly employ workers, as compared to family farms where family members are often expected to help run the farm sometimes without financial compensation. Also, because many farmers depend upon the sale of their farm to finance retirement, corporate farms provide a potential buyer to facilitate that transition.

However, it is the possible negative effects that are causing some rural citizens concern. Corporate farms in rural communities are often viewed as putting small family farms out of business, by using their size to achieve lower production costs and higher output levels compared to family farms. They are also criticized for eliminating future occupations

Figure 2. U.S. Counties by Change in Value of Sales, 1997-2002



for younger family members who might have chosen to run the family business. Corporate farms, like other non-locally owned businesses, are known to be less likely to purchase inputs locally, thus causing leakages from the rural economy. Tonts and Black (2002) state that because corporate farms often operate with contracts, local businesses may be bypassed. Through industrial linkages and household consumption patterns, there is concern that corporate farms, which do not have an attachment to the rural community, contribute to the demise of other rural businesses. Corporate managers that move into a community may not support local businesses like members of the family farm household, in terms of both inputs for the farm and personal consumption. This may ultimately result in decreased population and a change in dynamics of a rural community. In addition, Jobes (2008) argues that rural populations move away as labor is displaced by technology and resources decline. Large corporate farms are better able to afford the improved technology and equipment, making them more suitable to hedge weather risks and fluctuations in market conditions. Although economists tend to focus on profits, or lack thereof, the consequences of higher profits must be considered. Are higher profits of non-resident corporate farm owners/operators being traded for lower quality of life for native residents? Does the increased number of non-local corporate farms in rural America impact the lifestyle of those remaining in their community? Are the structural changes causing individuals to migrate to locations with better perceived opportunities? While this study does not answer each of these questions, hopefully the results will stimulate discussion and research in these directions.

Although urban cities may have more job and educational opportunities, most rural communities have the potential to create some of the same opportunities or advantages of their own. The proximity to family, sense of belonging and existing social networks may be

advantages to citizens remaining in rural communities. But, decreased change in population due to net migration, and its many negative consequences, such as improvement of infrastructure, makes the potential community opportunities difficult to achieve. Some negative consequences of negative population change in rural communities include: increased cost of services per person remaining in the community, changes in services demanded due to demographic shifts, and as Fan and Stark (2007) argue a 'brain drain,' or young, educated residents leaving the community.

All in all, the structure of agriculture is undoubtedly changing and these changes are affecting rural communities. Being able to identify some effects of the changing agriculture structure can help create potential advantages for rural residents.

*Definitions*

Definitions of commonly used terms throughout this study are important to completely understand what is being implied. The following terms will be defined in this section to aid the reader: corporate farm, other-than-family-held farms, market value of agriculture products sold, net cash farm income, and rural community.

The term *corporate farm* is defined by using three measures: legal status, production levels and profitability. These measures are all defined by the National Agricultural Statistics Service (USDA, NASS 2009, Appendix B). Legal status relates to farms by type of organization. The classifications used in the agriculture census are: (1) family or individual excluding partnership and corporation; (2) partnership including family partnership further broken down into (a) registered under state law, or (b) not registered under state law; (3) corporation, including family corporations and further broken down into (a) family held, (b) other than family held and (c) more than ten stockholders; and (4) other, cooperative, estate

or trust, institutional, etc. The type of organization focused on in this study is *other than family held corporation*. It is recognized that this measure has many drawbacks as there are a number of reasons for classifying a farm as such; some farms may do this for personal or tax reasons, not based on size. To measure production levels, the *market value of agricultural products sold* was used, found in the Census of Agriculture published by NASS. "This category represents the gross market value before taxes and production expenses of all agricultural products sold or removed from the place [current year] regardless of who received the payment. It is equivalent to total sales and it includes sales by the operators as well as the value of any shares received by partners, landlords, contractors, or others associated with the operation" (USDA, NASS 2009). NASS reports this data as the number of farms falling into a given range of sales within a given county. To measure the profitability of farms, the average *net cash farm income* measure was used. This term is defined by NASS as "derived by subtracting total farm expenses from total sales, government payments, and other farm-related income. Depreciation is not used in the calculation of net cash farm income" (USDA, NASS 2009). This measure is in dollars and adjusted for inflation, with 1997 as the base year. The aforementioned measures were used to capture the different aspects (profitability measure, legal definition, and size by volume) of farms that could contribute to the categorization of 'corporate' or large farms.

Although the definition of a *rural community* has changed over time, Jones (2008) defines rural communities as, "historically composed of a small population of relatively immobile residents who earned their living from the area and shared common values." This study focuses on the mobility of rural residents rather than the immobility mentioned by Jones. However, rural communities will similarly be defined as small populations sharing

common values where agriculture is likely a major component of income and lifestyle of residents. A more in depth analysis of *rural* as it pertains to this study is in the *Methods and Procedures* section.

Ultimately, the decreasing number of residents in rural communities is becoming a concern to many people. The study of change in population due to migration in rural communities with respect to corporate farms could help current rural residents and leaders understand this structural change and how they can provide opportunities to mitigate the impacts from the shift. As a result, this research will help local rural leaders suggest policies in order to adapt to this structural change. While there could be many other reasons why people are leaving rural communities, the interaction of population change and changes in farm structure are not well understood.

*Objective*

The overall objective of this research is to determine if the size of farms affect the overall population change in rural communities. More specifically, this research will determine if the number of corporate farms, defined by three measures, is associated with change in population due to migration in rural counties. This research uses utility maximization theory to explain a rural resident's decision to migrate or not, based on given, relevant information, particularly corporate farm measures.

*Theory*

The utility maximization theory will be used to examine an individual's decision-making process. This theory relates to the problem of decreased population of rural communities in many ways. If an individual's overall utility will increase as a result of moving, the individual is likely to move. On the other hand, if an individual's utility is higher

at the current location than it would be if they moved, the individual is less likely to move. Dust et al. (2008) discuss the expected utility as follows: in order to migrate, the level of utility in location *j* must be greater than the reference utility, *n*:

$$Migration = f(\bar{U}_j - \bar{U}_n) > 0, \quad (1)$$

where migration will occur if the utility incurred from moving to location *j*, $\bar{U}_j$, is greater than the utility incurred at the current location, $\bar{U}_n$.

Additionally, Dust et al. (2008) approximate information about amenities and prices of these amenities to show that the utility received from relative availability and price of amenities are joint determinants of migration.

A study done by Graves and Linneman (1979) focuses on household migration decisions, which is more complex than the individual decision. Assuming that the household will move based on one individual's decision, the individual theory is approximated by the household philosophy. There are a number of factors that affect a person's utility. The authors affirm that both traded and non-traded goods relate to a person's utility and, in turn, their decision to relocate. A traded good is a good that can be moved from one location to another such as clothing, appliances and automobiles. A non-traded good is a good that is location-specific, such as weather, crime rates, racial discrimination, and oceans. They argue that a person/family will only live in an area with low amounts of non-traded goods if they have a 'compensating differential' such as higher income or lower housing prices. Some of these goods, however, can be limited. Because traded goods are mobile by definition, the non-traded goods are the focus of migration studies.

Additionally, Graves and Linneman argue that expected income affects the migration decision. Using data from *A Five-Year Panel Study of Income Dynamics*, they find that

characteristics such as education and wages were important determinants of migration and justify their model.

While this theory examines an individual's decision to migrate, the data for this study is collected at the county level. Population change is the aggregation of individual decisions in a given county, and it is observable due to the availability of Census data. Because the interest in this study is on how corporate farms impact counties, using an aggregation of individual data is appropriate for this research.

This study relates to the utility maximization theory in a number ways. By examining the traded and non-traded goods in a rural community before and after a corporate farm locates, the differences in income with the presence of a corporate farm and the differences in goods and leisure opportunities available, an individual can determine what would maximize their utility and ultimately lead them to decide whether to relocate or remain in their current location.

The traded and non-traded goods available in a rural community may be much different before and after a corporate farm locates and small family farms presumably go out of business. Tonts and Black (2002) argue that contracting by corporate farms will likely result in economic activity bypassing the local businesses. This could force some local businesses to close, thus decreasing the amount of traded goods available in the local community and, in turn, the utility received from the local goods available. This could also impact the development of the rural community, in general.

The incomes of rural residents would most likely change if a corporate farm located in the community. Where output is sold on the local market, a flood of goods would decrease the price farmers receive for their product, thus reducing their income. On the other hand,

corporate farms may have the ability to pay higher wages than local businesses or provide additional jobs. When a person's income is expected to change, the theory would indicate that the individual may move to a location where they would receive a higher income.

A rural resident must also consider the current goods and leisure opportunities available currently compared to the possible goods and opportunities in a new location. Again, if the utility received from the possible goods and leisure in a new location is greater than in the current location, there is an incentive to move. The amount of leisure opportunities available can be captured to a certain extent by the natural amenity score (USDA, ERS, 2003) which is an independent variable in this study.

All in all, the entrance of corporate farms into a rural economy can directly affect the utility of native residents. The effect of corporate farms could provide an incentive to relocate or perhaps influence residents to remain where they are, based on the overall impact of the farm. The utility maximization theory will be the foundation for analysis in this study. It is assumed that individuals will make their decisions to move or not move from their community with a corporate farm based on what maximizes their utility. The previous literature provides insight on what factors are involved in making the migration decision. This study will incorporate other variables, relating to corporate farms and quality of life as a result of the entrance of corporate farms, into the model to help explain the relationship between migration and corporate farms in rural communities.

# CHAPTER II

## LITERATURE REVIEW

A number of articles have analyzed migration patterns. As with any subject area, new and innovative ways for measuring migration have come into the field throughout the years. Still, some original ideas remain accurate and resourceful. Using both old and new ideologies and methods, previous articles have helped address the importance of youth for the future of communities, discuss and recommend policies to help adjust to the consequences of migration, identify relevant and useful data, and determine which economic and amenity variables best fit in the model. This research will go into more depth in some of these areas focusing specifically on rural counties in the late 1990s and early 2000s.

### *Youth*

Although this study looks at the overall trends of population change due to migration of rural counties, it is worth mentioning the importance of youth in rural counties. Retaining youth or acquiring youth after education is a major concern for the future of rural communities. Youth exiting rural communities can have many additional negative impacts on rural communities such as continual decreased size of rural communities, and as noted earlier by Fan and Stark (2007), the 'brain drain'. Studies and surveys on youth migration have been limited for many possible reasons: availability of data, accuracy of data, and continuity of data as some survey participants discontinue their involvement in studies. One data source

that has been cited in numerous studies is the National Longitudinal Survey of Youth (NLSY). Mills and Hazarika (2001) used this data set to show net out-migration of youth from non-metropolitan areas. The authors investigated the relationship between race, gender, education of parents, employment growth rate, per capital income, and out-of-county or in-county parents and youth out-migration patterns. They found that young people have an incentive to move from their non-metropolitan county because of increased earnings. They also found that migration rates are positively correlated with paternal education and mother's birth outside of the state, among others.

There are many studies that can provide insight on why young residents leave their community. Garasky (2002) found that there are many different factors that affect a youth's decision to out-migrate, some deciding factors include: characteristics of the youth (personal factors), home environment (household factors), and characteristics of their local community (community factors). Entrance of corporate farms would be considered a community factor that may affect a youth's decision to migrate. The entrance of a corporate farm, of course, wouldn't be the only reason youth may leave their rural community. Another possible reason could be that youth are affected by how others perceive their decisions to remain in their rural community or to out-migrate (Jamieson 2000; Gabriel 2006). Perceptions of other people do, in fact, have an influence on their decision, which Jamieson and Gabriel found through a series of interviews and surveys. Determining if the increasing number of corporate farms is a factor in youth out-migration is complex seeing that the relationship could also be viewed the opposite; increasing youth out-migration could result in increased corporate farms. This research will look at the presence of corporate farms' impact on rural community

residents' decision to migrate; undoubtedly, this will affect younger members of small farm families or youth residents in general.

*Policies*

Policies are the main control mechanism for rural residents to ensure the future after the farm structure changes and/or decreased population due to migration. A change in net migration affects all residents of a community in one way or another. Community members remaining after individuals or families leave are concerned about more than just economic consequences. Out-migration of residents from rural communities has many not-so-obvious consequences that relate to the quality of life and utility of residents such as: survival of native language and traditions and the survival of identity and culture of the rural community (Stockdale 2004). Stockdale finds that it is important to implement public policy that recognizes the long-term consequences of the out-migration of residents, especially youth. Stockdale further finds that the focal point of these policies must pay attention to both the social and economic welfare of rural communities. Jobes (2008) points out that conflicts over identity and property rights bring uneasiness to rural communities with changing residents. Jobes finds that the presence of community planning and development will help when there is a change in residents. The understanding and participation by community leaders is essential in creating a balance between new and native residents.

Cushing and Poot (2004) find that the importance of clear communication of community information to policymakers is vital. When the problems are not clearly defined, the authors warn that some policies may have unintended consequences that could potentially hurt the rural community members. For example, social welfare programs create unintended consequences on low-income migration, such as creating benefits that attract high numbers

of low-income households to locations that have poor economic opportunities or inhibiting out-migration from these areas.

John Connell (1987) also addresses policies in his study. Connell finds that policies must emphasize the redistribution of social and economic opportunities to aid in rural development. Connell also affirms that the policy should be directed toward the causes and not the symptoms of migration. This study will try to determine if increased corporate farms are a cause of increased out-migration and how to deal with the effects.

Identifying possible policies will help aid rural residents and communities in coping with population change while creating the least negative effects or unintended consequences possible. The focus of this study will be on the economic consequences and potential policy ideas associated with corporate farms and the change of rural population. It is important to consider policies that help these rural communities survive when individuals relocate and large farms enter.

*Variables*

There have been numerous studies identifying the determinants of migration. Many authors have found that a person's decision to migrate is affected by economic and amenity variables, such as: income tax rates, expected future income per capita, number of violent crimes in state, climate, scenery, infrastructure, healthcare and public safety (Cebula 2005; Coomes and Hoyt 2007; Cushing and Poot 2004).

Studies have determined why some variables are very important in a potential migrant's decision-making process. For example, Greenwood (1975) argues that the income expected at the possible point of relocation is a very important part of the migrant's decision because a migrant will select a place to live that creates the greatest net benefit. Greenwood

also argues that personal characteristics such as education and age impact the decision of the migrant. With increased education, the employment information and job opportunities are expected to increase, therefore, influencing the migration decision. The unemployment rate has also been analyzed in previous studies. Greenwood (1975) notes that regions with high unemployment rates tend to have low in-migration while high levels of out-migration. However, there have also been studies that found unexpected signs and insignificant coefficients between unemployment rates and migration. Cebula (2005) adds that it is important to consider non-economic, quality-of-life factors when determining what impacts a person's decision to migrate. Cebula includes variables such as average annual percentage of possible sunshine, number of violent crimes, thousands of acres in state parks, number of hazardous waste sites, and the normal daily maximum temperature. Cebula found that crime and hazard have a negative and significant relationship while parks, sunshine and temperature all have positive and significant relationships with population concluding that non-economic variables do, in fact, influence the migration decision of residents. These variables, among others, are factors that people consider when deciding to migrate.

Poverty, known to be higher in most rural areas than urban areas, may also be an issue in rural communities. However, for individuals trying to escape poverty, relocation to an urban area may not necessarily improve economic status; if the person/family does not exit from poverty shortly after relocating to an urban area, it is much harder to exit poverty (Mimura and Mauldin, 2005). The poverty variable, representing an element of the relative economic condition of a rural community, will also be included in the model to help match similar rural communities.

Much research has been performed concerning migration patterns and the many migration determinants. This research will contribute to previous literature by concentrating on rural counties, uniquely defining corporate farms and combining the two phenomena of declining rural population due to migration and increasing size of farms to determine if the increasing size of farms are, in fact, causing rural residents to out-migrate. The unique time period and more recent data will contribute additional data to the rural migration literature. The results of this study will assist in suggesting possible areas of concern for rural communities so that policy makers can help these communities adjust to the structural change.

# CHAPTER III

## CONCEPTUAL FRAMEWORK

After analysis of previous studies to determine which factors should be included in this study, and with the addition of corporate farm measures, rural net migration is conceptualized as being influenced by the following factors:

*Change in Population Due to Migration in Rural Counties= f (measure of corporate farms, per capita income, unemployment rate, natural amenity score, high school graduation rate, Bachelor's degree rate, poverty level, total employment, median housing value and local government expenditure per capita)* *(2)*

The measure of corporate farms in the specified rural communities is the main concern of this research. The other variables were chosen based on previous research and the relevance of these factors in the studied areas to help match similar rural communities.

### *Variable Contributions*

A discussion of the variables used, and their reasoning, in this study follows. The independent variables: measure of corporate farms, per capita income, unemployment rate, natural amenity score, percent with high school degree, percent with Bachelor's degree, total employment, poverty level, average housing value, and local government expenditures per capita all relate to rural communities in some way. The variables may help explain the economic conditions of the community as well as relate to the quality of life of residents

living in these rural communities. Almost a quarter (23.3%) of the rural counties (defined as 'rural' in this study) in the U.S. are farming-dependent (USDA ERS, 2004). Farming-dependent is defined as, "either 15 percent or more of average annual labor and proprietors' earnings derived from farming during 1998-2000 or 15 percent or more of employed residents worked in farm occupations in 2000" (USDA, ERS 2004). The owners/operators of the production facilities and agriculture enterprises will likely affect the rural community in which they live. When a large corporation comes into a rural community, it changes the dynamics of the rural community in many ways, both economically and socially; one possible impact is on population change due to migration – the focus of this research. Per capita income, poverty level, and unemployment rate are good indicators of the condition of the rural economy and the associated quality of life. Favorable economic conditions such as higher per capita income, lower poverty rates, lower unemployment, etc. are more likely to retain and obtain individuals in a community due to increased quality of life. The natural amenities available to a rural community are very important factors because they may well relate to a person's happiness and satisfaction. Happiness is a fundamental aspect of an individual's life and if a person isn't happy or satisfied where they live, there is an incentive to move to a location that increases their happiness. This is consistent with the utility maximization theory in that individuals will do what maximizes their utility. The education variables are used because if a person is well educated, there is less incentive to move to a different location to receive education. Also, education is a proxy for human capital (i.e. skill set of workers) and productivity. Areas with higher education levels decrease out-migration with the idea that people would prefer to live in an area with high productivity. Total employment is an important variable to include as it helps show the size of the local labor

market; areas with higher employment likely provide greater opportunities for finding a job, and more specifically a job that matches with ones skill set. Local government expenditures relate to the wealth of the community and the services provided, which also relate to the level of community taxes. According to Mofidi and Stone (1990), areas with high taxes may be preferred to low-tax areas because of the higher quality of public services provided. On the other hand, the high costs of these expenditures could also deter future residents.

The dependent variable, rural population change due to migration, can have many impacts on rural communities and counties. If residents leave their community with no intention of returning, the population of that rural community will inevitably decline. Continual declines in population of rural communities can bring about many long-term consequences. Increased costs per person for necessary services and diminishing social networks are just a couple worth mentioning.

*Hypothesis*

The hypothesis in this study is: the presence of corporate farms in a rural community will have a negative relationship with population change due to migration. The expected outcome is hypothesized due to the increased resources of large corporate farms providing the ability to enhance technology and therefore decrease the amount of labor required. Corporate farms could also use monopsony/monopoly power at the local market to become the main purchaser/supplier of goods. By increasing the volume sold at the local market, they would decrease the competitive prices at the local elevator or livestock market. Continuous declines in expected income for local farmers will decrease the profitability of family farms and make it harder to compete with large, more efficient farms, possibly causing them to go out of business. If family farms do go out of business, they may no longer be able to provide

employment to family members in the future, through succession. Therefore, the children and other family members must find employment elsewhere. All of these reasons would contribute to a decline in resident well-being and lead to decreased population of rural communities.

The specific model in this study will bring new and relevant information into the rural development field. After determining the results, economists and other researchers will be able to use the results to understand how to adapt to the changing characteristics of communities facing population loss and/or changing structure of agricultural.

# CHAPTER IV

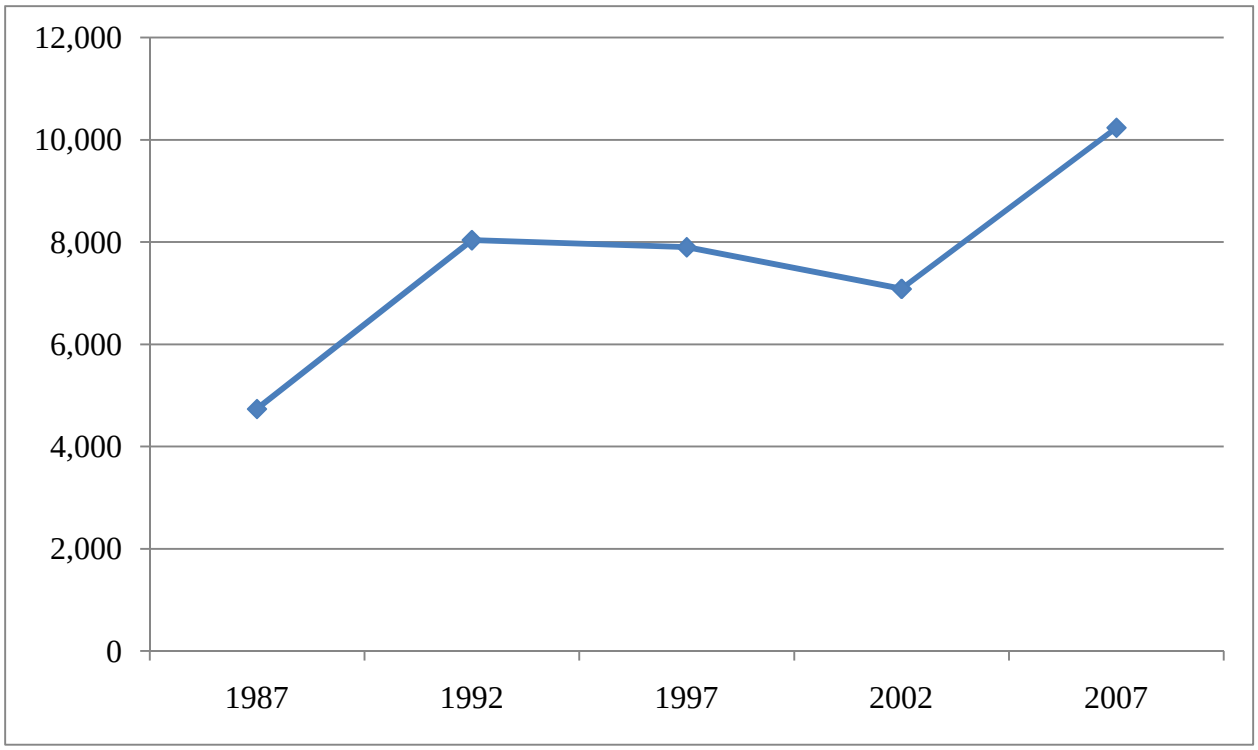
## METHODS AND PROCEDURES

With the overall decreasing size of rural communities and the increasing size of farms, it is the purpose of this study to determine if large farms are causing this population decline. This section will describe the data and procedures used to address this problem.

### *Data*

The data for this study comes from a number of secondary data sources at the county level. The data for all variables, except for the measure of corporate farm and population, is collected for the counties in all U.S. states, except Alaska and Hawaii in 2002. The measures of corporate farm are collected for years 1997 and 2002 and population due to migration is collected for years 2002 and 2007. The 'change in' values between the two years is calculated. Alaska and Hawaii are omitted because so few farms exist in these areas. Also, the means of transportation and costs of migration would be very different given that they are not connected to any other state by land. The years were chosen because of the dramatic increase in rural domestic out-migration from 2002-2007, seen in Figure 1. Another reason for the years of analysis is the increase in measure of corporate farm has changed considerably in the years prior to 2002-2007. As seen in Figure 3, there is a substantial increase in other-than family held farms from 1997-2002. In order to avoid endogeneity problems, researchers must have information for the years before the migration decision was

Figure 3. Change in Other-than-family-held corporations, 1987-2007




Source: National Agricultural Statistics Service, www.nass.usda.gov

made to reflect the knowledge possessed at the time of, or before, the move. The data collected by National Agricultural Statistics Service (NASS) on the number of other-than-family-held corporate farms, net cash farm income, and farms by value of sales are used. The NASS data helps to show various facets of the changing farm structure. These farm measures were described in more detail in the *Definitions* section. Poverty rate, median housing value, local government expenditure per capita, education level, net domestic migration and median household income all come from the U.S. Census Bureau. The Census Bureau creates estimates annually for all of these variables except median housing value, poverty and education level where data is only available in the decennial year, 2000, at the county level. The per capita income, total employment and total population due to migration information are from the Bureau of Economic Analysis (BEA, 2007). The population from BEA is identical to the U.S. Census Bureau estimates. The unemployment rate is from the Bureau of Labor Statistics (BLS, 2009). The Economic Research Service (USDA ERS, 2003) provides the rural urban continuum code and the natural amenity scale. Table 1 provides a summary of all variables and their statistical characteristics. Tables 2 through 4 show the characteristics of each corporate farm measure broken down into counties with above the mean and below the mean measures; this is further discussed in the *Methodology* section. The rural urban continuum code classifies counties using 2003 information, the most recent available. As suggested in a previous study by Dust et. al. (2008), rural counties are classified as those with a rural urban continuum code of six through nine, nine being the most rural and a population of no more than 20,000. The codes defined by ERS are following (USDA ERS, 2003):

- Code 6 is defined as “Non-metro county with urban population of 2,500-19,999, adjacent to a metro area,”
- Code 7 is defined as, “Non-metro county with urban population of 2,500-19,999, not adjacent to a metro area,”

Table 1. Descriptive Statistics for all variables included in model

| **Variable** | **Minimum** | **Maximum** | **Mean** |
|---|---|---|---|
| *Per capita income* | 5355 | 72662 | 21834.22 |
| *Unemployment rate* | 1.6 | 16.4 | 5.82 |
| *Natural amenity score* | 1 | 7 | 3.43 |
| *Percent with high school degree* | 0.10926 | 0.53249 | 0.36231 |
| *Percent with Bachelor's degree* | 0 | 0.40019 | 0.09429 |
| *Percent of population below poverty level* | 0 | 0.56917 | 0.15822 |
| *Median housing value* | 13800 | 750000 | 67487.38 |
| *Local government expenditures per capita* | 0.22501 | 15.92 | 2.99 |
| *Total employment* | 73 | 40660 | 8451.32 |
| *Change in Net Domestic Migration* | -0.26498 | 0.43944 | -0.01709 |
| *Change in measure of corporate farms:* | | | |
| *Value of Agricultural Products Sold* | -1 | 47 | -0.00885 |
| *Other-than-family Corporate Farms* | -0.90909 | 9 | 0.08080 |
| *Net Cash Farm Income* | -402.10 | 87.50 | -0.42690 |

Table 2. Descriptive Statistics for Counties Above the Mean and Below the Mean of Value of Sales

| **Counties with Above the Mean Value of Sales** | **Mean** | **Minimum** | **Maximum** | **Observations** |
|---|---|---|---|---|
| *Per Capita Income* | 21239.0572 | 5355 | 72662 | 594 |
| *Median Housing Value* | 69075.9934 | 20100 | 365400 | 604 |
| *Natural Amenity Score* | 3.6589 | 2 | 7 | 604 |
| *Total Employment* | 8233.7710 | 287 | 38704 | 594 |
| *Unemployment Rate* | 6.1872 | 1.6000 | 13.9000 | 603 |
| *Poverty* | 0.1692 | 0.0293 | 0.4986 | 604 |
| *High School Diploma* | 0.3576 | 0.1208 | 0.5112 | 604 |
| *Bachelor's Degree* | 0.0912 | 0.0258 | 0.3656 | 604 |
| *Local Government Expenditure* | 2.8312 | 1.2696 | 12.5146 | 594 |
| *Net Migration Change* | -0.0047 | -0.2500 | 0.3149 | 603 |
| *Change in Value of Sales* | 0.4208 | -0.0081 | 47.0000 | 553 |
| | | | | |
| **Counties with Below the Mean Value of Sales** | **Mean** | **Minimum** | **Maximum** | **Observations** |
| *Per Capita Income* | 22156.4923 | 8977 | 65486 | 1097 |
| *Median Housing Value* | 66615.0909 | 13800 | 750000 | 1100 |
| *Natural Amenity Score* | 3.3115 | 1 | 7 | 1101 |
| *Total Employment* | 8569.1158 | 73 | 40660 | 1097 |
| *Unemployment Rate* | 5.6243 | 1.9000 | 16.4000 | 1101 |
| *Poverty* | 0.1522 | 0.0000 | 0.5692 | 1101 |
| *High School Diploma* | 0.3649 | 0.1093 | 0.5325 | 1101 |
| *Bachelor's Degree* | 0.0960 | 0.0000 | 0.4002 | 1101 |
| *Local Government Expenditure* | 3.0693 | 0.2250 | 15.9242 | 1097 |
| *Net Migration Change* | -0.0239 | -0.2650 | 0.4394 | 1101 |
| *Change in Value of Sales* | -0.2247 | -1.0000 | -0.0088 | 1101 |

Table 3. Descriptive Statistics for Counties Above the Mean and Below the Mean of Corporate Farm other-than-family-held Measure

| **Counties with Above the Mean Number of Corporate Farms** | **Mean** | **Minimum** | **Maximum** | **Observations** |
|---|---|---|---|---|
| *Per Capita Income* | 22140.3038 | 11338 | 72662 | 395 |
| *Median Housing Value* | 67141.6667 | 24100 | 365400 | 396 |
| *Natural Amenity Score* | 3.4369 | 2 | 7 | 396 |
| *Total Employment* | 9259.1316 | 340 | 40660 | 395 |
| *Unemployment Rate* | 5.6497 | 2.2000 | 13.8000 | 396 |
| *Poverty* | 0.1577 | 0.0498 | 0.4832 | 396 |
| *High School Diploma* | 0.3627 | 0.1778 | 0.5254 | 396 |
| *Bachelor's Degree* | 0.0964 | 0.0318 | 0.3213 | 396 |
| *Local Government Expenditure* | 3.0065 | 1.0977 | 9.7377 | 395 |
| *Net Migration Change* | -0.0184 | -0.2650 | 0.2973 | 396 |
| *Corporate Farm other-than-family* | 1.2188 | 0.1250 | 9.0000 | 396 |
| | | | | |
| **Counties with Below the Mean Number of Corporate Farms** | **Mean** | **Minimum** | **Maximum** | **Observations** |
| *Per Capita Income* | 21740.9352 | 5355 | 65486 | 1296 |
| *Median Housing Value* | 67592.0489 | 13800 | 750000 | 1308 |
| *Natural Amenity Score* | 3.4339 | 1 | 7 | 1309 |
| *Total Employment* | 8205.1103 | 73 | 37715 | 1296 |
| *Unemployment Rate* | 5.8761 | 1.6 | 16.4 | 1308 |
| *Poverty* | 0.1584 | 0 | 0.5692 | 1309 |
| *High School Diploma* | 0.3622 | 0.1093 | 0.5325 | 1309 |
| *Bachelor's Degree* | 0.0937 | 0 | 0.4002 | 1309 |
| *Local Government Expenditure* | 2.9793 | 0.2250 | 15.9242 | 1296 |
| *Net Migration Change* | -0.0167 | -0.2500 | 0.4394 | 1308 |
| *Corporate Farm other-than-family* | -0.2635 | -0.9091 | 0 | 1309 |

Table 4. Descriptive Statistics for Counties with Above the Mean and Below the Mean of Net Cash Farm Income Measure

| **Counties with Above the Mean Net Cash Farm Income** | **Mean** | **Minimum** | **Maximum** | **Observations** |
|---|---|---|---|---|
| *Per Capita Income* | 21971.6000 | 5355 | 72662 | 970 |
| *Median Housing Value* | 67485.4230 | 20100 | 750000 | 981 |
| *Natural Amenity Score* | 3.3507 | 1 | 7 | 981 |
| *Total Employment* | 8966.9567 | 287 | 40660 | 970 |
| *Unemployment Rate* | 5.7534 | 1.6000 | 15.8000 | 980 |
| *Poverty* | 0.1549 | 0.0293 | 0.5232 | 981 |
| *High School Diploma* | 0.3658 | 0.1093 | 0.5175 | 981 |
| *Bachelor's Degree* | 0.0934 | 0.0301 | 0.4002 | 981 |
| *Local Government Expenditure* | 2.9327 | 0.9297 | 12.5146 | 970 |
| *Net Migration Change* | -0.0147 | -0.2500 | 0.4039 | 980 |
| *Net Cash Farm Income Change* | 0.7544 | -0.4262 | 87.4955 | 951 |
| | | | | |
| **Counties with Below the Mean Net Cash Farm Income** | **Mean** | **Minimum** | **Maximum** | **Observations** |
| *Per Capita Income* | 21649.4036 | 8977 | 61909 | 721 |
| *Median Housing Value* | 67490.0415 | 13800 | 358200 | 723 |
| *Natural Amenity Score* | 3.5483 | 2 | 7 | 724 |
| *Total Employment* | 7757.6033 | 73 | 37715 | 721 |
| *Unemployment Rate* | 5.9184 | 2.1 | 16.4 | 724 |
| *Poverty* | 0.1628 | 0 | 0.5692 | 724 |
| *High School Diploma* | 0.3576 | 0.1506 | 0.5325 | 724 |
| *Bachelor's Degree* | 0.0955 | 0 | 0.3656 | 724 |
| *Local Government Expenditure* | 3.0569 | 0.2250 | 15.9242 | 721 |
| *Net Migration Change* | -0.0204 | -0.2650 | 0.4394 | 724 |
| *Net Cash Farm Income Change* | -1.9785 | -402.1034 | -0.4272 | 724 |

- Code 8 is defined as, “Non-metro county completely rural or less than 2,500 urban population, adjacent to metro area” and,
- Code 9 is defined as, “Non-metro county completely rural or less than 2,500 urban population, not adjacent to metro area.”

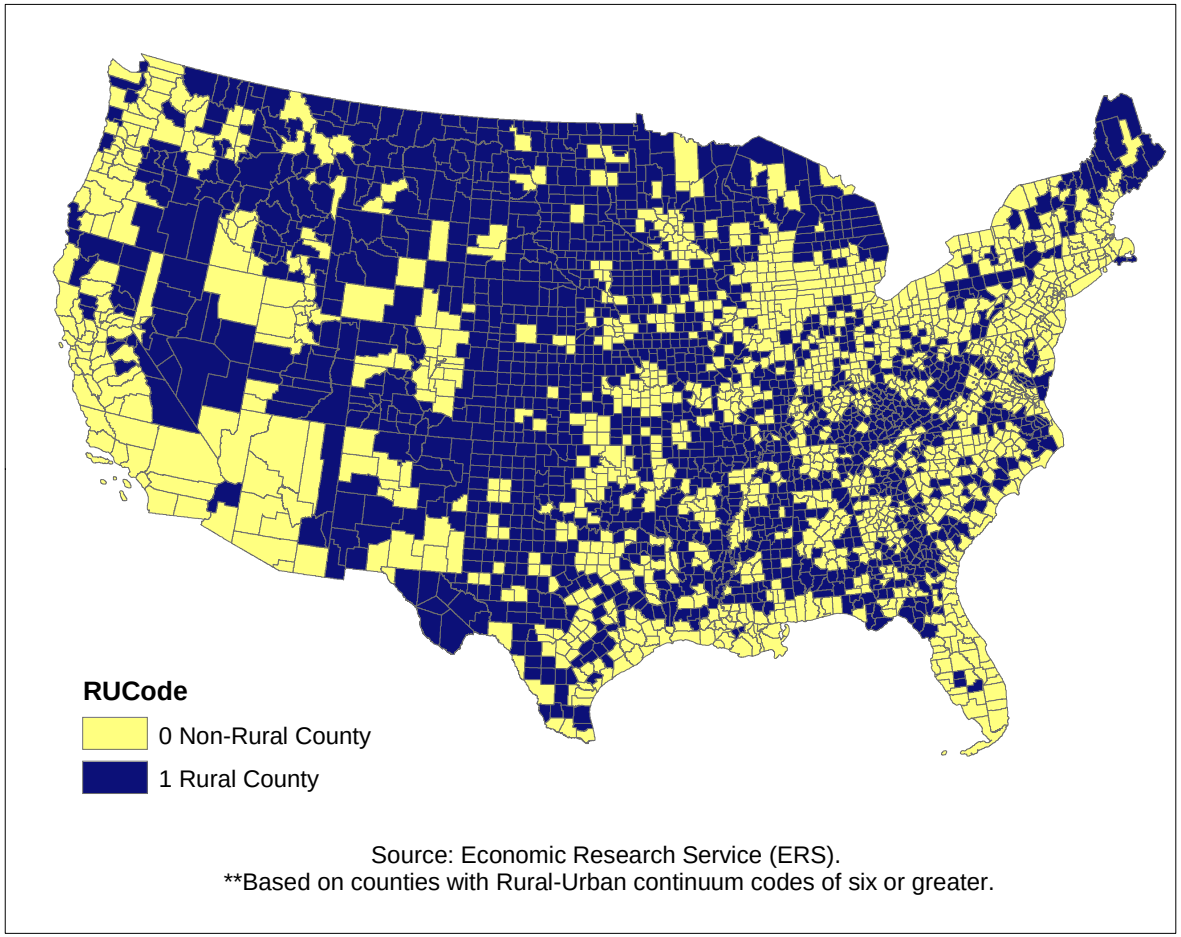
The codes help categorize the proximity to other counties and the size of counties in the United States. Different codes have been used in other studies to identify ‘rural’ but for the purpose of this research only codes six through nine will be used. Figure 4 shows the total number of rural and non-rural counties across the U.S based on this classification. Counties with classification codes of 1-3 are all in metro areas, while counties with codes of 4-5 are non-metro but have a population of 20,000 or more. A complete list of codes and number of counties included in each category can be found in Tables 5 and 6.

The Natural Amenity Scale is used to measure the overall amenities of a county. This scale includes: rural-urban continuum code of 1993, urban influence code of 1993, mean temperature for January 1941-1970, mean hours of sunlight for January 1941-1970, mean temperature for July 1941-1970, mean relative humidity for July 1941-1970, land surface form, and water in the area to determine the natural amenity score. Since the variables used to create the scale most likely haven’t changed significantly since the time period the data was collected, the scale is considered suitable. The scale ranges from one to seven, with seven being the most desirable, or providing the highest quality of life.

*Methodology*

Average Treatment Effect (ATE) is a statistical approach used in determining causation when direct experimentation is not possible. In this research, it is impossible to observe how a given community would perform with and without corporate farming present. Therefore, communities with similar characteristics will be matched to determine if the presence of corporate farming caused different outcomes in population change. The similar

Figure 4. U.S. Counties and Rural-Urban Continuum Codes **




Source: Economic Research Service (ERS).
**Based on counties with Rural-Urban continuum codes of six or greater.

Table 5. Description of Rural-Urban Continuum Codes

| Code | Description |
|---|---|
| Metro counties: | |
| 1 | Counties in metro areas of 1 million population or more |
| 2 | Counties in metro areas of 250,000 to 1 million population |
| 3 | Counties in metro areas of fewer than 250,000 population |
| Non-metro counties: | |
| 4 | Urban population of 20,000 or more, adjacent to a metro area |
| 5 | Urban population of 20,000 or more, not adjacent to a metro area |
| 6 | Urban population of 2,500 to 19,999, adjacent to a metro area |
| 7 | Urban population of 2,500 to 19,999, not adjacent to a metro area |
| 8 | Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 9 | Completely rural or less than 2,500 urban population, not adjacent to a metro area |
| | Source: USDA, Economic Research Service (2003). http://www.ers.usda.gov |

Table 6. Number of Counties and Population for Rural-Urban Continuum Codes 1-9

| Code | Number of counties | 2000 population |
|---|---|---|
| Metro counties: | | |
| 1 | 413 | 149,224,067 |
| 2 | 325 | 55,514,159 |
| 3 | 351 | 27,841,714 |
| Non-metro counties: | | |
| 4 | 218 | 14,442,161 |
| 5 | 105 | 5,573,273 |
| 6 | 609 | 15,134,357 |
| 7 | 450 | 8,463,700 |
| 8 | 235 | 2,425,743 |
| 9 | 435 | 2,802,732 |
| | | |
| U.S. total | 3,141 | 281,421,906 |
| Source | USDA, Economic Research Service (2003) | http://www.ers.usda.gov |

characteristics control for, it is assumed, all observable differences in the communities, so the only meaningful difference is the presence of corporate farming. ATE is a protocol that determines the effect of a treatment by accurately pairing non-treated units with treated units who have similar pretreatment characteristics (Caliendo and Kopeinig 2008). One can then determine if the treatment caused a particular outcome by analyzing the difference in outcomes between the two groups and its correlation to the treatment variable. The treatment, in this study, will be rural counties that have a greater-than-the-mean measure of corporate farm change among rural counties. A breakdown with statistical characteristics can be found in the *Methods and Procedures* section Tables 2-4. The mean was used as the base (counties with greater than the mean were given a value of 1 and counties with less than the mean were given a value of 0). Thus, this research will determine if a county with a greater proportion of corporate farms had a significantly different net migration due to population change than similar counties with fewer corporate farms. To do this, one simply differences the dependent and independent variables across the two groups. The differencing model among rural counties for this study is as follows:

$$(\text{Population } \Delta_T - \text{Population } \Delta_{UT}) = \beta_o + \beta_1 * (\text{Measure of corporate farms}\Delta_T - \text{Measure of corporate farms}\Delta_{UT}) + \beta_2 * (\text{Per capita income}_T - \text{Per capita income}_{UT}) + \beta_3 * (\text{Unemployment rate}_T - \text{Unemployment rate}_{UT}) + \beta_4 * (\text{natural amenity score}_T - \text{natural amenity score}_{UT}) + \beta_5 * (\text{percent with high school degree}_T - \text{percent with high school degree}_{UT}) + \beta_6 * (\text{percent with Bachelor's degree}_T - \text{percent with Bachelor's degree}_{UT}) + \beta_7 * (\text{poverty level}_T - \text{poverty level}_{UT}) + \beta_8 * (\text{median housing value}_T - \text{median housing value}_{UT}) + \beta_9 * (\text{local government expenditures per capita}_T - \text{local government expenditures per capita}_{UT}) + \beta_{10} * (\text{total employment}_T - \text{total employment}_{UT}) + \epsilon, \quad (3)$$

where *T*=treated group and UT=is untreated group.

In theory, because the observations in group T are similar to those in group UT, all the values of the differences in independent variables should be 0 except for the corporate farm variable. Thus, the only parameter estimate computed is the estimate for the effect of corporate farming on the difference in population due to migration between the two groups.

In order to match counties with more than average levels of corporate farms to counties with below average levels, a procedure called propensity score matching was used. The propensity score is a value that can be used to match counties based on numerous community characteristics; such matching allows the researcher to control for other factors in order to establish causality. The propensity score is created by using a logit model to predict the probability that a community will be in the treatment group, based upon their community characteristics (in this case, all independent variables discussed above were used). The predicted values from this logit model are the propensity scores. It is implied that counties with similar propensity scores have similar community characteristics. Basing the matching upon the propensity score enables the researcher to overcome potential sampling bias. For example, rural counties with less than the mean measure of corporate farms and rural counties with greater than the mean measure of corporate farm are sure to differ even before corporate farms locate in or near the rural community. Becker and Ichino (2002) and Caliendo and Kopeinig (2008) demonstrate how propensity scores overcome this potential bias by assigning the probability of being in the treatment group based upon the county's characteristics. Similar communities within the treatment group are matched, then, to communities that otherwise would have a high probability of being in the treatment group and thereby eliminating any bias.

Rather than explicitly matching each county in the treatment group to a set of control group counties, the kernel matching technique was used, which assigns the value of the weighted average propensity score of the control group counties for each treatment group county (Becker and Ichino 2002). These weights are inversely proportional to the distance between the propensity scores of treated and controlled variables (Becker and Ichino 2002). This technique minimizes "poor matches" due to large differences in propensity scores that can arise using other matching algorithms. Becker and Ichino (2002) also stress the need to ensure that the treatment and control group are, on average, the same to ensure that the exposure to treatment is random; they call this the balancing property. Stata, the statistical software used to perform analysis, has a method of verifying if this property holds prior to running the average treatment effect; to ensure the balancing property held, the logit model, in some cases, had to be modified for each measure of corporate farm by dropping variables (StataCorp 2007) . That is why the propensity score models presented in the Appendix Tables A through O comprises different sets of independent variables.

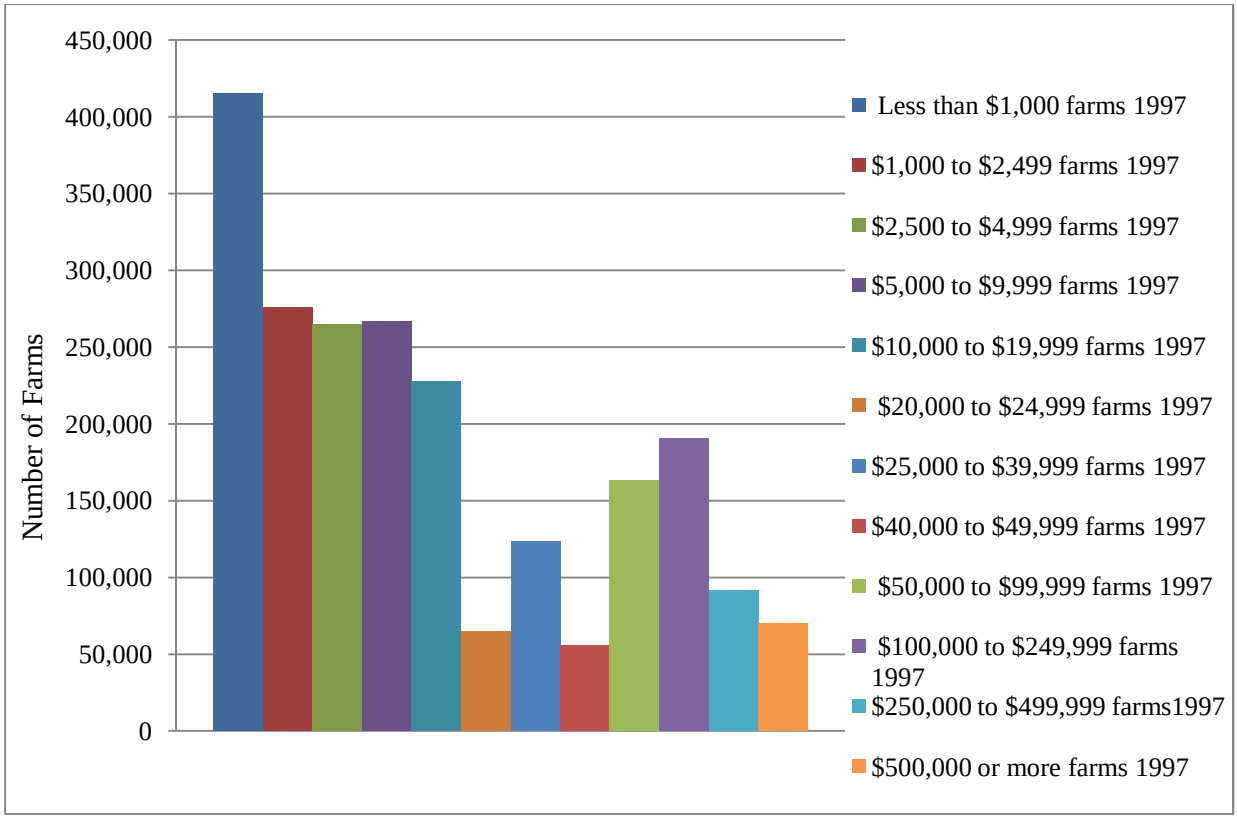
*Corporate Farm Data Analysis*

The percentage change in each corporate farm measure between 1997 and 2002 was calculated. The net farm cash income measure was adjusted for inflation with 1997 as the base year. The percent change in inflation-adjusted net cash farm income was then calculated using appropriate years. The number of corporate farms other-than-family-held measure was created by calculating the percent change of the appropriate years. Similarly, the farms by value of sales measure summed the total number of farms with sales of $100,000 and greater and then the percent change for given years was calculated. The number of farms with value of sales of $250,000 and greater was also considered. No additional information was

generated by this analysis. A break in the points of sales, $100,000 and greater was found to be the best group to explain the size of farms. But, as the reader will notice in Figures 5 and 6 there is a noticeable spike in category of $1,000 and less from 1997 to 2002. The explanation for the spike in less than farms with $1,000 value of sales could be due to a number of reasons. According to the S*tructure and Finances of U.S. Farms Family Farm Report, 2007 Edition* from the USDA Economic Research Service, "point farms" (Farms with less than $1,000 in sales but normally have at least $1,000 in sales and satisfy NASS's criteria in order to be defined as a 'farm.') increased for two reasons. One reason is due to a minor change in the Census farm definition and the second is the adjustment for under-coverage in the census farm count. It is important to note this large change in numbers of "point farms" and their explanations as the increase contradicts the phenomena of decreasing small family farms.

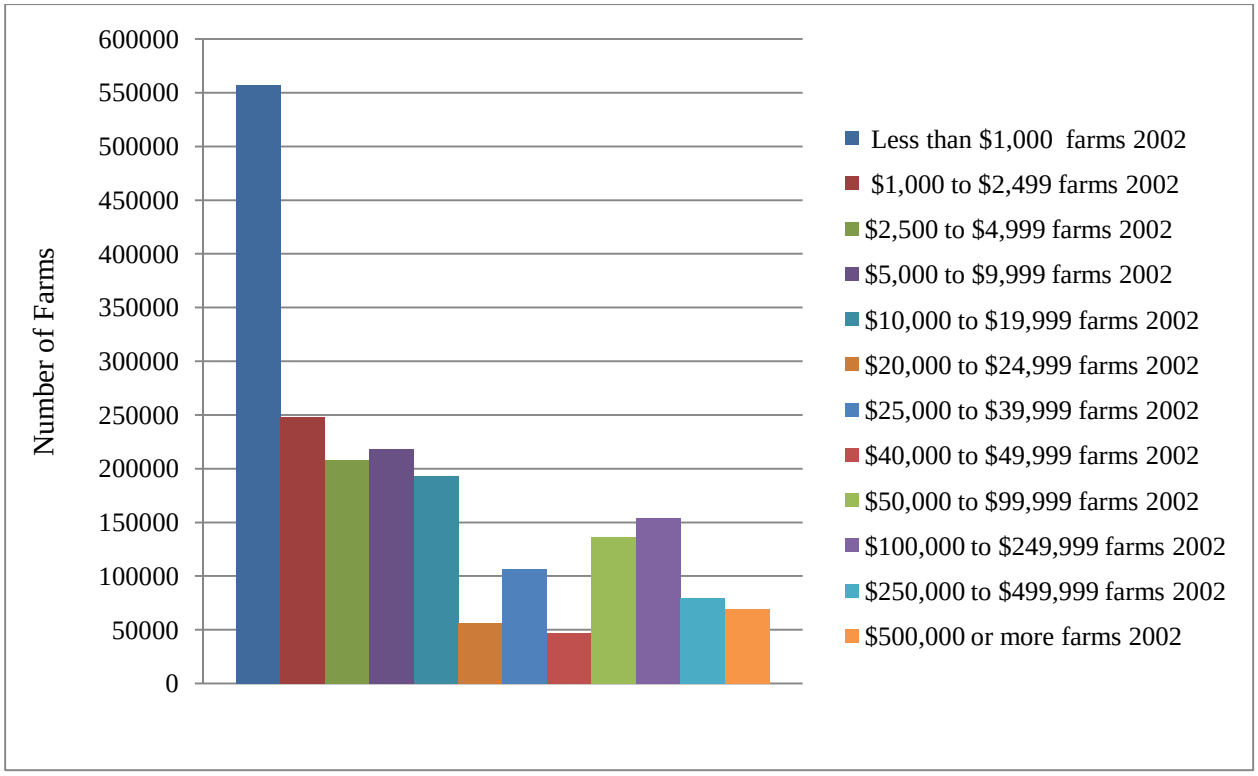
The overall objective of this research is to determine the effects of corporate farms on the change in population due to migration in rural counties. This research will determine if the number of corporate farms in counties in the United States is associated with measures of net migration. With careful examination and analysis of the regression results, it can be determined if migration of rural communities is, in fact, impacted by the increasing number of large, other-than-family-held corporate farms, increasing net cash farm income and increasing value of agricultural sales. The t-value and the Average Treatment of the Treated (ATT) numbers, given in the results, will determine this impact.

Figure 5. Sum of Total Farms by Value of Sales, 1997




Source: USDA, National Agricultural Statistics Service (1997). http://www.agcensus.usda.gov.

Figure 6. Sum of Total Farms by Value of Sales, 2002




Source: USDA, National Agricultural Statistics Service (2002). http://www.agcensus.usda.gov.

# CHAPTER V

## FINDINGS

### *Initial Model*

First, the initial model was tested for multicollinearity by creating correlation matrices to determine if there was a multicollinearity problem. Values greater than (+) or (–) 0.6 constituted multicollinearity in this study. Consequently, the median household income variable was omitted from all three farm measures because it was multicollinear with per capita income and poverty. Also, the local government expenditure variable was changed to local government expenditure per capita to eliminate its multicollinearity with total employment.

The output for the initial model ran in Stata is found in the Appendix Tables A through C (StataCorp 2007). The level of significance of the model was determined using the standard two-tailed t-test with ∞ degrees of freedom. The value of sales measure proved to be significant at the 1% level with a t-value of 4.328. The corporate farm other-than-family-held measure was not significant with a t-value of -0.089. This insignificance, however, can be explained. The S*tructure and Finances of U.S. Farms Family Farm Report, 2007 Edition* from the USDA Economic Research Service states that non-family corporations only make up a small and stable portion of farm numbers and sales. For example, non-family

corporations make up less than 1 percent of farms and only 6-7 percent of farm sales. Since this measure is fairly stable, it is expected that they don't explain much in the change of the communities' population. The weakness of using this as a measure is further explained in the *Limitations* portion of this paper. The net cash farm income measure had a t-value of 1.626, which is slightly smaller than the 10% significance value. A complete list of all t-values from the initial model is found in Table 7 for all three measures of corporate farm.

The ATT value explains the total impact of the farm measure on the population change due to migration. For example, the ATT value for value of agricultural sales was 0.014. The interpretation states that counties with above the mean levels of agricultural sales of $100,000 experienced a 1.4% greater change in population due to migration compared to those counties with less agricultural sales than the mean. So, these counties saw an increase in population due to increased agricultural sales, according to the output. Similarly, the population increases 0. 5% (ATT=0.005) more for counties with a net cash farm income above the mean than counties below the mean. The results indicate the need to reject the hypothesis for the value of farm sales and net cash farm income measures of corporate farm. Given the widespread decline in rural population, the results, implying that increasing corporate farming increases population, were not expected. However, it is explainable to some degree. When large farms move into rural communities, where the labor market is not very large, they look for people outside the community to become employees. The potential positive effects of a corporate farm in a rural community may also attract people to the community for reasons other than employment.

Table 7. Initial Model Results for Corporate Farm Change from 1997-2002 and Domestic Migration Change from 2002-2007

| Corporate Farm Measure | Results |
|---|---|
| **Farms by Value of Agricultural Sales** | ATT=0.014<br>t-value=4.328*** |
| **Number of Other-than-family-held farms** | ATT=-0.000<br>t-value=-0.089 |
| **Net Cash Farm Income** | ATT=0.005<br>t-value=1.626* |

***=Significant at the 1% level

**=Significant at the 5% level

*=Significant at the 10% level

*Sensitivity Analysis*

After analyzing the results from the initial model, a number of alternate specifications were analyzed to better understand the relationship between corporate farms and rural population due to migration. The following components were changed or further analyzed:

The significance levels specified in calculating the propensity score model were varied to insure that the values used for the model were not arbitrarily selected. The initial propensity scores for the logit models were ran at the 0.005 level. The level was varied to determine if a change would result in a different outcome of significance based on the t-value. When the level was changed to 0.025 (relaxing the significance constraint), the significance for the corporate farm measures did not change, reassuring that the 0.005 level was appropriate.

To account for differing agriculture production practices and commodities across different counties in the United States, the model was run with the U.S. Census region divisions as dummy variables. Only eight of the nine Census regions were included in the model to eliminate exact collinearity. The result of the value of farm sales measure was lowered slightly but remained significant at the 1% level with an ATT value of 0.013. Net cash farm income measure became insignificant at all levels with a t-value of 1.168 and an ATT value of 0.003. The other-than-family-held corporate farms significance level remained insignificant with a t-value of 0.244 and a positive ATT value of 0.001. Thus, the Census regions did not contribute additional significant information to the model.

The definition of rural counties, according to this study, was also examined. The analysis involved expanding the ERS rural urban continuum codes used from 6 through 9 to 4 through 9 (including all ‘non-metro’ counties in the study). The main difference between

these two definitions is the counties in the east north central and east south central portions of the United States. Numerically, including codes four and five will only contribute an additional 323 counties, or 10.3%. These counties also contribute a considerable amount of population, meaning these rural counties are heavily populated. The inclusion of only counties with rural urban continuum codes of 6 through 9 is also supported by Dust et. al. (2008). Thus, by including the two codes, it was determined an additional amount of *rural* data would not be explained. A complete list of number of counties in each code is found in Table 6.

Finally, since rural counties are widely known for dependence on agriculture and the types of agriculture differs greatly across the United States, counties dependent on farming and counties of population loss were also considered. The Economic Research Service, USDA, publishes county typology codes to measure rurality (USDA ERS, 2004). Among the categories to identify economic types was the dependence on: farming, mining, manufacturing, federal/state government, services and non-specialized. Policy types included: house stress, low-education, low-employment, persistent poverty, population loss, non-metro recreation, and retirement destination. Of these economic and policy types, farming dependent counties and counties with population loss were evaluated in four ways:

1) All U.S. counties with dummy variables for dependence on agriculture *and* experiencing a population loss included in determining the propensity score.
2) Limiting the sample size to only rural counties (codes 6-9) and including a dependent on farming dummy variable in determining the propensity score.
3) Limiting the sample size to only rural counties (codes 6-9) and including a population loss dummy variable in determining the propensity score.

4) Limiting the sample size to only rural counties (codes 6-9) and including a dependent on agriculture *and* a population loss dummy variable in determining the propensity score.

*Final Model Results*

1) The ATT and t-values were 0.004 and 1.362 for the net cash farm income measure, 0.006 and 2.093 for the value of sales measure, and 0.005 and 1.562 for the corporate farm other-than-family-held measure for all counties with dummy variables for dependence on agriculture *and* experiencing a population loss. These results are not surprising given they include urban counties which have very small levels of corporate farms.
2) The ATT and t-values were 0.006 and 2.103 for the net cash farm income measure, 0.013 and 4.169 for the value of sales measure, and -0.000 and -0.140 for the corporate farm other-than-family-held measure for only rural counties including a dependent on farming variable. These are consistent with our initial results.
3) The ATT and t-values were 0.004 and 1.175 for the net cash farm income measure, 0.013 and 4.188 for the value of sales measure, and-0.000 and -0.124 for the corporate farm other-than-family-held measure for only rural counties including a population loss variable.
4) The ATT and t-values were 0.005 and 1.505 for the net cash farm income measure, 0.013 and 4.085 for the value of sales measure, and -0.001 and -0.165 for the corporate farm other-than-family-held measure for only rural counties including a dependent on agriculture *and* a population loss variable.

These ATE results can be found on Table 8 and the propensity score output for the latest Stata models can be found in Appendix Tables D through O.

After evaluating the results, the model "Only rural counties including a dependent on farming variable" is the most inclusive model and produces the 'final' results. Overall, the results show that the corporate farm measure of farm by value of sales was the most significant measure of corporate farms in all models as well as the most consistently correlated measure with population change due to migration. The relationship between the value of sales measure and population change may be attributable to the idea that as large farms increase their value of sales; the population may also increase because of additional employment opportunities. The insignificance present in most of the results suggests that population change due to migration is not affected by increases in corporate farming, except when employment opportunities may exist (i.e. the results associated with the value of sales measure).

Table 8. Final ATT and T-value Results for Corporate Farm Measure Change 1997-2002 and Domestic Migration Change from 2002-2007.

| | **Net Cash Farm Income** | **Value of Sales** | **Corporate Farm Other-Than-Family-Held** |
|---|---|---|---|
| **1) All counties with dummy variables for dependence on farming *and* experiencing a population loss** | **ATT=0.004** t-value=1.362 | **ATT=0.006** t-value=2.093** | **ATT=0.005** t-value=1.562 |
| **2) Only rural counties including a dependent on farming dummy variable** | **ATT=0.006** t-value=2.103** | **ATT=0.013** t-value=4.169*** | **ATT=-0.000** t-value=-0.140 |
| **3) Only rural counties including a population loss dummy variable** | **ATT=0.004** t-value=1.175 | **ATT=0.013** t-value=4.188*** | **ATT=-0.000** t-value=-0.124 |
| **4) Only rural counties including a dependent on agriculture *and* a population loss dummy variable** | **ATT=0.005** t-value=1.505 | **ATT=0.013** t-value=4.085*** | **ATT=-0.001** t-value=-0.165 |

***= Significant at the 1% level

**=Significant at the 5% level

*=Significant at the 10% level

# CHAPTER VI

## CONCLUSIONS

In conclusion, this study shows changing farm structure does cause rural population change. More specifically, shows that farm size has had a small but significant positive impact on rural population. The impact of corporate farms affects the residents in the community and influences their decision to remain in the community or to relocate.

Farms have continued to grow in some form through the 1900s and 2000s, and there seemed to be a slight skewing of the farm distribution toward very small farms and very large farms. As communities face these new trends in agriculture, they should be ready with appropriate policies to maximize the impact agriculture can have on the local economy. Rural communities should embrace the entrance and existence of large farms that will ultimately lead to increased population, supported by the results in this study. They can do this by creating additional employment opportunities for family members of people employed by large, corporate farms, increase marketing efforts to new residents, and tailor the goods provided in the community to the needs of the large farm and its employees.

At the same time, corporate farm owners and their employees are generally less attached to rural communities. As mentioned previously by Tonts and Black (2002), they are less likely to purchase inputs locally and support local businesses. To minimize this negative effect of corporate farms on rural communities as it is related to rural economic development,

rural community leaders should use the results to create and support policies to preserve ties to the local community. Some ideas for rural leaders include:

-Smaller, locally-owned farms can form a cooperative in order to compete with the large, non-local farms, but maintain the strong ties to the local community.

-Rural leaders can help create entrepreneurial opportunities and programs in the community for locals to create new and diverse businesses that cater to the larger farms such as creating/selling input products.

- Creating opportunities for young residents both on and off the farm could provide benefits for the community. If young residents realize their community has job opportunities available to them, there is an incentive to remain in the community or to return after an education is attained.

- Local leaders could also promote niche marketing in agricultural products or agri-tourism. By encouraging these, the small, local farmers may be able to capture a different market than the large corporation and be able to remain in the community.

-Succession planning for small farmers to help with the multi-generation transition.

-Develop a local mentor/matching system to place local youth interested in farming in the community with elder farmers interested in retiring.

-Finally, economic development persons in the small community could encourage, and arrange or set goals for, the creation of more jobs in general, particularly for family members of small family farms for the access to health coverage, benefits, etc at lower costs.

All of these proactive ideas, approaches and policies could help communities adapt to a changing agriculture sector and maintain their population.

All in all, people's utility received from living in a particular location will drive their migration decisions. Preferences and economic situations, relating to quality of life, will also determine the location of which they live.

*Limitations of Study*

Due to the availability of data and the way in which the data was collected, there are some limitations to this study, particularly in the measures of corporate farms. The value of farm sales available at the county level is only available in twelve categories. The value of sales categories were broken down to number of farms with sales as follows: less than $1,000, $1,000 to $2,499, $2,500 to $4,999, $5,000 to $9,999, $10,000 to $19,999, $20,000 to $24,999, $25,000 to $39,999, $40,000 to $49,999, $50,000 to $99,999, $100,000 to $249,999, $250,000 to $499,999 and greater than $500,000. Given the breakdowns, the best measure to capture the change in sales was to sum the numbers of farms in the $100,000 and greater categories. It is understood that there are a lot of farms that produce a much greater amount of sales and that $100,000 in sales can be considered a small amount in some areas of the United States; however, this was the most reasonable measure given the data available. The measure of corporate farm other-than-family-held also has a limitation; farmers may choose to classify their farms as a corporation for a reason other than the mere size or production levels. This, ultimately, alters the number of corporations other-than-family-held classified as 'large' farms in this study. To help minimize the impact these limitations had on the results, three measures of corporate farms were used, as opposed to any single one.

Additionally, there was also difficulty finding county level data for some independent variables such as education level and median housing value. In these cases, the decennial census figures were used as best measures rather than the estimates for specific years.

Due to lack of data, the potentially significant variable of land value was excluded. Land values are very different throughout the U.S. due to natural amenities, distance from attractions, etc. If the study included a land value variable, the model could potentially better match similar counties across the U.S.

*Extensions for Future Research*

A possible extension for this research could be the inclusion of factors that may be causing decreased rural population due to migration. This study found that corporate farms do affect the population of rural communities in a positive way, but the trends of rural communities show decreasing population that must be caused by some other factors. Determining these factors in the same time period would help explain the population trends.

Though the population in rural communities has declined in the past, there is evidence that rural areas have seen influxes of people. Jobes (2008) identifies this time period between 1975 and 1980 and again from 1995 to 2000. He believes that improvements in communication and technology may attract people to rural areas. Examining both the location of corporate farms and also their access to communication and technology at the county level could result in a much needed study and some interesting conclusions as to whether corporate farms locate in areas with access to communication, or if it matters at all.

Including a multiplier for employment in the agriculture industry could help link rural counties to their dependence on agriculture. This would also better match similar counties based on their dependence on agriculture when creating propensity scores.

Finally, including additional industries found in rural economies, such as manufacturing, that are linked to corporate agriculture may help explain the structural shift as well as the population trends.

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APPPENDICES

Table A. Propensity Score Stata Output for Farms by Value of Sales, 1997-2002 (Initial Model)

| Value of Sales | Freq. | % of Total |
|---|---|---|
| 0 (county with change in value of sales < -0.0088) | 1101 | 64.57 |
| 1 (county with change in value of sales > -0.0088) | 604 | 35.43 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Value of Sales 1997-2002 | Coef. | Std. Err. |
| | | |
| lgepercap02 | -0.1604675 | 0.0493689 |
| bachperc2000 | -0.3645621 | 2.200553 |
| hsperc2000 | 0.2559341 | 1.279623 |
| poverty | 0.848116 | 1.143026 |
| uer2002 | 0.0609813 | 0.0322253 |
| te2002 | -0.0000114 | 9.07E-06 |
| natamscore | 0.3217373 | 0.0639066 |
| medhval00 | 3.24E-06 | 2.14E-06 |
| pci2002 | -0.0000278 | 0.0000208 |
| _cons | -1.337498 | 0.9212029 |
| | | |
| Log likelihood | -1051.9069 | |
| LR chi2(9) | 87.63*** | |
| Pseudo R2 | 0.04 | |
| Number of obs | 1690 | |

Table B. Propensity Score Stata Output for Farms by Corporate Farms, Other than Family Held, 1997-2002 (Initial Model)

| Corporate Farm Other-than-family-held | Freq | % of Total |
|---|---|---|
| 0 (county with change in number of farms < 0.0808) | 1,309 | 76.77 |
| 1 (county with change in number of farms > 0.0808) | 396 | 23.23 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Corporate Farms 1997-2002 | Coef. | Std. Err. |
| | | |
| lgepercap02 | 0.0302511 | 0.0526936 |
| bachperc2000 | 1.783624* | 2.464562 |
| hsperc2000 | 1.501971 | 1.411972 |
| poverty | 2.565774** | 1.298684 |
| uer2002 | -0.0675625 | 0.0388335 |
| te2002 | 0.0000319 | 9.56E-06 |
| natamscore | 0.0887752 | 0.0711282 |
| medhval00 | -5.15E-06 | 2.68E-06 |
| pci2002 | 0.0000364 | 0.0000219 |
| _cons | -3.042543 | 1.013457 |
| | | |
| Log likelihood | -908.133 | |
| LR chi2(9) | 21.58*** | |
| Pseudo R2 | 0.0117 | |
| Number of obs | 1690 | |

Table C. Propensity Score Stata Output for Net Cash Farm Income, 1997-2002 (Initial Model)

| Net Cash Farm Income | Freq. | % Total |
|---|---|---|
| 0 (county with change in farm income <-0.4269) | 724 | 42.46 |
| 1 (county with change in farm income >-0.4269) | 981 | 57.54 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Net Cash Farm Income 1997-2002 | Coef. | Std. Err. |
| | | |
| lgepercap02 | -0.0314064 | 0.0450685 |
| bachperc2000 | -3.114253*** | 1.867155 |
| poverty | -0.6807599 | 0.9713682 |
| uer2002 | -0.0395538 | 0.0313014 |
| te2002 | 0.0000236 | 8.75E-06 |
| natamscore | -0.1595534 | 5.82E-02 |
| medhval00 | 5.93E-07 | 2.06E-06 |
| pci2002 | 1.41E-05 | 1.92E-05 |
| _cons | 1.030592 | 0.5095097 |
| | | |
| Log likelihood | -1134.7606 | |
| LR chi2(8) | 36.2*** | |
| Pseudo R2 | 0.0157 | |
| Number of obs | 1690 | |

Table D. Propensity Score Stata Output for All counties with dummy variables for dependence on agriculture *and* experiencing a population loss (1) Farms by Value of Sales, 1997-2002

| Value of Sales | Freq. | % Total |
|---|---|---|
| 0 (county with change in value of sales < -0.0088) | 1,934 | 61.38 |
| 1 (county with change in value of sales > -0.0088) | 1,217 | 38.62 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Value of Sales 1997-2002 | Coef. | Std. Err. |
| | | |
| pci2002 | -0.000027 | 1.23E-05 |
| medhval00 | 5.10E-06 | 1.39E-06 |
| te2002 | 1.15E-07 | 2.36E-07 |
| uer2002 | 0.059772 | 0.02443 |
| hsperc2000 | -2.495067 | 0.823298 |
| bachperc2000 | -2.744167 | 1.541019 |
| lgepercap~02 | -0.015273 | 0.033913 |
| _cons | 0.546373 | 0.469493 |
| | | |
| Log likelihood | -1977.977 | |
| LR chi2(7) | 55.47*** | |
| Pseudo R2 | 0.0138 | |
| Number of obs | 3044 | |

Table E. Propensity Score Stata Output for All counties with dummy variables for dependence on agriculture *and* experiencing a population loss (1) Corporate Farms, Other than Family Held, 1997-2002

| Corporate Farm Other-than-family-held | Freq | % of Total |
|---|---|---|
| 0 (county with change in number of farms < 0.0808) | 2,387 | 75.63 |
| 1 (county with change in number of farms > 0.0808) | 769 | 24.37 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Corporate Farms 1997-2002 | Coef. | Std. Err. |
| | | |
| natamscore | 0.0593426 | 0.0486454 |
| poploss | -0.1807191 | 0.1261054 |
| farm | -0.1175599 | 0.1420747 |
| lgepercap~02 | 0.0016655 | 0.0390221 |
| bachperc2000 | 2.602535*** | 1.752588 |
| hsperc2000 | 1.734604* | 1.094196 |
| pov1999 | 0.4040049 | 1.037265 |
| uer2002 | -0.0462382 | 0.0307164 |
| te2002 | 2.91E-08 | 2.56E-07 |
| medhval00 | -2.06E-06 | 1.75E-06 |
| pci2002 | 0.0000191 | 0.0000145 |
| _cons | -2.25551 | 0.7566264 |
| | | |
| Log likelihood | -1691.9328 | |
| LR chi2(11) | 19.75*** | |
| Pseudo R2 | 0.0058 | |
| Number of obs | 3048 | |

Table F. Propensity Score Stata Output for All counties with dummy variables for dependence on agriculture *and* experiencing a population loss (1) Net Cash Farm Income, 1997-2002

| Net Cash Farm Income | Freq. | % Total |
|---|---|---|
| 0 (county with change in farm income <-0.4269) | 2,222 | 72.19 |
| 1 (county with change in farm income >-0.4269) | 856 | 27.81 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Net Cash Farm Income 1997-2002 | Coef. | Std. Err. |
| | | |
| poploss | -0.4425952 | 0.12445 |
| farm | 0.3816462 | 0.12981 |
| bachperc2000 | -4.207576*** | 1.39505 |
| pov1999 | 3.050533*** | 0.84526 |
| uer2002 | -0.0279647 | 0.02801 |
| medhval00 | 4.54E-06 | 1.64E-06 |
| pci2002 | 0.0000193 | 1.4E-05 |
| _cons | -1.569195 | 0.34621 |
| | | |
| Log likelihood | -1766.1473 | |
| LR chi2(7) | 48.14*** | |
| Pseudo R2 | 0.0134 | |
| Number of obs | 3006 | |

Table G. Propensity Score Stata Output for Only rural counties including a dependent on farming variable (2) Farms by Value of Sales, 1997-2002

| Value of Sales | Freq. | % of Total |
|---|---|---|
| 0 (county with change in value of sales < -0.0088) | 1,101 | 64.57 |
| 1 (county with change in value of sales > -0.0088) | 604 | 35.43 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Value of Sales 1997-2002 | Coef. | Std. Err. |
| | | |
| farm_depen~t | -0.3671862 | 0.1530545 |
| lgepercap02 | -0.1308069 | 0.0488436 |
| bachperc2000 | -0.3206562 | 2.175144 |
| hsperc2000 | -2.189638** | 1.084824 |
| uer2002 | 0.0624965 | 0.0317864 |
| te2002 | -0.0000219 | 9.43E-06 |
| pci2002 | -0.000051 | 0.0000195 |
| medhval00 | 5.83E-06 | 2.05E-06 |
| _cons | 1.200853 | 0.6385887 |
| | | |
| Log likelihood | -1062.129 | |
| LR chi2(8) | 67.19*** | |
| Pseudo R2 | 0.0307 | |
| Number of obs | 1690 | |

Table H. Propensity Score Stata Output for Only rural counties including a dependent on farming variable (2) Corporate Farms, Other than Family Held, 1997-2002

| Corporate Farm Other-than-family-held | Freq | % of Total |
|---|---|---|
| 0 (county with change in number of farms < 0.0808) | 1,309 | 76.77 |
| 1 (county with change in number of farms > 0.0808) | 396 | 23.23 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Corporate Farms 1997-2002 | Coef. | Std. Err. |
| | | |
| farm_depen~t | -0.0892341 | 0.169379 |
| lgepercap02 | 0.0322111 | 0.0528154 |
| bachperc2000 | 1.93421* | 2.482434 |
| hsperc2000 | 1.441368 | 1.417715 |
| poverty | 2.617443*** | 1.303979 |
| uer2002 | -0.0725031 | 0.040024 |
| te2002 | 0.0000303 | 0.00001 |
| natamscore | 0.0873983 | 0.0712659 |
| medhval00 | -5.48E-06 | 2.78E-06 |
| pci2002 | 0.0000371 | 0.000022 |
| _cons | -2.975163 | 1.021881 |
| | | |
| Log likelihood | -907.99364 | |
| LR chi2(10) | 21.86*** | |
| Pseudo R2 | 0.0119 | |
| Number of obs | 1690 | |

Table I. Propensity Score Stata Output for Only rural counties including a dependent on farming variable (2) Net Cash Farm Income, 1997-2002

| Net Cash Farm Income | Freq. | % Total |
|---|---|---|
| 0 (county with change in farm income <-0.4269) | 724 | 42.54 |
| 1 (county with change in farm income >-0.4269) | 978 | 57.46 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Net Cash Farm Income 1997-2002 | Coef. | Std. Err. |
| | | |
| farm_depen~t | 0.40362 | 0.1437467 |
| lgepercap02 | -0.05287 | 0.0459029 |
| bachperc2000 | -4.084976*** | 1.911421 |
| uer2002 | -0.0319569 | 0.030529 |
| te2002 | 0.0000327 | 9.26E-06 |
| natamscore | -0.1689377 | 0.0578008 |
| medhval00 | 1.95E-06 | 2.15E-06 |
| pci2002 | 0.000018 | 0.0000182 |
| _cons | 0.7138666 | 0.4642505 |
| | | |
| Log likelihood | -1128.1715 | |
| LR chi2(8) | 46.04*** | |
| Pseudo R2 | 0.02 | |
| Number of obs | 1687 | |

Table J. Propensity Score Stata Output for Only rural counties including a population loss variable (3) Farms by Value of Sales, 1997-2002

| Value of Sales | Freq. | % of Total |
|---|---|---|
| 0 (county with change in value of sales < -0.0088) | 1,101 | 64.57 |
| 1 (county with change in value of sales > -0.0088) | 604 | 35.43 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Value of Sales 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.1928033 | 0.1392633 |
| lgepercap02 | -0.1270171 | 0.0488155 |
| bachperc2000 | 1.047924 | 1.951208 |
| poverty | 1.533303 | 1.001347 |
| uer2002 | 0.0734799 | 0.032035 |
| te2002 | -0.0000172 | 9.18E-06 |
| medhval00 | 6.19E-06 | 2.19E-06 |
| pci2002 | -0.0000416 | 0.0000211 |
| _cons | -0.3362901 | 0.5211471 |
| | | |
| Log likelihood | -1064.608 | |
| LR chi2(8) | 62.23*** | |
| Pseudo R2 | 0.0284 | |
| Number of obs | 1690 | |

Table K. Propensity Score Stata Output for Only rural counties including a population loss variable (3) Corporate Farms, Other than Family Held, 1997-2002

| Corporate Farm Other-than-family-held | Freq | % of Total |
|---|---|---|
| 0 (county with change in number of farms < 0.0808) | 1,309 | 76.77 |
| 1 (county with change in number of farms > 0.0808) | 396 | 23.23 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Corporate Farms 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.0628578 | 0.1549638 |
| lgepercap02 | 0.0314827 | 0.0527472 |
| bachperc2000 | 1.961245** | 2.503955 |
| hsperc2000 | 1.522564 | 1.413406 |
| poverty | 2.604754*** | 1.303606 |
| uer2002 | -0.0682254 | 0.0388706 |
| te2002 | 0.0000311 | 9.76E-06 |
| natamscore | 0.0848391 | 0.071875 |
| medhval00 | -5.55E-06 | 2.90E-06 |
| pci2002 | 0.0000381 | 0.0000223 |
| _cons | -3.043734 | 1.013896 |
| | | |
| Log likelihood | -908.0505 | |
| LR chi2(10) | 21.75*** | |
| Pseudo R2 | 0.0118 | |
| Number of obs | 1690 | |

Table L. Propensity Score Stata Output for Only rural counties including a population loss variable (3) Net Cash Farm Income, 1997-2002

| Net Cash Farm Income | Freq. | % Total |
|---|---|---|
| 0 (county with change in farm income <-0.4269) | 724 | 42.54 |
| 1 (county with change in farm income >-0.4269) | 978 | 57.46 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Net Cash Farm Income 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.1668666 | 0.1327489 |
| lgepercap02 | -0.0407264 | 0.0459665 |
| bachperc2000 | -2.056898** | 2.148461 |
| hsperc2000 | 0.6602778 | 1.217907 |
| poverty | -0.3409856 | 1.105806 |
| uer2002 | -0.0435156 | 0.0314588 |
| te2002 | 0.000022 | 8.95E-06 |
| natamscore | -0.1680947 | 0.061181 |
| medhval00 | -5.19E-07 | 2.19E-06 |
| pci2002 | 0.0000191 | 0.0000196 |
| _cons | 0.7397961 | 0.8722113 |
| | | |
| Log likelihood | -1130.9544 | |
| LR chi2(10) | 40.48*** | |
| Pseudo R2 | 0.0176 | |
| Number of obs | 1687 | |

Table M. Propensity Score Stata Output for Only rural counties including a dependent on agriculture *and* a population loss variable (4) Farms by Value of Sales, 1997-2002

| Value of Sales | Freq. | % of Total |
|---|---|---|
| 0 (county with change in value of sales < -0.0088) | 1,101 | 64.57 |
| 1 (county with change in value of sales > -0.0088) | 604 | 35.43 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Value of Sales 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.1261936 | 0.1397198 |
| farm_depen~t | -0.3490536 | 0.1542913 |
| lgepercap02 | -0.1292284 | 0.0487722 |
| bachperc2000 | -0.0423978 | 2.194976 |
| hsperc2000 | -2.154841** | 1.085685 |
| uer2002 | 0.0622722 | 0.0317847 |
| te2002 | -0.0000232 | 9.54E-06 |
| medhval00 | 5.09E-06 | 2.20E-06 |
| pci2002 | -0.0000474 | 0.0000199 |
| _cons | 1.172594 | 0.6390986 |
| | | |
| Log likelihood | -1061.7201 | |
| LR chi2(9) | 68.01*** | |
| Pseudo R2 | 0.031 | |
| Number of obs | 1690 | |

Table N. Propensity Score Stata Output for Only rural counties including a dependent on agriculture *and* a population loss variable (4) Corporate Farms, Other than Family Held, 1997-2002

| Corporate Farm Other-than-family-held | Freq | % of Total |
|---|---|---|
| 0 (county with change in number of farms < 0.0808) | 1,309 | 76.77 |
| 1 (county with change in number of farms > 0.0808) | 396 | 23.23 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Corporate Farms 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.05444 | 0.1558839 |
| farm_depen~t | -0.0826222 | 0.1704068 |
| lgepercap02 | 0.033107 | 0.0528468 |
| bachperc2000 | 2.077255** | 2.516697 |
| hsperc2000 | 1.463808 | 1.419517 |
| poverty | 2.647062*** | 1.307761 |
| uer2002 | -0.0726951 | 0.0400165 |
| te2002 | 0.0000298 | 0.0000101 |
| natamscore | 0.0841373 | 0.0719429 |
| medhval00 | -5.81E-06 | 2.97E-06 |
| pci2002 | 0.0000385 | 0.0000224 |
| _cons | -2.981326 | 1.02234 |
| | | |
| Log likelihood | -907.93251 | |
| LR chi2(11) | 21.98*** | |
| Pseudo R2 | 0.012 | |
| Number of obs | 1690 | |

Table O. Propensity Score Stata Output for Only rural counties including a dependent on agriculture *and* a population loss variable (4) Net Cash Farm Income, 1997-2002

| Net Cash Farm Income | Freq. | % Total |
|---|---|---|
| 0 (county with change in farm income <-0.4269) | 724 | 42.54 |
| 1 (county with change in farm income >-0.4269) | 978 | 57.46 |
| | | |
| Propensity Score Logit Estimation Results | | |
| Net Cash Farm Income 1997-2002 | Coef. | Std. Err. |
| | | |
| pop_loss | -0.2176694 | 0.1340047 |
| farm_depen~t | 0.463901 | 0.1468862 |
| lgepercap02 | -0.0519992 | 0.0462751 |
| bachperc2000 | -2.755502*** | 2.168001 |
| hsperc2000 | 1.006931 | 1.227555 |
| poverty | -0.591564 | 1.111718 |
| uer2002 | -0.0200454 | 0.0323931 |
| te2002 | 0.0000302 | 9.39E-06 |
| natamscore | -0.1621065 | 0.0613712 |
| medhval00 | 6.90E-07 | 2.23E-06 |
| pci2002 | 0.000017 | 0.0000197 |
| _cons | 0.3995844 | 0.8817722 |
| | | |
| Log likelihood | -1125.9002 | |
| LR chi2(11) | 50.58*** | |
| Pseudo R2 | 0.022 | |
| Number of obs | 1687 | |

VITA

Cindi Ashby Browne

Candidate for the Degree of

Master of Science

Thesis: THE EFFECTS OF CHANGING FARM STRUCTURE ON RURAL MIGRATION IN THE UNITED STATES

Major Field: Agricultural Economics

Biographical:

Personal Data: Born in Lubbock, TX on May 11, 1986, daughter of Julia A. Wright and David A. Browne and sister of Lesley W. Dugan and Terri A. Browne.

Education: Graduated from Grand Island Northwest High School, Grand Island, Nebraska in May 2004; received a Bachelors of Science in Agribusiness at Kansas State University, Manhattan, Kansas in May, 2008; and completed the requirements for the Master of Science in Agricultural Economics at Oklahoma State University, Stillwater, Oklahoma in May, 2010

Experience: Graduate Research Assistant, Oklahoma State University, Stillwater, Oklahoma, August 2008 to May 2010; Area Clerk, USDA – Rural Development, Stillwater, Oklahoma, January 2010 to October 2010;Student Research Assistant, Kansas State University, Manhattan, Kansas, August 2005 to May 2008.

Name: Cindi Ashby Browne Date of Degree: May, 2010

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: THE EFFECTS OF CHANGING FARM STRUCTURE ON RURAL MIGRATION IN THE UNITED STATES

Pages in Study: 069 Candidate for the Degree of Master of Science

Major Field: Agricultural Economics

Scope and Method of Study: A decline in rural migration in the United States has been a concern to many for the last few decades. Simultaneously, corporate agriculture has grown its market share to dominate the industry. Given the dependence of many rural communities on agricultural employment, this study examines if there exists a link between the rise in corporate agriculture and decline in rural migration. The changing structure of farms from small, family-owned to large, non-family-owned corporate farms is a possible explanation for population loss in rural communities. Corporate farming is defined by three measures in this study: legal status, production levels and net income. The use of average treatment effects and these three measures allow the researcher to discern if farm size, ownership or profitability of farms drives population change for rural areas. The results of this analysis should determine the relationship between farm structure and population change so that communities can devise effective, local policies to address the issue.

Findings and Conclusions: This study shows changing farm structure does, in fact, cause rural population change. More specifically, it shows that farm size has had a small but significant positive impact on rural population. The impact of corporate farms affects the residents in the community and influences their decisions to remain in the community or to relocate. Farms have continued to grow in some form through the 1900s and 2000s, and there seemed to be a slight skewing of the farm distribution toward very small farms and very large farms. As communities face these new trends in agriculture, they should be ready with appropriate policies to maximize the impact agriculture can have on the local economy. Rural communities should embrace the entrance and existence of large farms that will ultimately lead to increased population, supported by the results in this study. They can do this by creating additional employment opportunities for family members of people employed by large, corporate farms, increase marketing efforts to new residents and tailor the goods provided in the community to the needs of the large farm and its employees. At the same time, rural community leaders should use the results to create and support policies that preserve ties to the local community.

ADVISER'S APPROVAL: Dr. David Shideler