THE INFLUENCE OF RURAL AMENITIES ON NON-METROPOLITAN POPULATION CHANGE IN THE UNITED STATES FROM, 1980-2000

by

HARRY LANDIS VOGEL

B.S., James Madison University, 1992
M.A., Western Kentucky University, 1995

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Sociology
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KANSAS STATE UNIVERSITY
Manhattan, Kansas

2006

Abstract

The chief aim of this research is to assess the influence of rural amenities on population change amongst all non-metropolitan counties in the United States (excluding Alaska and Hawaii) from 1980 to 2000. Rural amenities, as defined by this research, are the attributes of a non-metropolitan locale that enhance the quality of life of the people living or visiting there. First, I discuss the general patterns of population change in non-metropolitan areas during these three decades as well as the possible influence of rural amenities during this time period. I then examine how rural amenities have been studied by past research in order for me to hypothesize their influence on non-metropolitan population change in the United States. Additionally, I draw on past research in order to guide my conceptualization and measurement of rural amenities. Using data from the United States Census of Population, the National Outdoor Recreational Supply Information System (NORSIS), and David McGranahan's (1999) Natural Amenity Scale, a panel model data set was constructed for the aforementioned counties from 1980 to 2000. This research constructed a panel data set using data from the aforementioned sources for the years of 1980-2000. Accordingly, in this model the change scores on two measures of population change (absolute population change and percentage population change) were regressed on the amenity and control variables. Regression diagnostics were then used to examine the extent to which specific regression assumptions were validated by the data. Results suggest that climatic amenities, river and ocean based amenities, and warm weather recreational amenities were most significantly associated with increase in population amongst the counties examined by this study.

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Approved by
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TABLE OF CONTENTS

List of Figures

List of Tables

DEDICATION

This work is dedicated to the memory of:

Frederick David Vogel, USMC

and

Donald J. Adamchak, Ph.D.

CHAPTER 1-INTRODUCTION: THE STATEMENT OF THE PROBLEM

Bob is a web site designer currently living in the 21st century metropolis of St. Louis where he must deal with high rent, noise, pollution, and traffic. Although Bob lives in the city, he enjoys canoeing, hiking and fishing but, he must travel far away from his home in St. Louis in order to engage in these activities. Consequently, he does not get to do them as often as he likes. In years past, Bob had to be at an office in order to do his job as a librarian. Recent improvements in the computers he uses as well as the rise of the Internet have given him the ability to work at home.

Besides the different working conditions of his occupation as well as his occupation itself, the Internet has opened up a whole world of opportunities for Bob that was previously unavailable to him. For example, in the 1970s and 1980s, Bob had to travel all the way across the city to a coin and stamp shop in order to buy philatelic items for his stamp collection. Moreover, he could only do so at certain hours of the day and certain days of the week. Even so, Bob felt lucky to have such a place in close proximity to his home, because in many areas such shops were nonexistent. Bob also went to the local canoeing club meetings, chiefly, to obtain information on the latest equipment, trips that were being organized, and techniques about his passion for canoeing. The club met once a month at a Y.M.C.A. on Friday nights. For quite some time now he has not been attending the meetings, for he has been able to keep in touch with the members of the group via e-mail and has found most of the information he needs about canoeing on the Internet. In essence, Bob feels that he has very little reason to live in the city and longs for a life more fulfilling than that of the urban metropolis.

Recently, while on one of his canoe trips, Bob came upon a quaint town in a rural area in Missouri. The town seemed to have everything Bob was looking for: shops, friendly people, little or no traffic, an old battlefield site where he could visit and perhaps have a picnic and very beautiful scenery. Moreover, he has found a perfect house to live in right by the river. Bob decides that the quality of life of this area is much better than it is in St. Louis and makes plans to move there.

Our hypothetical migrant, Bob, typifies the people now moving to non-metropolitan locations in order to improve their quality of life. These men and women have been referred to as the rural "lone eagles and high fliers" by Beyers and Lindahl (1996). These so-called "lone eagles" are attracted to the amenities that are in rural areas, and, therefore, choose to live and conduct business in rural locations (Beyers and Lindahl 1996). As will be discussed later, rural amenities are attributes of a non-metropolitan locale which enhance the quality of life of the people living or visiting there. A key question guiding this research, was to what extent are people moving to non-metropolitan locations and what is the effect of amenities on the change in population in these rural locales? Since the rise of the industrial revolution, urban areas have outpaced rural areas in terms of population growth. Over the last 200 years, urban areas have stripped rural areas of their population as people went to the cities to find work in the bourgeoning factories and plants of the industrial city. A more recent trend seems to be evolving as more developed countries move from a industrially-based economy to a post-industrial one. By this, I mean to say that economies in more developed countries are moving from an economy based on the manufacturing of goods, to one based on services and the manipulation of information. Improvements in technology and transportation have made this change possible.

Additionally, these improvements have changed the *space* in which people work and are able to work. With the advent of broadband cable, the Internet, the widespread use of fax machines, as well as a host of other variables, people have been able to work farther away from the densely packed urban core than ever before (Munnich, Schrock, and Cook. 2002). These developments have provided the vehicle by which people have been able to move to areas of lower population density. Additionally, more people than ever are working from home. During a typical work week in 1997, 9.3 million people, roughly 7 percent of the workforce, put in at least one workday at home (Kuenzi and Reschovsky 2001). And many people do not have to go to their job site at all. Because of these factors it is more feasible for workers to relocate to rural areas, which have recently begun to add, rather than lose, population. However, not all rural areas are growing in population. The cause of the variation in rural areas may be attributed to a host of social, economic, and geographic factors. Past research has indicated that one such factor may be rural amenities. These amenities can be seen as an important pull factor drawing people to non-metropolitan areas. The purpose of this research is to examine the effect of rural amenities on population in these non-metropolitan areas. Between the years of 1980 and 2000, population change in non-metropolitan areas of the United States has taken dramatic twists and turns. The 1980s saw non-metropolitan population growth lagging behind metropolitan population growth, due to a variety of social, political, and economic factors, which are discussed in more detail in Chapter 2. From 1980 to 1989, non-metropolitan population growth, as reported in the U. S. Census (2000),

> Metropolitan areas grew faster than non-metropolitan areas in the 1980s. The average annual percentage growth was 1.1 percent for metropolitan areas and 0.3 percent for non-metropolitan areas (p. 2).

Another source, Frey and Speare (1992) also found that the 1980s favored metropolitan areas:

> National metropolitan growth patterns for the 1980s suggest a re-emergence of pre-1970s urbanization. Over 1980-90, large metropolitan areas (exceeding one million population) grew at a faster rate than metropolitan areas as a whole, and significantly faster than the much-reduced growth rate registered for non-metropolitan territories. These metropolitan category differences become even more accentuated for 1985-90, when non-metropolitan area growth is barely positive (p. 131).

In the 1990s, however, a reversal of this trend seemed to be emerging, as the United State's Census reported in 1998: "In the early 1990s the non-metropolitan population surged to 1.0 percent growth annually, while the metropolitan areas growth rates decreased to 1.1 percent growth."

The rise of the Internet and the expansion of digital technologies has created a revolution in many non-metropolitan areas. Where once distance and isolation greatly limited the ability of these areas to attract population and businesses, the digital revolution has opened non-metropolitan areas as never before (Greenspan 2001, Malecki 2001, Munnich, Schrock, and Cook 2002). One question regarding its influence on rural areas is the extent to which this has occurred as well as its possible effects on population change. As Malecki (2001) reports, there is little doubt that Rural America is going digital; the question is whether or not it is digital enough to attract amenity seekers, like Bob? An example of one such issue relates to the technological 'gap'[1] between non-metropolitan and metropolitan areas (Malecki 2001, Beaulieu, Geotz and Barfield 2002). According to Malecki (2001), the availability of broadband cable for high-speed Internet connections is one of the most pertinent issues in the technology gap between

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[1] Authors refer to the so-called technological 'gap' in nonmetro areas as a situation in which non-metromplitan areas are less likely to posses the technological infrastructure that most metropolitan areas posses.

metropolitan and non-metropolitan areas.

> Not so long ago, within memory for many of us, for businesses and households alike, telecommunications networks used to be like electricity, water, and other utilities. Monopoly providers offered plain old telephone service (POTS). Fax machines, Broadband access is growing as an essential dimension of Internet use. Internet browsers and their graphics slow down considerably at dial-up speeds. Audio (music files, sound clips, as well as radio) and video (clips, video conferencing, and streaming video of live events, and movies on demand) are among the applications that can barely be imagined at dial-up speeds. These are not merely recreational uses of Internet technology. Businesses need to provide pictures of what they sell; video conferencing is an important way for telecommuters to be in other locations "virtually." The wonders of the Internet become real only at broadband speed (p. 52).

A United States Census report conducted in the year 2000 also suggested that a technological 'gap' existed between metropolitan and non-metropolitan areas. This study indicated that 53.3 percent of metropolitan households had computer in them, whereas only 41.8 percent of non-metropolitan households had a computer in them (U. S. Census Bureau 2000, p. 3). The report also noted that the computer ownership varied from region to region, with the South having the lowest percentage of computer ownership (U. S. Census Bureau 2000, p. 3). Also a gap between homes with Internet access was reported, with 43.9 percent of metropolitan households possessing Internet access while only 31.6 percent of non-metropolitan households had Internet access in the year 2000 (U. S. Census Bureau 2000, p. 3). Therefore, we should also gain an appreciation of the influence these technological changes may have on rural population change in order to theorize about their possible connection to amenities. An understanding of these conditions may help us understand the relative weight that amenities carry.

Past research on amenities has chosen to focus primarily on the effect of amenities on either the quality of life or the economic development of non-metropolitan areas. Consequently, the effects of amenities on population change has not been widely addressed. In this research, I

argue that gauging the impact of amenities on population change is important to investigate because of the fact that population is such a crucial factor in the development of non-metropolitan areas. An area's net increases or decreases in population relative to its amenity stock can say a great deal about how that area is developing and, to some extent, why. By studying this relationship, I hope to answer some of these perplexing questions.

Organization of the Dissertation

The remainder of this dissertation is coordinated as follows: Chapter II is a discussion on the trends in population change in non-metropolitan counties in the United States of America during the decades of the 1970s, 1980s, and 1990s. Chapter II is intended to give the reader a cursory knowledge of the trends that occurred during these decades as well as some of the causes and consequences of these changes. In Chapter III, I examine the literature on amenities themselves. This chapter will give us an understanding of what amenities are, how they have been measured, as well as their effect on such factors as the quality of life and economic development of non-metropolitan areas. My theoretical conceptualization of amenities and their hypothesized effect on non-metropolitan population change is discussed in Chapter IV. In Chapter V, I discuss my research methodology for testing the study hypotheses. Chapter VI consists of the results of the analysis. The final chapter-Chapter VII- is a discussion and conclusion of the results of this analysis. It is in this final chapter that I also discuss suggestions for further research on the topic of rural amenities.

CHAPTER 2-POPULATION CHANGE IN NON-METROPOLITAN U.S. COUNTIES, 1970-2000

The focus of this research is to assess the effects of amenities on population change in non-metropolitan counties. This chapter will review pertinent literature and data on the population changes that occurred in non-metropolitan America during the period from 1970-2000. In so doing, I will be able to assess the importance of amenities in terms of the population changes that occurred in non-metropolitan counties during the decades of the 1970s, 1980s, and 1990s.

Factors Influencing Population Change

Before I examine the non-metropolitan population changes that occurred during the past three decades, I will first explore the causal mechanisms associated with population change. An exploration of these mechanisms will produce a better understanding of the dynamics of the changes occurring in non-metropolitan areas and the role amenities may play in this process. This will produce a better understanding of amenities in terms their part of the larger demographic context.

As Hamlyn (1997) states, "population growth in any given geographic area is a function of two variables: natural increase and net migration (p. 2)." Natural increase is the number of births minus the number of deaths (Marshall 1999 [1890]). Migration is accomplished by people either moving to the area, or, conversely, by people leaving the area. In sum, migration is defined as a form of geographic mobility that involves a change in one's residence from their usual place of residence to another (Shryock et. Al. 1976). Migration's importance has long been recognized in

terms of it's ability to change a given population's age structure, socioeconomic characteristics, racial and ethnic characteristics, and perhaps, most importantly, size. Since births and deaths cannot be directly linked to amenities, I will concentrate primarily on migration as the key population change variable in this study. As Shryock et. al. (1976) point out, many different social scientists and policy makers are concerned with migration, but for different reasons:

> The sociologists is concerned with the social and psychological effects of migration upon the migrant and upon the populations of the receiving and sending areas and the acculturation and adjustment of migrant populations. The economist has been interested in the relation of migration to the business cycle, and supply of skilled and unskilled labor, the growth of industry, and the occupational and employment status of the migrant. The legislator and the political scientist are concerned with the formulation of policies and laws regarding immigration and to a lesser extent, internal migration, and the enfranchisement and voting behavior of migrants (Shryock 1976, p. 349).

Migration is defined as the geographic movement of people in and out of a population. There are two basic types of migration. The first is internal migration. This is the movement of people within a political unit such as a state, county, parish, or country. Usually, however, internal migration refers to movement within a national border. International migration, the second type of migration, is the movement of people in and out of nation states. This having been stated, not all types of movement are considered migration. Migration entails the changing in residence of a particular person not simply his movement from one place to the next. As one can see, when dealing with migration there are many complicated issues the researcher must grapple. A researcher ,for example, may be examining the movement of people in and out of a particular state, or a particular region, or even within a particular town. In this way, the researcher can study migration on all types of populations varying in size or political or geographic area. It is up to the researcher to decide which units to examine, and to provide some type for justification for

he/she is doing so.

Since the topic of this dissertation deals chiefly with internal migration, it is helpful to explore some of the types of internal migration in detail. Internal migration may be temporary or permanent; it may involve individuals, families, or entire tribes or ethnic or religious groups. It may be forced, as was the case of the forced migrations of Native Americans in the United States during the eighteenth and nineteenth centuries, or, more recently, the partition of India during the mid-twentieth century. In both cases, large groups of people were forced to move within the boundaries of a nation to a particular area for political reasons. Probably the most frequent reasons for migration are economic in nature (Hamlyn 1997). Therefore, internal migration should be examined with this in mind in order to ascertain the nature of any economic reasons that are behind the internal movement of population within a nation.

Economic Factors and Population Change

Economic factors are the most studied group of factors influencing population change (Hamlyn 1997, Johnson and Fuguitt 2000). For thousands of years, human beings have moved in order to gain access to the basic necessities of life, such as food, shelter and clothing. In fact, for most of human history, people have had to move in order to provide for themselves. Our hunter-gatherer ancestors, for example, had to move whenever stocks of game and plant life had been depleted. It was only the agricultural revolution that prompted the development of the first permanent settlements and, later, the rise of cities. Therefore, "chasing the buck," whether paper or animal, has always been an important motivation for human migration.

As Williams and Safranka (1979) state, "research on internal migration has emphasized the importance of economic forces on the volume and direction of population movement (p. 239)."

The economist J.R. Hicks (1932) went even further, stating that "differences in net economic advantages, chiefly differences in wages, are the main causes of migration (p. 76)." Stated differently, people move in order to take advantage of economic opportunities in a particular area. Conversely, they move away from a particular area in order to escape a lack of economic opportunities at home, the basic argument being that 'people follow jobs'. This is only one side of the demographic coin, however. The other is that economic opportunities go to where population is highly concentrated. In other words, 'jobs follow people.' However, as McGranahan and Beale (2002) have concluded, non-metropolitan population loss in the United States is not simply a matter of job availability.

On an intuitive level, both ideas make sense. If people are dissatisfied with the economic opportunities they have in their place of residence, they are likely to move. Conversely, if a manufacturer wants a large pool of labor, he will move his plant to where the workers are, so to speak. In practice, however, it is difficult to determine which of the two is the most important, or the degree to which jobs follow people or people follow jobs. There are, indeed, a whole host of variables that affect these relationships. Besides economic concerns, certain quality of life preferences are also believed to influence migration (Howell and Frese 1983). Put simply, these researchers point out that people do not simply follow jobs, but rather that migrants are also concerned with the lifestyle that a particular area affords. They possess certain preferences for different types of qualities indigenous to a particular region. Therefore, migration streams are not exclusively controlled by economic or political factors; they are influenced by other contextual factors as well. Examples of these may include such things as an area's geography, culture, climate, population, schools, leisure activities, and so on.

These contextual factors are relevant to the potential effects of amenities on population change, which represents the primary concern of this research. However, attitudinal considerations are a nebulous topic to explore. Some people, for example, prefer an urban, cosmopolitan environment. Others, perhaps, would prefer a close-knit "gemeinschaft" community in which to live. Besides the rural versus urban distinction, preferences can also involve people's family, political loyalties, or attraction to a particular cultural region such as the South or the West, as well as a host of other factors.

While there is little doubt that peoples' attitudes affect where they choose to live, just what these types of attitudes are is an entirely different matter. They obviously vary from individual to individual and are more difficult to quantify than the wages earned from work. Therefore, there are many conceptual issues that need to be resolved before one is able measure them in a meaningful way.

Non- Economic Factors and Population Change

In addition to the economic factors associated with population change, I now wish to explore some of the non-economic variables that have been found to be associated with population change. These non-economic factors include such things as the racial structure of the population, its age structure, and educational level. The following section draws on past research in order to discern the connection between these types of factors and population change.

Age

The age of the population and the age structure of a non-metropolitan locale has been found to influence its population change in a variety of ways (Rathge and Highman 1999, Heaton, Clifford, and Fuguitt 1981, Shryock et al. 1976, Weinstein 1976). First, age influences both the

fertility and mortality of a particular area (Weinstein 1976). Fecundity (the natural capacity of a population to have births) is traditionally measured by the number or percentage of women of childbearing age (Hobbs and Stoops 2002, Shryock et al. 1976). Consequently, a higher percentage of younger people, particularly women, can potentially lead to an increase in population. Since older people are the ones more likely to experience death, the presence of older people can have the opposite effect. In terms of migration, however, the picture is less clear, especially in non-metropolitan locales. Over the past thirty years, the overarching trend in non-metropolitan America has been that younger people have migrated out, and the older population has remained, in those areas (Hobbs and Stoops 2002, Rathge and Highman 1999). Of course, this has not been the trend for all non-metropolitan areas, but it seems to be the case in the majority of them. One could, therefore, expect that the older a non-metropolitan's county's population is, the more likely is to have a declining population in terms of the big picture of non-metropolitan America.. Assessing the age structure of the population under study is of vital importance to being able to forecast and understand the population change exhibited in a given locale.

Race

Race is another factor often identified as a crucial factor in many studies on population change, and migration in particular (Howell and Frese 1983, Deller et. al. 2001, University of Arkansas Division of Agriculture 2003, Newman 2003). In terms of non-metropolitan counties in the United States, migration of African Americans out of the non-metropolitan South and into the urban areas of the North has been examined by demographers, historians, and other social scientists as well. It was the out-migration of African Americans from the South to the North that

characterized much of the migration pattern of African Americans for most of the nineteenth and twentieth centuries (Hobbs and Stoops 2002). Over the last 30 years, however, the picture is less clear and is not merely restricted to African Americans and whites. Moreover, Asians and Hispanics are moving into non-metropolitan areas (University of Arkansas Division of Agriculture 2003, Hobbs and Stoops 2002). In particular, Hispanics are becoming more and more a part of the non-metropolitan landscape across the United States (Beaulieu et. al. 2003, Williams 2003, Hobbs and Stoops 2002, Newman 2003). Newman (2003) reports that between the years of 1990 and 2000, the Hispanic population in non-metropolitan areas in the United States increased by 70 percent[2]. In terms of population change in non-metropolitan areas, it seems that the areas that experience the most pronounced growth are white. This is suggested by the research of Deller et. al. (2001) that found a negative correlation between the percent of an area that was non-white and population growth. Accordingly, one would expect that proportion of a non-metropolitan locale that is white will have a pronounced impact on that area's rate of population change.

Education

Educational attainment has also been studied in terms of its relationship to population change (Huang and Orazem 1997, Summers and Branch 1984). Previous research has indicated that higher levels of educational attainment are associated with slow population growth in non-metropolitan counties in the United States (Huang and Orazem 1997). This is often referred to as a "brain drain" of highly educated people moving from non-metropolitan areas to metropolitan areas for better job prospects. At this point in time, it seems that this remains the pattern in many

[2] Data for Newman's (2003) report was obtained from the United States Census

non-metropolitan areas, despite the possible in-migration of highly educated amenity seekers.

Metropolitan Proximity

A non-metropolitan locale's adjacency to metropolitan area and/or how remote it is from a metropolitan area can also have an influence on the population change of that locale (Vias 1999, Tucker 1976, Lichter, Fuguitt and Heaton 1985, McGranahan and Beale 2002 Beaulieu et. al. 2003). Intuitively, one could safely assume that those counties, locales, towns, or whatever type of place that you are examining that are close to metropolitan areas will be more likely to have greater population increase than those that are more remote. Not surprisingly, research has generally confirmed this assumption (Vias 1999, Tucker 1976, Lichter, Fuguitt and Heaton 1985). Moreover, it is more difficult for more remote areas to obtain the newer technological innovations-such as broadband cable- necessary for the new digital economy (Malecki 2001). In studying the population change in the Rocky Mountain West, Alexander Vias (1999) concluded that metropolitan adjacency was the chief factor in determining population increase in non-metropolitan areas of that region of the country from 1970 to 1995. I, therefore, expect to find a strong positive relationship between a non-metropolitan locale's adjacency to a metropolitan area and its level of population change.

Theoretical Perspectives on Population Distribution in Developed Countries: Regional Restructuring and Deconcentration

In order to more fully explore the dynamics of population change, we now turn our attention to a more specific topic related to the central concern of this research-the macro picture of population distributions in general the United States. By understanding the dynamics of this

distribution, we will attain a theoretical base from which to view the demographic changes that occurred in the United States during the 1970s, 1980s, and 1990s.

In order to explain the population distributions that has occurred in the United States, two theoretical perspectives have emerged. In essence, both perspectives try to explain the long term population fluctuations for primarily metropolitan areas. However, they are also used to explain the changes in non-metropolitan areas. The first perspective, called the *regional restructuring* perspective, focuses on the effects of the economic restructuring that occurred in the United States as industrialization evolved (Frey 1988, Fuguitt and Johnson 2000). According to William Frey (1988), the second perspective, referred to as the *deconcentration perspective,* argues that urban areas gradually depopulate as people are able to move to more desirable places to live. In order to see how these perspectives relate to the role of amenities in population change, we will examine their propositions in detail.

The Regional Restructuring Perspective

The *regional restructuring* perspective argues that large scale population movements are largely due to economic restructuring. They argue that the United States is moving from an industrial to a post-industrial, or service-based economy, while industrial production moves to less-developed countries. During this process, the spatial organization of production changes (Frey 1988). In other words, as the mode of production changes, so do the locations of production and, in turn, the places where workers live. Some metropolitan areas are able to successfully adapt to these changes while others do not. However, in both cases, people alter their living and working situations.

New technological innovations that affect the way people work can also affect where

people live and work. The automobile, fax machine, computer, and the Internet are some examples of technological innovations that have allowed businesses to locate in formerly non-metropolitan areas in the United States. However, the regional restructuring perspective does not see the depopulation of metropolitan areas as an ongoing process that will perpetuate itself indefinitely. Stated differently, this perspective hypothesizes that metropolitan areas in the United States will not be totally stripped of their population. Rather, restructuring, and the resulting depopulation that accompanies it, is a necessary step on the way to a new mode of production. The restructuring hypothesis also sees these processes as unevenly distributed across regions. Therefore, metropolitan areas will not disappear, but rather will change significantly in terms of their spatial organization.

The Population Deconcentration Perspective

The second theory particularly related to migration in the United States is the *deconcentration perspective* (Frey 1987), also or alternatively, the "new migration" paradigm (Johnson and Fuguitt 2000). This perspective contends that there will be a gradual and sustained depopulation of cities in the United States (Frey 1987, Seigel 1997). Advocates of this perspective seem to assume that jobs follow people in that people seek occupational locations that are in more desirable areas. They are able to do this because of the changing role of distance in determining residential space (Frey 1987). In other words, the changing distance from work to residence was shifting, or as Wardwell (1980) states:

> The concept of locational flexibility summarizes the process by which economic, technological, and other structural changes have expanded the array of choices within which firms and households make their locational decisions. The removal or weakening of constraints, which in the past dictated large urban locations for a wide range of production and consumption activities, means that firms and households can select from a wider range of city sizes without incurring increased production costs, reduced marketing gains, or

> fewer life-style options. Employment deconcentration is made possible by the expansion or relocation of these firms. Residential deconcentration, in combination with consumption values that influence the residential preferences of the population, is facilitated by employment deconcentration (p. 89).

In essence, this position contends that population in the United States will become less and less concentrated in the future as the nation enhances its transportation and communication systems. These theorists expect that metropolitan areas will gradually lose their population as people are able to move to areas that are further away from urban centers and more aesthetically pleasing areas. The deconcentration argument also emphasizes the importance of individual decision making in terms of residential patterns of settlement (Johnson and Fuguitt 2000). This perspective contends that people have more of a choice in terms of where they can live and their decisions about where to live are not purely determined by economic factors. The deconcentration perspective became popular during America's 'rural turnaround' of the 1970s (Johnson and Fuguitt 2000, Frey 1988, Fuguitt 1985). Before the rural rebound, demographers, scholars, and researchers had assumed that metropolitan areas would continue to grow at an increasingly faster pace compared to non-metropolitan areas. However, the population reversals of the late 1960s and early 1970s in the United States brought this assumption into question as people moved to non-metropolitan areas in the country. Bear in mind that this was not a phenomenon that occurred only in the United States, but also in some other developed countries as well (Fuguitt 1985). Consequently, the deconcentration perspective contends the phenomenon will spread on a global scale. However, the analysis in this study will consider deconcentration only as it pertains to the United States.

Trends in Non-metropolitan Population Change in the United States from 1970 to 2000

The following section will briefly summarize the overarching trends in population change that occurred in the United States from 1970-2000. I wish to understand these changes utilizing the population deconcentration and regional restructuring perspectives. Furthermore, the issue of amenities will also be tied into this discussion in order to find their place within the larger demographic context.

The Non-metropolitan Population Turnaround of the 1970s

Over the last two hundred years, the general population trend in the United States has been characterized by a declining non-metropolitan population and an increasing urban population. For example, in 1790, only about 5 percent of the United States population lived in urban areas, but by 1990 about 75 percent of the United States population lived in urban areas (United States Census 1990). The non-metropolitan West, in particular, was seen as an alternative to the growing urbanization in the East (Fuguitt and Beale 1978). People came to the United States in many cases for the large tracts of relatively cheap land originally in the East and later in the West. As the country became more urbanized, however, both East and West were characterized by the urban way of life. Large non-metropolitan to urban population shifts to the cities in the East and West were prevalent through both the late 19th century and for most of the 20th century. Most sociologists, researchers and demographers had the same expectation about the rest of the 20th century. The expectation was that urban areas would continue to grow in population and non-metropolitan areas would decrease in population. Rural to urban migration is, after all, the basis of urbanization. Therefore, it was expected that this trend would continue.

However, the 1970s led many to believe that this 'common sense' notion of migration trends was not the only perspective on migration in the United States and that something quite new was occurring in non-metropolitan America.

Up until the late 1960s the influx of rural-to-urban migration depleted many non-metropolitan areas of their population. The 1970s, however, saw a reversal of this trend. Not only was non-metropolitan America not losing population, it was actually gaining (Cushing 1997, Fuguitt 1985, Johnson 1985, Wardell and Brown 1980). "Nearly 80 percent of all non-metropolitan counties in the U.S. gained population between 1970 and 1977 compared with only 47 percent during the previous decade" (Johnson 1985, p. 101). Moreover, it was evident that this reversal was not merely the product of non-metropolitan-urban spillover (Bascom and Gordon 1999) [3]. Philips and Brunn (1978) and Garkovich (1989) found increasing migration to all types of non-metropolitan counties, from the most remote non-metropolitan counties to those close to urban areas. Fuguitt (1985) describes the general population change in non-metropolitan counties as follows:

> Over the 1970-1980 period, US non-metropolitan areas grew more rapidly than previously, achieving overall a faster growth rate than metropolitan areas, with more migrants going from metropolitan to non-metropolitan areas than in the opposite direction (p. 259).

The reversal was significant in that it seemed to reverse migration patterns that existed in the United Sates since the beginning of industrialization. According to Garkovich (1989), the precursor to this out-migration from metropolitan areas actually began in the late 1960s, and

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[3] By 'spillover' I mean the encroachment of peripheral urban areas into non-metromplitan areas by way of urban sprawl.

accelerated in the 1970s:

> Although metropolitan areas experienced net migration gains over the course of the 1960s and most non-metropolitan areas continued to experience net migration losses, from 1965 to 1970 there was actually a net out-migration of 352,000 persons from all metropolitan areas. This net movement from metro to non-metro areas at the end of the 1960s was a precursor to the migration patterns of the 1970s. Between 1970 and 1975, the total net out-migration from metro to non-metro areas was nearly 1.6 million persons, and from 1975 to 1980 it was just over 1.3 million persons (p. 133).

This reversal was also unforeseen because it was assumed that the major economic activities would be centered in urban areas (Fuguitt 1985). However, "between 1970 and 1979 the number of manufacturing jobs in non-metropolitan US counties increased 23.9 percent, while those in metropolitan America grew only 3.9 percent" (Summers and Branch 1984, p. 141). William Frey (1987) went so far as to suggest that the population redistribution was indicative of a much larger trend associated with post-industrial development. Frey hypothesized that core urban areas would lose their population as industrial centers moved their manufacturing base to other countries. Accordingly, we will now explore some of the conditions associated with this "rural turnaround" of the 1970s.

Wardell and Brown (1980) found that there were three factors associated with the non-metropolitan population turnaround of the 1970s. These were 'economic decentralization', a 'preference for rural living' and 'the modernization of rural life'. In terms of 'economic decentralization', they state:

> There has been a decentralization of employment opportunities from metropolitan to non-metropolitan areas. Between 1970 and 1977, non-farm wage and salary employment increased by 22 % in non-metropolitan areas. In addition, the character of non-metropolitan employment has changed: preforming service jobs have taken the lead in recent growth. Mining and energy extraction are new sources of employment growth in some areas such as the northern Great Plains. People are not being displaced from rural areas by diminishing employment in extractive industries to the extent that they were

> during the 1950s and 1960s. Commuting from non-metropolitan areas brings additional jobs within the reach of rural residents (p. 14).

As for the 'preference for rural living', they state:

> National surveys have repeatedly found a decided preference for living in the country and in small towns, particularly within the commuting range of a metropolitan central city. This preference for rural living becomes increasingly important as the employment constraints to living in rural areas are lessened (p. 14).

Finally, they feel that the modernization of non-metropolitan life also contributed to the non-metropolitan turnaround of the 1970s:

> All-weather roads, controlled access highways, cable television, telephone service, and centralized water and sewer systems have all helped to modernize rural living. And because of these advances the stereotype that rural areas are isolated and backward has become increasingly inappropriate (p. 14).

However, they caution that non-metropolitan America is extremely heterogenous and that these changes have not occurred in all non-metropolitan counties. Many non-metropolitan counties, they state, still lost population during the 1970s.

Fuguitt (1985) suggested that the non-metropolitan turnaround of the 1970s was associated with the decline of manufacturing jobs in urban areas. According to Fuguitt (1985), in the 1960s manufacturing jobs and manufacturing in general was on the rise in urban and non-urban areas. In the 1970s, the rise in manufacturing jobs in non-metropolitan areas was not significant. Fuguitt's work suggests that more non-metropolitan manufacturing jobs were not heavily related to the non-metropolitan turnaround of the 1970s.

This raises the question of whether or not the non-metropolitan turnaround of the 1970s was entirely motivated by economics as people were moving to non-metropolitan areas for a broader array of reasons. Although economic considerations were important, they were not the sole determinant for people moving to non-metropolitan areas. However, the nature of these

non-economic factors was not fully understood at the time. The problem stemmed from the limitations of the data available at the time, as well as a conceptual framework for explaining so-called 'quality of life' variables. Consequently, researchers did not fully understand the demographic changes occurring in non-metropolitan areas.

The demographic effects of the non-metropolitan turnaround of the 1970s have also been discussed by researchers. Prior to 1970, rural-to-urban migration was characterized by high fertility in non-metropolitan areas where the 'surplus population' moved to urban areas. In the 1970s this over-arching pattern dramatically shifted to a situation in which it was the non-metropolitan areas that were gaining in population. This placed special and unforseen pressures on these communities and, the new migration disrupted some non-metropolitan communities. However, it created opportunities as well. These opportunities included new retail businesses catering to migrants from metropolitan areas, who demanded a wider range of consumer goods to purchase. Naturally, housing all of these new migrants created a new market for construction materials and labor for building the new housing. Moreover, more service jobs were required in order to serve the needs of the of the new migrants. For example, plumbers, carpenters, stone masons, landscape architects, and a host of other types of service workers found a new market for their skills catering to the metropolitan migrants. These opportunities, in turn, may have attracted even more migrants to non-metropolitan areas. Past research has also indicated that urban migrants during the 1970s had very diverse backgrounds in terms of their demographics as their reasons for moving to non-metropolitan areas. Sofranko and Williams (1980) found that of migrants to the non-metropolitan Midwest during the 1970s did not conform to the media image of 'middle class escapists.' Sofranko and Williams (1980) also concluded that not all of the new

migrants were elderly retirees returning to home. Therefore, it can be assumed that many types of migrants were moving to non-metropolitan areas during the 1970s.

Not only were the migrants diverse, but regionally speaking, the settlement patterns of the migrants diverged widely. In their study of the population trends of non-metropolitan cities and villages in subregions of the United States, Fuguitt and Beale (1978) found there to be a great deal of variation between regions in the United States in terms of their patterns of settlement. They found that the dynamics of the new migration varied considerably in terms of the non-metropolitan locale's culture, economy, climate, geography and history. Moreover, they contended that these regional differences were often overlooked when researchers examined migration patterns using a macro approach.

Fuguitt and Beale's research (1978) suggests that the qualities of the non-metropolitan place itself, rather than merely its designation as metropolitan or non-metropolitan, was the chief reason people wanted to move there. Moreover, Fuguitt and Beale's research (1978) suggests that future study should pay close attention to regional differences as well as the qualities that non-metropolitan places have. This should be done not only in order to better understand the dynamics of the population turnaround of the 1970s, but also to understand the migration to non-metropolitan areas in subsequent decades.

One could argue that in terms of the two perspectives on population change in developed countries-regional restructuring versus deconcentration- it is the deconcentration perspective that best describes the 1970s non-metropolitan population increase. It is because of deconcentration's emphasis on personal choice in terms of where people live, rather than simply economic restructuring, that gives it more theoretical credence. Following this supposition, one can argue

that the 1970s were a time in which the deconcentration perspective came to be more relevant than the regional restructuring perspective.

In conclusion, the 1970s were a time of unexpected population growth in non-metropolitan America. It was unexpected because researchers assumed that the trends that had characterized population patterns in non-metropolitan areas for decades would continue to prevail. Additionally, it was assumed that economic push and pull factors would be the prime determinants of population dynamics. When it became apparent that economic factors were not the prime determinates of the population rebound, researchers scrambled to answer why this had occurred. In so doing, the effect of rural amenities was first hypothesized. Even more generally, the population rebound in non-metropolitan areas during the 1970s gave researchers an appreciation of the non-economic factors associated with population growth.

The Non-metropolitan Decline of the 1980s

The 1980s were a time of disappointing change for non-metropolitan America. The great gains in population that occurred during the 1970s waned, and family farms went out of business at an alarming rate as a result of the 'farm crisis.' Theoretically, researchers had expected the increases in population to continue into the 1980s and were grasping to understand why that did not occur. The 1980s seemed to suggest to some that the non-metropolitan population growth of the 1970s had been an anomaly, rather than a pattern of future population growth. Anomaly or not, the 1980s showed that growth in non-metropolitan America is not always steady or even predictable. In terms of the quantity of literature on the 1980s versus the 1970s, there is a much greater quantity of literature on the 1970s. This is not surprising, since the 1970s were a time of great unanticipated growth in the population of non-metropolitan America. In contrast, the 1980s

were a time in which much of the optimism about population growth in non-metropolitan America seemed to run aground. The following section will explore the literature in order to discern why this occurred, and to determine what the 1980s can tell us about non-metropolitan to urban migration streams in the United States, in particular, and in developing countries in general.

As noted above, the 1980s were a time of decline in population in non-metropolitan America. The U.S. Census (2000) reports:

> Metropolitan areas grew faster than non-metropolitan areas in the 1980s. The average annual percentage growth was 1.1 percent for metropolitan areas and 0.3 percent for non-metropolitan areas (p. 2).

What caused this reversal in metropolitan and non-metropolitan growth? Two major causes were the farm crisis of the 1980s, as well as an overall downturn in the US economy in the early 1980s. Therefore, the view of a 'non-metropolitan renaissance' was questioned as hard times and the accompanying out-migration plagued non-metropolitan areas.

Studies of residential preferences also indicated that, during the 1980s, more people preferred to live in cities rather than non-metropolitan areas. This shift in preferences was reported by Fuguitt and Brown (1990) in their study of the size of place preferences of individuals during the period of 1972 to 1988. In their study, they found a small shift in preferences among people toward larger cities. However, the number of people who favored non-metropolitan areas remained constant. Concerning the shift, however, the authors attribute their findings to an increase in urban dwellers' satisfaction with living in their urban environment. They also indicate that the preference for urban living was at the expense of smaller population areas located near cities, and not at the expense of non-metropolitan areas. Therefore, the preference for living in low-density non-metropolitan areas remained strong throughout the 1980s, although it was

slightly diminished from the 1970s. In sum, their research indicates that during the 1980s, many people still had a strong preference to live in non-metropolitan areas. However, urban dwellers were more satisfied with the way of life provided by cities.

Using a variation of the regional restructuring perspective, Galston and Baehler (1995) contend that many of the problems in non-metropolitan America stemmed from changes in the overall world economy, as well as U.S. Government policy:

> The difficulties rural America experienced in the 1980s were in large measure the product of vast shifts in the national and international economy. Nonetheless, federal government policies during this period also contributed to the re-emergence of rural disadvantage. For much of the decade, the macroeconomic regime produced currency distortions that impeded rural exports, as well as persistent high real interest rates to which the rural economy proved vulnerable. Deregulation in transportation and telecommunication wiped out long-standing implicit cross-subsidies to rural areas. Federal spending patterns, particularly in defense, tilted toward metropolitan areas, and the bias of federal rural dollars toward agriculture and current consumption was not conducive to long-term economic growth (p. 7).

These problems led non-metropolitan areas to decline in population during the 1980s. In the mid 1980s, migration out of non-metropolitan areas reached about 500,000 annually (Galston and Baehler 1995). Galston and Baehler (1995) also report that more than half of all non-metropolitan counties lost population during the 1980s. This was a significant decline in population, suggesting that migration patterns during the 1980s heavily favored urban areas.

Still other reasons cited for the non-metropolitan slowdown during the 1980s are attributed to world-wide economic changes and problems. Frey and Speare (1992) discuss the weak dollar in the 1970s as a factor that favored non-metropolitan areas at the time. In the 1980s, however, the dollar became much stronger in international markets, meaning that it was cheaper to manufacture goods overseas than it was domestically. Because a great deal of the 1970s non-metropolitan population growth was attributed to manufacturing jobs relocating to

those regions because of the pool of cheap labor, the strong 1980s dollar and its accompanying effect in terms of the price of labor meant that the advantage manufacturers had in relocating domestically was no longer as significant as it was during the 1970s. Moreover, worldwide agricultural shortages during the 1970s meant that farmers could demand a higher price for their products (Frey and Speare 1992). In the 1980s, however, agricultural shortages were replaced by agricultural surpluses; agricultural producers were getting a much lower price for their goods and had to make cuts in labor inputs. In turn, this led to fewer people moving to non-metropolitan areas and more people moving out. The decrease in petroleum prices also led to the falling fortunes of many non-metropolitan areas dedicated to mining and petroleum extraction.

More generally, the major reason for the metropolitan gain and non-metropolitan loss of the 1980s cited in the literature is the fact that many non-metropolitan areas' economies are not as economically diversified as those of metropolitan areas (Frey and Speare 1992). Like a developing country that often depends on a single crop, mineral, or other raw material, many non-metropolitan areas rely on a single industry or raw material as their primary source of economic well-being. The 1980s saw many of these industries move overseas because of the weak dollar. Moreover, declining agricultural demand and the corresponding lowering of prices in agricultural products led to economic stagnation and decline in many non-metropolitan areas. When energy resources such as coal and petroleum declined in price, non-metropolitan areas dependent on the extraction of these resources also declined. Metropolitan areas, however, were able to weather these economic storms because of the fact that their economies were much more diversified. In sum, the 1980s showed how vulnerable non-metropolitan areas were to economic period effects.

Although the reasons and implications for the non-metropolitan decline in the 1980s are many, the population research for that era suggests that the economy is an extremely important factor in determining migration to non-metropolitan areas. In the 1970s, there was a temptation to de-emphasize the importance of the economy, but the 1980s showed that the economy and, particularly jobs, have a deep and profound effect on migration. The contention of Johnson and Fuguitt (2000) that economic factors played a dwindling role in migration decisions to non-metropolitan America was probably over-simplistic, even leading some to conclude that the preferences people had for smaller non-metropolitan communities was an anomaly and not a trend that would continue for very long. Johnson and Fuguitt posit that economic concerns are diminished vis-a-vis migration decisions only in cases where the economic conditions of both metropolitan and non-metropolitan areas are the same. In the 1970s, this seems to have been the case. However, it was not the case in the 1980s. This suggests that unexpected outcomes from forecasts may result if this argument is ignored.

The 1990s: Another Non-metropolitan Rebound?

The 1990s were one of the most fruitful times in terms of population growth in the history of the United States. During the 1990s, the United States population grew by 32.7 million people-the largest numerical increase the United States ever experienced in any decade (Hobbs and Stoops. 2002). In terms of population change in non-metropolitan areas, the decade of the 1990s-like the 1980s-was a time of unexpected population change in non-metropolitan areas. However, this time the population was moving in the opposite direction. Early in the 1990s, researchers saw something quite different happening in non-metropolitan counties – a non-metropolitan population rebound (Johnson and Fuguitt 2000). "Remarkably, while economic

expansion in the 1980s left non-metropolitan areas behind, in the 1990s, rural areas have been growing at the same rate if not faster than the nation overall (Huang 1999, p. 1)." In the final analysis, Newman (2003) reported that between 1990 and 2000 population in the non-metropolitan areas of the United States had increased by 10 percent[4]. Once again, researchers, scholars and demographers grappled with how and why this had occurred. The rebound produced a reversal also on a theoretical level in that many of the theories coming out of the non-metropolitan renaissance of the 1970s were, once again, in vogue. It was also during this time that the topic of amenities worked its way back into the discussion on non-metropolitan population change. Therefore, for the purposes of this research, it is paramount for us to understand the dynamics of the non-metropolitan rebound of the 1990s and how it revived interest in the topic of amenities once again to the vanguard of investigation in non-metropolitan development. In the early 1990s the non-metropolitan population surged to 1.0 percent growth annually, while the metropolitan areas' growth rates decreased to 1.1 percent growth (U.S. Census Bureau 1998). Overall, most of the rapid growth in the U.S. population in the 1990s occurred in the Southern or Western part of the country (U.S. Census Bureau 1998). According to the U.S. Census, 12 states experienced the highest population growth during the 1990s: North Carolina with 21.4 percent growth, Georgia with 26.4 percent growth, Florida with 23.5 percent, Texas with 22.8 percent, New Mexico with 20.1 percent, Colorado with 30.6 percent, Arizona with 40 percent, Utah with 29.6 percent, Nevada with 66 percent, Idaho with 28 percent, Oregon with 20 percent, and Washington with 21 percent (U.S. Census Bureau 1998). Also according to

[4] As was noted above, data for Newman's (2003) report was obtained from the United States Census.

the United States Census, the United State's population as a whole had increased 13.1 percent in the decades of 1990 to 2000 (compared to 9.8 percent between the decades of 1980 to 1990). Additional regional differences in the population changes were also found on a more macro scale. According to the U.S. Census, from 1990 to 1996 the non-metropolitan West had the most pronounced growth of any region of the country (13.6 percent). The non-metropolitan Midwest, in contrast, only experienced a growth rate of 3.4 percent, while the non-metropolitan Northeast had a growth rate of only 2.5 percent. Vias (1999) reports that the population changes in the Rocky Mountain West were much more pronounced than they were in other areas of the country:

> In terms of population, the Rocky Mountain West has seen patterns of growth and decline similar to those throughout the rural United States over the last 25 years, especially the remarkable growth of the 1990s. However, the region's changes were generally more extreme-growth was much greater in the 1970's, and much more sustained. The downturn of the 1980's was quicker and more severe, while growth in 1990-95 was greater than for the non-metro U.S. as a whole. In employment, the region has followed national trends more closely, experiencing patterns of growth and decline tightly linked to the business cycle. Here again, annual growth rates in the Rocky Mountain West consistently outpaced those of the non-metro U.S. (p. 15).

This research suggests that the non-metropolitan rebound of the early 1990s varied considerably by region. According to Green (2001), the non-metropolitan areas that experienced the most population growth during the 1990s had two major characteristics in common. The first was that they were close to metropolitan areas; non-metropolitan areas that were close to metropolitan areas grew much faster during the 1990s than did those that were further away from metropolitan areas. The other characteristic, according to Green, was that they were rich in amenities. These two factors are highly related, however, because demand for amenities correlates with income (Green 2001). Therefore, it seems that economic growth may be a necessary element in order for amenities to come into high demand. One must be mindful of this when making projections on

the impact of amenities on population growth.

Most of the research on non-metropolitan population change has suggested that the economic boom of the 1990s contributed heavily to the new migration heading to non-metropolitan counties (Beale and Johnson 1998, McGranahan 1999, Deller, Tsung-Hsiu, and Marcouiller 2001**,** Green 2001). Coupled with this economic boom was a dramatic expansion of the high-tech sector of the economy and the expansion (almost overnight) of the Internet. Suddenly, thousands of jobs were created by this that were free of the former restraints of the so-called "old economy[5]." In other words, the new workforce was characterized by youth, mobility, and flexibility. What this meant was that people were able to live even farther away from metropolitan areas than would have been economically feasible during the days of the 'old economy'. Therefore, non-metropolitan counties were able to be accessed by more migrants than previously.

The rise of the so-called "new economy" has often been cited as a major factor in the population redistribution that occurred in the 1990s. Therefore, it should be beneficial to the reader to understand what exactly is meant by the "new economy" and what it entails. The Progressive Policy Institute (2000), has described the 'new economy' as follows:

> At the dawn of the 21st century, Americans are inventing a New Economy. Yesterday's industrial order is giving way to a more complex, dynamic and dispersed economy shaped by information technologies, global markets and new communications networks like the Internet. From the way we educate our children and organize our workplaces to how we improve our health, defend our international interest, and clean up the environment, these

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[5] What exactly is meant by the term old economy is a point of contention. For my purposes, however, I assume old economy to refer to the economic conditions in the United States after the Industrialization of the 19th and early 20th centuries to a post-industrial economy augmented with its technological infrastructure, particularly the Internet.

forces are transforming our society (p. 1).

The New Economy, in short, is a transformation process that is affecting how people live, work and communicate.

Researchers have identified many factors associated with the New Economy and I will examine a few of them now. First, globalization has been considered a major facet of the New Economy (Progressive Policy Institute 2000). More than ever, companies are marketing their products and services not just on a national level, but internationally. Lines of demarcation between companies and the countries in which they are located are being quickly blurred. A second factor is the proliferation of knowledge occupations (Progressive Policy Institute 2000). This factor relates to the workforce in the New Economy. In the New Economy, manufacturing jobs have given way to knowledge jobs based on the transfer, collection and manipulation of information (Goe 1994). Therefore, the workers that will be in demand are those who have skills in such things as computer programing, data manipulation and analysis, as well as other jobs that require an educated workforce. Third, the New Economy entails a transformation to a digital economy (Progressive Policy Institute 2000). This means that business will be conducted in the fast-paced world of digital communication in which face to face interactions are less likely to occur.

The New Economy also entails more economic dynamism and competition (Progressive Policy Institute 2000). More and more companies are entering the marketplace as new technology allows more products and services to be marketed. Finally, and perhaps most importantly, new technological innovation is the cornerstone of this New Economy (Progressive Policy Institute 2000). It is, after all, technological innovation that has given rise to the New

Economy and new technological innovations that will continue to fuel the New Economy. The transformations brought about by the New Economy will, therefore, continue to have a profound effect on the way people work and live (Rubin and Beaulieu 2000). In essence, the New Economy is much more flexible in terms of production of goods and services. Whereas the Old Economy based its production facilities in fixed locations, companies in the New Economy can locate anywhere, even non-metropolitan areas. For our purposes, we must consider what these changes will mean to migration patterns in the United States as well as the quest for amenities.

The aging of the U.S. population has also contributed to the growth of non-metropolitan areas in the United States during the 1990s (Green 2001). More and more people reached retirement age during this decade. Consequently, areas that offered scenic beauty and mild climates with low crime rates and a low cost-of-living became increasingly in demand for these retirement age migrants (Green 2001). Retirement-aged people moved to locations which were, naturally, in non-metropolitan locations. The movement also helped to spur economic growth in these areas as people transferred their capital to non-metropolitan areas and created demands on the service area of the economy. In other words, retirement migration led to the development of many non-metropolitan areas as the new migrants infused cash into the local economies and, therefore, created new jobs and businesses in these non-metropolitan locales. In sum, the changing demographics in terms of the age structure of the population of the United States has contributed greatly to the expansion of non-metropolitan areas of the country and has also spurred economic development in those areas. What seems to be different about the 1990s is the fact that the nature of the US economy has changed from manufacturing to one more heavily based on information gathering or a knowledge-based industry. One could speculate that the

ability of new technologies to permit people to live anywhere they choose would stimulate the growth of non-metropolitan locales that were largely inaccessible previously. With the advent of the Internet, and the emerging global economy augmented with it, businesses and workers have a great deal more latitude in terms of where they locate. Knowing this, we can assume that people having a choice will elect to live in areas they consider more favorable to their lifestyle and non-economic needs. Not all people, however, will choose to live in non-metropolitan locales, but many who formerly did not have the ability to do so may now exercise the prerogative to choose to live in these non-metropolitan locales because technological and economic changes have allowed them to do so.

One might also speculate that not all non-metropolitan areas are suitable to these migrants. This is due to the obvious fact that not all non-metropolitan areas are the same. Non-metropolitan areas vary considerably in terms of climate, topography, culture, and social structure. Therefore, it is paramount for us to understand which characteristics are more appealing to people moving to non-metropolitan areas. In this way, we can understand the new dynamics of population change in non-metropolitan areas at the end of the 20th century and the beginning of the 21st .

Major Themes in the Literature

The first major theme in the literature concerns the general trends in non-metropolitan population change during the 1970s, 1980s, and 1990s. In general, research from the 1970s found that this was a time of resurgence in population for non-metropolitan areas. It also shifted the paradigms in terms of viewing population change. It did so by introducing a way of explaining migration to non-metropolitan areas that did not heavily concentrate on economic

factors. The 1980s were a time of decline, and the 1990s seemed to be a time when non-metropolitan America rebounded from the decline of the 1980s. In examining these time periods, one finds that generally the 1970s were a period of unexpected population growth in non-metropolitan areas, while the 1980s were a period of unexpected declines in the population of non-metropolitan areas. The 1980s brought into question whether or not the non-metropolitan rebound was real in terms of its sustainability or whether it was merely a 'flash in the pan'. Additionally, the 1980s saw the re-emergence of economic explanations in terms of their dominance in explaining non-metropolitan population change. The 1990s have given rise to a renewed optimism in the rebound of population in non-metropolitan areas. Moreover, it is hypothesized that changes in the economy will spur migration to non-metropolitan areas and thereby increase the economic vitality and growth of non-metropolitan areas. For the purposes of this research, the increased importance of non-metropolitan amenities in terms of what is driving this growth also is a recurrent theme throughout the literature.

CHAPTER 3-EXPLORING, CONCEPTUALIZING, AND MEASURING AMENITIES: A REVIEW OF THE LITERATURE

Past research on population change in non-metropolitan areas during the 1970s, 1980s, and 1990s has increasingly identified amenities as important 'pull' factors encouraging people to move to non-metropolitan areas (Hunter, Boardman and Onge 2004). Moreover, previous research suggests that rural amenities enhance the quality of life of those areas and, therefore, encourage people to stay in a particular non-metropolitan locale (Goe and Green 2002, Hunter, Boardman and Onge 2004). However, little consensus has been reached on just what amenities are or what they refer to. Therefore, the following chapter will review pertinent literature as well as attempt to conceptualize amenities for the purposes of this research. Finally, I will use these conceptualizations in order to hypothesize how amenities are expected to affect population change in non-metropolitan areas. Therefore my purpose here is to address the cental problem presented by Fuguitt in 1985:

> More generally, we must get a better handle on what amenities are, what they mean to people, how they affect migration and the location of economic activities, and how tastes in amenities can change. (p. 275)

Deller et. al. (2001) contend that while the 'traditional' non-metropolitan economic activities such as resource extraction, farming, and manufacturing have received the most attention over the years in terms of their effects on migration, newer non-metropolitan economic activities, such as retirement and recreation, have not been as well documented or understood. They further contend that the reason for this is that the quest for amenities that influence recreational, retirement and other forms of migration form a 'latent' economic function. For example, it is easier to understand and study the economic dimensions of the forestry industry, but

it is much more difficult to assess the effects that a beautiful forest may have on the economic and demographic growth of a particular area. In terms of the forestry industry, one can quantify the numbers of people employed by loggers, the amount and value of the wood that is harvested, the services related to the industry and so on. Therefore the connections between the economy and the natural resources that are harvested is much more direct. In the case of the forest being an attraction to vacationers and migrants, one has a more difficult time quantifying its effects on the economy and population dynamics. It is because of these difficulties that the study of the effects of amenities on population growth has a much more difficult time establishing relationships than studies that have looked at other aspects of non-metropolitan economies. This has led one source to conclude that "the current methods of modeling regional economic structural change and growth fail to capture these nonmarket attributes of the non-metropolitan natural resource base (Deller et. al. 2001, p. 353).

The Nexus Between Amenities and Quality of Life

Quality of life, like amenities, is a very subjective concept (Liu 1975). It would be reasonable to assume that amenities add to or enhance the quality of life of a particular area. Defining just what is meant by quality of life is, however, difficult. Liu (1975) sees quality of life as being composed of two components:

> Most people approach "quality of life" with varying preconceived definitions, but it may be considered here as an output of two aggregate input factors: physical and spiritual. The physical input consists of quantifiable goods, services, material wealth, etc., while the spiritual input includes all nonmeasureable, psychological factors such as community belongingness, esteem, self-actualization, love, affection, etc. Although the production function expressing the relationship between output and input factors of QOL is known to be enormously complex (there are as many such factors as there are people), an aggregate homogeneous production function may be assumed for the community as a whole. Since psychological inputs are not quantifiable, the QOL output may be taken at a particular

> point in time as a positive function of those quantifiable, social, economic, political and environmental inputs (pp. 329-30).

Accordingly, a proper question to ask would be: which amenities are associated with each of Liu's two different components? The so-called physical aggregate input factor could encompass such amenities as the natural amenities[6], services such as shops, outdoor suppliers, gaming facilities, job opportunities, schools, as well as a host of other variables that have been discussed widely in the literature. However, Liu's so-called spiritual aggregate input factors are much more elusive and, therefore, harder to quantify. This is not to say that it is impossible to measure such things as a "sense of community" or "satisfaction with one's social life," only that it is more difficult. Consequently, one sees a marked paucity of studies that have examined these types of amenities in the literature. This is somewhat surprising, because one would assume that non-metropolitan locales would be brimming with such features in that many are close-knit communities. In other words, one would expect that the rural, or 'gemeinschaft'[7] way of life, one would offer a sense of strong communal bonds or an identification with the area in terms of it being a 'big family'(Tonnies trans. 1957). These types of qualities could be considered amenities that non-metropolitan areas possess.

In a contemporary study by Goe and Green (2002), a connection between an area's well being and amenities was found. The authors first defined a community's well being by using an index that measured the locale's total employment, aggregate income, and population. In terms

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[6] These types of amenities have to do with the natural resources of a locale.

[7]By gemienschaft, I am referring to Ferdinand Toinnes' two terms gemeinschaft (community) and gesellschaft (society). Toinnes used the term gemeinschaft to refer to the rural way of life that characterized the pre-industrial rural villages of his native Germany (Tonnies trans. 1957).

of the connection between well being and amenities, the authors found a moderate connection between the locality's amenity stock and its well being. This suggests that amenities do, in fact, play a role in the enhancement of the quality of life of a particular area. Other studies, such as those conducted on Canadian Provinces by Douglas and Wall (2000), also found a positive connection between amenities and the quality of life of a particular area, although, the association was often contingent on a variety of economic factors. In sum, more study is needed in order to measure which amenities are most salient, and to determine what other aspects of an area's quality of life are affected.

Past Research on Amenities

Keeping our discussion of quality of life issues in mind, what are rural amenities? Gottlieb (1994) defines amenities as: "location specific, non-exportable goods and services that primarily benefit employees in their role as residents or commuters (p. 271)". This is a quite limited view of what amenities are and how they affect population growth in non-metropolitan areas. It is limited because it does not address how local leaders might encourage the development of amenities in their regions.

In his conceptualization of amenities, Gary Green (2001) states that amenities have certain characteristics:

> Amenities have several important characteristics. First, amenities are restricted in an absolute sense and are characterized by **nonproductability.** In other words, the use of the amenity is restricted to a specific territory which helps distinguish the territory from other territories. Irreversibility is the second characteristic of amenities. The consumer value of the amenity is sensitive to change over time and it is impossible to restore the value once it has been destroyed. Third, amenities are positively and strongly correlated with income, what economists refer to as **high income elasticity.** Because of the growing demand for living in high amenity areas, the cost of living in these areas may be very high. At the same time, people may choose to live in high amenity areas, even though the wages

> may not be as high as other areas or the opportunities for employment are not as great. In fact, some economists have suggested that wages should be lower and unemployment higher in these areas because of the other benefits associated with living in these areas (Power 1996). Finally, amenities are generally **nonsubsitutable**; they are unique in a sense. A wildlife area is unique and cannot be substituted with another type of amenity or even another wildlife area. (Pp. 65-66)

Green's conceptualization of amenities is restricted compared to others' conceptualizations of amenities. The suggestion that they are positively correlated with income is debatable, since many of the more scenic areas of the country, such as parts of West Virginia, have many natural amenities, but are nonetheless poor. However, the suggestion that amenities are unique to a particular area is an insightful consideration. Amenities do, in many senses, make an area unique and are very difficult to replicate in another area. One cannot, for example, re-create the Smokey Mountains in another area anymore than one can control the amount of sunlight or rainfall in a particular area. Additionally, Green contends that amenities are non-substitutable in that one type of amenity cannot necessarily be substituted for another. Since Green was chiefly examining the effect of amenities on development, this contention was extremely important and a very good point.

Other types of development projects are highly substitutable. Developmentally speaking, it makes little difference whether a plant opening up in an area makes machine guns or light bulbs, provided that the workers at the plant receive similar pay, benefits and so on. Nor does it make any difference whether an Internet company is selling books or computers, provided the same conditions apply. This is not the case with amenities, however. One can easily say that one employer provides the same number of jobs as another, but one has more difficulty saying that a river attracts the same number of people as a mountain. Therefore, the importance of people's

preferences for a certain natural feature can have a profound effect on that amenity's ability to promote the development of a particular area. The effect of an employer that provides jobs is much more easily measured in terms of its effect on bringing people to a certain area, than the 'pull' abilities of a river or beautiful scenery (Hunter, Boardman and Onge 2004). This is not to say that one is more important than the other, but rather that the effect of an employer is more readily apparent, and, therefore, more easily measured than the other. It is not usually one particular amenity that drives people to a certain area, but rather a whole host of different amenities. When one states, for example, that they moved to a particular area because of a job opportunity, there is usually little more explaining that the person has to do. However, when they say that they like the scenic beauty of a place, they are bound to have to give much more detail to the questioner in order to explain just what it is about the scenic beauty of an area that caused them to move. Consequently, understanding people's idiosyncratic preferences for certain amenities, such as the scenic beauty of a locale, involves a much more detailed investigation on the part of the researcher than, say, understanding job-driven economic motivations for relocating.

What attracts people to non-metropolitan areas? This question has plagued researchers since the 'rural rebound' of the 1970s, discussed in the previous chapter. What, if any of these things, such as mountains, lakes, climate, culture, or activities, seem to be the most important to people who wish to relocate to more bucolic settings? In other words, what are the 'pull' factors that draw migrants to non-metropolitan areas? Answering this question in full is beyond the scope of this research. However, past research has speculated that non-metropolitan areas possess certain qualities that attract people to them. Such qualities are often referred to as amenities. However, determining what these amenities are is a topic of controversy.

Most research on amenities has focused on the natural beauty of non-metropolitan areas, which many find is in great contrast to the noise, pollution, traffic, and unbecoming scenery of urban settings. Non-metropolitan areas possess a kind of bucolic beauty that gives one a sense of serenity that many urban areas are lacking. One can take a long walk amongst the trees and diverse natural flora or, perhaps, a canoe trip down a crisp, windy river. A simple drive through the countryside on a Sunday afternoon can also be extremely fulfilling as one is able to take in the landscape, unfettered by the obstructions of urban life. There are also many outdoor activities that one can engage in more readily in non-metropolitan settings. These activities may include such things as canoeing, rafting, skiing, hunting, camping, and fishing, as well as a host of other outdoor activities that are not often available to the modern urban dweller. Additionally, there are a variety of scenic attractions such as national landmarks, both natural and historical, that one can visit. These things include such things as battlefields, historical sites, and natural wonders, that one can visit with one's family and friends. There is some evidence that people are even willing to forgo the high pay and jobs that the city life provides in order to take advantage of the quality of life that non-metropolitan life provides. Thrush (1999) reports:

> Over a decade ago, Janet Crane, a harried single mother with a young son, first made the ride into the Payson pines to clear her mind after a particularly bad week at work. "It was like nothing I ever saw before in my life," the 37-year-old New York native says. "I vowed then and there to move." It took her nine years to do it, but in 1997 Crane finally made it, although she paid a huge price for the privilege. What she found were higher housing costs and lower wages, and because Payson was out in the middle of nowhere, everything cost about 15 percent more. In order to relocate, Crane says she had to move into what she calls a "four-plex" apartment building crammed unglamourously between two insurance agencies on Payson's commercial strip. "But when you get outside," she says, "there's the view." (p.1)

As this anecdotal evidence suggests, some people are willing to move to non-metropolitan

locations in order to seek the qualities of life that some non-metropolitan areas have. More generally, Green (2001) also discusses some of the reasons why amenities are valued by locales':

> The reasons why amenities are valued, however, may vary considerably.
> The most basic reason is user value–individuals derive some benefit from direct physical use of the area, such as the case in recreation and tourism. Individuals do not have to use an amenity to derive some value from it. There are three alternative reasons for why individuals may value an amenity they are not using. They may not intend to use the amenity now, but want to keep the option available to use it. Some people may value the simple existence of an amenity. For example, many people may value the preservation of natural areas in Alaska, although few will actually visit the area. Finally, some people may not derive any current satisfaction from the amenity, but are interested in insuring that the amenity can be passed on to future generations–referred to as bequest value (p. 65).

In these ways, amenities can be seen as a positive asset to a community and, therefore, make it a more attractive place to live.

The non-metropolitan West is one area in particular that has received much attention in terms of accelerated rates of migration as well as its stock of amenities (Cromartie and Wardwell 2001, United States Department of Agriculture 2003). As noted above, the non-metropolitan West has increased in population the most during the 1990s. Therefore, it should receive particular attention in this research. Dennis Brownridge (1990) states that the non-metropolitan West is almost an oxymoron since most of the people in the West have traditionally lived in cities. The vast majority of the West is empty and is of little or no economic value (Brownridge 1990). Therefore, much of it is devoid of population. It is, however, full of scenic natural amenities. The West has vast tracks of open land, mountains, rivers, forests, and lakes. Because of this, tourism is one of the most important economic activities in Western states (Brownridge 1990). Therefore, natural amenities are considered one of the main assets of many Western States, such as Colorado. Moreover, changes in technology have helped add population to the non-metropolitan

West. As Vias (1999) reports:

> Today, however, remarkable improvements in communications have enabled entrepreneurs to succeed in remote locations. In addition, more leisure time and higher incomes have increased demand for homes close to scenic areas. Thus, there is now a demand for these natural environments that is not related to extracting natural resources from the ground-a demand that is able to take advantage of these resources without necessarily destroying them at the same time. The demand for environmental amenities, along with other rationales for population and employment change, is embodied in the quality of life model, a new explanation for the changes taking place in the Rocky Mountain West. (p. 15)

As this research suggests, the non-metropolitan West, especially the Rocky Mountain West, has gone through a transformation economically and demographically in which quality of life factors such as amenities have taken root as the chief reason for economic and demographic growth in this area. Locations which were once remote and inaccessible to business are now opening up, due to the growth in new technologies. If other non-metropolitan areas follow this model, we could hypothesize that now, more than ever, the amenity stock of a particular non-metropolitan area could be its most valuable economic asset. In sum, the non-metropolitan West presents the researcher with an optimal vantage point in which to explore the role of natural amenities in population change.

The first step is to catagorize amenities in a way in which they can be differentiated from one another. In order to do this, I will examine some of the ways in which researchers in the past have conceptualized amenities and categorized them. In so doing, I will be able to determine how the concept of amenities may be defined and identify which types of amenities seem to be the most important in influencing population change in non-metropolitan areas.

A second way in which the notion of amenities has been conceptualized is in reference to

the climate of a particular area. Obviously, some areas have a more pleasing climate than others. Retirees have tended to move to warmer areas of the United States, such as Florida and New Mexico, in order to take advantage of the warmer weather during the winter. Now, however, with the changes in the economy and increased technology, people who are not retired but continue to work, can also take advantage of regions that offer a more pleasant climate. People with the means to do so are increasingly moving to areas that offer a temperate climate in order to take advantage of the pleasant weather.

Additionally, an area may provide opportunities for recreational activities such as boating, fishing, camping, canoeing, rafting, skiing, hiking, skeet shooting, antiquing, hunting, as well as many others. Thus a third way in which amenities have been conceptualized is in reference to outdoor recreational activities.

Another possible type of amenity that the non-metropolitan areas possess is the opportunity for the resident to engage in activities around their home that would be otherwise impossible in urban settings. For example, one is more able to engage in horticultural activities such as gardening, landscaping, or even a kind of "hobby farm" on their property. With sufficient available land, the migrant may wish to raise horses or cultivate their own vineyard. This would give the migrant the opportunity to experience the pleasure of farming without having to be economically dependent on it. In his or her vegetable garden, the migrant could produce their own organically grown food so that they could feast on a wide variety of fruits, nuts and vegetables untainted by the chemicals and pesticides of modern factory farming. Beyond this, the migrant would feel a sense of satisfaction of being able to "live off the land." In examining the

literature on rural amenities, one finds that those receiving the most attention are amenities that concern the climate and topography of non-metropolitan areas. Clark and Cosgrove (1991) presume that climatic amenities that are the most important in determining the migration patterns of amenity seekers. "It appears that certain climatic amenities are important determinates of distance moved, holding other factors constant (p. 325)."

Although, research has found that the climate and topography of non-metropolitan areas are important pull factors that draw migrants to non-metropolitan areas, it has also found that other types of amenities draw people to non-metropolitan areas. One such type of amenity is tourist attractions. Unlike climate and topography, however, tourist attractions allow communities to be more deterministic in terms of their ability to develop their areas. "Popular tourist attractions are made rather than discovered, and just about any locality can decide to become a tourist destination (Galston and Baehler 1995, p. 183)." One example that Galston and Baehler (1995) cite is so-called ag-tourism. They use this term to refer to the attraction of tourists to culturally-related events to sell agricultural products (Galston and Baehler 1995). They also state that non-metropolitan tourism is not merely limited to outdoor activities such as camping, hiking, and fishing.

Another example of non-climatic and non-topographical amenities are cultural amenities such as historical monuments and battlefields. Clark and Cosgrove (1991) have found examples of areas that have created tourist attractions in order to draw people to their areas. One example was Reading, Pennsylvania that created a successful tourist development program out of nothing more than a few old textile buildings. Danville, Illinois is another example they cite in which the town residents instituted a successful annual event called 'Civil War Days' in which town

residents dress up in period outfits and recreate a Civil War battle in order to attract tourists. It seems inappropriate to assume that all communities can or should rely too much on tourist attractions to stimulate population. Communities with less of an amenity stock should ask whether or not it is economically viable to pursue an aggressive amenity plan in order to facilitate development.

One researcher found that such amenities in the South have, indeed, affected population change. Cromartie (2001) found that non-metropolitan areas in the South that have enjoyed increases in population tend to have scenic areas with growing recreation, tourism, and retirement activities. In the South, the author points out, flows of migrants favor some areas and not others. The non-metropolitan South has added 16 million people since the early 1970s. Unlike McGranahan, however, Cromartie adds what he refers to as 'urban' amenities to his analysis. These urban amenities, according to Cromartie, are such things as jobs, housing, schools and services. Natural amenities, on the other hand, include such things as mild winters, mountains, lakes and beaches. Cromartie assesses the effects of amenities on the migration patterns in the South by combining these two categories of amenities.

Other researchers have addressed the question of which factor is more important: economic concerns or amenities (Hunter, Boardman and Onge 2004). Clark and Cosgrove (1991) found that both exert significant effects on migration to non-metropolitan areas. Even so, of all amenities the authors found that climatic amenities seem to be the most important pull factors, holding all other factors constant. They caution, however, that below average economic growth can cause out-migration in an area, despite the fact that it might have an ample amenity stock.

Natural Amenities

The first and most prevalent way in which amenities are conceptualized are in terms of amenities being related to the natural resources of a particular area. These are often referred to as 'natural amenities' (McGranahan 1999). These natural amenities may be such things as forests, lakes, streams, mountains, valleys, hills, meadows, wildlife, plants or, perhaps, the natural flora of a particular area. Areas are said to have a certain stock of such amenities. That is to say that they have more or less of these types of things than other areas. Accordingly, researchers have attempted to analyze these amenities in terms of their salience (which natural amenities are more attractive to people) and, also an area's 'stock' of amenities (how many or the quantity of amenities that an area possesses). McGranahan (1999) has done extensive research on the effect of natural amenities on non-metropolitan areas. Natural amenities are particularly important because they are the resources in which the community has the greatest amount of control in our current system of government (McDowell 1995). McGranahan found that the importance of amenities varies greatly by region. He also found that job change was also highly related to natural amenities. McGranahan also points out that natural resources have attracted people to non-metropolitan areas in the past. However, recently it seems that amenities such as fertile land for crops and ore and minerals for resource extraction have given way to amenities that relate to the scenic beauty of an area.

McGranahan conducted his study by examining non-metropolitan counties in the United States as his unit of analysis. He examined six basic natural amenities. These were if the area had warm winters, amount of its winter sun, whether or not it has a temperate summer, low summer humidity, as well as its water area and topographic variation. In general, McGranahan found that

counties with the greatest population change from 1970 to 1996 also ranked highest in terms of his amenity index. Most of these counties were in the Western part of the United States, which, not surprisingly, also experienced the greatest population change during the 1970-1996 period. McGranahan's findings strongly suggest that amenities exert strong pull factors that draw people to non-metropolitan areas. Additionally, his findings suggest that amenities vary from region to region and that not all non-metropolitan areas have the types of amenities that seem to attract migrants.

A recent contributor to the study of amenities, Deller et al. (2001) chose to conceptualize amenities using a broad-based measure using five different types of amenities. These included the climate of the particular area, the land itself, water, winter recreation, and developed recreational infrastructure. In terms of the climate the authors examined the climatic conditions of the area including its temperature, rain as well as whether or not it had sunny winters and dry summers. "Developed recreational infrastructure" included such things as golf courses, tennis courts, historical attractions, playgrounds, and other items that related to its cultural and historical background. These items were used to measure the area's facilities as types of amenities. Land variables were used to measure the land resources of a particular region. These items included such things as an area's forests and farmland, as well as state and federal areas that served as parks for the larger public. Water items were used to measure the area's water resources such as its rivers, lakes, streams, and ponds. The last measures included winter sports opportunities such as skiing areas. In total, the authors used six variables to measure the climate, thirteen for regional infrastructure, sixteen for land resources, twelve for water resources, and six for winter facilities. In sum, Deller et. al. (2001) shows how some research has chosen to conceptualize

amenities in terms of many different attributes of a particular area.

Another study by Goe and Green (2002) analyzed amenities using three broad indexes of amenities. The first set of indexes measured natural resource amenities. The first index in this set of indexes measured the land-based amenities. This index included the acres of mountains, acres of forests and grasslands, the acres of federal land managed by the National Park Service, and the total acreage managed by the National Wilderness Preservation System. The second was the water-based measures that captured the natural amenities dealing with water, which was divided into three different categories of water-based amenities. The first category was river-based amenities. The river-based category consisted of five different items. These items were the total river miles, the river miles that were eligible for recreational status, the river miles with scenic value, and, finally, the river miles with wildlife value. The second category was the lake-based amenities. These included the acres of water bodies in lakes that were greater than or equal to forty acres in size, the acres of large lakes and streams, the acres of small lakes and streams, and the acres devoted to water-based recreation. Finally, ocean-based amenities was measured by a dichotomous variable that measured whether or not the area was located on an ocean coast.

In addition to natural amenities, Goe and Green (2002) also examined what they referred to as "recreational amenities." These amenities were divided into warm weather and cold weather recreational amenities. Warm weather amenities included the following items: the number of parks and recreational departments that an area had, the number of public and private tennis courts, the number of amusement places, the number of public and private golf courses, the number of riding academies and stables, and the number of organized camps. The index of cold weather amenities included such things as the number of skiing resorts, the number of cross-

country skiing firms, the number of downhill skiing areas, and the lift capacity per hour. Historical amenities were also measured by the authors. These amenities were measured by using an index that measured the following items: the number of historic/cultural tourist attractions, the number of museums, the number of natural resource tourist attractions, and the number of other unclassified tourist attractions.

Clark and Cosgrove (1991) also examined the effects of amenities while comparing them to labor market opportunities and their corresponding effect on the distance people move to a new residence. In their study they expanded the types of amenities examined in other studies. Like other studies, Clark and Cosgrove examined the climate as an amenity. They accomplished this by using variables that measured the inches of annual rainfall, the percent of available sunshine, the average number of heating degree days, the difference between average maximum July temperature and average minimum January temperature. Clark and Cosgrove also examined selected cultural amenities which included the number of art, science and technological museums, planetariums, historic sites and reconstructions as well as related facilities. Additionally, they examined the number of major-league baseball, football, basketball, and hockey teams as another type of amenity. Lastly, they contended that the number of daily airline flights also represented an amenity.

Another important question that should be addressed is the impact of age on the types of amenities that people seek. Intuitively, we can hypothesize that older people are going to seek different types of amenities than are younger people. Studies on migration streams have concentrated on the impact of age on migration. However, with amenities in mind, we should be especially concerned with age and how it relates to amenity seekers.

The discussion above has demonstrated how difficult an endeavor it is to come to a conceptual definition of amenities. The wide variety of definitions that have been used in the literature, as well as the conceptual ambiguity, has made the whole concept of amenities one that has been clouded with uncertainty. This situation has led one researcher to conclude the following on the previous research on amenities: "Within the literature the empirical representation of amenity attributes has tended to be single dimensional, simplistic, and to a large extent ad hoc" (Deller et. al. 2001, p. 356). If this is the case, how does one discern what are amenity attributes and how does one go about studying them? The answer, I believe, is to combine the generalizations of past research as well as some of the assumptions they raise in order to come to a more complete conceptualization of amenities.

Let us first look at some of the generalizations of what has been conducted in past research. It seems that the vast majority of past research on amenities has emphasized the importance of natural amenities (Deller et. al. 2001, Cromartie 1993, McGranahan 1999, Goe and Green 2002, Clark and Cosgrove 1991). Therefore, any conceptualization of amenities should include natural amenities. If the above reasoning holds, these are the attributes that make areas unique and thereby attract people to them. It must be emphasized that the issue is which natural amenities do we choose to examine and which are the most important in attracting people to non-metropolitan locales? Answering this question is one of the focal points of this research.

After natural amenities, what other amenities that are important in drawing people to non-metropolitan areas is a question of considerable debate. Certainly, cultural amenities such as historic attractions and events have received much attention in the literature. Additionally, so-called "man made" amenities, which often augment natural amenities, are also pertinent.

Examples of these may include such things ski slopes and golf courses. There are also intangible things that also may be considered amenities such as the culture of a particular area, and its diversity in terms of people and ideas. When we look at amenities using a broad conceptualization, we see that there are, indeed, many things that can be considered amenities and that make an area 'unique', as Green states. It is an important purpose of this research, therefore, to go beyond or transcend the amenities found in past research and examine some other amenities that attract people to non-metropolitan areas.

Another amenity that has been discussed in the literature that could be considered a cultural amenity are colleges and universities. Colleges and universities can provide all kinds of amenities that add to the quality of life of an area and, therefore, may attract people to live in a particular area. As Peter Wolf (1999) states, "colleges and universities are 'magnets' for migration to rural areas" (p. 48). Especially in non-metropolitan areas, colleges and universities, draw more highly educated people to a particular area as well as add population, although temporarily, in the form of students. Naturally, these students add to the business of the local economy as well as create markets for other amenities such as bars, restaurants, bookstores, and take advantage of the outdoor activities that may be provided by the area. Wolf (1999) also contends that the university plays a pivotal role in the modernization of a community. Universities and colleges must "keep up" with the current trends in information technology. Consequently, this creates a need for the communication infrastructure to be in place so that this is possible. Naturally, this has a positive spinoff for the community at large because these technologies help to promote business opportunities as well as allow people to conduct business far away from the densely packed urban core.

Colleges and universities also help the make the community at large more rich and diverse in a number of other ways. Many schools have extension programs that deal with adult education as well as sporting events, art shows, musical festivals, science fairs, lectures, and many other events that are open to the community. Hence, the college or university can contain many amenities that can attract people to non-metropolitan areas.

Therefore, using a very restricted conceptualization of amenities is probably not the best way to explore this topic.

With this in mind, it should not be necessary for amenities to be defined as non-exportable, or market based or non-market based, natural, manmade, or whatever restriction one wants to place on them. One key purpose of this research is to examine what things attract people to non-metropolitan areas. Accordingly, then, just about anything can be an amenity provided that people find them desirable. The question is, is there some agreement on what people define as amenities? For the present moment, however, determining the salience of these amenities in order to identify which is most important in effecting migration will be my primary objective. In so doing, I will be able to explore which variables are most important in terms of pull factors to non-metropolitan areas. This will add an important body of knowledge to the areas of both migration and non-metropolitan development as researchers have a better understanding of the role of amenities in the growth and dynamics of non-metropolitan population and development.

Conceptualization and Definition of Rural Amenities

As noted above, the bulk of the research on amenities has chosen to conceptualized amenities in terms of two basic types of amenities: natural amenities or recreational amenities.

Under these two rubrics, a myriad of different variables have been examined. In terms of recreational amenities such things as water sports (i.e. canoeing and rafting) have been analyzed, as well as winter sports such as skiing, snow-boarding, and mountain climbing. Natural amenities, by far the most numerous in terms of types that have been analyzed, include such things as the scenic beauty of an area, its mountains, lakes, and rivers as well as the climate of a particular area. One can argue that these two types of amenities often go hand in hand. For example, an area cannot have a ski slope without a mountain or a canoe area without a river or lake. Therefore, most recreational amenities are dependant on the natural amenities of a particular area. Even golf courses require a certain type of topography and climate to make them possible. One could not, for example, build one in the tundra of Alaska and expect it to work. In sum, most types of amenities that have been examined are natural or recreational in nature. There have also been a variety of definitions on the term "amenity" itself. Goe and Green (2002) define amenities as "qualities of a locality that make it an attractive place to live and work" (p. 2). Power (1988) defined amenities as "non-marketed qualities of a locality that make it an attractive place to live and work" (p. 142). Gottlieb (1994) defines amenities as "location specific, non-exportable goods or services that primarily benefit employees in their role as residents or commuters" (p. 271). Gottlieb goes on to state that the relationship between businesses and amenities is indirect. Additionally, the only way an individual can utilize better amenities is by moving.

In conclusion, in reviewing the definitions and conceptualizations of amenities in the literature, the following generalizations can be made:

1. A great deal of emphasis is placed on natural and recreational amenities.

2. Amenities are most often seen as fixed entities that cannot be moved from one locale to another.

3. They are seen as somewhat external or indirect to the chief economic activities of the locale. (Whereas they may attract people and jobs to a locale they are not usually the primary economic activity)

4. Amenities exert some beneficial impact on the locale they are in (e.g. people find them attractive, beneficial, fun, etc.).

5. Finally, the extent to which an amenity exerts a positive effect on a locale both in terms of attracting people to that locale and, in turn its development depends heavily on peoples' *preference* for a particular amenity.

Keeping this in mind, the definition I will use for amenities is as follows: *attributes of a non-metropolitan locale which enhance the quality of life of the people living or visiting there.*

Accordingly, then, amenities are likely to encourage in-migration, as Whitener and McGranahan (2003) imply:

> Enhancing rural communities as places to live, retire, and vacation may improve not only the quality of life for existing residents, but also the possibility of attracting new businesses and residents. (p. 7)

Additionally, amenities are in many ways unique to a particular locale. Certainly, some areas have amenities in common; however, an amenity such as a mountain or an historic site is almost impossible to duplicate in another area. Moreover, no two areas will posses the exact same stock of amenities[8]. It will be the purpose of the next chapter to theoretically and conceptually explore the ways in which amenities may engender population growth in non-metropolitan areas, as well as the types of amenities that are the most pertinent to this process.

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[8] By *stock* I mean the total number of different kinds of amenities a particular area has.

Limitations of Previous Research

Previous research on amenities has been limited in a number of ways. First, there is a great deal of conceptual ambiguity in terms of defining amenities. Second, most previous research has attempted to tackle the concept of amenities by also delving into the murky concepts of community development. Finally, and most importantly, previous research has not attempted to explore how amenities make a locale unique by examining the many different types of amenities an area has. In order to account for these shortcomings, this research will look at one aspect of community development (population growth) as well as attempt to account for the amenities a particular area has in their totality, rather than merely examining one type of amenity at a time, in order to assess the impact of amenities on population growth.

CHAPTER 4-HYPOTHESIZING THE EFFECT OF AMENITIES ON NON-METROPOLITAN POPULATION CHANGE

In the previous chapter, I examined the literature on amenities in order to comprehend how they have been operationalized, defined, and studied in previous research. My mission was twofold. First, I used past research to reach some kind of consensus on what amenities are, in order to come to a working definition of them. Second, I sought to hypothesize their effect on non-metropolitan population change. My conclusion was that amenities add to the quality of life of an area. Additionally, I concluded that amenities are in many ways unique to a particular area. I also argued that it is precisely this point that has been the major conceptual limitation of previous research. I, therefore, suggest that this research attempt to more fully assess the amenity stock of a locale instead of concentrating on a few particular amenities. In this way I hope to more fully understand their effect on population growth in non-metropolitan areas. In short, the following chapter will seek to draw on past research as well as my own theoretical speculation to better understand how amenities 'work' to produce population change in non-metropolitan locales.

As stated earlier, amenities attract people to a specific locale; they usually do not scare people away, as it were. This point is not likely to be contentious. However, what is difficult to understand, and *is* a point of major contention is how much, is the degree to which an amenity or a group of amenities can attract people to an area (an even more difficult question, and one that is beyond the scope of this research, is how long they will stay).

A Summary of the Pertinent Findings from the Amenities Literature

My examination of the literature on non-metropolitan amenities yields some important generalizations that are pertinent to this research and will help me hypothesize the relationship between amenities and population change in non-metropolitan locales. Generally speaking, amenities usually exert some positive impact on the locale they are in (e.g. people find them attractive, beneficial, fun, etc.). Therefore, in terms of their relation to non-metropolitan population change, amenities have been found to contribute to population growth rather than detract from it (McGranahan 1999). Moreover, they are seen as somewhat external or indirect to the chief economic activities of the locale. (Whereas they may attract people and jobs to a locale, they are not usually the primary economic activity) Finally, as was stated in Chapter 3, the extent to which an amenity exerts a positive effect on a locale, both in terms of attracting people to that locale and, in turn, its development, depends heavily on people's *preference* for a particular amenity.

The *degree* to which amenities promote non-metropolitan population growth is of central interest to this research. By this, I mean to say that I am concerned with discovering the relative impact of particular amenities on non-metropolitan population change while taking into account the significance of other factors that impact non-metropolitan population change. Previous research has suggested that all amenities are not the same in terms of their impact on the various aspects of non-metropolitan development analyzed by pervious studies. In other words, people seem to favor some amenities over others. For example, in his study of the influence of natural amenities on population change, McGranahan (1999) suggests that there is a great deal of variation in terms of the effects of certain natural amenities on non-metropolitan population

change. For example, he found that sunnier winters were of more influence on population change in areas than both water area and locales' summer climate. Moreover, his research also found that, perhaps in contrast to our "common sense" notions of natural amenities, the measures of natural amenities that he studied were not strongly correlated with one another. He therefore, concluded that "the low and inconsistent correlations suggest that most counties have some negative and some positive aspects to their amenities (p. 5)." Accordingly, my research will attempt to account for as many amenity and control variables as possible in order to more fully examine the relationship between amenities and population change in non-metropolitan counties.

In order to construct my hypotheses on the relationships between the amenity and control variables with non-metropolitan population change, I will integrate what is known about this relationship from previous research as well as the theoretical expectations I have developed based on pervious research. In this way, I will be able to construct a theoretical model that attempts to explain the relationship. Additionally, it will provide a framework that can be tested with the data available.

My basic assumption throughout this work has been that amenities make a locale a more desirable place to live. They do this by adding to the quality of life of a particular area, as well as attracting people to that area, and inspiring both 'indigenous' population as well as recent migrants, to stay in. However, as can be seen in the literature, the relationship is often not as direct or obvious as one might expect. By this, I mean to say that there are a host of other variables to be accounted for in order to properly assess the relationship between amenities and non-metropolitan population change. It is also one of my aims to account for these factors as well.

The Types of Non-metropolitan Amenities

In order to explore the association between amenities and population change in non-metropolitan counties in the United States, it is necessary for me to first review the types of non-metropolitan amenities examined by pervious research. Generally speaking, there are four broad amenity types. These amenity types are: Natural Resource Amenities, Climatic Amenities, Outdoor Recreational Amenities, and Historical and Cultural Amenities. Natural Resource Amenities include and/or pertain to the natural resources of particular locale that augment its natural beauty (Deller et. al. 2001, Goe and Green 2002, McGranahan 1999). They include such things as the forests, mountains, lakes, meadows, fields, natural fauna, soil, and so on. Natural Resource Amenities are almost always particular to a specific locale. That is to say that they are not transportable from one locale to another (Green 2001). Or, as Green (2001) states: "(for example) a wildlife area is unique and cannot be substituted with another type of amenity or even another wildlife area (p. 66)". Therefore, they add to the uniqueness of a particular locale. One might also say that amenities can be fundamental in forming the 'spirit' of a particular area. Outdoor Recreational Amenities pertain to outdoor activities of a particular locale that people may engage in and the infrastructure necessary to sustain them (Deller et. al. 2001, Goe and Green 2002, McGranahan 1999, Johnson and Beale 2002). These activities may include such things as: skiing, hiking, canoeing, snow-boarding, surfing, rafting, skeet shooting, hunting, camping, sailing, and wind surfing (Deller et. al. 2001, Goe and Green 2002, McGranahan 1999, Johnson and Beale 2002). In many ways, natural resource amenities are tied to recreational amenities in a profound way as Clawson and Knetch (1966) imply:

> There is nothing in the physical landscape or features of any particular piece of land or body of water that makes it a recreational resource; it is the combination of the natural qualities and the ability and desire of man to use them that makes a resource out of what otherwise be a more or less meaningless combination of rocks, soil and trees (p. 89).

Climatic Amenities, as the name implies, pertain to the climate of a particular locale (Goe and Green 2002). The climate, naturally, can have an influence on whether or not people choose to live in a particular locale. In the extreme, severe cold or heat can make an area uninhabitable. Conversely, a pleasant climate can make an area much more attractive to people. It is for these reasons that climatic amenities are important to catagorize and analyze. So-called historical and cultural amenities are also an important amenity category to explore, since they too enhance the quality of life of a given locale. Historical and cultural amenities have to do with cultural and historical heritage of a particular locale. Historical and cultural amenities include historic attractions such as battlefields and parks or festivals relating to the culture of an area. In short, they make an area unique in many ways and provide people with interesting things to do and learn about. Therefore, these amenities can attract people to an area, and, in turn, may encourage them to stay there.

To some extent, previous research has examined most all of these amenities in terms of their affect on a host of variables influencing non-metropolitan areas. However, my research will examine all of them as thoroughly as the data will permit. Doing so is of importance to our understanding of how amenities 'work' to influence non-metropolitan areas because I will be examining the combined as well as the unique affects of all of these amenities on population change in non-metropolitan areas. This will provide an important understanding of what *may* keep people in a non-metropolitan locale or prompt them to leave that area.

Climatic Amenities

Like the natural resources of a non-metropolitan area, the climate of a particular area is expected to have an influence on its population change (McGranahan 1999). On a very basic level, the climate itself can determine if the area is even suitable for human habitation in the first place. For example, the polar icecaps of the planet are devoid of human life (except for a few scientists) for obvious climatic reasons. Accordingly, if an area is too hot or too cold humans simply will not live in those areas. Examples of these types of areas are the polar icecaps or absolute deserts (Darwin 1859). For my purposes, however, I need to hypothesize the extent to which climate is an *amenity*. Therefore, I need to go beyond simply deducing whether an area is too cold or too hot for human habitation and discern what climatic amenities, as such, influence population change in non-metropolitan locales.

Before I proceed further with this investigation, however, it may be useful to understand some of the problematic interaction effects between some climatic amenities and some of the other amenities. McGranahan's (1999) seminal work on natural amenities and population growth in non-metropolitan areas noted that certain "trade-offs" were in order when studying the relation between amenities and population growth as well as economic growth. For example, mountainous non-metropolitan areas have a great stock of natural resource amenities as well as recreational amenities stemming from the mountainous terrain. However, they tend not to have mild winters which many people desire (McGranahan 1999). Likewise, nonmetropoitan areas with a great stock of water amenities have the benefits associated with those amenities, but they also have high humidity. The over-arching point is that some climatic amenities do not always correspond with natural, recreational, or historic/cultural amenities. Stated differently, the climate

of a particular locale does not always correlate favorably with the locale's amenities in many cases. McGranahan (1999) has found that these problems have resulted in mixed results regarding the effects of climatic amenities on other variables.

Intuitively, one would expect that a pleasant climate would enhance the quality of life of a particular area, make it a more attractive place to live, and, therefore, be associated with increase in population in those areas who have pleasant climatic attributes. Accordingly, we must ask: what makes a pleasant climate? In part to answer this question previous research has indicated that such things as warm winters, amount of winter sun, a 'temperate' summer, and low summer humidity are factors that make for a favorable climate (Deller et. al. 2001, McGranahan's 1999). Furthermore, these factors are amenities that may attract people to a particular non-metropolitan locale (McGranahan 1999). Therefore, it is expected that locales that posses these climatological qualities in the desired magnitudes will experience increases in population change. Accordingly, it is hypothesized:

Hypothesis 1: Non-metropolitan locales with more desirable climates[9] will experience increases in population.

Natural Resource Amenities

Of all non-metropolitan amenities, natural resource amenities have been the most widely examined by previous research. Moreover, natural resource amenities, more so than most other amenities, make a non-metropolitan locale unique. In non-metropolitan areas natural resource amenities may be divided into two categories. These two categories are *land-based* natural

[9] By this I mean to define 'desirable climate' as defined above using McGranahan's (1999) measures.

resource amenities and *water-based* natural resource amenities (Goe and Green 2002). Land-based natural resource amenities, as the name implies, are the amenities of a non-metropolitan locale that are on land. In non-metropolitan areas, these may include such things as forests, mountains, hills, meadows and the natural fauna of a particular nonmetropoitan locale (McGranahan 1999). McGranahan (1999) found that like other types of amenities, certain land-based natural resource amenities were associated with population increase in some non-metropolitan areas in the United States. On a theoretical level, I expect that land-based natural resource amenities will act the same as many other amenities in that they enhance the quality of life of the people living in an area as well as provide economic opportunities for the people living in those areas. Therefore, I expect that land-based natural resource amenities to exert a positive influence on population change in non-metropolitan areas. Water-based natural resource amenities have to do with the water resources of a particular locale (Goe and Green 2002, McGranahan 1999). In non-metropolitan areas, water-based resources are those resources connected with bodies of water in non-metropolitan areas. Goe and Green (2002) found it more useful to place water-based amenities into three different categories. These categories were: river based natural resource amenities, lake-based natural resource amenities, and finally ocean-based natural resource amenities. I shall use these categories as well in this research. River-based natural resource amenities are those having to do with the rivers, streams, and creeks in non-metropolitan areas[10]. Lake-based amenities are those having to with lakes and ponds and ocean-based amenities natural resource amenities have to do with such things as beachfront and other oceanic resources. It is expected that these water-based amenities (whether they be lake based,

[10] The measurement details of these water-based amenities are given in Chapter 5

river, or ocean based) will be associated with population increase in non-metropolitan areas. I expect this association because of the findings of previous research (e.g. Goe and Green 2002, McGranahan 1999) regarding these amenities and population change, economic activities and quality of life enhancement. That is to say, that I expect a very similar association between water-based amenities and non-metropolitan population change as would be found with land-based natural resource amenities. In accordance with the above expectations, Hypothesis 2 is stated as follows:

Hypothesis 2: The greater the stock[11] of natural resource amenities a non-metropolitan county possesses, the greater its population increase.

Outdoor Recreational Amenities

Outdoor recreational amenities, as the name implies, are those amenities having to do with recreational attractions which provide individuals with an opportunity to engage in outdoor activities (Goe and Green 2002, Johnson and Beale 2002). Previous research has suggested that these amenities attract visitors to non-metropolitan areas as well as inspire people to move to those locations (Johnson and Beale 2002). Outdoor recreational amenities can be divided into two major categories: *warm weather* outdoor recreational amenities and *cold weather* outdoor recreational amenities (Goe and Green 2002). Warm weather outdoor recreational amenities are those activities that are *typically* conducted in warmer climate conditions like those found in the summer months of most regions. In non-metropolitan areas warm weather recreational amenities may include such things as golf courses or tennis courts (Goe and Green 2002). They may also

[11] Once again, I use the term 'stock' to refer to the total number of a particular amenity type that a locale possess.

include such amenities as amusement parks, campgrounds, riding academes, and rifle ranges. In terms of the effect of these amenities on population change in non-metropolitan areas, the work of Johnson and Beale (2002) has suggested that they act as a draw of both visitors and new migrants. I theorize further, based on past research, that warm weather recreational amenities keep people from moving out of a non-metropolitan locale as they create jobs as well as enhance the quality of life of the people living in these non-metropolitan areas (Goe and Green 2002, Clawson and Knetsch 1966).

So-called cold weather recreational amenities are those activities that are best suited for colder weather such as that found in winter in most regions (Goe and Green 2002). That is to say, that they are recreational opportunities for winter climates. Cold weather recreational amenities in non-metropolitan areas include such things as ski slopes, ice rinks, and cross-county skiing trails (Goe and Green 2002). It has been suggested by previous research that- like their warm weather counter parts-cold weather recreational amenities also have the ability attract people to non-metropolitan areas, as well as keep the indigenous population from moving out of their respective non-metropolitan areas (Goe and Green 2002, Johnson and Beale 2002, Clawson and Knetsch 1966). Based on this logic, it is hypothesized:

Hypothesis 3: The greater the number of outdoor recreational amenities a non-metropolitan county contains, the greater its population increase.

Historical and Cultural Amenities

As stated above, historical and cultural amenities have to do with specific attractions or activities related to the culture or history of a particular locale (Clark and Cosgrove 1991, Goe

and Green 2002). Historical amenities in non-metropolitan areas may include such things as historic sites such as battlefields, museums, colonial homes, or restored period plantations. From the author's own experience, Williamsburg, VA provides a very good example of this type of amenity because practically the entire town recreates daily life in colonial Virginia with exhibitors wearing period costumes and so forth. Cultural amenities in non-metropolitan areas are things such as festivals, special performances, the people's way of life in a particular area as well as colleges and universities. Cultural amenities also enhance the quality of life of a particular area by making it a unique and interesting place to visit and live (Goe and Green 2002). An example of an area with a rich source of cultural amenities may be the Amish country in Pennsylvania. Both historical an cultural amenities have been found to enhance the quality of life of a particular locale as well as provide economic opportunities, such as gift shops and motels (Clark and Cosgrove 1991, Goe and Green 2002). Therefore, it is expected that historical and cultural amenities in non-metropolitan areas will have a positive affect on population change in non-metropolitan areas. This supposition is reflected in hypothesis 4:

Hypothesis 4: The greater the number of historical and cultural amenities a non-metropolitan area has, the greater its population increase.

Control Variables

Metropolitan Proximity

A non-metropolitan locale's proximity to metropolitan area and/or how remote it is from a metropolitan area can also have an influence on the population change of that locale (Vias 1999, Tucker 1976, Lichter, Fuguitt and Heaton 1985, McGranahan and Beale 2002, Beaulieu et. al.

2003). Intuitively, one could safely assume that areas that are close to metropolitan areas will be more likely to have greater population increase than those that are more remote. Not surprisingly, research has generally confirmed this assumption (Vias 1999, Tucker 1976, Lichter, Fuguitt and Heaton 1985). Moreover, it is more difficult for more remote areas to obtain the newer technological innovations-such as broadband cable- necessary for the new digital economy (Malecki 2001). In studying the population change in the Rocky Mountain West, Alexander Vias (1999) concluded that metropolitan adjacency was the chief factor in determining increase population change in non-metropolitan areas of that region of the country from 1970 to 1995. I, therefore, predict to find a strong positive relationship between a non-metropolitan locale's adjacency to a metropolitan area and its level of population change. In following with this supposition, Hypothesis 5 is as follows:

Hypothesis 5: Non-metropolitan counties that are adjacent to metropolitan areas will have experienced greater population increase.

Income

The discussion above about the economic concerns related to population change leads one to conclude that the heathier the economy of a locale, the more likely it will be that people will stay in that locale, have families, etc. Since the income of the population is the most direct way of measuring the economic status of the people in the area, I expect that there is a link between the income and population change. Moreover, as past research has indicated, the association between income and population change is positive (Treyz et. al. 1993, Roback 1983, Greenwood 1975).

Hypothesis 6: A county's per capita income will be positively associated with population growth in non-metropolitan counties.

Age Structure of Target Area

The age of the population and the age structure of a non-metropolitan locale can also influence its population change in a variety of ways (Rathge and Highman 1999, Heaton, Clifford, and Fuguitt 1981, Shryock et al. 1976, Weinstein 1976). First, age influences both fertility and mortality of a particular area (Weinstein 1976). Fecundity (the natural capacity of a population to have births) is traditionally measured by the number or percentage of women of childbearing age (Hobbs and Stoops 2002, Shryock et al. 1976). Consequently, the number or percentage of younger people, particularly women, can have the potential for increase in population. Since older people are the ones more likely to experience death, the number of older people can have the potential for decrease in population, by way of mortality. In terms of migration, however, the picture is less clear especially in non-metropolitan locales. Over the past thirty years, the overarching trend in non-metropolitan America has been that younger people have moved out of the non-metropolitan areas and the older population has remained in those areas (Hobbs and Stoops 2002, Rathge and Highman 1999). Of course, this has not been the trend for all non-metropolitan areas, but it seems to be the case in the majority of them. Therefore, one could expect that the older a non-metropolitan's county's population is, the more likely it will be that it will have a declining population. Following this supposition, Hypothesis 7 is as follows:

Hypothesis 7: The lower the median age of a non-metropolitan county the greater its population increase will be.

Unemployment

Most previous research on the influence of economic factors and population change has contended that, by and large, "people follow jobs" (e.g. Williams and Safranka 1979, Hicks

1932). In light of the major changes occurring during the 1990s in terms of the so-called "New Economy" I anticipate that more and more people will be able to work in a place of their choosing, rather than one determined by a particular job site. Even so, the general picture is that people follow jobs (at least for now). Unemployment, then, should be correlated to population decline, if we follow the major assumption that people will go where the jobs are. Hence, Hypothesis 8 is as follows:

Hypothesis 8: It is expected that unemployment will be negatively correlated with population growth in non-metropolitan counties during the 1980 to 2000 time period.

Race

Race has often been examined as a crucial factor in many studies on population change, and in particular migration (Howell and Frese 1983, University of Arkansas Division of Agriculture 2003). However, little is know about the racial composition of amenity-related migration streams to the non-metropolitan U.S. Socioeconomic status of the migrant, however, would be an important factor facilitating access to outdoor recreational amenities among other types found in the non-metropolitan U.S. Accordingly, it is expected that the vast majority of amenity seekers will be Caucasian. Independent of the attraction provided by amenities, it is expected that the non-metropolitan counties these migrants will be attracted to will be predominately white. Therefore, hypothesis 9 is as follows:

Hypothesis 9: The greater the percentage of the county's population that is white the greater the population increase will be.

Educational Level of Target Area

Like so many socio-economic status variables, educational attainment is hypothesized to have an effect on population change (Huang and Orazem 1997, Summers and Branch 1984). Given the influence of socioeconomic status on access to many types of non-metropolitan amenities it is likely that most amenity related seeking migrants would have higher levels of education. Moreover, independent of the influence of amenities, they should be more attracted to non-metropolitan counties with higher levels of education. Accordingly, Hypothesis 10 is stated as follows:

Hypothesis 10: The higher the level of education of the population of a non-metropolitan county the greater its population increase will be.

Quality of Life Enhancing Service Occupations

This variable is one of the more hypothetical (in the sense that it has not been explored by previous research) than most of the others in this research. I suggest that these occupations provide services that enhance the quality of life of the people living in particular non-metropolitan areas as well as provide vital services to them. Examples are the retail trade, repair services, and health care services. It is particularly vital, for example, that health care services are available to people living in an area so that illness and injury can be properly treated as quickly as possible. In sum, these occupations are hypothesized as being important infrastuctural conditions people will desire in order to move or stay in those places. It is, therefore, vital that these occupations be controlled for in this research. Therefore, hypothesis 11 is stated as follows:

Hypothesis 11: The greater the percentage of the workforce employed in quality of life enhancing services in a non-metropolitan area the greater its increase in population will be.

Contributions of this Research to the Knowledge Base on Rural Amenities

First and foremost, my research examines a wider range of amenities than most previous studies have examined, as well as new amenities that have not been examined at all by previous research. Second, my research examines non-metropolitan population change over 1980-2000 time period. This is significant due to the fact that most studies of non-metropolitan population change have examined it only over a ten year time period, rather than a longer time period. By looking at the population change of non-metropolitan locals over this longer (20 versus 10 year time period), it is hoped that this research will be able to gauge the more enduring trends of population change in non-metropolitan locales as well as the possible changing importance of amenities. Finally, this research examines the effects of a more comprehensive set of determinants than has been used in previous studies of non-metropolitan population change.

CHAPTER 5-DATA AND METHODS

The study hypotheses were tested using secondary data drawn from several different sources. A panel data set was constructed for the years 1980, 1990, and 2000 for all non-metropolitan counties in the United States[12]. This data set contains indicators of population size and factors that were hypothesized to independently affect change in the population in non-metropolitan counties during the 1980-2000 period. This time period was selected because, as will be shown, it was a period of population growth in the nonmetropoitan U.S. Moreover, it was a period of largely uninterrupted economic growth which involved an extensive restructuring of the U.S. economy. As previously discussed, these changes provided macro conditions which allowed for the resumption of non-metropolitan population growth. The primary objective of the empirical analysis was to test for relationships between the presence of different types of amenities and population change in non-metropolitan counties while statistically controlling for other determinants of population change.

Unit of Analysis

My research will focus on individual non-metropolitan counties in the United States as the unit of analysis. Counties will be defined as non-metropolitan using the 1993 rural-urban codes (also known as the "Beale Code") from the United States Department of Agriculture, Economic Research Service.

These rural-urban continuum codes are as follows:

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[12]Data for non-metromplitan counties in Alaska and Hawaii will be excluded to the nonavailability of data and radical changes in the county geography in Alaska over the last several decades.

Metro Counties:
0 Central counties of metro areas of 1 million population or more
1 Fringe counties of 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 (USDA, Economic Research Service 2002)

Accordingly, only counties with scores of 4 or above using the above scale are included in the analysis[13]. Therefore, the study population consists of all non-metropolitan counties in the continental United States[14]

Measuring Population Change: The Dependent Variable

"Population change is measured by the difference between population sizes at different dates (Shryock et al. 1976, p. 211)." There are, however, many ways of expressing this change. For example, one may choose to express it in terms of the average percent change in population of a given area over a specified period of time. Or, in contrast, the absolute change in population over the same period of time. Shryock (1976), distinguishes the two in the following statement:

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[13] The 1993 Beale codes were used in this analysis, were the 2000 Beale codes used some of the non-counties under the 1993 codes would be classified as metropolitan counties.

[14] As noted above, due to the lack of availability of the data, non-metromplitan counties in Alaska and Hawaii are to be excluded from this analysis.

> The absolute amount of change is obtained by subtracting the population at the earlier date from that at the later date. The percent of change is obtained by dividing the absolute change by the population at the earlier date (p. 211).

As was stated above, the chief factor or variable that this analysis will examine is the population change occurring in the non-metropolitan counties for the 1980-2000 time period. However, because of the fact that the population in non-metropolitan counties in the United States vary in population size considerably, an approach should be taken in which counties may all be compared to one another on an equal level. Doing so will enable me to more appropriately approximate the level of population change among one county to another despite the great differences in their respective absolute populations. Accordingly, population change was measured by both the percentage change in population that has occurred in theses counties between 1980 and 2000 as well as the absolute amount of population change in these areas. By measuring the rate of population change with percent population change and the total change in the numbers of people with absolute population change the two measures capture a more complete picture of population change in non-metropolitan areas in the United States from 1980 to 2000. Data for these variables came from the United States Census Bureau.

Measuring Amenities: The Independent Variables

Measuring and conceptualizing amenities is, perhaps, the most difficult part of this endeavor. To do so, I have drawn on past research as well as my own relevant theoretical conceptualizations of the concept. In accordance with the study hypotheses, the different types of amenities that were examined by my research were measured. as follows:

Climatic Amenities

The level of climatic amenities found in a non-metropolitan county will be measured in this

research using McGranahan's (1999) natural amenities scale. I am using the term "climatic" versus "natural" amenities in this research to distinguish climatic features from other types of natural resources (e.g. forests, wildlife areas) that might be found in non-metropolitan counties. As will be seen in the discussion below, the majority of the indicators used in McGranahan's natural amenities scale measure climatic features. It should be also pointed out that the natural amenities scale could be better termed an "index" since there is no underlying measurement model regarding the pattern of responses or values of indicators comprising this composite measure.

McGranahan's scale utilizes six indicators. A county's average January temperature is used as a measure of winter warmth. A county's average number of days of sun in January is used as a measure of winter sunshine. The amount of temperate gain in summer temperature was measured by the residual computed from regressing average July temperature on average January temperature. The average July humidity is used as a measure of summer humidity. Topographical variation is measured using McGranahan's (1999) analysis of the topography of U.S. counties in relation to five basic land formations: plains, tablelands, plains with hills or mountains, open hills or mountains, and hills and mountains. This analysis was based on a topographical map found in *The 1970 National Atlas of the United States of America.* Counties are assigned a score ranging from 1 to 21 based on the variety of land formations found in the county and the percentage of land area in the county covered by these formations. Finally, the logarithm of the percentage of the county area in water is used as a measure of water area.[15]

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[15] Since their boundaries extend three miles offshore, counties abutting the ocean coast were found to have much larger water areas compared to other counties. In order to address this problem, McGranahan limited the maximum water area to 250 square miles in calculating the percentage of land area in water.

Raw scores on each of these six indicators are transformed into standardized z scores with a mean of zero and a standard deviation of one. A total index score is then calculated by summing the z scores for the six indicators. In this research, the summative scores for the six items are used as an index to measure a county's level of climatic amenities.

Natural Resource Amenities

Following the work of Goe and Green (2002), I also construct an index of *land-based, natural resource amenities* from the following indicators:

a. Acres of Mountains
b. Acres of Forest & Grassland Managed by the USDA- Forest Service
c. Acres of Federal Land Managed by the National Park Service
d. Total Acreage Under the National Wilderness Preservation System

Index scores from these variables as well as the other remaining amenity indices used in this research will be constructed using factor analysis (Goe and Green 2002). Furthermore, factor analysis will be used in order to validate the unidimensionality of each index used to measure each amenity type (Goe and Green 2002). Correlation analysis and Chronbach's Alpha will be used in order to determine the reliability of each particular amenity index (Goe and Green 2002). A composite index score will be calculated using a weighted sum. The observed values of each indicator will be multiplied by the factor loading for that variable derived from the factor analysis. The weighted scores will then be summed to form a composite score. Data for those indices were all drawn from the National Outdoor Recreational Supply Information System (NORSIS).

In measuring *water-based natural resource amenities* Goe and Green (2002) found three different types of these amenities in non-metropolitan localities: *river based amenities, lake based amenities and ocean based amenities.* In following with their analysis, I also used their indicators for these three different types in my analysis: The indicators for river-based natural resource

amenities were as follows (Goe and Green 2002):

a. Total River Miles
b. River Miles Eligible for Recreational Status
c. River Miles With Recreational Value
d. River Miles With Scenic Value
e. River Miles With Wildlife Value

Their second type of water-based amenities, lake-based amenities use the following indicators to construct the index (Goe and Green 2002):

a. Acres of Water Bodies in Lakes >= 40 Acres in Size
b. Acres of Large Lakes and Streams
c. Acres of Small Lakes and Streams
d. Acres Devoted to Water-Based Recreation

Goe and Green's (2002) third type of water-based amenities were ocean-based natural resource amenities. Regrettably, the data used by Goe and Green (2002)-the NORSIS database-does not contain measures of natural resource features that were unique to the beaches or coastlines of oceans. Consequently, a binary variable was created that measured whether or not a part of a non-metropolitan locality was located on an ocean coast (Goe and Green 2002). Because there still exists a lack of data on this type of water-based amenities, I also created a binary variable measuring whether or not a non-metropolitan county is located on an ocean coast.

Outdoor Recreational Amenities

In measuring outdoor recreational amenities, Goe and Green (2002) found two different types of these amenities in non-metropolitan locations: warm weather outdoor recreation amenities and cold weather recreation amenities. These two indices were used in this research as well.

The warm weather index consists of the following items:

1. Number of Parks and Recreation Departments
2. Number of Public and Private Tennis Courts
3. Number of Amusement Places
4. Number of Public and Private Golf Courses
5. Number of Riding Academies and Stables
6. Number of Organized Camps

The cold weather index consists of the following indicators:

1. Number of skiing/resorts
2. Number of cross-country skiing firms
3. Number of downhill skiing areas
4. Lift capacity per hour

Historical and Cultural Amenities

In measuring historical and cultural amenities, I also used the index developed by Goe and Green (2002). This index consists of the following indicators:

1. Number of Historic/Cultural Tourist Attractions
2. Number of Museums
3. Number of Natural Resource Tourist Attractions
4. Number of Other Unclassified Tourist Attractions

Colleges and Universities

The influence of colleges and universities was also examined by this research. I have done so because of the fact that previous research has indicated that colleges and universities may provide a multitude of amenities to a non-metropolitan locale (Wolf 1999). This variable was measured by the total number of people employed by colleges and universities. To control for the great differences in the sizes of the labor forces amongst the counties in this analysis, the total number of persons employed by colleges and universities was divided by the total employment

number for each county. Data for this variable came from the Census of Population. In order to measure this variable I used percent of total employment accounted for by higher education in a non-metropolitan county.

Control Variables

In order to account for spurious relationships between amenities and non-metropolitan population change as well as provide contextual information on the population being studied, the following variables are used as statistical controls:

Metropolitan Proximity

Metropolitan proximity of a nonmetropoitan county will be measured by a using the rural-urban codes discussed above. In this classification, are assigned one of the following categories:

> **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 (USDA, Economic Research Service 2002)

Accordingly, counties adjacent to a metro area (4, 6, or 8) are compared with those, whom are not adjacent (5, 7, or 9) by creating a dummy variable with 1 representing adjacency (proximity) and 0 representing non-adjacency.

Income

Income is measured by the median household income of the population in a non-metropolitan county. Data for this variable also comes from the Census of Population.

Age Structure

The age structure of a non-metropolitan county's population is measured by the median age. The

data for this variable will be obtained from the Census of Population.

Unemployment

Unemployment is measured by the unemployment rate for each county in the analysis. Data for this variable will also come from the census of population.

Race

Race has often been examined as a crucial factor in many studies on population change, and in particular migration (Howell and Frese 1983, University of Arkansas Division of Agriculture 2003, Newman 2003). Race will be measured by the percentage of the county that is white. Data on race will come from the Census of Population.

Educational Level

This variable refers to the basic educational level of the population in each county. Educational attainment will also be measured as it is often related to migration and other population variables, and therefore, should be controlled (Huang and Orazem 1997, Summers and Branch 1984). As was stated in Chapter 4, the general picture regarding this variable that emerges from past research is that in non-metropolitan areas in the United States people with higher levels of education are more likely to move out of a non-metropolitan area (Huang and Orazem 1997, Summers and Branch 1984). Although this is contrary to what I theorize about amenity seekers, who I believe have attained higher levels of education, it is the target area-the non-metropolitan counties that amenity seekers move to-that are the unit of analysis. Consequently, I based my hypothesis concerning educational attainment based on previous research in those areas, which suggested that people with higher levels of education are likely to move out and, therefore, contribute to a decline in population in those specific areas (Huang and Orazem 1997, Summers

and Branch 1984). Therefore, the percentage of the county's population that has not received a high school diploma will serve as the reference group; since this group has been theorized to be the least likely to have the ability to move out of a non-metropolitan area. Data on educational level came from the Census of Population.

Quality of Life-Enhancing Services

In order to capture the chief elements of this variable this analysis examined the number of people employed in the following occupations: retail trade, repair services, personal services, health care services, the membership in religious and other membership organizations, and those employed in elementary and secondary schools. Once again, to control for the great differences in the sizes of the labor forces amongst the counties in this analysis, the total number of persons employed in these occupations was divided by the total employment number for each county. In this way I was able to obtain a percentage that could be analyzed using the regression model used for this study. Table 5.1 lists the each indicator and the source from which the data are to be drawn:

Table 5.1
Indicators, Variable Names, and Sources of Data for the Analysis

Variable/Indicator	Source of Data
Dependant Variables	
1. Absolute Non-metropolitan Population Change 1980-2000 (ABLUTE)	U.S. Census Bureau
2. Percent Non-metropolitan Population Change 1980-2000 (PERCHAN)	U.S. Census Bureau
Independent Variables (Amenity Variables)	
3. McGranahan's Climatic Amenities Index (CLIMAM)	McGranahan's natural Amenity scale
4. Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	NORSIS data set
5. Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	NORSIS data set
6. Goe & Green Lake-based Natural Resource Amenities Index (LAKEBAM)	NORSIS data set
7. Ocean-based Natural Resource (COASTAL)	NORSIS data set
8. Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	NORSIS data set
9. Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	NORSIS data set
10. Goe & Green Cultural/Historical Amenities Index (CULTAM)	NORSIS data set
11. Percent of total employment in higher education 1990 (PERHIGHED)	U.S. Census Bureau
Control Variables	
12. Metropolitan Proximity (ADJAC)	U.S. Census Bureau
13. County .Median Income 1989 (MDINC89)	U.S. Census Bureau
14. County. Median Age 1990 (MDAGE90)	U.S. Census Bureau
15. Unemployment Rate (UNEMP90)	U.S. Census Bureau
16. Percent total population that is white 1990 (PERWHITE)	U.S. Census Bureau
17. Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED)	U.S. Census Bureau
18. Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)	U.S. Census Bureau

Method of Analysis

This research constructed a panel data set using data from the aforementioned sources for the years of 1980-2000 in order to assess the relationship between amenities and non-metropolitan population change using linear panel analysis. The panel model, recommended by Allison (1990), uses ordinary least-squares regression on change scores for different periods of time (in this case). It has some similarities to an experimental design except for the fact that the 'groups' being analyzed are not randomly assigned (Allison 1990). By way of this method the following equation will be used in order achieve the desired analysis. The following are meanings for each term in the equation in Figure (1):

$$Y_{t3} - Y_{t1} = \tau + \Sigma(\beta_1 X_{1_{t2}} + \beta_2 X_{2_{t2}} + \ldots \beta_{16} X_{16_{t2}}) + (\varepsilon_{t3} - \varepsilon_{t1}) \quad (1)$$

Y_{t3} - Y_{t1} = 2000 county population - 1980 county population
τ = Intercept
ε_{t3} - ε_{t1} = Error term of change score

β_1= McGranahan Climatic Amenities Index
β_2= Goe-Green Land- Based Natural Resource Based Amenities Index
β_3=Goe- Green River-Based Natural Resource Based Amenities Index
β_4 =Goe-Green Lake- Based Natural Resource Based Amenities Index
β_5 =Ocean-based Natural Resource Based Amenities Index
β_6 =Goe-Green Warm Weather Based Recreational Amenities Index
β_7= Goe-Green Cold Weather Based Recreational Amenities Index
β_8= Goe-Green Cultural / Historical Amenities Index
β_9= Percent of total employment in higher education 1990
β_{10}= Metropolitan Proximity of County
β_{11}=County's Median Household Income 1989
β_{12}=County Median Age 1989
β_{13}= Unemployment 1990
β_{14}= Percent population 25 yrs. and over with a college degree 1990

β_{15}= Percent total population that is white 1990
β_{16}= Percent of total employment in quality of life enhancing services 1990

In explaining the model Goe and Green (2002) state:

> With this model specification, measures of the independent variables are temporally subsequent to the measurement of the dependent variable at the base point in time, and prior to the measurement of the dependent variable at the end point of the time period examined. This allows the determination of whether the "intervention" of the independent variables is associated with the change in the dependent variable (p. 14).

Therefore, by using this model, the change scores on population change were regressed on the amenity and control variables.

Regression diagnostics (Fox 1997; 1991) were then used to assess the extent to which specific regression assumptions are validated by the data. The importance of using these diagnostic tests whilst employing OLS regression is advocated by John Fox (1991) in the following paragraph:

> Linear least-squares regression analysis is the most widely used statistical technique in social research and provides the basis for many other statistical methods. Yet least-squares regression is susceptible to a variety of difficulties and makes strong and often unreasonable assumptions about the structure of the data. *Regression diagnostics* are techniques for exploring problems that comprise a regression analysis and for determining whether certain assumptions appear reasonable (p.3).

Therefore, it was vital for me to assure that the results of this analysis as well as the structure of the data was statistically sound in that the assumptions of the OLS regressions being used were not compromised. These diagnostic tests included one in which to assess the extent to which the data did or did not violate the assumptions regarding linearity, multicoliniarity, the assumption of constant error variance, and the normality of the error term (Fox 1991). In order to test the linearity assumption an examination of the partial regression residual plots and component plus

residual plots was conducted (Al-Sharideh and Goe 1998, Fox 1991). Multicoliniarity among the independent variables was detected by an assessment of their bivariate correlations as well as their variance inflation factor components (Al-Sharideh and Goe 1998, Fox 1991). In order to insure the presence of constant error variance among the variables studentized residuals were plotted against the predicted values of dependent variables (absolute population change and percent population change). Then, the plots of these residuals were, in turn, plotted against the partial values of the independent variables themselves (Al-Sharideh and Goe 1998). For the final assumption, the normality of the error term was assessed by a normal probability plot of studentized residuals and stem and leaf plots (Al-Sharideh and Goe 1998). By doing the aforementioned tests and plots, I was able to assess the extent to which the regression models were reasonable and accurate predictors of absolute population change and percentage population change.

CHAPTER 6-FINDINGS

Descriptive Analysis of Population Change Amongst Non-metropolitan Counties in the United States from 1980 to 2000

Table 6.1 displays the univariate statistics in terms of the measures of central tendency for the dependent (population) variables used in this analysis. An examination of the data in Table 6.1 shows that average (mean) population for the non-metropolitan counties in the analysis was 21,648 people in 1980, 22,174 in 1990, and 24,476 people in 2000. The data in Table 6.1 also shows the average change in population for the final two dependent variables (the absolute change in population in the non-metropolitan counties and percentage of population change in the non-metropolitan counties). In terms of the mean absolute change in the counties from 1980 to 2000, the counties gained 2827 people on average for this time period. As can also be seen in Table 6.1, this translates into a 10.43 percent increase in population for the counties in the analysis for the 1980 to 2000 time period.

In summary, the findings in Table 6.1 show a virtually negligible increase in population between the years of 1980 and 1990, with an average of only .36 percent. As was previously discussed in Chapter 2, this was the period of the so-called "rural bust". However, in the 1990s the data in Table 6.1 suggest that this situation was reversed with a mean population increase of over 8 percent. Therefore, the results of this data suggest a similar pattern reported by previous research (e.g. Fuguitt 1985, Beale and Johnson 1998, McGranahan 1999, Deller, Tsung-Hsiu, and Marcouiller 2001**,** Green 2001).

An examination of the data in Table 6.2 confirms the findings of past research in terms of

the population patterns of the two decades in the analysis (e.g. Fuguitt and Brown 1990, Newman 2003, United States Census 2000). First, I found that 1258 non-metropolitan counties experienced population decline during the 1980s versus 1017 counties that experienced an increase in population. In the 1990s, I found a reversal of this trend as only 595 counties experienced a population decline versus 1680 counties which increased their population. Over the past two decades (1980-2000), the data suggest that the overall population change amongst non-metropolitan counties was positive in that the majority of counties experienced population growth rather than decline (see Table 6.2).

Table 6.1 Measures of Central Tendency for the Population Variables in the Analysis[16]

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Skewness
Population 2000	24476.25	16942.00	23724	67	186742	2.25594682
Population 1990	22174.63	15511.00	20920	107	174092	2.13228956
Population 1980	21648.59	15495.00	19651	91	160630	2.05526549
Absolute Population Change 1980-1990	526.04	-141.00	3472	-14666	39569	3.98756577
Percent Population Change 1980-1990	0.36644	-1.48093	13.21310	-31.98330	125.61514	2.00305133
Absolute Population Change 1990-2000	2301.623	1002.000	4633.9028	-12998	59803	4.80792743
Percent Population Change 1990-2000	8.790161	6.822372	14.5504515	-37.38318	106.01286	1.58715316
Absolute Population Change 1980-2000	2827.66	758.00	7636	-22570	99372	4.4919067
Percent Population Change 1980-2000	10.43	5.99	28.64	-45.23	246.64	2.40

[16] As was noted previously, population is measured on the county level.

Table 6.2 Gains and Losses in Population Amongst Counties During 1980-1990, 1990-2000, and 1980-2000 Time Periods

Time Period	Number of Counties With Population Increase	Number of Counties With Population Decline
1980-1990	**1017**	**1258**
1990-2000	**1680**	**595**
1980-2000	**1372**	**903**

Tables 6.3, 6.4, and 6.5 lists counties in which population has decreased most dramatically over the 1980 to 1990, 1990 to 2000, and 1980 to 2000 time periods. Two of the counties- Covington, VA and McDowell, WV- appear in all three tables. Both of these counties are located in the economically troubled Appalachian region of the Eastern part of the United States (Cushing 1997). McDowell County, West Virginia, in particular, has always been dependent on resource extraction which consists of primarily coal and timber (Cushing 1997). Fluctuations in the market for these resources could have led to the drastic population loss by way of migration that occurred in this county during the time period for this analysis (Cushing 1997). It can all also be seen in Tables 6.3, 6.4, and 6.5 that a high proportion of the counties are in the state of Texas. Most all of these Texas counties are quite small, numbering less than 5,000 persons. For example; Stonewall, Briscoe, and Teller counties in Texas all have a population of less than 2000 people. In fact, almost five times as many people have visited Stonewall Texas' Web-site than live in Stonewall County (Stonewall County 2004). Population depletion in these counties has been caused by a situation in which resource extraction and restructuring in the modes of agricultural production caused people to move out of these locales. This process has continued uninterrupted since the end of World War II (Stonewall County 2004). In terms of metropolitan proximity, none of the counties in Table 6.5 with the exception of two (Covington, VA and Grant, ND) are adjacent to a metropolitan area. This finding suggested that the remoteness of these counties, as expected, played a role in their population decrease over the time period selected.

Table 6.3 Bottom 20 Counties in Percent Population Change From 1990 to 2000

County Name	Percent Population Change	Absolute Population Change
Carbon, Wyoming	-37.56%	-1020
Platte, Wyoming	-38.90%	-662
Shoshone, Idaho	-39.16%	-160
Covington, Virginia	-39.48%	-688
Briscoe, Texas	-40.03%	-181
Collingsworth, Texas	-40.36%	-367
Grant, North Dakota	-40.38%	-708
Logan, North Dakota	-41.62%	-539
Divide, North Dakota	-41.77%	-616
Blaine, Nebraska	-42.07%	-92
Slope, North Dakota	-43.00%	-140
Hettinger, North Dakota	-45.28%	-730
Prairie, Montana	-46.06%	-184
Cavalier, North Dakota	-46.26%	-1233
Hall, Texas	-46.40%	-123
Cottle, Texas	-46.42%	-343
Sheridan, North Dakota	-51.63%	-438
Hemphill, Texas	-52.50%	-369
Burke, North Dakota	-52.63%	-760
McDowell, West Virginia	-64.06%	-7904

Table 6.4 Bottom 20 Counties in Percent Population Change From 1980 to 1990

County Name	Percent Population Change	Absolute Population Change
Madison, Louisiana	-21.98%	-3512
Steele, North Dakota	-22.09%	-686
Blaine, Nebraska	-22.15%	-192
Covington, Virginia	-22.86%	-2027
Collingsworth, Texas	-23.13%	-1075
Briscoe, Texas	-23.58%	-608
Cottle, Texas	-23.75%	-700
Sheridan, North Dakota	-23.80%	-671
Carbon, Wyoming	-23.92%	-5237
Issaquena, Mississippi	-24.04%	-604
Prairie, Montana	-24.67%	-453
Dickens, Texas	-27.35%	-968
Shoshone, Idaho	-27.54%	-5295
McDowell, West Virginia	-29.39%	-14666
Greenlee, Arizona	-29.79%	-3398
Hemphill, Texas	-29.86%	-1584
Hall, Texas	-30.19%	-1689
Mineral, Colorado	-30.60%	-246
Lake, Colorado	-31.97%	-2823
Platte, Wyoming	-31.98%	-3830

Table 6.5 Bottom 20 Counties in Population Change From 1980 to 2000

County Name	Percent Population Change	Absolute Population Change
Stonewall, Texas	-29.63%	-713
Covington, Virginia	-30.45%	-2760
Briscoe, Texas	-30.59%	-789
Collingsworth, Texas	-31.02%	-1442
Terell, Texas	-32.23%	-514
Hall, Texas	-32.39%	-1812
Blane, Nebraska	-32.76%	-284
San Juan, Colorado	-33.01%	-275
Grant, North Dakota	-33.53%	-1433
Slope, North Dakota	-33.71%	-390
Logan, North Dakota	-33.92%	-1185
Divide, North Dakota	-34.66%	-1211
Prairie, Montana	-34.70%	-637
Cottle, Texas	-35.39%	-1043
Hettinger, North Dakota	-36.49%	-1560
Cavalier, North Dakota	-36.73%	-2805
Hemphill, Texas	-36.82%	-1953
Sheridan, North Dakota	-39.34%	-1109
Burke, North Dakota	-41.34%	-1580
McDowell,West Viriginia	-45.23%	-22570

Tables 6.6, 6.7 and 6.8 lists the top 20 counties in which population increased from 1980 to 1990, 1990 to 2000, and 1980 to 2000, respectively. The first thing that becomes apparent when these tables are examined is the fact that the population gains of the 1990s far surpass those of the 1980s. In Table 6.6 we see that only one county experienced a gain of 100 percent or more during the 1980s, compared to fourteen counties during the 1990s (see Table 6.7). Consistent with previous research, counties in the Rocky-Mountain West portion of the United States are highly represented in these tables (McGranahan 1999, Vias 1999). What is also of particular interest is the fact that during the 1980 to 1990 time period these Rocky Mountain Western states did not seem to "take off" in terms of their population increase as Table 6.6 indicates. In both Tables 6.7 and 6.8 the Western states dominate the population gainers, but not in Table 6.6 representing the 1980s. For example, although Eagle and Teller counties in Colorado posted gains during the 1980s they were not nearly as dramatic as they were in the 1990s, as can be seen in Table 6.6 and 6.7.

Another Rocky-Mountain state that posted the most dramatic gains in population during the 1990s was Summit County, Utah. Moreover, Elbert, Colorado and Washington County, Utah which experienced the most dramatic gains in population during the 1990s do not even appear among the top twenty population gainers in the 1980s. This finding suggests that dramatic increases in population did not come to the Rocky Mountain West until the latter half of the period in this analysis. An examination of the data in Table 6.8 reveals that 7 of the top 20 counties are located in just two states: Colorado and Utah. Topping the list is Washington County, Utah where population increased dramatically by 247 percent over the two decade period used in this analysis. In 1960, Washington County, Utah had a population of only roughly

10,000. As of this writing, its population numbers more than 100,000 (Washington County 2004). As can be seen on the county's web-site, Washington County has used amenities in order to encourage people to move and visit their county:

> We are very proud of where we live and work. Washington County is known for warm winter weather, snowbirds, and beautiful red rock scenery. It has been known as Utah's Dixie since pioneers settled here in the 1850's. Championship golf, tennis, walking paths, biking trails, hiking, warm, snow-free winters and year long low humidity all make life attractive here. (Washington County, 2004)

Two large parks-Snow Canyon State Park and Zion National Park-are also located in Washington county, Utah. Moreover, the county has the 1200 seat Cox Performing Arts Theater, a wildlife museum, as well as a large convention center. The evidence from Washington County, Utah suggests that amenities "work" to promote population increase in non-metropolitan counties. In the case of the second county in Table 6.8 (Dawson County, Georgia) the population increase was largely due to the State of Georgia constructing Highway 400 in the 1980s (Golden Ink 2004). Dawson County- which had been isolated for much of its history-became accessible to more people than ever before and hence a population explosion followed. Thus, in the case of Dawson County, it is more likely that the population increase is a product of infrastuctural enhancements (namely the new highway) rather than the influx of amenity seekers.

Table 6.6 Top 20 Counties in Percent Population Change From 1980 to 1990

County Name	Percent Population Change	Absolute Population Change
Camden, Georgia	125.62%	16796
Dawson, Georgia	97.51%	4655
Elko, Nevada	94.16%	16261
Salt Lake, Utah	86.30%	22495
Esmerelda, Nevada	72.97%	567
Citrus, Florida	70.95%	38812
Dare, North Carolina	70.04%	9369
Storey, Nevada	68.06%	1023
Gilcrest, Florida	67.63%	3900
Eagle, Colorado	64.63%	8608
Yavapai, Arizona	58.07%	39569
Harrisonburg, Virginia	56.10%	11036
Amador, California	55.53%	10725
Teller, Colorado	55.19%	4434
Calaveras, California	54.51%	11288
Lander, Nevada	53.73%	2190
Summit, Utah	52.17%	5320
Nevada, California	52.02%	26865
Indian River, Florida	50.61%	30312
Bandera, Texas	49.10%	3478

Like Washington County, Utah, Camden County, Georgia is also a locale in which evidence suggests that amenities were the catalyst for population expansion. Situated on Georgia's Coast, Camden has many historical sites to visit as well as parks and outdoor activities. Of the 20 counties on the list in Table 6.8, four of the Colorado counties: Eagle, Summit, Park and Teller are all adjacent to one another and are located around Vail, Colorado (one the most popular ski resorts in the country).

Fourth on the list in Table 6.8 is Eagle County, Colorado which is located only 30 minutes from Vail, Colorado. In addition to its proximity to Vail, it also possesses a large number of outdoor activities in addition to a well developed tourist infrastructure (Vail Valley Chamber of Commerce 2004). Obviously, the evidence from Eagle County suggests the hypotheses regarding amenities being positively associated with non-metropolitan population growth have considerable validity.

Finally, in terms of metropolitan proximity, six of the twenty counties in Table 6.8 are not adjacent to a metropolitan area, while the remaining fourteen are. Two of these six non-adjacent counties (Eagle, Colorado, and Summit, Colorado) are part of the so-called "Vail Valley" group discussed previously. This suggests that in terms of a pronounced population increase, metropolitan proximity seems to play less of a role than it did with the counties who experienced a pronounced population decrease.

In summary, Tables 6.3 to 6.8 suggest that non-metropolitan population growth was most pronounced during the 1990s which is consistent with past research (e.g. Fuguitt and Brown 1990, Newman 2003, United States Census 2000). Lastly, only five of the top twenty counties in population increase were in the Rocky Mountain West from 1980 to 1990. Accordingly, I

theorize that the high amenity counties of the Rocky Mountain West did not experience significant gains in population until the 1990s. The lack of more significant gains in the Rocky Mountain West during the 1980s is probably due to the non-metropolitan economic downturn of the 1980s as well as the relative infancy of the Internet, which prevented many people from working far away from the metropolitan core. Understanding why this area did not produce more significant gains in population represents an important question to be answered by future research.

Table 6.7 Top 20 Counties in Percent Population Change From 1990 to 2000

County Name	Percent Population Change	Absolute Population Change
Elbert, Colorado	135.00%	10266
Washington, Utah	132.39%	41794
Eagle, Colorado	129.24%	19731
Park, Colorado	128.10%	7349
Summit, Utah	125.91%	14218
Dawson, Georgia	119.05%	6570
Archuleta, Colorado	116.63%	4553
Summit, Colorado	114.12%	10667
Boise, Idaho	104.62%	3161
Lyon, Nevada	104.53%	14500
Custer, Colorado	102.54%	1577
Morgan, Colorado	100.43%	8087
Camden, Georgia	100.42%	13497
Bandera, Texas	100.00%	7083
Long, Georgia	93.20%	4102
San Miguel, Colorado	93.13%	2941
Gilmer, Georgia	92.36%	10088
Yavapai, Arizona	92.26%	59803
Sumpter, Florida	92.07%	21768
Torrance, New Mexico	91.59%	6626

Table 6.8 Top 20 Counties in Percent Population Change From 1980-2000

County Name	Percent Population Change	Absolute Population Change
Washington, Utah	246.64%	64289
Dawson, Georgia	235.12%	11225
Camden, Georgia	226.55%	30293
Eagle, Colorado	212.75%	28339
Summit, Utah	191.58%	19538
Elbert, Colorado	190.10%	13022
Park, Colorado	172.32%	9190
Archuleta, Colorado	170.14%	6234
Summit, Colorado	166.14%	14700
Elko, Nevada	162.27%	28022
Teller, Colorado	155.85%	12521
Lyon, Nevada	153.80%	20907
Gilchrist, Florida	150.33%	8670
Bandera, Texas	149.08%	10561
Yavapai, Arizona	145.82%	99372
Custer, Colorado	129.25%	1975
Long, Georgia	127.76%	5780
Storey, Nevada	126.15%	1896
Torrance, New Mexico	125.75%	9420
Dare, North Carolina	124.02%	16590

Descriptive Analysis of the Independent Variables

An examination of the data in Table 6.9 reveals the measures of central tendency for the independent variables in the analysis. Accordingly, the mean, median, standard deviation, minimum score, maximum score and skewness are given for the amenities indices as well as the control variables. First, examining the control variables we see that the average, median per capita household income for the non-metropolitan counties in 1989 was $21,561.00. However, there is quite a range income from county to county with a high of $42,565.00 and a low of $8,595.00. Moreover, the income for each county varies (on average) approximately $4,308.00 from the mean of $21,561.00 according to the standard deviation score. One could conclude, therefore, that the income of the counties in the analysis was quite diverse. There was less variance in terms of the median age of the counties in 1990. As can be seen in Table 6.9, the median age for the counties was 35. While the standard deviation is only about 4 years.

On average only about 12 percent of the population over 25 for each county had a college degree in 1990. This suggests that the vast majority of the people in the counties for this analysis do not have much in the way of higher education. The data in Table 6.9 also suggests that the population in these counties was predominately white in 1990, with an average of 87 percent being white and a median of 95 percent. Consequently, we can expect little diversity in terms of the racial composition of the counties in the analysis. Perhaps an encouraging finding is the relatively high percentage (36 percent) of those employed in quality of life enhancing services. As noted in the previous chapter these occupations include those people employed in the retail trade, repair services trades, personal services trades, health care services trade, religious and other membership organizations, as well as those employed in elementary and secondary schools. One

can surmise from this finding that there is a sizable percentage of the population is employed in these industries.

In terms of the amenity variables, Table 6.9 reveals descriptive statistics indicating that the presence of several types of amenities is strongly skewed across the 2260 non-metropolitan counties in this analysis. In particular, the distributions of lake-based, natural resource amenities, ocean-based natural resource amenities, cold weather amenities, and, cultural and historical amenities are highly skewed across the 2260 counties of the analysis. Employment in higher education was also found to be highly skewed. The problems resulting from the skewness of these indices and variables, necessitated the introduction of power transformations and other procedures when regression models were later constructed.

In conclusion, the descriptive analysis shows that the data correspond to my expectations regarding population change as well as the distribution of the control variables. However, the high level of skewness amongst the amenity variables presented a significant statistical problem, as this would be problematic for regression analysis. This problem necessitated power transformations as well as other techniques so as to not violate the assumptions of ordinary least squares regression.

Table 6.9 Measures of Central Tendency for the Independent Variables in the Analysis

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Skewness
McGranahan's Climatic Amenities Index (CLIMAM)	-0.0300	-.19	2.240	-6.400	11.15	.83
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	0.0004	-1.418	2.396	-1.418	9.603	1.828
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	0.0010	-2.814	3.390	-2.814	10.083	.6977
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBAM)	0.0015	-.721	2.870	-3.514	29.798	3.265
Ocean-based Natural Resource (COASTAL)	0.0558	0	0.229	0	1	3.871
Goe & Green Warm Weather Outdoor Recreational Amenities Index(WWORAM)	0.0013	-0.728	2.847	-3.040	13.862	1.353
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	0.00051	-1.010	3.289	-1.010	21.469	3.834
Goe & Green Cultural/ Historical Amenities Index (CULTAM)	-0.0001	-0.483	1.695	-0.483	35.605	7.581
Percent of total employment in higher education 1990 (PERHIGHED)	1.503	0.652	2.782	0	31.333	4.848
Metropolitan Proximity (ADJAC)	0.4400	0.000	0.496	0	1	0.241
County .Median Income 1989 in USD (MDINC89)	21561	21361	4308	8595	42565	0.461
County. Median Age 1990 (MDAGE90)	35.03	35	3.690	20	56	0.019
Unemployment Rate 1990 (UNEMP90)	6.86%	6.41%	3.31%	0%	30.46%	1.27
Percent total population that is white 1990 (PERWHITE)	87.97	95.86	16.154	5.099	100	-1.830
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED)	11.76	10.84	4.878	3.68	49.836	2.185
Percent of total employment in quality of life enhancing services 1990 U.S. Census Bureau (PERQOLSC)	36.190	36.132	5.399	8.474	56.622	0.025

The Determinants of Absolute Population Change in Non-metropolitan Counties, 1980-2000

As was indicated in Chapter 5, OLS regression analysis was used in order to interpret two panel models that explore the relationship between population change, non-metropolitan amenities, and the control variables. The first series of models, which has the absolute population change during the 1980-2000 period as its dependent variable, was used in order to analyze population change in the counties in terms of the differences in the total number of people. Table 6.10 displays the results of the initial regression findings before adjustments were made to the models in response to the regression diagnostics. In the following table three models are listed: (1) a model with the amenity variables only; (2) a model with the control variables; (3) a final model with both amenity and control variables. This was done in order to assess the additive influences of statically controlling for both the amenity and control variables.

An examination of the first model in Table 6.10 shows that climatic amenities, river based natural resource amenities, ocean based natural resource amenities, warm weather outdoor recreational amenities, cold weather outdoor recreational amenities, and cultural / historical amenities all have a significant effect on absolute population change when the control variables are not included in the model. With the exception of cold weather outdoor recreational amenities, all of their influence is positive, which is to say that they are associated with increase in population. This initial finding with cold-weather outdoor recreational amenities influence being negative is most likely anomalous, since it does not exert any significant influence on absolute population change when the control variables are added into the equation. The F statistic for this model is significant at the .001 level of significance, indicating that the model is

very robust. These six variables account for approximately 36 percent of the variation in absolute population change (adjusted r^2 = .3619). By examining the second model in Table 6.10, one is able to see the influence of the control variables on absolute population change (without controlling for the influences of the amenity variables). With the exception of county median age, all of these variables are significant predictors of absolute population change. This second model fits the data with a relatively week goodness-of-fit (adjusted r^2 is .1508). Furthermore, like the first model, the F statistic for this model is significant at the .001 level of significance, indicating that the model is very robust.

An examination of the third and final model in Table 6.10 reveals that climatic amenities, natural resource amenities, ocean based natural resource amenities, warm weather outdoor recreational amenities, and cultural / historical amenities all continue to have a significant influence on the absolute population change in the counties in this analysis when the control variables are introduced. Of the control variables, a significant relationship was found between the counties' metropolitan proximity[17], median age, level of unemployment, percentage white, and percentage of the workforce that was employed in the service industries and absolute population change. The R square value of .38 indicates that 38 percent of the variation in absolute population change is being controlled by these variables and fits the data with a strong goodness-of-fit. Moreover, as compared to models 1 and 2 the increase in the adjusted r^2 indicates that the addition of the control variables is additive. The F value of 90.28 is significant at the .0001 level which suggests that the model being used to explain the variation in absolute population change is

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[17] In regards to this variable the sign of the coefficient suggests that counties adjacent to metropolitan areas are the ones with the greatest increase in population.

robust. According to the standardized regression coefficients, warm weather outdoor recreational amenities [.4549] exerted the most influence over absolute population change for the 1980-2000 period.

This preliminary regression analysis in Table 6.10 suggests a number of things about the relationship between rural amenities and absolute population change. According to the beta weights, the amenity variables that exerted the most influence on absolute population (in order of precedence) were: warm weather outdoor recreational amenities, climatic amenities, ocean-based natural resource amenities, river-based amenities, and cultural/historical amenities. As is indicated in Table 6.10, no significant relationship was detected between land based amenities, lake based amenities, cold weather based recreational amenities, and employment in higher education and absolute population change. With the exception of these non-significant variables, the over-arching hypothesis of this research regarding the influence of amenities on population change is clearly reinforced by these analyses. Moreover, for most of the variables, a significant relationship was detected. Therefore, the relationship is not likely occurring by chance.

In terms of the control variables, Table 6.10 adds more evidence to the findings of previous research. With regards to income, Hunter, Boardman, and Onge (2004) found that areas with higher income levels also had higher levels of rural amenities and higher levels of population growth. The evidence from Table 6.10 suggests that the relationship may be more complex than Hunter, Boardman, and Onge (2004) originally found it to be. We see that it is indeed a significant predictor of absolute population change **when** the amenity variables are not present in the regression equation. However, the addition of amenity variables causes the relationship between income and absolute population change to be insignificant. Possible reasons for this may

be due to the use of median income as the sole indicator of income as well as its interactive effects with the control and amenity variables in the final equation. However, the relationship is more complex than I may have originally hypothesized and merits further analysis.

Table 6.10 **Unstandardized OLS Regression Coefficients for Regression of Absolute Population Change on the Independent Variables (n = 2260)*#**

Independent Variables	Model 1 Amenity Variables	Model 2 Control Variables	Model 3 All Variables
McGranahan's Climatic Amenities Index (CLIMAM)	851.13654*** (74.84802)		828.02250*** (77.16687) [.2426]
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	-52.02292 (74.25855)		63.98534 (76.17770) [.0201]
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	131.25515*** 41.02027)		110.28542** (41.43411) [.0489]
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN)	-63.29397 (49.98502)		-15.93766 (49.60762) [.0059]
Ocean-based Natural Resource (COASTAL)	2599.84669*** (618.98892)		1969.56466* (621.44104) [.0593]
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	1294.78523*** (54.99794)		1219.76685*** (61.26992) [.4549]
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	-92.04693* (45.56846)		-51.68134 (49.60762) [.0059]
Goe & Green Cultural/Historical Amenities Index (CULTAM)	217.36972** (80.46362)		232.53843** (79.20263) [.0023]
Percent of total employment in higher education 1990 (PERHIGHED)	-10.42914 (48.90992)		-14.10707 (65.74904) [.0050]
Metropolitan Proximity (ADJAC)		2386.40138*** (321.31225)	1330.00644*** (280.12896) [.0863]
County .Median Income 1989 (MDINC89)		0.48181*** (0.04731)	0.07426 (0.04709) [.0419]
County. Median Age (MDAGE90)		7.79497 (49.66808)	-113.20505* (45.70691) [.0543]
Unemployment Rate (UNEMP90)		191.22596*** (58.55730)	-187.36547*** (53.50463) [.0812]
Percent total population that is white 1990 (PERWHITE)		-51.56608*** (11.27093)	-31.56656** (10.33507) [.0666]
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED)		231.40035*** (39.19786)	-36.13225 (45.10720) [.0229]
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)		82.48107** (31.75454)	-59.88185* (28.47918) [.0423]
Intercept F Statistic for Model Adjusted R-Square	2720.10298 143.43*** .3619	-11345 58.32*** .1508	11197 90.28*** .3873

* Standard Errors are in parentheses

\# Standardized Regression Coefficients in Brackets

***p < .05; **p < .01; ***p < .001* **level (two-tailed tests)**

Regression Diagnostics and the Construction of the Respecified Models

As was specified in Chapter 5, regression diagnostics (Fox 1997; 1991) were employed to the absolute population change model in order to assess the extent to which the data violate the assumptions of OLS regression. In summary, these diagnostic tests were as follows:

1. A test the linearity assumption was conducted by an examination of the partial regression residual plots and component plus residual plots (Al-Sharideh and Goe 1998, Fox 1991).

2. Multicoliniarity among the independent variables was detected by an assessment of their bivariate correlations as well as their variance inflation factor components (Al-Sharideh and Goe 1998, Fox 1991).

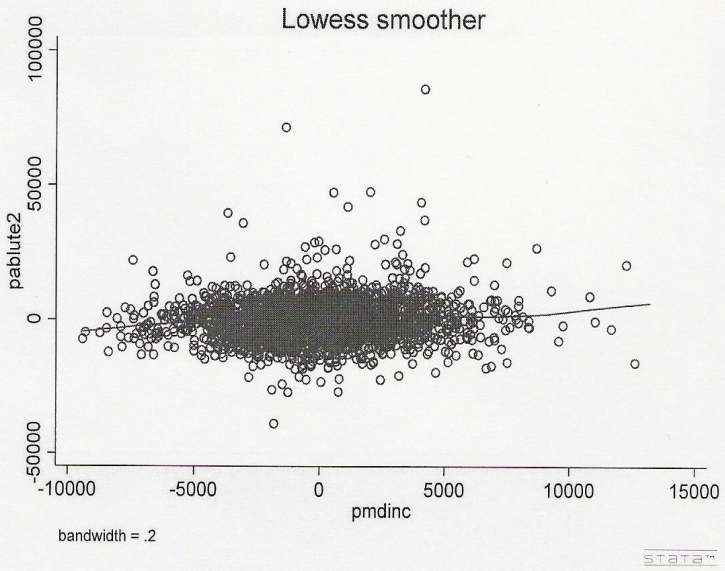
3. In order to insure the presence of constant error variance among the variables studentized residuals were plotted against the predicted values of dependent variables (absolute population change and percent population change). Then, the plots of these residuals were, in turn, plotted against the partial values of the independent variables themselves (Al-Sharideh and Goe 1998).

4. The final assumption-the normality of the error term-was assessed by a normal probability plot of studentized residuals and stem and leaf plots (Fox 1991).

Though aforementioned tests and plots, I was able to assess the extent to which the assumption of the regression models were met by the data. They also point the way for me to construct a respecified model that would more accurately model the relationship between the independent variables and absolute population change.

The examination of the partial regression residual plots and component plus residual plots indicated that the relationship between median income and

Figure 6.1: Partial Regression Residual Plot of Absolute Population Change with X County Medium Income 1989



absolute population change was non-linear (see Figure 6.1). In order to correct for this deficit in the original model, a power transformation was used in the respecified regression model. As noted above, high multicollinearity among the independent variables was detected by an examination of the variables' zero order correlations as well as their variance inflation factor coefficients. These subsequent tests found that there was little presence of multicollinearity amongst the independent variables as the all variance inflation factor coefficients were less than 3.00 (see Table 6.16). The presence of a non-linear relationship ,as well as, skewness amongst the independent variables necessitated the construction of a respecified model.

Findings of the Respecified Regression Model for Absolute Population Change

In order to reduce the skewness of the data as well as to better approximate a normal distribution of the data, the square root of absolute population change was used in the respecified model detailed in Table 6.11. An examination of the first model in Table 6.11 shows that climatic amenities, river-based natural resource amenities, ocean-based natural resource amenities, warm weather outdoor recreational amenities, cold weather outdoor recreational amenities, and percentage employed in higher education all have a significant effect on absolute population change when the control variables are not included in the model. In the respecified model, historical/cultural amenities did not have a significant effect. All of their influence is positive (with the exception of cold weather amenities), which is to say that they are associated with increase in absolute population change. The F statistic (164.81) for this model is significant at the .001 level of significance, indicating that the model is very robust. These six variables account for approximately 39 percent of the variation in absolute population change (adjusted $r^2 = .3948$).

By examining the second respecified model in Table 6.11, one is able to see the influence

of the control variables on absolute population change (untouched by the influences of the amenity variables). All of these variables are significant predictors of absolute population change with the exception of county median age and the unemployment rate. As was the case with the initial model, the respecified second model consisting of the control variables fits the data with a relatively weak goodness-of-fit (adjusted r^2 is .1612). Furthermore, like the first model in Table 6.12, the F statistic for this model is significant at the .001 level of significance, indicating that the model is very robust.

The third and final model in Table 6.11 incorporates all the variables in the analysis. Table 6.11 reveals that all of the amenity variables that were significant in the first model in which the control variables were absent are also significant when these control variables are present. This suggests these effects are not spurious. In terms of the control variables, the relationship is less clear. The counties' metropolitan proximity remains the strongest predictor of the control variables as indicated by its standardized regression coefficient of (.1023). However, the inclusion of the amenity variables cause percentage of employment in quality of life enhancing services and percent of the population that is white to lose their significance. County median age, conversely, becomes significant as a predictor of percent population change in the final model. In the second model containing just the control variables it was not a significant predictor.

These findings suggest that the relationship among many of the control variables is more complex than is the case with the amenity variables. Finally, the R square value of .4332 indicates that 43 percent of the variation in absolute population change is being explained by these variables, indicating a strong goodness-of-fit. Moreover, as compared to models 1 and 2, the increase in the adjusted r^2 (from .3948 to .4332) indicates that the addition of the control variables

increases the explanatory power of the model, although there is substantial overlap in the variance in the dependent variable that is explained by each set of variables.

The F value of 108.96 is significant at the .0001 level, which suggests that the model being used to explain the variation in percent population change is robust. According to the standardized regression coefficients, warm weather outdoor recreational amenities squared [.4581] exerted the most influence over percent population change for the 1980-2000 period. Furthermore, using the square root of absolute population and the power polynomials improved the goodness-of-fit of the model as the r-square value increased from .3873 in the initial full model to .4332 in the respecified full model.

Table 6.11 Ordinary Least Squares Partial Regression Coefficients for Regression of the Square Root of Absolute Population Change on the Independent Variables Corrected for Skewness and Non-Linear Effects (*n*=2260)*#

Independent Variables	Model 1 Amenity Variables	Model 2 Control Variables	Model 3 All Variables
McGranahan's Climatic Amenities Index (CLIMAM)	2.36305*** (0.19603)		2.37114*** (.19696) [.2607]
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	-0.05948 (0.19409)		.26975 (.19643) [.0318]
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	0.48464*** (0.10616)		.43667*** (.10576) [.0727]
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN) **LOG**	-0.26340 (0.73768)		.90199 (0.72952) [.0222]
Ocean-based Natural Resource (COASTAL)	5.96470*** (1.58563)		3.71382* (1.57206) [.0420]
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM) **SQUARED**	0.28602*** (0.01139)		025889*** (0.01191) [.4581]
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM) **LOG**	-2.27958*** (0.56262)		-1.76723** (0.56151) [- .0612]
Goe & Green Cultural/Historical Amenities (CULTAM) **LOG**	0.76057 (0.69779)		0.93329 (0.67922) [.0235]
Percent of total employment in higher education 1990 (PERHIGHED) **LOG**	1.38525* (0.59160)		1.66039* (0.69418) [.0478]
Metropolitan Proximity (ADJAC)		7.17777*** (0.83872)	4.20371*** (0.70725) [.1023]
County .Median Income 1989 **CUBED**		0.000001*** (0.00001)	0.000001*** (0.00001) [.0910]
County. Median Age (MDAGE90)		-0.14982 (0.12933)	-0.38134** (0.11373) [-.0687]
Unemployment Rate (UNEMP90)		0.24203 (0.15314)	-.069220 (0.13604) [-.1125]
Percent total population that is white 1990 (PERWHITE)		-0.11444*** (0.02940)	-0.06968 (0.02600) [-.0552]
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED) **LOG**		7.11564*** (1.47125)	-4.10400** (1.44725) [-.0722]
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)		0.19886* (0.08747)	-0.06388 (.07446) [-.0169]
Intercept F Statistic for Model Adjusted R-Square	131.484*** 164.81*** 0.3948	135.583*** 63.04*** 0.1612	181.162*** 108.96*** 0.4332

* Standard Errors are in parentheses ****p <.05; **p <.01; ***p < .001* level (two-tailed tests)**
# Standardized Regression Coefficients in Brackets

Weighted Least Squares Regression Model for Absolute Population Change

An inspection of the scatterplots of the studentized residuals times the predicted values of absolute population change displayed a great deal of heteroscedasticity in the respecified model. Furthermore, an inspection of a scatterplot of the residuals of absolute population change times the partial values of county median income, as displayed in Figure 6.1, suggested that the nonconstant error variance was correlated with median county income. A Goldfield-Quant test Berry and Feldman (1985) revealed a significant level of nonconstant error variance. Consequently, the respecified model was re-calculated using weighted least squares (WLS) regression in order to get more precise parameter estimates and unbiased standard errors.

Table 6.12 displays the results of the weighted least squares (WLS) regression of absolute population change and the independent variables in comparison to the re-specified OLS model. The results for the WLS model indicated substantial changes in the pattern of significance among the independent variables. First, the effects cold weather recreational amenities, median age, and unemployment were not significant. The effects of all other independent variables that were significant in the OLS model were also significant in the WLS model. However, the effects of land-based natural resource amenities and percent employment in quality of life enhancing services were found to be significant in the WLS model, but were not in the OLS model. Land-based natural resource amenities were found to have a negative effect, rather than positive as expected. The WLS results suggest that the nonconstant variance had a substantial effect on the accuracy of the inferences indicated by the OLS model. Therefore, the WLS model was accepted as the valid model and final model solution.

Table 6.12 Final Weighted Least Squares Partial Regression Coefficients for Regression of Absolute Population Change on the Independent Variables (*n*=2260*)*

Independent Variables	OLS Regression Coefficient*	WLS Regression Coefficient*
McGranahan's Climatic Amenities Index (CLIMAM)	2.37114*** (.19696)	1.85011*** (.13656)
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	.26975 (.19643)	-0.51903** (.16359)
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	.43667*** (.10576)	0.60889*** (0.07367)
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN) **LOG**	.90199 (0.72952)	0.61292 (0.55360)
Ocean-based Natural Resource (COASTAL)	3.71382* (1.57206)	2.23248** (0.90443)
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM) **SQUARED**	.025889*** (0.01191)	0.21358*** (0.01857)
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM) **LOG**	-1.76723** (0.56151)	0.41857 (0.48779)
Goe & Green Cultural/Historical Amenities Index (CULTAM) **LOG**	0.93329 (0.67922)	-0.23685 (0.61615)
Percent of total employment in higher education 1990 (PERHIGHED) **LOG**	1.66039* (0.69418)	1.22563** (0.44013)
Metropolitan Proximity (ADJAC)	4.20371*** (0.70725)	1.75504*** (0.46041)
County .Median Income 1989 (MDINC89) **CUBED**	0.000001*** (0.00001)	0.000001*** (0.00001)
County. Median Age 1990 (MDAGE90))	-0.38134** (0.11373	-0.10779 (0.07051)
Unemployment Rate (UNEMP90)	-0.69220*** (0.13604)	0.17066 (0.09546)
Percent total population that is white 1990 (PERWHITE)	-0.06968 (0.02600)	-0.01155 (0.01363)
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED) **LOG**	-4.10400** (1.44725)	-3.52193*** (1.05328)
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)	-0.06388 (.07446)	0.14232** (0.05261)
Intercept	181.162***	152.786***
F Statistic for Model	108.96***	77.18***
Adjusted R Square	0.4332	0.3934

* Standard Errors are in parentheses

***p <.05; **p <.01; ***p < .001* **level (two-tailed tests)**

The Determinants of the Rate of Population Change in Non-metropolitan Counties 1980-2000

The results of the second series of models-which has the percentage population change during the 1980-2000 period as its dependent variable-are listed in Table 6.13, 6.14, and 6.15. These were constructed in order to analyze the rate of population change. Table 6.11 displays the results of the initial regression findings before adjustments were made to the models in response to the regression diagnostics. As was done with absolute population change, three models were constructed and are listed as follows: (1) a model with the amenity variables only; (2) a model with the control variables; (3) a final model with both amenity and control variables. Once again, this was done in order to assess the additive influences of statically controlling for both the amenity and control variables.

An examination of the first model in Table 6.13 shows that climatic amenities, river based natural resource amenities, lake-based natural resource amenities, ocean based natural resource amenities, and warm weather outdoor recreational amenities, all have a significant effect on percentage population change when the control variables are not included in the model. Moreover, the F statistic for this model is significant at the .001 level of significance, indicating that the model is very robust. These five variables account for approximately 31 percent of the variation in the rate of population change (adjusted $r^2 = .3062$).

By examining the second model in Table 6.13, one is able to see the influence of the control variables on percent population change when not controlling for the amenity variables. With the exception of county median age and the percent employment in quality of life enhancing services, all of these variables are significant predictors of the rate of population change. As was

the case with absolute population change, this second model fits the data with a rather week goodness-of-fit (adjusted r^2 is only .1630). Furthermore, like the first model, the F statistic for this model is significant at the .001 level of significance, indicating that the model is robust.

An examination of the third model in Table 6.13 reveals that climatic amenities, river-based natural resource amenities, ocean-based natural resource amenities, and warm-weather based natural resource amenities are also significant predictors of percent population change (as the were with preliminary absolute population change model in Table 6.10). However, unlike the final model for absolute population change, cold weather recreational amenities are found to exert a significant influence on the percentage population change as are lake-based natural resource amenities.

However, the effect of lake-based amenities was negative rather than positive as hypothesized. Of the control variables, metropolitan proximity is also a powerful predictor of the rate of population change. Furthermore, median age is also a significant predictor of the rate of population change model as it was in the absolute population change model. However, unlike absolute population change, unemployment, the percentage of the county that is white, and the percent of the counties' workforce that is employed in life enhancing services do not serve as significant predictors of percent population change.

Finally, as can also be seen in Table 6.13, the F value of 83.59 is significant at the .0001 level and the r squared value of .3690 is only slightly less than that of the absolute population change model. These two measures indicate that the percent population change regression model has a robust level of goodness-of-fit, as was also the case in the absolute population change model. According to the standardized regression coefficients, it is climatic amenities [.4141]

exerted the most influence over percentage population change for the 1980-2000 period, followed by median income [.1887].

According to the beta weights, the amenity variables that exerted the most influence on percent population change (in order of precedence) were: climatic amenities, warm weather outdoor recreational amenities, river-based amenities, ocean-based natural resource amenities, and cold weather outdoor recreational amenities. As is indicated in Model 3 of Table 6.13, no significant relationship was detected between land based amenities, cultural and historical amenities, and employment in higher education and percent population change. With the exception of these non-significant variables, the over-arching hypothesis of this research regarding the influence of amenities on population change is clearly reinforced by these results.

Although there were many similarities between the percentage population change models in Table 6.13 and the absolute population change models in Table 6.10, there are a few differences worth noting. First-unlike in the final absolute population change model- cold weather recreational amenities and lake based natural resource amenities turn out to be significant predictors of percentage population change, while historical and cultural amenities are significant. Perhaps more importantly, climatic amenities is shown to have a much greater influence on percent population change than it exerted with absolute population change. So much so, that its relative weight overtakes that of warm weather recreational amenities. We could deduce from this finding that the relative importance of these two measures of amenities merits further examination by this research. In terms of the control variables, there are fewer similarities between the absolute population and percent population change models. One similarity they have in common is the importance of metropolitan proximity, which is significant in both models. A

major difference between the two models is the fact that median income is a significant predictor of percent population change, where it was not in the absolute population change model. Furthermore, although they were found to be significant predictors in the absolute population change model, unemployment, percent of population that is white, and percent employed in quality of life services were not significant predictors of percent population change.

Table 6.13 Unstandardized OLS Regression Coefficients for Regression of Percent Population Change on the Independent Variables (n = 2260)*#

Independent Variables	Model 1 Amenity Variables	Model 2 Control Variables	Model 3 All Variables
McGranahan's Climatic Amenities Index (CLIMAM)	5.13020*** (0.29212)		5.28903*** (0.29311) [.4141]
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	-0.10118 (0.28982)		-0.07263 (0.28935) [-.0061]
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	0.70443*** (0.16009)		0.76862*** (0.15738) [.0911]
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN)	-0.61059** (0.19508)		-0.37940* (0.18843) [-.0380]
Ocean-based Natural Resource (COASTAL)	12.08790*** (2.41579)		9.06288*** (2.36049) [.0729]
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	2.49769*** (0.21465)		1.36326*** (0.23273) [.1359]
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	0.32758 (0.17784)		0.37609* (0.17848) [.0433]
Goe & Green Cultural/Historical Amenities Index (CULTAM)	0.00741 (0.31403)		0.14812 (0.30084) [.0088]
Percent of total employment in higher education 1990 (PERHIGHED)	-0.05007 (0.19089)		0.01885 (0.24974) [.0018]
Metropolitan Proximity (ADJAC)		9.51927*** (1.19394)	8.08830*** (1.06405) [.1402]
County .Median Income 1989 (MDINC89)		0.00197*** (0.000175)	0.00125*** (0.000179) [.1887]
County. Median Age (MDAGE90)		-0.10640 (0.18456)	-0.72839*** (0.17361) [-.0934]
Unemployment Rate (UNEMP90)		1.49525*** (0.21759)	0.21579 (0.20323) [.0250]
Percent total population that is white 1990 (PERWHITE)		-0.12497** (0.04188)	0.01290 (0.03926) [.0073]
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED)		0.81214*** (0.14565)	-0.25516 (0.17134) [-.0432]
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)		0.05165 (0.11799)	-0.07731 (0.10818) [.0146]
Intercept F Statistic for Model Adjusted R-Square	9.96998 111.84*** .3062	-43.10514 63.87*** .1630	8.20369 83.59*** .3690

* Standard Errors are in parentheses

Standardized Regression Coefficients in Brackets

***p < .05; **p < .01; ***p < .001* **level (two-tailed tests)**

Findings of the Respecified Regression Model for Percent Population Change

As was done for absolute population change, the OLS regression model of percentage population change were put through the same battery of diagnostic tests. These were as follows:

1. A test the linearity assumption was conducted by an examination of the partial regression residual plots and component plus residual plots (Al-Sharideh and Goe 1998, Fox 1991).

2. Multicoliniarity among the independent variables was detected by an assessment of their bivariate correlations as well as their variance inflation factor components (Al-Sharideh and Goe 1998, Fox 1991).

3. In order to insure the presence of constant error variance among the variables studentized residuals were plotted against the predicted values of dependent variables (absolute population change and percent population change). Then, the plots of these residuals were, in turn, plotted against the partial values of the independent variables themselves (Al-Sharideh and Goe 1998).

4. The final assumption-the normality of the error term-was assessed by a normal probability plot of studentized residuals and stem and leaf plots (Fox 1991).

Since no non-linear effects were detected by the diagnostic procedures, only the skewness of the variables was corrected in the respecified model. As was done with absolute population change, multicollinearity among the independent variables and percent population change was detected by an examination of the variables' zero order correlations as well as their variance inflation factor components. These subsequent tests found that their was little presence of multicollinearity amongst the independent variables as the all variance inflation factor components were less than 3.00. The skewness of the data was corrected and the OLS model was re-estimated.

Table 6.14 displays the results of ordinary least squares partial regression coefficients for the regression of the percentage population change on the independent variables with the highly

skewed transformed to better approximate a normal distribution. As was stated previously, the results of the diagnostic tests on this OLS model revealed that the assumption of a linear relationship was reasonable for all the independent variables. As was done with absolute population change, three models were constructed and are listed as follows: (1) a model with the amenity variables only; (2) a model with the control variables; (3) a final model with both amenity and control variables. Once again, this was done in order to assess the additive influences of statically controlling for both the amenity and control variables.

An examination of the first model in Table 6.14 shows that climatic amenities, river based natural resource amenities, lake based natural resource amenities, ocean based amenities, warm weather outdoor recreational amenities, and percentage employed in higher education all have a significant effect on percent population change when the control variables are not included in the model. In the initial OLS model, (see Table 6.13) employment in higher education was not related to percent population change, likely due to skewness. With the exception of lake-based amenities, these relationships are positive, which is to say that they are associated with increase in percent population. The F statistic (121.83) for this model is significant at the .001 level of significance, indicating that the model is very robust. These six variables account for approximately 32 percent of the variation in percent population change (adjusted $r^2 = .3249$). By examining the second model in Table 6.15, one is able to see the influence of the control variables on percent population change while not controlling for the influences of the amenity variables. All of these variables are significant predictors of percent population change with the exception of percentage of the population over the age of 25 with a college degree and the percentage of people employed in the quality of life enhancing services. The percent population with a college degree was significant in the initial OLS model. Thus, the transformation for skewness diminished

the strength of this relationship.

As was the case with the absolute population change model, the second model consisting of the control variables fits the data with a relatively weak goodness-of-fit (adjusted r^2 is .1744). Furthermore, like the first model in Table 6.13, the F statistic for this model is significant at the .001 level of significance, indicating that the model is very robust.

The third model (Model 3) in Table 6.14 displays the final respecified model with all of the variables included in the analysis. The F-value of 5.83002 is significant at the .001 level, indicating that the model is not only significant, but very robust in terms of its goodness-of-fit with the data. The adjusted r-squared value of .4107 indicates that 41 percent of the variation in percentage population change is accounted for by the amenity and control variables. Therefore, the use of power transformations to reduce the skewness in the dependent variable and select independent variables improved the goodness-of-fit of the model.

Unlike the other models thus far, the counties' metropolitan proximity does not remain the strongest predictor of the control variables based on the standardized regression coefficients. It is the counties' median income that becomes the strongest predictor of percentage population change, rather than metropolitan proximity. Moreover, the inclusion of the amenity variables cause percentage of unemployment and percent of the population that is white to lose their significance. Conversely, percentage of the county over age 25 with a college degree becomes a significant predictor of percent population change in the final model once the amenity variables are introduced. In the second model containing just the control variables it was not a significant predictor. According to the standardized regression coefficients, climatic amenities (e.g. a warm climate) [.4317] exerted the most influence over percent population change for the 1980-2000 period, followed by median income [.2303].

Table 6.14 **Ordinary Least Squares Partial Regression Coefficients for Regression of Percentage Population Change on the Independent Variables Corrected for Skewness (No Non-Linear Effects Detected) (*n*=2260*)***

Independent Variables	Model 1 Amenity Variables	Model 2 Control Variables	Model 3 All Variables
McGranahan's Climatic Amenities Index (CLIMAM)	0.30843*** (0.01735)		32906*** (.01686) [.4317]
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	-0.01393 (0.01718)		.00253 (.01680) [.0036]
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	0.05376*** (0.00942)		.04712*** (.00909) [.0936]
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN) **LOG**	-0.16930** (0.06571)		- .05703 (0.06820) [-.0168]
Ocean-based Natural Resource (COASTAL)	0.66617*** (0.14007)		.43189 (.13425) [.0582]
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	0.16073*** (0.01302)		.09700*** (.01368) [.1620]
Goe & Green Cold Weather Outdoor Recreational (CWORAM) **LOG**	0.03850 (0.04935)		.09415* (0.04745) [.0389]
Goe & Green Cultural/Historical Amenities Index (CULTAM) **LOG**	-0.00463 (0.06191)		.03884 (.05812) [.0117]
Percent of total employment in higher education 1990 (PERHIGHED) **LOG**	0.15066** (0.05327)		.26625*** (.05968) [.0918]
Metropolitan Proximity (ADJAC)		0.59981*** (0.07083)	.48228*** (.06143) [.1401]
County .Median Income 1989 (MDINC89)		0.000134*** (0.000011)	.000009*** (.00001) [.2303]
County. Median Age 1990 (MDAGE90)		-0.02923** (0.01083)	-.04683*** (.00978) [-.1006]
Unemployment Rate (UNEMP90)		0.08964*** (0.01310)	-.00144 (0.13604) [-.0028]
Percent total population that is white 1990 (PERWHITE)		-0.00760** (0.00249)	-.00185 (.00226) [-.0175]
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED) **LOG**		0.14383 (0.12228)	-.89031*** (.12289) [-.1869]
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)		0.01167 (0.00725)	.00314 (.00640) [.0099]
Intercept F Statistic for Model Adjusted R Squared	4.32218*** 121.83*** .3249	4.39937*** 69.21*** .1744	5.83008*** 99.45*** .4107

* Standard Errors are in parentheses

****p <.05; **p <.01; ***p < .001* level (two-tailed tests)**

Standardized Regression Coefficients in Brackets

Weighted Least Squares Regression Model for Percent Population Change

As was done with the re-specified model for absolute population change, an inspection of a scatterplot of the studentized residuals times the predicted values of percentage population change in the respecified model indicated that the residuals displayed a substantial amount of nonconstant error variance. Furthermore, an inspection of the plots of the residuals of percentage population change times the partial values of each independent variable, suggested that the nonconstant error variance was correlated with warm weather recreational amenities. A Goldfield-Quant test (Berry and Feldman 1985) revealed a significant level of heteroscedasticity. Accordingly, the respecified model was re-estimated using weighted least squares (WLS) estimation.

Table 6.15 displays the results of the weighted least squares (WLS) regression model. The results for the WLS model indicated substantial changes in the pattern of significance among the independent variables. First, the effect of river-based natural resource amenities was not significant in the WLS model. The effects of all other independent variables that were significant in the WLS model. However, the effects of lake-based amenities, ocean-based amenities, unemployment, and the percent of population that is white were found to be significant in the WLS model, but were not significant in the OLS model. The WLS results suggest that the nonconstant error variance had a substantial effect on the accuracy of the inferences indicated by the OLS model. Therefore, the WLS model was accepted as the valid model and final model solution.

Table 6.15 Weighted Least Squares Partial Regression Coefficients for Regression of Percentage Population Change on the Independent Variables (*n*=2260*)*

Independent Variables	OLS Regression Coefficient*	WLS Regression Coefficient*
McGranahan's Climatic Amenities Index (CLIMAM)	.32906*** (.01686)	.29969*** (.01669)
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	.00253 (.01680)	.07225*** (.01886)
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	.04712*** (.00909)	.00023 (.00799)
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN) **LOG**	- .05703 (0.06820)	-.17073** (.05210)
Ocean-based Natural Resource (COASTAL)	.43189 (.13425)	.60619* (.19159)
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	.09700*** (.01368)	.09376*** (.01223)
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM) **LOG**	.09415* (0.04745)	.27224*** (.04685)
Goe & Green Cultural/Historical Amenities Index (CULTAM) **LOG**	.03884 (.05812)	.04919 (.05905)
Percent of total employment in higher education 1990 (PERHIGHED) **LOG**	.26625*** (.05968)	.32680*** (.04475)
Metropolitan Proximity (ADJAC)	.48228*** (.06143)	.42033*** (.05156)
County .Median Income 1989 (MDINC89)	.000009*** (.00001)	.000111*** (.000009)
County. Median Age 1990 (MDAGE90)	-.04683*** (.00978)	-.08500*** (.00879)
Unemployment Rate (UNEMP90)	-.00144 (0.13604)	-.02049* (.00885)
Percent total population that is white 1990 (PERWHITE)	-.00185 (.00226)	-.00362* (.00178)
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED) **LOG**	-.89031*** (.12289)	-1.39727*** (.09877)
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)	.00314 (.00640)	.00352 (.00521)
Intercept	5.83008***	11.30991***
F Statistic for Model	99.45***	177.65***
Adjusted R Square	.4107	.3890

* Standard Errors are in parentheses

***p < .05; **p < .01; ***p < .001* **level (two-tailed tests)**

Table 6.16 Variance Inflation Factors (VIF) for Amenity Variables and Control Variables in the Analysis (*n*=2260*)*

Independent Variables	VIF
McGranahan's Climatic Amenities Index (CLIMAM)	1.88628
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	2.11318
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	1.24673
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBLN)	1.27531
Ocean-based Natural Resource (COASTAL)	1.29219
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	1.92646
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	1.51535
Goe & Green Cultural/Historical Amenities Index (CULTAM)	1.14345
Percent of total employment in higher education 1990 (PERHIGHED)	2.01943
Metropolitan Proximity (ADJAC)	1.21906
County .Median Income 1989 (MDINC89)	2.60419
County. Median Age (MDAGE90)	1.77563
Unemployment Rate (UNEMP90)	1.98302
Percent total population that is white 1990 (PERWHITE)	1.75845
Percent population 25 yrs. and over with a college degree 1990 (PERCOLLED)	3.00617
Percent of total employment in quality of life enhancing services 1990 (PERQOLSC)	1.48894

CHAPTER 7-DISCUSSION AND CONCLUSIONS

The chief aim of this research was to examine the association between rural amenities and population change among non-metropolitan counties in the United States. My conclusion is that, indeed, some rural amenities are positively associated with population change in United States' non-metropolitan counties during the 1980-2000 period. In this final chapter, I discuss the general conclusions of this research more specifically, the limitations of this research, and ways in which future research may gain a further understanding of the role of amenities in population change in non-metropolitan locales.

In this analysis, rural amenities were defined as *attributes of a non-metropolitan locale which enhance the quality of life of the people living or visiting there.* I used multiple indicators from past research, as well as indicators derived from my own theoretical speculation, in order to measure this concept. Additionally, other indicators were utilized in order to act as statistical controls in order to account for possible spurious relationships between the dependent and independent variables in this analysis. A panel data set using data from a variety of sources for the years of 1980-2000 was used in order to assess the relationship between amenities and non-metropolitan population change using linear panel analysis. The general question of this research was: *what influence do rural amenities have on population change in non-metropolitan areas?*

A Summary of the Descriptive Analysis of the Independent Variables and Non-Population Change from 1980 to 2000

The following section is intended to refresh the reader on the chief findings of the

descriptive analysis of the dependent, test variables, and control variables. A more in-depth description of these variables is included in Chapter 6. However, for the sake of a contextual understanding of the data, I will summerize the main findings of the descriptive analysis.

In terms of population change (the dependent variable) the data show a virtually negligible increase in population between the years of 1980 and 1990, with an average of only .36 percent. However, in the 1990s the data suggest that this situation was reversed with a mean population increase of over 8 percent (see Table 6.1). Therefore, the results of this data suggest a similar pattern reported by previous research (e.g. Fuguitt 1985, Beale and Johnson 1998, McGranahan 1999, Deller, Tsung-Hsiu, and Marcouiller 2001**,** Green 2001).

Second, an examination of the control variables reveal that the average, median per capita household income for the non-metropolitan counties in 1989 was $21,561.00. However, there is quite a range in income from county to county, with a high of $42,565.00 and a low of $8,595.00. One could conclude, therefore, that the income of the counties in the analysis was quite diverse. There was less variance in terms of the median age of the populace in the counties in 1990. The vast majority of the people in the counties for this analysis do not have much in the way of higher education. The population in these counties was predominantly white in 1990, with an average of 87 percent being white and a median of 95 percent. Therefore, there was little diversity in terms of the racial composition of the counties in the analysis. There was a relatively high percentage (36 percent) of those employed in quality of life enhancing services. Therefore, one can surmise from this finding that a sizable percentage of the people in the counties is employed in these industries.

Finally, the descriptive statistics of the amenity variables revealed that the level of each

type of amenity was strongly skewed across the 2260 non-metropolitan counties. In particular, land-based natural resource amenities, lake-based natural resource amenities, ocean-based natural resource amenities, warm weather outdoor recreational amenities, cold weather amenities, cultural and historical amenities, as well as the percent of total employment in higher education for the 2260 counties of the analysis. The problems resulting from the skewness of these indices and variables, were later dealt with by way of the introduction of power transformations and other procedures when regression models were later constructed.

Testing the Hypotheses

Table 7.1 is a summary of the outcome of the hypothesis tests from the information from the WLS regression output. As can be observed in Table 7.1, climatic amenities prove to be significant predictors of both absolute population change as well as the rate (percentage) of population change. On a strictly intuitive level, it is not surprising that climatic amenities prove to be such strong predictors of both population change variables, for it is the climate that determines whether or not other amenities are able to function. For example, without warm weather, many outdoor activities such as golf, tennis, swimming, and many types of boating are not possible (or, at least quite difficult). Furthermore, particularly in the case of retirees, warm weather is a much appreciated luxury as compared to the cold, which is quite debilitating to older migrants and residents. The simple fact is that cold weather restricts residents to indoor activities for the most part. Particularly in non-metropolitan locales, warm weather activities that outnumber those that are available for colder settings. Furthermore, most cold-weather outdoor activities require geological features, such as mountains. It is in these ways that warmer weather most likely

promotes population growth.

In terms of the hypotheses related to natural resource amenities, the findings suggest that many, but not all, of these amenities, reinforce the hypothesis that they exert a significant influence over population change in non-metropolitan areas. Most notably, river based and lake based natural resource amenities failed to attain significance in the two respective models. River-based amenities failed to attain significance in the rate of population change model. Lake-based amenities failed to attain significance in the absolute population change model. This is probably due to the fact that defining lakes and rivers that are able to sustain outdoor activities, such as boating, and fishing, are not taken into account by the data in this analysis. In other words, the mere presence of lakes and rivers does not necessarily mean that these bodies of water will encourage people to live and stay in a particular locale. Therefore, what is needed, perhaps, is a way to account for the usefulness of these bodies of water in terms of their amenity generating ability. Overall, however, the results of the analysis reinforce my expectations concerning natural resource amenities and their corresponding influence on non-metropolitan population change.

A closer examination of Table 7.1 reveals some contrary findings in terms of the relationships hypothesized between rural amenities and non-metropolitan population change. First, note that five of the nine amenity indicators were positively associated with absolute population change as hypothesized. Conversely, six of the nine amenity indicators were positively related to the rate of population change as hypothesized. Second, land-based amenities were negatively related to absolute population change, but were positively related to the rate of population change. The third contradictory finding was that lake-based amenities were negatively related to the rate of population change. Finally, Table 7.1 shows that the percent of the

population with a college education was negatively related to both measures of population change. What explanations, if any, can be given for these contradictory findings?

In terms of college education, the explanation is a bit more obvious than is the case of the other contrary findings. Some studies have shown that particularly among young, non-metropolitan residents, a college education provides a certain mobility that allows these individuals to leave their communities in order to search for better economic prospects in other locales (Huang and Orazem 1997, Summers and Branch 1984). Within the context of this research and its emphasis on the identification of non-metropolitan amenities, I had hypothesized that this would not be the case. This was my conjecture because of the possible condition in which highly educated population would encourage residents to move to a particular area by providing a means in which they may gain contacts with others of a similar educational background. This was clearly not the case. I would speculate that previous research would more accurately describe the relationship, rather than my hypothesis for this work (Huang and Orazem 1997, Summers and Branch 1984). Accordingly, it is the probably the out-migration of young college educated people seeking better prospects in presumably urban areas that accounted for the negative relationship between percent employed in higher education and non-metropolitan population change. Perhaps the most puzzling finding to come out of this research concerns the land-based natural resource amenities. Land-based natural resource amenities were found to be positively related to the rate of population change, as hypothesized. However, these amenities were then found to be negatively related to absolute population change. In order to speculate on this contrary finding, it will be helpful to first examine again what the components of the index are. From page 85 we see that the index contains the following indicators:

a. Acres of Mountains
b. Acres of Forest & Grassland Managed by the USDA- Forest Service
c. Acres of Federal Land Managed by the National Park Service
d. Total Acreage Under the National Wilderness Preservation System

The first indicator-acres of mountains-may account for some of the contingencies in terms of the confounding findings. On the face of it, mountains provide a scenic backdrop and add to the natural beauty of an area. However, they are difficult places for people to live. The other indicators are also indicative of remote areas in which it is difficult for people to live, and, therefore, are most likely sparsely populated. Because of the fact that the analysis is dealing with rather small populations, it is not surprising that the findings regarding land-based amenities and their influence on population change are so contradictory.

Lastly, contrary to what was hypothesized, lake-based amenities were also found to be negatively related to both absolute population change and the rate of population change. One possible explanation for this contrary finding could be the fact that many of the activities associated with lakes are seasonal and temporal that the amenities associated with them do not foster permanent settlement of these areas. Clearly, further study regarding this amenity type is warranted.

Table 7.1 Results of the Hypothesis Tests

Hypothesis Number	Absolute Population Change Hypothesis Supported (ABLUTE)	Rate of Population Change Hypothesis Supported (PERCHAN)
1. Climactic Amenities	**YES**	**YES**
2. Natural Resource Amenities		
Goe & Green Land-based Natural Resource Amenities Index (LBNRAM)	**NO**	**YES**
Goe & Green River-based Natural Resource Amenities Index (RIVBAM)	**YES**	**NO**
Goe & Green Lake-based Natural Resource Amenities Index (LAKEBAM)	**NO**	**NO**
Ocean-based Natural Resource Amenities (COASTAL)	**YES**	**YES**
3. Outdoor Recreational Amenities		
Goe & Green Warm Weather Outdoor Recreational Amenities Index (WWORAM)	**YES**	**YES**
Goe & Green Cold Weather Outdoor Recreational Amenities Index (CWORAM)	**NO**	**YES**
4. Cultural and Historical Amenities	**NO**	**NO**
5. Percentage employed in higher education	**YES**	**YES**
Control Variables		
6. Metropolitan Proximity	**YES**	**YES**
7. Median Income	**YES**	**YES**
8. Median Age	**NO**	**YES**
9. Unemployment	**NO**	**YES**
10. Race	**NO**	**NO**
11. Educational Background	**NO**	**NO**
12. Population Employed in Quality of Life Enhancing Services	**YES**	**NO**

Some Contentions on the Relationship between Rural Amenities and Non-metropolitan Growth

The following is an attempt to address some possible contingencies regarding the relationship between rural amenities and non-metropolitan population change. This is being done in order to more fully address as many of the possible confounding influences of other factors on the relationship between rural amenities and non-metropolitan population change. Although these issues were not empirically examined, they should nevertheless be discussed in order to guide future research in a more holistic manner.

Amenities and Population Change: A Reciprocal Relationship?

Since many amenities are not static and have the ability to multiply, just as population has the ability to multiply, it is logical to assume that the relationship between the two variable types is *reciprocal*. That is to say, that one encourages the growth or increase of the other and vice versa. For example, say people are attracted to an area or stay in an area for its ski slopes and, thus, population in the area increases. Over time, more types of amenities are developed, or enhanced, to cater to this growing population, such as ice rinks or, perhaps, golf courses for the summer season when the slopes are not operating. Therefore, the two variables (amenities and population) encourage one another in a reciprocal fashion. Because of this reciprocal relationship, establishing causality between the two becomes problematic. Unfortunately, data are not currently available to assess possible changes in an areas' stocks of amenities over time. Therefore, I am only able to measure population change over time, whilst I will have to assume that an area's stock of amenities will remain fixed. Confronting the problem of the reciprocal

relationship between amenities and population change will, therefore, be recommended for future research.

A Search for Amenities or an Expansion of Sub-urbanization?

One can argue that researchers may be confused regarding what is actually responsible for increases in population in non-metropolitan locales. It may not be the quest for rural amenities, but rather flight from urban areas. After all, land costs are less expensive in rural areas, and, more and more, the outside suburbs of America's large metropolitan areas have become almost as overcrowded as the central city proper (Garreau 1991). By controlling for metropolitan proximity in the regression models in this analysis, I have been able to address this contention to some degree. These models show that although metropolitan proximity exerts an important influence on non-metropolitan population change, it does not account for a substantial proportion of the variation in both the rate of population change and absolute population change. Moreover, after statistically controlling for metropolitan proximity and the effects of other economic and demographic factors, specific types of amenities were found to have a significant, positive relationship with absolute population change and the rate of population change. Thus, this analysis suggests that amenities are significant predictors of non-metropolitan population change independent of the influence of flight from over-crowded urban and suburban areas.

The aforementioned contentious issues have not been totally resolved by this analysis. However, by controlling for metropolitan proximity I have shed some light on the possible causal relationship between amenities and non-metropolitan population change by showing the unique contribution of these amenity variables. In terms of the reciprocal relationship between amenities and population change, future research is clearly necessary as the data are not suited to address

this issue. It is hoped that future research will be able to do so.

The Final Contributions of this Research

It may be argued that the most enduring legacy of this research rests on the findings that suggest a profound connection to the qualities of an non-metropolitan locale-its amenities-and their corresponding association to **positive** population change. With the exception of lake-based amenities, and land-based amenities, a significant relationship between amenity measures and non-metropolitan population change were positive in direction. Conceptually speaking, these findings support the overarching hypothesis that amenities are important qualities of place that have helped promote non-metropolitan population change in the United States over the past two decades.

Furthermore, the addition of metropolitan proximity in this analysis, although significant, addresses concerns regarding whether the relationship is a construct of the expansion of suburbia. My analysis suggests that this is not completely the case. The findings indicate that amenities have a unique effect on population change independent of the proximity of these locales to urban areas. In turn, the research findings are consistent with the notion that people are seeking rural amenities and that such amenities may influence movement to non-metropolitan localities that posses them.

The Limitations of this Research

This research was limited in a number of ways. First, people's preferences for certain non-metropolitan amenities were not analyzed. This was not done due to the limited scale of this research and the relative paucity of research on the topic of tying amenities to people's relative preferences for them (Hellerstein et. al. 2002, Heins and van Dam 2001). People's relative preferences toward certain types of amenities merits in-depth exploration. Unfortunately, as

stated above, there is a paucity of research on this dimension of rural amenities. This is most likely due to the fact that tested measurement techniques for exploring these preferences have not been more fully developed.

Furthermore, this analysis did not examine migration. The ability to attract migrants to a given non-metropolitan area is most likely a possible function of amenities that merits study and whose importance is self-evident. Considering that migration is one of the most difficult of the demographic processes to measure and explain, it is not surprising to find that previous research has not explored this variables' connection to rural amenities. However, I surmise that most of the population change in the non-metropolitan examined was due to migration than due to natural increase. This may likely due to the fact that natural increase would not produce some of the dramatic increase and decrease in population seen in many of the counties examined.

Another problem with this research stems from the model specification used in the analysis. In using a similar panel model for their research Goe and Green (2002) stated the limitations of using this model in their work:

> A second problem is that the design and specification of the panel models do not take into account the fact that the local stock of amenities could, itself, change over time. This would particularly be the case with those amenities that require investment in infrastructure and services in order that they be consumed or experienced (e.g., recreational and historical/cultural amenities); or, those that may be depleted as a result of construction of the built environment (e.g., deforestation). Thus, the panel analyses cannot address the issue of whether non-metropolitan localities experienced greater increases in absolute well-being as a result of experiencing greater increases in the local stock of amenities. Further research is needed to both address these problems, and to gain a more detailed understanding of the intervening processes by which the presence of amenities can influence the well-being of non-metropolitan localities (p.22).

In this research the same problem arises in that the panel model does not take into account the

changes in the amenity stocks of the locales being investigated. This becomes particularly pertinent with those amenities that require upkeep in infrastructure and services in order for them to be used and also how they may be diminished by further development (Goe and Green 2002). An example of amenities being diminished by way of development would be the cutting down of forests in order to build vacation homes or the altering of the landscape by building golf courses, hotels, or strip malls. Therefore, over-development may destroy the very resources that make the area attractive in the first place. Stated differently, a locale's amenity development strategy, if not properly managed, can fall victim to its own success. To summarize, the panel analyses did not address the issue of whether non-metropolitan localities experienced greater increases in population change as a result of experiencing greater increases in the locale's stock of amenities (Goe and Green 2002).

Lastly, this research was limited by the fact that other possible rural amenities were not examined by this research such as farmland amenities (Irwin, Nickerson, and Libby 2003, Hellerstein et. al. 2002)[18]. As research on the topic matures, there is little doubt that new rural amenity variables will constantly be discovered and used in future analysis. It is paramount that future research to keep up with these new discoveries and incorporate them into studies on the topic.

Avenues for Future Research on Rural Amenities

There are several ways in which future research can develop a better understanding of the

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[18] The authors' define farmland amenities as "attributes of farmland that are uniquely provided by actively farmed land (p. 1)." According to the authors these attributes could include such things as rolling hills, absence of development, cornfields, and waves of grain.

role of amenities in population change in non-metropolitan areas as well as rural development in general. First, future research can take a regional approach to studying the problem. Second, case studies would be an excellent way to complement much of the macro-level work that has been done on amenities and their influence on non-metropolitan locales. The last avenue I propose is conceptual, rather than purely empirical. This conceptual avenue regards the way in which non-metropolitan amenities are conceptualized, and therefore operationalized. It is in the exploration of this issue where future research may make significant strides in understanding amenities and their corresponding influences on population change, economic development, and even social change in non-metropolitan areas.

Of the three proposals previously mentioned, the first regarding a more regional approach to studying the problem has already received the most attention in terms of research. The work of McGranahan (1999) is a prime example in terms of his analysis of the West. However, while some regions have received attention, others have not received much research attention at all. The American South, for instance, has not been the focus of many studies on non-metropolitan amenities. The fact is that we simply do not know how or to what extent the influence of amenities varies from region to region in the United States. Are people more attracted to the mountains in the South, or are they primarily a draw for population in the West?

Future research should also address the question of why some amenity development strategies in non-metropolitan areas do not achieve the desired results in terms of attracting population or promoting economic development. The general question becomes: have some locales mismanaged their amenities to the extent that they fail to achieve the desired results? There has been some speculation by researchers that this has occurred in some areas. But, as of

this writing, there exists a paucity of literature related to this issue. Case studies may be especially effective in illuminating this particular problem. Furthermore, they may serve as a warning to areas in terms of what amenity development strategies ***not*** to pursue.

Lastly, I consider the exploration of people's preferences toward different types of amenities to be the most 'untapped' area of this topic for future research to explore. By gaining an understanding of the structure of preferences for non-metropolitan amenities among the U.S. populace, than it may be possible to predict which non-metropolitan locales can expect population growth given their current stock of amenities as well as which can be developed to insure future growth be it economic, demographic or infrastuctural.

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Appendix A: Methods for Constructing Indices to Measure Types of Amenities; taken from (Goe and Green, 2002)

The distributions of the indicators of the various types of amenities were found to be highly skewed, reflecting an uneven spatial distribution of these amenities across the non-metropolitan U.S. Given that factor analysis assumes that variables are normally distributed, the asymmetries in the distributions of these indicators were corrected through finding the appropriate power transformation (see Fox 1997:59-67). The structure and dimensionality of all the amenity indicators was then tested through principal components factor analysis using varimax rotation. The results of this analysis are presented in Table A.1.

This analysis confirmed six dimensions in the structure of amenities in the nonmetropolitan U.S. Six factors were found to have Eigenvalues greater than 1.0. In total, these six factors explained 76.6% of the variance in the set of amenity indicators. Only the indicators measuring cold weather, outdoor recreational amenities loaded highly on factor one (see Table A.1). Only the indicators measuring warm weather, outdoor recreational amenities loaded highly on factor two. Only the indicators measuring river-based, natural resource amenities loaded highly on factor three. Only the indicators measuring lake-based, natural resource amenities loaded highly on factor four. Only the indicators measuring land-based, natural resource amenities loaded highly on factor five. Finally, only the indicators measuring historical/cultural amenities loaded highly on factor six.

Only variables that loaded highly on a factor were used to compute an index score for each dimension in the structure of nonmetropolitan amenities. Principal components factor analysis was conducted separately on the variables that loaded highly on each factor, confirming

the unidimensionality of the indices measuring each amenity dimension. Given the disparate nature of the measurement scales in measuring the different types of amenities, the transformed values of the amenity variables were standardized to have a mean of zero and a standard deviation of one. The standardized values for the relevant variables on each dimension were then multiplied by their factor loadings. These products were then summed to form an index score for the variables measuring each type of amenity.

The reliability of the indices measuring of each type of amenity was examined through the computation of Chronbach's alpha as an indicator of internal consistency. These results are presented below. Each index was found to have an acceptable degree of reliability with alpha coefficients greater than .80 with the exception of the index measuring cultural/historical amenities. The alpha coefficient for this index was .730.

Reliability Analysis of Indices Measuring the Different Types of Non-metropolitan Amenities:

	α
Index of Land-Based,Natural Resources Amenities	.830
Index of River-Based, Natural Resources Amenities	.941
Index of Lake-Based, Natural Resources Amenities	.984
Index of Warm Weather, Outdoor Recreation Amenities	.862
Index of Cold Weather, Outdoor Recreation Amenities	.951
Index of Historical/Cultural Amenities	.730

Table A.1. Results of Principal Components Factor Analysis for Indicators of Nonmetropolitan Amenities (N=466)

The FACTOR Procedure
Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix: Total = 24
Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	8.46154018	5.73676800	0.3526	0.3526
2	2.72477218	0.24965450	0.1135	0.4661
3	2.47511768	0.49647767	0.1031	0.5692
4	1.97864001	0.30687541	0.0824	0.6517
5	1.67176460	0.59317688	0.0697	0.7213
6	1.07858773	0.35144602	0.0449	0.7663
7	0.72714171	0.11615217	0.0303	0.7966
8	0.61098954	0.05101008	0.0255	0.8220
9	0.55997946	0.00339184	0.0233	0.8454
10	0.55658762	0.08500372	0.0232	0.8685
11	0.47158390	0.08423570	0.0196	0.8882
12	0.38734819	0.01667194	0.0161	0.9043
13	0.37067626	0.03003249	0.0154	0.9198
14	0.34064377	0.01814957	0.0142	0.9340
15	0.32249419	0.01765811	0.0134	0.9474
16	0.30483609	0.03024472	0.0127	0.9601
17	0.27459136	0.00491134	0.0114	0.9716
18	0.26968002	0.14814083	0.0112	0.9828
19	0.12153919	0.02617520	0.0051	0.9879
20	0.09536399	0.01333509	0.0040	0.9918
21	0.08202890	0.01781569	0.0034	0.9952
22	0.06421321	0.01442450	0.0027	0.9979
23	0.04978871	0.04969721	0.0021	1.0000
24	0.00009150		0.0000	1.0000

6 factors will be retained by the MINEIGEN criterion.

Table A.1 Continued

Factor Pattern With Varimax Rotation

	Factor1	Factor2	Factor3
1. Acres of Mountains (log10)	0.25734	0.07207	0.15497
	-0.03735	0.78914	0.03375
2. Acres of Forest & Grassland Managed by the			
USDA- Forest Service (log10)	0.20405	0.01137	0.26282
	0.08200	0.75738	0.07204
3. Acres of Federal Land Managed by the National Park			
Service (log10)	0.09556	0.13811	0.15903
	0.06999	0.69146	0.10277
4. Total Acreage Under the National Wilderness Preservation			
System (log10)	0.21803	0.04006	0.24567
	0.14305	0.76512	0.04579
5. Total River Miles (sqrt)	0.24793	0.23059	0.82863
	0.12539	0.29470	0.07160
6. River Miles With Recreational Value (sqrt)	0.18833	0.26423	0.85952
	0.07400	0.22318	0.05865
7. River Miles With Scenic Value (sqrt)	0.21023	0.13581	0.87079
	0.12936	0.26952	0.09518
8. River Miles With Wildlife Value (log10)	-0.07718	0.16846	0.82205
	0.02196	0.17650	0.10182
9. Acres of Water Bodies in Lakes>=40			
Acres in Size(sqrt)	0.10069	0.16924	0.07831
	0.96407	0.08320	0.05134
10. Acres of Lakes and Streams (sqrt)	0.15527	0.20173	0.10582
	0.92267	0.06537	0.05103
11. Acres Designated as Primary or Secondary Use in			
Water-Based Recreation (sqrt)	0.09986	0.16983	0.07890
	0.96403	0.08237	0.05237
12. Number of Parks & Recreation Departments (log10)	0.13865	0.75106	0.10437
0.06066 0.17567 0.09743			
13. Number of Local,Countyor Regional Parks (log10)	-0.00752	0.72032	0.17814
	0.03328	-0.14467	-0.03272
14. Number of Amusement Places (log10)	0.06442	0.76430	0.11315
	0.20054	0.08064	0.20140
15. Number of Public & Private Golf Courses (log10)	0.25522	0.78652	0.08944
	0.18166	0.03173	0.08596
16. Number of Riding Academies & Stables (log10)	0.29700	0.64238	0.17551
	0.08219	0.31329	0.17923
17. Number of Organized Camps (log10)	0.29494	0.59373	0.21415
	0.21417	0.09573	0.03760

18. Number of skiing centers/resorts (log10)	0.88545	0.18337	0.13659	
	0.09171	0.24072	0.02642	
19. Number of cross-country skiing firms (log10)	0.82836	0.11844	0.16748	
	0.15742	0.21802	-0.02565	
20. Number of downhill skiing areas (log10)	0.91688	0.21656	0.09819	
	0.08453	0.15955	-0.01330	
21. Lift capacity per hour (log10)	0.87612	0.21021	0.05110	
	0.08068	0.20815	-0.00727	
22. Number of Historic/Cultural				
Tourist Attractions(log10)	-0.03450	0.02484	0.09713	
	0.01304	0.00211	0.85148	
23. Number of Amusement/Entertainment Tourist				
Attractions (log10)	0.05159	0.15802	0.03638	
	0.08019	0.07598	0.84145	
24. Number of Natural Resource				
Tourist Attractions (log10)	0.06275	0.12457	0.07679	
0.03314	0.11644	0.67457		