ASSESSING THE IMPACT OF PRISON SITING
ON RURAL ECONOMIC DEVELOPMENT

by

William T. Holley Jr.
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
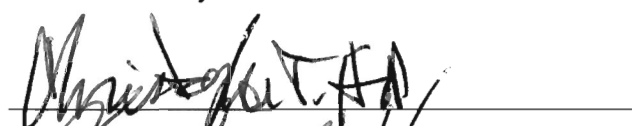Doctor of Philosophy
Public Policy

Committee:

_____   Stephen S. Fuller, Chair

_____   Roger R. Stough

_____   Timothy Conlan

_____   Terry Clower, External Reader

_____   Christopher Hill, Program Director

_____   Kingsley E. Haynes, Dean

Date: _17 November 2008_____   Fall Semester 2008
                                    George Mason University
                                    Fairfax, VA

Assessing the Impact of Prison Siting
On Rural Economic Development

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at George Mason University

By

William T. Holley Jr.
Master of Engineering Administration
George Washington University, 1986
Bachelor of Science
Virginia Polytechnic Institute and State University, 1977
Bachelor of Science
Virginia Polytechnic Institute and State University, 1974

Director: Stephen S. Fuller, Professor
School of Public Policy

Fall Semester, 2008
George Mason University
Fairfax, VA

DEDICATION

To my mother and father.

ACKNOWLEDGEMENTS

I would like to thank the many friends, relatives, and supporters who have helped make this possible. A special thanks goes to the members of my committee for their guidance and advice. My friends Dean Bellas and Matt Varga were particularly helpful with their encouragement and proof reading. My most fervent and patient supporters are my wife and children without whose understanding I would not have been able to complete this dissertation. The encouragement of my mother and father also contributed more than I can explain.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

ASSESSING THE IMPACT OF PRISON SITING ON RURAL ECONOMIC
DEVELOPMENT

William T. Holley Jr., Ph.D.

George Mason University, 2008

Director: Stephen S. Fuller, Ph.D.

From 1980 to 2002, the U.S. prison population grew from 330,000 to 1,350,000 inmates.
To house these prisoners, hundreds of new prisons were constructed in non-metro
counties. Most communities accepted prisons on the promise of new jobs and the hope of
economic development, but little research has been done to determine the actual
economic development value these institutions provide to the rural counties where they
are located. In order to measure the impact of new prisons on the rural economy, this
research compares indicators of economic development between non-metro counties with
new prisons and similar non-metro counties without prisons. Prisons, as a public good,
are limited in their ability to stimulate economic development.

INTRODUCTION

This dissertation examines the contribution of new prisons to the economic

development of rural counties. Prison building in rural counties became a common

practice in the 1980s and 1990s. During these two decades, prisons were built in non-

metropolitan areas with the assumption they would bring jobs and economic

development. Despite the number of counties with new prisons little research has been

done on the economic contribution of prisons to the region in which they are located.

Communities considering a new prison try to balance perceived negative social

consequences with the potential economic benefits. A significant body of research looks

at the societal impact of prison siting on the host community. Topics include the

potential for higher crime rates, the instability of property values, possible deterioration

of the business climate, assumed costs to local law enforcement and social services, a

lowering of the quality of community life, and fears of the deterioration of neighborhood

safety. While these issues do affect the initial community acceptance of prisons,

invariably the studies show almost no long-term impact from prison siting on these

factors. Little research has examined the economic impact of prisons in either

metropolitan or non-metropolitan areas. Many articles on economic development related

to prison siting are case studies based on anecdotal evidence or surveys limited to a

particular location. The current research does not segregate metropolitan and non-metropolitan locations.

Although rural counties continue to seek out prisons as a source of jobs to revitalize waning rural economies research has not adequately addressed the economic impact of these policy decisions. The factors that contributed to the explosive growth in prison construction are still in place and the need for new prisons is expected to continue. This dissertation will specifically address the economic impact of prisons built in non-metro counties during the 1980s and 1990s. Understanding how prisons contribute to the economy will help policy makers decide where to site prisons and how to leverage prisons to optimize economic benefits to the community. The results of this research will also provide county leaders a basis for analyzing the potential benefits of locating a new prison in their communities.

Research Hypothesis

The hypothesis of this dissertation is: "locating prisons in non-metropolitan counties contributes to the economic development of those counties." The null hypothesis is: "prisons have no net positive effect on indicators of economic development." This dissertation compares indicators of economic development in rural counties with prisons to those same economic indicators in rural counties without prisons.

Research Questions

This dissertation will provide answers to the following four research questions.

1. What are the underlying characteristics of rural economies that create the potential for growth and economic development?

2. How have rural counties been impacted by the national expansion of prison construction?

3. Does the presence of a new prison in a rural county contribute to structural economic change that leads to sustained development?

4. How can government influence the investment in rural prisons to enhance local economic development?

Question 1: Characteristics Supporting Rural Economic Development

Exporting industries supported by an interconnected network of supplier industries are the foundation for economic development. Rural areas have inherent characteristics that can attract the industry needed for economic development. These characteristics include social and cultural amenities, the availability of land and natural resources, and lower labor costs. In the past, transportation costs and economies of scale put rural areas at a disadvantage when seeking many of the industries found in urban centers but with the advent of transportation and communication networks that are more efficient rural communities have been able to develop economic linkages to urban and global markets. Some goods and services are more cost-effective to produce locally.

Other goods, like public goods, are not as subject to transportation costs and economies

of scale, and fit more easily into the context of the rural economy. Prisons are one of

these public goods.

Question 2: The Impact of National Prison Expansion on Rural Counties

Large-scale investment in prison construction affected non-metro counties as

policy makers used the growing demand for prisons to aid regional development.

Realizing that rural areas have inherent difficulties in attracting new industry,

government has encouraged economic development by producing public goods in rural

locations. Concurrently the exponential growth of illegal drugs, increases in crime

prevention legislation, stronger enforcement, and stricter prosecution created demand for

the construction of new prisons. Rural areas sought to fill the demand for new prisons as

a means to provide local economic development. During the 1980s and 1990s, a push –

pull relationship developed between the need for public safety and the desire for rural

economic development. The factors leading to higher levels of incarceration have not

changed and the need for prison construction will likely continue.

Question 3: Do Prisons Contribute to Sustained Economic Development?

Do new prisons contribute to structural economic change that leads to sustained

development n rural areas? In comparison to other government programs over the past

two decades, prisons have become increasing popular as engines of economic growth in

non-metropolitan areas. Prisons are most often accepted in rural areas due to the

perception they will create jobs. Economic development, however, is not only about job creation; it also involves structural changes in the regional industrial base that further promotes growth through the synergy of supporting industries. Prisons as an industry have an unusual niche in this environment. The fact that prisons create new jobs is unquestioned, but because prisons have no product to export and require little support from local industries, their overall value in regional economic development is difficult to ascertain. Prisons generate local income, directly and indirectly and can be the dominant industry in the counties where they are located, yet being the dominant industry in a county does not necessarily lead to sustained economic development.

Question 4: How Can Public Policy Enhance the Impact of Prisons on Economic development?

How can government influence the investment in rural prisons to enhance local economic development? Understanding the role prisons play in the economic system is the key to increasing the economic development potential of prisons. Because prisons are a public good, economic development models based on private industry are not fully applicable. Therefore, understanding how public goods interact in the marketplace is important to helping prisons become a stronger contributor to local economic development. Like other industries, prisons also have the potential to benefit from agglomeration. Indeed, communities that already have prisons often build additional new prisons or expand existing prisons. Investigation of the collected data may reveal other synergies and limitations of prisons as a tool of economic development.

Organization of the Research

This dissertation has five chapters. Chapter I provides the theoretical foundation for the research, it explores the limitations inherent in development of rural economies, as well as theories of growth and economic development. Chapter I also examines how prisons fit into regional economic development models. Chapter II provides the historical context of prison construction during the last two decades, and describes the role of prisons to the economic development strategies of non-metro counties. Also included in the Chapter II is a summary of the current research on how prisons act as stimuli for economic development. Chapter III describes the methodology used to evaluate the economic contribution of prisons to rural counties. Important to understanding the application of the methodology is understanding how the data were collected. Particular attention is given to the selection of the control counties used to compile comparison data. Chapter IV contains the results of the analysis that compares economic development in counties with prisons to the economic development of counties without prisons. The last chapter, Chapter V, concludes the dissertation by answering the research questions and discussing the public policy implications of using prisons as a stimulus for rural economic development.

CHAPTER I

THEORETICAL FRAMEWORK AND BACKGROUND

Any study is based on a foundation of work laid down by others and only by understanding these starting places can current research be put in context. The research in this dissertation builds upon existing theory to understand how prisons interact in the non-metro economy. This chapter consists of three interrelated parts, providing a context to understand rural economies and formulate a research methodology for investigating prisons as a source of economic development. The first part is a discussion of the characteristics of rural economies and how they different from urban economies. Central place theory and location theory characterize rural and urban economies. These theories point to factors in the non-metro economy that can enhance or limit economic development. The second part of the chapter describes growth and economic development. To determine if prisons create a basis for economic development it is fundamental to understand the definitions of growth and economic development. The theories on economic development describe the role of industry in the process of development. Also important to this dissertation are theories on the role of government investment in this process. The third section of the chapter reviews selected models used to analyze local economies. These models will also be the basis of examining how prisons, an industry producing a public good, fit into the economic system. The models

7

illustrate the factors needed in conjunction with the prison industry to stimulate economic development. These three sections, drawing from existing theory, will show how the characteristics of a rural economy contribute to economic development and how prisons fit into that model. By examining differences in characteristics of a developed urban economy and a less developed rural economy, we can find indicators of economic development. These indicators provide a measurement to help determine changes in the local economy over time.

What is Rural?

Non-metro counties are commonly referred to as rural counties, but counties are often a mix of urban and rural places. Understanding the impact of prison siting on the rural economy requires a clear definition of what is rural and how rural characteristics affect the economic structure. In non-metro counties, approximately 60 percent of the population lives in rural areas and 40 percent live in urban areas. In metropolitan counties, 13 percent of the population is rural and 87 percent is urban. Yet in 2000, metro counties contained a larger number of rural residents (30,060,121) than did non-metro counties (29,001,246). This distinction occurs when counties are near a metropolitan center and 25 percent of the workforce commutes to the metropolitan center. These counties are classified as metro counties in that they are part of a metropolitan area (Cromartie, 2007). Table 1: Residency Patterns for New Rural Urban and Metro - Non-metro Definitions shows the distribution of the urban and rural populations by metro and non-metro areas.

8

Table 1: Residency Patterns for New Rural Urban and Metro - Non-metro Definitions
Source: (Cromartie, 2007)

County Residence	Rural		Urban		Total	
	Number	Percent	Number	Percent	Number	Percent
Non-metro	29,001,246	49.2	20,157,427	9.0	49,158,673	17.4
Metro	30,060,121	50.8	202,203,104	91.0	232,263,225	82.6
Total	59,061,367	NA	222,360,531	NA	280,421,898	NA
Share of metro and non-metro residents living in rural and urban areas:						
Non-metro	NA	58.9	NA	41.1	NA	NA
Metro	NA	12.9	NA	87.1	NA	NA
Total	NA	21.0	NA	79.0	NA	NA

NA= Not applicable
Note: New urban-rural definitions, based on the 2000 decennial census, were released in May 2000; new metro-non-metro definitions were released in June 2003
Source: Calculated by Economic Research Service of the Department of Agriculture from 2000 Census of Population Data

What differentiates rural from urban? According to the U.S. Census Bureau, "An urban area generally consists of a large central place and adjacent densely settled census blocks that together have a total population of at least 2,500 for urban clusters, or at least 50,000 for urbanized areas. Urban classification cuts across other hierarchies and can be in metropolitan or non-metropolitan areas." The definition of a rural area is simply an area that is not urban. In the year 2000 59 million people, 21 percent of the population lived in rural areas.

Unfortunately, the definition of rural is incomplete. It just says what rural is not; it is not urban, not densely populated. The definition contains no information on social or economic characteristics. Their distance from large urban areas is the major characteristic of non-metro counties. Large sparsely populated areas dominate non-metro

counties but they may also contain urbanized centers, micropolitan cities. Why do some regions develop urban characteristics, becoming centers of population and economic activity, while other areas are slower to develop in the same manner? Comparing characteristics of non-metro counties them to the characteristics of urban metropolitan areas helps provide an understanding of the differences. As rural areas become more developed, they take on characteristics of urban economies. Measuring these changes is an indicator of the success of an economic development policy. The theory and literature on regional development explain the evolution and distinction of rural and urban places.

Central Place Theory

In 1933, Walter Christaller published his Central Place Theory. This theory provided a basis for explaining the location, size, and number of urban centers. Using certain unifying assumptions, Christaller postulated that the size and location of urban centers are dependent on the production and distribution of goods and services, and the willingness of people to travel to obtain those goods and services. Each central place distributes goods to a region within a certain distance of its location. All other things being equal, the price of these goods is dependent on distance from the central supply. The price is dependent on the transportation cost of the goods and the distance that people are willing to travel to obtain the good at that price. The price of the good increases the further it travels from the central place until at a certain distance another center can offer the good at a lower price. This distance a good can be offered competitively is the "range of the good." At the boundary, people would be able to travel

toward different centers and obtain the good for the same price. Each product also has a threshold production level. This "threshold of the good" is the scale or number of consumers needed to produce the good economically. Different goods have different thresholds. Lower order goods, such as bread, have low thresholds and higher order goods, such as machinery, have high thresholds. As a result, small centers can offer only low order goods, while larger centers offer the full range of goods. This phenomenon results in a hierarchy of central places, limiting the size and number of centers and the distance between them. Central places serve the market needs of the hinterland regions surrounding them.

To prevent overlap or unserved regions Christaller theorized the hinterlands served by a central place would be hexagonal. Hexagons will combine to form larger regions, which offer a greater variety of goods to an increasingly larger population. The great cities, offering a complex mix of goods and services to a large regional population, are at the center of the largest hexagonal regions. Many studies attempt to validate Christaller's hypotheses. In regions that approximate the idealized general assumptions of the theory, the results are generally conforming. The upper Midwest of the United States and the rural region of Southern Germany best approach the pattern predicted by Central Place Theory. In highly industrialized areas the pattern is more distorted (DeSousa & Stutz, 1994).

August Lösch expanded on Christaller's theory in 1940 by generalizing the theory using smaller mixed economic areas. Lösch found similar hexagonal areas to be the most efficient. Based on industry mix and non-uniform population distributions, the central

11

urban area may not be at the center of a hexagonally shaped region, but the areas of influence would be less uniform with a greater and lesser concentration of cities. The theories of both Lösch and Christaller are important in developing an economic basis for analyzing urban distribution and location (L. J. King, 1984).

Christaller described the limitations to rural economic development in Central Place Theory. Markets and distances limit the number, size, and proximity of urban areas. As rural areas seek to grow and develop, their own population and competition from existing towns and cities limit them. Established city centers having large populations and high concentrations of existing firms offer amenities to new industry that are unavailable in rural areas, and any economic development in rural regions is competing with these more efficient economies of scale. The economic rewards of industry agglomeration in urban areas reinforce these market principles, providing yet another competitive disadvantage to hinterland development. Often rural economic development potential is dependent on their proximity to urban centers. When a rural area comes within the expanding sphere of an urban center, low cost land and labor might attract firms seeking to combine the agglomeration advantages of the nearby urban economy with lower location costs.

In rural areas, traditional industries are agriculture, mining, logging, and light manufacturing. As extractive industries have become more efficient and less labor intensive, rural communities have tried to turn to other industry sectors to secure jobs and promote economic development. The natural amenities of rural areas and the cultural values of rural life help create jobs in rural areas. Regional economic development plans

often seek jobs in service industries such as tourism, retirement communities, and creating recreational opportunities for urban dwellers (Deller & Tsai, 2001).

Urban centers expanded greatly after the industrial revolution. Modern urban center economic development moves from advantages of geographic location to advantages found in the massing of economic activity. Economically cities grew for the same reason industry grew, they benefited from economies of scale. The concentration of labor, infrastructure, and large industry increased economic productivity. Urban centers also benefited from economies of agglomeration. The services, public and private, needed by industry are more efficient when many firms and households share the costs. Centrally located suppliers also generate economies of scale and costs of production are lowered for producers (Levy, 1985). As predicted by Christaller and Lösch, economies of scale dictate the services available in an urban area and the size of the urban center.

Christaller's central place theory is very dependent on modes of transportation. If goods can be efficiently transported further distances at lower costs, the markets available to any central place will grow. Advances in transportation have marked the postindustrial phase of urban development in two ways. First, as the automobile became commonplace, the urban landscape has expanded beyond a densely populated central core to suburban areas. Transportation in the expanding metropolitan area evolved from horses, to commuter rail, to road networks carrying an increasing number of automobiles further from the city core. The amenities offered by the suburbs first attracted residents, then

13

services, then industry. The suburbs evolved into satellite cities surrounding the original central place.

Other transportation advances such as airfreight, container shipping, and interstate trucking have allowed urban centers to expand existing markets beyond the traditional hinterlands and into global economies. International trade and lower transport costs permit export industries to generate more income for a region. The income in turn makes the region more attractive to service providers, and other export industry enhancing the economic stability of the region. Some goods such as international finance, insurance and multinational business management have minimal transportation costs, and centers supplying these services have indeed become world cities. The revolution in information technology has accelerated this effect (DeSousa & Stutz, 1994).

As goods and services travel greater distances at lower costs the rural economy suffers. Rural commercial centers no longer have a price advantage due to the transportation cost of goods. Urban and global markets can satisfy the local rural demand. As the "range of the good" expands, rural industry becomes less competitive with the economy of scale enjoyed by urban centers.

Location Theory

Location theory analyzes factors that influence the geographic siting of industry. Industrial location may result from something as simple as siting a factory at the founder's birthplace. In reality, the location decisions of firms are so complex and subjective that analysis of firm location does not easily lend itself to a general model.

More often location theories explain only part of the decision making process that firms use to locate new plants. The location of firms and the resulting growth of cities is an evolutionary process that has taken place over decades and many changing factors influenced the process. In some ways, change in the variables associated with the original location decision can account for the rise and fall of industries and cities.

Location theories began as a concept to explain the spatial distribution of manufacturing industries and started with an evaluation of transportation costs. The basic premise for the ideal industrial location was to find a site that minimized transportation costs. Transportation costs include both the transportation of raw materials to the manufacturing location, and the movement of finished products to the market. Since transportation costs are the major variable, location theory works best with industries where shipping costs represent a significant part of the price of a product. As firms are less transportation dependent their location options become greater, but are not unconstrained (Blair & Premus, 1993).

Location theory can be less about minimizing transportation costs and more about maximizing profits. For many industries, labor costs are the production factor with the greatest potential variation. Labor costs are comprised of not only wages, but also productivity associated with skills, and stability of the work force. Wages are supply and demand dependent and areas with surplus labor will have lower wages while areas with shortages of labor will see higher wages. Since both firms and labor can migrate to different regions, the relationship between firm location and labor is not straightforward. Firms may locate to an area of labor surplus to minimize labor costs or they may go to a

more desirable location, such as an area of agglomeration of similar businesses, even though labor costs there are more expensive (Webber, 1984).

A region's business climate also influences the location of new plants. Managers making location decision factor in the regional differences in regulation, taxation, utility rates, land cost, and local incentives. Locations also offer different mixes of amenities to satisfy the workforce's desire for a quality of life. Residential amenities include affordable housing, lack of traffic congestion, public education, public services, recreational opportunities, and public safety. If a region can attract and maintain a stable experienced workforce, industries that require those labor skills will be attracted to the area. A circular and reinforcing process develops where industry attracts labor and the availability of labor skills attracts new industry (Gottlieb, 1995).

The Hotelling Model of 1929 described how two sellers would locate next to each other to prevent their competitor from gaining market share that might result if they located some distance from each other. Though ignoring public benefit and transportation costs, this early model predicts agglomeration of industries in urban environments (Higgins & Savoie, 1995). Agglomeration is a characteristic of the economic region, most commonly an urban center that finds the total of the region's economic strength is more than the sum of its individual economic activities. Firms tend to move to population centers where similar firms are already prosperous in order to benefit from both available skilled labor and existing demand for their product or services. In part, locating near similar firms minimizes uncertainty and offers synergies in services, the supply chain, labor force skills, and market access, along with providing

some insight into the disposition of competitors (Richardson, 1979). A multiplier effect develops from the co-location of similar industries. Several studies indicate that productivity increases with city size and population density (Selting, Allanach, & Loveridge, 1994).

Finally, any location decision must overcome the basic inertia of change. Moving locations may weaken existing customer and supply relationships. In an existing area all the impacts of decision criteria are well known and there is a level of risk and uncertainty about the attributes of new locations (Webber, 1984).

Characteristics of rural areas

By definition, most rural areas are remote with small populations. These remote communities suffer by their distance from urban agglomeration economies. They lack a base of suppliers, skilled labor, and like firms that attract new industry into a region. A lack of diversified industries limits economic development in non-metro areas. In rural areas one half of the land and ten percent of the population are employed in farming (Fawson, Thilmany, & Keith, 1998). Limited industrial diversity increases transactional costs for firms located in non-metro areas. Remoteness also increases transaction costs further reducing rural competitiveness. As rural areas become less competitive, industry and then labor are more likely to leave for urban or foreign locations. A economic development strategy that tries to counter this trend, involves government policy to enhance existing industries and promote the linkages between existing firms (Markley & McNamara, 1995). Indeed fully 80 percent of new job growth in some non-metro

counties is attributable to expansion of existing industry (Drabenstott, 1995). The keystone then is to establish an industry base that can be refined. Government programs may help meet this need.

What characteristics of rural locations can promote economic development? Characteristics that contribute to economic output are rural "capital." Rural locations have natural capital in the form of land, water, and environmental amenities. The labor force has different levels of human capital. The labor force is generally not unionized and is available a lower cost and often in greater quantity than the same level of human capital in urban locations. Since there is less demand for labor in rural areas, wages and the cost of living are less expensive. Institutional capital in the form of government services and infrastructure are available in proportion to the size of the population that supports it. Health care and school systems are established. Geographically apportioned seats in the legislature give rural counties political capital disproportionate to their population. Fewer industries and a smaller more cohesive population create a rural social and cultural capital that many people prefer (Flora, Flora, & Fey, 2004).

Another characteristic helping in the economic development of rural America is the increase in demand occurring as rural areas become less self-sufficient and more consumer based. Lower transportation costs and internet commerce expands the "range of goods" as defined by Christaller. The relationship of the hinterland to urban centers becomes distorted as the factors that determined those relationships change while the relative locations of trading partners remain constant. The expansion of commerce

creates both supply and demand linkages between rural and the global economies (Flora et al., 2004).

As described in central place theory and location theory, rural areas are at a disadvantage in attracting new industry. First, few firms relocate and those that expand often seek overseas locations with lower labor costs and fewer regulations. Rural locations present limitations for firms expanding in the domestic market. Transportation costs are greater and there are few supporting industries. Labor is less skilled and education levels are lower than urban areas. There is also less local demand for the firm's output.

In many ways, prisons are well suited to rural, non-metro locations. Prisons are an expanding industry seeking new locations. Transportation costs are not a significant factor, prisons require few supporting industries, and can make use of lower skilled labor. Another advantage for rural counties is prisons are not subject to foreign competition.

Regional Economic Development

This section reviews the theory on economic development, extrapolates those theories to the rural economy, and describes the role prisons perform in the economy. As a starting point in a discussion of regional economic development, the terms growth and economic development require definition. Kindleberger, 1977, describes growth as an increase in output, while defining economic development as not only increases in output but also structural changes in the technical and institutional aspects of the economy.

Economic development builds on the interrelationships between industrial sectors. A developed economy results in improvements to the quality and standards of living, among these are higher literacy, improved living conditions, greater health and longevity, diverse choices, improved opportunity, and lower poverty (Kindleberger & Herrick, 1977). Industries that support economic development not only provide regional income, but also are a foundation for other industrial growth, both vertically from supplier firms, and horizontally by making the region attractive to similar industries. This agglomeration of interconnected industries evolves into urban economic activity. The economic vitality of the urban centers serves as a gauge to the economic development of the region.

Theories of growth and economic development have evolved to describe the advances resulting from economic development. The economic literature contains many definitions of growth and economic development. Growth means increased output and the measures of growth are factors related to aggregate product or per capita income. These factors do not reference any differences in the structure of the economy. Economic development involves structural changes in the economy. These changes occur in the social, cultural, institutional, and technical characteristics of the economy. Factors of economic development are not always quantitative making them very difficult to measure. They also occur over different periods and over different geographic regions. Economic development and growth are also interconnected. The definition of economic development includes increase in output along with structural change. Growth is limited as it eventually comes to a point of diminishing returns. Economic development is the

structural change that overcomes the diminishing returns of growth, allowing the economy to expand and improve the quality of human life (Flammang, 1979).

Theories of growth and economic development started with Thomas Malthus. In studying population growth in agricultural economies, Malthus postulated that the value of labor decreases with exponential population growth, until the limited amount of land cannot yield enough to support the subsistence cost of labor. Malthus understood the concept of diminishing returns of growth. In the early 1900's Joseph Schumpeter expanded the discussion of economic growth by introducing the concept of technology brought about by entrepreneurs. Technology increases productivity, lowers prices, and expands economies of scale. The next significant advance in growth theory was the Harrod-Domar model introduced in the 1930's. In their model, growth rate is a function of national savings and the capital /output ratio, a measure of productivity. One of the limitations of the model is the need to have labor and capital grow at the same rate in order to have both fully utilized. The need for this "knife-edge" condition and the lack of a technology component, proved to be the primary drawbacks to the Harrod-Domar model.

In 1956, to overcome the Harrod-Domar knife-edge limitation on growth, Robert Solow introduced the Neo-Classical growth model, which is based on a Cobb-Douglas production function that allows capital and labor to vary at different rates. Under the Solow model, economic performance across nations converge as the mobility of labor and capital along with the transfer of technology begin to minimize differences in national economic advantage. The predicted convergence occurs between nations in the

developed world, but less developed nations have tended to diverge economically from more developed nations.

Testing the Solow model with empirical evidence reveals that increases in labor and capital do not fully explain the output found when measuring a nation's gross national product (GNP). Fully 50 percent of the national growth rate results from advances in "technology." This weakly explained residual has given rise to endogenous growth or new growth theory. By placing importance on human capital, infrastructure, and research and development, endogenous growth theory helps explain the continuing divergence in growth rates between more developed and less developed economies. The management and organizational skills of enterprises, economies of scale, the existence of stable and reliable markets, and banking systems all contribute to the economic growth and development of regions (Kindleberger & Herrick, 1977).

Some believe government investment also has a significant impact on growth. In 1988, Aschauer published a seminal paper attributing a large part of the Solow residual to the influence of nonmilitary government spending on public infrastructure. He argued that public infrastructure enabled private capital to be more productive. Aschauer went so far as to ascribe economic downturns to the decrease of government investment in prior years (Aschauer, 1988). These findings generated a great deal of research and debate on the economic effects of public investment. Munnell agrees with Aschauer on productivity gains due to public capital expenditure, while Holtz-Eakin concludes no such correlation exists (Holtz-Eakin, 1994; Munnell, 1990). Still others suggest that Aschauer overstates the effect of public capital (Andrew & Swanson, 1995). The debate

focuses on productivity enhancement, not the importance of direct economic impacts contributed by roads and other public infrastructure. Aschauer's research lends some credibility to the assumption that public investment in prison construction could increase the economic productivity of a region.

Theories of regional economic development explain the concentration of industry, commerce, and people into urban areas. As Kindleberger states, theories of economic development do not lend themselves to mathematical formulas and statistical analysis as easily as growth theories. Economic development is more complex and subjective than simply defining relationships between labor and capital as inputs used to derive an economic output. Economic development progresses from agricultural and/or mining industries to manufacturing and associated service industries. In more developed regions, economic development may mean the transition from one type of manufacturing to another by adapting advancing technology. Economic development comes from changes in a growth economy. There are many sources of economic change. Improvements in technology increase output, decrease costs, and stimulate demand. Change can come from the need for new labor skills, new types of economic activity provided by entrepreneurs, government, or existing firms refocusing their activity. Innovation also happens in economic and social institutions as skilled and productive labor demands increased levels of private and public services.

Economic development results in changes in the labor force. From both technological improvements and human capital gains, labor becomes more skilled and more productive. The composition of the labor force changes; education levels are higher

23

and female labor force participation increases. Increased human capital results in higher wages stimulating demand for services thus increasing the complexity and interconnectedness of the economy (Kindleberger & Herrick, 1977).

Growth theory, described above, is supply dependent in that more output is dependent on a greater supply of labor, capital, and other factors. Market size limits growth not the amount of capital, land, or labor available. If the supply of land and labor are constant, then growth comes from increasing the supply of capital. Capital accumulation and savings become vehicles to economic development. Demand models approach economic development from the other side of the equation. Economic development occurs not from the supply of any particular asset but from the demand for the output produced by industry. As markets grow and become more complex with more buyers and sellers, no one producer or seller can affect the price. The elasticity of demand and supply expands as the market develops (Kindleberger & Herrick, 1977).

Since the primary driver in demand models of economic development is the existence of exporting industries, one must examine why these industries choose a particular location to understand regional economic development. Industrial location quickly leads to the study of agglomeration of industry into urban centers. Largely the understanding of regional economic development is an understanding of the importance and evolution of urban centers. These centers are not only the concentration of economic development in the region but also determine the nature of economic activity throughout their sphere of influence.

Macro Demand Models

Macro demand models ascribe economic development to the external demand for goods produced within a region. A region's income will increase as its industries export goods to areas outside the region and bring capital back into the region. Regional income, thus regional economic development, is then dependent on these export base industries. In this theory, regional firms are described as either basic (exporting) or service industries. As basic industries bring income into the region, they buy local products and pay wages. This interregional demand and induced demand from households wages, act as multipliers to the externally generated income. This multiplier effect varies for different kinds of basic industries. Extraction industries like mining have lower multipliers than manufacturing. Knowledge based business service industries produce high regional multipliers. Under demand models, economic development can be obtained by attracting export base industries to the region or expanding export industries already there through increased trade. The problem with demand models is that they assume infinite supply. They also do not account for labor productivity, nor are spatial and dynamic effects considered (Richardson, 1979).

North notes that regional growth is very dependent on export industries and how the region utilizes the income from the export industries. If income expands the export base and stimulates domestic consumption, the region will diversify and grow. However, reliance on a single export industry over time often results in a stagnant local economy (North, 1966). Prisons as an industry may provide a focused case study for validating this theory.

A specialized case of demand modeling is the input-output model. The model measures specific transactions between industries and within regions. By analysis of the detailed transactions, indirect effects, and induced effects of households, employment and income multipliers can be determined for base industries in the region. Input-output analysis can be very helpful in quantifying regional economic development, but it requires detailed data collection and gives only a snapshot of economic activity (Hewings, 1985; Hoover, 1975).

Rural economic development ends up being a corollary to other theories of economic development. In general, the rural economy lacks those factors that create urban centers. Extractive industries common to the early stages of more robust economic development continue to dominate rural economies. In rural areas, traditional industries are agriculture, mining, logging, and some manufacturing. As extractive industries have become more efficient and less labor intensive, rural communities have tried to turn to other industry sectors to secure jobs and promote economic development. Often these jobs rely on the natural amenities of rural areas and the cultural values of rural life. Economic development plans seek jobs in service industries such as tourism, retirement communities, and creating recreational opportunities for urban dwellers (Deller & Tsai, 2001). The competitive advantages of a rural location are its inherent amenities, or the low cost of land and labor, but it is difficult to transform these factors into new growth and subsequent economic development by attracting new industry. Rural areas must compete with urban areas on cultural amenities, foreign labor on costs, and each other on natural and cultural values.

26

Rural areas are also dependent on urban and global systems over which they have little influence. Decisions made in urban areas affect the ability of rural economies to attract and maintain industry (Castle, 1998). Rural goods are dependent on urban governments, market centers, and transportation centers for their economic well-being.

Malthus was partially correct in his analysis of an agricultural economy, but rather than an exponential growth in population, it was an exponential growth in technology that made land unable to support more employment. Rural counties need economic development to employ excess labor and support their population and life style. Rural economic development policies try to attract new industry by strategies such as low cost loans, minimizing taxes, providing infrastructure, and enhancing skills of low cost labor. These policies build on inherent advantages of rural areas: low cost labor, availability of natural resources, and ease of transportation. Low cost labor, as predicted by the neo-classical growth theory, can be a strong attraction for capital investment. The cost of labor and the productivity of labor are the keys to profitability but even areas of low cost labor must provide certain skill sets in order to be attractive.

Prisons as an industry do not clearly fit into either New Growth supply side models or Macro Demand models of economic development. Prisons produce a public good and although the demand for the public good, public safety, is high, very little can be done to improve the output. Improvements in technology have limited ability to improve efficiency of housing prisoners. Prisons are somewhat independent industries and may not provide opportunity for supporting supplier firms. The next section looks at economic models to explain the role of prisons as an industry in the rural economy.

Economic Development Models

Porter created a model for national economic development that is applicable on a smaller scale to counties seeking to develop their economies. Figure 1: The Determinants of National Advantage shows the structure of Porter's model. Porter states, "Indeed, the reasons why a particular city or region is successful in a particular industry are captured by the same considerations embodied in the "diamond." … The theory can be readily extended to explain why some cities or regions are more successful than others."

```
                    ┌──────────────────┐
                    │  FIRM STRATEGY,  │
                    │  STRUCTURE, AND  │
                    │     RIVALRY      │
                    └──────────────────┘

┌──────────────┐                          ┌──────────────┐
│    FACTOR    │                          │    DEMAND    │
│  CONDITIONS  │                          │  CONDITIONS  │
└──────────────┘                          └──────────────┘

                    ┌──────────────────┐
                    │   RELATED AND    │
                    │   SUPPORTING     │
                    │   INDUSTRIES     │
                    └──────────────────┘
```
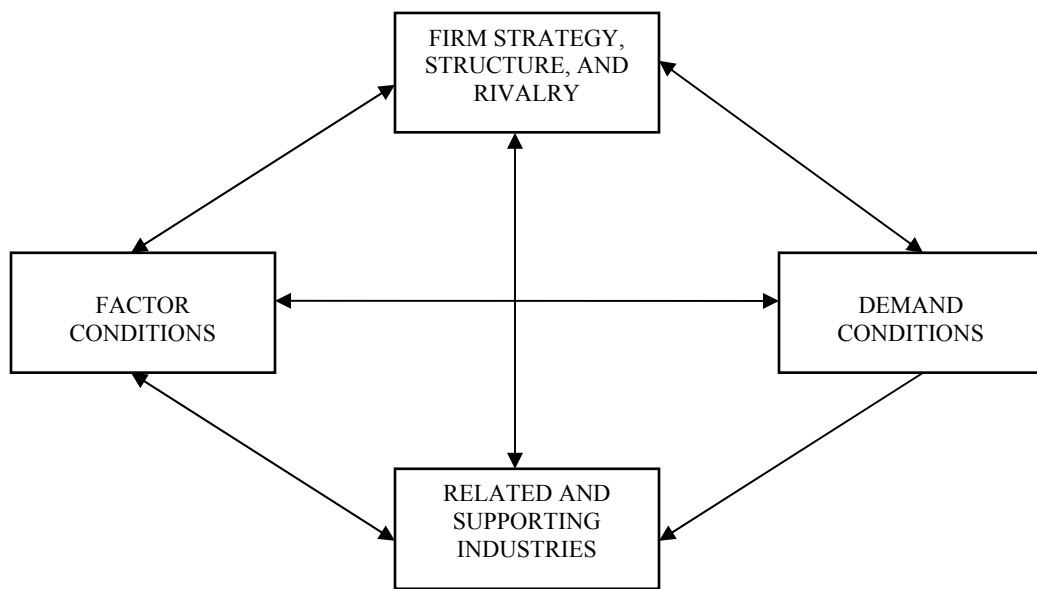
Figure 1: The Determinants of National Advantage
Source: (Porter 1990)

As previously defined, economic development involves structural changes in the technical and institutional aspects of the economy that are reflected in the

28

interrelationship between industrial sectors. For regional economies, these changes move from a beginning in agricultural production, to manufacturing, to the dominance of service sectors, and perhaps to informational-based economies. Frequently the percent of population involved in each sector gives a history of growth for a region (Hansen, 1994). Structure can be both vertical and horizontal. The vertical economic structure consists of a dominant industry that supports its own chain of suppliers and service providers within the region. As regions become more developed and complex horizontal relationships develop between varieties of industries that support the economic base with common suppliers and services. The latticework of related industries, suppliers, and service providers give the region stability and synergistic growth (Porter, 1990). Different theories explain the evolution of regional economic development.

Porter defines "Factor Conditions" as the requirements for production. Factor Conditions include human resources, physical resources, knowledge resources, capital resources, and infrastructure. Factor conditions are further broken down into basic factors and advanced factors. Included in basic factors are natural resources and semiskilled labor. Porter states that although basic factors remain important in rural extractive industries and agriculture they are of diminishing importance and provide little competitive advantage. Advanced factors include such items as communications infrastructure, high levels of education, and advanced research institutions. Advanced factors support economic development by providing a competitive advantage for the region.

"Demand Conditions" consist of the nature of the demand in the home market, the size and growth pattern of the home demand, and mechanisms of transferring demand to other markets. The "Related and Supporting Industries" portion of the diamond refers to supplier industries that are competitive outside the region. The determinant of "Firm Strategy, Structure, and Rivalry" concerns management style, organizational objectives, and domestic competition within the dominant industry.

In Porter's model, government influences all the factors but not as a fifth factor. Governments can regulate markets, create demand, and improve factor conditions, but government policy has only a partial role in creating competitive advantage. Porter states that among the more important and traditional roles of government are improvements in education, upgrading infrastructure, and government purchases.

Public investment, like private investment, does not necessarily increase the ability of the economy to produce more output. One of the traditional economic roles of government is to provide public goods such as public safety, public health, and public infrastructure. A public good is a good that is both non-rivalrous and non-excludable. A non-rivalrous good is one that can benefit one consumer without diminishing the benefit to others. The internet is an example of a non-rivalrous good. A non-excludable good is a good that you cannot restrict people from using. A public park can be a non-excludable good. The capacity of public investment is difficult to access in the marketplace since public goods are non-rivalrous. Idle capacity of public investment is as likely as idle capacity of private capital investment. Public investment is valuable to the private economy but the value is difficult to measure. Since public goods are non-excludeable it

is hard to measure how much is enough or if more needed (Kindleberger & Herrick, 1977).

In simple resource-intensive or low technology firms not all the determinants of the Porter model need to be in place to develop a competitive advantage. "Factor Conditions" are often the most important in the beginning but an integration of all the determinants becomes significant as industry and regions develop. Prisons in the non-metro economy represent a labor-intensive low-tech industry where factor conditions are dominant. Government may be able to enhance factor conditions such as education and infrastructure to improve the potential for economic development. Supporting industries that create outside demand would help create sustainable economic development.

Figure 2: Regional Economic Model is a diagram of a regional economy functioning according to a demand model of regional development. The basis of the model is private industry importing goods and services and transforming them into new goods and services to satisfy external demand. Supporting the basic industry are supplier industries that also interact with the external marketplace. Industry is dependent on government services, household labor, and financial institutions. In turn, industry provides the taxes, earnings, and returns for the respective sectors to function and expand. The system is dynamic and multiplier effects increase the wealth of the region as money circulates through the economy.

REGIONAL ECONOMIC MODEL

```
                    goods                              goods
 IMPORTS FROM       services      LOCAL                services       EXPORT
 OTHER REGIONS      dollar        INDUSTRY             dollar         MARKETS
                    payments      -------------------  payments
                                  INTERINDUSTRY
                                  LINKAGES
```

services   taxes   earnings   purchases   payments   loans

```
                    taxes                        savings
 GOVERNMENT                   HOUSEHOLDS                   CAPITAL
                                                           INVESTMENT
  purchases       services                       returns
        loans
```
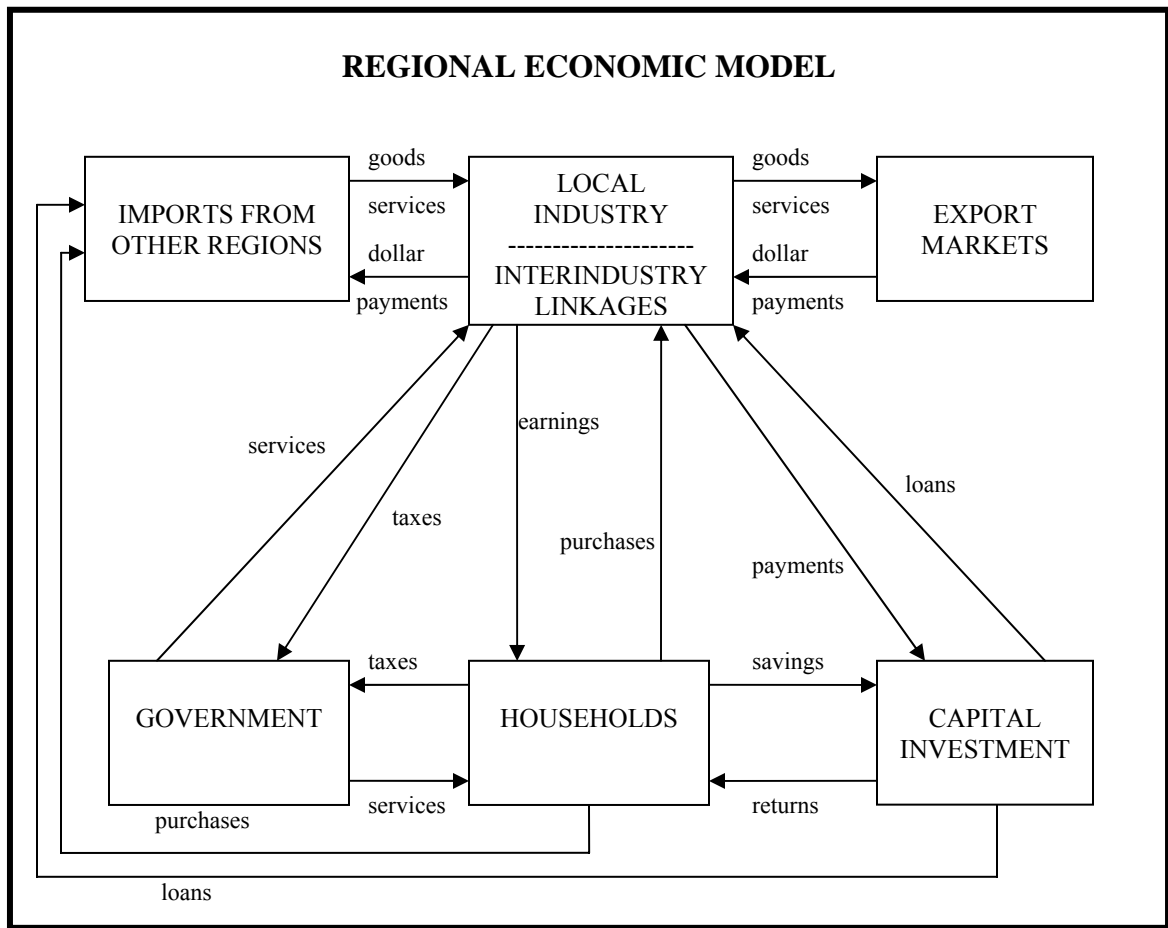
Figure 2: Regional Economic Model

Non-metro counties seek industries that conform to this model of economic
development: base exporting industries supporting service industries, paying wages to
households, and providing revenue to local government. As will be discussed in Chapter
V, prisons and other industries providing public goods may not be a good fit in this
model.

Conclusions on Theory and Background

To develop their economies non-metro counties must move from traditional extractive industries to more interdependent economies based on manufacturing and services. Rural areas must leverage the various types of capital available to them to recruit new industry. Natural capital, low cost human capital, social and cultural capital, and political capital are areas where they may have some competitive advantage over urban centers and other non-metro regions. Prisons are an expanding industry that fit well with the advantages available to non-metro counties.

Prisons, however, producing a public good may not follow the same model of economic development as other industries. Evidence that prisons have been successful in bringing economic development to non-metro counties would manifest itself by characteristics and benefits of a more urban economy. These characteristics would include: higher total county output; greater labor force participation; increased earnings; increased earnings and labor force participation in supporting industries; greater local government revenues; increases in private and self employment; and increases in levels of education. Chapter II describes the effect of prisons on local economic development in rural counties.

CHAPTER II

PRISONS IN THE RURAL ECONOMY

This chapter reviews the policy and history by which prisons as an industry became important in trying to achieve rural economic development. The first section describes the events that converged to create the boom in prison construction since 1980. Understanding the source of these events gives context to the policy decisions on prison location and helps provide a basis for any future policy changes. The second part summarizes the current research on the regional economic impact of new prisons.

One method policy makers have used to stimulate rural economic development is to produce pubic goods in rural areas. Public goods are those that are both non-rivalrous and non-excludable. An unlimited number of consumers can enjoy non-rivalrous goods simultaneously and a good is non-excludable when people who have not paid for it can benefit from it. Examples of government investment in "public industries" to produce public goods include educational facilities, military bases, parks, and public works. Public investment in rural areas in the United States began with the land grant colleges of the 1800s. Rural public investment in education continues today when community colleges are located in non-metro regions. Like larger land grant universities, the community college acts a focal point for government and private funding to support various regional initiatives (Rivard, 2002). Fort Drum in New York and Kings Bay

34

Naval Base in Georgia are two examples of rural economic development resulting from new military base construction. Parks not only fulfill a public desire for preservation and conservation, but also create spillover benefits from visitors. One study, using a government formulated cost-benefit analysis, found national parks generate four dollars in value for each tax dollar spent. The report stated national parks support $13.3 billion of local private-sector economic activity and 267,000 private-sector jobs. The parks attracted businesses at a rate one percent greater than comparable state growth rates (Hardner & McKenney, 2006). Like military bases and parks, prisons are an example of government investment in the production of public goods.

Some public projects, such as the Interstate Highway System or the Tennessee Valley Authority, are so large they have national economic consequences. Undoubtedly, rural areas are structurally changed and economic development patterns significantly altered because of projects of this magnitude. These mega-projects and their impact on regional and national economic development seem to put them in a different class from public investment in prisons, however, over the past two decades the exponential growth of prison construction has changed the face of rural America on a similar scale. The change has not come as a single event to a specific location, but rather as a multitude of projects dispersed across the nation.

Prison Construction in the 1980s and 1990s

One of the first to recognize the trend to locate prisons in non-metro communities was Calvin Beale, a senior demographer for the Economic Research Service of the U. S. Department of Agriculture. His research started in 1980, when he realized Crowley County, Colorado was gaining residents while most other communities in the Mid-West plains lost population. The reason for this anomaly was the construction of new prisons in non-metro locations. Beale's research revealed that during the 1980s non-metro prisons opened at an average rate of 16 per year. This trend accelerated during the 1990s when 245 prisons (57 percent of all new prisons) opened in rural America. Opening at a rate of 24.5 prisons per year resulted in a ten-year period when a new prison opened, on average, every 15 days somewhere in rural America. In-migration of inmates accounted for over 500,000 people locating in non-metro counties during the 1990s, most of these prisoners coming from urban areas.

Two operational factors are important in the selection of prison sites. First, the location should not inhibit visitors to the prison and secondly services such as hospitals and courts should be within a reasonable travel distance. These operational factors favor metropolitan prison locations but site factors also govern the decision. Site factors include the size and cost of the site, availability of utilities, topography, receptiveness of the local community, and ease in recruiting staff (Thies, 1998). Site factors favor rural locations. When these factors combine with the advocacy of rural economic

development groups and the opposition of urban neighborhood associations, rural locations often are selected as locations for new prisons.

Since 1980, the country has placed a disproportionate number of its prisoners in non-metro locations. In 1991 with only 23 percent of the US population, non-metro areas housed 44 percent of all inmates. Between 1980 and 1991 the total number of non-metro prisons doubled as 213 prisons were constructed in rural areas during the time period (Beale, 1999). Beale estimates that since 1980 more than half of all non-metro counties acquired new prisons or are within commuting distances of new prisons (Beale, 2001). Figure 3: Metro versus Non-Metro Prisons by Period Opened shows the location and opening timeframe for prisons that house over 300 inmates. For this research, the 1993 OMB definition of metropolitan statistical area determines if the prison is in a metro on non-metro location.

The data presented in Figure 3 shows opening dates of prisons that were still in operation as of 2000. Some of the operating prisons have been in existence for over 100 years and prison growth for most of the 20th century was constant, most likely the result of population growth. For the past two decades, however, prison construction exponentially accelerated and most of the new prisons were located in rural counties.
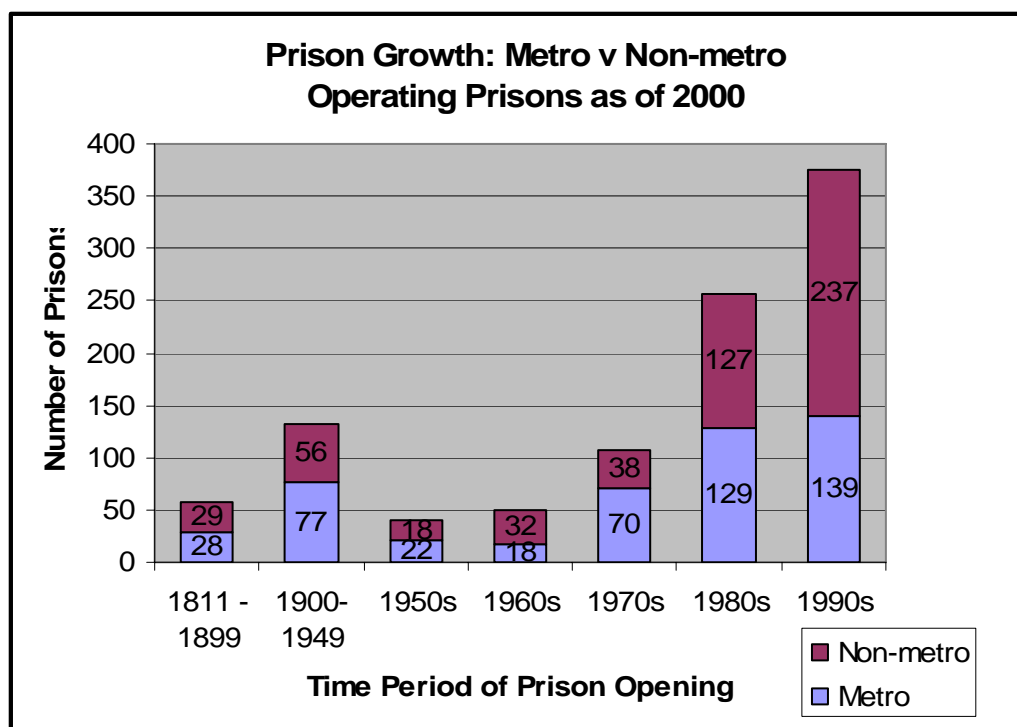
Figure 3: Metro versus Non-Metro Prisons by Period Opened

Government spending accounts for a large share of the income of non-metro regions. The Department of Agriculture describes 244 non-metro counties as government dependent. Their primary source of income is local, state, or federal governments. In these counties, population grew from six to eleven percent during the 1980's while the overall non-metro population grew at only 0.6 percent. During this time, the income gained by government dependent counties was three times higher than the other non-metro counties. Prison construction has been one contributor to population and income growth in these counties (Salsgiver, 1996).

Figure 4: Growth in Non-metro Government Jobs shows a graph of non-metro government employment form 1969 to 1993. Government employment became an

increasing important source of new jobs for non-metro regions. New prisons, state and

federal, brought 56,000 new jobs to non-metro regions between 1980 and 1991

(Salsgiver, 1996) .

Nonmetro government employment, 1969-93

*Growth in State and local government jobs has pushed government employment
higher*
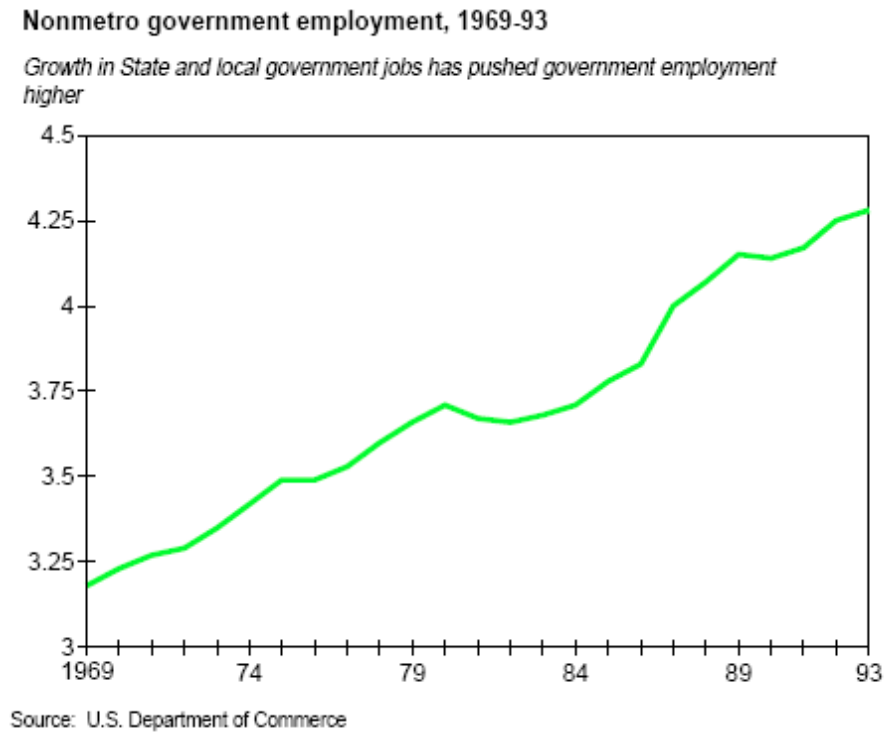
Figure 4: Growth in Non-metro Government Jobs
Source: (Salsgiver, 1996)

Government investment in purchasing and operating prisons has also increased

over the past two decades. Operating costs for the nations prisons grew from $3.1 billion

in 1980 to $17.7 billion in 1994 (1994 dollars). The Federal Bureau of Prisons (FBOP)

estimates it spent $4 billion on building new facilities from 1996 to 2006. Estimates for

state prison construction range from $10 billion to $15 billion for the period from 1995 to

2000 (GAO, 1996). As shown in Figure 5: State Cost of Prisons, state spending on

corrections went from $10.6 billion in 1987 to $44 billion in 2007 (Warren, 2008). This

large and continuing investment of public funds creates a potential for government

directed economic development in rural areas.

TWENTY YEARS OF RISING COSTS

Between fiscal years 1987 and 2007, total state general fund expenditures on corrections rose 315 percent.
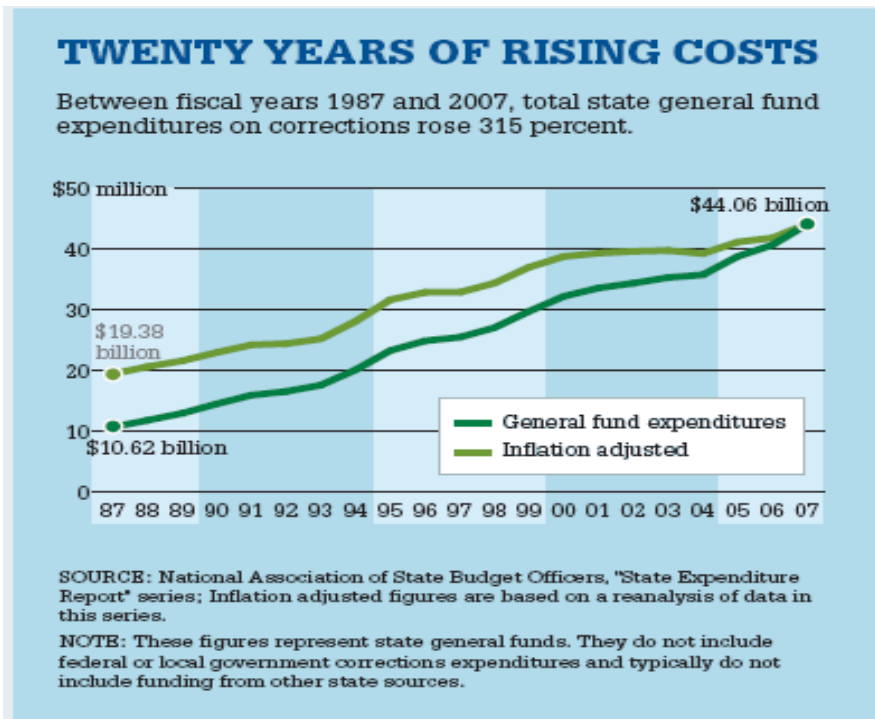
Figure 5: State Cost of Prisons
Source: (Warren, 2008)

Figure 6: Growth in Prison Population 1977 to 2004 shows the growth in federal and state prison populations from 1977 to 2004. From 1980 to 2002, the federal prison population grew from 24,252 to 139,183 inmates, a 474 percent increase. During the same time period state prison populations increased from 305,458, to 1,208,003, a 295 percent increase (Harrison & Beck, 2002). Stricter sentencing laws, federal drug laws, improved enforcement, and tougher crime policies have all contributed to larger prison populations.
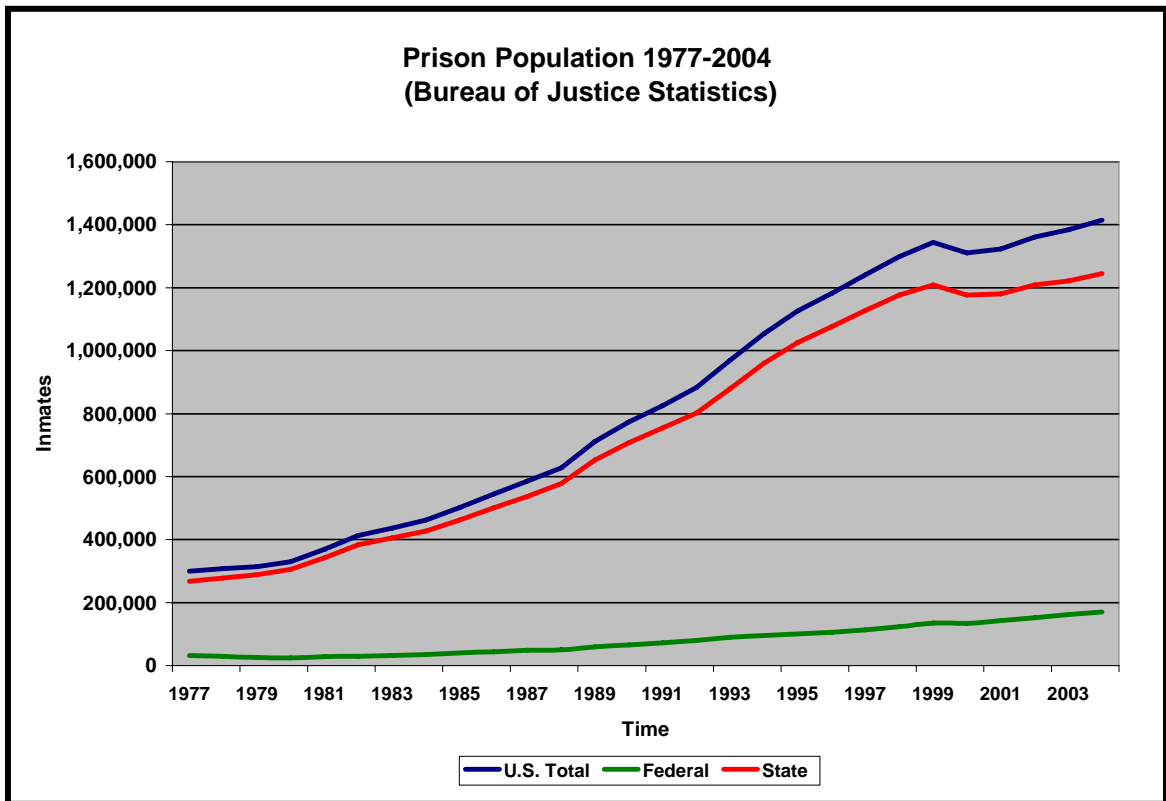
Figure 6: Growth in Prison Population 1977 to 2004
Source: Bureau of Justice Statistics

Not only are there more prisoners but they are incurring longer sentences. Longer

minimum sentences are imposed on violent crime, drug crime, and crime involving

firearms. In conjunction with these increases, the Sentencing Reform Act of 1984

abolished parole in the federal system and the 1986 Anti-Drug Abuse Act required

mandatory minimum sentences for most drug offenses (GAO, 1996). Many states have

"truth in sentencing" laws mandating that an inmate must serve 85 percent or better of

their sentence. Some states have eliminated parole and half the states now have "three

strikes" laws requiring life imprisonment for a third felony conviction (Eckl, 1998).

The federalizing of drug laws had a dramatic effect on the inmate population of

the Federal Bureau of Prisons (FBOP). In 1980, 25 percent of the 19,023 prisoners

sentenced were in federal prison for drug offenses. By 2002, 55 percent of the 128,090

sentenced prisoners were drug offenders, down from a high of 61 percent in 1994 (FBOP,

2001).

Prisoner growth rate finally began to slow at the turn of the century. By the end

of 2001, there were 1,406,031 adults incarcerated in either Federal or State jurisdictions.

The prison population only grew by 1.1 percent in 2001, much less than the average of

3.8 percent since 1995. The lowest prison growth rate since 1972 occurred in 2001. Still

one in every 112 men and one in every 1,724 women were serving sentences in 2001.

These included 1,324,465 in prison, 631,240 in jails, and 27,961 in military, territorial or

immigration detention centers. At the end of 1999 there were also 108,965 juveniles held

in correctional facilities (Harrison & Beck, 2002).

In Figure 7: Historical Incarceration Rates grafts the incarceration rate per

100,000 of the estimated population from 1925 to 2001. The incarceration rate of about

100 inmates per 100,000 people remained essentially flat from 1925 until 1980. Since

1980, the rate has grown exponentially. The incarceration rate for states has increased

from 134 per 100,000 residents in 1980 to 422 per 100,000 in 2001. Louisiana had the

highest rate with 800 per 100,000 and Maine the lowest at 127 per 100,000. The federal

incarceration rate per 100,000, increased from 11 to 48 during the same period (Harrison

& Beck, 2002). The Bureau of Justice Statistics estimates that 5.1 percent of the U.S.

population will be confined to a state or federal prison sometime during their life

(Bonczar & Beck, 1997). Unless there are significant changes in policy, the need for

prison construction will persist and the impact on rural America will continue.
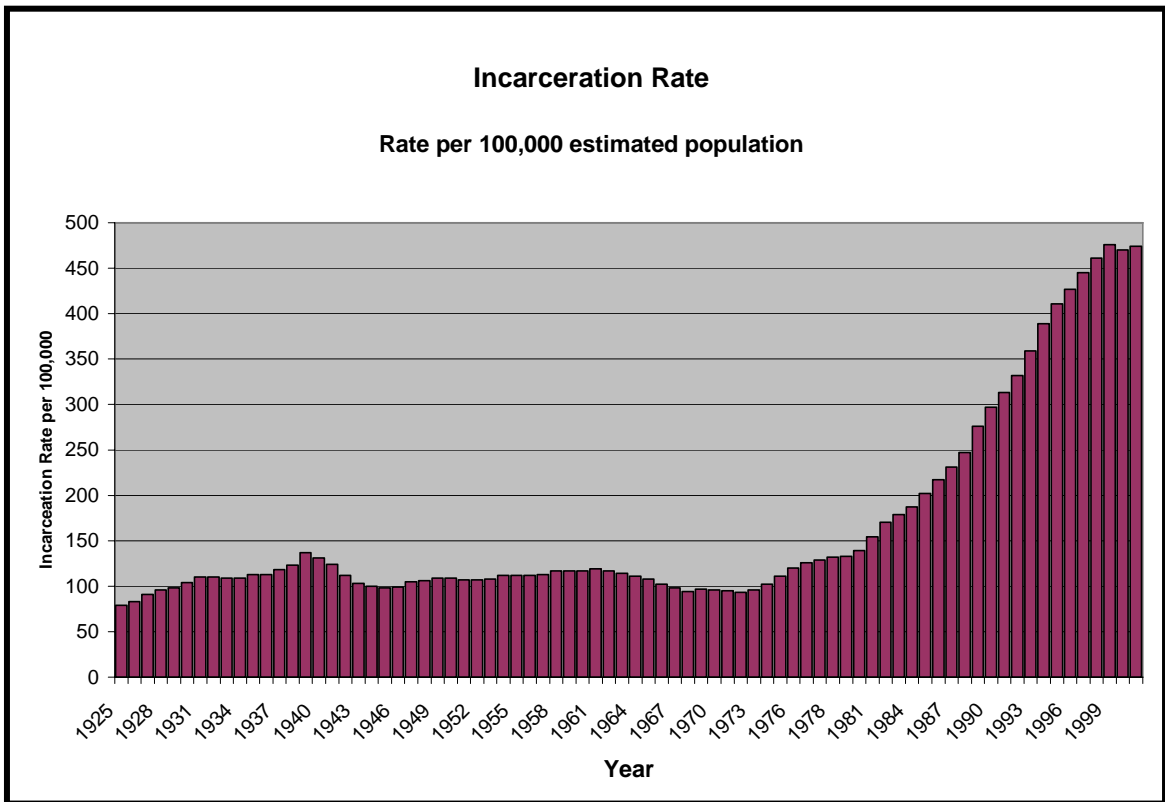
Figure 7: Historical Incarceration Rates
Source: U.S. Census Table No. HS-24, *Federal and State Prisoners by Jurisdiction and Sex*
          1925 to 2001

Predicting prison population increases, however, is a risky business. The FBOP

and some states have developed algorithms to help determine the future need for new

prison facilities. Practitioners claim these models are reliable and accurate to within two

percent, but projections for five years or even for as little as two years show the models

are only rough estimates of actual populations (GAO, 1996). Realizing the number of complex time dependent variables required for the models, it is not difficult to understand their error rate. As the procurement cycle for new prisons from site selection through construction to activation exceeds five years, the supply of new prisons is often out of cycle with their demand.

Federal prison construction, in part due to the federalizing of Washington, DC inmates, has continued to be strong. Recent downward trends in crime rates and more difficult state budget circumstances have diminished the growth rate in state prison construction, although states expect the need for new prison construction to continue. For example, Virginia expects its current prison population of 38,000 to grow to 44,700 by 2013. The state will need as many as six new prisons each costing $100 million to build and $25 million annually to operate. The Virginia Department of Corrections is now the largest state agency with 13,000 employees and a budget of over $1 billion. Virginia is 20th in a ranking of state per capita spending on prisons (Associated Press, 2008).

Typically studies on siting prisons have looked at four general areas, public safety and crime, property values, quality of life, and local economic impact (Fehr, 1995). Most research refutes myths about prison siting. Many people assume a prison will increase crime, lower property values, decrease the quality of life, and cause an adverse economic impact. The literature reviewed does not support these assumptions, finding no impact on crime, property values, or measurable quality of life factors. Fewer studies look at the economic outcomes of prison siting.

45

Studies on the Economic Impact of Prisons

A county hopes to get short-term and long-term benefits from a new prison. The first economic benefit is the capital investment in prison construction. A new prison costs between $70 million and $100 million to build. Construction provides well paying short-term employment, but more importantly once activated prisons provide jobs and the potential for economic development. Many rural communities believe prisons bolster declining populations, provide employment, and diversify the economic base. The economic development potential from prisons in declining rural areas is though to be so great that communities compete for prisons by investing their own assets.

Localities seeking a new prison are often required to donate land and provide infrastructure improvements, sometimes at large expense to the community. An extreme example is Appleton, Minnesota, where a small town of 1,552 people issued $28.5 million in bonds to open a private 472-bed facility thereby hoping to employ as many as 160 people. Appleton was the second community in the nation to build a private prison. Unfortunately, the prisoners did not arrive as quickly expected and in 1993 the town started to miss interest payment on its bonds (Terry, 1993). A turnaround did not come until November 1995 when Appleton secured 515 Colorado inmates and created 175 new jobs. The town then expanded its prison capacity, even though future expansion was dependent on continued overcrowding in out-of-state prisons (Beale, 2002). Appleton now has 1,300 beds housing prisoners from Wisconsin, North Dakota, Hawaii, and Puerto Rico. The prison supports a $14 million budget and is the largest industry in the

county (Doyle, 2002). Minnesota has a prison capacity of 8,200 beds. Half of those were built since 1980 and 84 percent, including, Appleton, are in rural areas (Clement, 2002).

Local communities desire to be the site of new prisons primarily to gain new jobs. More importantly, rural communities have an underlying expectation that public investment in prisons will result in local economic development. In 1990 the New York Corrections Commissioner viewed prisons a "the anchor for development in rural areas" (R. S. King, Mauer, & Huling, 2003). That prisons result in job creation is evident, but their role in regional economic development is less certain.

The phenomena of rural counties trying to stimulate economic development with new prisons only recently become the focus of research. Journal articles on the topic of economic development from prisons are rare. Community fear associated with new prisons is a more common topic of research. Smykla described some factors associated with growth and economic development in a case study comparing three Alabama counties with state prisons to three similar counties without prisons. In comparing population growth, total employment, per capita income, and retail sales, the study found neutral or positive effects on these factors in counties with prisons in comparison with the counties used as a control. Four of the six counties studied, however, are within metropolitan areas. The metropolitan character of the region minimizes, or at least clouds, the ability to attribute economic development to prison siting (Smykla et al., 1984).

Thies describes modest economic development in towns with prisons. She found when prisons are located in small towns, population increases, unemployment declines,

47

income grows, and revenues expand. The study recommends an open-siting approach that solicits and accepts community involvement in prison issues affecting local jurisdictions. Thies claims economic development from prisons is linked to community involvement and empowerment. The article does not clearly describe the economic development results of prisons, but indicates there are positive changes such as reduced unemployment, increases in per capita income, gains in revenue and increased property values. The article goes on to describe growth in jobs and population noting that small towns may incur more traffic, crime, and a rise in property values. The article provides no quantitative measures of improved economic development (Thies, 2000).

Rogers and Haimes studied the local impact of a Federal Correctional Institution in Loretto Pennsylvania. The prison is located in the Altoona metropolitan area. Their study measured the economic impact of the prison against the costs to local "community infrastructure." The local infrastructure included public safety, schools, and housing, along with the negative effect prisons may have on attracting other businesses. The study looked at public expenditures of the prison and multipliers they brought to the local region. The study, using multipliers of 2.6 for wages and salaries and 3.3 for the construction, projected significant impact from the building and operation of the prison. The overall economic impact on the region was said to be substantial based on salaries, purchases, and multiplier effects. Impact on "community infrastructure" was deemed minor and easily absorbed within the greater economy. Acceptance of the prison was a factor of the confidence the community has in prison management. Economic development impacts were not specifically addressed (Rogers & Haimes, 1987).

Research on the impact of correctional facilities in Washington State found five studies conducted between 1981 and 1988 provided little data on the economic impact of prisons on the local region. Generally, the studies agreed on a large short-term construction employment benefit, and that prison employment stability has positive impacts on the economy. The "hot topics" of the studies tended to be crime rates and property values, neither of which was found to be adversely affected by prison location. Lindman et al, went on to study six prisons in Washington state. Three of the prisons were located in non-metro counties and three were in metropolitan areas. Lindman found economic results varied according to location (Lindman, Poole, & Roper, 1988).

Part of the Washington study focused on local taxes generated from payrolls and purchases. Revenues varied based on the authority the locality had to levy taxes. The City of Walla Walla, Washington, because of its taxing authority, gained the most revenue, while the county locations without taxing authority received very little income from prison operations. Procurement taxes were also location dependent. Many localities were not able to provide the taxable goods the prison required. Lindman determined the prison population contributed to the population base and provided some income to the counties from state redistribution of tax revenues. Again, this primarily benefited the incorporated City of Walla Walla, which received approximately $50 per person in benefits as compared to $3 per person for county locations. More useful to the counties was the population based redistribution of sales taxes, which provided higher revenues to counties with prisons. Beyond these factors, the study again focused on property values, crime rates, and the impact on local services.

New York constructed 38 new prisons since 1982, most of them in rural counties. A study for the Sentencing Project compared counties in New York that have prisons to those that do not and found no significant difference in the two groups. They looked at unemployment rates, and per capita income in counties that are in categories 4 to 9 on the Department of Agriculture's Rural Urban Continuum scale. Counties in categories 4 to 9 are considered rural. A prison had opened sometime between 1982 and 1992 in each of the fourteen non-metropolitan counties studied. Unemployment rates of non-metro counties with prisons were not significantly difference than similar non-metropolitan counties without prisons. They also concluded that the presence of a prison in a county did not affect per capita income when compared to counties without prisons. They found a slightly greater per capita income in non-metro counties without prisons, but it is not clear whether they adjusted data for the prison population. The Census includes prisoners as part of the county population and this increase in the denominator reduces the per capital income calculation. The authors conclude the low economic benefit of prisons is due to six factors: correctional officers do not live in the host county, local residents may not qualify for construction work on the prison, local residents may not be able to compete for prison jobs, local businesses may not be able to supply prison needs, limited multiplier effects, and inmates fill low wage jobs (R. S. King et al., 2003). The article did not address the contribution of prisons to the economic development of the host county. In New York State, prisons are so prevalent in non-metro counties that commuting from adjacent counties may result in spillover effects making comparison between non-metro counties difficult. Even those non-metro counties without prisons are

usually within commuting distances of a prison in an adjacent county. Chapter IV contains an analysis of the spillover effect in New York State.

In a dissertation on Texas prisons, Chuang measured the economic impact of new prisons by the growth of sales tax revenue. Sales tax is a measure of consumer spending and said to be an important part of the Texas economy, but the correlation of sales tax to prisons was not clear. Nine out of 41 prisons were found to have a significant impact on the sales tax growth rate albeit some of these were fairly small, four were less than $5,000 per month and one, Texas City, had a significant negative tax growth rate. The largest monthly tax revenue increase, $103,883, was in the metropolitan area of Amarillo. The remaining 32 locations had no significant changes in tax revenue. As measured by sale tax revenue, increases in overall economic activity was in most cases not realized (Chuang, 1998). This research did not specifically address non-metropolitan counties, nor were economic factors other than tax revenue examined. The reported did not explain the reason for differences in tax revenue between prison host cities and did not specifically study any economic development resulting from the prisons.

Another dissertation conducted a case study of a prison built in the town of Potosi, Missouri in rural Washington County. As part of this study Jeanie Thies looked at the economic impact of the new prison and compared Washington County to Henry County, a cross state location without a prison. The economic results varied. Although the new prison created jobs, many of the staff did not reside in Washington County. Few local residents had the required educational level to qualify for a job at the prison. A housing shortage around Potosi also contributed to staff living outside the county. The

population of Washington County increased after the prison was built but the Census inmate count was not considered in the study. The town did not add to its tax base because of the prison, yet incurred significant cost in attracting the prison to its location. Washington County did experience growth in sales tax revenue. Some of the initial spikes in economic activity were attributed to simply being selected as the site for a new prison and the resulting construction of the facility. Unemployment in Washington County, which was high before the prison opened, has declined steadily since the prison was built. The decline was greater than could be attributed to statewide trends and trends in Henry County. A shoe factory opened six years after the prison was activated and the shoe factory contributed to the decline in unemployment, but Thies described the prison as the primary cause for the decline. Overall, Thies finds that, other than the decline in unemployment, the high expectations generated during early support for the prison were not realized after the prison opened (Thies, 1998).

Terry Besser and Margaret Hanson did an extensive national study comparing small towns without prisons to those with prisons built in the 1990s. They concluded, "Small towns that acquired a new state prison in the 1990s experienced higher poverty levels, higher unemployment rates, fewer total jobs, lower household wages, fewer housing units, and lower median value of housing units in 2000, when 1990 population and economic indicators, and region are controlled, than towns without a new state prison." New prison towns were found to have higher populations, greater public employment, and an increase in minority populations. These increases are due to the demographics of prisoners and the fact that the Census counts prisoners as residing where

they are incarcerated rather than being counted as residents where they were convicted. The authors concluded small towns do not gain economic benefits from new prisons (Besser & Hanson, 2004).

Clement, in writing for the Federal Reserve Bank in Minneapolis, described mixed results for the many communities in the Ninth District that have turned to prisons as economic stimulus. As acknowledged by other writers, prisons were described as having strong appeal but limited impact. They generate jobs but do not require supporting industries, resulting in few opportunities for a community to develop the web of industries needed for economic development. Still prisons are considered vital to areas such as the upper peninsula of Michigan where nearly 3,000 people work in prisons, work that allows them to live in this remote area. Clement also notes the political and economic impact of prisons resulting from the Census including inmates as part of the population in the jurisdiction where the prison is located. The state of Minnesota estimates that as much as $200 to $300 in federal funds is received for every person counted under the Census. A thousand prisoners would result in $200,000 to $300,000 in otherwise unexpected benefits. Other effects include skewed male to female ratios and lower per capita incomes. At the extreme, some Congressional districts could be realigned as a result of the Census bureau counting prisoners as residents of the county in which they are incarcerated, a large economic impact indeed (Clement, 2002).

The Justice Policy Center of the Urban Institute commissioned a study in 2004 to examine impact and location of prison growth during the 1980s and 1990s. The study focused on the ten states with the highest rate of prison growth. In the ten states, the

53

percent of counties having a prison increased from 13 percent in 1979 to 31 percent in 2000. In each state at least five counties had five percent or more of their population count coming from inmates. In thirteen counties, 20 percent or more of the population is in prison. Eight of these are in Texas. Although not all prison growth occurred in non-metro counties, this shift in population accompanied a shift in economic resources and political influence. The report provides a foundation for understanding the political consequences of locating prisons in smaller communities (Lawrence & Travis, 2004).

In his book <u>Gates of Injustice: the Crisis in American Prisons</u>, Alan Elsner describes how small communities desire the stable jobs that prisons will create. He goes on to show that the expansion of prison populations provides opportunity for private corporations to finance the capital costs of prison construction and to reduce labor related operating costs (Elsner, 2004). Public prisons are normally constructed with up-front funding and staffed with employees earning state wage rates. When state budgets are under stress, private prisons can be an attractive alternative. As Thies found in her case study of Potosi, Missouri, local communities are at a negotiating disadvantage when courting private prison companies to secure a new prison at their location (Thies, 1998). The desire for any stimulus to local economic growth and the number of counties seeking such stimulus, limit the ability of local communities to require commitments from either the state or private operators to behave in a manner that improves the conditions for economic growth and development of the community.

An economic impact report prepared by the LENOWISCO Planning District Commission in Southwest Virginia predicted some large theoretical impacts of a new

federal prison and a new state prison located in Lee County, Virginia. The study concluded that prisons would increase county population by seven percent, increase county sales tax by 28 percent, increase employment by 27 percent, and increase disposable income by 8.5 percent. The institutions would provide 875 new direct jobs and 560-support job. If these projections were achieved, the report states unemployment would be hypothetically eliminated in Lee County. The study does not identify where in the region economic impact will occur. As stated "Obviously, not all economic benefits will accrue to Lee County, but there is no statistically simple or valid way to analyze existing data on anything other than a county jurisdictional basis" (LENOWISCO Planning District Commission, 1996). This report demonstrates the need for further research on the impact of prison siting on rural counties.

Conclusions on Current Research

Like other projects to produce public goods in rural areas, prisons influence non-metro communities. "Get tough on crime" policies, stricter sentencing laws, drug laws, no parole, and "three strikes" laws created an explosion in the prison population during the 1980s and 1990s. As a result, governments constructed many new prisons throughout the country and a disproportionate number of these prisons are in non-metro counties. Since the underlying causes have not changed, state and federal governments continue to build new prisons and spend an increasing part of their budgets on operating and maintaining these facilities. Despite the number of new prisons, a limited amount of

research has been done to describe the economic development benefits of prisons as an industry. Much of the research has focused on the community's reaction to prison siting. Many of the economic studies have analyzed measures of growth: jobs, income, and population, rather than measures of economic development. Results of the studies vary with most research showing limited or no economic benefit from prison siting and few studies address non-metro counties where, due to the limited local economy, impacts from prison may be more easily measured. There is a need for more research on changes to the local economy subsequent to prison activation.

The next chapter discusses the variables, methodology, and data used to measure the contribution of prisons to the economic development of non-metro counties. The chapter also describes the selection of counties as cases for analysis. Selection of the counties results in two populations used to test the hypothesis that locating prisons in non-metropolitan counties contributes to the economic development of those counties.

CHAPTER III

RESEARCH METHODOLOGY AND DATA REQUIREMENTS

This chapter describes the economic variables used to measure the impact of prisons on rural economic development, the statistical method used to analyze those variables, and the data source for the variables. This chapter includes a description of the method used to select counties as cases for the analysis.

Counties seek the economic benefits that new prisons promise. They hope prisons will bring growth through new jobs and economic development by improving the county economic structure. Improvements to the quality of life, opportunity for local employment, higher incomes, and a stable population are some of the underlying benefits of growth and economic development. Developed regions have improved standards of health, greater opportunity, increased personal freedom, higher education, richer cultural diversity, and sustainable environmental factors (Todaro, 1994). Since these quality of life factors are difficult to uniformly quantify, the success of policy initiatives to stimulate economic development is commonly measured by population changes, income levels, and changes in economic structure (Hoover, 1975).

Indicators of Economic Development

Changes in economic variables will determine if prisons contribute to regional economic development. The two primary categories of economic variables are employment and income. Counties seeking prisons perceive population stability as an economic benefit. For this reason changes in population will also be examined, however, population changes are influenced by many factors and can be a weak indicator of economic development.

Employment

Employment variables measure both growth and economic development. As a region develops, changes in industrial sector employment will be evident. Porter describes employment changing from basic unskilled or semi-skilled labor to advanced skills of engineering, scientific research, and telecommunications (Porter, 1990). Jobs in manufacturing, services, and finance will increase. As supplier industries develop and households become more affluent, jobs expand in wholesale, retail and construction sectors. As industries evolve and change, a higher level of human capital is needed to fill the more knowledge-based jobs. Human capital as measured by education levels will increase. Some variables measure growth and others economic development, but the distinction is not always clear. Economic development may cause increases in all factors but growth may result in increases in a limited number of factors.

Job growth is examined on four levels: 1) measures of total employment, 2) jobs by industry, 3) class of workers and 4) educational attainment level. The total number of jobs, civilian labor force participation, and female labor force participation will be used to measure changes in total employment. Total employment is a measure of economic growth. Total jobs include the average annual number of full-time jobs, part-time jobs, and sole proprietors in an area by place-of-work. A region may need more labor to increase output without experiencing economic development. For example, an increase in the demand for coal may increase the demand for miners but not necessarily result in more regional economic development.

Labor force participation is similar to total employment. Growth or economic development may increase labor force participation if a region has under-utilized labor. Labor force participation is used instead of unemployment because unemployment data does not measure people who do not have a job and have stopped looking for work. Measuring labor force participation, like total employment, is not sufficient to determine if a region is developing. If the total number of jobs rises but there is no diversity in those jobs, the rise may show growth and not economic development. Migration and demographics can also change labor force participation rates. For example, the number of jobs in a region may remain constant and the population may grow from retirees moving into the region. The labor force participation rate would appear to drop with no real changes in the number of jobs or the number of people seeking jobs.

The Bureau of Labor Statistics defines the labor force as: "Persons 16 years and over in the civilian non-institutional population who, during the reference week, (a) did

any work at all (at least 1 hour) as paid employees; worked in their own business, profession, or on their own farm, or worked 15 hours or more as unpaid workers in an enterprise operated by a member of the family." The labor force participation rate is the labor force as a percent of the civilian non-institutional population. For this analysis, it is important to note the labor force and labor force participation rate do not include inmates housed in the county (U S Census Bureau, 2003). Unlike population, which includes prisoners, labor force participation will be a direct measure between prison counties and control counties.

Female labor force participation is more likely an attribute of economic development than total labor force participation. Relevant to this analysis is the fact that women work in prisons, even those holding male inmates. Since World War II, female labor force participation has increased as a larger percentage of women have entered the workforce. A developing economy provides greater opportunity for all members of the workforce. Increased female labor force participation is the result of many factors: the advent of birth control, increased educational opportunity, social and cultural attitudes, and advances in household technologies (Hotchkiss, 2006). However, Oppenheimer states the economic development of the United States since WWII has created a demand for female labor. The demand was created as industrial expansion (development) created supplier industry jobs such as nurses, teachers, and business sector service jobs commonly filled by females (Oppenheimer, 1973).

The second measure of employment is the evaluation of jobs by industry. As described in Chapter II, growth is an increase in output, whereas economic development

results from structural changes in the character of the economy. These structural changes as described by Porter and Kindleberger involve the interrelationship between industrial sectors and the progression of economies from extraction-based economies to manufacturing to service to technology-based economies. Change in the job mix across industrial sectors is a measure of the structural change in the economy. Many prisons are located in non-metro counties with extraction-based economies. After a prison opens, job growth in specific industries can show the impact of prison location on county economic development. When a new prison is located in a rural area, ideally other support firms would move to the region to supply the prison industry and existing firms would expand to accommodate new business. Over time, other industries establish a stronger economy by seeking the labor skills and suppliers available in the region. The developing non-metro economy should shift from extractive industries, to manufacturing, and services while showing increases in supporting wholesale and retail industries. To measure changes in the structure of the economy, the analysis will examine the rate of change of employment in various sectors. Data collected during the time of this research are under the standard industrial classification system. The following standard industrial classifications (SIC) are analyzed: agriculture, manufacturing, construction, wholesale, retail, services, FIRE, and public administration.

The third measure of employment is the class of worker. The class of worker refers to the type of industry in which people find employment. The three classes of worker included in the analysis are public workers, those employed in private industry, and the self-employed. The expectation is the number and class of workers will change

61

with the opening of a new prison. Specifically, the number of state or federal government employees should increase as a direct result of employment in government run prisons. Private prisons should increase the number of service workers. If prisons contribute to economic development then increases in private and self-employment are expected.

Since economically developed regions require high levels of skilled labor, the final measure of employment is an indicator of the amount of human capital present in the labor force. Human capital is a combination of many factors including education, experience, health, skills, and abilities. In this research, education levels will be the indicator used to measure levels of human capital in non-metro counties. If prisons contribute to economic development they should also increase the need for more highly educated labor. The measure of education levels will be the percent change in the population 25 years old and older who have: 1) not completed high school, 2) graduated high school, 3) completed some college, and 4) received a four-year college degree.

Income

Similar to employment, income increases with growth and economic development. Increases in income alone are not sufficient to describe a region as developing. Income can increase as a result of growth alone; however structural changes in the economy can be discovered by examining changes to the income generated by different sectors of the economy. In order to create economic development, new industry and the supporting indirect industries must raise income levels within the region. The

prison workforce should have moderate salaries paying slightly higher than other jobs in the region. The prison attracts a small number of higher skilled jobs in administration, health care, security electronics, and legal services. These direct payroll earnings will provide multiplier effects in the regional economy as employees seek goods and services. Other industries provide goods and services directly or indirectly to the prison. Retail trade, hospitality services, business services, and manufacturing may all increase as a result of prison location.

Income analysis will be parallel to the analysis of employment: 1) measures of total income, 2) income by industry, 3) income from farm, non-farm, and private earnings, and 4) local government income. Growth in county income will be measured by growth in total personal income. Total personal income is a measure of output. Since data for gross county product are not available, total personal income serves as a measure of county output. Like total employment, gross measures of income to include total personal income and per capita personal income are generally measures of growth and are not sufficient to describe a region as developing. Two subsets of total income are earnings resulting from wage and salary disbursements, and earnings by place of work. Earnings are a key indicator of the economic growth and prosperity of the county. Both of these measures, total income and wages and salaries, are commonly examined independent of population. Per capita income (PCI) and earnings per worker are better measures of wealth. PCI alone is a measure of growth only indicating increases in output. To evaluate economic development, PCI and earnings per worker must be analyzed in conjunction with other factors. The institutionalized (incarcerated)

population influences PCI as the measure is based on total population count. Prison counties will have a diluted PCI. Increases in PCI or earnings per worker demonstrate an increase in the economic health of the population and the potential for consumer markets. Changes in PCI over time can be used to evaluate rates of growth within a region. Trends in per capita income between regions in the United States have tended to converge since the 1930s with the increased migration of labor and technology (Fosler, 1988).

A prison opening may result in the economic development of supporting industry or increases in output from existing businesses. As a rural economy becomes more developed there is a transition from the traditionally extractive industries to manufacturing, trade, and services. These increases in sector income to some extent would mirror increases in employment. Income will be examined by looking at output in the industrial sectors of: construction, manufacturing, wholesale trade, retail trade, FIRE, services, and government.

Like class of worker, changes in different income types can show structural changes in the non-metro economy. Farm earnings, non-farm earnings, and private earnings may change because of a prison opening. As compared to counties without prisons, these categories of earning can show the change from farm based economies to economies based on a more diverse industry mix.

An increase in local government expenditure is a consequence of both growth and economic development. Continued increases beyond the time a prison opens may indicate regional as more businesses and supporting industries contribute to the tax base. Government revenues and the resulting public investment should increase as the residents

and businesses of the county prosper. If prisons result in economic development and increases in regional output, direct general expenditures by local government should increase. Direct general expenditures are a variable that will measure the institutional changes expected in a developing economy.

Population

Prisons bring population change to non-metro counties. The census of population counts inmates as part of the population of the county where the prison is located; therefore, the population of a county will increase when a new prison opens. The county population may also increase from experienced employees brought in by the prison system to train new workers and operate the facility. Approximately half the staff of a new prison transfers in from other prisons. Transferred staff may live in the host county or may commute from surrounding areas. The prison may also provide jobs for local residents who might otherwise have to migrate out of the county for work. Local jobs are often the primary reason non-metro counties seek new prisons.

Population changes are many times used as a measure of growth, but changes in population do not always indicate either growth or economic development. Certainly, the inmate count is of value primarily for the number of staff employed to manage them. Local employment, reflected by increases in labor force participation rates, may slow historical population out-migration common in non-metro counties. The local labor force may even meet the demand of supplier industries that develop or expand to support the

prison. Prisons should contribute to population stability in non-metro counties when compared to similar counties without prisons.

Population change must be used in conjunction with labor force participation to measure growth. Without a stable population, increases in labor force participation may result from migration rather than any increases in local employment. A stable population, rising labor force participation rate, and increases in employment by supporting industries would indicate a developing economy.

Table 2: Economic Indicators summarizes the variables examined in this research. The variables are generally separated into measures of growth and economic development, but they are interrelated and changes in the variables must be analyzed in relation to each other. Population and PCI provide an example of interconnected variables.

Table 2: Economic Indicators

	Measures of Growth	Measures of Economic Development
Employment	Total Jobs Labor Force Participation	Female Labor Force Participation Farm, Construction, Manufacturing, Wholesale, Retail, FIRE, Services, Public Administration Public, Private, Self-Employed Education Levels
Income	Total Personal Income Wage and Salary Disbursements Earnings by Place of Work Per Capital Income	Construction, Manufacturing, Wholesale, Retail, FIRE, Services, Government Farm Earnings, Non-Farm Earnings, Private Earnings Local Government Expenditures
Population	Total Population	

Methodology

The hypothesis of this dissertation is "Siting prisons in non-metropolitan counties contributes to the economic development of those counties." The null hypothesis is "Prisons have no net positive effect on indicators of economic development." The null hypothesis will be tested using an independent two-sample t-test. The two-tailed t-test determines if the means of two normally distributed sample populations are significantly different. The first population is non-metro counties with a new prison. The second population is non-metro counties without a prison. The populations of the two samples are equal in size; the number of counties in each sample is the same. The populations are selected independently. The methodology used to select the populations (counties) is described in the section entitled "Selection of Sample Populations." The normality of the populations was validated using histograms, Q-Q plots, and the Shapiro-Wilk test for normality.

The equation for the independent two-sample t-test where the two samples are the same in number is:

$$ t = \frac{\overline{X}_1 - \overline{X}_2}{s_{\overline{X}_1 - \overline{X}_2}} \text{ where } s_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{(s_1)^2 + (s_2)^2}{n}} $$

Where s_i is the sample variance of group i, and n is the number of samples. In this case, the number of samples is equal. $\overline{X}i$ is the mean of group i. $s_{\overline{X}_1 - \overline{X}_2}$ is the standard error.

For confidence intervals where the population variance is unknown the equation is:

$$\left(\mu_1 - \mu_2\right) = \left(\overline{X}_1 - \overline{X}_2\right) \pm t_{\frac{\alpha}{2}} S\left(\overline{X}_1 - \overline{X}_2\right)$$

Where $t_{\frac{\alpha}{2}}$ is the critical value of t with $n_1 + n_2 - 2$ degrees of freedom and n is the number of participants in each sample. The analysis is tested to a 95 percent confidence interval; an alpha level of 0.05 was used for all statistical tests. ($\alpha = .05.$)

The analysis will measure the difference in the means of the two sample populations for a particular variable. The variables will be normalized, meaning they will be analyzed not in absolute terms but in relative terms. For example, the growth of income will be measured not in absolute dollars but in the percent of change from the previous period. The mean for the rate of change for each sample population will be calculated first and then the two independent means compared using the t-test. For example, the mean of the rate of change of income growth, for the counties with prisons will be compared to the mean of the rate of change of income growth for the counties without prisons. If the difference in the two means is statistically significant at the five percent significance level, then the null hypothesis will be rejected. The accumulation of results over all the variables analyzed will determine if the hypothesis is to be accepted.

Two sets of sample populations will be analyzed. The first set includes counties with prisons activated between 1981 and 1985 and an equal number of similar counties without prisons. The second set includes counties with prisons activated between 1991

69

and 1995 and an equal number of similar counties without prisons. The labels for the two sets are "the 1980 sample" and "the 1990 sample," respectively. Selecting only counties that built prisons in the first half of the decade allows sufficient time for the prison to influence economic variables measured in the subsequent U. S. Census.

The samples are compared across three periods, 1970 to 1980, 1980 to 1990, and 1990 to 2000. For the 1980 sample, changes in data from 1980 to 1990 and from 1990 to 2000 will be used to evaluate the null hypothesis. For the 1990 sample, only the 1990 to 2000 data will be used for evaluation. The analysis of the variables will determine if the prison counties and non-prison counties were economically similar before prisons were built. Statistically there should be no difference in the means of the variables during the time before prisons were built. For the 1980 sample, the counties should be economically similar from 1970 to 1980. For the 1990 sample, both 1970 to 1980 and 1980 to 1990 data will be used to test for expected economic similarity. After prisons are built, statistically significant changes in the variables will be the basis for rejecting the null hypothesis.

Sources of Data

Data used to analyze the changes in economic variables come from two government sources, the U.S. Census Bureau and the Bureau of Economic Analysis.

Census Data

Census data are the source for the means comparison of the prison counties and control counties for the 1980 and 1990 study groups. Census data come from the 1970, 1980, 1990, and 2000 census of population. Data on local government direct general expenditures are from the U.S. Census City County Data books.

Bureau of Economic Analysis Data

Bureau of Economic Analysis (BEA) data are from the BEA website on regional economic accounts, http://www.bea.gov/bea/regional/reis/. The data are derived from tables, CA05-Personal income and detailed earnings by industry and CA25-Total employment by industry.

Selection of Sample Populations

This section describes the selection of the two independent sample populations used to test the hypothesis. The first population is a set of non-metro counties with new prisons; the second population is a similar set of non-metro counties without prisons.

The U.S. Census has collected county economic and demographic data over long periods of time. Yet, the difficulty in using counties to measure regional economic development is the porous nature of county boundaries in containing both people and economic activity. This limitation occurs in many economic studies that attempt to measure impacts from a point source in a region, without knowing the boundaries of that

region, or having a specific subset of data for that region. Unlike political definitions of rural and urban areas, the boundary between levels of economic development is not always clear. County boundaries provide only a proxy for the actual area of impact from a prison or any other economic enterprise. Many factors contribute to this disconnect between unit of data collection (county) and the area of economic impact. Prisons are seldom located at the geographic or population center of a county; while the proximity of transportation corridors and the amount of urban influence vary from site to site.

Still, county units are important not only in gathering economic data but also in the political process of locating prisons. The county government in rural areas is the institution that seeks out and approves building new prisons. Indeed, for private prison construction, the county may have the primary role granting approval for prison location. Even with State and Federal prison construction in rural areas, the county provides the political forum where economic benefits versus social costs are debated. Counties as a geographic and political unit provide continuity of data when studying prisons as an instrument of economic development.

Two groups of counties were selected, one set with prisons as the variable group and the other without prisons to be used as a control group. Understanding the basis for selecting the counties in these groups is important to understanding the analysis, the findings derived from the analysis, and the conclusions drawn from the findings. The delineation of counties with prisons will be discussed first, but integral to the choice of the prison counties selected is an appreciation of the associated control counties.

Prison Counties

There are more than 3,100 counties in the continental United States. Of those 836 were in metropolitan statistical areas and 2,305 were in non-metro or rural areas as defined by the Office of Management and Budget (OMB) in 1993 (Commerce, 1995). A subset of non-metro counties is those with one or more prisons but this subset is dependent on the definition of a prison.

The American Correctional Association (ACA) defines a prison as "A confinement facility administered by the state, federal government or private company for offenders sentenced to more than a year." (American Correctional Association, 1998) For this analysis, juvenile correctional facilities are not included nor are community correctional facilities, local jails, or halfway houses, regardless of size. Boot camps, regional jails, and medical facilities, as they operate in a manner similar to other prisons, are part of the dataset if they met the minimum inmate capacity. Data are not segregated into security classifications, since these are defined differently by different jurisdictions, nor were any differentiation made among prisons owned or operated by state, federal, or private agencies. The number of federal and private prisons that meet the selection criteria is insufficient to provide a meaningful statistical analysis. In particular, private prisons were not common during the early 1980s. In addition, the analysis only considers prisons in the continental United States. The charts and data do not include institutions run by the municipalities of Philadelphia, New York City, or Cook County Illinois.

Regional jails can operate in a manner similar to a prison. A jail is defined by the ACA as "A confinement facility usually administered by a local law enforcement agency,

intended for adults but sometimes also containing juveniles, which holds persons pending

adjudication and/or persons committed after adjudication for sentences of a year or less."

(American Correctional Association, 1998) The majority of the people held in jails are

awaiting trial or arraignment, transfer to prison, or transfer to medical facilities. In 1993,

there were 9.8 million new admissions to jails. Most served only a few days and the

number of readmissions is unknown. Jail admissions were over 30 times the number of

people admitted to prisons in 1993 (Bonczar & Beck, 1997).

The names, locations, and data for U.S. prisons came from three sources. The

first is the 2003 Directory of Adult and Juvenile Correctional Departments, Institutions,

Agencies, and Probation and Parole Authorities published by the American Correctional

Association (ACA) (American Correctional Association., 2003). Other sources of prison

data are the Census of State and Federal Correctional Facilities conducted by the Bureau

of Justice Statistics, and the web site links to state corrections organizations. The web

sites are located from the links associated with www.corrections.com, the website of

Corrections Connection. From these sources, data on 1,068 prisons were reviewed as

part of this analysis. Figure 8: Location of Prisons Analyzed shows the location of the
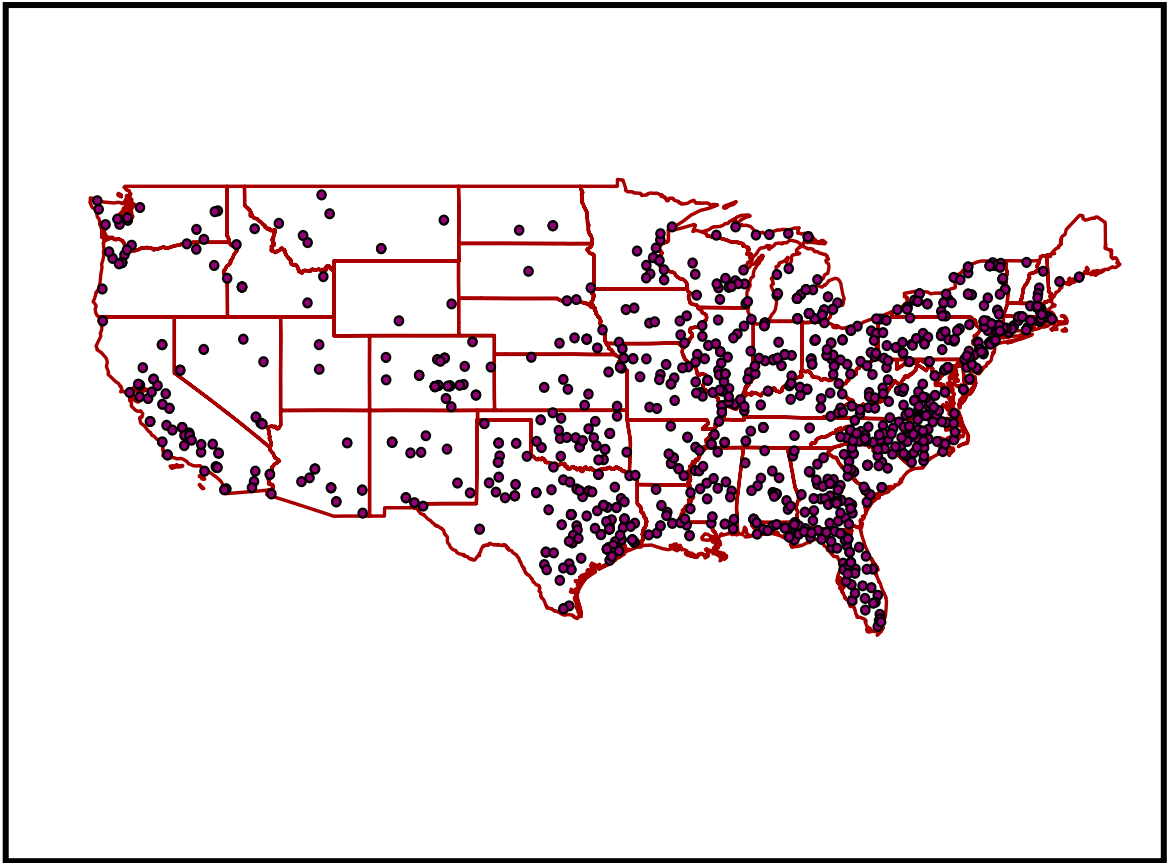
prisons.

Figure 8: Location of Prisons Analyzed

For purposes of this research, the definition of a prison was further restricted. Prisons range in size from 70 inmates for some minimum-security facilities, to as many as 7,000 inmates at Avenal State Prison in California. The average prison capacity is 1,200 to 1,400 inmates and depends on the method used to measure capacity. The average capacity of the prisons in the counties analyzed is 1,200 inmates. This research includes only adult facilities with a minimum daily population or design capacity of 300 inmates in order to avoid small prisons with a minimal ability to influence the regional economy. Three hundred inmates generally require a prison staff of 100. Prison size is

75

based on two measures of inmate population. The first, average daily population, is the average daily inmate population count over the course of a year. This measure recognizes that prison population changes over time as inmates are incarcerated, released, transferred, or die in prison. The second measure is the design capacity of the prison.

Design capacity refers to the number of inmates that should be housed in the facility based on the criteria established for the particular level of prison security; two inmates per cell at a medium level correctional institution, for example. Design capacity standards vary from state to state and across the equally varied definitions of security levels. Over-crowding will cause variances between design capacity and average daily population. Using these measures the minimum prison size, as defined by inmate population, was first limited to those prisons with an average daily population of 300 or greater. If the average daily population data were not available, the design capacity of the prison is used. The prison had to have a design capacity of over 300 inmates. If the inmate population or design capacity could not be determined, the prison was not included among the cases examined.

Although aggregate inmate population data were collected at state and national levels, data on inmate population by individual prisons are not uniformly available across the over 1,060 prisons in the United States. This is due in part to security reasons or in the case of private prisons, competitive reasons. Like inmate populations at the prison level, and probably for similar reasons, staff populations are not widely reported by individual prisons. The data for both inmate and staff populations analyzed in this section are primarily from the 2003 ACA Prison Directory.

A prison with 300 inmates needs a staff of at least 100. An analysis of more than 1,000 prisons where the design capacity exceeded 300 inmates found that 463 had data available on the design capacity of the prison and the staffing level. A comparison of these 463 prisons showed an average design capacity to staff ratio of 3.13 to one. The average design capacity was 1,272 inmates with a staff of 443. When average daily population data (ADP) were evaluated for 543 prisons where ADP was greater than 300 and staffing data were available, the average inmate population to staff ratio was found to be 3.48 to one. Using the ADP data, the average prison size is 1,424 inmates with 428 staff. These ratios are slightly different due to prison overcrowding, ADP most often being greater than design capacity.

Staffing ratios show variation between states, state and federal facilities, gender, and security level. Higher security level prisons require more staff as do prisons holding female inmates, possibly due to the wide range of security levels usually found in female prisons. In general, a community can expect a one-to-three ratio (1:3) of direct prison jobs to inmate population. Those jobs are usually split between new local hires and experienced staff being transferred into the location of the new prison from other prisons. Experienced staff opens the prison, provide management, and train new hires. This of course means that communities with existing prisons are also affected from the construction of new prisons regardless of location, as jobs that are vacated by transferring staff must be backfilled. In analyzing the potential for regional growth and economic development, a community must understand how inmate population, security level, and gender of inmates affect the potential job growth in a county. Prisons are non-cyclical

and recession proof providing steady employment but a prison cannot become more productive and produce more output. Overcrowding is the only way to expand output without significant capital investment. Staffing level, as determined by design capacity, will result in a fixed, direct labor benefit from a new prison.

Criteria for Counties with Prisons

Establishing a minimum prison population size and refining the definition of a prison permits the selection of counties to use in the evaluation of variables of economic development. The selected counties with a new prison located within their boundaries will be referred to in this research as "prison counties."

Two subsets result from the list of more than 1,060 national correctional institutions. These subsets are, prisons built between the years 1981 to 1985, and prisons built between 1991 and 1995. These periods permit comparison of regional economic development of counties with new prison to control counties using U.S. Census data. Limiting study cases to the first half of the decade allows time for economic development to occur in the counties under study. The effects of economic development will appear in the demographic and economic data collected in the following Census. Selected prisons have at least five years to change the structure of the county economy before the next decennial census.

To eliminate the possibility of selecting counties with preexisting prisons the county location of all 1,060 prisons on the original list were determined using the zip codes and the corresponding Federal Information Processing Standards (FIPS) number as

designated by the National Institute of Standards and Technology (NIST). Non-metro areas come from 1993 Office of Management and Budget (OMB) definitions as reflected on Census maps. No county in a metropolitan statistical area (1993 OMB classification) is in the analysis. Figure 9: 1993 Metropolitan Statistical Areas shows the 1993 OMB classification of metropolitan statistical areas. Non-metro locations are being used in this research to minimize the spillover effects of urban areas. Urban economic influence makes economic development variables resulting from prisons difficult to measure.
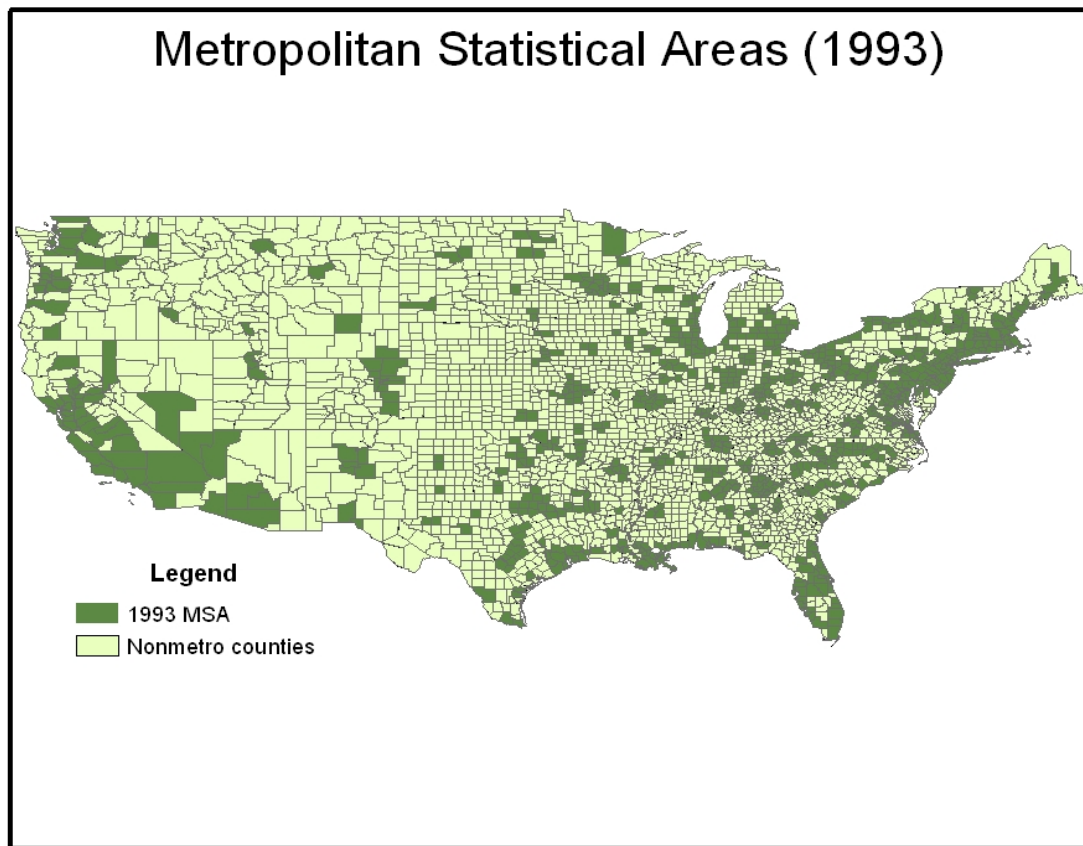
Figure 9: 1993 Metropolitan Statistical Areas

The list of prisons activated in the 1980s and 1990s is from the American Correctional Association National Jail and Adult Detention Directory. Figure 10: Counties with a Prison in 2000 shows the location of counties that host at least one prison and also identifies the 1993 metropolitan designation of the county. Between 1980 and 1989, 256 prisons opened. Of those prisons, 127 opened in non-metro counties. Of these 127 non-metro counties with prisons, 27 counties that did not have preexisting prisons, built new prisons between 1981 and 1985. Between 1990 and 1999, 379 prisons opened. Of these prisons, 237 were in rural counties and 131 of the prisons were built from 1991 to 1995. By eliminating counties with pre-existing prisons the list was reduced to 75 counties containing a total of 84 new prisons. Finally, each prison county was evaluated to determine if a control county was available for comparison.

Counties with Prison in 2000

Legend
Nonmetro w Prison
Metro w Prison

1993 MSA Designation
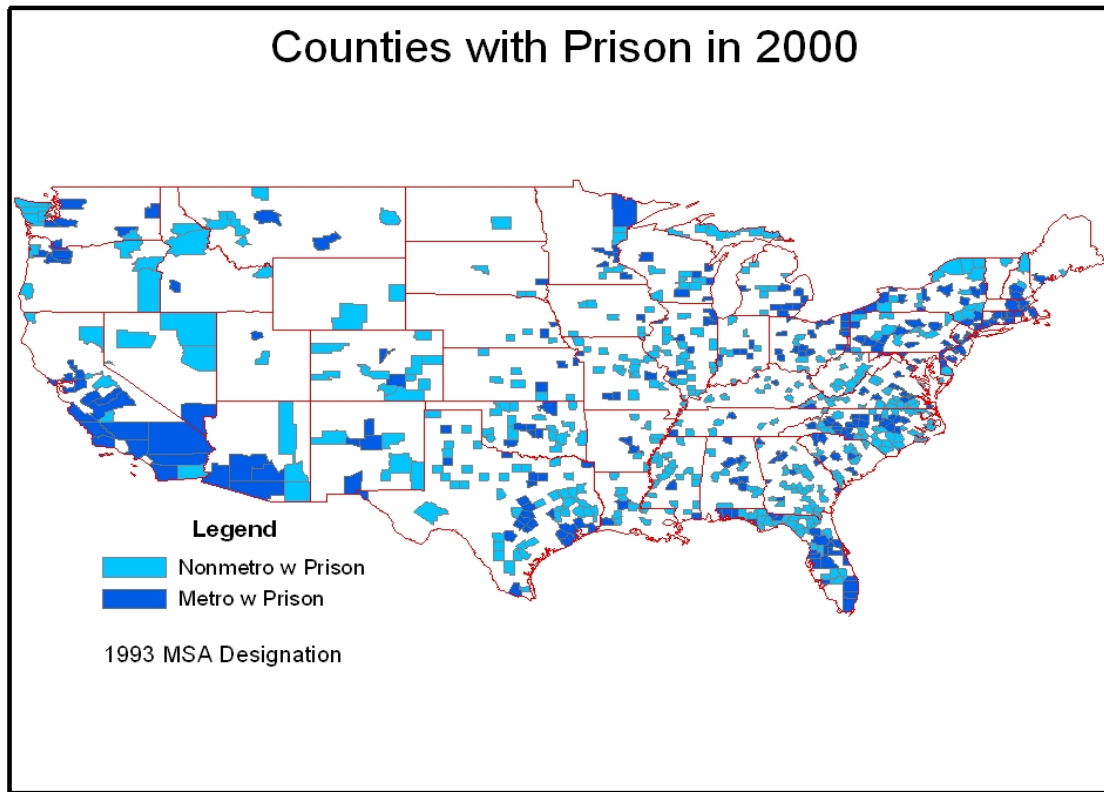
Figure 10: Counties with a Prison in 2000

Control Counties and the Location of Prisons

A major consideration in selecting prison counties is the availability of similar counties without prisons to comprise the second population sample in the analysis. Counties used in the analysis as a basis of comparison are labeled "control counties." What are the characteristics desired in a control county? First, the county should not contain a prison, neither a pre-existing prison nor the site of a prison built at any time during the period of analysis from 1970 to 2000. Control counties should also have similar characteristics to prison counties. They should be non-metro counties without strong urban influence. Both groups of counties should have similar demographic and economic characteristics before the time of prison construction. The analysis of 1970 and 1980 Census data should not show any significant variations in the means of the selected economic indicators for the two groups. Control counties were initially matched based on similar 1970 Census population size. To minimize jurisdictional variances, control counties and prison counties are located in the same state.

Prisons located in adjacent counties should not influence control counties. A county bordering a prison county may benefit from a spillover of jobs and economic benefits. To minimize this possibility control counties were selected only if their boundaries were outside of a 45-minute commute from an existing prison. Thies found in her 1998 study of the Potosi prison in rural Washington County, Missouri that most employees traveled less than 30 miles and none of her survey participants lived over 50 miles from the prison (Thies, 1998). All prisons were located on a map using Microsoft's Streets and Trips software to determine the minimum 45-minute commuting zone. After

a preliminary selection based on population, all non-metro prisons in the proximity of the selected control county were mapped and a 45-minute drive time zone was drawn behind the road network around each prison. The control county was selected only if its boundary was outside the drive time zone for all adjacent prisons. An additional check was made by selecting a 20-mile buffer around each rural prison and verifying the selected control counties were outside that buffer.

Finding control counties is more difficult than finding prison counties. Prisons are pervasive in many parts of rural America, particularly in eastern states where counties are smaller and prisons are more dispersed. Philosophies on prison location vary from state to state. Some states like Colorado and Arizona tend to concentrate prisons in a limited number of locations, often resulting in fewer prisons with larger inmate populations. Other states have prisons in almost every county. Examples of these States include: Florida, North Carolina, and New York.

Florida has 67 counties. Of those 33 are rural counties and 34 are in metropolitan statistical areas (MSAs) and 47 of the counties have prisons. In Florida 26 of the 33 rural counties have prisons as do 21 of the metro counties. This leaves only seven rural counties that do not have prisons. These counties are Bradford, Franklin, Hendry, Indian River, Levy, Monroe, and Suwannee. Of the seven, Levy is located next to three adjacent rural counties with prisons and is within a 45-minute drive time zone of these prisons. All the counties surrounding Suwannee have a prison. Hendry is within the 45-minute drive of the Moore Haven Correctional Facility in Glades County. Bradford County is well within the drive distance from three existing prisons in adjacent Union County.

Indian River is within the drive zone of prisons in Okeechobee and Brevard Counties.

Figure 11: Florida with MSAs and Prison Locations shows the location of prisons sites

and rural counties. Metropolitan counties are in green.
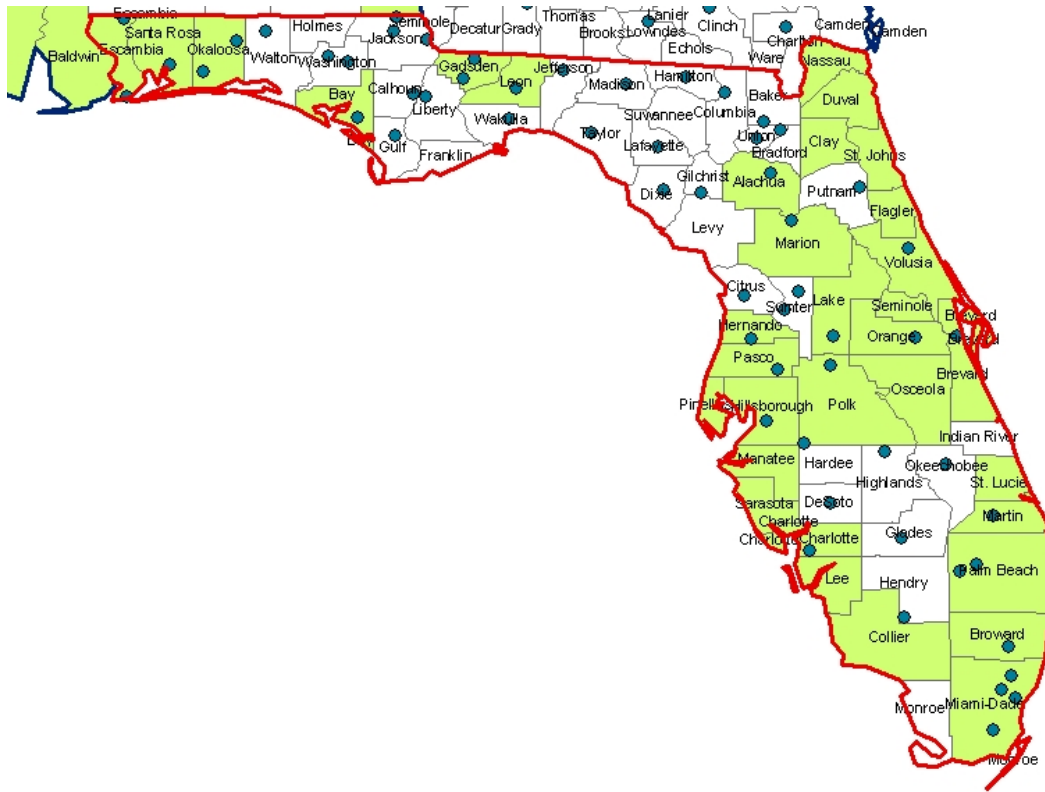
Figure 11: Florida with MSAs and Prison Locations

North Carolina has 105 counties; 35 are parts of MSAs. Of the remaining 70 rural

counties, 32 have prisons located in them. Only 14 counties are not within a 20-mile

radius of a prison. Figure 12: North Carolina with Metro Areas and 20 mi Buffers on

Rural Prisons shows the location of rural prisons and metropolitan counties.
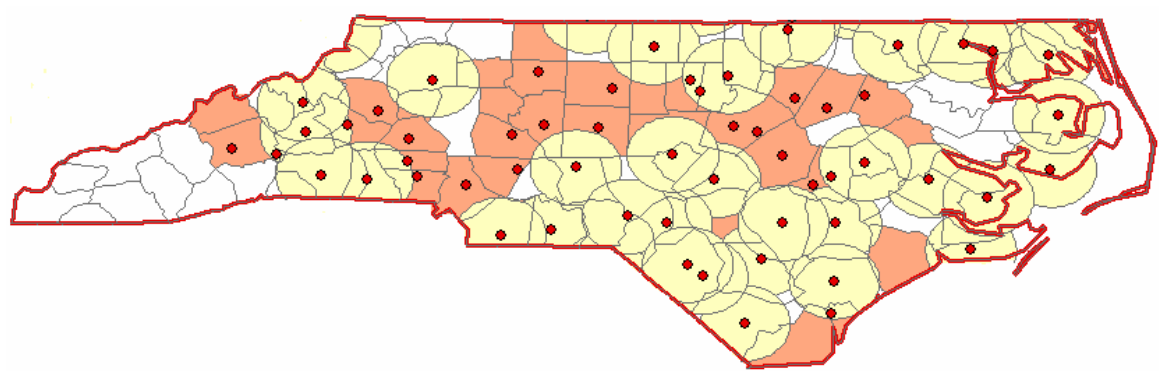
Figure 12: North Carolina with Metro Areas and 20 mi Buffers on Rural Prisons

New York has 62 counties; 24 are non-metropolitan, while the remaining 38 are metropolitan. The state has over 62,000 inmates in 69 prisons and 31 of those prisons are located in 13 non-metro counties. Since 1980, New York has opened 39 new prisons, and 21 of those prisons are in non-metro counties. Most New York counties are within commuting distance of a prison. No New York counties are included in this research because new non-metro prisons are in counties that had a preexisting prison or a second prison was built in the county outside the period established for the sample population. A map produced by New York State Department of Correctional Services, Figure 13: Prison Location New York State, shows the location of New York State prisons.
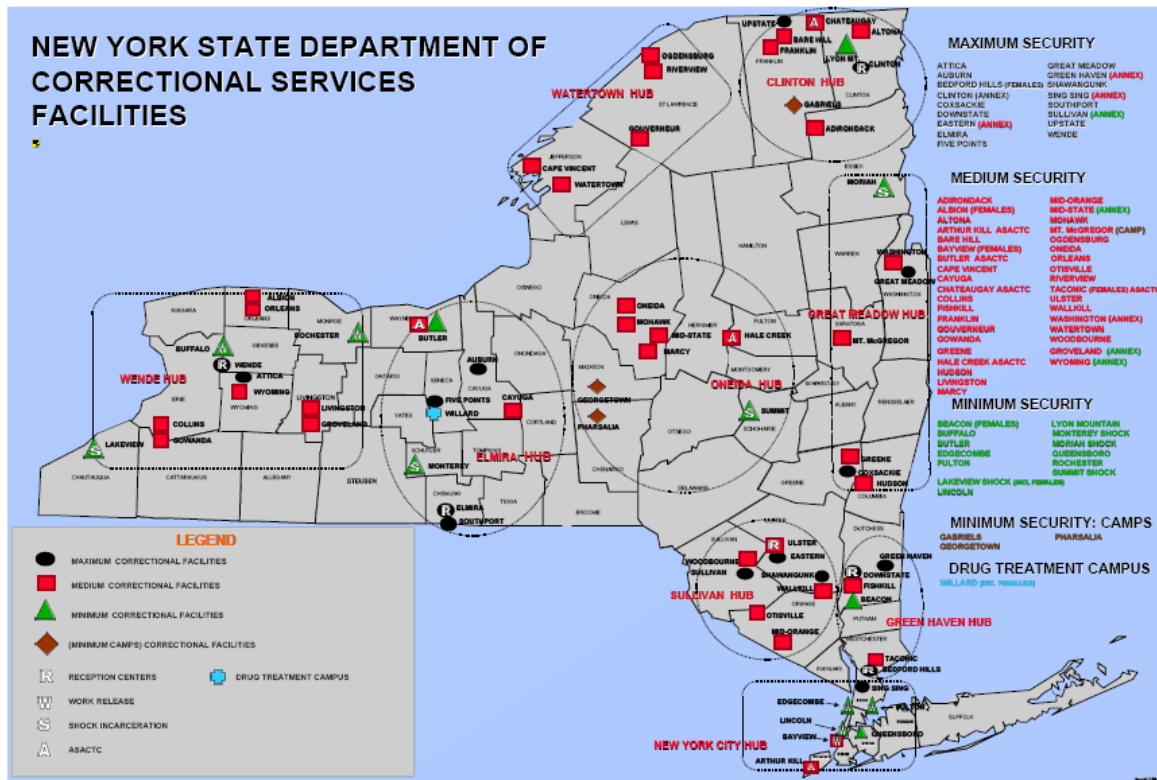
Figure 13: Prison Location New York State
Source: New York State Dept of Corrections Services, http://www.docs.state.ny.us/

Sample Sets of Counties

Two groups of prison counties are now established. The first group contains 27 counties with prisons that opened between 1981 and 1985 and a second group includes 75 counties where prisons opened between 1991 and 1995. These two lists were further refined in order to maximize the potential of measuring economic impact due primarily to prison construction during the study period. First, all counties were evaluated for population size and urban influence. Secondly, all selected counties were examined to determine if another prison opened outside the timeframe of the sample population.

86

Large population and urban influence

Non-metro counties with larger populations or in the sphere of influence of urban centers have many factors that impact their economies. The ability to commute to urban centers, plus the established economic base represented by larger populations may mask a prison's contribution to economic development. For this reason, counties with larger populations or a high degree of urban influence were removed from the two study groups. Defining a county as either within or outside of a metropolitan statistical area is beneficial for broad categorization of urban and rural areas, but measures of economic activity show that the development spectrum is a continuum of rural and urban dependency as was postulated by Christaller. This continuum is measured by the Economic Research Service (ERS) of the U. S. Department of Agriculture and counties are classified by two scales, urban influence and a rural urban continuum. ERS has modified the classifications of urban influence and rural continuum codes as data became refined and definitions of metro areas evolved. ERS best explains the concept of urban influence (Parker, 2003).

> An area's geographic context has a significant effect on its economic development. Economic opportunities accrue to a place by virtue of both its size and its access to larger economies. And, access to larger economies—centers of information, communication, trade, and finance—enables a smaller economy to connect to national and international marketplaces. These relationships among economies are basic concepts of the central place theory commonly studied in regional economics. Population size, urbanization, and access to larger communities are often crucial elements in research dependent on county-level

data sets. To further such research, ERS developed a set of county-level urban influence categories that captures some differences in economic opportunities.

To evaluate the economic impact of prison location on rural counties, those counties with higher urban populations and adjacent to metropolitan areas of influence were not considered. These counties generally had urban populations of 20,000 or more and were located adjacent to small metropolitan areas. ERS describes them as micropolitan. In addition to a weak urban and metropolitan influence the counties included in this research generally had a 1970 population of less than 50,000 people.

The urban influence analysis eliminated six counties from each of the two study groups, after reviewing ERS classifications and population data. In the 1980 group the counties removed based on population, size and urban influence were: Cochise, AZ, Putnam, FL, Vermilion, IL, Washington, LA, Jefferson, NY, and Umatilla, OR. For similar reasons Imperial, CA, Crawford, PA, Northumberland, PA, Angelina, TX, Rusk, TX, and Raleigh, WV were eliminated from the initial selection for the 1990 group.

Counties with Multiple New Prisons

Additional prisons built after the first new prison in a non-metro county may inadvertently influence the analysis of the economic impact from the first prison. If Smith County built a prison in 1983, for example, and an additional prison was added in 1992, or any period later than the study period of 1981 to 1985, the later prison's contribution to economic development in the county could be confused with economic development provided by the original prison. For this reason any counties with

additional prisons built after the period of study but before the year 2001 (2001 is after the last set of Census data used in this analysis) were not included in the set of cases studied. If a county had more than one prison built during the period of the study group (one built in 1982 and another in 1984 for instance) they remained in the group for consideration since the separate smaller prisons would influence economic development over time similar to one larger prison. Two instances of this phenomenon occur in the 1980 study period. Three prisons, the Florence Crane Correctional Facility, the Lakeland Correctional Facility, and the Ionia Maximum Correctional Facility opened in Branch County, Michigan in 1985. In Grimes County, Texas, built two new prisons near the town of Navasota; in 1982, the Luther Unit became operational and in 1983, the Pack Unit opened. In the 1990 study group multiple prisons opened in the following counties: Bee County, Texas 1992 and 1994, Jones, County Texas 1992 and 1994, Medina County, Texas 1993 and 1995, Pecos County, Texas in 1992 and 1995. Finally, Greenville, Virginia had prisons open in 1991 and 1995. These counties are included in the analysis since the additional prison opened during the time of study, 1991 to 1995.

Because of additional prison construction outside the period of study, four counties from the initial 1980 group are not considered. They were Wayne County, Tennessee, and Brunswick County and Buckingham County in Virginia. In addition to having a larger population and strong urban influence, Jefferson, County, New York, also had a second prison built in 1993. The 1990 group did not contain any counties with a second prison constructed after 1995.

Using these criteria the final population samples of prison counties and their complimentary control counties were selected. This winnowing process resulted in 18 prison counties in the 1981 to 1985 sample and 69 prison counties in the 1991 to 1995 sample. Each group has an equivalent number of control counties associated, one for each prison county. For reference, the 1981 to 1985 subset will be labeled the "1980 sample" and similarly the 1991 to 1995 subset will be labeled the "1990 sample." Appendix A and Appendix B show the list of counties in the 1980 sample and the 1990 sample, respectively.

Figure 14: Counties in the Sample Populations is a map of the selected counties.
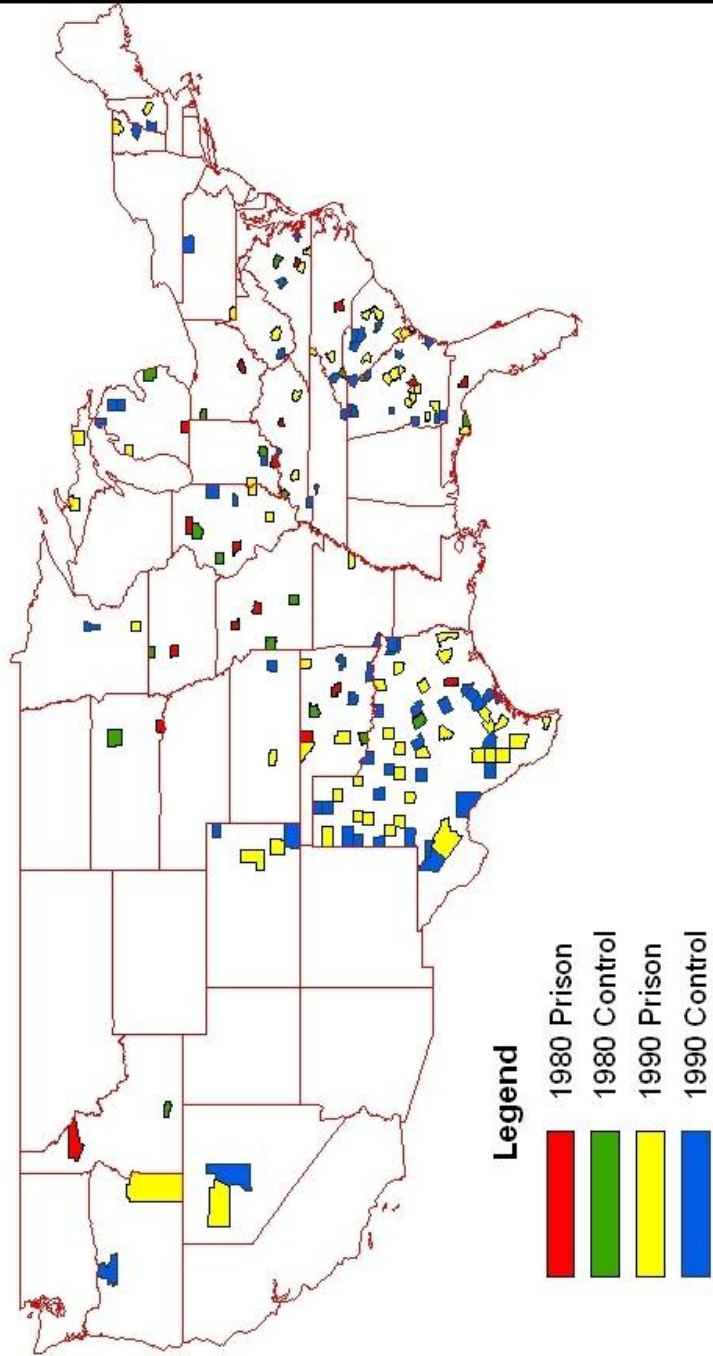
Figure 14: Counties in the Sample Populations

Conclusion

The economic variables, a statistical methodology, and data sources are in place to examine the research hypothesis: do prisons contribute to rural economic development? The economic variables come from theories on regional economic development. The statistical methodology compares similar populations to evaluate if the addition of a new prison significantly changes the means of the variables to be tested. The county level data for the analysis are from the U.S. Census and the Bureau of Economic Analysis. The cases used in the sample populations minimize the influence of spillover effects from urban areas and other counties with prisons. The variables, methodology, and sample populations will measure the structural changes that occur in the non-metro economy after a new prison opens.

Structural changes to the institutions and economy of a region evolve in response to the opening of a new industry. New industry may generate growth without causing the structural changes needed for economic development. Analyzing the selected variables provides an understanding of the impact prisons have on the structure of non-metro economies. The following chapter details the results of the analysis.

CHAPTER IV

ANALYSIS: IMPACT OF PRISONS ON THE RURAL ECONOMY

One of the primary reasons for locating prisons in non-metro counties during the

1980s and 1990s was to stimulate rural economic development. To measure the

contribution of prisons to non-metro economies, this research compares counties with

prisons to counties without prisons. This chapter describes the results that comparison.

The first three sections of this chapter group the variables by employment, income, and

population and then compares the rate of change of theses variables for the two sample

populations. The first sample population is comprised of counties with prisons built in

the early 1980s and the second sample population is comprised of counties with prisons

built in the early 1990s. The statistical analysis examines the differences across each

individual variable within the two groups of counties. Some of these variables are

measures of "growth" and some are measures of "economic development." The final

section of this chapter draws conclusions about the economic contribution of prisons to

non-metro counties from the interrelationships between individual variables.

Analysis of Employment Variables

The analysis of employment occurs on five levels as described in the previous chapter. The first level, total employment, provides information on the rate of change in county job growth. Labor force participation rates are the second set of employment variables. Total employment and labor force participation are measures of growth. The last three levels of measure, employment by industry sector, employment by class of worker, and changes in education level are measures of economic development.

Total Employment

Total employment examines the rate of change in the total number of jobs in the counties included in the two sample populations. Table 3: Rate of Job Growth summarizes the results of the analysis of total employment for the sample populations.

Table 3: Rate of Job Growth

Employment: Total Job Growth							
Change in the total number of jobs and the rate of change							
Sample	Type County	1970-1980		1980-1990		1990-2000	
1980	Control	3,492	6.5%*	27,845	22.8%*	19,858	13.8%
	Prison	18,693	19.1%*	4,534	4.6%*	12,042	9.6%
1990	Control	41,033	11.3%	80,771	20.6%*	55,339	10.8%
	Prison	74,223	22.3%	13,200	1.6%	54,925	10.8%
* difference in the means statistically significant at the five percent significance level							

1980 Sample

The counties in the 1980 sample showed a significant difference in the rate of job growth between 1970 and 1980 and between 1980 and 1990. During the 1970s, the eighteen prison counties created 18,696, an average 19.1 percent rate of job growth. The eighteen control counties added only 3,492 jobs at an average a rate of increase of 6.5 percent. The difference in the mean rate of growth during the 1970s is statistically significant at the five percent significance level. The second statistically significant difference occurred during the decade the prisons opened. Between 1980 and 1990 changes in the job growth rate reversed with control counties creating jobs at a significantly greater rate than prison counties. The average job growth rate in the control counties was 22.8 percent with 27,845 jobs created while prison counties added only 4,534 jobs at a rate of 4.6 percent. Control counties continued to add more jobs than the prison counties during the 1990s but not at a significantly greater rate (13.8 percent (Control) versus 9.6 percent (Prison)). In 1970 the two groups had nearly identical job numbers of 110,259 (Control) and 110,162 (Prison), yet by the year 2000, despite the construction of new prisons, the eighteen counties in the control group had added 16,020 more jobs than the prison counties (161,454 (Control) versus 145,434 (Prison)).

1990 Sample

For the 1990 sample, there are significant differences in the rate of job growth between the two sets of counties both during the 1970s and 1980s. During the 1970s jobs in the prison counties increased by 22.3 percent as opposed to an 11.3 percent increase

for the control counties. Counties would build prisons in the future added 74,223 jobs

while the opposing counties added only 41,033 new jobs. The difference in means

between the two groups was statistically significant at the five percent significance level.

Similar to the 1980 sample this trend reversed during the next decade. Here the control

counties grew at a 20.6 percent average rate adding 80,771 new jobs while the still future

prison counties added only 13,200 jobs for an average 1.6 percent increase. This

difference in the means of job creation is statistically significant at the five percent

significance level. These differences cannot be attributed to prison siting since the

prisons in 1990 sample did not start opening until 1991. During the 1990s, the rate of job

creation for the two groups is identical at 10.8 percent each; the prison counties added

54,925 new jobs while the control counties added 55,338 jobs.

For the 1990 sample, the total jobs in the 69 control counties went from 362,996

in 1970 to 540,138 in 2000. The 69 prisons counties started with 370,760 jobs in 1970

and by 2000 had 513,108.

Labor Force Participation

The labor force participation rate is the ratio between the labor force and the same

population cohort. In this case, the civilian labor force sixteen years old and older is

compared to the population of persons sixteen years old and older. From 1980 to 1990,

the 1980 sample shows a significant difference in labor force participation rates between

prison and control counties. The mean rate of change for the prison counties was -0.81

percent while the control counties increased labor rate participation at a mean rate of 2.4

percent. This difference is statistically significant at the five percent significance level.
The trend between the two groups continued in the 1990 to 2000 period with prison
counties continuing to have a small negative labor force participation rate while control
counties showed a mean 1.7 percent increase, but the difference was not statistically
significant.

Analysis of the 1990 sample produces different results from those found for the
1980 sample. There is no statistically significant difference in the labor force
participation rate from 1980 to 1990 in the two groups. A statistically significant
difference in labor force participation rates occurs from 1990 to 2000 when the mean rate
for the prison counties decreases by 5.5 percent while the control counties decrease by
0.3 percent. This difference is statistically significant at the five percent significance
level. The decline in labor force participation occurs during the decade new prisons were
activated.

Table 4: Civilian Labor Force Participation Results

Civilian Labor Force Participation Rate			
Sample	**Type County**	**1980-1990**	**1990-2000**
1980	Control	**2.445 ***	1.669
	Prison	**-0.812 ***	-0.397
1990	Control	1.580	**-0.292 ***
	Prison	1.632	**-5.491 ***
* difference in the means statistically significant at the five percent significance level			

Both samples experience significant decreases in the civilian labor force participation rate during the decade when the prisons were opened. The prison counties have a lower and statistically significant participation rate. The decrease in labor rate participation cannot be attributed to the new inmate population as the institutionalized population is not included in the derivation of the labor force participation rate. Table 4: Civilian Labor Force Participation Results summarizes the results.

Labor force participation is not strictly a measure of job growth and factors other than employment affect the county level participation rate. Migration and demographics within a county can change the denominator of the ratio and may alter the participation rate more than changes in employment. Never the less, this analysis measures the relative differences in labor force participation rates between control counties and prison counties. The third section of this chapter examines changes in population that can account for differences in the labor force participation rate. As will be described prison counties lost population at a greater rate than control counties. The larger decline in labor force participation along with the population loss reflects loss of employment in prison counties relative to control counties.

Female Labor Force Participation

Female labor force participation is the number of females in the civilian labor force compared to the number of females of the same age, sixteen and older, in the county population. Unlike the overall labor force participation rate, the female labor force participation rate was strong in the 1980s and the 1990s. As shown in Table 5:

Female Labor Force Participation Rate, in both the 1980 and 1990 samples female labor force participation grew more than five percent during the 1980s and continued to increase during the 1990s. This increase was almost identical in both prison and control counties, and occurs while the overall civilian labor force participation rate is decreasing. The difference indicates more women and fewer men are in the labor force. Other studies address the causes of this change in male and female labor force participation, but in non-metro counties, prisons are not a significant contributing factor to this demographic transformation.

Table 5: Female Labor Force Participation Rate

Female Labor Force Participation Rate			
Sample	Type County	1980-1990	1990-2000
1980	Control	6.686	6.686
	Prison	6.138	6.138
1990	Control	5.759	2.547
	Prison	5.539	2.874
no statistically significant differences in the populations			

Employment by Sector

Employment by sector is a measure of structural changes within the economy. If prisons contribute to economic development, there will be increases in employment in sectors associated with a more developed economy, manufacturing, wholesale, retail, FIRE, and services. In addition to these sectors, changes in agriculture, construction, and public administration were also evaluated.

Table 6: Employment Growth by Industry shows the results of the independent two-sample t-test of the means for growth in employment across sectors of the economy. The statistically significant differences are highlighted in blue.

Table 6: Employment Growth by Industry

Employment: Change in Job Growth by Industry					
Rate of change in the mean number of jobs					
SIC	Sample	Type County	1970-1980	1980-1990	1990-2000
Agriculture	1980	Control	26.2%	-20.5%	-8.9%
		Prison	28.9%	-18.8%	-19.0%
	1990	Control	286.4%	-25.4%	56.1%
		Prison	142.1%	-34.0%	31.8%
Construction	1980	Control	22.7%	**50.5%***	97.0%
		Prison	25.8%	**-1.4%***	106.0%
	1990	Control	45.2%	30.3%	107.2%
		Prison	41.2%	3.2%	102.8%
Manufacturing	1980	Control	26.6%	1.1%	5.8%
		Prison	46.6%	-4.3%	-0.7%
	1990	Control	62.6%	-4.0%	6.1%
		Prison	64.2%	-6.0%	12.3%
Wholesale	1980	Control	143.2%	8.7%	13.8%
		Prison	150.8%	-4.1%	21.9%
	1990	Control	96.8%	-2.1%	13.2%
		Prison	105.0%	-4.4%	21.8%
Retail	1980	Control	21.6%	18.1%	-13.6%
		Prison	14.6%	8.1%	-15.6%
	1990	Control	27.1%	21.1%	-17.0%
		Prison	24.5%	11.4%	-19.7%
Fire	1980	Control	80.7%	21.7%	31.1%
		Prison	103.4%	11.2%	27.8%
	1990	Control	118.6%	**34.7%**	17.4%
		Prison	104.0%	**20.1%**	19.7%
Services	1980	Control	30.4%	44.6%	24.8%
		Prison	34.1%	23.0%	32.8%
	1990	Control	25.8%	40.9%	29.6%
		Prison	19.5%	28.7%	29.3%
Public Admin	1980	Control	25.1%	**7.7%**	43.2%
		Prison	41.3%	**52.4%**	31.7%
	1990	Control	47.9%	11.0%	**35.0%***
		Prison	55.5%	13.0%	**91.4%***
* difference in the means statistically significant at the five percent significance level					

1980 Sample

Construction and public administration are the only two sectors in the 1980

sample that show significantly different growth rates between prison and control

counties. Unexpectedly construction jobs grow faster in control counties than in prison

counties during the period from 1980 to 1990. By 1990, the control counties added 3,101

new jobs while the prison counties only added 331 new construction jobs. The average

rate of increase of construction jobs in control counties was 50.5 percent while the

average prison county showed a 1.4 percent decline in the rate of construction job

formation. This difference is statistically significant at the five percent significance level.

With the construction of 18 new prisons during the early 1980s, an increase in the

number of construction jobs in the prison counties was expected. Both prison and control

counties had a similar number of construction jobs in 1970, (7,262(Control) versus 7,304

(Prison)) and 1980 (8,553 (Control) versus 8,224 (Prison)). During the 1990s

construction jobs in both control counties and counties with prisons doubled from

previous levels. Building complex facilities like prisons requires the skills and capital of

large urban-based construction firms; still some regional construction job growth could

come from hiring local labor or subcontracting to local firms. One explanation is that

local labor if employed in the construction of prisons may migrate out of the county

following their new employer to other jobsites when the prison construction is completed.

The rate of increase in public administration jobs showed a statistically significant

difference from 1980 to 1990. As expected, the prison counties added jobs in public

administration at a greater rate than the control counties. The U. S. Census defines

"public administration" as regular government functions, such as legislative, judicial, administrative, and regulatory activities of governments. Other governmental activities, such as schools, hospitals, liquor stores, and bus lines, are classified by the industry in which the job is normally found. When the Census categorizes jobs by class of worker, all government workers are included in the "government" category (U S Census Bureau, 2003).

Each prison county averaged 119 new public administration jobs when control counties averaged seven new public administration jobs. The average rate of growth in public administration for a prison county was 52.4 percent while the control counties grew at only 7.7 percent for the decade and this difference in the means was statistically significant at the five percent significance level. The total number of new public administration jobs added to prison counties during the 1980s was 2,016. Jobs in public administration accounted for slightly less than half of all the 4,534 new jobs created in prison counties during the 1980s. The estimate of the total number of staff for the eighteen new prisons is 6,300 and since most these are federal or state prisons, the jobs are in public administration. Host counties captured only about a third of the potential jobs from the new prisons.

For the 1980 sample, no other sectors of the economy show significant differences in job growth between prison counties and control counties. The lack of difference in job growth by sector supports the null hypothesis that prisons do not contribute to the rural economic development.

1990 Sample

The economic sectors of agriculture, manufacturing, wholesale, retail, FIRE, service, and public administration were also analyzed for the 1990 sample. One of the two sectors with significant differences found is in the number of FIRE jobs created during the 1980s, before prisons were constructed. FIRE jobs increased at a rate of 34.7 percent in the control counties while increasing only 20.1 percent in the future prison counties. This difference in the means is statistically significant at the five percent significance level, but the difference cannot be attributed to prison location.

Construction jobs for the 1990 sample showed a pattern similar to the 1980 sample. From 1970 to 1980, growth in construction jobs was almost identical for prison (9,998) and control counties (9,585). From 1980 to 1990, control counties added another 3,384 jobs compared to a loss of 127 construction jobs in prison counties. The average rate of growth of construction jobs in control counties is 30.3 percent and in prison counties is 3.2 percent. The independent samples t-test for equality of the means resulted in a t-statistic of 1.94 with a significance of .054. From 1990 to 2000, construction job growth in control counties was 42,564 and in prison counties is 35,613 and this resulted in an average growth rate of 107.2 percent in control counties and 102.8 percent in prison counties.

The rate of increase in public administration jobs is also significant in the 1990 sample during the decade the prisons opened. Between 1990 and 2000, prison counties added 13,895 public administration jobs compared to 4,942 similar jobs in the control counties. The 91.4 percent average rate of increase in public administration jobs for the

prison counties compared to the 35.0 percent average rate for the control counties is statistically significant at the five percent significance level.

The net increase in public administration jobs between the prison counties (13,895) and the control counties (4,942) in the sample is 8,953. The federal and state prisons built in the 1990 sample counties had a staff population of around 21,200. If all the new public administration jobs came from prison employment, the counties where the prisons are located did not capture approximately 12,000 of the new public administration jobs created by the prisons.

Employment by Class of Worker

The three components of employment by class of worker are private, government, and self-employed. Private jobs include all workers that receive income in private industry. These consist of jobs in for-profit companies and in not-for-profit, tax exempt and charitable organizations. Private jobs include owners of incorporated companies, since the owners are salaried employees of the company even if the owner of the company is performing most or all of the work. Government jobs include those employed by local, state, tribal, and federal governments and may include jobs in education, health care, retail, and other SIC classifications where the workers are government employees. Self-employed jobs count workers in their own unincorporated businesses, professional practice, or farm (U S Census Bureau, 2003). Table 7: Employment Class of Worker summarizes the results of the t-test analysis of the means of the rate of change for these categories of workers.

Table 7: Employment Class of Worker

	Sample	Type County	1970-1980	1980-1990	1990-2000
Employment: Class of Worker					
Rate of change in the mean number of jobs					
Public	1980	Control	45.5%	0.8%	9.9%
		Prison	46.4%	2.0%	14.9%
	1990	Control	55.0%	3.4%	**12.3%***
		Prison	58.7%	-0.1%	**25%***
Private	1980	Control	34.4%	14.4%	**18.6%***
		Prison	25.7%	10.1%	**12.7%***
	1990	Control	34.7%	**12.2%***	13.0%
		Prison	33.3%	**5.1%***	10.7%
Self	1980	Control	6.2%	-7.3%	2.4%
		Prison	11.9%	-7.7%	-3.9%
	1990	Control	21.1%	-3.7%	4.6%
		Prison	14.9%	-9.1%	1.6%
* difference in the means statistically significant at the five percent significance level					

1980 Sample

For the 1980 sample, the only significant difference in the class of worker, between the control counties and the prison counties is in the number of private jobs added from 1990 to 2000 when the control counties average an 18.4 percent increase in private job creation, as opposed to an 12.7 percent increase for the counties with prisons. In the independent samples t-test of the means this result is statistically significant at the five percent level of significance. The growth in private jobs occurred in the 1990s a decade after building prisons. The analysis does not show if the difference in the means of private job creation is due to an advantage found in the control counties or a disadvantage inherent in prison counties.

A surprising result is the lack of a difference in government job growth between prison and control counties from 1980 to 1990 because most of the prisons in the 1980 sample are federal or state prisons whose employees would hold government jobs. The growth in government jobs in the prison counties during the 1980s averaged 2.0 percent while the control counties averaged 0.84 percent. Although these numbers are not significantly different they do indicate slow growth of government jobs for the 36 counties in the sample. Grimes County, TX had the largest rate of government job growth among the prison counties, growing at 101 percent from 704 government employees in 1980 to 1,420 government jobs in 1990. Two prisons opened in Grimes County during the study period, one in 1982 and the other in 1983 and these prisons require a staff of nearly 700 employees. Undoubtedly, not all these prison employees reside in Grimes County, but prisons seem to have had a positive influence on government job formation. Excluding Grimes County from the analysis results in a negative 3.9 percent average growth rate of government jobs in prison counties. Most prison counties had a net loss of government jobs during the decade when prisons opened in the county. The net loss occurred even though Census data shows prison counties added 2,016 public administration jobs between 1980 and 1990. Government job loss must have occurred in other SIC classifications.

During the 1990s, government job growth increased at a rate of 14.9 percent in the prison counties and a rate of 9.9 percent in control counties. The difference is not statistically significant at the five percent significance level.

Analysis of the 1980 sample shows no significant difference in the self-employed class of worker for any of the three decades.

1990 Sample

Control counties in the 1990 sample experienced an increase in private job growth between 1980 and 1990, the decade before opening prisons in the prison counties, and the rate of change is statistically significant at the five percent significance level. The number of private jobs increased by an average of 12.2 percent in control counties while future prison counties created jobs at a rate of 5.1 percent. From 1970 to 1980 and from 1990 to 2000, average growth in private jobs between the two sets of counties is nearly identical.

From 1990 to 2000, the difference in the mean rate of growth for government jobs in the 1990 sample is significant at the five percent significance level. As expected, the rate of government job growth for the prison counties exceeds that of the control counties during the decade when new prisons opened. Counties with new prisons increased the number of government jobs by 25.0 percent as opposed to a 12.3 percent increase in the control counties. A total of 16,906 government jobs were added to prison counties while 8,247 jobs were added to control counties. Although for prison counties this is a significant number of new jobs, approximately 8,600 more than the control counties, the state and federal prisons built in prison counties require over 21,000 staff. If government jobs in other SIC classifications remained stable, the counties with new prisons captured less than half the potential job growth from prison employment.

Analysis of the 1990 sample shows no significant differences in the number of self-employed jobs in any of the census periods from 1970 to 2000.

The lack of significant private, public, or self-employed job growth in counties with prison indicates little change in the structure of the economies of counties with new prisons. Prisons did not create more private jobs, they did not create more opportunity for self employment, and most surprisingly, for the 1980 sample, they did not significantly increase the number of jobs in the public sector. Control counties created private jobs more often than counties with prisons.

Education Level

The analysis compared four levels of education: less-than-high school, high school, some college, and a four-year college degree or higher. Table 8: Education Level gives the results of the analysis. Although all levels of education improved over time, there were no significant differences between the two groups of counties in the 1980 sample.

The 1990 sample showed similar results with one exception, the number of people with a college degree was significantly higher in the control counties in the years from 1990 to 2000. The rate of increase for a college degree for the control counties was 2.4 percent as opposed to 1.3 percent for the prison counties and this difference was statistically significant at the five percent significance level.

The level of education is increasing over time in all the non-metro counties studied, but prisons have no noticeable impact on this measure of human capital

improvement. Not stimulating a need for higher levels of education, prisons do not contribute to the increases in human capital needed for economic development.

Table 8: Education Level

Education Rate of change in education level					
	Sample	Type County	1970-1980	1980-1990	1990-2000
Less than	1980	Control	-13.1%	-11.7%	-9.2%
High School		Prison	-13.8%	-10.5%	-8.3%
	1990	Control	-13.6%	-11.7%	-8.9%
		Prison	-13.3%	-12.5%	-8.3%
High School	1980	Control	5.9%	2.0%	1.0%
		Prison	7.0%	1.8%	7.8%
	1990	Control	6.7%	2.7%	1.9%
		Prison	6.7%	4.0%	2.4%
Some College	1980	Control	3.8%	8.0%	5.3%
		Prison	3.6%	7.9%	4.4%
	1990	Control	3.7%	7.8%	4.5%
		Prison	3.7%	7.3%	4.7%
College	1980	Control	3.5%	1.7%	3.0%
4 yrs or more		Prison	3.2%	0.8%	2.1%
	1990	Control	3.2%	1.2%	2.4%*
		Prison	2.9%	1.2%	1.3%*
* difference in the means is statistically significant at the five percent significance level					

Analysis of Income Variables

Total Personal Income

The BEA defines total personal income as the income from all sources received by all persons who live in a specific area. Total personal income, like total employment, is a measure of economic growth. Personal income estimates are by the place of

residence of the income recipients and are a measure of gross county product since data on the gross output of counties are not available from the BEA. Total personal income captures increased output of a non-metro county only if those working in the county reside in the county.

The independent t-test of the means for the both the 1980 and 1990 samples showed no statistically significant difference between prison counties and control counties for the variable of total personal income.

Wage and Salary Disbursements

Wage and salary disbursements are defined by the BEA as "Wage and salary disbursements consists of the monetary remuneration of employees, including corporate officers salaries and bonuses, commissions, pay-in-kind, incentive payments, and tips. It reflects the amount of payments disbursed, but not necessarily earned during the year. Wage and salary disbursements are measured before deductions, such as social security contributions and union dues." Use of this variable narrows the range of income used for comparison, focusing specifically upon the primary type of income generated from prisons. Analysis of wage and salary disbursements for prisons and control counties in the two samples shows no statistically significant difference in the mean rate of growth for this variable.

Earnings by Place of Work

Earnings by place of work also measures county output and is a measure of growth. This measure differs from total personal income by measuring output by place of employment rather than place of residence. This variable contributes all employment output from the prison to the county where it is located. No statistically significant difference was found between prison and control counties in the rate of change of earnings by place of work in either the 1980 or the 1990 samples.

Per Capita Income

Per Capita Income (PCI) is regional income received from all sources divided by the total population of the region. All income data used in the PCI analysis are direct Census data and not adjusted for inflation. Income data presented in the Census reports are based directly on field surveys of households. The analysis examines the rate of change of PCI in both prison counties and control counties in the 1980 and 1990 sample sets. PCI is a measure of a region's growth.

Included in the per capita income calculations are people living in group quarters, which consist of college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and similar places. The population in group quarters is also included in the earnings estimates. Inmates will affect per capita income calculations in counties with new prisons. The presence of inmates should reduce PCI in prison counties by increasing the population and providing

minimal contribution to income. Table 9: Income - Total Income Measures summarizes

the results of this series of growth indicators

Table 9: Income - Total Income Measures

Income: Characteristics of Total Income					
Rate of change in total income measures					
	Sample	**Type County**	**1970-1980**	**1980-1990**	**1990-2000**
Total Personal Income	1980	Control	34.8%	20.4%	24.4%
		Prison	28.7%	12.5%	20.5%
	1990	Control	34.3%	22.5%	22.5%
		Prison	31.4%	16.9%	22.8%
Earnings by Place of Work	1980	Control	18.6%	16.8%	14.6%
		Prison	9.3%	11.1%	17.3%
	1990	Control	18.9%	18.7%	16.0%
		Prison	17.1%	13.3%	20.0%
Wage and Salary Earnings	1980	Control	32.4%	7.8%	20.2%
		Prison	22.7%	7.8%	21.6%
	1990	Control	31.9%	5.6%	20.9%
		Prison	33.2%	-0.3%	26.2%
Per Capita Income	1980	Control	151.2%	81.5%	**63.1%**
		Prison	151.0%	74.8%	**86.3%**
	1990	Control	157.5%	79.9%	**69.4%**
		Prison	160.7%	77.3%	**90.1%**
* difference in the means statistically significant at the five percent significance level					

1980 Sample

Control and prison counties in the 1980 sample show nearly the same per capita

income trends from 1969 to 1979. The rate of change for per capita income for the

control group and the prison group is 151.2 percent and 150.0 percent respectively. The

two groups had similar economic patterns as reflected in per capita income.

From 1979 to 1989 per capita income between the two groups was not significantly different even though prisons were constructed and in operation during this time. The rate of change in the two groups from 1979 to 1989 averaged 81.5 percent for the control counties and 74.8 percent for the prison counties, about half the growth in income that occurred in the prior decade. The exact prison population and staffing level during the period is not known, however the 2003 Directory of ACA reports the average daily population for the 21 prisons built in these 18 counties (a complex of three prisons opened in Branch County MI in 1985) is 20,395 with staffing of 6,357. The aggregate population of the prison counties in this group was 355,061 in 1990. Inmates could account for almost six percent of this number assuming prisons are operating at near capacity. The six percent increase in population would dilute the per capita income of prison counties. Without prisoners, the PCI for prison counties would likely have been very close to the 81 percent growth found in the control counties.

For the 1980 sample from 1989 to 1999, the difference in the average rate of change in per capita income was statistically significant at the five percent level of significance. The two-tailed significance level is less than .001. Per capita income in the control counties grew at an average rate of 63.1 percent while the prison counties saw per capita income increase at a rate of 86.3 percent despite dilution of the variable from inmate populations. The non-institutionalized PCI would be close to 92 percent.

Bon Homme County, SD showed the greatest increase in per capita income during the period, growing at a rate of 136 percent despite its small population in relation to inmate capacity. PCI in the county grew from $8,208 in 1989 to $19,356 in 1999.

114

Bon Homme County had a population of 7,193 in 2000 with a probable prison population of 818 inmates representing 11 percent of the total population. Bon Homme County had a population of 8,059 in 1980 before inmates arrived and a population of 7,089 in 1990, which includes around 800 inmates.

1990 Sample

Per capita income trends for the 1990 sample follow the same pattern as the 1980 sample. From 1969 to 1979 and from 1979 to 1989 the rate of PCI change in control counties and prison counties is nearly identical, again showing the counties were economically similar before the construction of prisons. The average PCI increase is 158 percent for control counties and 161 percent for prison counties in the 1970s. In the 1980s, PCI increased in the control counties by 80 percent and prison counties by 77 percent.

From 1989 to 1999, the rate of change in the PCI for prison counties exceeds the rate of change in the control counties by 20 percent. Prison counties saw an average 90 percent increase in PCI while control counties averaged only 69 percent. An independent sample t-test of the means shows this to be significant at a greater than five percent level of significance. These results occur despite the approximately 86,600 inmates counted in the population base. The total population of the 69 prison counties in the 1990 sample is 1,320,690 with prisoners representing about six percent of that number. Excluding inmates, the PCI rate of change would be about 96 percent.

Swisher County TX, a county with a small population, shows the largest rate of growth in PCI. PCI in Swisher County grew 155 percent in the 1990s even though its

population did not change. The population was 8,133 in 1990 and 8,109 in 2000. Per capita income increased from $9,693 in 1989 to $24,730 in 1999. A prison constructed in 1992 added about 600 inmates to the population representing about 7 percent of the total population. The staff of the prison number 123 about half of whom could have transferred from other areas. In the decade before the prison was built Swisher had lost 16 percent of its population. Swisher County has a declining population: in 1970 the population was 10,373; in 1980 9,723; in 1990 8,133; and even with the addition of 600 inmates the 2000 population continued to fall to 8,106.

The differences in PCI for the counties included in the analysis suggest that prison siting has significantly improved the income levels in the counties in which they are located. However, other factors are affecting the PCI in counties with prisons. Per capita income for the county is an average income derived by dividing total county income by total county population. A closer look at data for Bon Homme County, SD and Swisher County, TX , as shown in Table 10: Census Data for Bon Homme County, SD and Table 11: Census Data for Swisher County, TX, reveals a different source for the increases in PCI. Although these two counties have new prisons, they continue to lose population and jobs relative to the increases in total county income. Increases in county income are in part coming from inflation and commodity increases from goods or services already produced by the county, perhaps increases in agricultural products. The salaries from the prison are also contributing to total income. Increases in total income in these prison counties demonstrate how growth in output can accompany a decline in economic

development. The prisons in these two counties have not provided the economic

contribution needed for recovery of the local economy.

Table 10: Census Data for Bon Homme County, SD
1980 Sample

Bon Homme County, SD	1970	1980	1990	2000
Population	8,577	8,057	7,089	7,193
Inmate population	-	-	800	800
Net Population	8,577	8,057	6,289	6,393
% Change in Pop		-6%	-12%	1%
% Change Civ Pop		-6%	-22%	2%
Population > 16 yrs		6,264	5,543	5,850
Number of Jobs	3,234	3,531	2,866	3,088
% Change Job		9%	-19%	8%
PCI	$ 2,516	$ 4,609	$8,208	$19,356
LFPR		58%	52%	54%
% Change in LFPR			-6%	4%
Census Income	$21,580	$37,135	$58,187	$139,228
Income Year Surveyed	1969	1979	1989	1998
BEA Income	$ 24,686	$54,747	$ 96,441	$ 159,064

Table 11: Census Data for Swisher County, TX
1990 Sample

Swisher County, TX	1970	1980	1990	2000
Population	10,373	9,723	8,133	8,106
Inmate population				600
Net Population	10,373	9,723	8,133	7,506
% Change in Pop		-6%	-16%	0%
% Change Civ Pop		-6%	-16%	-8%
Population > 16 yrs		6,930	5,904	6,322
Number of Jobs	3,731	4,029	3,396	3,332
% Change Job		8%	-16%	-2%
PCI	$ 2,488	$ 5,355	$ 9,692	$24,730
LFPR	36%	41%	42%	44%
% Change in LFPR		7%	-6%	4%
Census Income	$ 25,808	$ 52,067	$ 78,825	$200,461
Income Year Surveyed	1969	1979	1989	1998
BEA Income	$ 50,220	$ 68,430	$182,765	$ 206,523

Income by Sector

Income from the following SIC classes was examined for both the 1980 sample and the 1990 sample; farm earnings, construction, manufacturing, wholesale, retail, FIRE, services, and government. Income data are from the Bureau of Economic Analysis table CA25. Changes in income by sector are indicators of economic development. If prisons contribute to economic development, construction, manufacturing, wholesale, retail, FIRE, and services income should increase.

Farm earnings showed no significant differences in the means of either the 1980 or the 1990 sample. Wide variations in farm earnings between counties and large standard deviations in the data indicate many external factors influence farm earnings and they may not be a good measure for evaluating economic development.

Analysis of construction income shows prison and control counties are very similar with little difference in the mean rate of change of construction income. The cost of building new prisons does not reflect in construction income for the prison counties.

No significant difference exists between prisons and control counties in the rate of change in income for manufacturing, wholesale, retail, FIRE, or services. Siting prisons in non-metro counties, represented by the 1980 and 1990 samples, did not affect the structure of the local economy in a manner reflected in changes to the income level of these sectors.

The only significant difference in sector income levels is in government income in the 1990 sample from 1990 to 2000. The average rate of change for prison counties is

57.6 percent and for control counties is 24.6 percent. This difference is statistically significant at the five percent significance level.

Government income for the 1980 sample showed a marked increase from 1980 to 1990 growing at a rate 60.1 percent as opposed to a 15.7 percent rate in the prior decade. When compared to the control county growth rate of 28.1 percent from 1980 to 1990 the rate of change in prison counties in not statistically significant. Two prison counties, Lafayette County FL and Grimes County TX, had increases in government income of 247 and 372 percent respectively. These small counties skewed the overall rate of change of government income for prison counties in the 1980 sample. Without their influence, the prison county rate increase for government income would be 29 percent. Similar to the results for government job growth, prisons in the 1980 sample did not cause significant increases in income from the government sector of the economy.

Prisons do not contribute to economic development as measured by changes in income across different sectors of the economy. Table 12: Income- by Industry shows the results of the statistical analysis of the changes in income across the industry sectors studied.

Table 12: Income- by Industry

SIC	Sample	Type County	1970-1980	1980-1990	1990-2000
Income: Change in Income by Industry					
Rate of change in mean income					
Farm Earnings	1980	Control	-52.2%	365.0%	-24.0%
		Prison	-70.4%	50.0%	41.8%
	1990	Control	-58.5%	-111.8%	-107.6%
		Prison	-75.3%	-2.0%	-10.4%
Construction	1980	Control	89.2%	6.8%	37.4%
		Prison	80.7%	-6.0%	38.5%
	1990	Control	101.7%	7.7%	41.9%
		Prison	85.9%	-3.6%	25.9%
Manufacturing	1980	Control	53.3%	14.9%	7.6%
		Prison	105.9%	34.2%	23.3%
	1990	Control	81.9%	13.7%	28.2%
		Prison	59.8%	12.8%	11.5%
Wholesale	1980	Control	96.1%	-2.3%	20.6%
		Prison	185.4%	-12.1%	32.7%
	1990	Control	90.0%	-0.4%	22.4%
		Prison	95.5%	-11.9%	39.2%
Retail	1980	Control	3.9%	-5.7%	15.1%
		Prison	-5.4%	-9.5%	13.4%
	1990	Control	3.4%	-3.2%	12.4%
		Prison	6.5%	-5.5%	8.9%
Fire	1980	Control	38.2%	2.9%	90.7%
		Prison	23.5%	-0.6%	41.0%
	1990	Control	46.9%	7.7%	84.8%
		Prison	38.5%	2.4%	85.8%
Services	1980	Control	25.6%	31.5%	21.4%
		Prison	19.8%	17.8%	42.5%
	1990	Control	27.5%	30.9%	40.2%
		Prison	21.4%	20.4%	40.0%
Government	1980	Control	25.6%	28.1%	24.9%
		Prison	15.7%	60.1%	19.8%
	1990	Control	28.7%	32.0%	**24.6%***
		Prison	32.7%	32.5%	**57.6%***
* difference in the means statistically significant at the five percent significance level					

Income by Type of Earnings

Analysis of non-farm and private income differences determined if income changes occurred in the broader economy because of prison construction. No statistically significant differences were found in any period for either the 1980 or the 1990 samples.

Local Government Expenditure

The final measure of comparison between prison counties and control counties for the two sample groups is local government expenditure. As prisons contribute to the local economy, revenues should accrue to local government resulting in increases to government expenditure. Direct general expenditure includes payments to employees, suppliers, contractors, beneficiaries, and other final recipients of government outlays and is a measure of economic development. Analysis of the difference in the mean rate of change of local government expenditure for both the 1980 and 1990 sample shows no significant difference in the any of the periods studied.

Table 13: Income by Sector summarizes the results of the analysis of income by sectors.

Table 13: Income by Sector

Income: Characteristics of Income Sectors					
	Sample	Type County	1970-1980	1980-1990	1990-2000
Nonfarm Income	1980	Control	32.2%	7.7%	20.6%
		Prison	22.6%	9.4%	21.2%
	1990	Control	33.7%	6.5%	21.6%
		Prison	35.1%	1.7%	25.8%
Private Earnings	1980	Control	33.4%	3.9%	19.9%
		Prison	24.9%	-1.8%	23.1%
	1990	Control	34.6%	2.1%	21.7%
		Prison	35.9%	-4.6%	17.0%
Local Govt Expenditures	1980	Control	190.4%	135.3%	78.8%
		Prison	144.3%	113.8%	85.4%
	1990	Control	184.1%	152.9%	80.6%
		Prison	171.3%	145.2%	86.6%
No statistically significant difference in the means at the five percent significance level					

Analysis of the Population Variable

As discussed in Chapter III population alone is not a good indicator of economic development. Clearly many developing nations have population increases that exceed measures of their economic development. Fertility, mortality, and migration are major determinants in the population of a region. All of these can have some relationship to economic growth and development. Economically developed nations have lower birth rates, and longer life expectancy. Migration patterns result from people seeking jobs and better standards of living. Still, an analysis of population must consider other variables when trying to measure the growth and development of an economy.

Non-metro counties can increase in population from in-migration of retirees without corresponding increases in economic development, but more commonly non-metro counties suffer from out migration due to a lack of economic opportunity within the county. Administrators of non-metro counties seek and accept prisons in the belief prisons will stem or reverse out-migration by providing local jobs. The growth in jobs and a more stable population can provide a basis for economic development. This section analyzes the contribution of prisons to county population stability and growth. Table 14: Population Comparison summarizes the population analysis.

Table 14: Population Comparison
Source: U.S. Census
Estimate of the inmate population from the 2003 ACA Prison Directory

	Population							
N	**1980 Sample**	1970	1970-1980	1980	1980-1990	1990	1990-2000	2000
36	Total Population	626,059	50,563	676,622	-257	676,365	51,544	727,909
18	Control Counties	313,001	34,662	347,663	-2,225	345,438	27,410	372,848
18	Prison Counties	313,058	15,901	328,959	-18,427	310,532	24,134	334,666
	Inmates				20,395	20,395		20,395
N	**1990 Sample**	1970	1970-1980	1980	1980-1990	1990	1990-2000	2000
138	Total Population	2,080,238	254,401	2,334,639	4,851	2,339,490	248,309	2,587,799
69	Control Counties	1,033,555	119,302	1,152,857	22,146	1,175,003	92,106	1,267,109
69	Prison Counties	1,046,683	135,099	1,181,782	-17,295	1,164,487	69,603	1,234,090
	Inmates						86,600	86,600

1980 Sample

The 1980 sample consisted of 18 non-metro counties each with at least one new prison and a matching 18 non-metro counties without prisons. The 1980 sample, as expected, showed no variation in the mean change in population from 1970 to 1980 the decade before prisons opened in the prison counties of the group. This result indicates the counties were not significantly different in population growth before prisons were built. Unexpectedly analysis of the means shows no significant difference in population growth between the groups for the two decades after prisons opened and are in operation. From 1980 to 1990, the means of population change showed a small decrease for both sets of counties. The mean of population change for the prison counties was -0.5 percent and for the control counties was -0.8 percent. The two growth rates are nearly identical and the difference not statistically significant. The 95 percent interval of means for population change during this time ranged from -7.9 to 7.3 percent.

From 1990 to 2000, the mean growth rate was 5.6 percent for prison counties and 7.7 percent for the control counties. The difference in the rates of 2.1 percent is not significant. The 95 percent interval of the means for this period ranged from a -5.2 percent to 9.3 percent.

As inmate count is included in Census data on population, these results bear further investigation. The prisons included in this group would house around 20,400 inmates based on the 2003 average daily population or design capacity of these facilities. The sum of the population of the 18 prison counties in 1980 was 328,959. By 2000, the population had grown to 355,061 an increase of 26,102. Inmate population could account

for all but about 5,700 of the total increase. The control counties grew from 347,663 in 1980 to a population of 372,848 in 2000. The difference of 25,185 does not include inmates. Excluding prisoners, the population of control counties grew at over four times the rate of the population of prison counties.

Counties with small populations such as Alfalfa, OK, with a 1980 population of 7,077, and Bon Homme, SD with a 1980 population of 8,059 showed continuous population declines from 1970 through the 2000 Census despite new prison construction in the early 1980s. A prison opened in Alfalfa County in 1982 and with an inmate capacity of about 850. Even with the new prison Alfalfa county continued to show a steady decline in population losing 661 people between the 1980 and 1990 Census and an additional population loss of 411 people by 2000. In 1984, Bon Homme County opened a prison with an average daily population of 818 inmates. Despite the prison, the population of Bon Homme County in 1990 declined by 970 people to a 7,089, a loss of twelve percent. Bon Homme's population stabilized in the 1990s by an increase of only 105 people. The stabilization in the population may be due in part to prison inmates and staffing.

The population of most prison counties showed little growth or negative growth during the decades of the 1980s and 1990s. There were exceptions to this general trend as some counties continued population growth rates that began in the 1970s. Lafayette County, FL showed the strongest growth rate of between 30 and 40 percent for each of the three decades examined, due in part to a very low initial population of only 2,892 in 1970. Other counties showing continual growth over the 30 year period include

126

Montgomery, NC, Hocking, OH and Branch, MI. The 1970 population of these counties is larger than most of the counties studied having 19,267, 20,322, and 37,906 people respectively. Grimes, TX showed the strongest continual growth rate of 14.6, 38.6, and 29.6 percent in each of the three decades respectively. Two prisons opened in Grimes TX, one in 1982 and the other in 1983. They had a combined inmate capacity of 2,800. The population of Grimes County increased from 13,580 in 1980 to 24,398 in 2000.

Copper County, MO did not have strong growth in the 1970s but the addition of a prison seems to have helped stabilize its population. After anemic population growth of a negative 0.6 percent in the 1970s and 1.3 percent in the 1980s, the population increased by 12.3 percent in the 1990s. The population was 14,732 in 1970 and 14,643 in 1980. A prison with a capacity of 1,263 inmates was opened there in 1983, yet even with the prison, the 1990 population had increased to only 14,835, but by 2000 the population had grown to 16,659. Factors other than the prison may have contributed to this growth.

Branch County, MI offers a good example of prison construction on population. Three prisons opened in Branch MI in 1985. These prisons had an average daily population of 3,335 with a staff of 1,029. Branch County MI grew in population from 1980 to 2000 by 5,538 people, a 14 percent population growth rate over the two decades. An inmate population of 3,335 would account for 8 percent of this growth.

The control counties showed similar trends to the prison counties. The average growth in the 1970 was 11.7 percent, -0.8 percent in the 1980s, and recovered to 7.7 percent population growth in the 1990s. This was slightly better than the average decennial growth rates in the prison counties of 5.9 percent,-0.5 percent, and 5.6 percent

127

respectively. In real terms, however the population increase of the control counties was greater that that of the prison counties as the increase did not include inmates. An analysis of the mean population growth of these two groups showed no significant difference at the five percent level of significance. Prisons in the 1980 sample have no noticeable effect on the civilian population.

<u>1990 Sample</u>

Interestingly the 1990 sample shows different results. The 1990 sample contains 69 counties with new prisons built between 1991 and 1995 inclusively and an equal number of control counties without prisons. The mean population growth rate of the two groups is nearly identical between 1970 and 1980. For control counties the mean of the rate of change is 12.0 percent, compared to 11.6 percent for the counties in which prisons will be built in the early 90s. During the 1980s, the population of both groups changes very little. The control counties grew at a mean rate of only 1.8 percent (adding only 22,146 people) while the future prison counties lost population (losing 18,427 people) at a rate of -2.6 percent. The 4.4 percent difference between the two means is statistically significant at the five percent significance level. There is only a 1.6 percent chance of observing a mean difference at least this large if the null hypothesis is true. During the 1980s the control counties population is growing at a significantly greater rate than the prison counties. Most of the prison counties are losing population with very few showing any significant growth. The control counties show an almost equal mix of counties with population loss compared to counties with population growth.

The most interesting fact about the 1990 Census data is that by 2000 the trend has reversed. Prisons are built and occupied, and the population growth rate for the counties with new prisons increases to an average of 15.8 percent over the decade. This compares with an average rate of population growth for the control counties of 7.6 percent, less than half the prison rate. The 8.2 percent difference between the means of prison and control counties is statistically significant at the five percent significance level. The difference would suggest that prison building has been successful in helping economic growth reverse declining population trends but the population increase is only due to the influx on inmates into these counties.

The total growth in population for the prison counties between 1990 and 2000 was 156,203. For the same time period, the total population of the control counties increased by 92,106. The exact number of prisoners is not know but the capacity or average daily population of the prisons as reported in the 2003 Directory of the American Correctional Association is 86,578. This would account for 47 percent of the increase in prison county population and would account for 100 percent of the difference in growth rate between the two groups. In other words, although the population growth rate of the prison counties is twice that of the control group during the 1990 to 2000 Census period there is very little difference in the growth rate of the civilian population. The significant negative growth rate of prison counties during the 1980 stabilized and reversed perhaps in part due to the introduction of the prison industry.

Conclusions

Comparing changes in economic variables for counties with prison to counties without prisons shows how prisons contribute to the economic development and growth of non-metro counties. The analysis shows very few areas in which prison counties are significantly different from other non-metro counties. However, the analysis of the variables of employment, income, and population provides unexpected results on the economic contribution of prisons.

Prisons do not change the structure of the local economy as measured by change in employment and income over a wide range of industry sectors. Prisons do not increase the total county output, as measured by total personal income, in comparison to other non-metro counties without prisons. Counties with prisons suffer a decrease in the male civilian labor force participation rate during the decade when the prisons are opened. Although there are gains in public administration jobs resulting from new prisons, those gains do not always result in growth to the public sector of the economy. Public sector employment in prison counties grows by fewer than half the jobs available from prison staffing. A decade after prisons opened control counties in the 1980 sample produced significantly more private sector jobs than prison counties.

Building prisons did not create any lasting construction jobs in the host counties. During the 1980s, construction jobs grew significantly faster in the control counties than in the counties with new prisons. New prisons do not increase the rate of construction jobs or construction income in the counties where they are built.

Prison counties lost population at a greater rate than control counties in both of the samples examined. During the 1980s non-metro counties had slow population growth. Most counties lost population, prison counties lost more people than control counties. Even the addition of prisons in the 1980 sample does not prevent sharp declines in population during that decade. From 1990 to 2000, the non-incarcerated population of prison counties grew at a slower rate than control counties. Prisons may have helped slow population decline but excluding prisoners, they do not increase county population.

Even the large increase in the rate of growth of per capita income during the 1990s is an indication of the poor economic performance of counties with prisons. The higher PCI rate results from the stagnation of population and jobs accompanied by increased output from existing sectors of the economy. Statistically higher PCI rates occur more frequently in counties with prisons than in similar non-metro counties. Prisons counties suffered greater population loss and slower economic growth than other non-metro counties during the 1980s. During the 1990s, population stabilized and personal income increased significantly as county output kept pace with other non-metro counties.

Prisons do not contribute to the economic development of non-metro counties. They do not attract new businesses in a way that structurally changes the non-metro economy. Jobs and income in manufacturing, retail, FIRE, and services are similar to other non-metro counties. Education levels do not significantly change in non-metro counties with new prisons and so prisons do not add to the level of human capital needed for a more developed economy.

Prisons may not contribute significantly to economic growth. Public administration jobs increased and income from government jobs increased but total job growth and total personal income were not significantly different from the control counties and most of the jobs available from new prisons do not translate into job growth for prison counties.

During the 1980s, the national economic climate negatively affected many non-metro counties. Counties that would eventually have new prisons suffered greater economic hardship than other non-metro counties. Declining populations, poor job creation, and slow income growth are evidence of this. These conditions may have influenced the decision to seek out and support prisons as a source of jobs and potential economic development. By 2000, prison counties had recovered to levels of population, income, and employment closer to those in other non-metro counties. Improvements in the national economy during the 1990s undoubtedly contributed to stability in the non-metro economy. Prison jobs may help in the recovery of counties where prisons are located, but prisons did not result in economic improvements in the host county beyond those found in similar non-metro counties. At best, prisons provided some stability in already weak non-metro economies.

CHAPTER V

RESEARCH FINDINGS AND POLICY IMPLICATIONS

This chapter summarizes the results of the research dissertation and describes the public policy implications of siting prisons in rural counties. The resulting policy implications are relevant to state and county administrators seeking to understand what local economic benefits maybe derived from locating new prisons in rural counties.

Research Findings

This dissertation compares the economic development attributes of rural counties with prisons to the economic development attributes of rural counties without prisons. Based on this comparison, the hypothesis that prisons contribute to the economic development of nonmetropolitan counties is rejected. Analysis of the data finds strong evidence that new prisons in the nonmetropolitan counties have no statistically significant positive effect on indicators of economic development.

The answers to the research questions posed in the introduction of this dissertation are the basis for rejecting the hypothesis that new prisons contribute to economic development in rural counties.

What are the underlying characteristics of rural economies that create the potential for growth and economic development?

Economic growth differs from economic development. Increased output characterizes economic growth, whereas, economic development in addition to increased output, requires structural change to the institutions and types of industry that make up an economy. The variety and interconnectedness of industry in a developed economy provide for stability in diversity of jobs and symbiotic support between industry sectors. Industries migrate to already developed regions in order to take advantage of the available supporting industries and labor skills. Institutions grow and become more robust. Banking and education expand to fill the demand created by the supply of new labor skills and the diversity of industry and public investment grows with increases in tax revenue and the demand for services. Social and cultural systems expand as they gain support and interest. Regional economic development fosters urbanization.

Residents of rural areas also want sustainable economic development but do not necessarily want more urbanization, as they find value in the inherent characteristics of their regions. Rural areas must compete with existing urban centers for industries that are the source of economic development. Christaller postulates that the number and size of urban centers is limited by the population they can support over a given distance. As transportation becomes less expensive, extractive industries less labor intensive, and urban areas more consolidated, rural areas have become less competitive and less populated. Attempting to reverse this decline, rural counties try to attract industry to diversify their economic base and support growth and economic development.

Rural regions are difficult to define because they have a wide variety of characteristics and due to that diversity, finding similar advantages for economic development is a formidable task. To illustrate this point, a common definition of rural areas is they are non-metropolitan; yet many rural counties have micropolitan urban centers. Rurality also can be described as a continuum based on population density and distance from urban centers. Urban centers, by providing jobs and income, draw nearby rural counties into the metropolitan sphere of influence. More distant rural regions, however, tend to have limited economic development and are often characterized by dominant extractive industries that grow as a result of increased technological efficiency. Rural areas lack the economic diversity necessary to employ the excess labor resulting from more productive, less labor intensive, extractive industries. The loss of jobs and the corresponding loss of the labor force weaken the rural economy. To prevent the loss of population rural leaders seek new industries to expand the economic base. Demand models show that base exporting industries are the foundation that underpins the economic development of a region. To attract exporting industry non-metro regions must provide some type of competitive advantage in the labor or capital needed to produce output.

One way to evaluate the potential for rural economic development is to understand the amount and type of capital available in the rural economy that can contribute to growth and economic development. For extractive industries, they have the advantage of land and natural resources; for manufacturing and services industries where

135

the capital value of land is less important, they are at a competitive disadvantage to urban centers.

Rural economies frequently have excess labor available at relatively low cost, but this labor force may not have sufficient human capital, in the form of skills and education, needed for employment by new industries. Another measure of human capital is female workforce participation. Similar to urban areas, rural regions experienced a boost in human capital performance from female participation in the workforce, in some cases this has come at the expense of male workforce participation.

Rural regions also offer other social and cultural amenities not available in urban areas. For instance, the lack of diverse industries and a smaller more cohesive population provide a stronger base for social and cultural capital that some people feel contribute to their quality of life. Rural regions have the public institutions and infrastructure needed for economic development but on a smaller scale than in urban areas. Rural counties, when represented in the legislature by geographic districts, have political capital disproportionate to size of their population.

How have rural counties been impacted by the national expansion of prison construction?

The 1980s were a decade characterized by "get tough on crime." The "war" on drugs was expanding, drug crimes were federalized, enforcement was stepped up, more police were hired, and courts were full. As penalties for drug crimes increased, the federal system and in many states eliminated parole, "three strikes" laws and mandatory sentences became public policy, and the incarceration rate rose from 145 per 100,000 in

1980, to 470 per 100,000 in 2001. The demand for prison space exploded. In 1980 there were 330,000 inmates imprisoned under state and federal jurisdiction. By the end of 2001 federal, state, and military prisons, jails, detention centers, and juvenile facilities of the United States held over 2,000,000 inmates.

The 1980s also started with a national economic recession that deeply affected rural counties. As employment opportunity vanished, populations declined and per capita income stagnated. The recession, combined with the demand for prisons, created a boom in rural prison construction that has lasted for over two decades. While the residents of urban areas were resisting new prisons, rural communities sought out prisons for the economic opportunities they offered. Prisons and rural counties became a natural fit. Prisons require few supporting industries, little infrastructure, available labor and large low cost sites. Rural counties welcomed new prisons and were able to supply their basic requirements.

In the 1993, OMB listed 3,143 counties, parishes or independent cities in the United States. Of these, 2,285 were not in a metropolitan statistical area. These rural counties had a population of 48 million people in 2000 while 232 million people lived in metropolitan regions. Between 1980 and 2000, 364 prisons were build in 311 non metro counties. Calvin Beale, a senior demographer at of the Department of Agriculture, estimates that since 1980 more than half of all non-metro counties acquired new prisons or are within commuting distances of new prisons (Beale, 1999). As many as 268 prisons were built in 185 metro counties during the same period.

The new prisons built in rural counties house approximately 500,000 inmates and employ over 150,000 staff members. This resulted in a disproportionate number of prisons in rural areas housing inmates from urban areas. In 1991 non-metro areas with only 23 percent of the US population, housed 44 percent of all inmates.

Federal and State governments invested billions of dollars building and operating new prisons in the past two decades. In 2000, the states expended over $30 billion out general funds on corrections. By 2007 this had risen to $44 billion annually (Warren, 2008). Expenditures for this "public good" increased in proportion to the exponential growth of prisoners and prisons. In some cases, the Department of Corrections grew to be the largest agency in the state.

Unless there are significant changes in policy, the need for prison construction will persist, and the impact on rural America will continue. Due to their reliance on prison jobs, rural counties could politically oppose alternative policies on crime and sentencing that would reduce the demand for prisons. The system is self-reinforcing.

Does the presence of a new prison in a rural county contribute to structural economic change that leads to sustained economic development?

Growth and economic development are interrelated but different economic phases. While growth is an increase in output, economic development in addition to more output is also a structural change in the organization of the economy. The latticework of development dampens economic fluctuations and builds quality and variety of life. Economic development also changes the composition and skills of the labor force by requiring higher levels of human capital.

Prisons need few supporting industries, moderate infrastructure, and low skilled labor force. A large requirement for establishing a new prison in a rural area is political acceptance by the local community. Needing little, prisons also contribute little to the economy. Although prisons produce a public good, they provide no exports, require little supporting industry from the local economy, and bring half their labor force from elsewhere.

Not only do prisons fail to contribute to economic development but they may not contribute substantially to economic growth. Prisons do not contribute to economic development because they do not facilitate change in the structure of the local economy as measured by change in employment and income levels over a wide range of industry sectors. The economic growth of counties with new prisons, as measured by total personal income, did not improve when compared to counties without prisons. Neither total job growth nor total personal income are significantly different from non-metro counties without prisons.

Prisons do bring jobs but host counties capture only half the new jobs available. Building prisons does not create any lasting construction jobs in the counties where they are located. In relation to control counties, male labor force participation suffers during the decade when prisons open. Gains in public administration jobs do not always result in growth to the public sector of the economy. In addition to a lack of public sector growth in counties with prisons, the 1980 sample showed control counties produced significantly more private sector jobs in the decade after the prisons opened. Education levels do not significantly change in non-metro counties with new prisons, indicating that

139

prisons do not add to the level of human capital needed for a more developed economy. Although new prison jobs helped in the recovery of counties that host prisons, they did not result in overall economic improvements of the counties beyond those found in similar non-metro counties.

While not contributing significantly to the growth or economic development of rural counties, prisons may help stabilize declining economies. During the 1980s prison counties suffered greater population loss and slower economic growth than other non-metro counties. These conditions may have influenced the decision to seek out and support prisons as a source of jobs and potential economic development. By 2000, prison counties had stopped the declines experienced during the 1980s. Improvements in the national economy during the 1990s undoubtedly contributed to the stability of the non-metro economy. Excluding inmates, the construction of new prisons did not increase county population. Even statistically significant increases in per capita income are signs of a weakening non-metro economy as the increases are due in part to the loss of population in prison counties as compared to control counties. Prisons increased public administration jobs and income from government jobs. Prisons may have helped stabilize the county economy and prevented further economic decline, but this stability did not result from economic development and may only delay further weakening of some rural economies.

How can government influence the investment in rural prisons to enhance local economic development?

One of the roles of government is to produce public goods and public safety is one of those essential public goods. Government's role in promoting economic development, however, is less clear. Government facilitates economic development by regulation, insuring the stability of institutions, by providing training and education, and by building public infrastructure; these measures provide a favorable foundation for private industry development. Yet the government by producing public goods does not influence the marketplace in the same way as private industry. Even privately run prisons are producing public goods as proxy for the government. In order to understand how government investment in prisons can enhance local economic development, first it is important to understand how the role of public goods in the marketplace differs from the role of private industry.
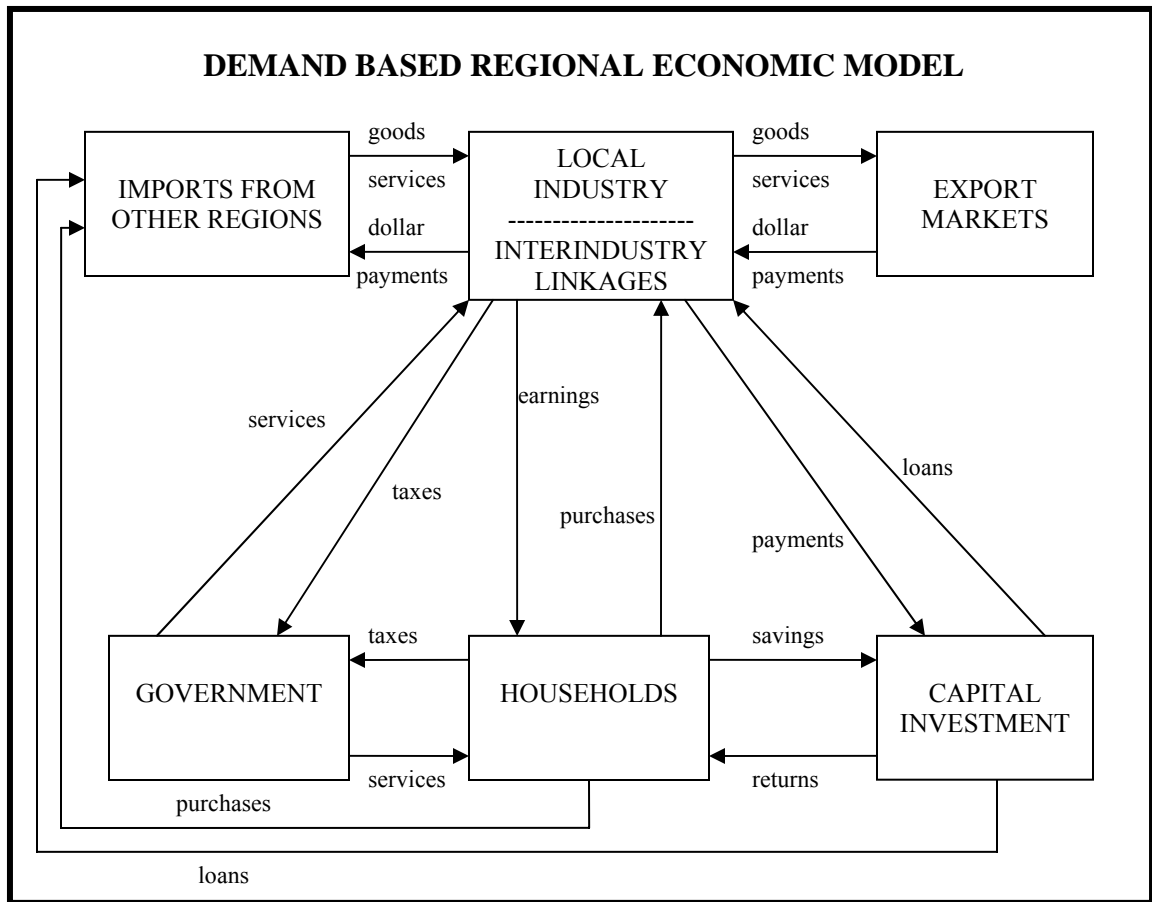
DEMAND BASED REGIONAL ECONOMIC MODEL

(Diagram contents:)

IMPORTS FROM OTHER REGIONS — goods, services, dollar, payments — LOCAL INDUSTRY ---------------------- INTERINDUSTRY LINKAGES — goods, services, dollar, payments — EXPORT MARKETS

services, taxes, earnings, purchases, payments, loans

GOVERNMENT — taxes, services — HOUSEHOLDS — savings, returns — CAPITAL INVESTMENT

purchases, loans

Figure 15: Demand Based Regional Economic Model

Figure 15: Demand Based Regional Economic Model shows a model of a demand

driven, industry based regional economy illustrating the interconnected and

interdependent nature of all sectors. The marketplace multiplies the effects of production

from basic exporting industries. Industry, by creating demand, is able to increase output

strengthening the bond between sectors. Increased output induces more investment, more

jobs, larger supporting industries that in turn results in more taxes, and the creation of

greater levels of service. This demand model shows how exports provide the foundation

for economic development. In contrast, a public good has a different model.

PUBLIC GOODS BASED REGIONAL ECONOMIC MODEL
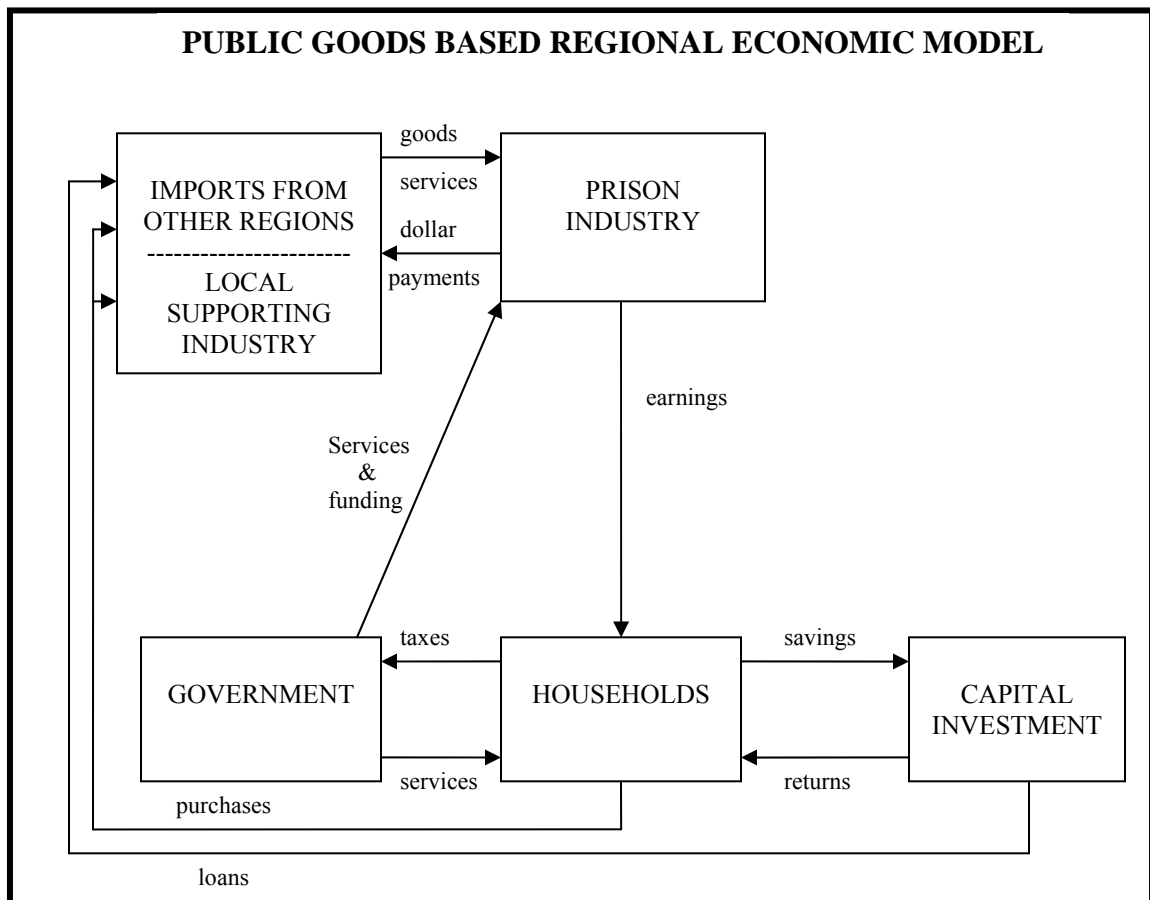

Figure 16: Public Good Economic Model

The model of public goods as the basis of economic development lacks many of

the connections present in a demand driven economic model. As shown in Figure 16:

Public Good Economic Model, the lack of interconnections minimizes the multiplier

effect of public goods. Public goods, being non-rivalrous, do not create additional

demand and they do not increase exports. Being non-excludable, public goods do not require purchases from households and generally do not need private capital, but rather are funded from government revenues and as such return no taxes to the government. Private prisons are also producing a public good and the capital investment in private prisons is an extension of government borrowing.

If locating prisons in rural counties does not positively contribute to factors of economic development, what can county and state governments do to improve the local economic benefit from prisons? Prisons provide two potential economic benefits to the local economy, wages earned by households and payments to local supporting industry. Local government can enhance local economic development by capturing as many jobs as possible and by having suppliers provide services needed by the prison. Some local economic benefit may also come during the construction phase of prisons.

Rural counties in economic decline seek and support new prisons located in their jurisdiction based on the promise of jobs, but jobs alone do not guarantee economic development although they may provide a basis for economic growth or at least economic stability. New prisons however do not guarantee jobs. There are three types of jobs that local government officials can influence as new prisons open; the jobs created during the construction phase, jobs that will transfer in from other prisons, and jobs in the prison that are hired locally. The ability of a county to capture these jobs depends on the composition and skills of its labor force.

Bureau of Economic Analysis data do not reflect an increase in construction jobs in counties that built new prisons. The number of construction jobs in counties with

prisons decreases during the decade prisons are built. The lack of permanent construction jobs reflects the short duration of prison construction, 2-3 years, and the mobility of construction labor. Local labor if employed in the construction of prisons may migrate out of the county to other jobsites when the prison construction is completed. To capture some local economic benefit during the construction period county administrators should examine the type and quantity of labor, equipment, and material needed during prison construction and determine if local firms can supply or manufacture any of the needed items. Local labor and construction firms may find subcontracting opportunities during prison construction if they are of sufficient size to participate in a meaningful way. Construction crews and companies building prisons also need services from supporting industries that can be supplied locally. These include lodging, food services, warehousing, and material transportation.

The construction phase of prisons also provides counties opportunity to upgrade their utility systems, roads, and other infrastructure. Fire and police stations often need to expand to support the prison. County officials should meet with state officials, construction firms, project managers, and subcontractors to understand the needs of the firms and describe the resources available in their counties. If practical, the county should explore the possibility of setting aside some part of the construction contract for local subcontractors. Job fairs and public outreach programs can also result in more local employment.

After construction, the source of new jobs for the county will come from the staff positions for the prison. To capture these jobs county administrators need to understand

the basic composition and staffing requirements of the proposed prison. The number of prison staff ties directly to the inmate housing capacity of the prison. As a rule, a prison hires one employee for every three inmates it houses. Not all prison jobs are alike. Transferees from other prisons fill jobs such as prison management and specialty jobs that require higher skills and provide higher pay. Transferees will make up nearly half of the initial staffing of a prison. New hires will make up the remaining half. Union rules and state established job qualifications may limit the number of jobs available to residents of the county. Other localities outside the county, including more urbanized regions, will also compete for the available jobs.

Most new transferees choose not to settle in the county where the prison is located because amenities from nearby metropolitan counties or neighboring counties with larger cites are more attractive. These amenities include better schools, diverse populations, larger available housing stock, more retail, cultural, and educational opportunities. Transferring staff, especially if they had social relationships established at prior locations, are able to develop transportation networks that minimize commuting problems to distant prison sites. In order to circumvent transferees from living elsewhere rural county administrators must work to get the prison job transferees to reside in the host county. They should evaluate what amenities new staff seeks when deciding where to live. The administrators need to consider how their county compares with surrounding regions in available housing, schools, retail, and educational opportunities. If they are competitive in these areas the county should advertise the counties advantages to new staff before they transfer. There are also State and federal programs such as relocation expenses,

temporary housing, or house hunting trips that may encourage transferees to reside in the host county.

In order to be able to capture the new jobs available for local hire, county administrators must understand the basic requirements of these jobs. They must know whether there are there union rules for hiring corrections officers, understand the minimum standards of education and training, know the requirements for entrance tests, and be aware of how recruiting will be conducted in the local area. To assist in the hiring process county should offer potential applicants training or assistance with the application process.

Prisons can contribute to the local economy by purchasing the goods and services they need from local sources, but prisons need few supporting industries. Prisons provide public safety as an output and their input comes from crime adjudicated through the justice system. Prisoners provide the labor and services needed to maintain the prison. Due to security, staff within the prison provide most of the specialized services needed in the operation of the prison. These services include educational programs, medical care, religious services, and rehabilitation programs. Prison staff need other services such as prison fitness facilities and weapons training facilities and the locality may be able to provide these services or develop them jointly with the prison. Prison visitors also need lodging and transportation services from the local economy.

Although some prisons purchase needed supplies locally, more commonly, regional or statewide contracts govern prison purchases and opportunity for local participation is limited. To determine the possible benefit to the local economy, county

administrators should seek to understand what purchasing authority local prisons have to buy local goods. Subsequently administrators should obtain agreements on these purchases as part of the negotiations on prison siting.

Many prisons employ inmates in the production of goods and services within the prison. For example, the Federal Bureau of Prison produces a wide variety of goods used by the federal government. Inmates manufacture systems furniture for federal offices. Inmates in general can perform labor-intensive low value tasks. Minimum-security prisons have inmates working outside the prison boundaries. Some low security prisoners provide labor on military installations. County officials should work with state and federal correctional departments to develop industries that provide work to inmates and can support the local economy. Prison industries following a private sector economic model need materials to produce basic goods and local suppliers can be a source of these materials. Local industry may be able to add value to prison goods or provide other services such as warehousing and transportation.

An additional economic benefit is prison inmates boost the Census population count and in some rural counties with small populations, the percentage increase can be significant. A higher population count can increase the federal and state benefits available to the county. These benefits provide an additional source of revenue indirectly from prisons for improving county services. Douglas Clement writing for the Federal Reserve Bank of Minneapolis, reports federal programs that apportion funding according to population can provide benefits of $200 to $300 per year per resident. A prison with 1,200 inmates would mean up to $360,000 in federal spending available to the county

annually. In some States, revenues from gas and sales tax are also redistributed in

proportion to the Census population count. The city of Marquette, Minnesota gains an

estimated $250,000 in state aid by counting the inmate population of the local prison

within its jurisdiction (Clement, 2002).

Policy Implications

The primary mission of prisons is to improve public safety. In many regions,

prisons are undesirable facilities, but in rural counties with weak economies, the allure of

job opportunities promotes the acceptance of prisons as a stimulus of growth and

economic development. Prisons, by producing a public good, are poorly suited to be a

catalyst for the structural changes needed to develop an economy. Without changes in

public policy, there will be a continual need for prisons. Both urban areas, where crimes

are committed, and rural counties where prisoners are housed and jobs are created will

resist changes to public policy on crime. The need for sustainable economic development

in rural counties is also continuous. The rural economy is at a competitive disadvantage

with urban centers and foreign labor. Policy makers must realistically address the

dilemma these conditions create.

On the national level, rural prisons have the potential to skew Census counts

affecting federal benefits and potentially representative district boundaries. The number

of prisons spread out over a large number of counties, both metro and non-metro, creates

a constituency that can reduce the possibility of changes to policy on crime and sentencing.

On the state level, policy makers are facing an ever greater burden of financing the cost of prisons. In attempting to reduce costs, states have contracted with private prisons and sent prisoners to other states with lower costs of operation. Due to budget constraints states will need to consider reducing the number of inmates, especially those convicted of non violent offences.

States vary on their policy of concentrating prisons in one area. Putting prisons in a few limited regions improves operations and reduces cost much like the agglomeration of industry. More dispersed prisons provide easier access for visitors. The structure of the particular system makes the policy difficult to change, but states with dispersed prisons may find expansion of existing prisons more beneficial than opening prisons at new sites. Expansion of existing sites results in jobs originating and staying in the location of the prison.

County administrators must fully understand how prisons will fit into the local economy before accepting a prison based on the hope of economic development. Prisons can create a market for jobs and may need some local supporting industry, but are not engines for economic growth or development. Prisons can contribute to the economic base but do not produce an output that can make them the central core for economic development. When seeking a new prison county administrators need to look at a cost benefit analysis with sensitivity to the number of jobs that will remain within the county. Although the state or a private firm may pay the capital costs for building a prison, the

150

costs to a rural county for land, utility upgrades, and lobbying for the prison can be significant. The county should also perform an analysis to realistically measure the impact of prisons on the local economy. County official should understand the payback period between their costs for attaining the prison, and the economic benefits the prison will bring. Administrators should also visit rural counties with new prisons to determine if the prison provided the economic opportunity the county had hoped to achieve.

County administrators considering hosting a new prison must go beyond just the work needed to get the new facility located in their county. Much more effort should be put into understanding what a prison can do and cannot do to help the county economy. County officials must understand the number and type of jobs that will be required by the prison and that some of these jobs will be new, and some will be filled by transferring staff. They must carry out a realistic assessment to determine the number of transferred staff who will take up residence in the county. They also need to negotiate agreements, before accepting new prisons, about the quantity of supporting goods and services the prison will purchase from local industry.

With a new or an existing prison, the only way to expand the economic impact is to increase the number of prisoners. Any significant increase in prisoners requires an also significant increase in capital construction. Prisons need prisoners and there is a direct relationship between number of jobs and number of prisoners. Expanding an existing prison decreases the need for transferring staff and may increase jobs available for local hire. Staff from the existing prison can start up the new facility and local jobseekers can fill the vacant positions in both the new prison and existing facility.

151

New prisons in rural counties provide an isolated case study of government producing a public good in the private economy. Prisons do bring some new jobs, in a specialized field, but they create little growth or economic development. With proper planning, however, county administrators can increase the economic benefits to household incomes from the available jobs and help create a niche for some supporting industry.

This analysis of prisons as a public good may also have value to the implementation of other government policies that use public goods to stimulate economic growth and development. To be fully effective the policies must go beyond the creation of jobs and understand the limitations and potential of producing public goods in the local marketplace.

1980 Sample

	Prison County	State	Control County	State
1	Lafayette	FL	Franklin	FL
2	Dodge	GA	Hart	GA
3	Calhoun	IA	Emmet	IA
4	Clearwater	ID	Jerome	ID
5	Lee	IL	Bureau	IL
6	Morgan	IL	McDonough	IL
7	Perry	IN	Washington	IN
8	Mercer	KY	Union	KY
9	Branch	MI	Sanilac	MI
10	Cooper	MO	Bates	MO
11	Livingston	MO	Wright	MO
12	Montgomery	NC	Transylvania	NC
13	Hocking	OH	Paulding	OH
14	Alfalfa	OK	Cotton	OK
15	Okfuskee	OK	Noble	OK
16	Bon Homme	SD	Spink	SD
17	Grimes	TX	Bosque	TX
18	Nottoway	VA	Louisa	VA

Appendix B: 1990 Sample

1990 Sample

	Prison County	State		Control County	State			Prison County	State		Control County	State
1	Lee	AR		Little River	AR	36		Lee	SC		Chester	SC
2	Bent	CO		Baca	CO	37		Johnson	TN		Polk	TN
3	Lincoln	CO		Phillips	CO	38		Lake	TN		Houston	TN
4	Gulf	FL		Franklin	FL	39		Bee	TX		Hill	TX
5	Calhoun	GA		Stewart	GA	40		Brown	TX		Val Verde	TX
6	Dooly	GA		Pike	GA	41		Burnet	TX		Austin	TX
7	Hancock	GA		Gilmer	GA	42		Childress	TX		Hansford	TX
8	Johnson	GA		Jenkins	GA	43		Dawson	TX		Andrews	TX
9	Macon	GA		Fannin	GA	44		De Witt	TX		Calhoun	TX
10	Mitchell	GA		Decatur	GA	45		Duval	TX		Zavala	TX
11	Pulaski	GA		McIntosh	GA	46		Fannin	TX		Milam	TX
12	Washington	GA		Elbert	GA	47		Freestone	TX		Morris	TX
13	Wilcox	GA		Miller	GA	48		Frio	TX		Comanche	TX
14	Crawford	IL		Douglas	IL	49		Gray	TX		Hutchinson	TX
15	Jefferson	IL		Iroquois	IL	50		Hale	TX		Deaf Smith	TX
16	Sullivan	IN		Orange	IN	51		Hartley	TX		Dickens	TX
17	Pawnee	KS		Anderson	KS	52		Jack	TX		Haskell	TX
18	Clay	KY		Meade	KY	53		Jasper	TX		Cass	TX
19	Muhlenberg	KY		Calloway	KY	54		Jones	TX		Wilbarger	TX
20	Baraga	MI		Montmorency	MI	55		Karnes	TX		Jackson	TX
21	Luce	MI		Oscoda	MI	56		La Salle	TX		Cochran	TX
22	Manistee	MI		Emmet	MI	57		Medina	TX		Atascosa	TX
23	Waseca	MN		Mille Lacs	MN	58		Mitchell	TX		Marion	TX
24	McDowell	NC		Haywood	NC	59		Pecos	TX		Ward	TX
25	Belknap	NH		Sullivan	NH	60		Polk	TX		Colorado	TX
26	Pershing	NV		Lander	NV	61		Stephens	TX		Runnels	TX
27	Caddo	OK		Pontotoc	OK	62		Swisher	TX		Parmer	TX
28	Craig	OK		Choctaw	OK	63		Terry	TX		Reeves	TX
29	Woods	OK		Haskell	OK	64		Willacy	TX		Lavaca	TX
30	Malheur	OR		Wasco	OR	65		Wood	TX		Cooke	TX
31	Greene	PA		Tioga	PA	66		Greensville	VA		Surry	VA
32	Clarendon	SC		Union	SC	67		Lunenburg	VA		Nelson	VA
33	Greenwood	SC		Oconee	SC	68		Orleans	VT		Orange	VT
34	Hampton	SC		Fairfield	SC	69		Fayette	WV		Logan	WV
35	Jasper	SC		Calhoun	SC							

REFERENCES

REFERENCES

American Correctional Association. (1998). *Dictionary of Criminal Justice Terms*. Lanham, MD: American Correctional Association.

American Correctional Association. (2003). *2003 Directory Adult and Juvenile Correctional Departments, Institutions, Agencies, and Probation and Parole Authorities* (2003 ed.). Lanham, MD: American Correctional Association.

Andrew, K., & Swanson, J. (1995). Does Public Infrastructure Affect Regional Performance. *Growth and Change, 26*, 204-216.

Aschauer, D. A. (1988). Is Public Expenditure Productive? *Journal of Monetary Economics, 23*, 177-200.

Associated Press. (2008). Thousands Expected to Enter Virginia's Prison System by 2013: WJLA/NewsChannel 8, a division of Allbritton Communications Company.

Beale, C. (1999). Prisons, Population, and Jobs in Nonmetro America. *Rural Development Perspectives, 8*(3), 16-19.

Beale, C. (2001, August 18). *Cellular Rural Development: New Prisons in Rural and Small Town Areas in the 1990's.* Paper presented at the Rural Sociological Society, Albuquerque, NM.

Beale, C. (2002). Rural Prisons: An Update. *Rural Development Perspectives, 11*(2), 25-27.

Besser, T. L., & Hanson, M. M. (2004). Development of Last Resort: The Impact of New State Prisons on Small Town Economies in the United States. *Journal of the Community Development Society, 35*(2), 1-16.

Blair, J. P., & Premus, R. (1993). Location Theory. In R. Bingham & R. Mier (Eds.), *Theories of Local Economic Development* (pp. 3-26). Beverly Hills, CA: SAGE Publication.

Bonczar, T. P., & Beck, A. J. (1997). *Lifetime Likelihood of Going to State or Federal Prison* (Special Report No. NCJ-160092). Washington, DC: Bureau of Justice Statistics, Department of Justice.

Castle, E. N. (1998). A conceptual framework for the study of rural places. *American Journal of Agricultural Economics, 80*(3), 621.

Chuang, S. C. (1998). *The Distribution of Texas State Prisons - Economic Impact Analysis of State Prison Siting on Local Communities.* Unpublished PhD, University of Texas, Arlington, TX.

Clement, D. (2002, January). Big house on the prairie. *Fedgazette of Federal Reserve Bank of Minneapolis,* p. 1.

Commerce, U. S. Department of. (1995). Federal Information Processing Standards Publication 8 - 6 (FIPS PUB 8 - 6). In Department of Commerce (Ed.): National Institute of Standards.

Cromartie, J. (2007, 22 March 2007). *Measuring Rurality: What is Rural?* Retrieved 20 February 2008, from http://www.ers.usda.gov/Briefing/Rurality/WhatisRural/

Deller, S. C., & Tsai, T.-h. (2001). The role of amenities and quality of life in rural economic growth. *American Journal of Agricultural Economics, v83*(2), 352.

DeSousa, & Stutz. (1994). Cities as Retail and Service Centers. In *The World Economy* (pp. 361-406). New York: Prentice Hall.

Doyle, Z. (2002). Does Crime Pay? Pros and Cons of Rural Prisons *Economic Development Digest*(July).

Drabenstott, M. (1995). Rural development: implications of structural change for policies and institutions: discussion. *American Journal of Agricultural Economics, 77*(5), 1271 (1273).

Eckl, C. (1998). The cost of corrections. (state corrections budgets). *State Legislatures, 24*(2), 30-34.

Elsner, A. (2004). *Gates of Injustice: The Crisis in America's Prisons.* Upper Saddle River, NJ: Financial Times Prentice Hall Books.

Fawson, C., Thilmany, D., & Keith, J. E. (1998). Employment stability and the role of sectoral dominance in rural economies. *American Journal of Agricultural Economics, 80*(3), 521.

FBOP. (2001). *State of the Bureau.* Washington, DC: U. S. Department of Justice, Bureau of Prisons.

Fehr, L. M. (1995). *Literature Review of Impacts to Communities in Siting Correctional Facilities*. Seattle, WA: Washington Council on Crime and Delinquency.

Flammang, R. A. (1979). Economic Growth and Economic Development: Counterparts or Competitors. *Economic Development and Cultural Change, 28*(1), 47-61.

Flora, C. B., Flora, J. L., & Fey, S. (2004). *Rural Communities: Legacy and Change* (2nd ed.). Cambridge, MA: Westview Press.

Fosler, R. S. (1988). The State Economic Role in Perspective. In R. S. Fosler (Ed.), *The New Economic Role of American States* (pp. 8-18). New York: Oxford University Press.

GAO. (1996). *Federal and State Prisons: Inmate Populations, Costs, and Projection Models* (No. GAO/GGD-97-15). Washington: U. S. General Accounting Office.

Gottlieb, P. D. (1995). Residential Amenities, Firm Location and Economic Development. *Urban Studies, 32*(9), 1413-1436.

Hansen, N. (1994). The Strategic Role of Producer Services in Regional Development. *International Regional Science Review, 19*(1&2), 187-195.

Hardner, J., & McKenney, B. (2006). *The U.S. National Park System: An Economic Asset at Risk*. Washington, DC: National Parks Conservation Association.

Harrison, P. M., & Beck, A. J. (2002). *Prisoners in 2001* (Bulletin No. NCJ 195189). Washington DC: Bureau of Justice Statistics, Department of Justice.

Hewings, G. (1985). *Regional Input - Output Analysis*. Beverly Hills, CA: SAGE Publications.

Higgins, B., & Savoie, D. (1995). Location Theory. In *Regional Development Theories and Their Applications* (pp. 115-122): Transaction Publications.

Holtz-Eakin, D. (1994). Public Sector Capital and the Productivity Puzzle. *Review of Economics and Statistics*, 12-21.

Hoover, E. (1975). How Economic Regions Develop. In A. A. Knopff (Ed.), *An Introduction to Regional Economics* (2nd ed., pp. 207-243).

Hotchkiss, J. L. (2006). Changes in Behavioral and Characteristic Determination of Female Labor Force Participation, 1975–2005. *Economic Review: Federal Reserve Bank of Atlanta*.

Kindleberger, C. P., & Herrick, B. H. (1977). *Economic Development* (3rd ed.). New York: McGraw-Hill.

King, L. J. (1984). *Central Place Theory*. Beverly Hills: SAGE Publications.

King, R. S., Mauer, M., & Huling, T. (2003). *Big Prisons, Small Towns: Prison Economics in Rural America*. Washington, DC: The Sentencing Project.

Lawrence, S., & Travis, J. (2004). *The New Landscape of Imprisonment: Mapping America's Prison Expansion*. Washington, DC: The Urban Institute, Justice Policy Center.

LENOWISCO Planning District Commission. (1996). *Economic Impact Report, Lee County, VA*. Lee County, VA: LENOWISCO Planning District Commission.

Levy, J. (1985). Urban Growth. In *Urban and Metropolitan Economics* (pp. 1-58). New York: McGraw-Hill.

Lindman, R. M., Poole, M., & Roper, P. (1988). *Impacts of Washington State's Correctional Institutions on Communities*. Olympia: Washington State Institute for Public Policy, The Evergreen State College.

Markley, D. M., & McNamara, K. T. (1995). Sustaining rural economic opportunity. *American Journal of Agricultural Economics, 77*(5), 1259 (1256).

Munnell, A. H. (1990). Why Has Productivity Growth Declined? Productivity and Public Investment. *New England Economic Review*(January/February), 3-22.

North, D. (1966). *The Economic Growth of the United States 1790 - 1860*. New York: Norton.

Oppenheimer, V. K. (1973). Demographic Influence of Female Employment and the Status of Women. *American Journal of Sociology, 78*, 184-199.

Parker, T. (2003). *Measuring Rurality: Urban Influence Codes*. Retrieved 13 March, 2006, from http://www.ers.usda.gov/Briefing/Rurality/UrbanInf/

Porter, M. (1990). Four Studies in National Competitive Advantage. In *The Competitive Advantage of Nations*. New York: Free Press.

Richardson, H. (1979). Macro Demand Models. In *Regional Economics* (pp. 82-101): University of Illinois.

Rivard, N. (2002). Putting the "Community" Back in Community Colleges. *University Business, 5*(7), p55(55).

Rogers, G. O., & Haimes, M. (1987). Local Impact of a Low-Security Federal Correctional Institution. *Federal Probation*(September), 28-34.

Salsgiver, J. (1996). Government Plays a Significant Role in Nonmetro Employment. *Rural Conditions and Trends, 7*(1), 48-51.

Selting, A., Allanach, C., & Loveridge, S. (1994). *The Role of Agglomeration Economics in Firm Location: A Review of the Literature (Staff Paper P94-14).* St. Paul, MN: University of Minnesota, Department of Agricultural and Applied Economics.

Smykla, J., Feguson, C., Cheng, D., Trent, C., French, B., & Waters, A. (1984). Effects of a Prison Facility on the Regional Economy. *Journal of Criminal Justice, 12*, 521-539.

Terry, D. (1993, Jan 3). Town builds a prison and stores its hopes there. (Appleton, Minnesota builds private prison that is so far empty). *The New York Times,* p. p9 p14.

Thies, J. S. (1998). *The Big House in a Small Town: The Economic and Social Impacts of a Correctional Facility on Its Host Community.* Unpublished PhD, University of Missouri, St. Louis.

Thies, J. S. (2000). Prisons and host communities: Debunking the myths and building community relations. *Corrections Today, 62*(2), 136-139.

Todaro, M. P. (1994). *Economic Development* (Fifth ed.). New York: Longman.

U S Census Bureau. (2003). Selected Appendixes: 2000 Summary Social, Economic, and Housing Characteristics 2000 Census of Population and Housing. In U. S. Department of Commerce (Ed.).

Warren, J. (2008). *One in 100: Behind Bars in America 2008*: Pew Charitable Trusts.

Webber, M. J. (1984). *Industrial Location* (Vol. 3). Beverly Hills: SAGE Publications.

CURRICULUM VITAE

William Holley attended Virginia Polytechnic Institute and State University where he received a Bachelor of Science degree in Biology in 1974 and a Bachelor of Science degree in Civil Engineering in 1977. In 1986, he completed his Masters in Engineering Administration at George Washington University, Washington DC. William is a registered professional engineer. William Holley is a career civil servant with the federal government where he has held management level positions with many agencies. William is presently the Chief Engineer with the Public Buildings Service of the General Services Administration. He is currently a Ph.D. candidate at the School of Public Policy, George Mason University. His dissertation focuses on the economic impact of prisons constructed in non-metropolitan counties.