An Empirical Approach to Characterize Rural Small Business Growth and Profitability

by

Innovation & Information Consultants, Inc.
72 Junction Square
Concord, MA 01720
(978) 369-0550
info@iic-inc.com

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Purpose

Changes in the business cycle have had mixed effects on the rural economy. For example, Drabenstott (2000) suggests that the most recent economic expansion has had a two-fold effect on the rural economy. Some parts have fed off the expansion, while others, such as more remote rural areas, and farm-dependent communities, are struggling to keep up.

With this in mind, the Office of Advocacy sought to study the factors which lead to small business growth in rural areas. Why do certain rural regions expand more than others? Past studies suggest that possible explanatory factors might include population trends, educational attainment, economic conditions at the federal and local level, access to business capital and infrastructure, the availability of technology, and various quality of life measures. This study explores each of these factors, supplementing the examination with case study analysis from six states: Kentucky, Maine, Nebraska, Nevada, North Carolina, and Utah.

Overall Findings

Areas that experience greater population growth also have increased changes in the number of small business. The growth rates of rural small businesses are influenced by different factors during periods of varying economic conditions. Between 1997 and 1999, significant growth in the number of rural small businesses was influenced by demographic, economic, and quality of life variables. During the period that included the recession, 2000 to 2002, economic variables were more significant.

Highlights

• Education was a significant explanatory variable in assessing the growth of rural small businesses. The number of high school graduates increases the number of rural small businesses. Moreover, one of the challenges facing rural communities is how to retain a younger, more educated population.

• The amount of "natural amenities" available in an area can impact rural small business growth. This is defined as the attractiveness of a place to live, based on factors such as climate, topography, and proximity to surface water.

• Rural areas have difficulty attracting profitable, high-tech businesses, primarily because of a lack of both an educated labor force and necessary infrastructure.

• Rural policy initiatives are geared primarily toward specific topics or regions, which often proves effective when there are sufficient resources to help rural small businesses. According to individuals interviewed on the topic, rural development centers and non-profit organizations are vital components for economic development.

• Some explanatory variables were specific to particular states. These range from the number of rural primary care physicians per capita in North Carolina to immigration growth in Maine.

Scope and Methodology

The authors developed and modified empirical models to determine which factors were most influential in quantifying observed changes in rural small business growth and profitability. Time-series, cross-sectional, and longitudinal (panel) data analyses were all tested and included a wide variety of dependent and explanatory variables.

A national econometric analysis was first examined using panel data from 1997 to 2002. The authors contrasted the model findings by dividing the panel into two distinct time frames: 1997 to 1999, when the economy was growing, and 2000 to 2002, when it was in a downturn.

The authors supplemented their national findings with six state case studies. This included an investigation into demographic, economic and small business trends, an extension of the national-level econometric modeling to the state level, and different policy initiatives and programs enacted to assist rural small businesses.

This report was peer reviewed consistent with the Office of Advocacy's data quality guidelines. More information on this process can be obtained by contacting the Director of Economic Research at advocacy@sba.gov or (202) 205-6533.

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The full text of this report and summaries of other studies performed under contract with the U.S. Small Business Administration's Office of Advocacy are available on the Internet at *www.sba.gov/advo/research*. Copies are available for purchase from:

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Executive Summary

The mid to late 1990s were a period of economic expansion in the United States. Followed by an economic recession beginning in 2000, these different economic conditions had a profound impact on the number and relative profitability of U.S. businesses, including large and small businesses, as well as those located in both urban and rural environments. Throughout the expansion and recession, several notable trends can be observed concerning rural small businesses. First, rural America is undergoing several notable demographic shifts, with certain rural areas experiencing a decline in population. Second, rural areas tend to have significantly higher unemployment than urban counterparts. Finally, the difference between average wages and per capita income in rural and urban areas continues to grow, as rural areas fall further behind. Although rural small businesses tend to be largely outnumbered by their urban counterparts, their contribution is vital for the economic success, or failure, of local and state economies. Federal agencies, including the Small Business Administration (SBA), state agencies and local rural development councils have all expressed interest in analyzing the impact macro- and microeconomic factors have on the growth and profitability of small, rural-based businesses.

In this report, Innovation & Information Consultants, Inc. (IIC, Inc.) focuses on econometric and case study analyses investigating the ways in which different economic and demographic factors influence rural small business growth and profitability. The research methodology we have employed in this study included a review of the relevant literature on issues facing rural small businesses, which provided us a broader understanding of the specific factors and analyses previously performed to address rural small business growth, profitability, and policy initiatives. We subsequently developed and modified empirical models in light of the findings of the literature review. The objective of our econometric modeling was to determine which factors most influence the quantification of observed changes in rural small business growth and profitability. We collected and analyzed data compiled from various federal and state agencies, including specialized data provided by the Office of Advocacy of the SBA. The national econometric models used multivariate regression analysis using time-series, cross-sectional, and panel data.

We extended our national analysis of rural small business growth and profitability to a state level by performing six state case studies. Each case study included an investigation into demographic, economic, and small business trends, extension of national-level econometric modeling to the state level, and analysis of different policy initiatives and programs enacted to assist rural small businesses. We selected Kentucky, Maine, Nebraska, Nevada, North Carolina, and Utah for our state case studies. Finally, we conducted a limited number of interviews to illuminate and expand upon some of the findings from the data analysis and literature review.

Based on our literature review, national and state econometric modeling, state policy analysis and interviews, we generated several conclusions including the following:

- A positive relationship exists between rural population growth and change in the number of rural small businesses. As population increases, we expect an increase in the number of rural small businesses. One of the key issues facing rural

communities is how to retain the younger, more educated population. Employment trends are important in establishing rural small businesses. We extend the term "employment" to include an educated labor force. Rural areas typically experience a "brain drain," where they lose the educated population to urban areas.

- The growth rate in the number of rural small businesses is influenced by different factors during periods of different economic conditions. Between 1997 and 1999, we observed significant growth in the number of rural small businesses, influenced by demographic (population, education), economic (wages, employment), and quality (natural amenities) variables. During a recessionary period (2000 through 2002) we observed lower growth, and greater explanatory power was derived from economic variables as opposed to demographic variables.

- Rural policy initiatives are primarily geared toward specific topics or regions. Programs were focused on improving regions that were generally struggling in certain socioeconomic areas, such as high levels of unemployment and poverty.

- Rural areas have difficulty attracting profitable, high-tech businesses, primarily because of a lack of an educated labor force and a lack of infrastructure.

- The current focus in rural small business development involves helping the rural entrepreneur. Future research on rural entrepreneurship is warranted to assess the best ways rural entrepreneurship policy can be implemented to assist rural small businesses.

- Rural development centers and non-profit organizations are vital components in rural small business development.

- The impact of urban changes on the rural small business environment was mixed. Several regression models indicated positive relationships between the change in urban small businesses and rural small businesses, although other regression results displayed a negative relationship. On an aggregate basis, we were unable to definitively explain these apparent trends, and the urban-rural relationship was indeterminate based on our results.

Chapter I
Introduction and Conclusions

The economic expansion of the mid to late 1990s had a profound positive impact on the number and relative profitability of U.S. businesses. An upturn in the business cycle positively affected both large and small businesses, as well as those located in both urban and rural environments. Following a robust late 1990s, the economy began to slow, as an economic contraction began and persisted throughout 2002. Although rural small businesses tend to be largely outnumbered by their urban counterparts, their contribution is vital for the economic success, or failure, of local and state economies. Federal agencies, including the Small Business Administration (SBA), state agencies and local rural development councils have all expressed interest in analyzing the impact macro- and microeconomic factors have on the growth and profitability of small,[1] rural[2]-based businesses.

Small businesses represent over 99 percent of the total number of U.S. businesses, and employ over 50 percent of the domestic workforce.[3] In addition, the growth in the number of small businesses continues to match the growth in the civilian non-institutional population. Between 1992 and 2001 the number of small businesses grew almost 11 percent while the population grew 10 percent.[4] Yet, rural small businesses continued to face a diverse set of challenges, as many of the changing economic and demographic variables were not universally applicable for rural (as opposed to urban) areas. Policymakers need to be cognizant of the possible relationships between rural and urban small business growth.

Innovation & Information Consultants, Inc. (IIC, Inc.) was contracted by the Office of Advocacy of the U.S. Small Business Administration to perform an econometric analysis investigating the ways in which these different economic, and demographic, factors shape rural small business growth and profitability. We rely upon special Census data tabulations provided by the Office of Advocacy, in addition to publicly available federal- and state-level data. The following represent several of the hypotheses and relationships we tested:

- We expect that changes in the number of small rural businesses depend upon population changes. Thus, as the rural population increases, we expect to observe a corresponding increase in the number of small businesses.

- We tested whether population changes in urban areas have an effect on the change in the number of rural small business. We postulate a "spillover" effect, where

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[1] One way in which the SBA defines a small business is one that has less than 500 employees. In this study, we employ this definition for small businesses.
[2] For the purposes of this study, "urban" and "rural" areas are defined by the Office of Management and Budget's metropolitan (MSA) and non-metropolitan (non-MSA) areas. Metropolitan areas include core counties with one or more central cities of at least 50,000 residents or with an urbanized area of 50,000 or more and total area population of 100,000. Rural areas fall outside of the MSA definition.
[3] The data are based on U.S. Census Data concerning the number, employment, and annual payroll and receipts for employer firms and establishments by firm size. The 99 percent represents the measure of small employer firms related to large employer firms.
[4] The data are based on U.S. Census Bureau tabulations and Bureau of Labor Statistics employment data.

increases in urban population have a positive effect on rural business, although not nearly as significant as changes in the rural population.

- It is necessary to test whether changes in rural small businesses depend on additional demographic factors, separate from population. For example, we expect rural areas that experience an increase in the level of education of the local population will experience an increase in the number of rural small businesses.

- Is the change in the number of small rural businesses independent of macroeconomic factors? Do existing small rural businesses weather economic downturns, and do we observe new small rural businesses entering the market to replace those that have ceased operations? We tested the degree to which observed changes in the number of small rural businesses are the result of economic factors including unemployment, per capita income, etc.

- We expected that although the number of small rural businesses may be independent of economic factors, small rural business profitability should be directly related to the current state of the economy. We tested whether observed changes in small rural business profitability are explained primarily by economic changes, and whether changes in profitability are influenced by demographic factors. We hypothesized that the most important explanatory variable would be a measure of the wealth of rural areas, e.g. if increases in purchasing power will lead to an increase in the profitability of rural small businesses.

- One must consider regional differences when examining data at a national level. We used dummy variables to test for the significance of regional differences.[5]

- Changes in small rural business growth and profitability may be a direct result of changes in urban small business growth, profitability or other demographic and economic factors. We tested whether observed changes in small urban business growth help drive changes in small rural business growth.

- Finally, we tested different combinations of urban and rural demographic and economic variables to ensure accurate consideration of possible factors that explain changes in small rural business growth and profitability.

An analysis involving the testing of these hypotheses will enhance the general state of knowledge concerning the growth and profitability of rural small businesses by quantitatively assessing the different economic and demographic variables that influence rural small businesses. Our research also incorporates the views and opinions of individuals familiar with a variety of issues facing rural small businesses. In many cases, their opinions help support the conclusions determined from the quantitative analysis. This research also provides important information to the Office of Advocacy of the SBA and other policy makers regarding programs

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[5] The breakout of different U.S. Regions was based on Bureau of Economic Analysis definitions.

and initiatives that might improve the development, growth and sustainability of rural small businesses.

Research Design

We first reviewed the relevant literature to give a broader understanding of the specific factors and analyses previously performed to address rural small business growth, profitability, and policy initiatives. Previous findings, as they relate to the nature of rural small business growth, are included and discussed as part of the literature review in Chapter II. We subsequently developed and modified empirical models in light of the findings of the literature review. The objective of our econometric modeling was to determine which factors are most influential in quantifying observed changes in rural small business growth and profitability. We designed the econometric models to measure significance[6] using data aggregated at the national level, before applying modified models on a less aggregated, state-level basis. We developed and tested a series of regression models, primarily focusing on cross-sectional and longitudinal data analysis. We achieved significant results in testing a large number of our hypotheses. In Chapter III, we discuss in detail the evolutionary process of our econometric modeling, including results at the national level.

We employed several different regression models to test our research hypotheses. Time-series, cross-sectional, and longitudinal (panel) data analyses were all tested, and we included a wide variety of different dependent and explanatory variables. Models were developed and modified based on data availability and considerations for different periods of economic performance. Panel data analysis, covering the 1997 through 2002 time period yielded the most successful results, although we also obtained adequate results with cross-sectional data analysis of small business growth and profitability during a period when the U.S. economy was enjoying prosperity (1997-1999) and alternatively, entering a recession (2000-2002).

After completing the national-level regressions, we performed six state case studies, including an investigation into demographic, economic and small business trends, extension of national-level econometric modeling to the state level, and different policy initiatives and programs enacted to assist rural small businesses. We investigated whether the conclusions reached in our national analysis also held true at a disaggregated, state level. In many cases, we reverted back to time-series regression models due to the reliance on county-level data, which were available over an extended time period.[7] We were able to verify that many of the conclusions reached at a national level held at the local state level as well. Finally, we discuss the different policy programs or initiatives available in each state for rural small businesses. The results of our state analyses are discussed in Chapter IV, while the case studies are presented in their entirety in Appendix B.

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[6] For the purposes of this study, we define significance based on different confidence intervals in regression analysis. We calculated the probability that the observed variable is sufficiently different than our hypothesized value to test whether the variable makes a difference in explaining rural small business growth or profitability. We established three levels of significance, a 1 percent level, a 5 percent level and a 10 percent level. By nature of the probability calculation, if a variable is statistically significant at the 1 percent level, this leads to a more conclusive result than at the 10 percent level.

[7] We elected to use the number of small establishments, obtained from the Census Bureau's County Business Patterns database, as a proxy for small businesses. We did not use these data in the time-series analyses at a national level since we obtained firm-specific data from the Office of Advocacy.

Finally, throughout the research project we interviewed several individuals[8] with relevant experience in rural small business issues. When appropriate, we include their comments to help support or reject our research hypotheses and conclusions.

Results and Policy Implications

Our primary research findings include:

- We confirmed the relationship between population change and rural small business growth.
- We observed that most rural policy initiatives were often implemented at a local (not statewide) level, almost on a niche basis.
- Employment dynamics (e.g. labor force and unemployment) are significant, especially concerning changes in rural business growth.
- A significant amount of rural policy has been focused on a specific topic, primarily health care and education. Although not specifically geared toward rural small business development, there are obvious benefits to small business based on quality of life improvements in the community.
- We found that changing technology was an important concern facing rural small businesses, and observed certain shifts in the types of businesses that were starting in rural areas.
- Perhaps the most important finding was the continuous reference to rural entrepreneurship. Throughout the literature review, our interviews, and state research into rural policy, we consistently found that rural entrepreneurship was a key area of focus for rural development.

Organization of Report

The rest of this report is organized as follows. Chapter II provides a summary of the key findings of the literature review. Chapter III provides the results of our econometric modeling at the national level. Chapter IV provides summary results of our state case studies, including both quantitative and qualitative information. Chapter V presents our conclusions and policy implications stemming from this report. Appendix A presents our bibliography and Appendix B presents our six state case studies, in their entirety.

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[8] Interviewees included Dr. Edward Malecki (director of the Center for Urban and Regional Analysis), Dr. Deborah Markley (co-director of the Rural Policy Research Institute (RUPRI) Center for Rural Entrepreneurship), Bim Oliver (Rural Development arm of the Utah Governor's Office of Economic Development), Jon Bailey (Center for Rural Affairs), Jeff Reynolds (Rural Enterprise Assistance Program (REAP), Nebraska), and Michelle Hall (North Carolina Rural Economic Development Center).

Chapter II
Literature Review

The purpose of our literature review was two-fold. First, we based our empirical models on analyzing the change in the number and profitability of rural, small businesses (dependent variables) as a result of several different possible demographic and economic factors (independent variables). In reviewing the existing literature, we sought to broaden our understanding of those factors researchers believe are most relevant in defining the trends in growth and profitability of rural small business. Second, in assessing the significance and impact of each independent variable in our models, we rely on multivariate regression models. The existing literature helps provide foundation and support for our models, ensuring that we not only build upon past empirical work, but avoid solely replicating such work.

From the literature, we concluded the following:

1. Population is an important determinant in small business growth. Several studies link demographic trends, including population growth (or decline), with observed trends in small business growth.

2. Various additional variables play a role in small business growth, including in rural areas, which warrant investigation. However, analytical studies often present limited or contrasting results concerning the nature of these variables.

3. Technology is important to small business growth and profitability. The proper measure of technology is difficult to quantify, and may reflect a shift in the nature of small rural businesses, as opposed to overall growth and profitability.

4. Interrelationships between urban and rural areas are not fully understood. Analysis of the impact of urban events on nearby rural areas is limited and warrants further investigation. The literature prompts us to question how extensive changes in the urban environment affect corresponding rural areas.

5. Researchers and policy experts have offered several policy initiatives and suggestions designed to assist rural areas. In particular, we expect our interviews and state-level analyses to investigate the efficacy of these programs, although we recognize many are in their infancy and tangible results may be a few years away.

Trends in Rural Small Business Dynamics

Small businesses are the predominant form of business in rural economies, where they account for 90 percent of all rural establishments (Buss and Yancer 1999) and nearly two-thirds of all rural jobs, making them a vital part of the rural economy (McDaniel 2001). Almost 75 percent of rural small businesses have fewer than 20 employees, accounting for a quarter of rural jobs, but only a fifth of rural payrolls (McDaniel 2001).

The types of industries served by small rural businesses are primarily in the non-producer service industries, including accommodations, social services, retail, and amusement and recreation, which are generally lower paying industries. On the other hand, small businesses in urban areas are focused in higher paying industries such as producer services, including management, finance, and technology (McDaniel 2001). The urban/rural divide in earnings has been evident over time, and between 1990 and 1998, the ratio of rural real earnings per non-farm job to urban earnings fell from 73 percent to an all-time low of 69 percent (Gale and McGranahan 2001). As evidenced by the widening spread in earnings, small firms in rural areas were generally out-performed by their urban counterparts during the 1990s.

A second concern involving the growth of rural and urban small businesses is the rate of business survival. Recent data indicate that less than 40 percent of small businesses exist for five years or more (Muske, Jin and Yu 2004). Although differences in location do not necessarily account for the difference in survival rates of new firms, the survival rates of new small businesses tend to be much higher in industries focusing on technology and innovation, which are often lacking in rural areas (Variyam and Kraybill 1994; Acs and Malecki 2003). As part of our research design, we focused on examining not only the aggregate growth of rural small businesses, but also the change in rural small births and deaths.

We measured profitability of small businesses using non-farm proprietors' income as a proxy for overall small business income.[9] Data culled from government sources and the existing literature show differences between the number and profitability of rural and urban small businesses. This is true in both a static sense (e.g., examining the relative difference in the annual non-farm proprietors' income for rural small businesses compared with urban businesses) as well as a dynamic sense (e.g., examining how the profitability of rural small businesses has changed over time).

Possible Explanatory Factors in Assessing Rural Small Business Trends

Our review of the literature led us to several factors that researchers discussed as affecting rural, small business success. Before we discuss these factors, it is important to note two observations that relate to our review and discussion of the existing literature. First, we understand and recognize the potential for interrelationships between many of the topics, and the subsequent independent variables we employ in our empirical models. Second, regardless of the particular topic under investigation, we realize that there is a strong likelihood that the trends observed in urban areas may influence trends observed in rural areas. We tested this by including urban variables as possible explanatory variables for observed trends in our rural dependent variables.

Population and Education Level

Population change, specifically the immigration from and emigration to rural areas, appears to be a key factor in explaining rural small business trends. Studies have found that

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[9] The U.S. Department of Commerce uses non-farm proprietors' income as a gauge for the income of small business owners and the self-employed (Gongloff 2003).

population losses are highly correlated with a decline in business performance (Kean 1998), and there was a significant "out-migration" from rural areas between 1990 and 2000.[10] Several key factors are related to rural population dynamics, as researchers cite changing economic conditions, an aging population, proximity to urban areas, and level of natural amenities as drivers of rural population change (Cromartie 2002; McGranahan and Beale 2002).   Several researchers noted a link between small business entrepreneurship and population growth. Rebecca Winders (2000) found that Georgia counties with growing populations were more likely to see higher levels of entrepreneurial activities and McGranahan and Beale (2002) cite small business entrepreneurship as one of the reasons why rural counties were able to maintain their populations.

Increasing reliance on services is another reason for rural population loss. A larger number of people are situating themselves for easier access to health, education, and retail services. Easy access to these services is typically associated with urban, not rural, settings. As a result, we observe a shift in the rural dynamics involving certain services. Large retail chains are positioning some of their stores in more rural locations, where they can reach the widest range of shoppers (McGranahan and Beale 2002).   Although this may be beneficial for population growth, discount stores often have a deleterious impact on small businesses in areas which cannot compete with the low prices offered by these larger retailers (Stone 1997).

The observed rural population loss between 1999 and 2001 is also largely associated with the education level of the population.   The correlation between educational attainment and population growth in rural areas largely reflects the difference in the types of jobs available in rural and urban areas.   Educated workers have a greater chance of finding work in today's technology-driven, urban job markets, whereas the less-educated workers tend to remain in the rural areas where the lower skill jobs are more readily available.   The loss of a more highly educated workforce in rural areas could pose an obstacle to economic development in these areas (Cromartie 2002). Furthermore, a smaller population and low population density in general make economies of scale difficult to achieve for businesses in rural areas (W.K. Kellogg Foundation 2004).   Hart and McGuinness (2000) also found that educational attainment by itself has a positive and significant impact on small business success.[11]

Federal and Local Economy

Changes in the business cycle have had mixed effects on the rural economy.   For example, Drabenstott (2000) suggests that the most recent economic expansion has had a two-fold effect on the rural economy. Some parts have fed off of the expansion, while others, such as more remote rural areas, and farm-dependent communities, are struggling to keep up. Small business growth has also had an encouraging effect on helping the rural economy rebound (Winders 1997).   The existence of small firms, as opposed to large manufacturing or branch establishments, increases the resilience of a community by avoiding the displacement that occurs

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[10] Out-migration should not be confused with overall population growth. It represents the differential between the urban population and rural population. Thus, while both populations could rise, the out-migration could expand as urban areas enjoy a more rapid rate of growth.

[11] In their study, Hart and McGuinness (2000) used employment change as a measure of small business success.

from mass layoffs (Winders 2000). Drabenstott (2000) adds that in the early 1990s recession, urban areas were actually hit harder than rural areas.

The economic expansion of the late 1990s, however, left rural areas trailing urban areas in overall economic growth (Drabenstott 2000). Attributes and factors that led to the disparate growth in the rural economy compared with the urban economy include reliance on slow-growth, goods-producing industries; lack of knowledge and technology based industries coupled with a less educated workforce; deregulation of certain industries (e.g., telecommunications, banking, trucking); and globalization.

Employment, Earnings and Wages

The existing literature suggests that employment and earnings are tied to the difference in growth and profitability between rural and urban small businesses. During the 1990s, urban and rural employment and earnings rose, but jobs and earnings in urban areas grew at a faster pace than in rural areas. This is largely attributed to the expansion of service and technology-based industries which occurred in urban areas, widening the gap between rural and urban economies (Gale and McGranahan 2001). Figure II-1 illustrates the growing gap in wages between urban and rural areas, with the greatest gap occurring in 2000, when rural wages made up only 68 percent of urban wages. Equivalent data on labor earnings mirror this trend. Ghelfi (2002) suggests that factors such as the size of the local labor market, the proximity to a large labor market, and the mix of industries within the labor market explained the difference in the level of earnings.

Figure II-1

Source: BEA REIS Table CA030, values converted to 2000 dollars using GDP deflator

8
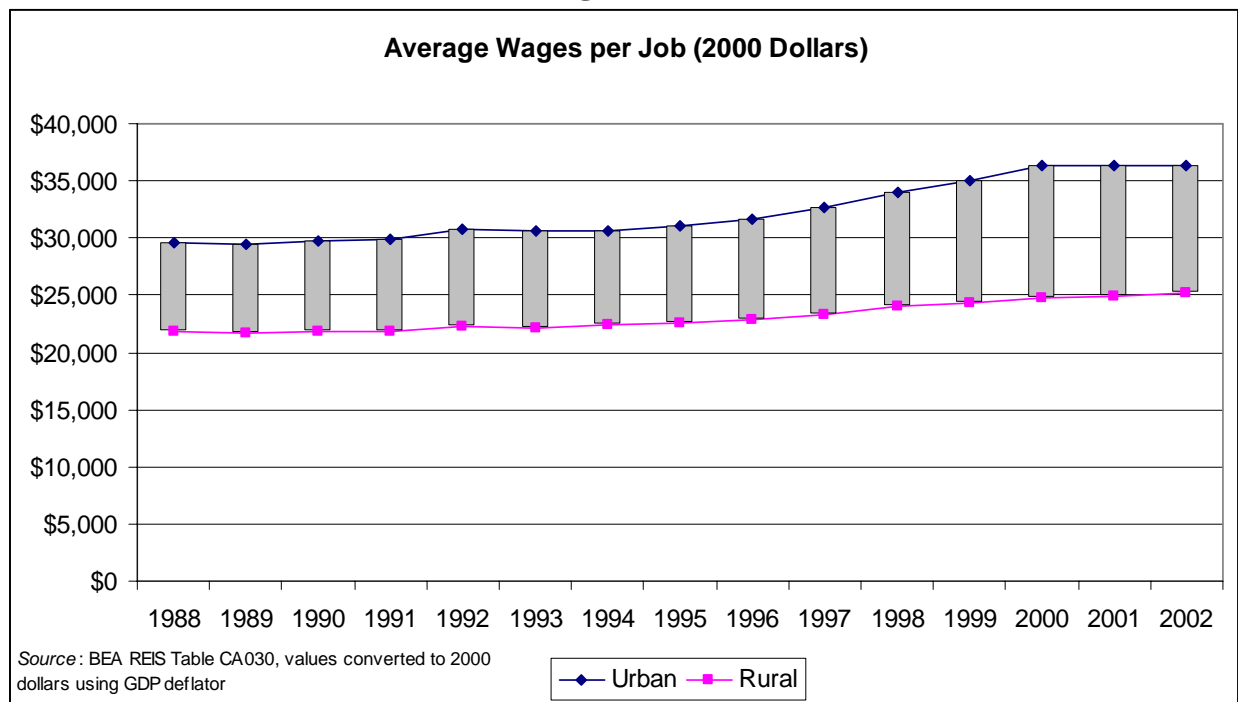
Rural unemployment rates have generally exceeded urban unemployment rates since the 1980s (U.S. Department of Agriculture 1999). Higher unemployment rates in rural areas can be tied to several things. Mills (2000) suggests that displaced workers in rural and urban areas face different adjustments tied to labor market efficiency, leading to a longer period of unemployment for rural workers (Mills 2000). In addition, the rural labor force has historically been characterized by lower skill level and lower educational attainment. However, jobs for the unskilled in both rural and urban areas have become scarce relative to the supply of unskilled workers in rural areas (Freshwater 2001).

Poverty

Another factor contributing to the changes in growth and profitability of rural small businesses is the poverty rate.[12] Levernier et al. (2000) examined whether employment growth, another measure of business success, is tied to the level of poverty in a given area. This study and others have shown that rural areas generally have higher poverty rates than their urban counterparts (Levernier et al. 2000; Jolliffe 2002). This may be related to lower cost of living, past reliance on agriculture and other "extractive" industries, other demographic characteristics and less human capital in the labor force. The Levernier et al. (2000) study also indicates that the higher the population in rural areas, the lower the poverty rates. However, these rates still remain higher than urban poverty rates. The literature suggests that regional differences exist in poverty rates, warranting inclusion of regional differnces in our empirical models.

Access to Business Capital

The issue of small business finance in rural areas has been the topic of a number of studies. In a recent study on capital for rural entrepreneurs, the Rural Policy Research Institute (RUPRI) center for Rural Entrepreneurship determined not only that rural entrepreneurs are "under and inappropriately capitalized," but also that the capital provided to rural entrepreneurs is generally smaller in size with a lower level of growth potential (W.K. Kellogg Foundation 2004). This leads one to question whether the limited access to sufficient capital contributes to the success or failure of rural small businesses; if capital were more easily accessible, would there be more rural small businesses? In addition if there was an increase in available credit to existing, rural small businesses, would this have a positive impact on their profitability? What *is* clear is that the rural small businesses do not account for a significant portion of capital investment.[13]

Drabenstott, Novack and Abraham (2003) suggest that venture capitalists generally avoid rural businesses because of the high costs of funding, supporting, and liquidating deals in rural areas. They insist that success of rural small businesses depends on federal programs focusing

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[12] According to the US Census Bureau, a family is considered to be in poverty if the total income of the family is less than the threshold appropriate for that family. Thresholds vary according to the size of the family and the ages of the family members. The Census Bureau updates poverty thresholds annually for inflation using the Consumer Price Index.

[13] Although rural businesses make up 19.2 percent of total business establishments, only 1.6 percent of total venture capital investment went to these firms. In addition, 5 states (CA, MA, NY, TX and CO) accounted for two-thirds of this investment (McDaniel 2002).

on venture capitalists. Some examples of current programs (state-funded, publicly managed venture capital funds) are the Kentucky Rural Innovation Fund, the Minnesota Technology Investment Fund, the North Dakota Development Fund, and the Small Enterprise Growth Fund in Maine. There are also some state-funded privately managed venture capital funds, such as the Colorado Rural Seed Fund, Kansas Venture Capital, Inc., the Magnolia Venture Capital Corporation of Mississippi, and the Northern Rockies Venture Fund of Montana. These programs help fund venture capital programs or provide tax incentives to increase private funding (Drabenstott, Novack and Abraham 2003).

A large portion of the existing rural small business finance literature we reviewed related to the types and availability of loans at local community banks. Gilbert (2000) and McDaniel (2001) asserted that most small businesses in rural areas look to local banks for financial support. However, rural bankers serving smaller communities generally lack the capital and expertise to take risks on entrepreneurs in small communities (Buss and Yancer 1999). Given the constraints faced by rural small business, the literature suggests that empirical models should test the significance of access to credit. However, the availability of adequate data on capital access created limitations on the inclusion of this variable in the regression analysis.

Natural Amenities

Rural population changes have been driven largely by the amount of "natural amenities" available in the area. Natural amenities can be summarized as the attractiveness of a place to live, based on factors such as climate, topography, and proximity to surface water. McGranahan (1999) created a natural amenities index, based on the following criteria: January temperature, days of sun in January, July temperature, July humidity, water area and topography. The milder the climate, the more varied the topography, and the closer proximity to surface water enhances the natural attractiveness of a location. McGranahan found that these "amenities" are more closely tied to rural population change than are urban proximity, population density, or economic type. Some studies found that natural amenities in revitalizing parts of rural America. More germane to our study is whether the presence of natural amenities leads to a larger number of more profitable rural small businesses. Inclusion of, or at least the distinction between, geographic areas with higher levels of natural amenities in the empirical models allows us to address the importance of natural amenities in the trends observed in rural small businesses.

Technology

Technological innovation and infrastructure, particularly the emergence of the use of internet and electronic commerce, have changed the way small businesses operate. Web sites allow small firms to reach new customers, improve their competitive position, and increase sales. Rural areas have historically trailed their urban counterparts in internet access. In addition, internet service access is more expensive in rural areas, due to the absence of a large customer base, and broadband technologies are often not available in remote rural areas. In fact, in 2000 56 percent of cities with populations of 100,000 or more had access to DSL (Digital Subscriber Line) technology, whereas less than 5 percent of cities with populations under 100,000 had access to DSL (Malecki 2003). In a recent study on the internet in rural areas, 29 percent of rural internet users said that there was only one internet service provider (ISP) available to them,

compared to only 7 percent of urban internet users (Bell, Reddy and Rainie 2004). In General, high-speed internet, which is becoming more and more critical to business operations, remains concentrated in urban areas.

Internet use among people living in rural areas has been increasing steadily over the past several years. In December 1998, an estimated 29.3 percent of rural dwellers used the internet, according to a study performed by the U.S. Department of Commerce (2002). A more recent study by Bell et al. (2004) indicates that rural internet use jumped up to 52 percent in 2003. However, rural areas still trail urban areas in internet use, with 67 percent of the urban population using the internet in 2003.

Technology can improve significantly the profitability of small businesses. We were interested in addressing the question of whether the lower level of technology-use by rural small businesses has a detrimental effect on the number and profitability of these businesses. Will the expansion and increase in technological development reach the rural areas and assist in small businesses success? The major obstacle in addressing these questions is the availability of adequate data on a state-level, distinguished between rural and urban areas. We were unable to obtain adequately disaggregated data on technology factors to include in our regression analyses. As a result, opinions concerning the impact of technology on rural small business growth are based on anecdotal evidence, distinct from the conclusions reached through econometric analysis.

The Role of Policy in Relation to Rural, Small Business Development

Federal rural policy has historically been focused on agriculture, with commodity price support as the primary rural policy (W.K. Kellogg Foundation 2004). Today only one in ten rural counties relies on agriculture as its primary source of income compared to one in four rural counties in 1972. Technological change and globalization, as well as the diminished role of agriculture and manufacturing in rural areas have reconstructed the shape and scope of rural America. Globalization has had a profound effect on the rural economy. Rural America no longer "feeds the world" because other countries are able to produce similar products of equal or greater quality at lower costs (Stauber 2001).

Several authors outline various ideas to target rural development policy. It has been suggested, for example, that policy at the national level will be too broad in nature, and thus state and local policy must prevail in order for such a policy to be effective. In a rural entrepreneurship study by the W.K. Kellogg Foundation (2004), the authors cite to a Corporation for Enterprise Development (CFED) study which said:

> An off-the rack federal strategy or state development policy based on outmoded assumptions about rural areas is likely to be ineffective…Instead, state and local policymakers should focus on building local and regional capacity to use flexible programs and tools, designing effective delivery systems, and creating supportive development institutions.

Taking into account a preference for local policy, we have outlined below several areas of focus for future policy initiatives, based on our review of literature.

- *Targeting specific regions or industries:* Rural policy does not need to cover all rural small businesses to be beneficial. Targeting specific areas or industries is one way to enhance the rural economy. For example, renewed focus on tourism in a rural region can provide an economic stimulus that leads to an increase in the number and profitability of rural small business.

- *Forming regional partnerships and increasing rural small business networking to improve rural business conditions:* The primary goal behind these policy initiatives is to connect rural businesses together, allowing exchange of ideas, increased education, better working relationships, etc.

- *Increase focus on rural entrepreneurship:* Numerous articles, researchers and interview subjects continually focus on the importance of entrepreneurs to a successful rural economic development strategy. Benefits of rural entrepreneurship include keeping profits within the community, rural job creation, and increased reliance on the local community to dictate the future of local rural economies. Key facets of rural entrepreneurial development include education and training, creation of business networks, ensuring access to capital, and infrastructure and institutional support.

- *Access to capital and increased investment at the state and local level:* Continuing to increase the availability of funds to rural small business is a priority for numerous rural policy initiatives and programs. Many rural development organizations specialize in micro-lending or other loan options. Furthermore, an expanding infrastructure is needed to support the new technologically-driven businesses that are appearing.

- *Leadership development and small business training:* Rural communities will benefit from an increased level of leadership at the local level. This applies not only to local government but civic business leaders, who can improve the community. In addition, we consistently observe a focus on training for rural small businesses, to assist them in not only starting, but surviving and expanding.

- *Importance of rural development councils and organizations:* The role of rural development councils and organizations has taken on a more significant role in light of recent declines in federal funding for rural initiatives. These organizations can provide education, business training, networking opportunities, and in some cases, funding for small business start-up or expansion.

Guidance from the Econometric Literature

The econometric literature has tested a considerable number of independent variables relating to the growth and profitability of rural small businesses. The preceding sections of this chapter discussed the majority of the variables which we tested in our models. Many of these variables, including population, per capita income, educational attainment, and proximity to urban areas, show up repeatedly in the econometric studies. We also identified other variables, such as purchasing power, which were utilized in our study.[14]

Initially, we intended to utilize Ordinary Least Squares (OLS) estimations, given their successful application in previous research. We also observed that many of the previous studies examine differences across businesses, or differences across location in a static, cross-sectional sense. We discovered that due to data limitations, the OLS time-series analyses did not provide significant results. While we intended to use time-series macroeconomic data, as opposed to many of the cross-sectional microeconomic studies, we eventually conceded that cross-sectional analysis was appropriate based on the significance of the results. However, through further investigation, we revisited the inclusion of temporal changes by employing longitudinal data analysis (panel studies) which essentially "combines" aspects of cross-sectional and time-series regression models.Three studies that proved to be particularly useful were Levernier et al. (2000), Glancey (1998), and Winders (1997). The Levernier et al. study (2000) aimed to explain the variation in poverty in the United States, including the differences between rural and urban areas. We were able to modify the Levernier regression models by replacing the poverty variable with our measures of rural small business growth.[15] The Glancey study (1998) investigated the relationship between the characteristics of a company and its subsequent profitability and growth. Although this study looked at firm-to-firm growth, rather than collective region-by-region firm growth, Glancey indicated that there was a potential relationship between firm growth and firm profitability, which we subsequently tested in the development of our models. Finally, the Winders (1997) study looked at the contribution of small business development to economic performance of non-metropolitan counties in Georgia. However, rather than look at the contribution of small businesses to economic performance, we intended to look at the reciprocal relationship by measuring the effect of economic performance, among other things, to rural small business development.

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[14] Kean et al. (1998) use purchasing power as an independent variable in the examination of rural retail business performance, which is measured using return on sales. Purchasing power, in this case, is measured as the population in a given area times the per capita income in that area.

[15] Their model included three "vectors": one identifying the location of the county (in our case, rural or urban), one identifying demographic variables, and one identifying economic variables. In addition, many of the variables tested in this study were applicable to our study, such as population, educational attainment, and labor force statistics.

Chapter III
Data Analysis and Findings – National Level

The objective of our econometric modeling was to determine which factors are most influential in quantifying observed changes in rural small business growth and profitability. As the literature review noted, the development of econometric models depends heavily on the availability of adequate, relevant, and accurate data. Our hypotheses relating to national-level data analysis are outlined in Chapter I. Through the application of testing these hypotheses, we employed a variety of regression models, involving different variables and time periods.[16] Based on these analyses, we reached the following conclusions involving rural small business growth and profitability at a national level:

- A positive relationship exists between rural population growth and change in the number of rural small businesses. As population increases, we expect an increase in the number of rural small businesses. Given the close correlation of these variables, many of our subsequent regression models employed variables on a per capita basis.

- The growth rates of rural small businesses are influenced by different factors during periods of different economic conditions. Between 1997 and 1999, we observed significant growth in the number of rural small businesses, influenced by demographic (population, education), economic (wages, employment), and quality (natural amenities) variables. During a recessionary period (2000 through 2002) we observed lower growth, and greater explanatory power was derived from economic variables as opposed to demographic variables.

- We also used small business births and deaths, as opposed to aggregate number of small businesses to provide an alternate measure of rural small business growth. Our results tend to confirm what we observe when examining results from regressions using the number of rural small businesses. We observe that during periods of economic success (1997 to 1999), rural small business births tend to drive the rural business growth and are closely correlated with population and several demographic trends. Alternatively, during periods of economic downturn (2000 to 2002), regression analysis using rural small business deaths provide the most robust results, and are influenced by population and economic factors including unemployment.

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[16] Initially, we intended to utilize Ordinary Least Squares (OLS) estimations, given their successful application in previous research. However, due to data limitations, the OLS time-series analyses did not provide significant results. We then turned to a cross-sectional analysis which we considered to be appropriate based on the significance of the results. However, through further investigation, we revisited the inclusion of temporal changes by employing longitudinal data analysis (panel studies) which essentially "combines" aspects of cross-sectional and time-series regression models.

- The impact of urban changes on the rural small business environment was mixed. Several regression models indicated positive relationships between the change in urban small businesses and rural small businesses, although other regression results displayed a negative relationship. On an aggregate basis, we were unable to definitively explain these apparent trends, and the urban-rural relationship was indeterminate based on our results.

- The regression models may be incomplete given data availability. Through our literature review and interviews, we learned that technology and entrepreneurship were very important factors in assessing rural small business growth and profitability. However, limited data exist on a time-series basis to incorporate into our regression models. Thus, even the most significant regression models (in terms of explanatory power) still do not fully explain some of the observed trends in rural small business growth and profitability. This is an area for future research.

- Results from our models of rural small business profitability were less robust and conclusive. We confirmed that rural small business profitability is largely related to economic conditions as opposed to changes in demographic or qualitative variables.

Regression Variables

Dependent Variables

Once we postulated the initial econometric models, we attempted to determine the most effective ways to measure small business growth and profitability. The U.S. Census Bureau collects data by firm size, including total number of firms, establishments, employment, and annual payroll. These data are reported in the *Statistics of U.S. Businesses* (SUSB). Additionally, the Census Bureau provides data on firm births, deaths, expansions and contractions in the *Dynamic Firm Data* resource.[17] We presumed growth could be measured in a variety of ways using 1997-2002 Census Bureau data, including annual small business count, rural firm births and deaths, and employment changes in rural small firms.[18]

Relying solely on the 1997-2002 data resulted in time-series regressions containing only a limited number of observations. We also collected data on the annual number and income of non-farm proprietorships broken out by urban and rural areas. We obtained annual data between 1969 and 2002 from the Bureau of Economic Analysis (BEA). Although non-farm proprietors'

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[17] Regrettably, an extended time-series of these data broken out between urban and rural areas proved difficult to obtain. Our initial investigation, conducted prior to drafting the research proposal, indicated that small business count, births, deaths, and employment change existed for both urban and rural areas between 1997 and 2001. We obtained these data from the SBA in February 2005. We subsequently obtained 2002 data from the SBA in May 2005. However, we were unable to procure data for periods prior to 1997.

[18] The Census Bureau prepared the 1997-2002 data from raw data and provided them to the SBA. In discussions with the Census Bureau, the overall cost to obtain these data for prior periods, both in Census Bureau work hours and associated fees, far exceeded the limitations of our research time and budget.

income is not a direct measure of small business revenue, we believe it was a reasonable proxy given our review of its use in other studies.[19]

Independent (Explanatory) Variables

We considered the following categories of independent variables to consider for inclusion in the regression model:

- *Population:* We collected state and national population data, compiled by the BEA, for both urban and rural on an annual basis between 1969 and 2002. We expected a positive sign on rural population and negative sign on urban population when measuring rural small business trends.

- *Education:* We obtained education data from the Census Bureau (attainment) and the National Center for Education Statistics (diploma recipients and student-teacher ratios). We expected a positive correlation between the education level of the rural population and small business growth and profitability in rural areas.

- *Wealth:* We selected several measures of area wealth including per capita income, poverty levels, purchasing power and housing data. Data were obtained from the BEA, Census Bureau and Department of Housing and Urban Development. We expected a positive coefficient on rural wealth, as increased wealth leads to increasing purchasing power to support local small businesses.

- *Employment:* We collected employment, labor force, and unemployment data from the Bureau of Labor Statistics, using average annual labor force data by county. We expected a positive correlation between the size of the rural labor force and rural small business growth, while a negative sign was expected on unemployment variables.

- *Wages:* We collected earnings and wage data from the BEA, broken out by state urban and rural areas for the years 1969 to 2002. The sign of the coefficient on rural wages is ambiguous. A positive sign on the coefficient might indicate that higher wages in rural areas draw a more educated workforce, thus increasing growth of rural small businesses. In contrast, a negative sign on the coefficient could imply that inexpensive labor is more readily available in rural areas, enticing small businesses to locate in these areas to reduce business costs.

- *Technology:* We believe that the availability of new technology and access to an advanced infrastructure are important determinants in the development of small businesses in rural areas. However, time-series and cross-sectional data for technology were difficult to obtain, and as such will be left for future studies as data become more readily available.

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[19] In a prior SBA study on rural small business lending (2003), the authors state that "Nonfarm proprietors' income also reasonably closely track[s] the performance of small business."

- *Access to Business Capital:* Previous studies, including SBA-sponsored research (2000), focused on whether rural small businesses have less access to capital than their urban counterparts. Like technology, time-series and cross-sectional data for capital access were somewhat limited at the level of detail required for this study.

- *Quality of Life:* Where appropriate, we incorporated quality of life variables including those related to natural amenities and crime rate. We expected a positive correlation between quality of life variables and rural small business growth.

- *Macroeconomic Variables:* Variables pertaining to the federal and local economy were intended to account for overall economic conditions in the nation, and where available, at the state and local level. These variables served as control variables, where we expected to see a correlation between rural small business growth and the appropriate measures of economic health. We used Gross Domestic Product (GDP), obtained from the Economic Report of the President. Historical values for Gross State Products were collected from the BEA. Additionally, we adjusted historical values expressed as dollar amounts to real values (2000 dollars) using the GDP deflator.

Annual Average Growth Rate Regressions at the National Level

The availability of data for our dependent and independent variables highlights the major difficulties with time-series regression models: lack of data over a sufficient length of time leads to results that are inadequate to test our hypotheses. As previously mentioned, we were limited to only six years (1997-2002) of data relating to the number of small businesses, broken out between urban and rural areas. We quickly realized that several problems arose in using the limited data in a time-series regression. We faced limitations in the number of independent variables we could include in the log-linear time-series regression due to the minimal number of observations. When we did attempt to include several combinations of independent variables, we achieved regressions with very high R-squared[20] values indicating multicollinearity.[21] The time-series results were insufficient to address the majority of our research hypotheses.[22]

A significant number of the analytical studies related to this research topic focused on cross-sectional data, looking at a single year of observations in multiple localities, as opposed to using strictly time-series data in the econometric modeling. As a result, we elected to develop a cross-sectional data series. In developing the appropriate cross-sectional analysis, we relied upon

[20] The R-squared (R^2) statistic measures the success of the regression in predicting the values of the dependent variable within the sample. When examining regression results, we look at *Adjusted R-Squared*, as this measure accounts for the number of independent variables in the model.
[21] Examining a correlation matrix of our independent variables justifies our suspicions concerning the high R^2 values in time-series OLS equations. We observed that there was a substantial amount of correlation between many of our independent variables, and their inclusion in the time-series regression models undermines the results because of the presence of multicollinearity.
[22] The time-series OLS regressions allowed us to confidently address one of our initial working hypotheses. We observed that rural population changes have a significant, positive effect on the number of small rural businesses at the 5 percent confidence level.

the fact the general economy experienced widespread growth throughout the late 1990s before entering a recession in late 2000.[23] We elected to look at cross-sectional data over two distinct time periods: the first covering the 1997-1999, when there was consistent economic growth, and the second covering the 2000-2002, when there was consistent economic decline. We then computed the average annual percent change for each three-year period for each of our dependent and independent variables.[24]

The use of cross-sectional data enabled us to accomplish several things which had eluded us when using our time-series data. First, by examining cross-sectional data we are able incorporate many of the variables that were only available for one year.[25] We are also able to include several variables that do not differentiate between urban and rural areas. Although we sacrifice a level of accuracy, using certain indices and rankings at the state level provides a general sense of state-level differences in business conditions.[26] Finally, the use of cross-sectional data allows us to address regional differences. We rely upon the BEA definition of economic regions[27] and create dummy variables for each region.[28]

We define our cross-sectional equation(s) using the annual average growth rate between 1997 and 1999, and 2000 and 2002 respectively in the following form:

$$\Delta N_k = C + \beta_1(\Delta I_{1,k}) + \beta_2(\Delta I_{2,k}) + \ldots + \beta_n(\Delta I_{n,k})$$

where:

ΔN	=	change in rural count of small businesses per state
C	=	regression constant
β	=	variable coefficients
ΔI	=	change in independent variables (e.g., population, unemployment, etc.)
k	=	number of cross-sectional observations
n	=	number of independent variables to test in regression equation

Regression results using cross-sectional data are shown in Table III-1. These models represent our "best" model when measuring growth in the gross number of rural small businesses, growth in rural small business births, and growth in rural small business deaths respectively. The patterns seen in these regressions take place over two distinct time periods: during an overall positive growth period in the U.S. economy from 1997 to 1999 and during a period when the economy does not fare as well, from 2000 to 2002. These models allow us to analyze the different elements of small business growth from both an aggregate (gross small businesses) standpoint as well as looking at each individual component (births and deaths) which

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[23] The recession technically began in March of 2001.

[24] We employed the use of the average annual growth rate, using the following formula: AAGR – LN(X_t / X_0) / n. Where = X_t 2001 Data, = X_0 1997 Data, and n = the number of years that fall in between X_t and X_0.

[25] For example, we incorporate the Natural Amenities Index, essentially as a dummy variable for each state's urban and rural portions.

[26] We are hesitant to rely exclusively on these types of indices, as they may not account for any differences between rural and urban areas within a particular state.

[27] State distinctions can be found at www.bea.gov/bea/regional/docs/regions.asp

[28] In performing regression analysis, we assign a value of one to states that fall within the particular economic region we wish to distinguish, and zero for all other states outside the region.

make up the gross number of small businesses. We can also make comparisons across the different time periods, in terms of which independent variables become significant when the economy is doing well, and similarly, which variables are significant during a period of economic decline.

Table III-1
Cross-Sectional Regression Results Measuring Rural Small Business Establishments, Births and Deaths, 1997-1999 and 2000-2002.

Independent Variable	Rural Establishments		Rural Births		Rural Deaths	
	1997-1999	2000-2002	1997-1999	2000-2002	1997-1999	2000-2002
Rural Population	0.859 ***	0.634 ***	2.654 ***			3.059 ***
Rural Real Avg. Non-Farm Proprietors' Income	-0.119 ***				-0.281 **	
Rural Unemployed						0.135 *
Rural Labor Force				0.823 ***		
Urban-Rural Wage Gap	0.063 ***	0.029 *			0.157 ***	
Rural Amenity Index		0.005 ***	0.024 ***			
Urban Amenity Index		-0.002 **	-0.011 ***		0.005 **	-0.013 **
Urban Population		-0.282 *	-1.218 **			
Urban Jobs		-0.246 *				
Urban Real Wages						-1.838 **
Urban Small Businesses (Gross)	-0.254 ***	0.531 ***				
Urban Small Business Births			0.357 **			
Urban Small Business Deaths				0.214		
Rocky Mountain Region Dummy		0.009 ***				
Southeast Region Dummy		-0.005 **	0.014 *		0.016 **	-0.034 **
	*Significance: *** 1 percent, ** 5 percent, * 10 percent*					
Observations	48	46	46	49	46	46
R-squared	0.6343	0.8458	0.7129	0.1945	0.498	0.5743
Adjusted R-Squared	0.6003	0.8072	0.6687	0.1595	0.449	0.5211
S.E. of regression	0.0104	0.0045	0.0224	0.0304	0.0201	0.035
Mean dependent variable	0.0109	0.0014	-0.0953	0.0786	-0.0113	0.0583

During prosperous times our expectation was that rural *births* would be the dominant driver in overall rural small business growth, while during economic downturns we expected rural *deaths* to be the predominant factor in dictating growth. Using this perspective, an analysis of rural small business deaths is potentially more relevant and revealing when assessing rural small business growth.[29] The following discussion categorizes noteworthy observations from the regression results presented in Table III-1:

- **Population** − Both rural and urban population show up as significant explanatory variables in the cross-sectional regressions. Rural population is a significant explanatory variable in all but two of our six regression models, and maintains a positive sign. The positive sign is expected when measuring gross establishment growth and growth in business births, however, somewhat peculiar when measuring growth in rural small business deaths. We attribute this to population growth dynamics, where despite a general increase in business deaths due to the state of the economy, we continue to observe an increase in general population. The positive

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[29] Measuring the growth in rural births during 2000 to 2002 did not provide robust results. We only found one significant variable, change in rural labor force, but do not believe the results are sufficient to form any concrete conclusions concerning rural small business births during the economic recession.

sign on rural population for both time periods when measuring gross rural small businesses indicates that regardless of the state of the economy, population growth has a positive effect on rural small business growth.

Urban population growth has a negative correlation with rural small business growth, as it is a significant variable when measuring gross rural small businesses over the 2000-2002 period, and rural small business births over the 1997-1999 period. This implies that an increase in the urban population may cause an increase in urban small businesses at the expense of rural small businesses.

- **Rural Small Business Profitability** – Rural small business profitability, measured as Average Non-Farm Proprietors' Income (Adjusted to 2000 dollars), is significant with a negative coefficient when measuring gross small businesses and small business deaths, both in the 1997-1999 time period. The negative sign indicates that an increase in profitability actually *decreases* the level of growth in the gross number of rural small businesses, and *increases* the number of small business deaths. The latter is logical, in that as profitability decreases, more small businesses are forced to shut down. The negative relationship between small business profitability and gross small establishment growth, however, is less obvious. One potential explanation is that the growth of rural small businesses could outstrip the growth of non-farm proprietors' income. Either through dilution (new businesses sapping earnings) or lag structures (new businesses might not earn a profit in their first few years – even during economic prosperity) the negative relationship between small business growth and profitability can be posited.

- **Labor Force Dynamics** – Two aspects of labor force dynamics are significant explanatory variables within these models: The number of unemployed persons in rural areas is positive and significant when measuring the growth in rural small business deaths from 2000-2002 and the size of the rural labor force is positive and significant when measuring growth in rural small business births over the same time period. The positive sign on rural unemployment indicates that an increase in unemployment is correlated with an increase in small business deaths. This may simply be explained by a casual relationship that occurs between these two variables as a result of the struggling economy. The positive sign on the rural labor force when measuring rural small business births highlights an important point addressed by several of our interviewees: a pool of available workers is an important dynamic of determining the location of a new business. Thus small business births will increase in part as a result of an increase in the size of the labor force.

We also see that growth in urban jobs is negatively correlated with the growth in the gross number of rural small businesses in the 2000-2002 time period. Job availability is an important factor related to the labor force, in that the labor force is drawn to wherever jobs are available, particularly during a recessionary economic time period. This idea is substantiated as the negative correlation seen between *urban* job growth and *rural* small business growth indicates that particularly during struggling

economic times, rural small business growth will suffer at the expense of the rural labor force being drawn to the availability of jobs in urban areas.

- **Wages** – Earlier in this chapter, we discussed our uncertainty about the relationship between wages and rural small business growth. On one hand, lower wages might attract small businesses that are looking to lower costs. On the other hand, however, lower wages in rural areas might not draw the more educated workforce that seeks higher wages more often offered in urban areas. We see in these regressions that wages, whether included as a stand-alone measure or as the gap between rural and urban regions, is routinely significant at the tested levels. The analysis of the regressions leads us to ambiguous results. The positive sign on the urban-rural wage gap, when measuring growth in the gross number of establishments, indicates that as wages become comparatively lower in rural areas (i.e. an increase in the wage gap), there is growth in the gross number of establishments, regardless of the time period. However, the positive sign on the wage gap and the negative sign on urban wages, when measuring growth in rural small business deaths indicates the contrary: lower wages in rural areas lead to growth in the number of small business deaths. Thus the interpretation of the relationship between wages and small business growth remains somewhat ambiguous.

- **Quality of Life** – Our measure of "quality of life" here is measured by the level of natural amenities in both the rural and urban parts of the state. We expect that a high level of natural amenities in rural areas would be beneficial to rural small business growth, and that likewise, a high level of natural amenities in the state's urban areas would be unfavorable to rural small business growth. These theories are supported in five of six cases when the amenity indices are included in the model. The rural amenity index is positively correlated with growth in both the gross number of small businesses and the number of small business births. The urban amenity index is accordingly negatively correlated with these measures of small business growth and positively correlated with growth in the number of small business deaths over the 1997-1999 time period. Only in the 2000-2002 regressions when measuring growth in rural small business deaths is the sign on the amenity index (urban) contrary to what is expected. The negative sign there indicates a higher amenity index in the urban parts of the state correlates with a decrease in the growth in rural small business deaths. It must be noted, however, that this relationship occurs during the period of the recession, which may impair the ability to interpret the results accurately.

- **Urban Business Activity** – One of our original hypotheses was to determine what effect, if any, urban small business growth has on rural small business growth. The results of our regression analyses provide mixed results. When measuring growth in the gross number of rural small businesses, urban small business growth is a significant explanatory variable in each time period, however, with a negative correlation over the 1997-1999 time period, and a positive correlation over the 2000-2002 time period. When measuring growth in rural small business births, growth in urban small business births has a positive coefficient, indicating that when urban areas experience growth in small business births, so too do rural areas, taking into

account that this relationship occurs during a positive economic time period. Finally, we see that during the 2000-2002 time period growth in urban small business deaths is positively correlated with growth in rural small business births. This may be an indication that there will be positive growth in the number of rural small business births at the expense of urban areas losing businesses.

- **Regional Differences** – Finally, we examined whether regional differences have an effect on rural small business growth by including dummy variables to represent states in the different BEA regions. We subsequently found that both the Southeast and Rocky Mountain Region dummy variables were significant explanatory variables. The Rocky Mountain Region dummy was positively correlated with growth in the gross number of rural small businesses over the 2000-2002 time period, meaning that small business growth was higher in the Rocky Mountain region than other states, an indication that rural areas in these states might have weathered the economic downturn better than others. In the same regression, we find that the Southeast Region has a negative sign indicating the possibility that states in the Southeast Region were hit harder by the recession. The Southeast Region dummy variable is significant in regressions measuring growth in both rural small business births and deaths as well. However, the differing signs on the coefficients confuse the interpretation of these variables. The repeated significance of the Southeast Region dummy variable may simply be an indication of a high level business turnover in these states over the 1997-2002 time period.

Analysis of the relative differences of the 1997-1999 and 2000-2002 regression results indicates that economic conditions play a role in determining the factors that influence the growth of rural small businesses, particularly during poor economic times. Although there are some similarities between the models, for the most part, we observe different variables that are significant in explaining the growth of rural small businesses. This indicates that under different economic conditions we expect significant changes in how rural small business growth reacts to changes in the urban environment.

Panel Data Analysis at the National Level

To further support our conclusions, we used another method, panel data analysis,[30] to measure changes in rural small business growth in the United States. To perform such analysis, we developed a data set which contained six years of economic and demographic data for each of 49 states[31] covering the 1997-2002 time periods. Each state contributed six observations, giving us a grand total of 294 possible observations. The panel data regressions take the following form:

$$LN(Y_{it}) = C + \beta_1 LN(I_{it}) + \beta_2 LN(I_{2it}) + \ldots + \beta_n LN(I_{nit})$$
$$\text{for } i = 1, 2, \ldots, N \text{ and } t = 1, 2, \ldots, T$$

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[30] Panel data analysis involves regressing variables across both cross-sectional and temporal components. It allows one to perform time-series analysis on multiple sets of data (cross-sections). We primarily relied upon the constant coefficients model for our panel analysis.
[31] Recall that New Jersey, which is entirely urban, is excluded from the analysis.

where:

Y   =   Number of Rural Small Establishments
C   =   Regression Constant
β   =   Variable Coefficients
I   =   Independent Variables
i   =   Number of Cross-Sectional Observations (49)
T   =   Number of Time Periods (6)
n   =   Number of Independent Variables to Test in Regression Equation

        Initial panel regression testing involved confirming our original hypothesis that population would have a significant, positive effect on small business growth. Regression results demonstrated that changes in population explain a large portion of the variation in the number of rural small establishments, with an R² of .77. This is entirely consistent with our previous non-panel regression results involving comparison of population change and rural small business growth.[32] We performed panel regressions using rural establishments per capita as the dependent variable. Table III-2 presents the results from our best model.

Table III-2
National Level Panel Data Regression Analysis Measuring Changes in the Number of
Rural Small Businesses: 1997-2002

Independent Variable	Coefficient	Significance
C	-1.885	
LN(Rural Labor Force Per 1000 Pop.)	0.994	***
LN(Rural Per Capita Income)	0.884	***
LN(Rural Diploma Recipients Per 1000 Pop.)	0.468	***
LN(Rural Real Wages)	-0.765	***
LN(Real Urban Avg. Non-Farm Proprietors' Income)	-0.183	***
LN(Urban Establishments Per 1000 Pop.)	0.486	***
LN(Urban Jobs Per 1000 Pop.)	-0.501	***
Rocky Mountain Region	-0.117	***
Included observations	6	
Number of cross-sections used	47	
Total panel (balanced) observations	279	
R-squared	0.9120	
Adjusted R-squared	0.9094	
S.E. of regression	0.1322	
Mean dependent var	3.1640	

*Significance: *** 1 percent, ** 5 percent, * 10 percent*

        The results indicate that the size of the rural labor force, on a modified per capita basis, explains a large percentage of the variation in the number of rural small establishments. The

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[32] We accept these results with a measure of hesitancy. There is an inherent bias in the panel equation, as by nature, larger states will have larger populations, and in turn a greater number of rural establishments. We were able to eliminate this concern in our cross-section analysis by essentially "normalizing" the data through the use of a percent change (annual average growth rate). In this case, we adjusted our data such that all variables that were not already measured on a "per unit" basis were normalized by representing them on a per capita basis

positive coefficient implies that the larger the work force in rural areas, the more likely that small establishments will be willing to locate there. Dr. Edward Malecki, director of the Center for Urban and Regional Analysis, stated that, "as a rule of thumb, a business is better off in urban areas because of increased labor force and supplies."[33] We note that an increase in the labor force is a significant factor in generating rural small business growth, either through the formation of new businesses or relocation of existing businesses in urban areas.

Several economic variables, including rural per capita personal income, rural wages, and urban non-farm proprietors' income were all significant at the 1 percent level. We originally hypothesized that the level of wealth in a community would be a strong indicator of the number of businesses in that community. Businesses need people with the means to buy their products, thus we theorized that an increase in the per capita income of rural areas would create an increase in the number of small businesses, due to the increased buying power of the population. The regression results confirm our hypotheses as positive changes in per capita income lead to positive changes in the number of rural small businesses. The negative sign on the rural wage variable is consistent with previous regression results and indicates that a decreasing wage rate in rural areas will coincide with an increase in the total number of small businesses in rural areas.

We tested several educational variables and found that the growth in rural high school diploma recipients[34] was positive and significant at the 1 percent level. Increases in the number of diploma recipients per capita indicate an increasing graduation rate, as opposed to strictly observing an increasing number of graduates. Dr. Deborah Markley, Co-director of the Rural Policy Research Institute (RUPRI) Center for Rural Entrepreneurship, stated that "a primary issue in rural areas is that the best and the brightest are leaving, because there aren't opportunities. This means that there is not really a labor force for businesses that need highly skilled workers."[35]

Change in urban average non-farm proprietors' income using 2000 dollars, a proxy for small business profitability in urban areas, is significant at the 1 percent level with a negative sign on the coefficient. This implies that when small business profitability is up in urban areas, we expect a decrease in the change in the number of rural small businesses.   In this case, urban small businesses take advantage of having greater access to resources, infrastructure and supplies, as well as an educated labor force. One distinct advantage that urban areas have over rural areas is easier access to resources, particularly an educated labor force. An educated labor force is more necessary in the types of businesses that are likely to locate in urban areas as opposed to rural areas. According to Dr. Markley, high-tech industries are one such example, as the infrastructure and labor force in rural areas fail to accommodate these businesses.

Change in urban small establishments is positive and significant at the 1 percent level. The positive coefficient implies that when there is an increase in the number of urban establishments, there will be a corresponding increase in the number of rural establishments.

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[33] IIC, Inc. conducted a telephone interview with Dr. Malecki in May 2005, at which time he was the director of the Center for Urban and Regional Analysis.

[34] The number of high school diploma recipients in rural areas (per 1000 population) is only a proxy for the level of education in a particular community. We feel that it is an adequate way of measuring an increase in the number of educated people in the rural labor force.

[35] IIC, Inc. conducted a telephone interview with Dr. Markley in May 2005.

This may indicate general economic conditions, such that when the business environment is positive in urban areas, it spills over to rural areas. Likewise, when urban small businesses struggle, so do small businesses in rural areas.

We expect that as more jobs are available in urban areas, more people from rural areas, particularly those with an education would flock to urban areas, diminishing the labor force in rural areas. The panel regression results confirm this hypothesis, as the change in the number of urban jobs per 1000 population has a negative coefficient, and is significant at the 1 percent level.

Finally, we tested each of our regional dummy variables in the model. Only the Rocky Mountain region was significant at the tested levels, as it is significant at the 1 percent level with a negative coefficient. This implies that the number of rural small establishments per 1000 population is generally lower in the Rocky Mountain region states than in all other states (other things being equal).

Based on the success of our panel data regression analysis in measuring changes in the number of rural small establishments, we looked to replicate the analysis by using panel data to measure changes in the two components that make up the gross number of establishments: establishment births and establishment deaths. Rather than run regressions on each of these variables individually, however, we performed an analysis that uses business turnover in general, measured by the small business replacement rate.[36] Table III-3 presents replacement rates by region.

Table III-3
Small Business Replacement Rate by Region

Year	Far West	Great Lakes	Mideast	New England	Plains	Rocky Mountain	Southeast	Southwest
1997	118.43%	122.31%	123.48%	128.30%	119.70%	128.94%	120.85%	116.87%
1998	103.80%	101.51%	100.84%	104.97%	102.52%	118.02%	102.36%	102.26%
1999	104.49%	99.66%	103.01%	121.90%	97.48%	114.99%	101.49%	94.11%
2000	102.44%	100.34%	102.95%	111.51%	96.25%	113.94%	95.28%	92.93%
2001	109.89%	94.78%	104.77%	102.84%	98.09%	113.56%	96.89%	101.62%
2002	103.39%	95.08%	103.66%	106.69%	103.94%	110.24%	102.49%	105.85%
1997-2002 Total	107.07%	102.15%	106.47%	112.27%	103.10%	116.42%	103.21%	102.33%

Replacement Rate Calculated as the Region's Number of Rural Small Establishment Births divided by the Region's Number of Rural Small Establishment Deaths in a given year. The 1997-2002 Total is the total number of births divided by the total number of deaths over the entire time period.

Our regression results using rural replacement rate tend to confirm the results we observed previously in both panel and growth rate analyses. The rural amenity index, rural labor force, real gross state product, and urban small business replacement rate were all significant, explanatory variables in the replacement rate regressions. Each variable was positively related to the change in rural small business replacement rate. In addition, we tested each of our regional dummy variables in our model. Our results found that the dummy variable for the New

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[36] The replacement rate is determined by taking the total number of small establishment births and dividing it by the number of small establishment deaths. If the replacement rate is greater than one, new businesses are forming at a greater rate than those going out of business.

England Region States, which is positive and significant at the 1 percent level, added the most explanatory power to the model.

Panel Data Analysis of Profitability

The proposed research focused on rural small business growth and profitability. We elected to perform a series of regressions using panel data with rural average non-farm proprietors' income as our dependent variable. It is important to note this variable is independent of the number of non-farm proprietorships and its use is intended to investigate the change in profitability of all rural small businesses, as opposed to the growth in number. Table III-4 shows our panel data regression analysis using rural average non-farm proprietors' income (adjusted to 2000 dollars) as the dependent variable, with our best model explaining only 42 percent of the variation in the dependent variable.

The number of rural establishment births (per 1000 population) is included as an independent variable. Although by itself it does not explain much of the variation in the dependent variable, it remains consistently significant at the 1 percent level. The negative sign on the coefficient is somewhat expected, as with a greater number of new small businesses, the average income of all small businesses would likely decrease due to the lower income levels of start-up businesses.

We tested the significance of Real Farm Proprietors' Income (per 1000 population). The inclusion of this variable, which is significant at the 1 percent level, causes a relatively significant increase in the model's explanatory power. Farm Proprietors' Income is intended to represent the general dependence on farming, as well as the success of the farm economy within the particular state's rural areas. The negative sign on the coefficient indicates that when the farm economy is doing well or there is a larger dependence on the farm economy, non-farm institutions do not do as well. We found this conclusion a little puzzling, as we expected that when the farm economy performs well, associated rural small businesses would benefit.

Rural Per Capita Income (adjusted to 2000 dollars), a measure of the relative wealth of an area, is significant at the 1 percent level. The level of wealth in a particular area would presumably increase the profitability of the businesses in that area because of the increased spending power of the population. The positive sign on the Per Capita Income coefficient affirmed this presumption. Furthermore, the inclusion of this variable causes another significant increase in the overall explanatory power of the model.

Table III-4
National Level Panel Data Regression Analysis Measuring Changes Rural Small Business
Profitability: 1997-2002

Indpendent Variable	Coefficient	Significance
C	7.112	
LN(Rural Establishment Births Per 1000 Pop.)	-0.137	***
LN(Real Rural Farm Proprietors' Income Per 1000 Pop.)	-0.020	***
LN(Real Rural Per Capita Income)	0.458	***
LN(Real Urban Avg. Non-Farm Proprietors' Income)	0.278	***
LN(Real Urban Wages)	-0.447	***
Real Gross State Product	0.739	***
Great Lakes Region Dummy	-0.064	**
Southeast Region Dummy	0.049	**
Included observations	6	
Number of cross-sections used	47	
Total panel (balanced) observations	262	
R-squared	0.4385	
Adjusted R-squared	0.4207	
S.E. of regression	0.1125	
Mean dependent var	9.6692	
*Significance: *** 1 percent, ** 5 percent, * 10 percent*		

We added urban average non-farm proprietors' income (adjusted to 2000 dollars), a measure of urban small business profitability. Previous models established relationships between urban and rural areas, and business conditions in rural areas seem to follow the conditions in urban areas. In this model, urban small business profitability is positively correlated with rural small business profitability. Again, we see that success in urban small business will spill over to success in rural small business, in this case, in terms of the profitability of small businesses.

The change in urban wage levels is significant at the 1 percent level, and adds additional explanatory power to the model. The interpretation of the negative sign on the coefficient is somewhat ambiguous. We found earlier that higher wages in urban areas actually coincided with an increase in the gross number of small businesses in rural areas. This was most likely due to the availability of cheap labor in rural areas. However, here we see that an increase in the level of wages in urban areas actually leads to a decrease in rural small business profitability. One explanation here is that higher wages in urban areas might draw the more skilled, educated workers out of rural areas. This might decrease the productivity of these rural businesses, as they rely on less skilled workers, thus decreasing their profitability.

We also included the state's real Gross State Product, which acts as a proxy for the general condition of the state's economy. The Gross State Product is significant at the 1 percent level with a positive coefficient. Not surprisingly, this indicates that the profitability of rural small businesses is unconditionally tied to the state of the economy. When the economy is healthy, rural small businesses will experience a higher level of profitability. Likewise, during

times of economic decline, rural small business profitability will face decreasing levels of profitability.

Finally, we added regional dummy variables to the model. In this case, both the Great Lakes[37] and Southeast region dummy variables are significant at the tested levels. The negative sign on the Great Lakes region indicates that states in the Great Lakes region experienced lower overall levels of rural small business profitability over the 1997 to 2002 time period. In contrast, the positive sign on the Southeast Region dummy variable suggests that states in the Southeast Region collectively experienced higher levels of profitability than states in other regions over the same time period.

The national regression analyses provided us valuable insight into many of the factors that contribute to rural small business growth and profitability. From a policy standpoint, we have yet to address the different programs and initiatives that exist to help rural small businesses. We found that the most useful information concerning rural policy existed not at the national level, rather at the state and local level. As a result, we extended our national analysis to several different states, with the intention of examining specific rural policy issues in greater detail. In the next chapter, we summarize our findings from the state-level investigation.

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[37] Great Lakes Region states include Illinois, Indiana, Michigan, Ohio and Wisconsin. Southeast Region states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

Chapter IV
Rural Policy Research at the State Level

This chapter summarizes the results and findings of our state-level analyses.[38] The primary purpose of the state analyses was to test our research hypotheses at a state level, and determine whether the conclusions reached at the national level (described in the previous chapter) can be supported at the state level. We addressed the following research topics at the state level:

- Our national regression results indicated a strong, positive correlation between population dynamics and changes in the number of rural small businesses. Do we observe this same trend at the state level?

- Several of the national regression models highlighted the importance of events or changes in the urban environment on corresponding rural areas. We were interested in whether urban variables explain observed trends in rural small business growth at the state level. Specifically, we tested how the urban-rural interrelationship changes based on variations between rural and urban population growth rates, wages, employment, etc., among different states.

- We employed the average non-farm proprietors' income as a proxy for small business profitability. However, the results we achieved at the national level were less than desirable in testing our hypotheses. We tested whether the use of non-farm proprietors' income is significant at the state level.

- State-level policy is an important aspect that is obscured when examining the national regression results. We were interested in investigating and summarizing state-specific rural development policies, initiatives, and programs and their possible application at the national level.

- Pending the availability of data, what is the efficacy of specific state-level rural policy initiatives and/or programs in explaining rural small business growth and profitability?

To address these research issues, we analyzed six states including a summary of the relevant demographic, economic, and business trends for each selected state, econometric analyses, summaries of key state policy aimed at assisting rural small businesses, and when appropriate, more detailed econometric analysis to test the impact of selected programs or initiatives. The following section describes our selection process for the states chosen for in-depth analysis.

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[38] The detailed case studies are contained in Appendix B.

State Selection Criteria

We used the following criteria in selecting states for further analysis:[39]

- Which states exhibited exceptional (either positive or negative) growth in rural small businesses? Which states exhibited the greatest growth differentials between urban and rural small businesses?

- Which states initiated significant policy initiatives aimed at assisting rural small businesses?

- Which states have had the largest demographic changes that may result in a positive/negative impact on rural small businesses? In particular, do we observe net population loss in rural areas in any specific states?

- Which states have rural development councils or rural organizations that can provide data and input into the regression models?

- Which states have additional data sources sufficient to perform econometric analyses?

We isolated states that exhibited significant rural small business growth or decline and interesting changes in rural and urban employment.[40] We obtained population, employment, and wage data from the BEA to narrow down our potential pool of states. The next step in the selection process was to perform a cursory investigation into rural organizations, state data sources, and state policies that might assist and enhance the relevance of our investigation. Finally, we attempted to include states that represented a geographic cross-section of the United States. Our search process led us to select six states to help answer our research questions. The six states, including the primary reasons for inclusion, are:

- *Kentucky* – Kentucky, located in the Southeast Region, exhibited small business growth (number of establishments) consistent with the U.S. average. We observed similar trends in rural and urban business and demographic trends, and Kentucky had a significant number of rural *and* urban small businesses. Finally, Kentucky has implemented several programs aimed at assisting rural economic development.

- *Maine* – Maine, based in the Northeast, was selected as a result of our review of business trends associated with the growth of small businesses and employment. Unlike the majority of the country, Maine exhibited a net gain in employment in 2001, despite the economic downturn. In addition, Maine experienced a 1.55 percent average annual growth rate in the number of rural small businesses

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[39] Given the significance of certain regional variables we thought it prudent to include a geographically diverse set of states, as opposed to selecting all states from one region (e.g., Southeast).

[40] We obtained state-specific data on the number of establishments, births, deaths, and employment from the SBA Office of Advocacy.

between 1997 and 2002 ranking them in the top 10 in the nation for rural small business growth.

- *Nebraska* – Nebraska, located in the Great Plains, consists primarily of rural counties. Between 1997 and 2002, Nebraska experienced a net decline in the number of rural small businesses, commensurate with stagnant population growth and observed out-migration in several rural counties. Interestingly, unemployment rates in Nebraska were almost identical for rural and urban areas, and were significantly lower than U.S. averages. Finally, Nebraska has several organizations that specialize in assessing policy implications of rural development.

- *Nevada* – Nevada, located in the Far West, experienced tremendous *urban* population growth between 1988 and 2002, with little change in *rural* population over the same time period. Furthermore, there appeared to be very little rural economic development policy initiated over this time period, providing an opportunity to examine the welfare of rural small businesses in a state that focused on urban growth.

- *North Carolina* – North Carolina, located in the Southeast, was selected based on the explosive growth in both urban and rural regions during the 1990s. In particular, North Carolina was one state that had larger numbers of urban small establishments per capita than rural areas. North Carolina has several organizations that assist rural businesses and provide information on rural policy and economic development. Finally, the state has a very active data center, which provides disaggregated state data which are useful for econometric analysis.

- *Utah* – Utah, located in the Rocky Mountain region, was selected as a result of the SBA observation that it had experienced considerable growth in small businesses during the 1990s.[41] Indeed, Utah was one state that remained largely sheltered from the economic downturn that began in 2000, exhibiting increases in rural employment.

Overview of the Case Studies

We attempted to perform each case study based on a similar outline to allow cross-comparison between the different states. Generally, we first introduce each state by providing data collected concerning population growth, small business trends, wages, per capita income, and unemployment. From these data we can assess the different trends that differentiate each state, and provide information concerning some of the interesting aspects that might influence rural small business growth.

We address many of the research questions through modified regression analysis performed at the state level. However, we immediately encountered two major issues

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[41] http://www.sba.gov/advo/research/rs256tot.pdf (Camp, 2005.)

concerning the extension of the national cross-sectional and panel regression models at the state level. First, our cross-sectional units at the state level were counties, and we did not have detailed small business firm data broken out on a county level. As a result, we elected to employ the number of small establishments as a proxy, and obtained county-level data from the Census Bureau's County Business Patterns. Second, at the national level, each cross-sectional unit (states) had both urban and rural data. However, at the state level, our cross-sectional units were counties, which were entirely classified as either rural or urban. The inability to have both rural and urban data for each cross-sectional unit limited the usefulness of cross-sectional and longitudinal data analysis at the state level. In addressing these issues, we pursued several avenues, often employing different regression models for each state depending on the availability of the data. As a result we used:

- *Time-series regression models* – The use of time-series regression models offers the advantage that we are able to include both rural and urban variables, aggregated from county data at the state level. The main drawback of these models was multicollinearity among independent variables and the limited number of observations.[42]

- *Panel regression models* – Using this type of regression models allowed us to expand the number of observations and include county-level differences that are masked when aggregated to the state level. The primary disadvantage was the inability to examine the influence of urban effects due to the "rural" nature of the cross sections.

- *Modified longitudinal analysis* – In specific instances we modified the panel data by aggregating regions within a particular state, in essence, redefining the cross-sectional units. The advantage in this scenario is the ability to include both urban and rural data within each cross-section unit. However, this was only feasible in states with a large number of urban counties that were geographically dispersed throughout the state.

We performed regression analysis for each selected state, although many of the regression models differed in form and content. In almost every case, we found that changes in population were highly correlated with changes in the number of rural small establishments, mirroring the conclusions reached at the national level. As a result, in almost all cases, we elected to modify our dependent variable from number of rural small establishments to number of rural small establishments per capita. Similarly, most economic and other demographic variables were normalized to account for population dependence by placing them on a per-capita basis.

The state regression models were informative in isolating relevant factors and variables that help explain changes in rural small business growth. Of equal importance was our investigation of the existing policies in effect to help rural small business growth. For each state, we summarize and discuss the different policies, initiatives, programs, or resources available at

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[42] These issues were similar to the ones encountered in the national regressions, leading us to investigate cross-sectional and panel regression analysis.

the local level. For several states, we performed additional econometric analyses designed to test whether certain policies or resources were in fact beneficial for rural small businesses. However, in almost all cases, we observed that many of the programs and initiatives were relatively new and tangible results had yet to be realized.[43] Detailed regression results for each individual state are presented in the state case studies, attached as Appendix B.

Results of State Case Studies

We compiled state-specific data to modify our national regression models, test our hypotheses on a state level, and develop our state case studies. The following represent important conclusions reached through our state level analyses:

- Regression results consistently supported the national-level observations that population growth and rural small business growth are positively correlated.[44]

- Regression results show a positive correlation between rural small business growth and economic variables. Positive significant relationships were observed for per-capita income (Kentucky, Nevada, North Carolina, Utah), wage levels per capita (Maine), or annual payroll per capita (Nebraska). These results confirmed our national observations that increases in measures of rural wealth led to increases in the number of rural small businesses.

- Education was a significant explanatory variable in assessing the growth of rural small businesses. In Kentucky, Nebraska, Nevada, and Utah, education variables related to high school diploma recipients and student-teacher ratios were included in panel regressions. As the number of high school recipients grew, so did the number of rural small businesses.

- Employment trends were also influential in explaining the variability in rural small business growth. We observed that unemployment rates were significant in Nebraska, Nevada, and North Carolina. Interestingly, we observed a positive correlation between unemployment and rural small business growth in Nebraska. We expected a negative sign on the coefficient, which it was for Nevada and North Carolina.[45] We also observed a positive correlation between the growth in the labor force and the growth in the number of rural small businesses. This

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[43] The lack of tangible results from many of these new programs was somewhat hindered by the availability of data. Our analyses relied upon data only through 2002, which represented the most recent data on the number of small businesses available from the SBA and Census Bureau.

[44] As a result, we performed the majority of state panel regressions using variables adjusted to a per-capita basis.

[45] There are several reasons why the coefficient could be positive for Nebraska. It is conceivable that addition of unemployed workers comes from large business. Perhaps these employees find themselves starting new businesses or relocating to areas with greater job prospects. Indeed, we have consistently seen a population shift to urban regions in Nebraska (rural population loss). As the unemployment rate increases, if a population shift were to occur, it is possible that the number of small rural establishments per capita will *increase* as a result of the decrease in population.

underscores the importance of small businesses to rural communities in terms of job creation.

- We found several explanatory variables were specific to particular states. North Carolina provided data on primary care physicians by county, which allowed us to conclude that a positive change in the number of rural primary care physicians per capita is a significant variable in the growth of rural small businesses in North Carolina. Likewise, we observed positive, significant relationships involving rural small business growth and the growth in international immigrants (Maine), per-capita public school expenditures (North Carolina), crime index (North Carolina) and state and local payments to non-profit institutions for education assistance and for employment and training (Kentucky). Equally as important, we did not observe statistically significant relationships with other variables at the state level, including economic development expenditures (North Carolina) and agricultural production (Nebraska).

- Rural development organizations contribute to the growth and health of rural small businesses. They provide services including education, training, networking, and in some cases, access to business capital. Existence of rural development organizations and policy initiatives were statistically significant variables in helping rural small business growth.

- Technology, although difficult to quantify, was a primary issue for many states. A key focus of rural policy was how advances in technology need to be extended to rural communities.

- Entrepreneurship is a common theme among each state investigated. This includes the extension of "entrepreneurship" training to the educational system, including to grades K-12. Almost every interviewee cited the importance of entrepreneurship in rural small business growth.

Chapter V
Conclusions and Policy Implications

This study has analyzed rural small business growth and profitability. Through a literature review, econometric analysis at both the national and state level, and interviews with rural research and policy personnel, we have been able to isolate significant factors that influence rural small business growth and profitability. Our research has led us to the following conclusions and policy recommendations:

- A positive relationship exists between rural population growth and change in the number of rural small businesses. As population increases, we expect the number of rural small businesses to increase. Policymakers should focus on making rural areas more attractive places to live and improve infrastructure, increase health care access, and take advantage of natural amenities. Dr. Edward Malecki, the Center for Urban and Regional Analysis, adds that consumer quality of life in terms of the availability of amenities such as shopping and restaurants, is just as important as quality of life related to natural amenities.

- One of the key issues facing rural communities is how to retain the younger, more educated population. Every interviewee noted the tendency for the younger population to leave rural areas, often for college or other opportunities, and not return. There is a perception that rural areas "do not have anything to offer" the younger population. As a result, rural small business development suffers. Jeff Reynolds (Rural Enterprise Assistance Program), Deborah Markley (Rural Policy Research Institute Center for Rural Entrepreneurship) and Jon Bailey (Center for Rural Affairs) each noted the importance of teaching entrepreneurship in rural elementary schools as an effective method for helping retain the educated rural population and develop rural small businesses.[46]

- The growth of rural small business is influenced by different factors during periods of different economic conditions. Between 1997 and 1999, we observed significant growth in the number of rural small businesses, influenced by demographic (population, education), economic (wages, employment), and quality (natural amenities) variables. During a recessionary period (2000 through 2002) we observed lower growth, and greater explanatory power was derived from economic variables as opposed to demographic variables. Increased efforts should focus on assisting rural small businesses in times of economic hardship. This can be achieved by continuing to educate rural small business owners, and refining their business models to handle different economic conditions.

- Rural policy initiatives are geared primarily toward specific topics or regions. This proves very effective when there are sufficient resources to help rural small

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[46] Dr. Malecki also noted the importance of elementary school education in maintaining the rural population. He noted that most young people feel they cannot make it in rural areas. There is an absence of role models, namely successful rural businesspeople, to help educate the younger generation.

businesses. For example, Jeff Reynolds, director of the Rural Enterprise Assistance Program (REAP), noted that by having REAP representatives located throughout Nebraska, rural small businesses were more likely to take advantage of available services. Bim Oliver (Rural Development arm of the Utah Governor's Office of Economic Development), suggests that this is particularly important in larger states, such as Utah, where the large distance between rural communities makes resource delivery difficult. Policy initiatives should cater to the different needs of different rural areas, even within the same state. This implies that local government should work with rural programs, such as REAP, and develop policy to address the unique needs of their particular area.

- Rural areas have difficulty attracting profitable, high-tech businesses, often because of a lack of an educated labor force and lack of infrastructure. Rural communities need to focus on building the infrastructure to support more technologically-advanced small businesses. Programs such as the Smart Sites Program in Utah, the Rural Innovation Act in Kentucky, and the Pine Tree Development Zone Program in Maine attempt to address this issue and bring more technologically-focused businesses to rural areas.

- The current focus in rural small business development involves helping the rural entrepreneur. Every interviewee noted the importance of entrepreneurship in helping rural small business development. Future research on rural entrepreneurship is warranted to assess the best ways rural entrepreneurship policy can be implemented to assist rural small businesses. One example is the recently started Kellogg Foundation Entrepreneurial Development System, which intends to assist rural small businesses in North Carolina by providing a networked system of rural small business services.[47]

- Elected government officials need to recognize the importance of rural small business development. Mr. Reynolds acknowledged that while the Nebraska legislature has made significant advances in recognizing the importance of microenterprises, more needs to be done on the federal level. He cites significant decreases in federal funding for microenterprise development. Ms. Michelle Hall (North Carolina Rural Economic Development Center) also noted that elected officials need to recognize the importance of entrepreneurship in rural North Carolina. She hopes that proposed "policy summits" will educate elected officials on the benefits of rural entrepreneurship policies and initiatives. The federal government needs to play a greater role in assisting rural small businesses by providing a greater level of leadership to help develop sustainable rural communities.

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[47] Michelle Hall, the project coordinator, cites a lack of knowledge on the part of rural entrepreneurs. They are unsure where to obtain different services, and by increasing communication between government agencies, rural organizations and other non-profits, these rural entrepreneurs will recognize the wealth of resources available in the rural marketplace.

- Rural development centers and non-profit organizations are vital components in rural small business development. Dr. Markley and Mr. Reynolds each cited the importance of small business development centers (SBDC). Local organizations need to modify operating strategy to increase the effectiveness of the services they provide. One of the key goals of the REAP program is to reach capacity with less staff. Indeed, the current North Carolina rural entrepreneurial development program headed by Ms. Hall is primarily geared to increase efficiency at the state-level in assisting rural small businesses.

- The relationships between urban and rural small businesses are mixed. Our quantitative results could not clearly delineate the impact urban trends had on rural small business growth and profitability. One primary issue we did not address in our econometric studies was the proximity of rural communities to urban areas. A second area of concern relates to policy initiatives that are intended to support all small businesses, but disproportionately help urban areas. Mr. Bailey noted Nebraska's Employment and Investment Growth Act, as an example of legislation that was intended to assist all of Nebraska, but the results indicate an overwhelming majority of benefits are going to urban businesses. Additional research is needed to gauge the urban-rural relationships, and discover ways to help rural communities bridge the widening gaps in several key economic variables, including the wage gap.

Appendix A
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Appendix B
Detailed Case Studies from Six States

Kentucky
Maine
Nebraska
Nevada
North Carolina
Utah

Kentucky[48]

The national-level regression analysis demonstrated that population plays a vital role in determining changes in the number of small businesses in rural areas. From 1988-2002, approximately 18 percent of the U.S. population lived in rural areas. Over that same time period, approximately 52 percent of Kentucky's population lived in rural areas,[49] making it an interesting subject for measuring rural small business trends. Kentucky's rural population increased at an average annual rate of 0.6 percent between 1988 and 2002. However, population in urban areas of the state increased at a slightly higher rate, resulting in a net decline in Kentucky's rural share of the population (Figure B-1). During the same time period, Kentucky's rural areas housed approximately 46 percent of the state's small businesses. Both rural and urban areas exhibited annual growth in the number of small businesses, however, urban areas' firm growth was slightly higher at a rate of 1.3 percent compared with a growth rate of only 1 percent in rural areas. As recently as the 1997 to 2000 time period, Kentucky's rural areas showed a steady increase in the number of small businesses, only to experience a decline in 2001 and 2002. Table B-1 provides information on recent small business trends specific to rural and urban areas of Kentucky. This includes establishment births and deaths, which accounted for a 103 percent replacement rate[50] in rural areas, slightly less than the 108 percent replacement rate in urban areas.

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[48] Maps created at http://monarch.tamu.edu/~maps2/

[49] For the purpose of this study, all but 21 of Kentucky's 120 counties have been classified as rural, based on U.S. Census Bureau definitions. Source: http://www.census.gov/datamap/fipslist/AllSt.txt

[50] The replacement rate is calculated as the number of establishment births divided by the number of establishment deaths.

Figure B-1

Kentucky Population: Rural vs. Urban
1988-2002

Table B-1
Recent Trends in Kentucky Rural Small Business

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Percent
Rural Establishments	31,166	31,747	31,785	31,853	31,497	31,466	0.19%	
Rural Establishment Births	4,066	3,541	3,391	3,161	3,060	3,598		103%
Rural Establishment Deaths	3,403	3,306	3,307	3,382	3,231	3,499		
Urban Establishments	35,342	36,348	36,426	36,477	36,420	36,425	0.60%	
Urban Establishment Births	4,851	3,914	3,848	3,733	3,873	4,093		108%
Urban Establishment Deaths	3,715	3,681	3,725	3,686	3,742	3,910		

Kentucky's rural demographic and socioeconomic profiles follow national trends, as rural per capita income and wage levels trail that of urban levels, and rural unemployment rates exceed those in urban areas. Figure B-2 below shows general wage levels in rural and urban areas, as well as the growing gap in the wage level. Since 1988, the wage gap has increased by 155 percent, a measure that is not advantageous in drawing a more educated labor force to rural areas. A younger, more educated population is attracted to the prospect of higher earning potential in urban areas, leaving rural areas with a less educated labor pool which might otherwise attract small business owners.[51] On the contrary, lower wage trends allow small business owners in rural areas to pay their workers less.

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[51] In 2000 nearly 23 percent of Kentucky's urban population (ages 25+) had obtained a bachelor's degree, compared to only 11.8 percent of the rural population (www.thinkkentucky.com).

Figure B-2

Kentucky Real Wages (2000 Dollars): Rural vs. Urban 1988-2002
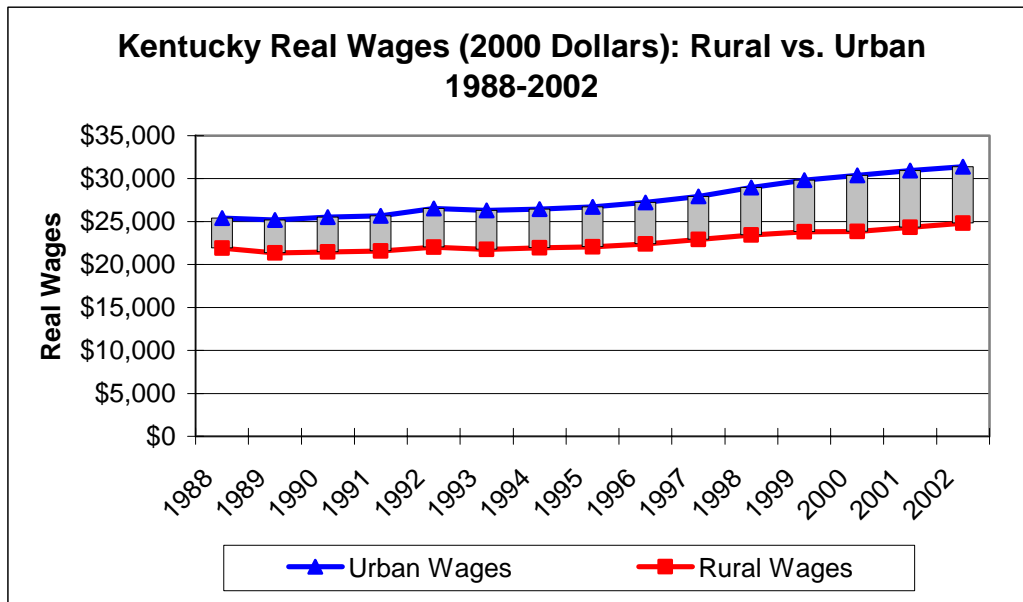
Kentucky showed similar trends when measuring rural and urban "wealth", as a growing gap existed in the level of per capita income in rural and urban areas over the 1988-2002 time period. The level of wealth in a community is a measure that is important to small business owners. A higher level of wealth increases the purchasing power of the population, thus lower levels of wealth in rural areas decreases the purchasing power in these areas, which make rural areas unattractive when determining the location of a small business. One must take into account, however, the cost of living, as it is usually much higher in urban areas, which can somewhat offset the gap in the level of wealth.

Figure B-3 presents unemployment rates for both rural and urban regions, as well as the unemployment rate for a 41-county area in Kentucky's eastern Appalachian region. As expected, unemployment is more prevalent in rural areas than urban areas. However, beginning in 1991, the state as a whole exhibited a decline in the unemployment rate through the end of the decade before it jumped up again in 2001 and 2002. The 41 counties in the eastern part of the state have been known for historically high levels of poverty and unemployment. The USDA has identified 43 Kentucky counties, nearly all of which are included in this 41-county area (all rural) as "persistent poverty counties," meaning that they have had poverty rates of 20 percent or higher in 1969, 1979, 1989, and 1999. Figure B-3 demonstrates the higher levels of unemployment found in this region compared to Kentucky's overall rural and urban unemployment rates.

Figure B-3

Kentucky Unemployment Rate
1990-2002

Legend: Urban, Rural, 41 Eastern/Appalachain Rural Counties
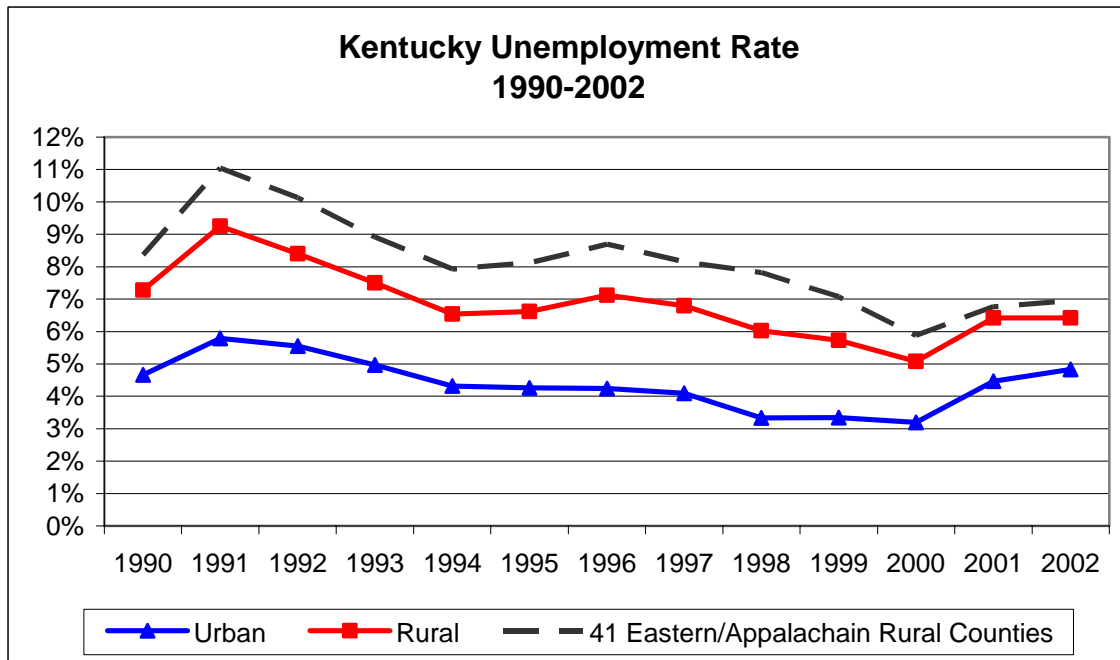
Regression Analysis

In order to better grasp which factors played the biggest role in measuring changes in growth and profitability in small, rural Kentucky businesses, we performed regression analyses, using both time-series and panel data. Unlike the national data where we had limited observations, with the state-specific regression we had 15 years of data (1988-2002) giving us a much better timeframe from which to run time-series data. However, we were still unable to generate useful results using time-series data. Much like the national time-series regressions we found that population was the overwhelming factor in determining changes in the number of small businesses in rural areas. In a simple time-series regression, we found that changes in population explained 94 percent in the variation in small establishments in rural areas. We therefore turned to a panel data analysis of Kentucky's rural counties. Using county-level data for Kentucky's rural counties, we were able to form a panel data set, giving us 1,485 observations (15 years x 99 rural counties).

After attempting several different variations of right-hand-side variables, our best model consisted of per capita income, the size of the educated labor force,[52] farm proprietors' income, the number of farm proprietors, state and local government payments,[53] and non-farm proprietors' income, each of which were measured in per capita (per 1000 population terms) in order to normalize for the size of the county. The results of the regression are shown in Table B-

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[52] The size of the educated labor force was derived by taking the percent of the population with a bachelor's degree and multiplying it by the size of the labor force. We had educational attainment data for 1990 and 2000, thus 1990 values were used for 1988-1995 observations, and 2000 values were used for 1996-2002 observations.

[53] Payments from state and local governments consist of state and local government payments to nonprofit institutions for education assistance and for employment and training.

2 below. Per capita income, a measure of the area's wealth, appears to be the biggest driver of change in the number of establishments, with a coefficient of 0.4367. The positive coefficient on farm proprietors' income indicates that when the farm economy is doing well, there is a higher level of growth in the number of small establishments. The negative coefficient on the number of farm proprietors indicates that the higher the concentration of farm proprietors, the fewer number of small businesses there will be in rural areas.. Finally, the negative coefficient on state and local government payments suggests that monetary support for education assistance and for employment and training increases as the number of small businesses decrease, indicating that the state is taking notice in the well-being of small business by providing these programs to improve the overall quality of the workforce.

Table B-2
Kentucky Rural County Regression Analysis

Dependent Variable: Log(Small Establishments) (Per 1000 Pop.) Method: Pooled Least Squares Sample: 1988 2002 Total panel (unbalanced) observations: 945	
Variable	**Coefficient**
C	-2.973 ***
LN(Population)	0.094 ***
LN(Per Capita Income)	0.437 ***
LN(Educated Labor Force) (Per 1000 Pop.)	0.190 ***
LN(Farm Proprietors' Income) (Per 1000 Pop.)	0.030 ***
LN(Number of Farm Proprietors) (Per 1000 Pop.)	-0.066 ***
LN(State & Local Government Pmts) (Per 1000 Pop.)	-0.183 ***
LN(Non-Farm Proprietors' Income) (Per 1000 Pop.)	0.104 ***
R-squared	0.5823
Adjusted R-squared	0.5792
S.E. of regression	0.1841
Mean dependent var	2.8312

*Significance: *** 1 percent, ** 5 Percent, * 10 Percent*

Program and Policy Analysis

There are several programs and initiatives that are aimed at improving quality of life in the rural areas of the state, which in turn can have a positive effect on the business climate in these areas. Such programs include Kentucky Rural Economic Development Act ("KREDA"), the Kentucky Tourism Development Act, the Rural Innovation Act, the Local Entrepreneurship Initiative Program, the Mountain Association for Community Economic Development ("MACED") and the Kentucky Center for Rural Development. KREDA, established in 1988, allows businesses in qualifying rural Kentucky counties that establish new manufacturing plants or expand existing manufacturing operations to receive a 100 percent tax credit against the Kentucky income tax liability on taxable income generated by the project.

The Tourism Development Act provides businesses with the ability to recover up to 25 percent of a project's development costs over a 10-year term for tourism attractions, such as

cultural or historical sites, recreation or entertainment facilities, areas of scenic beauty, entertainment destination centers, Kentucky crafts and products centers, theme restaurant destinations and certain lodging (including that in the 100 least populated Kentucky counties). As of June 2001, only four projects had qualified under the Act, but attempts have been made, in both 1998 and 2000, to bring more attention to the Act in rural areas, hopefully spurring development in these regions (Crowley 2001).

The Rural Innovation Program, part of the Innovation Act of 2000, is a funding program which provides vouchers to rural small companies to undertake research, development, and entrepreneurial innovation work in partnership with Kentucky post-secondary institutions, the Small Business Development Center Network in Kentucky, and other entities engaged in research and development work.

The Local Entrepreneurship Initiative Program was started in 2002 by the University of Kentucky Cooperative Extension Service (UK-CES). The program aims to assist communities in providing a supportive environment for existing and potential entrepreneurs. The program, which is being pilot tested in Kentucky's Green and Wolfe Counties, has both short-term and long-term objectives. The short-term objective consists of assisting existing entrepreneurs in hope that more small businesses will be able to survive through the initial, more critical years of business existence. The long-term goal of the program is to provide programs that can stimulate entrepreneurship in a community.[54]

MACED, a program that has been in place for more than 27 years, primarily serves counties in the Appalachian region of Kentucky. The MACED program aims at creating economic opportunity for the people of the region through the sustainable use of natural resources. This includes strengthening local entrepreneurs and homegrown businesses and empowerment of people and organizations so that they can improve their community. This is accomplished through technical assistance and lending, community development innovation, assistance and training, and advocating for public policies that provide support for strengthening local economies.

Finally, the Kentucky Center for Rural Development, a non-profit organization, opened in June of 1996 with the goal of "providing, promoting and supporting innovative and sustainable community development solutions" in Kentucky, particularly in the Eastern coalfields and Appalachian Mountain regions in the southeast part of the state. The Center serves a 42-county area[55] providing assistance in entrepreneurship, as well as economic development, environmental issues, tourism, commerce, and extension services. The Center's business and educational training programs are intended to help aspiring entrepreneurs realize business opportunities, facilitate the attainment of new employment for the unemployed, and assist the general workforce in achieving higher levels of technological skills. Each of these

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[54] For more information on this initiative, please visit: http://www.joe.org/joe/2003december/iw5.shtml

[55] The 42-county area includes the following counties: Adair, Bath, Bell, Breathitt, Casey, Clay, Clinton, Cumberland, Estill, Floyd, Garrard, Green, Harlan, Jackson, Jessamine, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lincoln, Magoffin, Martin, McCreary, Menifee, Metcalfe, Monroe, Morgan, Owsley, Perry, Pike, Pulaski, Rockcastle, Rowan, Russell, Taylor, Wayne, Whitley, and Wolfe.

areas of assistance focuses on preparing the people of rural Kentucky for the demands of today's economy and changing business environment.

Maine
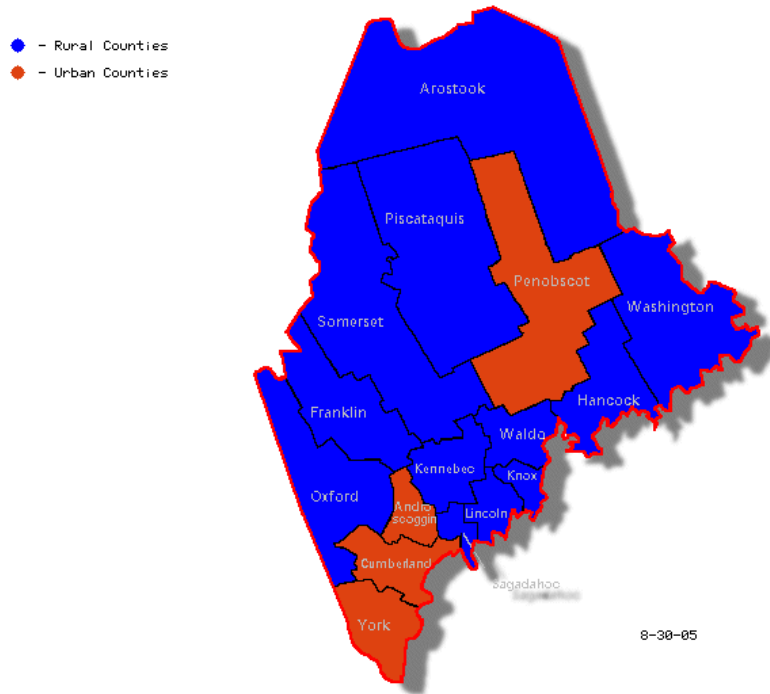
We selected Maine for several reasons, the most significant being the level of small business growth in the state between 1997 and 2002. This included both rural and urban regions, which experienced a 1.55 percent and 1.63 percent average annual growth rate, respectively, over that time period. Nationally, these growth rates were located in the top 10 compared with the other states. Keeping these factors in mind, we also thought Maine would be an interesting subject based on the layout of the state and the proportion of rural counties to urban counties. For the purpose of this study, only four of the state's 16 counties are urban, including three which are located in the southeast corner of the state.

Between 1988 and 2002, approximately 43 percent of Maine's population lived in rural areas, compared to the national average of only 18 percent. This means that well over half of Maine's population lived in the state's four urban-classified counties. During the 15-year span from 1988 to 2002, Maine's rural population increased at an average annual rate of 0.26 percent, while Maine's urban population increased at a rate of 0.73 percent, creating a slight net decline in Maine's rural share of the population (Figure B-4). Specifically, in 1988 Maine's rural population accounted for 43.5 percent of Maine's total population, compared to only 41.9 percent by 2002.

Figure B-4

Maine Population: Rural vs. Urban
1988-2002
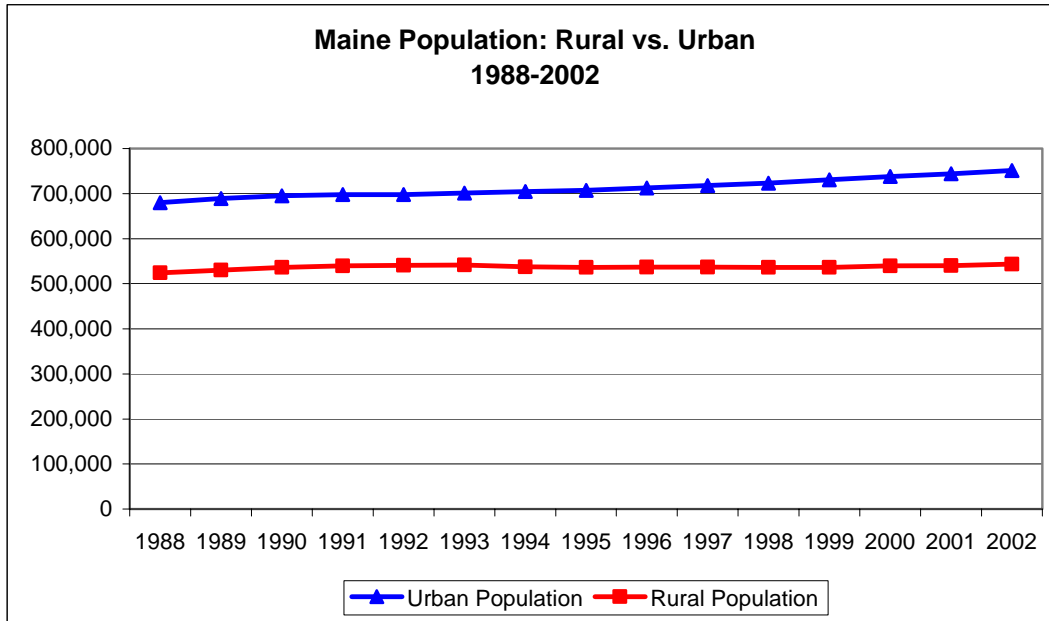
Beginning in 1988 and extending until 2002, small businesses in rural areas grew at 1 percent rate annually, while urban areas exhibited a 1.02 percent annual growth rate of its small businesses. In 1990 and 1991, both rural and urban business growth actually declined, coinciding with a national economic recession.[56] Maine's business climate has since rebounded, as recent data show a replacement rate of 115 percent in both rural and urban regions over the 1997 to 2002 time period. Maine's recent small business trends are outlined in Table B-3.

**Table B-3**
Maine's Recent Small Business Trends

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Rate
Rural Establishments	17,459	17,977	18,162	18,566	18,826	18,864	1.55%	
Rural Establishment Births	2,342	2,089	2,195	2,074	1,975	2,464		
Rural Establishment Deaths	1,825	1,882	1,708	1,790	1,972	2,268		115%
Rural Replacement Rate	128%	111%	129%	116%	100%	109%		
Urban Establishments	10,846	11,200	11,319	11,408	11,508	11,769	1.63%	
Urban Establishment Births	1,528	1,330	1,273	1,254	1,387	1,221		
Urban Establishment Deaths	1,181	1,127	1,141	1,105	1,115	1,291		115%
Urban Replacement Rate	129%	118%	112%	113%	124%	95%		

Maine's socioeconomic profile is consistent with national trends as both wage levels and per capita income in rural areas are consistently lower than those in urban areas, while the unemployment rate is higher in rural areas. In Figure B-5 below, Maine's average rural and urban real wages are presented, showing a constant increase in the wage gap between rural and urban areas between 1988 and 2002. In fact, the real wage gap increased by 40.8 percent from 1988 to 2002, which implies opposing ideas concerning the attractiveness of rural areas for growth. As we saw in the federal regressions, the widening wage gap could be advantageous in

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[56] In fact, Maine was hit particularly hard during that period, as real state gross product declined by 3.19 percent.

expanding rural small businesses due to reduced labor costs. However, on the other hand, the lure of a more lucrative salary in urban areas may drain rural areas of its educated workforce.

Figure B-5
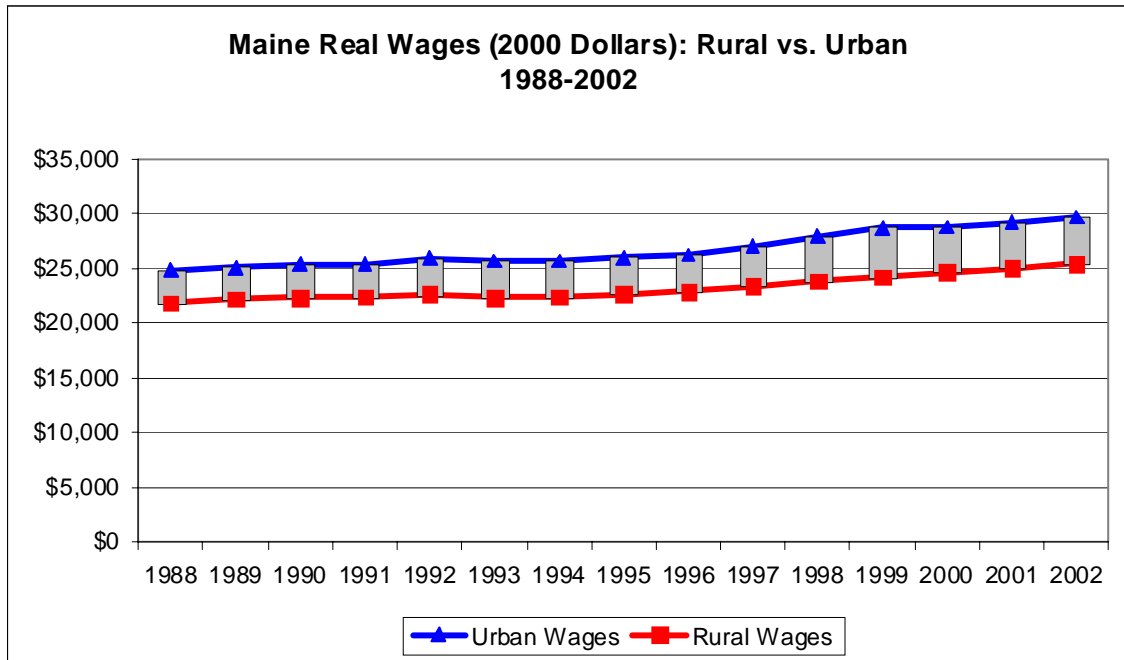
The state also experienced a substantial increase in wealth, measured as real per capita income, over the 1988 to 2002 time period in both rural and urban areas. However, this corresponded with an increasing gap in the level of wealth between rural and urban areas, with an increase of 14.6 percent over the 15 years. Despite the increase in the income gap, the overall increase in rural per capita income is likely an important determinant in getting businesses to locate in these areas. An increase in wealth, combined with an increase in population that we noted earlier, creates an increase in the purchasing power of rural communities, making them more attractive locations for small business owners.

Finally, in Figure B-6 we present Maine's unemployment rates for both rural and urban regions from 1990 to 2002. Unemployment rates are often tied to economic conditions, thus the trends we see here coincide with what would be expected, as the United States experienced economic hardship in both the early 1990s, and at the turn of the century. It is important to observe that the rural unemployment rate is consistently higher than the urban unemployment rate. From 1990 to 2002, the state's urban unemployment rate averaged 1.34 points less than that in rural areas.

Figure B-6

**Maine Unemployment Rates: Rural vs. Urban
1990-2002**
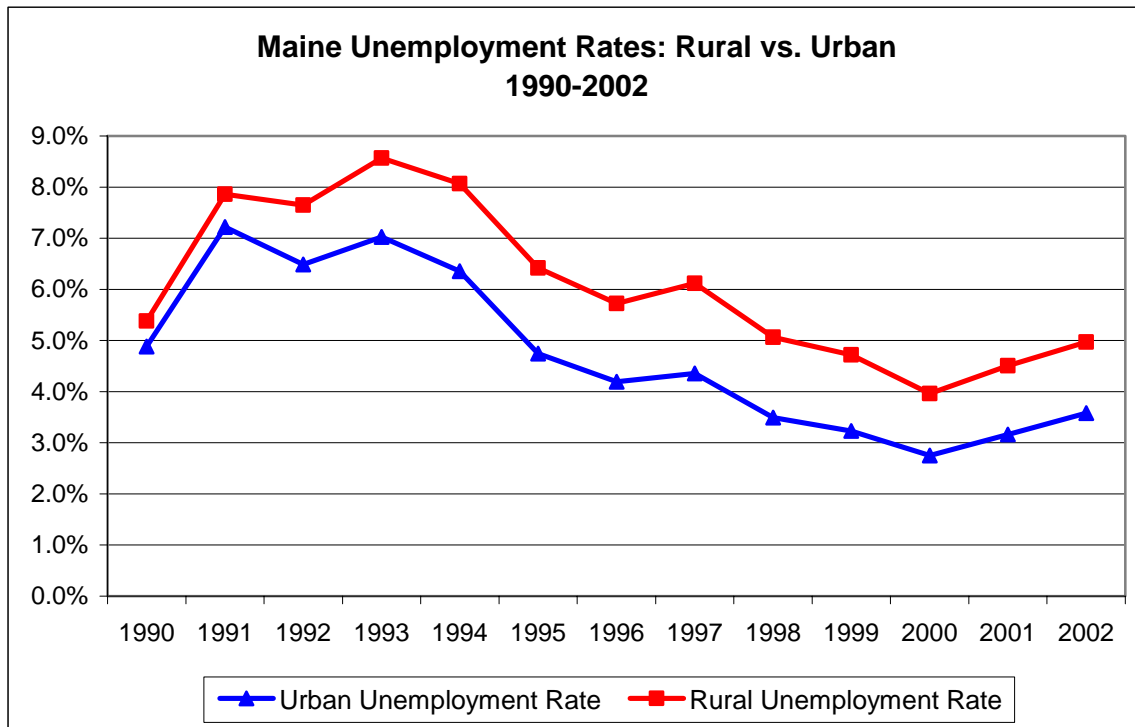
Regression Analysis

To determine the cause of changes in rural small business growth in Maine over the 1988 to 2002 time period, we performed regression analysis using the number of rural small establishments as our dependent variable. Our independent variables tested included each of the measures discussed above (population, wages, wealth and unemployment) as well as other measures, such as the size of the labor force, natural amenities, and poverty.[57] Time-series analysis proved unsuccessful, as the statistics of regression results indicated a high level of serial correlation in the models, which distorted the results.[58] We therefore turned to panel regression analysis, in which each rural county in the state made up a cross-section. The time period covered remained the same, although as certain variables were added to the model, such as the labor force (available only for 1990-2002) the total number of observations would decline due to missing observations. Nevertheless, we allowed ourselves a possibility of 180 observations (12 cross-sections x 15 years of data).

Based on our prior analysis at the federal level, we first tested population as the sole independent variable when measuring rural small business growth. We found at the federal level that population was a very powerful explanatory variable, which sometimes masked the effects

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[57] We collected data on the number of small establishments by county from the Census Bureau's County Business Patterns. We subsequently broke out rural and urban establishments based on the classification of the county as rural or urban. Other relevant data were collected from the Bureau of Economic Analysis, the National Center for Education Statistics, the Census Bureau, the Bureau of Labor Statistics, the Real Estate Center at Texas A&M University, and the Maine Department of Labor (Labor Market Information).

[58] This may have been due to a lack of a sufficient number of observations, as not all tested variables were available for the 1988 to 2002 time period.

of other factors that play a role in small business growth. This trend is consistent in Maine, as population by itself explains 85 percent in the variation of rural small business growth. Due to the overwhelming explanatory power of the population variable, we modeled our federal regressions, such that we put all variables on a per capita basis, including the number of small establishments which is subsequently measured as the number of small establishments per 1000 population.

Panel regression results using the number of rural small establishments per 1000 population for Maine's rural counties are shown in Table B-4 below.[59] Our best model includes the natural amenity index, the size of the labor force, the dollar value of food stamps issued (a measure of poverty), the wage level, and the number of new international immigrants as independent variables. These variables collectively explain 64 percent of the variation in the number of small businesses in Maine's rural counties.

The natural amenity index has a positive sign on the coefficient, indicating that Maine's rural counties with a higher natural amenity index showed greater levels of growth in the number of small businesses over the 1988-2002 time period. The natural amenity variable acts as a dummy variable to differentiate the attractiveness of each county (cross-section). This is consistent with what we found at the federal level, and confirmed in interviews with experts, that generally, business owners are more likely to locate in attractive locations.

Table B-4
Panel Regression Analysis of Maine's Rural Counties

Dependent Variable: LN(Small Establishments) (Per 1000 Pop.) Method: Pooled Least Squares Sample: 1988 2002	
Variable	**Coefficient**
C	8.874***
Amenity Index	0.044**
LN(Labor Force) (Per 1000 Pop.)	0.772***
LN(Real Food Stamps) (Per 1000 Pop.)	-0.377***
LN(Real Wages)	-0.857***
LN(International Immigrants) (Per 1000 Pop.)	0.044***
Total Panel Observations	107
R-squared	0.6572
Adjusted R-squared	0.6403
S.E. of regression	0.1307
Mean dependent var	3.3348

The size of the labor force is measured as the total number of people in the labor force per 1000 people in the county. Commensurate with what we found at the federal level, the size of the labor force adds significant explanatory power to the model, as the variable is significant at

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[59] Similar panel regressions using Non-Farm Proprietors' Income and Average Non-Farm Proprietors' Income as dependent variables to try and model Maine's rural small business profitability trends were unsuccessful, as none of our independent variables were significant at the tested levels, and no combination of independent variables (regardless of their individual significance) provided any explanatory power in the model.

the 1 percent level with a positive coefficient. The positive value on the coefficient indicates that as availability of workers increases in a given county, we expect a greater likelihood that new or expanding businesses will choose to locate there.

The per capita dollar value of food stamps variable acts as a proxy for the level of poverty in a given community. This variable is significant at the 1 percent level with a negative sign on the coefficient, implying that counties that an increase in the prevalence of poverty experienced a decline, or at least lower growth in the number of small businesses from 1988-2002. On the contrary, those counties that experienced a decrease in the level of poverty over this time period were more likely to see an increase in small business activity.

We observed in the national and state analyses that rural wages generally take on a negative coefficient when measuring rural small business growth. Maine follows this trend, as wages are negatively correlated with small business growth, with individual significance at the 1 percent level. The negative sign on the coefficient indicates that business growth is higher in areas with lower wages. In other words, new and expanding businesses are more likely to locate in areas where they can take advantage of cheap labor.

Finally, we included the per capita number of international immigrants to the model. The data were obtained from the Real Estate Center at Texas A&M University. In an interview with Dr. Edward Malecki, he stated that an increase in the number of foreigners will help keep rural small businesses afloat. This comes as a byproduct of getting jobs in larger businesses, such as meat packing plants that actively recruit immigrants. The new jobs create a demand for new services provided by small businesses. The results of our regression model provide support to this statement, as the variable is significant at the 5 percent level with a positive coefficient. This indicates that an increase in the number of immigrants creates growth in the number of small businesses in rural counties.

Programs and Policy Analysis

For the purpose of this project, we encountered a considerable number of development programs in Maine, many of which are focused on entrepreneurship. We reviewed the most applicable programs for the purpose of interpreting the effects of such economic development programs on small business growth and profitability in Maine's rural areas. However, it is important to recognize that many of these programs have only recently been implemented, and that it is difficult to both understand the direct effect of these programs and to anticipate their future influence.

As part of the state's focus on expanding entrepreneurship, Maine was one of six states[60] that took part in a study carried out by the Center for Rural Entrepreneurship, the Ewing Marion Kauffman Foundation, the National Rural Development Partnership, and the Nebraska Community Foundation. The study, appropriately called the *Rural Entrepreneurship Initiative,* was launched in 1999. The study consisted of providing assistance to the six states in the form of guidance and technical assistance in order to assess the state's overall climate for entrepreneurship, and to develop a strategy for implementing programs and policies that would

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[60] Other states included Colorado, Minnesota, Missouri, Texas and West Virginia.

be beneficial for rural entrepreneurs. As part of this project, the Maine Rural Development Council developed a "prototype" rural entrepreneurial community in addition to completing a study addressing the needs of entrepreneurs in rural parts of the state (W. K. Kellogg Foundation 2004).

As a byproduct of the study, the Kauffman Foundation formed a partnership with the Maine governor's office in late 2001. This partnership was aimed to develop a plan to strengthen the overall entrepreneurial environment across the state. Also stemming from the participation in the study was the development of the *Downeast Rural Entrepreneurship Initiative (DREI)* by the Maine Rural Development Council in 2001. This program is also focused on the implementation of an entrepreneurial development strategy in Maine.[61]

A third project, the *Entrepreneurship Working Group*, was developed in March 2000 through the Maine Department of Economic and Community Development. This group was also focused on improving the entrepreneurial climate in Maine, particularly attempting to determine how and where to strengthen the support infrastructure for entrepreneurship and small business development across the state. One way is to focus on entrepreneurial education in the public school system. Beginning in 2003, the state adopted a "K-16 Initiative" under the partnership with the Kauffman Foundation. The K-16 Initiative, which is focused on youth entrepreneurship, is developing a strategy to implement an entrepreneurial curriculum into Maine's K-16 education system.

Several other programs have been implemented across the state to benefit small businesses, including those in rural areas. The state provides several financing programs, including the Small Enterprise Growth Fund, and the Regional Economic Development Revolving Loan Program, each of which are designed specifically for small businesses, the Employment Tax Increment Financing (ETIF) Program, the Pine Tree Development Zones Program and Local Tax Increment Financing.

ETIF is a program which reimburses a company 30 percent, 50 percent, or 70 percent of its income tax withholding from new qualified employees, depending on the county's employment rate. Businesses are eligible if they have hired at least 15 (net) new employees within two years, and if these employees a) receive a wage greater than the average per capita income of that county, b) receive full health insurance[62], and c) are provided with a retirement plan. In addition, the company must also prove that it could not have undergone its expansion project without the aid of ETIF funding.

In a related program, the state of Maine created Pine Tree Development Zones (PTDZs) in 2003. These zones were first accepted in January 2004, and have been used to stimulate and reward economic development by supporting new and expanding businesses[63] throughout the

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[61] See Maine Rural Development Council (2002).
[62] Many employees of small businesses are not offered health insurance by employers. By encouraging small businesses to offer health insurance as a perquisite for program qualification, both employees and the employer receive incentives.
[63] Eligible businesses include those in one of seven technology sectors targeted by Maine: biotechnology, aquaculture and marine technology, composite materials technologies, environmental technology, advanced technologies for forestry and agriculture, information technology, and precision manufacturing technology.

economically distressed regions of Maine, many of which are located in rural areas.   There are eight "zones" across the state. Qualified businesses in these eight "zones" are assisted with a 100 percent state corporate income tax credit for the first five years, and a 50 percent credit for the following five years.   Other benefits of PTDZs include Employment Tax Increment Financing (ETIF) of 80 percent of new employees' state income tax withholding for ten years (beginning in 2004), and a 100 percent sales tax exemption for all building materials and tangible personal property, beginning in July 2005.

Finally, a project established through the USDA Fund for Rural America, was launched in 2001 by the University of Maine's Department of Resource Economics and Policy.[64]   The project was designed to gather consumer preferences and develop new networks that could benefit rural, independent grocery stores in Maine. The study found that Maine's rural grocery store owners and operators were most interested in gaining a better understanding of business management principles and related technical assistance that would help them better manage their business. As part of the program, researchers addressed the possibility that local food producers would be willing to partner with small, independent stores to provide them with new products. Small, independent grocery stores are generally forced to buy from wholesalers, compared with large grocery chains which can cut costs by purchasing directly from major food producers due to the sheer volume in large chains. By creating arrangements with local food producers, small, independent grocery stores have the opportunity to cut costs and create their own niche, by offering locally grown foods (McConnon et al. 2002).

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[64] For more information on the Fund for Rural America, please visit: www.mainesbdc.org/events/ffra/index.htm
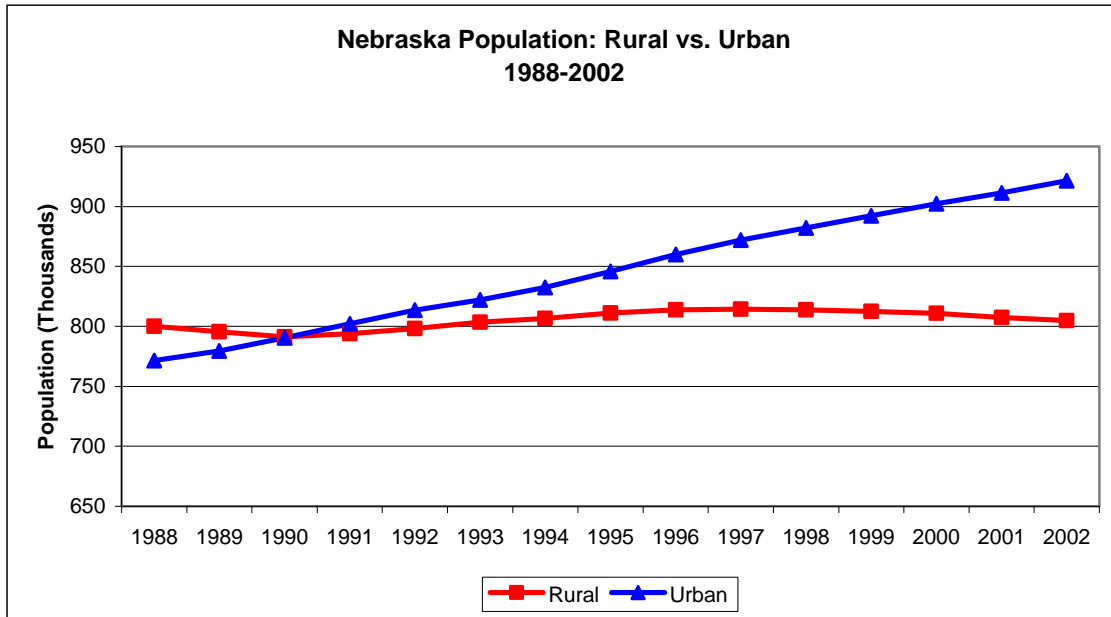
Nebraska
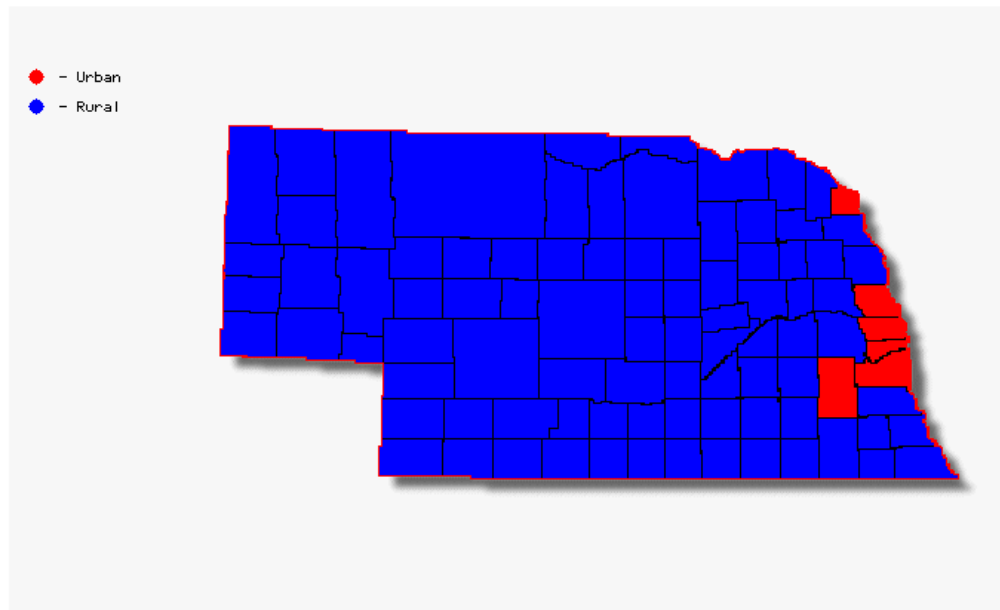
We elected to investigate Nebraska based on the state-level demographic and economic trends observed throughout the 1990s. In addition, the Nebraska Center for Rural Affairs proved to be a valuable resource in assessing rural small business trends and policy initiatives undertaken to assist these businesses. There are several important reasons we selected Nebraska as an interesting state warranting further investigation. Nebraska is located in the Great Plains region, where a vast majority of its landscape is classified as rural. For the purpose of this study, 87 of Nebraska's 93 counties are classified as rural, and only six are classified as urban.

Despite the vast amount of rural land, Nebraska experienced a population shift from rural to urban areas from the late 1980s through the present. Prior to 1990, the majority of Nebraska residents were located in rural areas (Figure B-7). However, between 1988 and 2002, the urban population exploded, growing nearly 20 percent, while aggregate change in the rural population was almost non-existent (0.61 percent growth). Indeed, the annual average growth rate of the urban population was 1.27 percent while the corresponding rural rate was only 0.04 percent. As Figure B-7 portrays, we observe a decline in the rural population between 1997 and 2002.

Figure B-7

Perhaps the most interesting observation is the population dynamic at the county level. *Two* out of every *three* Nebraska counties experienced a population decline between 1988 and 2002 Not surprisingly, the population declines occurred in rural counties. The national regression results imply a significant relationship between population and the number of small establishments. Given the atypical population trends of Nebraska we are particularly interested to see the impact on rural small establishments.

Trends in the number and formation of small businesses generally follow the observed population trends (Table B-5). The aggregate number of small rural firms actually declined between 1997 and 2002, while the corresponding number of small urban firms rose by nearly 1,000. Interestingly, rural areas experienced an almost level replacement rate[65] of 101 percent, compared with 115 percent for urban areas. This is not particularly surprising given the strong correlation between population and the number of establishments. As the rural population declines, there is a reduced pool of potential entrepreneurs or business owners to help offset small firm failures.

Table B-5
Recent Trends in Nebraska Small Business

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Percent
Rural Firms	20,202	20,561	20,442	20,259	20,163	20,168	-0.03%	
Rural Firm Births	2,149	1,753	1,635	1,627	1,822	1,911		101%
Rural Firm Deaths	1,815	1,810	1,791	1,704	1,755	1,946		
Urban Firms	17,464	17,929	17,865	17,995	18,289	18,412	1.06%	
Urban Firm Births	2,295	1,853	1,914	2,031	2,055	2,347		115%
Urban Firm Deaths	1,816	1,832	1,716	1,689	1,884	1,965		

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[65] The replacement rate is calculated as the number of establishment births divided by the number of establishment deaths.

Despite the population shift from rural to urban areas, we observe that the number of small rural firms still remains higher than the number of small urban firms. Furthermore, as the rural population has declined, the number of small businesses per capita has increased. This differs from what we normally expect, given that the number of small firms per capita is usually higher in urban areas, corresponding with the urban population growth. Other Nebraska rural demographic and socioeconomic profiles follow national trends, as rural per capita income and wage levels trail that of urban levels, and rural unemployment rates exceed those in urban areas. Figure B-8 shows general wage levels in rural and urban areas, as well as the growing gap in the wage level. Since 1988, the wage gap has increased by 34 percent, a measure that is not advantageous in drawing the labor force to rural areas. A younger, more educated population is attracted to the prospect of higher earning potential in urban areas, leaving rural areas with a less educated labor pool which might otherwise attract small business owners.
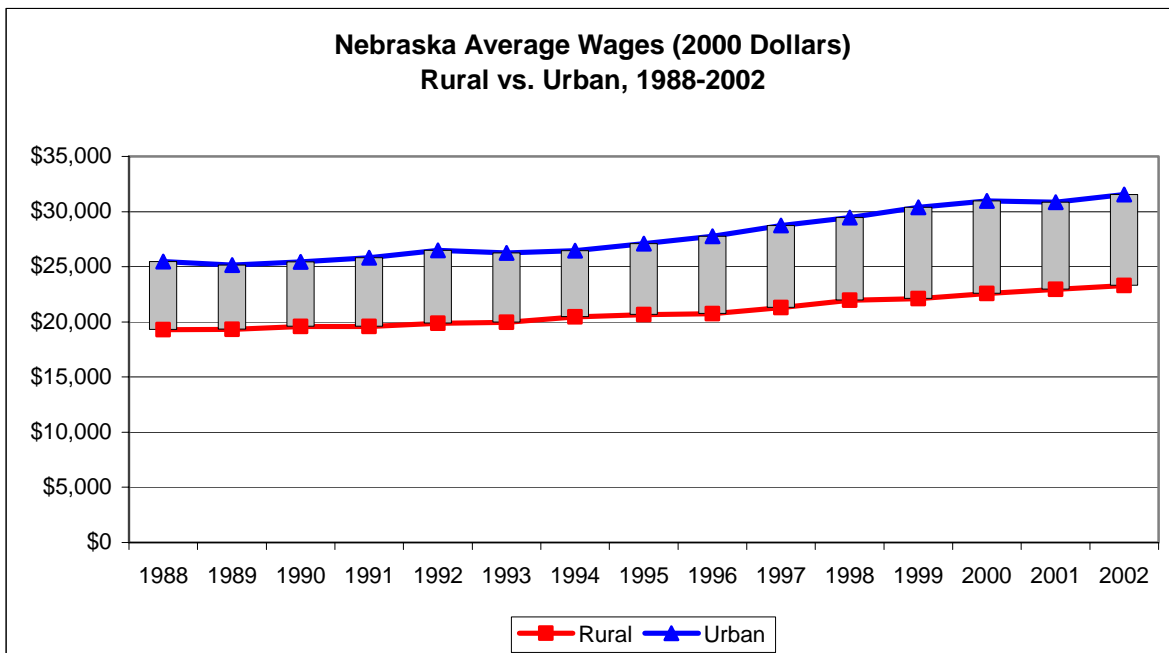
Figure B-8

Figure B-9 presents unemployment rates for both rural and urban regions of Nebraska and the United States. Nebraska is somewhat unique in that (1) the unemployment rates for both rural and urban areas are significantly lower than the U.S. averages over the same time period, (2) that the Nebraska unemployment rates do not trend with the U.S. averages, and (3) there is relatively little difference between the unemployment rates for the rural and urban regions. In certain years the urban unemployment rate actually exceeds the rural unemployment rate.
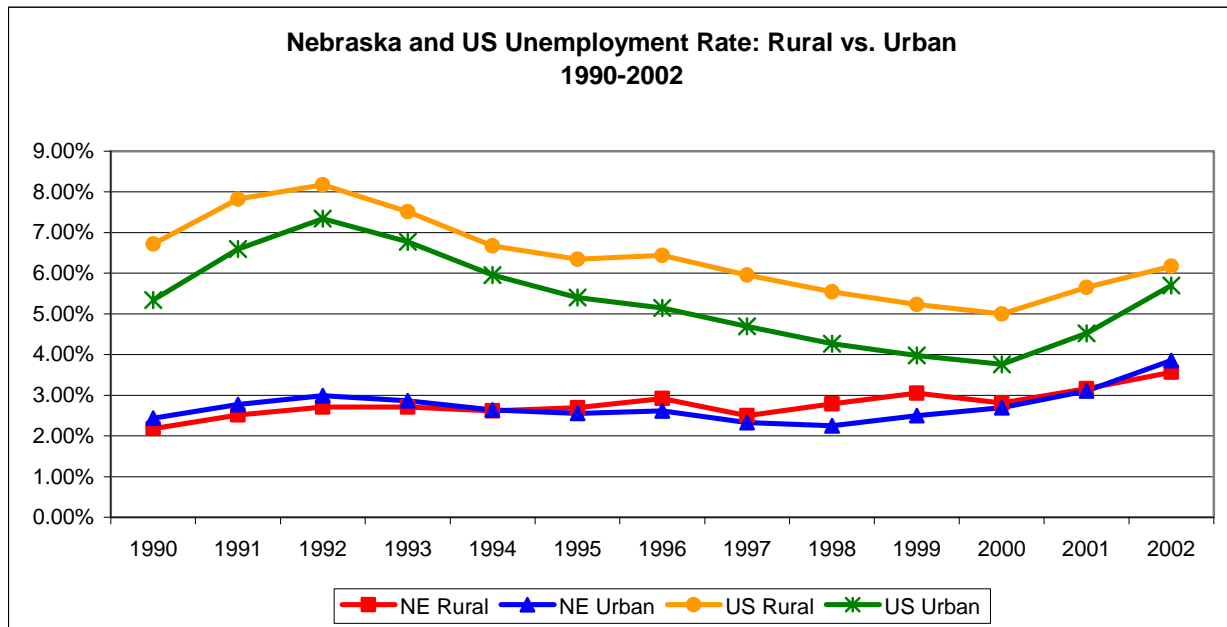
The interesting trends in the unemployment rate are yet another unique feature of the Nebraska business environment. Revisiting the population and small business trends may help explain the relatively stable unemployment rates. We observe a population decline in numerous counties in Nebraska between 1988 and 2002, yet the overall number of rural small businesses remains relatively consistent. Without a large increase in population, it appears that rural Nebraska has been able to maintain employment for its labor force, as shown by the stable number of businesses. Either unemployed persons are the reason for the out-migration in many counties, or alternatively, rural areas are able to offer sufficient job opportunities to retain workers.

Extension of National Econometric Models to Nebraska

One of the primary objectives of our research was to test the results observed at a national level on a smaller, more regional state level. As discussed in the national regression section, we experienced a variety of obstacles in developing log-linear time-series models designed to isolate the most significant economic and demographic variables in explaining rural small business growth and profitability. Given the interesting trend of declining population yet increasing rural small business growth we initially tested the relationships in Nebraska using a time-series model. Much like the federal regressions, time-series regressions using data for the state of Nebraska indicated that population was the overwhelming factor in determining changes in the number of small establishments in rural areas. In a simple time-series regression, we found that changes in population explained 79 percent in the variation in the number of small establishments in rural areas.

Although the correlation between population and the number of small businesses was lower for Nebraska than other states, we performed additional time-series analyses on the

number of small rural establishments per capita. Despite yielding some interesting results, we did not feel the aggregate, state-level time-series model adequately explained the changes in rural small business growth and profitability in Nebraska. We observed that a majority of counties lost population throughout the 1990s, and we felt we might be obscuring local differences by only looking at time-series data at the state level. In addition, we encountered similar multicollinearity issues discussed in our national analyses.[66]

In light of these econometric issues, we elected to modify the proposed models to incorporate cross-sectional and longitudinal-data analysis. Unlike the federal data where we had limited observations, state-specific regressions included 15 years of data (1988-2002) giving us a much better timeframe from which to run time-series data. Using county-level data for Nebraska's rural counties, we were able to form a panel data set, giving us 1,305 observations (15 years x 87 rural counties). Our primary concern given the increasing number of rural establishments per capita (due to population decline) was whether we would be able to achieve any significant results in testing several of our hypotheses concerning the growth and profitability of rural small businesses.

We started by using the pooled least squares regression technique to attempt to explain changes in the number of small rural establishments per capita. We employed a constant coefficient and intercept model and tested the significance of different variables on the rural small establishments per capita. The results of several of these regressions are presented in Table B-6. We found the most explanatory, significant variable was the annual payroll per capita. In every regression, the variable was significant at the 1 percent level, with a positive coefficient ranging between 0.25 and 0.34. This is consistent with our hypothesis concerning the impact of positive economic conditions and the growth of rural small business. As the annual payroll per capita increases, we observe a corresponding increase in the number of small businesses per capita.

The addition of personal income per capita does little to change the overall explanatory nature of the regression model, yet the variable is significant at the 1 percent level. Interestingly, the coefficient is negative, implying a decrease in the personal income per capita leads to an increase in the number of small establishments per capita. However, we do not feel that the variable adds anything to the regression, and we do not believe it is a powerful driver of the observed change in the number of rural establishments per capita.[67]

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[66] For example, multicollinearity is one explanation for the positive coefficient on urban small establishments per capita in regression 5 of Table D-14.

[67] Running a constant coefficient and intercept model with just personal income per capita as the sole explanatory variable leads to a positive sign on the coefficient but an R-squared of only 9 percent.

Panel Data Regressions Using Small Rural Establishments per Capita as the Dependent Variable

Regression Number	1	2	3	4	5	6
C	-3.886	-2.109	-3.157	-2.506	-3.885	-3.858
LN(Annual Payroll per Capita)	0.257 ***	0.287 ***	0.295 ***	0.340 ***	0.255 ***	0.255 ***
LN(Personal Income per Capita)		-0.183 ***				
LN(Student Teacher Ratio)			-0.313 ***	-0.441 ***		
LN(H.S. Diplobas per Capita)				0.090 ***		
LN(Unemployment per Labor Worker)					-0.0005	
Unemployment Rate(-1)						-0.009
	*Significance: *** 1 percent, ** 5 percent, * 10 percent*					
R-squared	0.444924	0.456861	0.476851	0.506866	0.45054	0.458418
Adjusted R-squared	0.44494	0.456019	0.47604	0.505717	0.44955	0.457365
S.E. of regression	-3.60053	-3.60053	-3.60053	-3.601044	-3.591382	-3.586308
Mean dependent var	0.224414	0.222074	0.217949	0.211537	0.220998	0.216771

We also included two educational variables to test the hypothesis that higher standards of education lead to an increase in the number of rural establishments per capita. We chose to include the change in the annual county-level student to teacher ratios, as well as the annual change in the number of high school diplomas awarded per capita. As shown in regressions three and four of the Table B-6, both of these variables were significant at the 1 percent level, and the coefficients were of the expected sign. Concerning the student teacher ratio, we hypothesized a decrease in the ratio to result in a positive increase in the number of rural establishments per capita. We reason that as the ratio declines, the students receive more focused teacher attention and this can lead to a positive impact on educational attainment.[68] Likewise, as the number of high school graduates per capita increases, we also expect a positive correlation with the number of rural establishments per capita. A more educated population leads to better business owners and entrepreneurs.

Finally, we wanted to test whether the number of rural small establishments per capita was directly affected by changes in the unemployment rate. We expected to see the number of rural establishments per capita fall in times of higher unemployment and rise in times of lower unemployment. We also tested this condition using a lagged structure where a rise in this year's unemployment rate would have a negative impact on next year's growth (or decline) in rural small businesses. However, our regression results were insignificant and we could not reject our null hypothesis. In hindsight, this is not surprising, given the relatively "stable" unemployment rates of Nebraska (Figure B-9).[69]

The pooled least squares regression models provided us with some interesting results, yet one key factor was being neglected . As we have stated previously, there were significant differences in the population trends of Nebraska counties between 1988 and 2002. Population is

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[68] It is conceivable this ratio could decline in two ways, either by adding more teachers (increasing the denominator) or losing a number of students (decreasing the numerator). Although we have not performed an analysis of this ratio, it is important to realize that we are measuring the net effect of a more educated workforce, independent of whether the workforce has increased, decreased, or remained the same.

[69] We included a variety of explanatory variables, including the average non-farm proprietors' income, the amount of corn grain produced, and farm proprietors' income, among others. These variables were not significant explanatory variables in assessing the change in the number of rural small establishments per capita.

a factor in our dependent variable (the denominator). We investigated using a fixed effects model to estimate cross-section specific intercepts to account for possible county-differences in the longitudinal data analysis. The results, using the same explanatory variables as in our previous constant intercept equations, are presented in Table B-7.

Table B-7
Panel Regression Data Using Rural Small Establishments per Capita as the Dependent Variable – Fixed Effects Model

Regression Number	1	2	3	4	5
C	County-Specific				
LN(Annual Payroll per Capita)	0.136 ***	0.154 ***	0.131 ***	0.122 ***	0.119 ***
LN(Personal Income per Capita)		-0.133 ***			
LN(Student Teacher Ratio)			-0.083 **		
LN(H.S. Diplobas per Capita)			-0.033 ***		
LN(Unemployment per Labor Worker)				0.0404 ***	
Unemployment Rate(-1)					0.0146 ***
	*Significance: *** 1 percent, ** 5 percent, * 10 percent*				
R-squared	0.935604	0.937502	0.936381	0.941378	0.950085
Adjusted R-squared	0.930955	0.932934	0.93167	0.93637	0.945427
S.E. of regression	-3.60053	-3.60053	-3.601044	-3.591382	-3.586308
Mean dependent var	0.079118	0.077976	0.078651	0.075139	0.075139

For the most part, we observe consistent results as those achieved in the constant coefficient model, with a few notable exceptions. Not surprisingly the R-squared values rise significantly, as the ability to perform the regressions across different county intercepts increases the explanatory ability of the regression model. We also note that, in general, the coefficient values are consistently of the same sign. However, unlike the previous regression models, the coefficients on our unemployment variables (regressions 4 and 5 in Table B-7) have changed sign, and are now significant at the 1 percent level. We did not expect to see a positive coefficient on the unemployment variables. We hypothesized that increases in unemployment would reflect a decrease in the number of rural small establishments per capita. However, there are several reasons why we might observe an increase in times of high unemployment.

It is conceivable that addition of unemployed workers comes from a large business. Perhaps these employees find themselves starting new businesses or relocate to areas with greater job prospects. Indeed, we have consistently seen a population shift to urban regions. As the unemployment rate increases, if a population shift were to occur, it is conceivable that the number of small rural establishments per capita will *increase* as a result of the decrease in population. We tend to prefer the results of our fixed effects model, particularly given the county-level differences in changes in population. This seems particularly germane when investigating employment trends.

However, the use of the fixed effects model is not faultless By using the fixed effects model with constant coefficients and different intercepts, we are including a large number of dummy variables. If we use too many we would drain the model of enough degrees of freedom for powerful statistical tests. Likewise, we may experience a high degree of multicollinearity, which will inflate the standard errors and result in a loss of the model's statistical power.

Program and Policy Analysis

We have noted that the number of small businesses per capita has remained relatively consistent over time, despite the economic slowdown in 2000 and continued population loss in certain Nebraska counties.

One organization affiliated with the University of Nebraska Rural Initiative[70] is the Center for Applied Rural Innovation (CARI). The ideals of the program are to create economically viable and sustainable rural communities, including those heavily dependent on agriculture. CARI promotes small business growth through education and training at a local, community level through the EDGE ((Enhancing, Developing and Growing Entrepeneurs) program. The three areas of interest include entrepreneur, agricultural entrepreneur, and business expansion. CARI was established in 2000, thus it is difficult to assess the viability of the program examining data through the year-end 2002.[71]

One statewide initiative intended to assist small businesses, including rural small businesses, was the Employment and Investment Growth Act (LB 775), instituted in 1987. LB 775 was passed in 1987 and represents a performance-based tax incentive program. It provides companies the opportunity to completely eliminate income tax, sales and use tax, and personal property tax on certain items for up to 15 years. This is accomplished by earning credits over a seven-year period for meeting the program requirements. However, a review of the companies and regions that have received the most benefits from LB 775 show the discontinuity between rural and urban regions. The Center for Rural Affairs cites that although Omaha represents less than a quarter of the state population, the urban area received 43 percent of investment and 53 percent of job creation from LB 775. Indeed, 22 percent of the state population did not receive any support from LB 775. Overall, very few rural communities have reaped the benefits of this act, and in fact, may have ultimately lost possible funding as a result of loss of statewide revenue in tax receipts. The Center for Rural Affairs (2002) provided strong evidence of the failure of LB775 to assist small rural businesses.

Recognizing that rural areas of Nebraska continued to experience population decline and were not receiving the benefits of LB 775, the Governor and legislature passed LB 936, the Rural Economic Opportunities Act. Unfortunately, the Center for Rural Affairs points out that through 2002 there were no qualified applicants for this program. One conclusion reached is that the industrial economic development model employed in Nebraska's urban regions may not necessarily fit the needs of rural areas.

In light of shrinking state budgets, one of the primary outlets for rural economic development resides with non-governmental rural development councils. The Center for Rural Affairs (CFRA), established in 1973, is one such organization which has taken strides to enhance

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[70] The rural initiative is a University-wide approach to focus the knowledge, skills, and creativity of the four University of Nebraska campuses upon stabilizing and enhancing the economy and quality of life in nonmetropolitan Nebraska. For more information, please visit http://ruralinitiative.nebraska.edu/.

[71] Currently, numerous data sources (County Business Patterns, Census firm size data, BEA data) report data only through the end of 2002, or at best 2003. When these data sources are updated, a better assessment of possible impacts of many initiatives placed into service in the new millennium will be made.

the small business environment in rural Nebraska. The Center follows, monitors, introduces and maintains policy initiatives designed to assist and enhance rural communities. The Center operates on a regional basis, as opposed to one central location, in order to assist particular regions more closely.[72]

One of the most successful programs instituted by the Center for Rural Affairs is the Rural Enterprise Assistance Program (REAP). First instituted in 1990, REAP concentrates on helping start, expand or improve rural small businesses. The program focuses efforts into four separate categories:

- Credit access,
- Business education,
- Networking, and
- Technical assistance.

Most importantly, the program focuses on the latter three areas to enhance the first credit access. Among other things, REAP works with local communities to form associations of entrepreneurs, providing key assistance in the formation of new rural small businesses. Jeff Reynolds, the director of REAP, explained how the program has evolved since its inception in 1990. Originally, REAP began as a peer group only type of assistance organization, but now focuses much more on an individual basis. The program is production-based, focusing heavily on providing the aforementioned services on an individual basis.

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[72] Numerous research papers and CFRA position papers are available on the CFRA website at http://www.cfra.org.
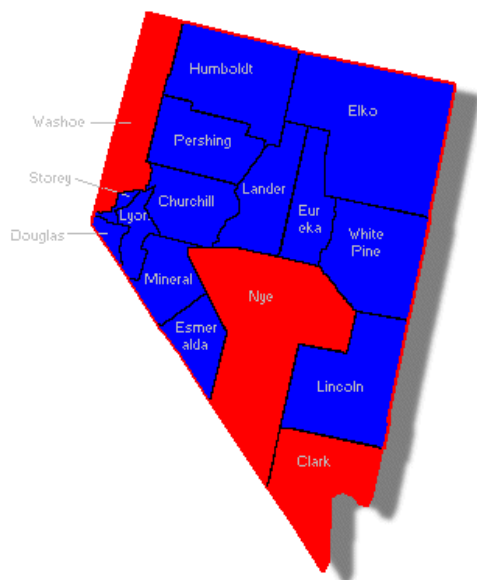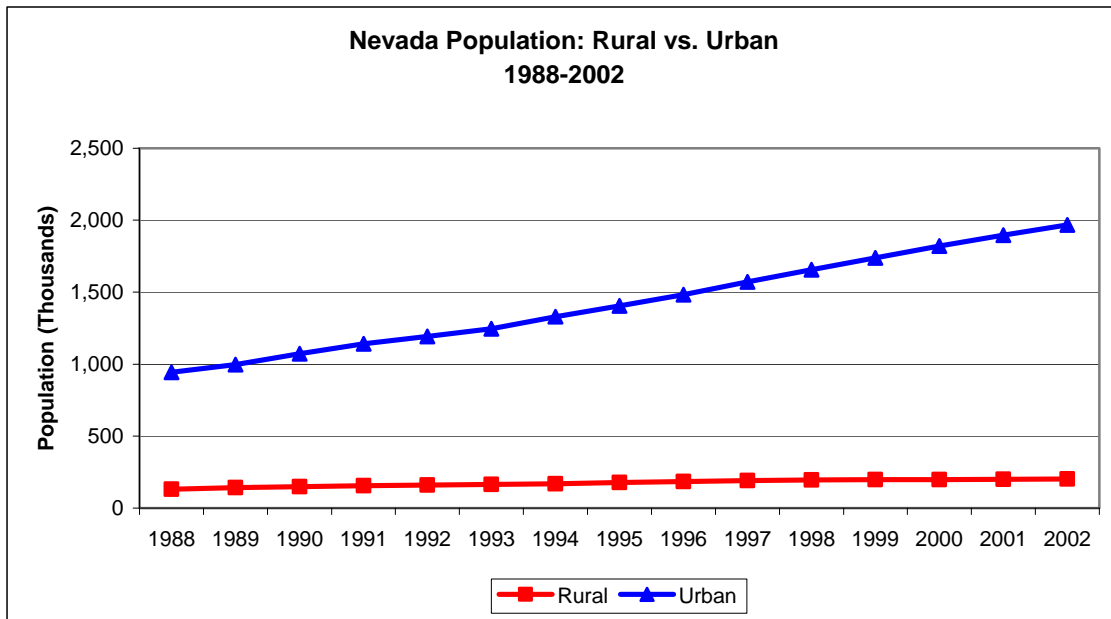
Nevada

We elected to investigate Nevada based on the state-level demographic and economic trends observed throughout the 1990s. Nevada was a state that had a tremendous amount of growth in the urban population throughout the 1990s, with little observed increase in the rural population. In fact, Nevada bills itself as the fastest growing state over the past 17 years.[73] Furthermore, there appeared to be very little rural economic development policy initiated over this time period, providing an opportunity to examine the welfare of rural small businesses in a state that focused on urban growth.

Despite a relatively large land area, Nevada remains one of the lesser populated states in the United States. However, between 1988 and 2002, the statewide population more than doubled from just over 1 million residents to 2.1 million residents (Figure B-10). Interestingly, rural regions of Nevada only grew at an average annual growth rate of 3.04 percent, while urban areas grew at an average annual growth rate of 5.25 percent. Needless to say, while the urban population increased 108 percent, the rural population increased only 53 percent between 1988 and 2002, leading to a decline in the percent of total population living in rural areas (from 14 percent in 1988 to 10 percent in 2002).

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[73] State demographer press release in January 2004, available at http://gov.state.nv.us/pr/2004/01-13UNR.htm

Figure B-10

The most interesting aspect of the population change in Nevada is observed at the county level, in particular in the population change experienced in Clark County. In 1988, 60 percent of Nevada residents resided in Clark County, but by 2002, this percentage had risen to almost 70 percent. Clark County is home to the cities of Las Vegas, Henderson, and Laughlin, which have enjoyed tremendous growth over the past 20 years. Given the overwhelming growth in this urban area, we expect to see significant business trends favoring urban areas.

Trends in the number and formation of small businesses generally follow the observed population trends (Table B-8). The number of rural and urban small firms increased between 1997 and 2002, although the annual average growth in urban firms was significantly higher than growth in rural firms (4.19 percent compared with 1.94 percent). Rural areas experienced a positive replacement rate[74] of 111 percent, compared with 129 percent for urban areas. This is not particularly surprising given the strong correlation between population and the number of establishments. Given that urban population growth is outpacing rural population growth, we expect to see higher replacement rates. On the positive side, we note that both rural and urban areas experience replacement rates well over 100 percent, indicating a continual net gain in the overall number of small businesses.

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[74] The replacement rate is calculated as the number of establishment births divided by the number of establishment deaths.

Table B-8
**Recent Trends in Nevada Small Business**

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Percent
Rural Firms	4,752	5,001	5,196	5,225	5,176	5,235	1.94%	
Rural Firm Births	886	797	726	712	748	734		111%
Rural Firm Deaths	606	615	697	743	705	774		
Urban Firms	24,071	25,865	26,957	28,261	29,095	29,679	4.19%	
Urban Firm Births	5,310	4,728	4,997	4,893	4,985	5,761		129%
Urban Firm Deaths	3,541	3,568	3,745	3,980	4,407	4,601		

Despite the dramatic increase in urban population, especially relative to the rural population, we observe a significantly higher number of small firms per capita in rural regions as opposed to urban regions. There are several possible reasons for this, including the significant number of large corporations that control one of Nevada's primary business segments, gaming. These companies employ more residents, and tend to offer a variety of services that compete with smaller establishments (e.g., restaurants, convenience stores, etc.).

The trend in the number of small firms per capita in both rural and urban areas seemingly matches the overall economic trend between 1997 and 2002. From 1997 through 2000, the number of rural small firms per capita increases in both rural and urban areas, consistent with a period of economic growth in the United States. As the economy entered a downturn during 2001 and 2002, we see a corresponding decrease in the number of small firms per capita. This is also shown in Table B-8, when examining the increase in small firm deaths versus small firm births, particularly for rural areas. Between 2000 and 2002, rural areas of Nevada experienced a net gain of only 10 small businesses, compared with a net gain of 473 between 1997 and 2000.

Other Nevada rural demographic and socioeconomic profiles follow national trends, as rural per capita income and wage levels trail that of urban levels, and rural unemployment rates exceed those in urban areas. Figure B-11 shows general wage levels in rural and urban areas, as well as the growing gap in the wage level. Since 1988, the wage gap has increased by 61 percent, an indicator of the difficulties in drawing the labor force to rural areas. A younger, more educated population is attracted to the prospect of higher earning potential in urban areas, leaving rural areas with a less educated labor pool which might otherwise attract small business owners. It is worth noting that the wage gap has not "grown" steadily, rather we observe periods of expansion and contraction. However, during the economic boom of the late 1990s, we observe the significant widening of the wage gap.

Nevada Average Wages (2000 Dollars)
Rural vs. Urban, 1988-2002
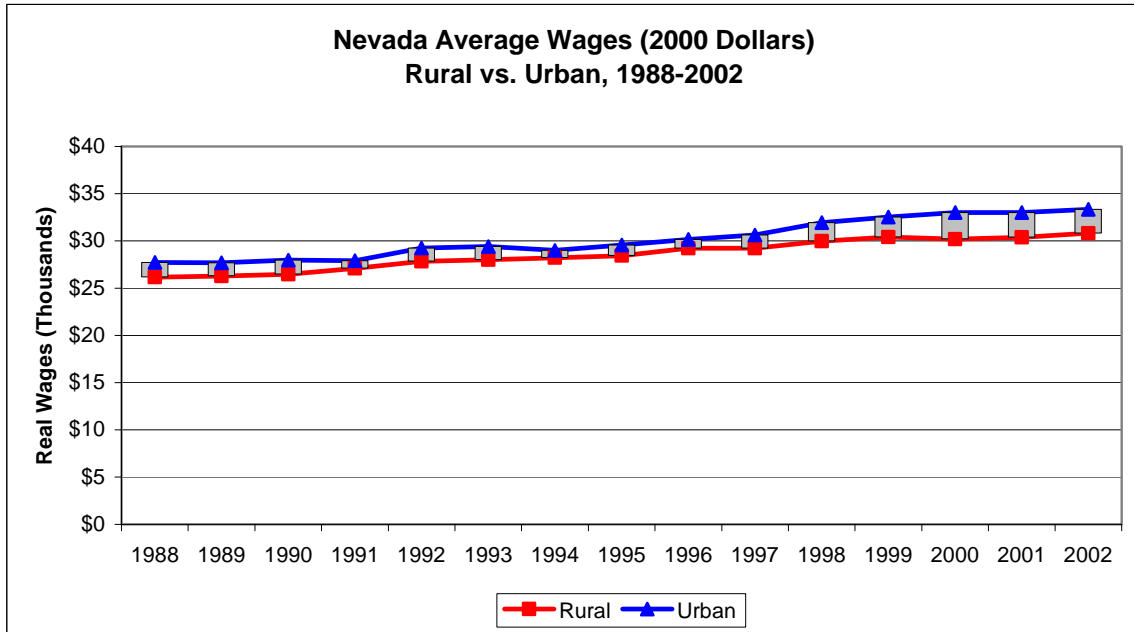
Similar to Figure B-11, the gap in urban and rural per capita income expands and contracts during the early years (1988-1997) before experiencing a significant widening through 2002. The difference between rural and urban per capita income in 1988 was only $530, compared with $3,410 in 2002.

Figure B-12

Nevada Unemployment Rate: Rural vs. Urban
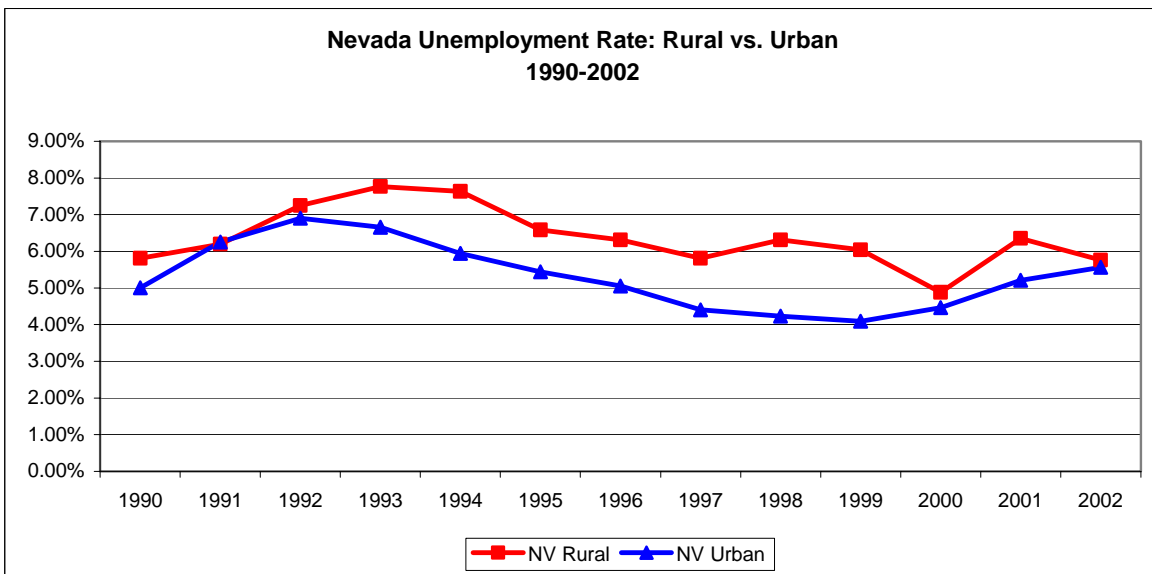**1990-2002**

Figure B-12 presents unemployment rates for both rural and urban regions of Nevada. Rural areas typically experience higher levels of unemployment, although in certain years (1989,

2000, and 2002) the difference in rural and urban unemployment is minimal. We observe some significant shifts in the unemployment rate in rural areas, which is partly attributed to the relatively lower level of population in Nevada's rural areas. For example, the rural unemployment rate dropped significantly in 2000, from 6.04 percent to 4.88 percent. A similar drop was not observed in urban areas, which actually experienced an increase from 4.10 percent to 4.47 percent. However, the decrease in the rural unemployment rate depended on a shift of only 500 (approximately) unemployed persons finding work.

Extension of National Econometric Models to Nevada

One of the primary objectives of our research was to test the results observed at a national level on a smaller, more regional state level. As discussed in the national regression section, we experienced a variety of obstacles in developing time-series models of a log-linear form designed to isolate the most significant economic and demographic variables in explaining rural small business growth and profitability. However, the population and small business dynamics in Nevada's urban areas warrant an investigation into looking at time-series data to gauge and to explain any relationships between urban and rural areas. Much like the federal regressions, with the time-series regressions we found that population was the overwhelming factor in determining changes in the number of small establishments in rural areas.

The high correlation between the rural population and the number of rural small establishments led us to perform regression analyses using the number of rural small establishments per capita, in essence normalizing across population changes. We performed numerous regression analyses adding a variety of explanatory variables, yet were unable to achieve significant results. For example, given the explosive growth of the urban population during the 1990s, we tested the explanatory power of changes in the number of urban small establishments per capita on the change in rural small establishments per capita. The results indicate the failure of this regression model to provide us any substantial information concerning the urban-rural interaction. We are unable to accept the hypothesis that changes in urban small establishments per capita influence, or explain, the change in rural small establishments per capita.

The only time-series regression model that provided significant results included personal income per capita in both rural and urban areas as explanatory variables. These results indicate significance at the 1 percent level, with an R-squared of approximately 0.69. In addition, the coefficients have opposite signs, with the rural variable exhibiting a positive sign, and the urban variable a negative sign. Intuitively, we perceive the positive sign on the rural variable to indicate that increases in rural personal income translate to rural small business growth, while an increase in the urban personal income implies a decrease in rural small business growth. However, we do not feel comfortable accepting that personal income per capita in rural and urban areas are the defining explanatory factors in assessing change in the growth of rural small businesses in Nevada. Primarily, we note the strong correlation between these two independent variables (a correlation coefficient of 0.98), as well as the fact that when we individually tested these variables we did not receive significant, or satisfactory results.

We also attempted time-series regression analysis using average non-farm proprietors' income as a proxy for small business profitability. Once again, our regression models, involving the testing of a combination of different explanatory variables, failed to provide significant results. We were unable to prove, or disprove, different hypotheses concerning the driving factors behind changes in the average non-farm proprietors' income. An investigation into the rural non-farm proprietors' income contrasted with the urban non-farm proprietors' income revealed some interesting, yet unexplainable, results. First, the gap between the rural and urban average non-farm proprietors' income increased from $3,482 in 1988 to a high of $17,830 in 2001. Second, between 1998 and 2002, the rural amount continually declined, reaching a total decline of $7,400. Without an in-depth investigation into the nature of the rural non-farm proprietors, we are unable to shed light on these trends, and elected not to use the average non-farm proprietors' income as a proxy for small business profitability.

Despite yielding some interesting results, we did not feel the aggregate, state-level time-series model adequately explained the changes in rural small business growth and profitability in Nevada. As a result, we focused on developing cross-sectional data sets designed to increase the robustness of available data. Nevada is comprised of 16 counties and one incorporated city, allowing us to create cross-sectional panels and perform longitudinal data analysis. However, each county is strictly classified as either urban or rural, limiting the ability to measure the influence changes in the urban environment have on rural small business growth. We began by strictly analyzing changes in the rural small business growth as a function of different rural variables.

Similar to the time-series regressions, the different combination of independent variables failed to yield significant results with the exception of rural income per capita. In addition, the breadth of county data available for Nevada was considerably lower than for other states. We primarily used data from the BEA and the Census Bureau's County Business Patterns, which limited the number of independent variables available to include in the regression models. Table B-9 presents the results of several cross-sectional regression models we tested to explain the growth of rural small establishments per capita.

Table B-9
Nevada Panel Regression Data Results

Regression Number	1	2	3	4	5	6
Dependent Variable:	LN(Small Rural Establishments per Capita)					
C	-11.73593	-12.11326	-11.96397	-11.88531	-11.56515	-11.63928
LN(Personal Income per Capita)	0.779 ***	0.812 ***	0.742 ***	0.751 ***	0.776 ***	0.742 ***
LN(Annual Payroll per Capita)		0.013				
LN(Student-Teacher Ratio)			0.221 ***			0.155 **
LN(Unemployment per Labor Worker)				-0.155 ***		
Unemployment Rate(-1)					-2.248 ***	-2.336 ***
	Significance: *** 1 percent, ** 5 percent, * 10 percent					
R-squared	0.3677	0.3691	0.4045	0.4505	0.4711	0.4877
Adjusted R-squared	0.3645	0.3622	0.3983	0.4496	0.4642	0.4776
Mean Dep. Variable	-3.9055	-3.9065	-3.9055	-3.5914	-3.9124	-3.9124
S.E. Regression	0.1755	0.1784	0.1708	0.221	0.1631	0.1611

We performed the panel regressions using a common coefficient and balanced panel.[75] The only variable which was consistently significant was rural personal income per capita. In Regression 1 of Table B-9, we observe that the rural personal income per capita variable has a positive coefficient, is significant, and leads to an R-squared value of 0.36. The positive coefficient is similar in nature to the one observed in the time-series regression, and implies that as individuals experience an increase in income, we should see an increase in the growth of rural small businesses. In Regression 2, we add the annual payroll per capita, but the variable is not significant and adds little to the regression model. Several similar variables, including rural diploma recipients per capita, labor wages, net earnings, and proprietors' income were also insignificant as explanatory variables.

In Regressions 3 through 5, we demonstrate a series of other variables that were significant, each at the 1 percent level, when added to the model along with rural personal income per capita. However, the addition of each of these variables added little to the overall explanatory nature of the model, as exhibited by moderate increases in the R-squared. Notably, in Regressions 4 and 5 we see that a decrease in unemployment, either concurrently or lagged one year, leads to an increase in the number of rural small establishments per capita. Finally, we present a model using the lagged unemployment rate and the student-teacher ratio in Regression 6. There is little gained in the R-squared value from regression 5 to 6, and our education variable is only significant at the 5 percent level.

The major drawback of the regression models presented in Table B-9 is the absence of variables capturing change in the urban environment. We know that major changes occurred in urban areas, including a population and business explosion in Clark County, where Las Vegas is located. We performed Regression equation 6 of Table B-9, but switched out the rural variables for urban variables. Thus, we examined the change in the number of urban small establishments as a function of personal income per capita, unemployment rate, and student teacher ratio. We achieved an R-squared of 0.71, and the urban personal income per capita and lagged unemployment rate were both significant at the 1 percent level, while the urban student-teacher ratio variable was significant at the 10 percent level.

The results of our cross-sectional and time-series analysis failed to provide sufficient insight into the factors affecting rural small business growth. The data do show considerable growth in urban areas, while rural regions have grown at a much lower level. Nevada represents one state where the focus has been on urban growth, and as such, lack of significant regression results are not surprising.

Program and Policy Analysis

The primary organization coordinating rural economic development is the Nevada Commission on Economic Development. A review of those counties that maintain a regional website provided some useful information concerning the acquisition of funding for business start-up, relocation, or expansion. Resources available to Nevada small businesses include:

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[75] Certain county-level variables, such as annual payroll, were left blank due to disclosure requirements. Using a balanced sample would exclude all cross-sections (counties) that were missing data items.

- *Nevada Small Business Development Center (NSBDC):* Centrally located at the University of Nevada – Reno, the NSBDC has 13 offices located throughout the state. The NSBDC is a statewide resource for business assistance, including training. The NSBDC serves all small businesses, including those in both rural and urban locations.

- *Rural Nevada Development Corporation (RNDC):* A 501(c)(3) non-profit development corporation formed in 1992, the organization was originally designed to offer business finance and community housing development services, although they have expanded services specific to each community served. RNDC programs are distinguished by housing, lending, Native American, and Small Business.

- *Nevada State Development Corporation (NSDC):* Providing business financing to all types of Nevada businesses, the NSDC is the state's primary lender under the SBA 504 loan program and offers business loans on more favorable terms then traditional lending outlets.

In addition, the Nevada Microenterprise Initiative (NMI) is a private non-profit community development financial institution founded in 1991. Similar to the NSBDC, the NMI provides business training and business loans to Nevada businesses.

Nevada businesses also enjoy favorable tax advantages over businesses in other states. There is no personal or corporate income tax. However, given that these incentives apply to all businesses, it does not appear this favors rural businesses over their urban counterparts. The key remains to initiate programs and policies that provide strong economic incentives to help rural small businesses enjoy the growth and profitability seen with urban small businesses.
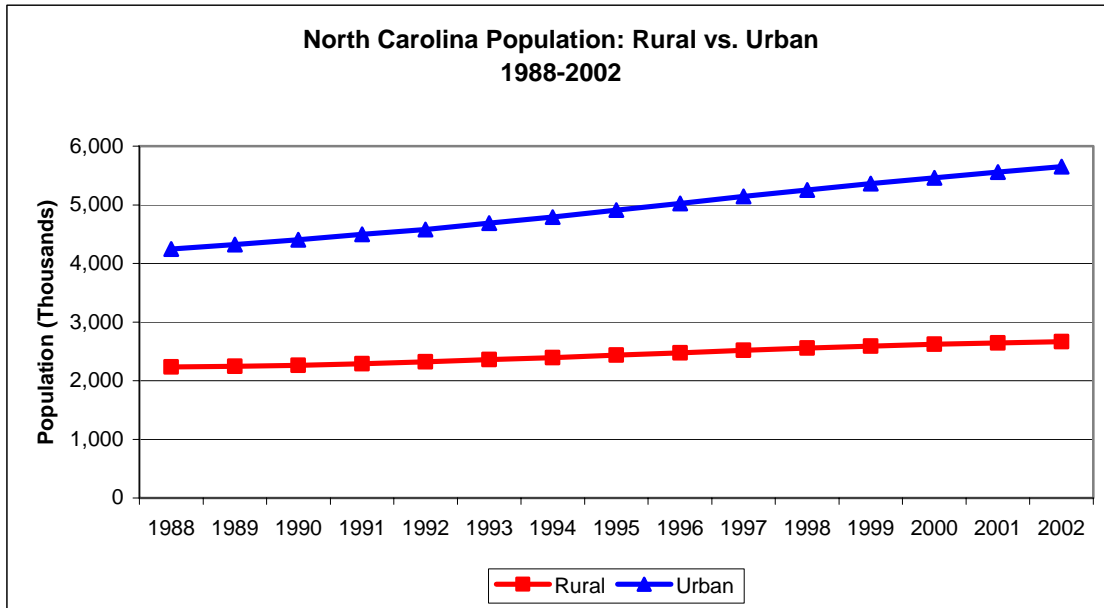
North Carolina
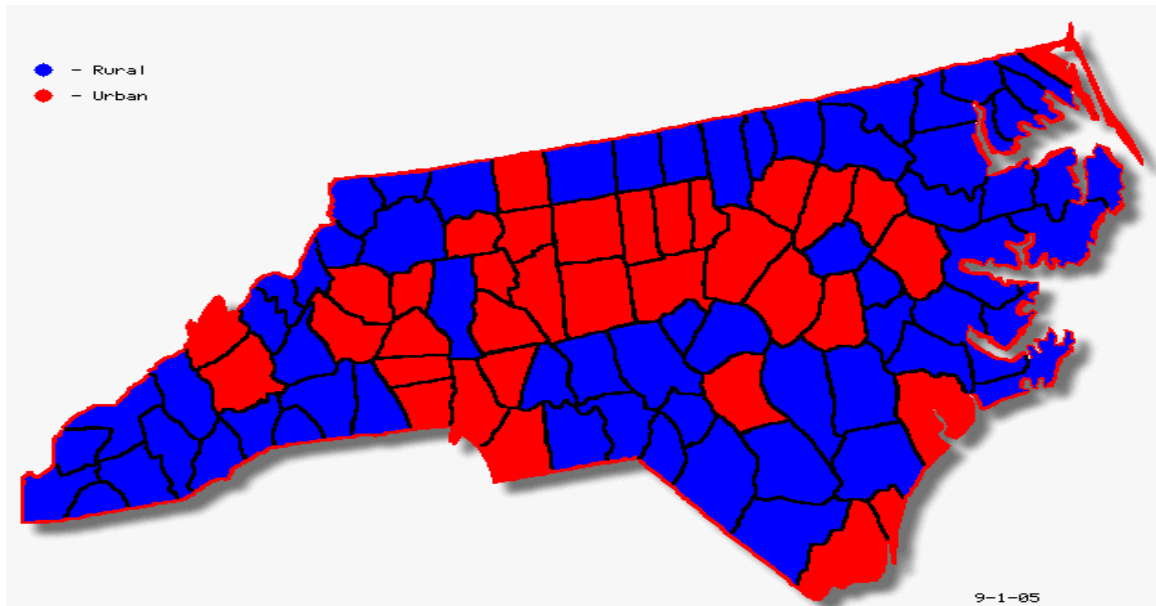
We elected to investigate North Carolina based on the state-level demographic and economic trends observed throughout the 1990s. In addition, the North Carolina Rural Economic Development Center and the State Data Center proved to be valuable resources to assess rural small business trends and policy initiatives undertaken to assist these businesses. North Carolina is a particularly interesting state when considering the small rural business environment. Throughout the 1990s, North Carolina experienced significant population growth in both rural and urban areas. Between 1988 and 2002, the rural population grew by more than 16 percent, while urban areas increased by more than 24 percent. However, as shown in Figure B-13, the percent of the population residing in rural areas as a percent of the total North Carolina population has continually decreased.[76] Not surprisingly, the four North Carolina counties to experience population declines between 1988 and 2002 were classified as rural counties (Bertie, Edgecombe, Martin and Washington).

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[76] During the 1990s, ten North Carolina counties were reclassified from a rural status to an urban status. For the purpose of our analyses, we elected to classify these counties as "urban" to avoid possibly disjoints in the timing of reclassification.

North Carolina Population: Rural vs. Urban 1988-2002

Similar trends are observed in the formation and growth of North Carolina small businesses (Table B-10). Between 1997 and 2002, the overall number of rural small businesses increased by 1.11 percent, while urban small businesses enjoyed a slightly higher level of overall growth at a rate of 1.75 percent. Perhaps of greater importance, both rural and urban regions enjoyed a replacement rate[77] higher than 100 percent, indicating a greater number of small business births than deaths over the same time period, although urban small businesses tended to form at a slightly higher rate compared with firm closures. It is interesting to note that the gap between small firm births and deaths (for both rural and urban areas) narrowed by 2002, as the economy entered a recession.

Table B-10
**Recent Trends in North Carolina Small Business**

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Percent
Rural Firms	43,959	45,531	45,788	46,193	46,139	46,461	1.11%	
Rural Firm Births	6,121	5,160	5,164	4,832	5,151	5,423		109%
Rural Firm Deaths	4,582	4,844	4,640	4,880	4,885	5,409		
Urban Firms	97,857	102,671	103,988	105,296	105,795	106,785	1.75%	
Urban Firm Births	15,505	12,805	13,043	12,326	13,075	14,029		116%
Urban Firm Deaths	10,555	11,123	11,248	11,611	11,895	13,200		

Evidence of the recession and the subsequent narrowing of firm births and deaths are also supported by examining the unemployment rate for urban and rural areas (Figure B-14). While the rural unemployment rate consistently remained higher than the urban rate, both measures increased significantly between a low in 1999 and subsequent high in 2002. We also observe that the overall number of small businesses per capita remained relatively unchanged between 1997 and 2001, indicating a strong correlation with population growth. Interestingly, the number

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[77] Replacement rate represents the ratio of small firm births to small firm deaths. A ratio greater than 100 percent indicates births are exceeding deaths leading to a net gain in small firms.

of small firms per capita was higher in urban areas of North Carolina, as opposed to rural areas. There are several possible reasons for the larger number of small firms per capita in urban areas, the most significant perhaps being the difference in the economic "health" of urban areas compared with rural areas, as demonstrated by Figure B-14 (unemployment rate) and Figure B-15 (wage levels).

Figure B-14
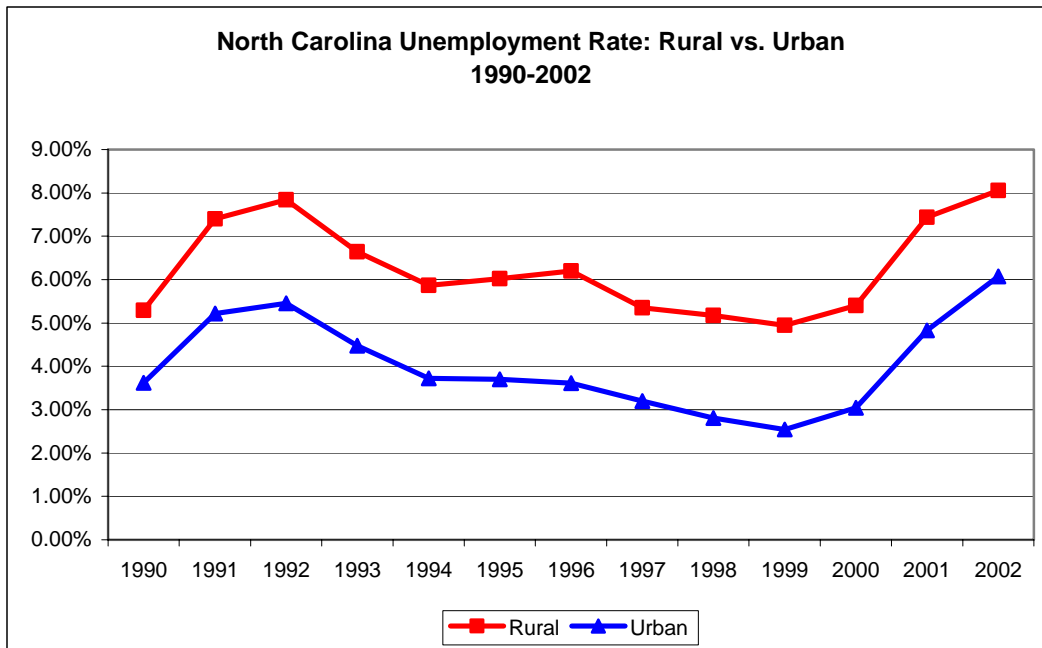
The higher amount of personal wealth available for consumption in urban areas has a positive impact on the ability to sustain a greater number of small businesses. This is clearly seen when comparing the level of income with the number of small firms in rural and urban areas. For example, in 2001, the ratio of total personal income to the number of small establishments was $1,293 in rural areas and $1,516 in urban areas. Thus even though the number of small businesses per capita in urban areas is already higher than rural regions, it appears that urban areas could actually support an even larger number of small businesses when solely considering the "available" personal income.[78]

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[78] This is a simplified conclusion, as we have implicitly held all other economic considerations constant. For example, if significant cost of living differences exist between urban and rural areas in North Carolina, then the importance of the income gap is minimized, as equivalent purchasing power in rural and urban areas could be achieved.

Figure B-15

North Carolina Average Wages (2000 Dollars)
1988-2002
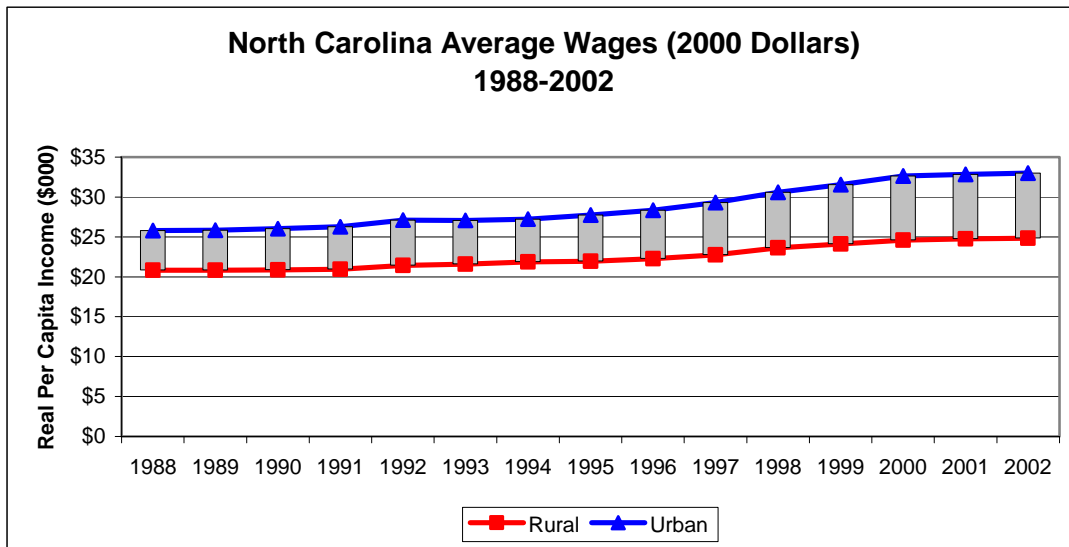
Extension of National Econometric Models to North Carolina

One of the primary objectives of our research was to test the results observed at a national level on a smaller, more regional state level. As discussed in the national regression section, we experienced a variety of obstacles in developing time-series models of a log-linear form designed to isolate the most significant economic and demographic variables in explaining rural small business growth and profitability.[79] In light of these econometric issues, we elected to modify the proposed models to incorporate cross-sectional and longitudinal-data analysis. We were able to achieve significant results given the availability of rural and urban data for 50 observations (corresponding to the 50 states). However, at the state level, the construction of cross-sectional and longitudinal data sets was constrained by the ability to divide the state into a sufficient number of cross-sectional areas, and the availability of data for each cross-sectional area. We attempted to perform the cross-sectional and longitudinal data analysis at a state level by using county-level data.

North Carolina contains 100 counties, of which 65 are classified as rural, and the remaining 35 are classified as urban. In applying the national-level econometric models to the state data, it is insufficient to use each county as an observation as a result of each county being entirely classified as rural or urban.[80] However, we were able to rely upon a classification system used by the North Carolina Rural Economic Development Center, Inc. (NC Rural

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[79] As an initial test, we compiled rural and urban North Carolina data (1988-2002) at the state level. Using the number of small rural establishments as our dependent variable, we attempted to perform time-series regressions. However, we encountered the same multicollinearity and degrees of freedom issues as observed in the national level regressions. For example, the correlation between the number of rural establishments and the rural population time series was 0.98. Unreliable results were achieved, even when using the number of establishments per capita as our dependent variable.

[80] Recall, we were able to use each state as an independent cross-sectional variable since there existed urban and rural data for each state, with the exception of New Jersey and the District of Columbia (which were excluded from our analysis).

Center). The NC Rural Center relied upon seven different economic regions of North Carolina, where each region contained both rural and urban counties (classified as metropolitan or non-metropolitan). Table B-11 lists the seven regions, and the rural and urban counties contained within each region.

Table B-11
North Carolina Economic Regions

Region	IIC Abbreviation	Metropolitan (Urban) Counties	Non-Metropolitan (Rural) Counties
Advantage West	AW	Buncombe, Burke, Caldwell, Madison	Alleghany, Ashe, Avery, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Watauga, Wilkes
Charlotte	CL	Alexander, Cabarrus, Catawba, Gaston, Lincoln, Mecklenburg, Rowan, Union	Anson, Cleveland, Iredell, Stanly
Eastern	EA	Edgecombe, Nash, Onslow, Pitt, Wayne	Carteret, Craven, Duplin, Greene, Jones, Lenoir, Pamlico, Wilson
Northeast	NE	Currituck	Beaufort, Bertie, Camden, Chowan, Dare, Gates, Halifax, Hertford, Hyde, Martin, Northampton, Pasquotank, Perquimans, Tyrrell, Washington
Piedmont Triad	PT	Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Stokes, Yadkin	Caswell, Montgomery, Rockingham, Surry
Research Triangle	RT	Chatham, Durham, Franklin, Johnston, Orange, Wake	Granville, Harnett, Lee, Moore, Person, Vance, Warren
Southeast	SE	Brunswick, Cumberland, New, Hanover	Bladen, Columbus, Hoke, Pender, Richmond, Robeson, Sampson, Scotland

Source: North Carolina Rural Economic Development Center, Inc.

We compiled county-level data from several public sources, including the Census Bureau's County Business Patterns (CBP),[81] the BEA,[82] the North Carolina Department of State Treasurer, the North Carolina Department of Public Instruction, the North Carolina Department of Justice and the University of North Carolina.[83]

The initial time-series regressions failed to provide useful results, thus we employed longitudinal data analysis to assess the growth and profitability of rural small businesses in North Carolina. As expected, initial econometric models showed a strong correlation between the number of small establishments and the population level as the R^2 exceeded 90 percent. We relied upon a common coefficient and intercept, although similar results were achieved when estimating using fixed effects intercept and cross-sectional specific coefficients.

Given the strong correlation between population and the number of small establishments, we continued our econometric investigation using the number of small rural establishments per capita. We limited our initial modeling efforts by investigating only rural variables to explain

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[81] We relied upon the CBP for the number of small establishments at a county-level, the annual payroll, and the number of employees. We recognize the inherent difference in firms and establishments, but due to disclosure constraints and availability of county-level data we were constrained to rely upon establishments.

[82] All BEA variables were obtained from county data contained on table CA30, available from the Regional Economic Information Service data sets on the BEA web site.

[83] We obtained county-level data for economic development expenditures from the State Treasurer, public school expenditures from the Department of Public Instruction, the crime index from the Department of Justice, and the number of personal care physicians from the University of North Carolina.

changes in the number of rural establishments per capita. Table B-12 presents several regression results. We began by investigating the significance of per capita income, as well as the number of per capita primary care physicians (PCPs) in rural areas (Regression 1). The PCPs coefficient was significant at the 1 percent level, while the per capita income was significant at the 5 percent level. The positive coefficient on the per capita income is consistent with the results obtained at the national level. The PCPs variable is interesting, as we associate the number of PCPs with quality of life and healthcare. Therefore, rural areas that exhibit increases in the number of physicians may represent regions with a higher quality of life, a variable that attracts and promotes small business growth.

Table B-12
North Carolina Rural Regression Results

Dependent Variable	LN(Rural Establishments per Capita)			
Regression Number	1	2	3	4
C	-1.661	-1.307	-1.33	-1.769
LN(Per Capita Income)	0.0376 **	0.0677 ***	0.0649 ***	0.0681 ***
LN(Per Capita Primary Care Physicians)	0.346 ***	0.319 ***	0.353 ***	0.296 ***
LN(Crime Index)		-0.0968 ***	-0.0602 **	-0.0604 *
LN(Per Capita Public School Expenditures)			-0.171 **	-0.151 *
LN(Per Capita Economic Development Expenditures)			-0.0189	
Unemployment Rate				-1.249 *
	*Significance: *** 1 percent, ** 5 percent, * 10 percent*			
R-Squared	0.4155	0.4827	0.5396	0.5522
Adjusted R-Squared	0.404	0.4673	0.5125	0.5202
Mean Dep. Variable	-3.8123	-3.8123	-3.8123	-3.8123
SE Regression	0.0833	0.0788	0.0768	0.0762

Adding another "quality of life" variable, the rural crime index,[84] enhances the regression model and is statistically significant at the 1 percent level (Regression 2). We expect rural areas with a decreasing level of crime to experience an increase in the number of small businesses. This expectation is confirmed by the regression results, as the coefficient of the crime index is inversely related to the growth (or decline) in rural small establishments.

We were able to obtain two measures of potential investment in rural areas for the state of North Carolina. We subsequently tested whether state spending in rural areas on education and economic development were significant and positively correlated with the number of rural small businesses. In Regression 3, we add the per capita public school expenditures[85] and the per capita economic development expenditures[86] variables. In this case, only the public school expenditures variable is significant (5 percent level), with a negative sign on the coefficient. The negative coefficient seems counterintuitive, considering that improving the educational system (by increasing the money spent on operations) should have beneficial effects on the community and the attraction to rural small business growth. However, the public school expenditures

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[84] The crime index is derived from the N.C. Department of Justice and represents a total of seven major offenses used to measure the extent, fluctuation, and distribution of crime. Crime classifications presently used in the index are murder, forcible rape, robbery, aggravated assault, burglary, larceny, and motor vehicle theft.

[85] The public school expenditures, obtained from the N.C. Department of Public Instruction, represent the current expenditures associated with the operations of public schools in North Carolina.

[86] Economic development expenditures are those by the county or municipal government for planning and zoning, economic development, community development, special employment programs (JTPA), and other economic and physical development.

variable excludes capital expenditures for new buildings and grounds, existing building renovations, and miscellaneous equipment purchases, as well as community service programs and inter/intra fund transfers. We believe these expenditures represent a more attractive investment from a small business growth perspective.

The most interesting aspect of Regression 3 is the insignificance of the economic development expenditures. We hypothesized that the amount of state money spent on economic development in rural counties would spur growth of rural small businesses. We performed several iterations including those where we incorporated lags to account for the likelihood that economic development expenditures made today may not translate into immediate small business growth. However, the amount of economic development expenditures remained insignificant and we rejected our hypothesis.

The final regression presented in Table B-12 includes the rural unemployment rate as a potential explanatory variable for small rural businesses growth. We hypothesized that as the unemployment rate declines we should observe an increase in the number of small businesses. The coefficient of the unemployment rate is negative, consistent with our hypothesis, and the variable is significant at the 10 percent level. As for our other variables, the per capita personal income and number of primary care physicians remain positive and significant at the 1 percent level, although the crime index and public school expenditures are only significant at the 10 percent level.

We expanded our North Carolina regression model to include variables specific to the urban counties of each geographical classification. Most importantly, we were concerned with the possible explanatory effect of urban establishments. Our first regression looked at the number of rural establishments explained by the number of urban establishments. Although the coefficient was significant, the R-squared was extremely low (0.07), explaining little change in rural establishments. Adding the urban population variable, we observed a loss of significance in both urban population and number of urban establishments, and our R-squared is still very low. Finally, we compare the change in rural establishments versus the change in urban establishments on a per capita basis. Interestingly, we did not observe significance, as it appears that for North Carolina, the change in rural small business is largely independent of the change in urban small businesses.

In another model, we added an additional variable for urban establishments per capita into our last "rural" only regression model (Regression 4 of Table B-12). The variable was not significant and added little to the explanatory power of the model. However, investigation of the underlying data provides insight as to why the change in urban establishments has very little effect on the change in rural establishments. The issue is two-fold. First, as is shown in Table B-13, the number of urban establishments per capita has dropped substantially since 1988, while the number of rural establishments per capita has remained relatively unchanged. The series correlation over all 14 years is only -0.311. However, examining the correlation from 1997 through 2002, the two are highly correlated (0.9532). The primary reason for the sharp drop in urban establishments per capita is not a decline in the number of establishments (numerator) but rather a sharp increase in the urban population (denominator) during the early to mid-1990s (Table B-14).

Table B-13

	Establishments Per Capita		
	Urban	Rural	Correlation
1988	0.2177	0.1539	-0.3100
1989	0.2131	0.1551	
1990	0.2049	0.1556	
1991	0.1943	0.1525	
1992	0.1927	0.1532	
1993	0.1884	0.1531	
1994	0.1847	0.1539	
1995	0.1838	0.1549	
1996	0.1836	0.1568	
1997	0.1879	0.1597	0.9532
1998	0.1837	0.1584	
1999	0.1825	0.1580	
2000	0.1773	0.1569	
2001	0.1709	0.1546	
2002	0.1716	0.1564	

Table B-14

Annual Average Population Growth 1988-2002		
Region	Urban	Rural
Advantage West	1.26%	1.33%
Charlotte	2.39%	1.59%
Eastern	0.88%	0.96%
Northeastern	2.77%	0.58%
Piedmont Triad	1.55%	0.85%
Research Triangle	3.15%	1.89%
Southeastern	1.73%	1.35%
Total	2.04%	1.25%

With the exception of the Advantage West and Eastern Regions, urban population increased over the 1988-2002 period and outpaced the growth of urban establishments .[87]   . . Only in the later 1990s do we observe a return to the highly correlated trend of urban and rural establishments per capita that we previously saw in the national level regressions. However, even when one only examines only the 1997-2002 time period in a longitudinal analysis, there is little significance and explanatory power of the change in small urban establishment growth when measuring growth in small rural establishments. This is largely due to the regional differences observed among the seven areas defined as economic partnerships in North Carolina. When running an OLS time-series regression to estimate the impact of change in small urban establishments on the change in small rural establishments for the entire state, the coefficient on the urban variable is 0.664 and significant at the 1 percent level. However, the R-squared is an

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[87] Recall that 10 counties were reclassified from rural to urban in the 1990s. It is essential to note that we have normalized this change by classifying the counties continuously over the time period. Thus, the large rise in urban population is captured by the increase in population of the reclassified counties, but the rural population (and small business) variables are not "penalized" by a disjoint at the time of classification.

unrealistic 0.993 demonstrating the likelihood of multicollinearity between the dependent and independent variables.

Program and Policy Analysis

Over the past 15 years, several programs and policy initiatives have been instituted by local governments and charitable organizations within the state, as well as the NC Rural Center. More importantly, there is significant cooperation among many of the different organizations, both private and government, that are committed to revitalize the rural economic landscape. The NC Rural Center lists and describes many of the policy initiatives that have been implemented to assist economic development in rural regions of the state.

The majority of rural "economic" development programs and initiatives are designed to target one specific sector of the rural environment (e.g., healthcare or infrastructure), with the objective that improvements in the particular sector will have widespread benefits for the rural economy as a whole. For example, in 1991 the North Carolina General Assembly created the Low-Wealth and Small County Supplemental Funds, which provides annual financial assistance to help rural and other needy school systems. In fact, on a per capita basis, North Carolina invests more public school expenditures in rural counties as opposed to urban counties. As illustrated in Figure B-16, the gap between rural and urban public school expenditures per capita reached a high of $86 per person in 1996, although the gap has narrowed significantly in recent years.

Figure B-16
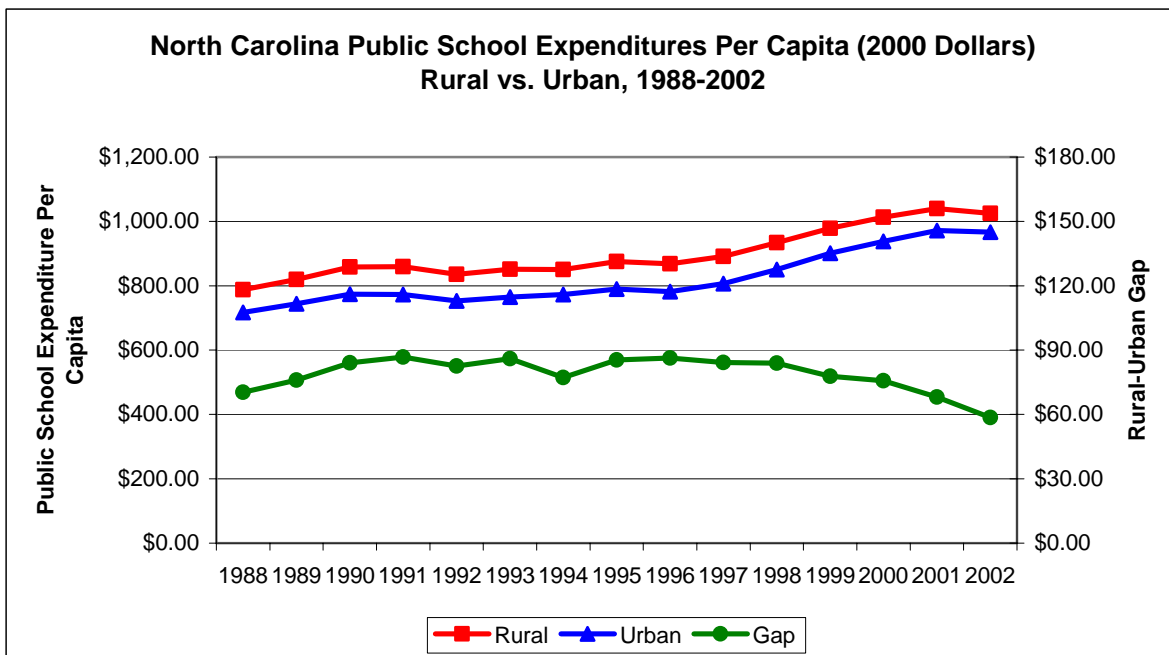
The North Carolina Microenterprise Loan Program provides rural people with small business loans (up to $25,000) to assist in the formation or expansion of small business. The program is designed for individuals who have solid business plans but lack the ability to secure

bank loans to promote growth. In addition to providing funds within strict guidelines, the program also assists with business planning and technical assistance in partnership with small business centers located at educational institutions and small business technology development centers.

In the late 1990s, North Carolina took steps toward an overall rural advancement. Promoting education, expanding internet access to all state areas, improving water and sewer infrastructure, advancing rural business, and focusing on development of a stronger agriculture business were all discussed as important issues facing the rural areas of North Carolina. In 1999, former Governor Jim Hunt formed the North Carolina Rural Prosperity Task Force to develop innovative strategies for bringing economic opportunities to rural regions. In February 2000, the Task Force recommended a Sustainable Communities Initiative to assist rural communities in meeting economic and social challenges of the new century. The NC Rural Center began development of this initiative[88] in spring 2000, working to develop three primary components:[89]

- A rural leadership development fund to provide need-based scholarships for future rural leaders who wish to participate in leadership development programs;

- A rural technical assistance program to help rural communities undertake collaborative and comprehensive planning to solve local problems; and

- A model civic venture fund to provide grant money to help communities implement projects that result in sustainable enterprises and communities.

In July 2004, the N.C. General Assembly created the North Carolina Economic Infrastructure Fund to stimulate business growth and job creation in rural and low-wealth communities. The majority of funding is set aside for water and sewer improvements, which not only provide new jobs in rural communities but also improve the quality of life and local business environment. In addition, funding is also intended to expand state outreach to rural communities by improving access to business and technology assistance, renovating vacant buildings for reuse by new and expanding businesses, and investing in research and development projects with the potential to stimulate job growth. This program is extremely new, and has yet to provide quantitative indications of increased job growth or rural small business formation.

Finally, entrepreneurship at the rural small business level has been highlighted as an essential plan to develop rural communities. The NC Rural Center recently received funding from the Kellogg Foundation to help network state agencies and non-profit organizations in order to provide a better quality of services to rural small businesses.

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[88] This initiative is relatively new and still in the early stages of implementation.
[89] http://www.ncruralcenter.org/research/sustain.htm.
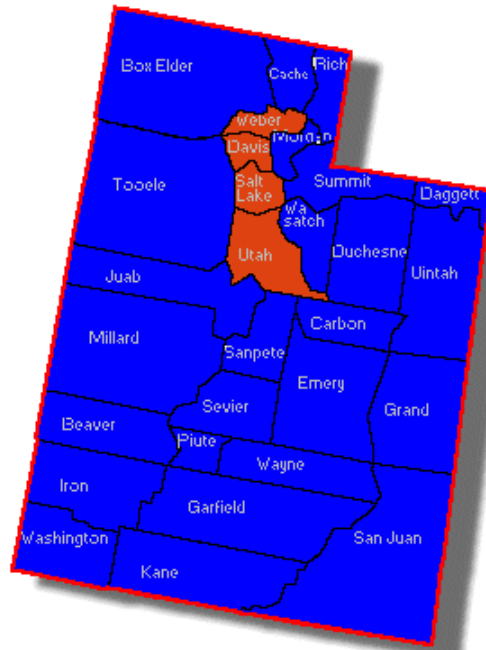
Utah

It is difficult to ignore Utah when examining rural small business trends at the state level. Over the 15 year period from 1988-2002, Utah exhibited remarkable growth in the number of rural small businesses, despite only mediocre changes in some important demographic and economic factors. From 1988 to 2002, Utah experienced an 89.7 percent increase in the number of small establishments in rural areas. The state experienced especially high growth during the 1990s, with an average annual growth rate in the number of establishments of 5.4 percent. Furthermore, from 1997 to 2002, Utah performed better than any other state, experiencing a 21 percent increase in the number of rural small establishments, with an average annual growth rate of 3.8 percent over the time period. This compares to the U.S. rural averages of 3.1 percent and 0.6 percent respectively. We discussed this growth with Bim Oliver of the Rural Development arm of the Utah Governor's Office of Economic Development.[90] A potential explanation for Utah's recent growth compared to other states is that Utah, in particular its rural areas, was somewhat sheltered from the recession that hit the United States late in the 1990s decade. Table B-15 shows recent small business trends specific to Utah's rural and urban regions. The data not only demonstrate Utah's recent rural small business success, but also success in urban areas

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[90] IIC, Inc. conducted a telephone interview with Mr. Oliver in August 2005.

However, on the whole Utah's rural regions have fared slightly better in recent years in terms of both the average annual growth rate and the replacement rate of new firms.

Table B-15
Utah's Recent Small Business Trends

	1997	1998	1999	2000	2001	2002	Average Annual Growth Rate	Replacement Rate
Rural								
Establishments	8,543	9,131	9,426	9,697	10,003	10,334	**3.81%**	
Establishment Births	1,633	1,464	1,434	1,396	1,569	1,820		**130%**
Establishment Deaths	1,063	1,168	1,152	1,095	1,223	1,490		
Urban								
Establishments	27,095	28,537	28,879	29,475	29,844	30,561	**2.41%**	
Establishment Births	4,927	4,145	4,369	4,275	4,659	5,219		**121%**
Establishment Deaths	3,404	3,640	3,727	3,795	3,883	4,354		

Over the 1988-2002 time period, Utah exhibited steady population growth in both rural and urban regions. Over this time period, Utah's rural population, which includes all but four of the state's 29 counties, accounted for an average of approximately 12 percent of the state's total population. Utah's rural share of the population decreased slightly in each year, for a total net decline of 1.23 percent from 1988-2002. Figure B-17 below demonstrates Utah's population growth in both rural and urban regions from 1988-2002. Unlike other trends we have seen, however, Utah's rural population growth does not necessarily move at the same pace as the growth in the number of establishments. Utah's rural population exhibited an average annual growth rate of only 1.5 percent compared to the 3.8 percent rate of growth in rural small establishments (see Figure B-18).
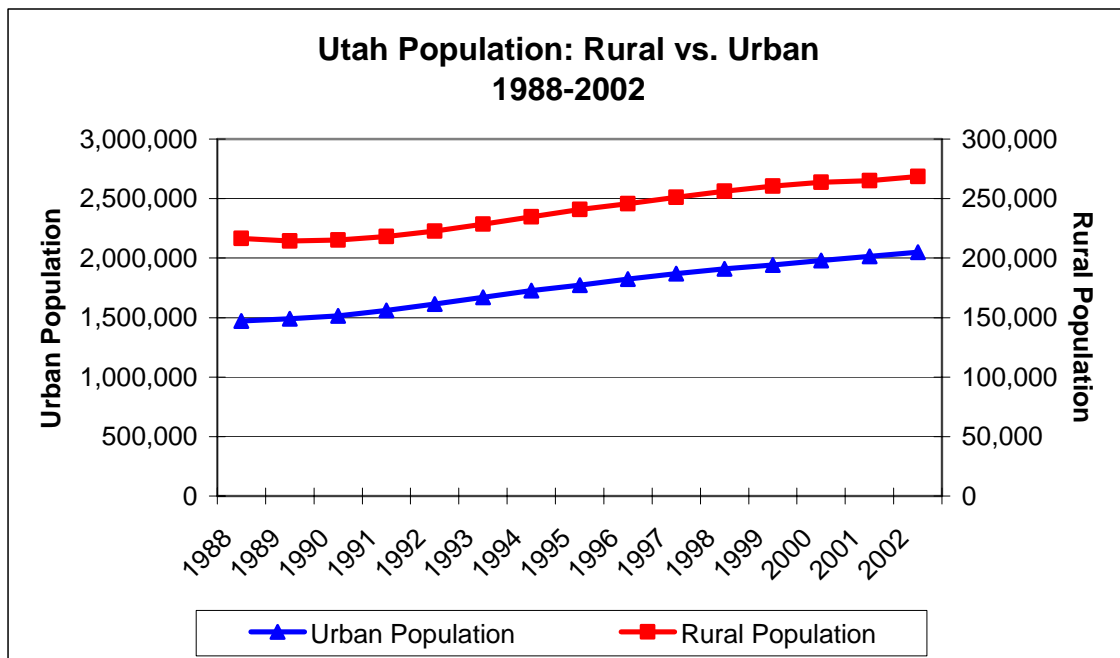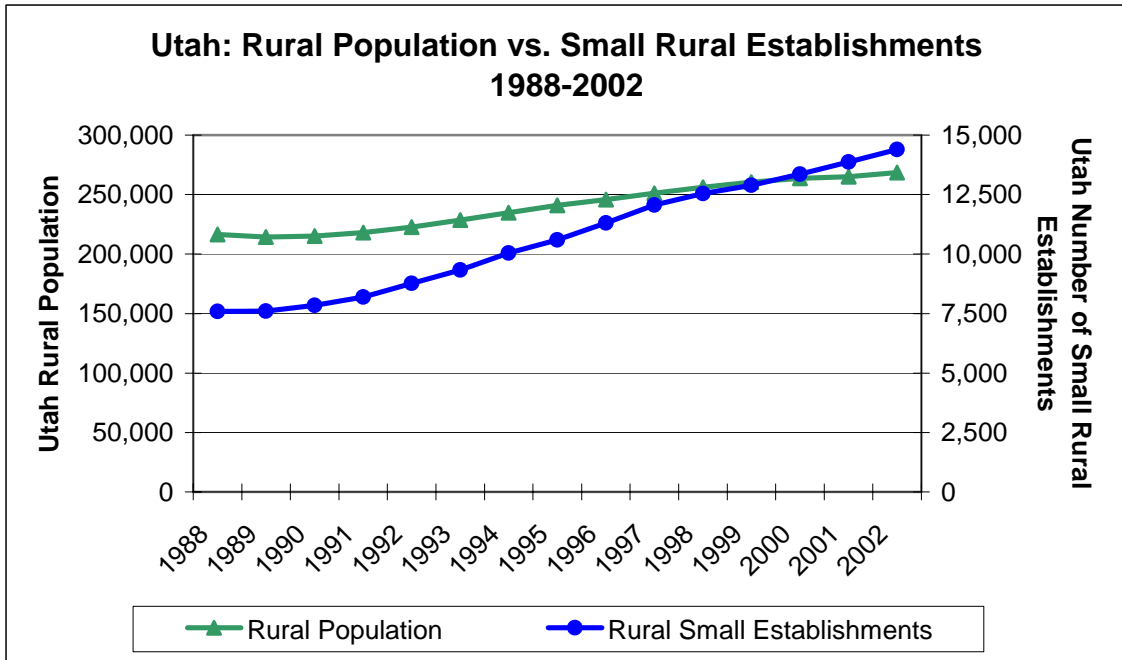
Figure B-17

Utah Population: Rural vs. Urban 1988-2002

Utah: Rural Population vs. Small Rural Establishments
1988-2002

For the most part, Utah has followed expected trends when comparing rural and urban demographic and socioeconomic trends. Utah's rural areas have historically exhibited higher unemployment rates (Figure B-19), and lower income and wage levels. However, over the fifteen year period from 1988 to 2002, the income gap between rural and urban areas (urban minus rural) grew from $2,744 to $5,366 (2000 Dollars), with an average annual growth of 4.8 percent. In addition, wage gap increased by 3300 percent, from $143 in 1988 to $4850 in 2002 (Figure B-20). In addition, real wages in rural areas remained relatively constant throughout the 15 year time period, with the greatest change being a decrease of $710 from 1992 to 1993, and an overall average annual change of only $27 (0.1 percent). In spite of these trends, which would typically be seen as a disadvantage to rural business owners, Utah still experienced remarkable success in rural small business growth, as seen in Figure B-18 above.
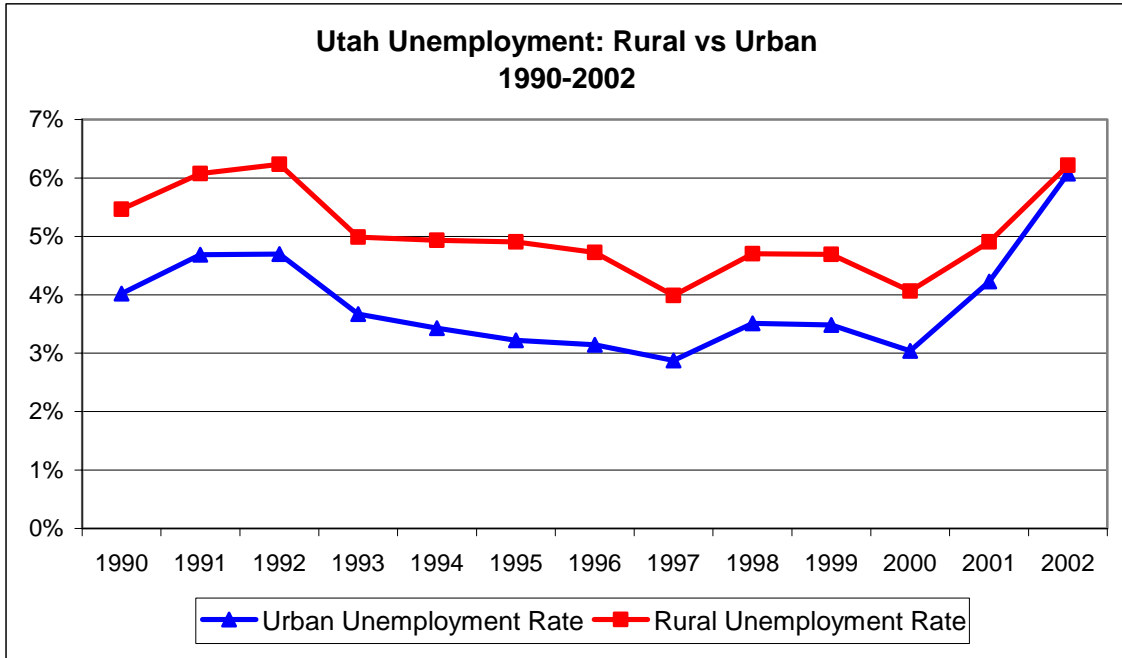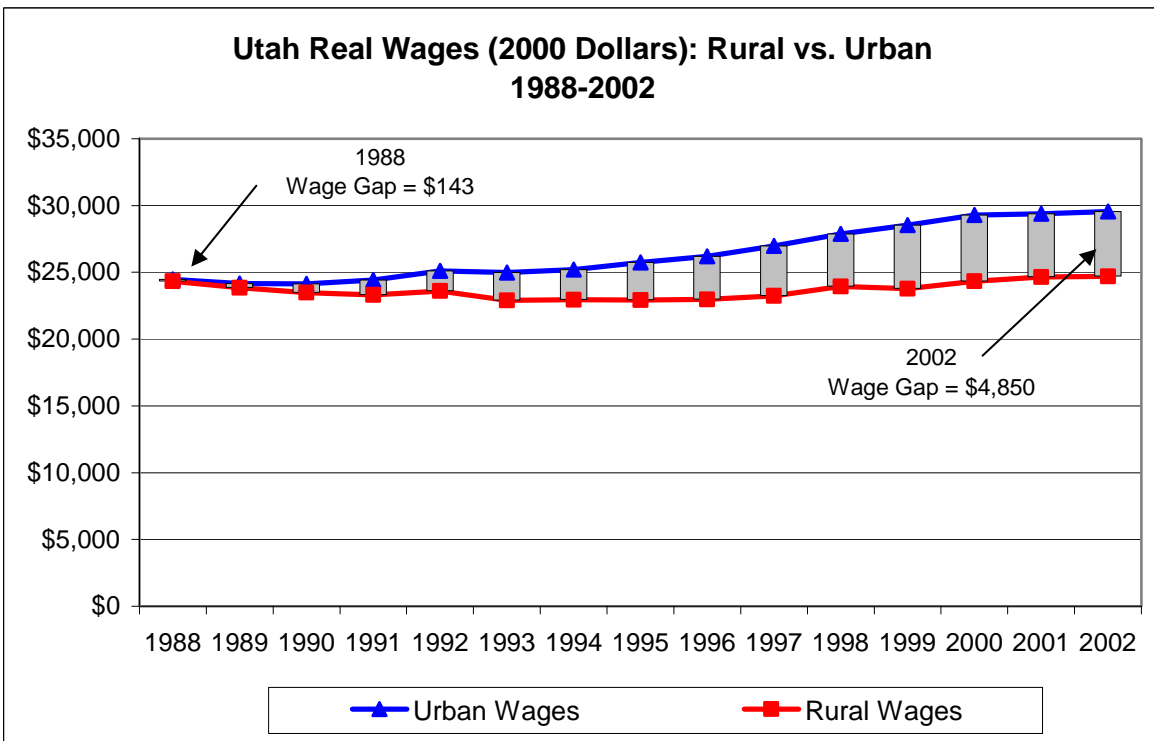
Figure B-19

Utah Unemployment: Rural vs Urban
1990-2002

Figure B-20

Utah Real Wages (2000 Dollars): Rural vs. Urban
1988-2002

Regression Analysis

Because of the interesting trends in Utah's rural regions discussed above, it is difficult to attempt to quantify changes in rural small business success using time-series regression analysis. For example, as we have observed in the data, both the wage gap and the number of rural establishments had considerable, consistent growth from 1988 to 2002, making it difficult to ignore the high correlation, whether casual or not, between these two variables. In addition, although we had 15 years of data we found that there was a very high level of correlation between nearly all of our independent variables and our two dependent variables, the number of rural establishments and real average non-farm proprietors' income (ANFPI). The average correlation coefficient (Absolute Value) between our dependent variables and each of our independent variables was .75 (Rural Establishments) and .64 (Rural ANFPI), making it difficult to obtain unbiased results.

We therefore turned to panel data analysis using each of Utah's 25 rural counties as a cross section, with data for each county covering the 1988-2002 timeframe. County-level data was obtained from the Bureau of Economic Analysis, the Census Bureau's County Business Patterns, the National Center for Education Statistics, the Economic Research Service of the U.S. Department of Agriculture, the National Association of Counties, and the state of Utah Economic and Demographic Research Database.

We first began with panel regressions using the number of small establishments as the dependent variable. Our first regression included only population as an independent variable, and as we found at the national-level regressions, population was a dominant variable in determining the variation in the number of establishments. Not surprisingly, population was significant at the 1 percent level with a positive coefficient, simply indicating that the counties with growing populations will experience an increase in the number of small establishments, and vice versa. To account for population differences across Utah's counties, all variables that were not already measured on a "per unit" basis were normalized by representing them on a per capita basis.[91] This included our dependent variable, the number of small establishments, which would now be measured as the number of small establishments per 1000 population. We subsequently tested several other combinations of independent variables, and developed a model in which the independent variables collectively explained 55 percent of the variation of the number of small establishments per capita (Table B-16).

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[91] For any variable that was not already on a per capita basis (i.e. wages and per capita income), we divided the value of the variable by each 1000 population in the county for the particular year of the observation. For example, the number of establishments in County A in 1999 is transformed to be the number of establishments per 1000 population by dividing County A's 1999 number of establishments by the population in County A in 1999 divided by 1000.

Table B-16
Panel Regression Analysis of the Number of Small Businesses in Utah's Rural Counties

Dependent Variable: LN(Small Establishments per 1000 pop.) Method: Pooled Least Squares Sample(adjusted): 1990 2002 Total panel (balanced) observations: 325	
Variable	**Coefficient**
C	-9.690 ***
LN(Real Income Per Capita)	0.512 ***
LN(Labor Force (Per 1000 Pop.))	1.205 ***
LN(High School Diplomas Per School)	0.078 ***
LN(Farm Proprietors (Per 1000 Pop.))	-0.067 ***
LN(Pupil-Teacher Ratio)	-0.158 *
LN(Real Average Non-Farm Proprietors' Income)	0.093 ***
R-squared	0.557
Adjusted R-squared	0.549
S.E. of regression	0.228
Mean dependent var	3.093

Significance: *** 1 Percent, ** 5 Percent, * 10 Percent

The regression results presented in Table B-16 tell us several things. Each of the independent variables is significant at the 1 percent level, except the pupil-teacher ratio which is significant at the 10 percent level. Per capita income and the size of the labor force appear to have the greatest impact on changes in the number of establishments, as their coefficients are relatively large compared with the coefficients of the other independent variables. The negative coefficient on the number of farm proprietors indicates that communities in Utah that experience an increase in farm dependency (growth in farm proprietors per capita) will experience a decrease in the number of small businesses.

Finally, the positive coefficient on real average non-farm proprietors' income signifies that the more successful small businesses are, in terms of profitability, the higher the rate of growth in the number of small businesses. This indicates that as small businesses fare better (in terms of profitability) it is more likely to attract additional small businesses to the particular rural community.

When performing regression analysis on small firm profitability in Utah, we achieve some very interesting results. Our dependent variable, average non-farm proprietors' income,[92] was regressed upon the same selection of independent variables as previously used in our panel data analysis using small establishments as the dependent variable. Although the model is not very robust, in terms of the overall explanatory power of the model (R^2), the signs of the coefficients on the independent variables are notable. Population, the unemployment rate, the wage level, and the level of natural amenities in the county are all significant at the 1 percent

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[92] Average non-farm proprietors' income was adjusted for inflation, stating all values in year 2000 dollars.

level when measuring changes in small firm profitability (Table B-17).   However, only population maintains the expected sign on the coefficient, with a positive value. One would expect a lower unemployment rate, higher wage levels, and a high level of natural amenities to be consistent with an increase in small business profitability. On the contrary, the regression results imply that areas with higher unemployment, lower wage levels, and lower natural amenities are the ones that are experiencing growth in small firm profitability.

Table B-17
Panel Regression Analysis Small Business Profitability in Utah's Rural Counties

Dependent Variable: LN(Real Average Non-Farm Proprietors' Income) Method: Pooled Least Squares Sample: 1988 2002 Total panel (balanced) observations: 375	
Variable	**Coefficient**
C	13.495 ***
Log(Population)	0.105 ***
Unemployment Rate	0.033 ***
Log(Real Wages)	-0.515 ***
Log(Natural Amenity Index)	-0.110 ***
R-squared	0.184
Adjusted R-squared	0.176
S.E. of regression	0.299
Mean dependent var	9.411
*Significance: *** 1 Percent, ** 5 Percent, * 10 Percent*	

Program and Policy Analysis

The success of the Utah's rural business climate in from 1988-2002 could partially be attributed to the state's Enterprise Zone program, which was established in 1988 to assist overall economic development in the state's rural areas.[93] Despite the success of Utah's rural small businesses throughout the 1990s, in late 2000, Utah's governor outlined what was thought at the time could be "the most significant rural development initiative in the history of the state."[94] The rural development initiative ("Rural Development Program") included a $3.3 million investment in the state's budget to help "rural Utah become a viable player in the New Economy." The focus of the investment was to help Utah transition from the "Old Economy" to the "New Economy" by improving and maintaining rural transportation and telecommunication options and by emphasizing the quality of Utah's rural workforce and the attractiveness of Utah's rural landscape. Utah's "Smart Site" program was developed under this program, and is touted as "the most innovative economic development initiative in America."[95] Additionally, the state of Utah has developed the Pioneer Communities/Main Street program which works with

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[93] Any part of the state that is not a part of a Metropolitan Statistical Area (MSA), as defined by the U.S. Census Bureau, is eligible to apply for enterprise zone designation. In order for a city to apply, the city's population must be less than or equal to 10,000. In order for a county to apply, the county's population must be less than or equal to 50,000.

[94] http://www.utah.gov/governorwalker/newsrels/2000/newsrel_1213c00.html

[95] http://www.smartsites.utah.gov

communities throughout the state to "restore the physical and economic vitality of their historic business districts."[96] The state also has several Small Business Development Centers, sponsored by the U.S. Small Business Administration, throughout the state, as well as Procurement Technical Assistance Centers, some in rural areas which assist Utah businesses in becoming more competitive in the government and commercial marketplace.

Utah's Enterprise Zone program provides tax credits for eligible companies that locate within areas of the state that are designated as "enterprise zones."[97] The tax credits are based primarily on new job creation and new investment in plant and equipment, and retail businesses, public utilities and construction jobs are ineligible. In recent years, the program has fared well; 21 companies claimed an average of $308,125 in Enterprise Zone Tax Credits between 1998 and 2002. Table B-18 shows that the dollar value per return steadily grew up until 2002 when values dropped off (Utah Division of Business and Economic Development 2004).

Table B-18
Utah Corporate Tax Returns Claiming Enterprise Zone Tax Credit

Year	Number of Returns	Dollar Value	Dollar Value Per Return
1998	13	$104,214	$8,016
1999	20	$278,957	$13,948
2000	25	$423,082	$16,923
2001	26	$455,501	$17,519
2002	21	$278,871	$13,280

To quantify the effect of the Enterprise Zone program on rural small business growth, we relied upon a recent list of Utah's rural counties designated as Enterprise Zones and their subsequent beginning dates. In order to provide an unbiased sample, we included all counties for which we had data three years leading up to the beginning date, as well as three years after the beginning date, including the first year of full designation. For each of these rural counties for which we had sufficient data, we compared the three-year average number of small establishments per 1000 population prior to the county's designation as an Enterprise Zone with the three-year average following the county's designation.[98]

Our sample of 14 rural counties indicated on average that the county exhibited an increase of 5.1 percent increase in the average number of establishments per 1000 population in the three years following the county's designation as an Enterprise Zone (Table B-19). Ten of the 14 counties exhibited positive growth in the number of small businesses, led by Piute County demonstrating the largest (a robust gain of 24.5 percent), followed by Rich County (with a 15.6 percent increase). Despite these gains, four counties actually had a decline in the number of small establishments. Wayne County exhibited the largest decline in the average number of

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[96] http://goed.utah.gov/pioneer_communities/index.html

[97] Enterprise Zones are designated through an application process. Approval is based on economic development need and other considerations, based on a variety of economic distress factors, such as poverty and unemployment, and local planning.

[98] For example, Emery County was granted designation beginning January 1, 1999. We therefore compared the average number of establishments per 1000 population from 1996 to 1998 with the average number from 1999 to 2001.

small businesses, with a 5.1 percent decrease in the first three years designated as a Enterprise Zone.

Table B-19
Three-Year Average Number of Small Establishments Per 1000 Population Before and After County Designation as Enterprise Zone

County	Beginning Date	3 Years Prior	First 3 Years	Percent Change
Box Elder	1/1/00	17.960	18.641	3.8%
Carbon	1/1/98	23.921	24.954	4.3%
Duchesne	1/1/00	25.473	27.134	6.5%
Emery	1/1/99	16.237	16.663	2.6%
Grand	1/1/98	41.226	44.032	6.8%
Juab	1/1/98	18.514	18.280	-1.3%
Kane	1/1/97	28.408	29.040	2.2%
Millard	1/1/98	19.406	19.072	-1.7%
Morgan	1/1/99	17.853	20.307	13.7%
Piute	1/1/99	12.817	15.955	24.5%
Rich	1/1/98	26.639	30.782	15.6%
Sanpete	1/1/98	16.482	15.782	-4.2%
Uintah	1/1/99	26.959	29.313	8.7%
Wayne	1/1/00	30.842	29.270	-5.1%
Total		**23.053**	**24.230**	**5.1%**

As part of Utah's Rural Development Program, the Smart Sites Program was developed in order to assist both communities and entrepreneurs that have an interest in developing technology-based jobs in rural areas. The Governor's Rural Partnership can award designation as a "Smart Site" to small communities that are prepared to accommodate companies that employ workers who use computers and the Internet to perform tasks for clients.[99] In order for a community to earn Smart Site designation, there must be at least one facility for sale or lease within the community which can be served by high speed Internet access. The program targets companies that provide jobs in the $10-$20 an hour range that require mid-level technology training.[100] In the first three years of Smart Sites, 50 rural, technology-based businesses were able to create over 1,000 new jobs, helping the program receive national recognition.

Finally, Utah's "Pioneer Communities" Main Street Program was initiated in 1993 to try and "restore the physical and economic vitality"[101] of downtown business districts in rural Utah communities. The focus is on sustainable development, focusing on economic stability, rehabilitation and restoration of important buildings, reduced vacancy, increased sales and property tax revenues, an enhanced sense of community identity, and more efficient, effective use of community resources.[102] The services offered by the program include workshops, comprehensive training, technical assistance and funding. The services are provided by the "Main Street Team", a consulting group with expertise in architecture and historic preservation, marketing and promotion, streetscape and public improvement planning and design, organizational development, and economic development.

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[99] For more information on the Smart Sites program, please visit: http://smartsites.utah.gov/overview/index.html
[100] Ibid.
[101] http://goed.utah.gov/pioneer_communities/index.html
[102] Ibid.