THE EFFECTS OF FISCAL DECENTRALIZATION ON ECONOMIC GROWTH IN
U.S. COUNTIES

DISSERTATION

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By

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ABSTRACT

This study investigates the effects of decentralization on economic growth in U.S. counties. Decentralization has given counties the added responsibility of economic growth and welfare administration. Counties use various strategies to attract and retain businesses so they can provide income and jobs for residents. Localization of economic development and decentralization of welfare programs may have an effect on economic growth of county governments. County governments in the U.S. may act strategically by setting lower welfare benefit levels, and offering business incentives to new and existing firms, thus resulting in the possible under-provision of local public services and a decrease in economic growth.

Key objectives of this study are to construct a measure of decentralization and investigate whether decentralization leads to differences in economic growth in U.S. counties. A simultaneous equation framework is used to explore the relationship between decentralization and economic growth. Economic growth is measured by population and employment growth. An interaction term is constructed between decentralization and rural status to verify whether decentralization's effects differ by rural status of counties.

County level data from forty-six states in the U.S. are used in the analyses. The hypothesis that the effect of decentralization on rural counties is different from that of urban counties is tested. The hypothesis that decentralization has a negative effect on

economic growth of U.S. counties is also tested. Other hypotheses that are tested are that population growth and employment growth each has a positive effect on the other.

The results reveal that population and employment growth both positively affect each other. Decentralization has a significant effect on population growth but no effect on employment growth. Both rural and urban counties show a negative relation with population growth so the hypothesis that decentralization results in lower economic growth (in terms of population) is accepted. Since population decreases might have a stronger effect on the economy of rural counties, a spatial marginalization hypothesis is accepted with caution. Crime rates and population density have a significant effect on economic growth but amenities and income show no effect. All other variables show mixed effects on growth.

This work is dedicated to my husband, Kwasi, and our children, Jayden and Isabel.

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CHAPTER 1

INTRODUCTION

Fiscal decentralization is a process whereby local governments are given authority over the economic activities in a locality. It involves defining fiscal responsibilities of the different levels of government. It also consists of fiscal instruments and procedures that have the aim of helping in the delivery of public goods (Bird et al., 1995). Fiscal decentralization is defined by Akai and Sakata (2002) as devolution of the authority associated with decision making to a lower-level government. Thiessen (2001) views fiscal decentralization as entailing "a transfer of responsibility associated with accountability to sub-national governments". It could thus be viewed as the ability of lower level governments to raise tax revenues, and decide on how to spend their money on different programs within legal criteria (Thiessen, 2001). There is the belief that fiscal decentralization leads to economic growth even though there could be implications for resource redistribution (Martinez-Vazquez and McNab, 2001). Fiscal decentralization is often seen as part of a reform package to improve efficiency in the public sector, to increase competition among subnational governments in delivering public services, and to stimulate economic growth (Bird and Wallich, 1993).

Over the past few decades, there has been an increase in decentralization of governments in the U.S. and in many other countries all over the world. The International Conference on Federalism (2002) had a theme summary that highlights the fact that fiscal federalism and decentralization is a much-debated political issue in many countries today. In addition, different countries are at different stages of fiscal decentralization.

There are different degrees (or extent) of authority of lower level governments. Some of this allocation of authority has led to complete or partial decentralization of economic development projects in some countries. Lower level governments may be given responsibility for all economic development programs or just a subset of economic development programs. Akai and Sakata (2002), note that allocation of authority is based on legal relationships between various levels of government. Fiscal decentralization, which is also referred to as devolution of authority, can be applied to various programs – for instance, the organization and implementation of welfare programs in a state or county.

Decentralization can include not only assigning exclusive jurisdiction for different tasks or functions but also situations where there are co-occupied jurisdictions in which one level of government has the ability to influence, in varying degrees, the decisions taken by the other government (Oates, 1999). Such influences could be in the form of regulations, the power to override decisions, or financial intervention.

In the recent literature, there are several studies on the effects of fiscal decentralization on economic growth in various countries. The results of these studies have, however, been inconclusive. Some studies have found a positive relation between fiscal decentralization and economic growth while others have found the opposite

relationship. One reason for the differing conclusions may be that various authors have used different measures of fiscal decentralization.

From a review of the literature, it is clear that it is difficult to accurately measure allocation of authority (Bird, 2000). If inappropriate or ambiguous measures of fiscal decentralization are used, one could make wrong inferences about the effect of fiscal decentralization on economic growth (Ebel and Yilmaz, 2002). Akai and Sakata (2002) claim that some authors who found a negative relationship between fiscal decentralization and economic growth used flawed measures of decentralization. Martinez-Vazquez and McNab (2001), however, state that there is no single or best measure for fiscal decentralization.

As far back as 1972, Oates observed that central governance in many countries was coming under attack because governments were not able to provide adequate public services to residents. He found that due to budgetary difficulties faced by governments, there was renewed concern about intergovernmental fiscal relations. Central governments are typically big and far removed from local communities and so may not be able to meet the specific public service and economic development needs of local communities. Some analysts view fiscal decentralization as a solution to the shortcomings of the public sector (Oates, 1972).

Fiscal decentralization has been studied at various levels of government within nations and across nations. Some studies have focused on one country, such as the U.S. or China, whereas others have studied numerous countries, both developed and less developed. Researchers have looked at fiscal decentralization at state, provincial, and local levels of government.

Most studies in the literature on fiscal decentralization in the U.S. have been implemented at the state level. It is, however, also important to carry out such studies at the county level. Data from the U.S. Census Bureau show that counties are increasing in importance in the U.S. and rural counties are at the forefront of significant governmental changes (U.S. Census Bureau, 2000). County level studies are important because county governments in many states now play a significant role in redistribution of resources and are important providers of services related to welfare reform (Gold, 1996).

Though counties are major service providers in rural areas there is little systematic research on their capacity to respond to the additional load placed on them by decentralization. One of the reasons why there are so few county level studies is the lack of readily available county government data. In this study, I take an in-depth look at new relationships in government structure at the county level and how these changes have influenced economic growth in the U.S. The analysis makes use of a unique dataset that has only recently become available.

1.1 Motivation

Fiscal decentralization is now widespread. With many countries embarking on some form of fiscal decentralization, it is important to study its impact on economic well being. In light of the general trend towards increased degrees of fiscal decentralization, this study seeks to evaluate some of the potential effects on economic growth.

An important background to this study of decentralization in the U.S. is the welfare legislative changes that occurred in 1996. The legislation, called the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), not only placed

time limits on welfare recipients but also required involvement in some work-related activity to qualify for welfare. This requirement makes it crucial for local governments, such as county governments that administer welfare at the local levels, to put in place measures that can increase employment opportunities in various localities. Counties and local governments are faced with the challenge of providing a business friendly atmosphere to attract employers who can employ those who have exhausted their time limits on welfare. Whether local governments are able to attract businesses to provide the much needed jobs and effectively create an increase in the levels of economic activity is a matter that requires further investigation.

This study is timely given the increased strain on local governments in the U.S. due to globalization and the slow rate of national economic growth. One needs to listen to only one newscast to become aware of the serious job losses occurring in local communities all over America due to outsourcing by local businesses. Globalization puts extra pressure on local governments as they attempt to stimulate job creation and increase incomes of local residents.

This study will provide policy recommendations that could help formulate improved economic development agendas of county governments and increase economic growth. The findings of this study can help inform policy makers about the strengths and weaknesses of fiscal decentralization and help them design improved economic growth and welfare policies. In addition to its relevance to policy makers, the study will add to the academic discourse on impacts of fiscal decentralization.

Decentralization will be studied at the county level in this study. There are several reasons for selecting counties as the unit of analysis. According to the National

Association of Counties (NACo), the role of counties has changed over recent decades. Traditionally county governments dealt with record keeping, road maintenance, property assessment, poor relief, and administration of elections and judicial functions. In recent times, however, counties are increasingly involved in economic development, child welfare, consumer protection, water quality, job training, welfare program administration, planning, and zoning. County governments have experienced a change in their functions and an increase in their levels of activity in many categories of service delivery.

The 2000 U.S. Census indicates that counties are the fastest growing general purpose local government in the U.S. in terms of employment. The census shows that from 1980 – 1997, the percentage increase in government employment was 31% in counties, 26% in states, 8% in municipalities, 15% in townships, while employment decreased by 3% at the federal level (U.S. Census Bureau, 2000).

Moreover, county governments are important because they help coordinate regional planning (Cigler, 1993). Counties coordinate activities between higher governments and local residents as well as those among local governments. For instance, county governments play a significant role in the attempts at annexation by municipal governments. County governments have the power to accept or reject such annexation attempts. Cigler points out that when there are disputes between local landowners and federal agencies, county governments are generally the level of government that arbitrates such disputes.

Despite the increasing importance of county governments little research has been done at this level (Reese, 1994). A number of studies on the effect of fiscal decentralization on economic growth have been carried out at the state level (Akai and

Sakata, 2002). These studies do not take into account the growing importance of county governments in economic growth.

Some studies that distinguish between state and local governments lump all local governments together to form one aggregate group (Robalino et al., 2001; Jin and Zou, 2002). This results in loss of information since local governments have various structures and functions. County governments, for example, are a diverse group and perform different functions in the various states. Lumping together all local governments either within a state or across states implies that all types of local governments are homogenous, which is not the case.

1.2 Problem Statement

According to some observers, central governance has failed to adequately provide the expected levels of economic growth, income distribution, poverty alleviation, and provision of public goods and services (Oates, 1972). One economic argument for decentralization stems from the Tiebout Hypothesis according to which households vote with their feet by moving to local government jurisdictions with the mix of public goods and taxes that maximize their utility. Fiscal decentralization allows localities to provide different mixes of such services so that, in principle, every household can find a locality that offers the bundle of public goods and services that they prefer or desire in equilibrium.

In this study, I investigate whether there is an increase in economic growth from decentralization as is expected from the viewpoint of efficiency. The idea behind fiscal

decentralization is that since local governments are closer to their constituents than the federal government they will be in a better position to design and provide public services.

With the increasing focus on fiscal decentralization, the burden of formulating policies and implementing programs is now much greater at lower levels of government than it was in the past. County governments and other local governments need to look for ways to increase their economic growth. These local governments have to search for resources to sustain their local economies. There are several ways in which local governments can promote economic growth in their local communities.

Local governments may pursue economic growth by seeking to attract new businesses or expand existing ones. To achieve this, county officials may build industrial parks, hire development professionals, or travel to other states or countries to look for investors. Various incentive packages may also be offered to encourage businesses to locate in an area. The general aim is to make a locality an attractive place for businesses as well as residents. Politicians are generally interested in increasing the availability of jobs and local government managers are generally interested in increasing tax revenues received from growing levels of economic activity in order to meet the demand for public services. The quest for more businesses by county governments through economic development incentives could lead to a decrease in economic growth.

Local governments vary in the extent to which their citizens are involved in local economic development planning and implementation. When citizens in a locality are involved in the economic development process through focus groups, neighborhood associations, advisory groups or committees, and other citizen input mechanisms, they can potentially increase the efficiency of local governments, and this may promote

economic growth. Local governments may also get feedback from residents in the community on the problems in the availability or delivery of public services, and this may affect the rate of economic growth.

To promote economic growth, and to provide public services, local communities need funds. Local governments may have to increase taxes to fund their economic growth activities. The drawback of taxation is that it could ultimately lead to a decrease in economic growth. When people are taxed, their disposable personal income decreases and they spend less since their purchasing power also decreases and this could dampen economic growth.

The question of whether fiscal decentralization works differently for different types of county governments needs to be addressed. Local governments tend to have different levels of human capital and infrastructure. When decentralization of welfare programs occurs at the county level, local government agencies are faced with the task of helping the unemployed find jobs. Because of the differences in local government capabilities, they are able to deal with decentralization in different ways. While some counties may have qualified personnel to lobby for jobs for the county others may not have the capacity to do so. Fiscal decentralization may thus vary across local governments. Different geographic and ecological characteristics of counties may also attract or fail to attract different types of businesses and people. By virtue of location, quality, and quantity of public services, various local governments may also attract varying amounts of population and employment.

1.3 Objectives

Given the move towards fiscal decentralization, and the need to assess its impact, the objectives of this study are to:

1. Construct a measure of fiscal decentralization for U.S. counties.

2. Determine if fiscal decentralization has an effect on county economic growth.

3. Evaluate the effect of fiscal decentralization on economic growth in rural versus urban counties.

4. Determine the effect of employment growth on population growth.

5. Determine the effect of population growth on employment growth.

In the study, I will construct a measure of fiscal decentralization and evaluate its effect on the level of local economic activity in U.S. counties. I will then explore the differences (if any) between the effects of decentralization on economic growth in rural versus urban counties. It is expected that rural counties will be at a disadvantage because of the limitedness or lack of resources, infrastructure, and personnel.

1.4 Hypotheses

The hypotheses that will be tested in this dissertation are given below. These hypotheses are based on the conceptual framework presented in chapter 3.

1. Fiscal decentralization has a negative effect on economic growth in U.S. counties.

2. Fiscal decentralization causes lower economic growth in rural counties compared to urban counties.

3. Employment growth has a positive effect on population growth.

4. Population growth has a positive effect on employment growth.

1.5 Methods Used

County growth is assumed to be simultaneously determined by population and employment growth. As a result, a simultaneous equation model similar to models frequently used in local economic growth evaluations is estimated. The model assumes that population and employment are also determined by other factors such as characteristics of the county, fiscal decentralization, and other social characteristics. To control for state effects, state dummies are included in the model. The endogenous variables are also included as regressors in the model.

1.6 Organization

This document is divided into six chapters. The first chapter consists of an introduction, motivation for the study, objectives, hypotheses, and the reason why counties are chosen as the unit of analysis. The second chapter contains a review of the relevant literature on decentralization. This chapter contains a discussion of the particular focus of the studies, the unit of analyses used, and the variables and models estimated. A summary of the results of the studies is also given in this chapter. Next, a discussion, based on the literature, is given of the pros and cons of fiscal decentralization. Literature on economic growth is also presented in this chapter. This chapter also contains a discussion of some studies on the impact of welfare reform on county economic growth. The third chapter of this document is a discussion of the economic theories and hypotheses behind this study. In the fourth chapter, the empirical model to be estimated and the data that will be used are described. In the fifth chapter, the results obtained from the empirical analyses are discussed. The last chapter is a conclusion of this study. In the

last chapter, potential policy implications of the study are also discussed. Areas for

further studies are included in the last chapter.

CHAPTER 2

LITERATURE REVIEW

There has been a proliferation of fiscal decentralization studies over the past several years. These studies have focused on various aspects of the economy and how they are impacted by fiscal decentralization. Most of these studies, however, have been at the cross country or national level. Numerous studies have also focused on Eastern European countries as well as developing and transition countries. None of the studies reviewed have studied fiscal decentralization at the county government level or an equivalent local level of government. The effect of fiscal decentralization on economic growth, government size, healthcare system, and the macro economy are among the studies that have been done in the area.

The literature reviewed in this section was chosen for its relevance to proposed research for this dissertation. Due to the limitedness of studies at the U.S. county level, the studies reviewed will be mainly cross-country and studies based on countries other than the U.S. Studies on the impact of fiscal decentralization will be discussed first. Next, a discussion of the advantages and disadvantages of fiscal decentralization will be presented. Then, literature on economic growth is discussed. Finally welfare reform and its implications for local economies are discussed.

2.1 Studies on the Impact of Fiscal Decentralization

This section reviews studies on the relationship between fiscal decentralization and economic growth, the methods used, and a summary of the results obtained.

Davoodi and Zou (1998) use panel data from 1970 – 1989 for 46 countries to study the effect of fiscal decentralization on economic growth. They estimate an ordinary least squares (OLS) model in which the dependent variable is the per capita GDP growth rate, and the independent variables are human capital (measured by secondary school enrollment rate), GDP, average tax rate, population growth, fiscal decentralization, and country and time fixed effects. The study uses data from national and subnational government levels. The authors find a negative relationship between fiscal decentralization and growth in developing countries but no relationship in developed countries.

Xie et al. (1999) use time series data from 1948 – 1994 to evaluate the effect of fiscal decentralization on economic growth in the U.S. They estimate an econometric model in which the dependent variable is per capita output growth rate while the independent variables are the average tax rate, labor growth rate, Gini coefficient, fiscal decentralization, openness of the economy (measured by ratio of foreign trade volume to GDP), and inflation rate. The average tariff rate, used as an alternative measure of openness of the economy, is computed as the ratio of total customs duties to total imports for consumption. Other variables included in the model are shares of government spending at different levels, price index of energy products, and gross private investment in physical capital. The share of government spending is defined as the ratio of subnational government spending to consolidated government spending. Three levels of

government (federal, state, and local) are identified in the study. Local government spending shares had negative coefficients while state spending shares had positive coefficients. All the coefficients were insignificant, however. Despite the lack of significance of the coefficients, they conclude that the insignificant coefficients in their analysis indicate that the current government spending shares are consistent with growth maximization. Further decentralization, they argue, will move the economy away from the growth maximizing path and may thus be harmful to economic growth in the U.S.

Akai and Sakata (2002) use U.S. state level data to evaluate the contributions of fiscal decentralization to economic growth. They estimate a linear regression model in which change in gross state product is the dependent variable. Independent variables are population growth rate, state economic characteristics, the level of gross state product, fiscal decentralization, openness (the ratio of state exports to other countries and other states to nominal gross state product), income distribution measured by the Gini coefficient, and growth rate of gross state product. Other independent variables include quality of regional human capital (measured by number of patents), level of human capital (measured by educational levels and labor quality), and region specific effects (measured with a dummy variable indicating whether the state is Southern or not). The authors find a positive relation between fiscal decentralization and economic growth at the state level in the U.S.

Stansel (2005) studies the relationship between local decentralization and local economic growth in U.S. metropolitan areas. He uses cross-sectional data from 1960 – 1990 for 314 U.S. metropolitan areas to evaluate the effect of decentralization on economic growth and concludes that local decentralization enhances economic growth.

Metro area economic growth is measured by the growth in the log of population and the growth in the log of real per capita money income. These two variables are used as the dependent variables. Stansel points to the fact that most other studies use per capita GDP as the dependent variable for economic growth studies; however, this measure is not available at local (county) government levels. The independent variables include an index of fiscal decentralization measured by the number of general purpose governments per 100,000 residents in 1962, growth in the log of population, real per capita income, unemployment rates, manufacturing share of employment, percent of population with 16 years or more of education, and 48 state dummies. Stansel estimates an ordinary least squares model and concludes that decentralization increases local economic growth. The decentralization coefficient was significant and positive indicating that decentralization has a positive effect on per capita income growth. The study also concludes that fiscal decentralization has a positive and significant effect on population growth.

Jin and Zou (2002) study how fiscal decentralization affects government size. They use a cross-country panel data with three levels of government. Their methodology involves two models; a fixed effects model and a feasible generalized least squares (FGLS) model. Government size is the dependent variable. Independent variables include GDP, fiscal decentralization, urbanization (measured by urban population as a share of total population), openness of the national economy (measured by the sum of exports and imports as a percentage of GDP), and country fixed effects. The authors use dummy variables for whether the country is a federation, has elected officials, has constraints on subnational government borrowing, and has an independent central bank. If the central bank governor does not change within six months of a change in political leadership of

the country, the central bank is considered to be independent. The study concludes that fiscal decentralization leads to bigger sized subnational governments. Bigger sized governments are presumed by the authors to be less efficient and less cost effective.

Many studies done on fiscal decentralization in China include those by Lin and Liu (2000) and Zhang and Zou (1998). In Lin and Liu's 2000 study on fiscal decentralization in China, they investigate whether the Chinese economy has been positively affected. They test whether fiscal decentralization increases economic efficiency. The econometric model in their study is a Cobb Douglas production function. Per capita output is modeled as a function of per capita capital, technology level, and the fraction of the population in the labor force. The growth rate of output is dependent on technology and capital. Technology includes differences in resource allocation and endowment as well as institutional differences. The technology variable also includes unobservable location specific characteristics. Fiscal decentralization is introduced in the model via the reform programs upon which technology is dependent.

Lin and Liu (2000) use panel data on China's provinces. The data span a 23 year period starting from 1970. The dependent variable is GDP and the independent variables used include measures of fiscal decentralization, rural reform, price of farm products compared to non farm products, per capital real gross domestic product, population, the rural population share, share of non-state-owned enterprises in total industrial output, growth rate of per capita investment, and provincial dummies.

As noted by many other authors, measuring fiscal decentralization is a challenge. Numerous studies have used the share of subnational government spending in total government spending. Lin and Liu use a different measure since this data is not readily

available in some areas. Refer to Lin and Liu (2000) for a detailed discussion on why these traditional measures are not appropriate in the Chinese case. Unlike other decentralization studies, they use the marginal revenue increments retained by provincial governments as a measure of fiscal decentralization. In addition to the above measure, average revenue retention rates were also used to measure fiscal decentralization. The results indicate a positive relation between fiscal decentralization and growth. Their results also show that other key factors that influence economic growth are rural reform, capital accumulation, and non state sector development.

Zhang and Zou on the other hand use a 12 year panel dataset from 1980 – 1992 to study decentralization in China. The dependent variable used is the provincial income growth rate and the independent variables are measures of fiscal decentralization, investment rate, growth rate of labor, share of total volume of foreign trade in province income, inflation rate, tax rates, and provincial fixed effects. Fiscal decentralization was measured as the share of provincial spending in central government spending. Using a least square regression model, Zhang and Zou (1998) find a negative relationship between fiscal decentralization and economic growth.

2.2 Literature on the Advantages and Disadvantages of Fiscal Decentralization

In this section, a summary of the most often cited advantages and disadvantages of fiscal decentralization is discussed. The first advantage that is often cited in favor of fiscal decentralization is economic efficiency. As stated by Tanzi (1996), "the main economic justification for decentralization rests largely on allocative or efficiency grounds". With fiscal decentralization, local governments are likely to provide different

combinations of public goods and services since they are more likely than centralized governments to take into consideration the different tastes of residents. Proponents of decentralization believe that economic efficiency is achieved by decentralized governments because they provide the mix of output (goods and services) that best reflect the preferences of individuals living in the community (Oates, 1972). Centralized governments on the contrary are more likely to provide a uniform package of output products across all jurisdictions. If individuals have variations in their consumption preferences, then the centralized provision of uniform output will result in inefficient resource allocation. Thus as stated by Oates (1972), "a decentralized form of government therefore offers the promise of increasing economic efficiency by providing a range of outputs of certain public goods that corresponds more closely to the differing tastes of groups of consumers". Local provision of public goods could also be associated with lower administrative overheads because agency and monitoring costs are likely to be lower (Oates, 1999).

In addition to benefits from economic efficiency, fiscal decentralization is also thought to increase accountability of local officials, especially when they are elected (Oates, 1999). Government officials are more likely to allocate resources efficiently and do their best to provide optimal levels of economic development and public services when they are closer to the electorate. Otherwise, they risk the chance of not being re-elected. Also, when local jurisdictions have to fund the services they provide, they are more likely to do so at a cost efficient level where the marginal benefit equals the marginal cost if services are decentralized rather than centralized (Tanzi, 1996). According to Thiessen (2001), central governments could be more inclined to spend less

on issues of local concern such as education, child care, and local infrastructure and rather concentrate more on national defense.

Under fiscal decentralization, local communities serve as "research labs" for the rest of the country (Osborne, 1988). Decentralization allows experimentation and innovation in the public-service production process (Tanzi, 1996). Local experimentation may lead to increased technological progress in the production of governmental goods and services and public policy (Oates 1999). When local communities develop and implement economic development programs in a decentralized system, programs are first implemented on a relatively small scale. If the program is a success, then other parts of the country may adopt it, too. However, if the program fails to meet its objectives, then only a few local communities will suffer rather than the whole nation. According to Oates (1999), the recent legislation that transfers the responsibility for welfare programs to the states represents a recognition of the failure of existing programs and an attempt to make use of the states as 'laboratories' to find out what sorts of programs work best.

The experimentation with different service production processes by local governments can lead to gains from competition among local governments (Oates, 1999). Competition is an advantage when it leads local governments to adopt more efficient technologies of production than they had previously used. Oates argues that with a highly centralized government that provides all public goods with little or no competition, it is likely that there will be little or no incentive to be innovative and efficient.

Also, Brennan and Buchanan (1980) argue that decentralization is likely to be associated with smaller public sectors. They contend that this produces economies that are more efficient.

A drawback of fiscal decentralization lies in the likelihood of redundancies and duplications in public service provision (Oates, 1972). Due to decentralization, the same program may be present in different, adjacent, or overlapping jurisdictions. Rather than having, say, one big park between two adjacent counties, the situation arises where each community spends scarce resources to build similar parks within a few miles of each other. This may be a waste of resources if the parks provide similar services.

Associated with this disadvantage of decentralization is the loss in economies of scale (Oates, 1999). Gains from economies of scale are lost when smaller jurisdictions are in charge of providing public services whose production or delivery costs decline with scale. Each local government needs to implement its economic growth agenda independent of other local governments in a decentralized system and so might end up spending more per unit of service output because they would be operating at a smaller scale.

Another disadvantage of fiscal decentralization is "the quality of local bureaucracies" (Tanzi, 1996). Central governments are likely to have personnel with higher qualifications than decentralized governments because they provide better pay and career opportunities (Prud'homme, 1994). Local governments are likely to offer fewer opportunities for career advancement and may pay lower salaries. The presence of personnel with low qualifications in local governments, especially in rural areas, could limit the efficiency gains from decentralization. Some rural counties, for instance, have county commissioners and managers with only a high school education or less. Urban counties on the other hand tend to have commissioners and managers with college or graduate degrees.

Although competition among local governments was mentioned as an advantage of fiscal decentralization, it could also have a negative effect. In the case where competition between local governments leads to inefficient provision of services, fiscal decentralization may be undesirable for the society as a whole. Communities may cut public services to drive out people who contribute little to the tax base in an effort to lower the tax burden on tax-paying firms and residents. Competition of this kind creates fiscal externalities borne by other local governments. This phenomenon has been dubbed in the literature as a *race to the bottom* (Brueckner, 2000; Saveedra, 2000).

In Paul Peterson's book, City Limits, he argues that another potential disadvantage of fiscal decentralization is the trade-off between growth activities and redistribution or community welfare activities. Under pressure to engage in economic growth activities, local governments may switch resources from other programs in order to carry out economic growth initiatives. This practice creates a disadvantage for residents in the community who would gain from redistributive or welfare activities.

Fiscal decentralization could help increase regional inequalities (Thiessen, 2001). Under fiscal decentralization, different regions provide different mixes of public goods and services and taxes. Wealthier communities may therefore attempt to drive away poorer individuals and households from their locality. Fiscal decentralization can therefore reinforce regional inequalities, thus decreasing economic growth (Thiessen, 2001).

Finally, another drawback of fiscal decentralization is the possible increase in corruption, especially in developing countries. It is generally believed that local governments are more easily bribed than national governments (Tanzi, 1994;

Prud'homme, 1994). Oates (1994) mentions corruption as a disadvantage but does not conclude whether it is greater at the national or local level.

2.3 Literature on Economic Growth in Counties

In this section I discuss what economic growth is, how it occurs, and some studies on local economic growth. Economic growth can be defined as a rise in national or per capita income and product (Gillis et al., 2001). Thus if the production of goods and services in a country rises by whatever means, one can speak of that rise as economic growth. Economic growth of a county could be measured by a growth in the number of people, jobs, and a growth in total earnings or employment. A lot of studies have been done on economic growth at higher government levels, especially at the national level, but since this study deals with local governments, only studies that deal with local economic growth will be reviewed.

Carlino and Mills (1987) explore the factors that determine population and employment growth. They evaluate the effects of economic, demographic, and climatic variables on population and economic growth. They estimate a two stage least squares (2SLS) model with employment density and population density as dependent variables. The independent variables include percent black, interstate highway density, tax rates, crime rates, education levels (measured by median school years attained), family income, and Industrial Revenue Bonds (IRBs). Several dummy variables for metro status, regional dummies, and central city dummies are also included in the regression.

Carlino and Mills (1987) find that climate influences population and employment. They also find evidence of a preference for Sunbelt states. Variables that depend on

public policies such as crime rates, taxes, and IRBs had little impact on county population or total employment growth. They conclude that since population and employment growth are interrelated, a policy option available to decision makers is to implement strategies that will help retain and attract county population and employment will follow population to such areas. This is the classic jobs follow people hypothesis.

An important study on local economic growth in the U.S. is the study by Deller et al. (2001). The study stresses the importance of natural amenities in determining local economic growth. Certain rural areas are experiencing rapid growth as documented by Deller et al. (2001). Rural counties experiencing rapid growth seem to be counties with non-market attributes and natural amenities. Growth in these rural counties has been in the form of increases in employment, income, housing levels and value, and population (Deller et al., 2001). The model used by Deller extends the Carlino and Mills county growth model to include income. Deller et al., test the hypothesis that local economic growth is dependent on available amenities. The amenity indexes used include climate, land, water, winter recreation, and developed recreational infrastructure. The amenity index used in this study goes a step further than the commonly used amenity scale, developed by USDA's ERS, that is commonly used in amenities studies.

The land amenity index consists of attributes such as golf courses, tennis courts, playgrounds, and swimming pools. Other characteristics included in the amenities index are percentage of federal lands, state parks, farmlands, and forests. The water amenity index consists of the percentage of land covered by rivers, lakes, and bays as well as other resources for activities such as canoeing, fishing, and diving. Presence of skiing facilities was used as a measure of winter amenities in the area.

The study is based on 2,243 non-metropolitan rural counties in the U.S. The economic growth model assumes that growth is influenced by four factors including the market, labor, government, and amenities. A simultaneous equation model similar to that used by Carlino and Mills (1987) is used. The dependent variables are the growth rates of population, employment, and per capita income from 1985 to 1995. The independent variables used include initial population, initial employment, initial per capita income levels, crime rates, property tax, number of physicians, government expenditures, unemployment rates, income distribution, and five amenities indexes. The model also includes the percentages of high school graduates, non-white population, and the number of households whose incomes fall under the national poverty levels. Two population groups, one group representing children (less than 17 years) and the second group representing the elderly (over 65 years) are also included as independent variables.

The results show that initial levels of population, employment, and incomes, negatively affect growth. Higher initial levels of employment and per capita income are associated with lower rates of growth in rural counties. Initial population levels are positively associated with higher employment growth and per capita income. Counties with higher income inequality levels tend to be negatively related to population growth. Also, property taxes are negatively related to growth. The amenities indexes were found to be positively related to local economic growth. Specifically, climate had a positive and significant influence on population growth. Rural counties with higher levels of water amenities were positively associated with higher population and income growth. Developed amenities such as recreational infrastructure were positively associated with local population, employment, and per capita income growth rates. Other results indicate

that land amenities positively affects employment and population growth rates and winter recreational activities are also found to be positively related to population, employment, and per capita income growth rates.

According to Deller et al. (2001) the results indicate that rural counties that are able to combine both natural and developed amenities have the potential to experience increased economic growth and expand their local economies. Thus all five amenities indexes were found to positively influence local economic growth of rural counties.

In the recent literature there have also been several studies on employment and population growth in the U.S. Desmet and Fafchamps (2006) for instance use county level employment data to study future job distribution if the current pattern remains unchanged. The dependent variable in their model is the annual growth rate of employment. Variables used include several dummies to account for differences in counties. Economic activity is measured as the number of jobs in a county. Latitudes and longitudes are also included as independent variables. The analysis uses data from 1970 - 2000. Convergence analysis and linear regressions were used to arrive at their results.

This county level study shows that jobs are becoming more concentrated over time. According to Desmet and Fafchamps (2006), manufacturing may be less concentrated but services are becoming more concentrated. Hence manufacturing may be less important as a factor in explaining aggregate employment. Their results suggest that employment in the U.S. is becoming more concentrated. Different regions reveal big differences in the employment available. They point out that other factors such as congestion on the consumer side, changes in consumer taste and preferences, and rising

housing costs may be some reasons why employment concentration is occurring across U.S. counties.

In an earlier study using 1972 – 2000 county data, Desmet and Fafchamps (2005) study employment changes and also find that employment has concentrated over time. County level employment data from 13 sectors of the economy are used in the analysis. The data used are from the Regional Economic Information System (REIS) compiled by the Bureau of Economic Analysis. Other secondary data from the U.S. Geological Survey were also used.

A first model uses the annual sectoral employment growth as the dependent variable and sectoral employment share and initial aggregate employment as the independent variables. A second model is estimated taking into account spatial spillovers. The results of the analysis show that manufacturing is moving away from large agglomerations while service sectors are moving towards large agglomerations. Thus employment in the non-service industry has deconcentrated while those in the service industry have shown evidence of concentration. They find a higher rate of growth of service sectors in areas with lower economic activity. The study also finds that localization economies are more important in non-service sectors than urbanization economies. The service sector, however, showed mixed effects.

Employment growth was regressed on initial employment at different distances to account for the potential spatial spillovers that affect neighboring counties. When spatial spillovers are included, the results show that employment in non-service sectors has moved from high employment localities to nearby locations. In the service sector, employment grew in areas with high aggregate employment and decreased in adjacent

counties (Desmet and Fafchamps, 2005). One possible reason for the trend is a decrease in transportation costs. Also, although some studies find deconcentration across all sectors, Desmet and Fafchamps (2005) find deconcentration only in the non-service sector.

Carlino and Chatterjee (2002) study employment determination at the metropolitan statistical area (MSA) level in the U.S. Their study looks at employment trends taking in to consideration densities. Two concepts namely, employment deconcentration and employment decentralization are discussed in the article. Employment deconcentration is defined as a decline in the share of urban employment in dense MSAs and a rise in the share of employment in less dense metropolitan areas. This deconcentration pattern has occurred both across MSAs and within MSAs. This trend, they argue, has resulted in a decrease in spatial inequality. Employment decentralization is defined as a decrease in the 'share of MSA employment accounted for by the relatively dense counties in an MSA' (Carlino and Chatterjee, 2002). In other words, employment decentralization is deconcentration within MSAs.

Employment data from County Business Patterns, population data from the U.S. Census and other secondary data from the City and County Data Book are used in the study. Counties are combined to create close to 300 MSAs for the analysis.

The study finds evidence of employment deconcentration in dense MSAs. That is, the share of employment in dense MSAs has decreased while that in less dense MSAs has increased. They also find evidence of population deconcentration in the post war period. The authors note that employment deconcentration has been stronger than population deconcentration. The summary of the findings is that dense MSAs grow slower than less

dense MSAs. The same result is shown for population. From their theoretical framework, they show that rising costs of goods in dense areas lead to the overall decrease in growth as compared to less dense areas. They therefore show an inverse relation between increasing population density and employment growth. Various checks and tests are conducted to ensure that the obtained results are not driven by measurement errors.

According to Carlino and Chatterjee (2002), previous studies show a stable urban structure in terms of population. These studies, however, fail to consider the importance of employment and population density. The evidence suggests that growth processes in dense MSAs (mostly urban) are different from less dense MSAs (mostly rural).

A possible reason for the observed trends is that there is a general increase in aggregate employment. Other reasons cited by the authors for their results are changes in technology, government policy, and tastes of consumers. Decreases in agglomeration economies due to cheaper cost of transportation, production innovation, and communication technologies have led to employment and population increases in small, less dense locales (Carlino and Chatterjee, 2002). Changes in people's preferences and the increased desire of Americans for rural lifestyles could be some reasons why less dense MSAs have experienced an increase in their population. The above are some reasons why rural areas may have grown at the expense of urban areas.

In a study by Beeson et al. (2001), county level population data from 1840 – 1990 is used to explain how produced and natural characteristics affect growth. The dependent variables used are the levels, densities, and growth rates of population and the independent variables are natural and produced amenities. Specific regressors include access to water transportation, different types of climate, presence of minerals, industrial

mix, educational infrastructure, and access to transportation. The Census is the source of data for their study.

Beeson et al. (2001) find that in earlier decades, presence of natural endowment caused a significant increase in population for counties that had these resources. They find that human capital positively affects growth. The results also show that natural amenities such as mild climates, land area, access to water transportation, and less mountainous terrain were associated with higher populations. Counties with larger shares of employment in manufacturing and commerce had higher growth over the 150 year period. They find that population has become more concentrated in densely populated counties. Based on population density in 1840, Beeson et al. (2001) find that larger counties grew faster than smaller counties. They use nonlinear least squares to evaluate whether population has converged or diverged. Their results support the cumulative causation endogenous growth theory. In summary, they find little population convergence in the whole sample. Population divergence is also found when frontier counties are excluded from the analyses.

In a subsequent study on county growth in the U.S. from 1840 to 1990, Beeson and DeJong (2002) also find evidence of population divergence. Aggregation to the state level, however, shows population convergence. Initial population has a positive effect on subsequent population. These results differ from the study by Carlino and Chatterjee (2001) where they find employment deconcentration. Employment deconcentration is most likely due to the effects of congestion being greater than agglomeration economies.

2.4 Welfare Reform Overview

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 changed the way welfare is administered in the U.S. Among the new requirements was a 5 year lifetime limit on welfare for individuals. Individuals who had stayed on welfare for more than 5 years were to be cut off from the welfare assistance program. States also had the option of setting shorter time limits on welfare. Twenty states have set lifetime welfare limits shorter than 60 months (Schott, 2000).

In addition to time limits, the federal welfare reform act of 1996 placed work requirements on welfare recipients. Individuals were expected to be working or engaged in some work related activities to qualify for welfare. Such work related activities include on the job training, community service programs, job search and job readiness assistance, and education directly related to employment for individuals without a high school diploma (Library of Congress, 1996).

Another aspect of the law was a change from matching grants to block grants for temporary assistance to needy families. States were also given incentives for moving people from welfare to work.

Given these reforms, states and counties that administer welfare assumed added responsibilities in ensuring that people moved from welfare to jobs. This also placed additional pressure on local governments to be successful in the welfare implementation program.

2.5 Welfare Reform and Economic Growth

Since the implementation of welfare reform, numerous studies have evaluated the effect of all aspects of this reform. Ochel (2004) studied the impact of welfare time limits on employment. Previous studies reviewed by Ochel have focused on effects of welfare reform on caseloads. Some of such studies (Ziliak et al., 2000; Hofferth et al., 2002) have evaluated these impacts using data from 1996 or earlier. These studies do not capture the effect of time limit requirements for the post 1996 time period.

Schexnayder et al. (2003), study effects of time limits using post 1996 data and find statistically significant but small reductions in welfare receipt. Economic growth, measured in terms of employment, increased slightly. Welfare recipients with short histories of welfare dependence and those with higher job preparedness had the highest employment rates. Grogger and Michalopoulos (2003), find a significantly high effect of welfare time limits on employment rates. They find that due to the forward looking behavior of welfare recipients, they conserve their benefits for future use and so tend to rely on welfare for shorter periods of time. The regression estimates had welfare use as the dependent variable and characteristics of recipients and state effects as the independent variables.

Several other studies have been done on economic status after time limits are reached. Bloom et al. (2002) review eight surveys on individuals who had been cut off welfare due to time limit constraints. Most of these recipients reported lower incomes and increased hardship as a result of time limits. It was noted, however, that most ex-welfare recipients continued to receive other forms of assistance such as Food Stamps and Medicaid.

Schoeni and Blank (2000) studied the impact of welfare reform on employment, income, poverty, and family structure using data on adult women from the Current Population Survey (CPS). The data used were from 1977 to 1999. This allowed for comparison between the pre and post welfare reform periods. Panel data with over 14,000 observations were used. The reduced form model had outcome variables such as employment as the dependent variable. The independent variables used include three categories for the number of years of education (less than 12 years, 12 years, and 13 or more years), state and year effects, dummy variables for whether states offer TANF, whether the state had time limit waivers in place, linear state specific time trends, current and lagged employment growth rates, log of maximum AFDC benefit, and the age of the respondent.

The results revealed that for states that provided TANF, the impact of time limits on work participation, hours worked, own earnings, and family earnings were not significant. Alternative measures using residual changes in outcome variables before and after welfare reform showed significant increases in earnings and decreases in poverty.

2.6 Conclusion

In this chapter a review of literature on fiscal decentralization, economic growth, and welfare reform changes was discussed. The literature serves to show the research that has been done on decentralization and local economic growth as well as welfare reform. Since there is limited research on counties in the U.S., most of the studies reviewed are at the metropolitan, state, or federal level. Some studies used data from different countries for the empirical estimation.

The studies are relevant to this dissertation because they show what has been done in the past and consequently show that this study will help fill some gaps in the literature, particularly in relation to studies on county governments. The methodologies as well as variable selection from the studies reviewed above help shape those that are used in this study.

CHAPTER 3

CONCEPTUAL FRAMEWORK

In this chapter, the theoretical background for the study is discussed. Since the study evaluates how welfare reform policy affects economic growth, a review of some relevant regional economic growth theories is provided. Although there is no unified theory on economic growth, the theories in this section provide some contribution to the framework upon which the study is based. The conceptual framework discussed in this chapter also serves as the basis for the hypotheses.

Various economic processes help explain the link between economic growth and decentralization. Governmental processes or policies such as decentralization affect well being of populations. The three ways in which decentralization can affect economic growth are also discussed in this chapter.

3.1 Economic Growth Theories

The neoclassical growth theory, growth pole theory, cumulative causation theory, role of natural amenities, and agglomeration economies are discussed as various theories or determinants of regional economic growth.

3.1.1 Neoclassical Growth Theory

In the neoclassical regional growth theory, growth depends on labor and capital. In other words the supply of labor and capital is the driver of economic growth (Malizia and Feser, 1999). Factors of production will move across regions until returns to factors of production converge. In other words, factors of production will move until equalization of regional factor returns is achieved.

Given a production function such as

$$Y_r = f(K_r, L_r, T_r)$$

where Y_r is the net output, K_r is capital, L_r is labor, and T_r is technology, growth occurs through accumulation of factors of production and is simply a movement along the production function. Assuming we have a Cobb Douglas production function $Y = TK^a L^{1-a}$ with constant returns to scale and profit maximization in a competitive market, producers will hire labor input until marginal revenue product of input equals input price. In each region capital and labor are hired until $MRP_K = r$ and $MRP_L = w$ respectively. From the production function above the marginal product of labor is

$$MP_L = \frac{\partial Y}{\partial L} = (1-\alpha)TK^{\alpha}L^{-\alpha} = (1-\alpha)T\left(\frac{K}{L}\right)^{\alpha}$$

Increasing the capital labor ratio increases the marginal product of labor (MP_L). Here the wage rate is positively related to the capital labor ratio. Similarly, for capital, the marginal product is

$$MP_K = \frac{\partial Y}{\partial K} = \alpha TK^{\alpha-1}L^{1-\alpha} = \alpha T\left(\frac{L}{K}\right)^{1-\alpha}$$

Increasing the capital labor ratio decreases the marginal product of capital.

The neoclassical growth model predicts that regions with the highest capital labor ratios have the highest wage rates. Low rent regions tend to have higher population or labor growth rates and a higher growth of the rental rate than high-rent regions (Richardson, 1973).

3.1.2 Growth Pole Theory

Another theory that is often used to explain the process of growth is the growth pole theory. According to this theory regional growth occurs when concentration of economic activity leads to dynamic forces of attraction that causes more economic growth. The theory is used to explain the difference in growth between cities and their hinterlands. Cities because of their concentration of manufacturing and service firms are considered to be engines of growth and it is proposed that linkages between rural and urban areas would lead to a 'trickle down' of urban growth benefits to rural areas (Richardson, 1973). Growth poles are defined as urban centers with some threshold size with the rate of population growth and employment growth greater than the region where it is located. A second attribute is that the growth pole's growth should be greater than some threshold percentage of the total growth of the region. This theory recognized the fact that the spatial distribution of economic activity affects the rate of economic growth.

According to the growth pole theory, regions are in a state of imbalance and imbalances such as excess demand and supply of goods and services can lead to growth. In addition to growth being caused by price signals in decentralized markets, this theory also pointed out that economic growth can occur through governments and large enterprises exerting influence on the growth process (Mckee, 1970).

3.1.3 Cumulative Causation Theory

The cumulative causation theory is a growth theory that attempts to explain why there are differences in the growth of different regions. Growth and decline are viewed as self-reinforcing forces that operate via markets. According to this theory, economic growth in prosperous localities results in both positive and negative forces on surrounding regions. These effects are known as spread and backwash effects respectively (Richardson, 1973).

The spread effects occur when the prosperous region provides a market for the non prosperous regions. Conversely, the backwash effect occurs when there is migration of labor and capital from the non prosperous region to the prosperous region. When the backwash effect is greater than the spread effect it could lead to divergence in growth where the prosperous region continues to grow and the lagging region declines in growth (Richardson, 1973).

This theory goes farther than the neoclassical growth theory because it explains regional growth and decline. The theory does not, however, have an explanation for why regions become prosperous in the first place. Likewise it does not explain how lagging regions become so to begin with.

From this theory, differences in regions affect growth. From the literature, differences have been observed between highly urbanized counties and rural counties (Kantor, 1995). Urban counties may be likened to prosperous regions and rural counties to lagging regions under the cumulative causation theory. From a survey of county governments, Lobao and Kraybill (2005) find significant differences between urban and rural counties with the latter being disadvantaged. Further investigation by these

researchers revealed that rural compared to urban counties are likely to have reduced capacity and limited resources to efficiently carryout added responsibilities brought about by decentralization. The difference between the two regions could be increased by migration of rural residents to urban localities to find better opportunities and have access to better public services. Since rural and urban counties have different resource endowments and structural capacity, it is likely that policies that require inputs by local governments will have different impacts and outcomes in rural compared to urban counties. Due to differences that exist between rural and urban areas, it is possible that policy effects will also have varied results depending on a county's rural status. Also, rural counties are disadvantaged in terms of human capital and other physical resources, and so it is likely that the impact will be negative and more severe compared to urban counties. Based on the above, it is hypothesized that fiscal decentralization causes lower economic growth in rural compared to urban counties.

3.1.4 Natural Amenities as a Determinant of Growth

Economic growth may also be driven by the presence of natural amenities. Increasingly, Americans value natural resource based amenities and small town values (Deller et al., 2001). People are therefore willing to relocate to enjoy these amenities. Gottlieb (1994) states that amenities play an important role in economic growth since people benefit when amenities are used to promote economic growth.

Rural areas have shown different trends in population growth over the past decade. According to Deller, rural regions in the Mountain West, Upper Great Lakes, the Ozarks, South Blue Ridge Mountains, Southern Florida, and several rural regions

adjacent to metropolitan areas such as Atlanta, Seattle, Portland, and Maine have grown in population. Rural areas that are dependent on agriculture on the other hand have experienced population decreases. For rural areas that are showing increased population and incomes, Deller proposes that natural amenities may be the driver of this growth. Traditional extractive industries and manufacturing do not appear to be the cause of this increase in population in rural areas (Deller et al., 2001). This increase in population tends to be people migrating to enjoy the rural amenities and quality of life.

Several regional growth initiatives focusing on local areas are taking into account the amenity factor. In earlier studies such as that by Carlino and Mills (1987), they use city, suburb, and nonmetro variables as measures of congestion related amenities. Regional dummy variables are used as a measure of climate type. Since amenities can have an effect on growth, an amenity factor is included in the model estimated in this dissertation. The model is described in the next chapter.

3.1.5 Agglomeration Economies

According to growth theorists, sustainable growth may be due to agglomeration economies (Richardson, 1973). Increasing returns that are related to the spatial distribution of economic activity are known as agglomeration economies. Krugman (1991) describes the process of regional growth as follows. He explains how interaction of demand, increasing returns, and transportation costs drive the process of regional divergence.

Some businesses tend to congregate in a region because of the advantages of being near other businesses. Classic examples are chips in Silicon Valley and cars in

Detroit. A model of geographic concentration can be used to explain these processes. Various factors interact to cause concentration in a region. These factors are increasing returns, transportation costs, and demand.

According to Krugman when there are strong economies, firms would rather locate in a concentrated manner. To decrease transportation costs firms tend to locate near markets (local demand). At the same time local demand will locate close to areas where employment can be found. Transportation networks could also be a force that creates geographical concentration of industry.

As far back as 1920, Alfred Marshall identified three main reasons for localization of industry. First, concentration allowed an industrial center to have a pooled market for workers with specialized skills. This rich source of labor benefits both workers and firms in an area. Other advantages are that localization provides a constant market for skill. Employers seeking to minimize their search cost will also want to locate close to the labor pool. Likewise, labor is likely to gravitate towards areas where employers seeking their skills are located so that they can be gainfully employed. There is therefore a concentration of skilled labor and specialized support firms, which further add to the pros of concentration. When an employee loses their job in one firm it is less difficult to obtain one in a nearby firm.

The second reason put forth for localization is that it creates the provision of non-traded inputs that are industry specific. These are provided at reduced costs. The provision of specialized inputs and services makes industries more efficient when there is localization.

Lastly, there are technological spillovers, which make geographical concentration of firms and people advantageous. As workers from different firms interact with each other, they are likely to transfer information on inventions, improved technology, and production methods that are efficient (Krugman, 1991). In summary, Marshall's three reasons for geographic concentration and subsequent economic growth are labor market pooling, supply of intermediate goods, and technological spillovers. All these processes help to promote growth. From the concentration of economic activity and the benefits of agglomeration, two hypotheses are derived for this study. First, people move to localities where they can find jobs. Second, employers tend to move to localities with a skilled labor supply. These location decisions help all labor to increase employment opportunities and employers to decrease search and operating costs. This shows that areas with high population will attract more businesses (employment). Thus the presence of high population in an area will potentially lead to an increase in employment in the region. In the same way, if an area has high employment opportunities people will move into the region and cause an increase in population. These processes reveal the positive effect that population and growth have on each other. It is therefore hypothesized that population growth has a positive effect on employment growth and vice versa.

In the model that is discussed in the next chapter agglomeration effects are captured by population density and employment in manufacturing as a share of total employment. These are commonly used measures of agglomeration in the literature.

According to Krugman (1991), the interaction of increasing returns and transportation costs can be used to explain the uneven development of regions. Thus regions that get a head start with production tend to attract industries away from regions

that start with less favorable conditions. As time passes these effects reinforces themselves thus resulting in distinct differences in regional development.

The above theory thus emphasizes increasing returns rather than comparative advantage as the source of economic growth. Little attention is, however, paid to governments in the model.

Differences in growth could also result from opportunity costs of engaging in growth activities. Regions with fewer resources such as rural counties tend to have a higher opportunity cost as they engage in economic growth initiatives due to decentralization. This could further create disparities in the growth of localities.

The above are some theories of economic growth. This dissertation proposes that fiscal decentralization affects these growth processes by influencing the location decisions of firms.

3.2 Economic Growth Strategies

Two broad categories of growth strategies are presented in the literature. They are firm-specific and economic-system strategies. Firm specific strategies are designed to assist specific businesses in locating in an area. These aid packages typically are in the form of tax breaks (tax abatements and tax incentives). These are implemented with the aim of increasing jobs and attracting outside businesses (employment). Economic system strategies on the other hand are geared towards formation of human, physical, and or social capital. These strategies aim at increasing the overall health of the economy.

According to Donahue (1997) and Leroy (2005) there is an increase in the usage of firm-specific strategies by local governments. This has implications for economic

growth since firm-specific growth strategies tend to benefit few firms and households with little spillovers to the rest of the population. Despite their limited potential to benefit the population as a whole, firm-specific strategies are often used by local governments. Based on these growth strategies, measures of human capital and local government business attraction and retention strategies are included in the growth model in the next chapter.

3.3 Perspectives on Decentralization

Decentralization tends to be conceptualized as changes in government structure such that provision of goods and services become more localized rather than centralized. Effects of decentralization may be different in various parts of the country. There are three main perspectives on the effects of decentralization on local economies. According to Lobao and Kraybill (2006), these perspectives can be labeled as (1) pro-decentralization, (2) anti-decentralization, and (3) intermediate decentralization. The three perspectives of decentralization discussed below are borrowed from Lobao and Kraybill (2006).

3.3.1 Pro-decentralization Perspective

The pro-decentralization perspective is based on efficiency grounds and the limitations of central governance. This perspective is supported by the benefits that are proposed to occur when there are decentralized governments. The advantages of fiscal decentralization that were discussed under the literature review in chapter 2, serves as the

motivation for this point of view. The pro-decentralization perspective proposes a positive effect of decentralization on economic growth.

3.3.2 Anti-decentralization Perspective

Unlike the pro-decentralization stance, the anti-decentralization perspective is based on limitations of local governments and the drawbacks of placing key responsibilities on the shoulders of local governments. Here all the disadvantages of fiscal decentralization that were discussed under the literature review in chapter 2 are used as the bases for the anti-decentralization point of view. According to the anti-decentralization perspective decentralization has a negative effect on economic growth. Based on the anti-decentralization perspective, it is hypothesized that decentralization has a negative effect on economic growth in U.S. counties. The proposed negative relation is because of limitations of local governance and the increase in fiscal stress due to the added responsibilities from decentralization.

3.3.3 Intermediate Perspective

In between the pro and anti-decentralization perspectives lies another proposed school of thought which can be denoted as the intermediate perspective on decentralization. This view stresses the importance of location in the effects of decentralization. There are place-specific, institutional processes that make the effects of decentralization differ from locality to locality. According to this perspective, institutional relationships between governments, citizens, and businesses influence the course of development of a region. Literature supporting this view includes the urban-

regime theory (Lauria, 1997), growth machine perspectives (Logan and Molotch, 1987), and urban-regime-civic-culture approaches (Reese and Rosenfeld, 2002).

The urban regime theory, for instance, helps explain relationships between public and private sectors. According to Mossberger and Stoker (2001), under the urban regime theory, businesses and neighborhood groups in different regions have different degrees of strength or power. Cities differ in the amount and distribution of institutional resources they possess. A city's wealth and resources together with capital flows into the city affect its growth (Savitch and Kantor, 2002; Kilburn, 2004). Cities with different types and amounts of resources will therefore have different growth rates. This argument can be translated to the county level to suggest that similar differences exist between counties of different rural-urban structures.

Lobao and Kraybill (2006) argue that it is necessary to take into account regional and local variations when studying the role of government in economic growth and redistribution. The effects of shifts in government authority have different effects in different spatial settings. Also, different localities have different internal dynamics that result in variations in effects of decentralization. In the same manner, past institutional arrangements and economic structures in different localities also influence a locality's present structure and attributes of the government. This also influences the well being of the local population.

Since there are differences in government structure and institutions in different areas, the intermediate perspective on decentralization argues that the effects of decentralization will differ from region to region. Thus the ability and willingness of local governments to take on the added responsibilities from decentralization will be

varied. Due to the spatial difference of decentralization we propose a spatial marginalization hypothesis whereby remote rural counties will be adversely affected by decentralization since they would have to devote their time and scarce resources to attract mobile capital as they try to carry out largely unfunded or inadequately funded public service mandates (Kantor, 1995).

According to the marginalization hypothesis when spatial mismatch is present in a region, marginalization may last for a long time. According to researchers like Bausman and Goe (2004), marginalization is dependent not only on inadequate income but also on availability and stability of available jobs. Given that rural counties are likely to have limited resources and less stable and low income jobs, it is hypothesized that fiscal decentralization will result in lower economic growth in rural counties compared to more urban counties.

Another aspect of the intermediate perspective is that contrary to the trade-off theories between economic growth activities and public service provision especially to the poor, the engagement in economic growth initiatives by local governments may not decrease social or public service provision. It is posited here that localities that have historically been generous towards the poor will continue to do so even if funding decreases. This could then lead to fiscal stress in the region. Recent studies by Alperovitz (2005) and Barbaro (2006) suggest that many states and localities have implemented progressive legislation to improve the safety net in order to cater for federal funding shortages. The three perspectives above help demonstrate the three major outcomes of decentralization on local economies. They are also the basis for the hypothesis tested in this dissertation.

3.4 Conclusion

In this chapter, economic theories behind the study are discussed. In addition to a review of growth theories, some determinants of regional growth are discussed. Finally, some perspectives on how fiscal decentralization affects economic growth are discussed. These theories and growth determinants form the conceptual framework for this study and also motivate the hypotheses that are tested in this study.

An empirical model based on the conceptual framework discussed in this chapter and the work by Carlino and Mills (1987), is estimated in this study. Details on the model are described in the next chapter.

CHAPTER 4

METHODOLOGY

This chapter contains a description of the empirical model that will be used in this

study. The chapter starts with the model that will be estimated and discusses specific

variables that will be used in the estimation. The reasoning behind inclusion of the

variables as well as identification of the model will be explained in this chapter. A

description of data used in the analyses and the sources of the various datasets are given

in the second section of this chapter.

4.1 Empirical Model

The model used in this study is adapted from the growth model used by Carlino

and Mills (1987). The model used for the empirical analysis is shown below.

Employment Growth $= \alpha_0$ Population Growth $+ \alpha_1$ Fiscal Decentralization $+ \alpha_2$ County Characteristics $+$
α_3 Economic Characteristics $+ \alpha_4$ State Dummies $+$ Error Term $_____$(1)

Population Growth $= \beta_0$ Employment Growth $+ \beta_1$ Fiscal Decentralization $+ \beta_2$ County Characteristics $+$
β_3 Economic Characteristics $+ \beta_4$ State Dummies $+$ Error Term $_____$(2)

The system of equations shown above will be estimated using a two stage least

squares (2SLS) approach. The endogenous variables will be population growth and

employment growth from 1990 to 2000. From the conceptual framework, the exogenous

variables used will be a measure of fiscal decentralization, county characteristics, economic characteristics, and state dummies. In addition, the endogenous variables will be included as independent variables as shown in equations (1) and (2). The error term is assumed to be normally distributed.

4.2 Variable Selection

Bird (2000) states that it is not easy to measure fiscal decentralization. The difficulty lies mainly in how to account for intergovernmental transfers. A look at the literature reveals that fiscal decentralization is measured in different ways. Some of the most common measures used are revenue decentralization, expenditure decentralization, or fiscal autonomy. For a particular sub-national government jurisdiction, expenditure decentralization is the ratio of subnational government expenditure to total government expenditure and revenue decentralization is the ratio of subnational government revenue to total government revenue. Fiscal autonomy is measured as the subnational share of local government own revenue in total local government revenue. Of the three measures, revenue decentralization is most often used in the literature. This indicator (revenue decentralization) was used by Robalino et al. (2001) to study whether fiscal decentralization improves health outcomes, by Fisman and Gatti (2000) to study the relationship between fiscal decentralization and corruption, and by Davoodi and Zou (1998) to study fiscal decentralization and economic growth in several countries. Some studies such as Stansel (2005) have also used the number of local governments in a locality as the measure of fiscal decentralization.

Since this study evaluates the effects of decentralization of welfare on county employment and population growth, an important independent variable that will be included in the empirical model is a measure of decentralization. The measures of decentralization described above do not seem to be the most appropriate measure of decentralization for this study. The Census of Governments is usually the source of county level revenue and expenditure data. This source of county level expenditure and revenue data has some limitations that make the data inappropriate for this study. It is not very clear how the revenue and expenditure data are generated since there is insufficient metadata. It is also not clear whether the collection methods are similar for different regions of the country. Due to difficulties that the secondary data that are typically used for this variable might have, an alternative measure of fiscal decentralization will be used in the study. A dummy variable for whether or not county governments administer welfare at the county level will be used as the decentralization measure in the estimation. This variable is more appropriate for measuring decentralization's effects on county economic growth.

Based on the conceptual framework, the following categories of variables will be selected for the empirical analysis. From the anti-decentralization perspective discussed in chapter 3, it is likely that the characteristics of counties will have a potentially important impact on a region's economic growth. For instance, remote rural counties may lack the human capital and physical capacity to undertake the added responsibilities brought on by decentralization. Due to this potential influence of rurality on economic growth some variables showing specific county characteristics will be added to the model.

Similarly, from the cumulative causation and growth pole theories, different regions tend to grow at different rates. These theories explain how differences can occur in the economic growth rates of different regions of a country. Based on these theories we can evaluate the differences in growth in rural compared to urban counties.

The importance of adding these variables is further strengthened by the third decentralization perspective proposed in the conceptual framework. From this perspective of decentralization, inherent characteristics such as institutional processes of certain locations make a difference in how a county responds to decentralization. It is therefore important to consider the county's characteristics when studying the effects of decentralization. It is proposed that variables that show a county's metropolitan status be added to the model.

Businesses, when deciding on whether to locate in an area, will take into consideration location characteristics, business incentives, public services, agglomeration economies, the local business climate of the area, the cost of doing business in the area or transaction costs, and availability of skilled labor before making a choice. Localities with high costs, less skilled labor, and fewer incentives are more likely to suffer from businesses either leaving the area or not locating there in the first place. From observations in rural and urban areas it is noticed that rural areas might get fewer businesses because of the possible increase in transaction costs, lack of skilled labor, and inadequate public services and infrastructure. Transaction costs are likely to be higher in remote rural counties because of their limited resources and infrastructure.

Whether counties attempt to retain or attract businesses and how they attract businesses into their locality or enable existing businesses to expand is also important.

Local areas that provide little or no business incentives and areas that have poor facilities tend to lose in the bid for new businesses. Remote rural counties will tend to fall in this category and so might lose businesses to urban counties. The above comparison between more rural and more urban counties is important because the intermediate perspective of decentralization argues that economic growth is influenced by differences in regions and localities.

The role of amenities in the location of households and businesses has been stressed in the regional economic growth literature. The availability of both natural and or developed amenities tends to influence location decisions. This consequently has an effect on economic growth. Population tends to migrate to localities with desirable amenities. Some businesses may also locate in an area if the area possesses certain amenities.

From the above discussion on groups of variables that will be required in the model, some specific variables that will be included in the estimation are given below. Specific county characteristics such as the rural-urban continuum codes for counties will be added to the model as an exogenous variable. In order to test the hypothesis that fiscal decentralization causes lower economic growth in rural compared to urban counties, I will create an interaction variable and use a t-test to check whether the coefficient on the interaction variable is significant. The interaction variable is obtained by multiplying the decentralization variable with the rural-urban variable. This will allow for comparison of more rural versus more urban counties in the effects of fiscal decentralization on economic growth.

Since certain policies or characteristics may be state specific, it is possible that certain institutional characteristics may be similar for all counties in a given state. In order to control for any similarities in counties due to the fact that they are within the same state, state dummy variables are included in the model.

Other independent variables that will be used are the level of human capital (measured by the population with bachelor's degrees), median family income, crime rates, county growth initiatives such as presence of industrial parks and presence of development professionals, and attraction of new businesses or expansion of old ones through incentives. The percentage of employment in manufacturing is also included in the regression.

Counties with more educated residents will tend to attract more employers. Educated people will also attract more high-skill type employers. This will help to increase employment and growth in the county. Also, individuals with higher levels of education tend to earn more thus increasing the tax revenues and economic status of the county. It is hypothesized that there is a positive relation between education levels and county economic growth. Other studies have shown that as people become more educated their productivity increases (Carlino, 1995). Higher education makes people learn better and faster on the job. Gottlieb and Fogarty (2003) show that not only will productivity increase but the rate of growth of productivity will also be higher.

Counties with higher incomes also serve as an attracting force for population. People will migrate to counties that on average have higher wages compared to counties with lower average wages. Thus the income levels of a county will affect its rate of

growth. It is hypothesized that higher median family incomes are positively related to county economic growth.

Crime rate is included in the model because it is one of the important factors that affect household location decisions. Counties with higher crime rates tend to witness a decrease in their populations. New residents shy away from such counties and current residents leave the county when they can. Due to the low desirability of high crime areas, it is hypothesized that crime is negatively associated with county economic growth.

County government policies are assumed to also influence location decisions of both firms and households. Counties with policies to attract and retain employers are assumed to experience more economic growth. Whether counties provide business incentives is included in the estimation since incentives have been shown to affect economic growth. According to Honadle et al. (2004), for instance, although provision of incentives may lead to long term growth it may also result in no tax revenues or less tax revenues for local governments in the short-run. It is hypothesized that provision of incentives is positively related to county economic growth. Counties with an economic growth plan also tend to experience higher levels of economic growth. An index of county economic growth initiatives is added to the model to capture this potential effect on local economic growth. It is hypothesized that counties with business attraction and retention strategies are positively related with economic growth. Similarly, counties with a higher number of economic growth strategies are hypothesized to be positively associated with high economic growth.

Manufacturing share of total county employment has an effect on county population growth. Counties that have higher percentages of their workforce employed

by the manufacturing sector may experience higher levels of economic growth since historically manufacturing has been a driver of regional growth. More recently, however, due to the decrease in manufacturing jobs and the closing down of many firms, especially smaller sized firms, the effect of manufacturing on growth may be negative (Dunne et al., 1989). The decrease in economic growth, which is measured in terms of decrease in employment, may be influenced by the age, size, and particular industry that is being studied (Dunne et al., 1989). It is hypothesized that higher shares of total employment in manufacturing is related to economic growth. The direction of the relation will depend on the magnitudes of the two effects discussed above.

Lastly, population growth and employment growth are added as regressors in the model due to the hypothesized simultaneity between the two variables. Employment growth is likely to affect population growth and population growth is also hypothesized to affect employment growth (Carlino and Mills, 1987).

All the above county characteristics and economic characteristics are hypothesized to affect county population and employment growth. A base model without the interaction term will first be estimated. A second model that includes the interaction term will be estimated next.

4.3 Empirical Issues

There are some empirical issues that need to be addressed in the model. The study uses cross-sectional data so there is the likelihood that heteroskedasticity will be present. This will be tested for by using Pagan-Hall general test.

There is the possibility that fiscal decentralization is endogenous with respect to population and employment. Hausman test for endogeneity will be used to test for the possible relation. If the test is negative, the model can be estimated as is and will yield consistent estimates. On the contrary, if the test is positive, the endogeneity problem can be corrected for by using an instrumental variables approach. Here a regression will be run with fiscal decentralization as the dependent variable and the regressors will be the regressors from the original equation. This model when estimated will yield predicted values for the fiscal decentralization variable. These predicted values will then be used in the original equation.

4.4 Spatial Spillovers

According to LeSage (1998) traditional regression analysis assumes a linear relationship exists across sample data observations. In other words, regressors are fixed in repeated sampling. When sample relationships change as we move across the sample then spatial methods should be used. LeSage argues further that data collected from geographic units such as zip codes, counties, and states may have measurement errors if these boundaries are different from the underlying processes generating the data. Anselin (1988) also states that in the presence of spatial dependence and spatial heterogeneity, standard econometric techniques may be inappropriate. Standard econometric approaches may have to be changed or modified to account for these spatial spillovers (Anselin, 1988).

Failing to account for spatial effects may lead to biased and inconsistent estimates (LeSage, 1998; Anselin, 1988). According to Anselin (1988) when there is spatial

residual autocorrelation, OLS parameter estimates are unbiased but inefficient. Although some studies such as Dobkins and Ioannides (2001) find that cities with neighbors tend to have interdependent growth rates the relation may or may not be directly transferable to counties. It should be noted that this study does not take into account spatial spillovers. There is the possibility of spatial spillovers since counties are used as the unit of analysis. Spatial spillovers may be important in the effects of decentralization on economic growth but this dissertation does not address this. This is clearly a limitation of the study especially if spatial spillovers do exist in the data.

4.5 Identification of Model

In estimating a simultaneous equation model, it is important to verify whether the system is possible to estimate. Firstly, to have a system of equations that is complete and can be estimated, the number of equations must be equal to the number of endogenous variables (Greene, 2003). In the model used for this study, the number of endogenous variables is equal to the number of equations in the simultaneous equation system.

Secondly, it is important to verify whether the system is identified. The system must meet the rank and order conditions. The reduced form equation may have more than one solution. If the system is identified, this problem is avoided. The condition of rank and order must be met in order to guarantee a unique solution.

According to Greene (2003), to satisfy the order condition, the number of exogenous variables (K) excluded from the equation should be larger or equal to the number of endogenous variables (M) in the system. This condition is a necessary but not

sufficient condition for identification. To ensure a unique solution, the sufficient condition or rank must also be met. That is, $rank\left[\pi^*, \Pi^*\right] = rank\left[\Pi^*\right] = M$.

The structural form is $Y'\Gamma + X'B = E'$

or $\begin{bmatrix} E \\ P \end{bmatrix} \begin{bmatrix} 1 & \gamma_1 \\ \gamma_2 & 1 \end{bmatrix} + \begin{bmatrix} 1 \\ X_1 \\ \vdots \\ X_K \end{bmatrix} \begin{bmatrix} \alpha_1 & \beta_1 \\ \vdots & \vdots \\ \alpha_k & \beta_k \end{bmatrix} = \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix}$

Y represents the endogenous variables (employment growth, E and population growth, P), X represents the exogenous variables, B represents the parameters of the exogenous variables and k is the number of exogenous variables. Solving for the reduced form of the equation gives the following:

$Y' = -X'B\Gamma^{-1} + E'\Gamma^{-1} = X'\Pi + V'$
$\Rightarrow \Pi = -B\Gamma^{-1}$
so $\Pi\Gamma = -B$

and $\begin{bmatrix} \pi & \Pi \\ \pi^* & \Pi^* \end{bmatrix} \begin{bmatrix} 1 \\ -\gamma \end{bmatrix} = \begin{bmatrix} \alpha \\ 0 \end{bmatrix}$

Where π is the parameter for the exogenous variables and π^* is the parameter for the excluded variables.

Thus,

$\pi - \Pi\gamma = \alpha$
$\pi^* - \Pi^*\gamma = 0$

$\Rightarrow$ The number of equations equals the number of exogenous variables and the number of equations equals the number of excluded variables.

The order condition ensures that $\pi^* - \Pi^*\gamma = 0$ has a solution while the rank

condition given as $rank[\pi^* \quad \Pi^*] = rank[\Pi^*]$ ensures that $\pi^* - \Pi^*\gamma = 0$ has a unique

solution so that the system of equations can be solved. In this study, more than one

variable has been excluded from each equation so both identification conditions have

been met. The system is just identified since $K^* = M$ and the rank condition is also met.

4.6 Data

The lack of readily available data and the high cost of obtaining this kind of data

make it difficult to conduct studies at the county government level. A survey conducted

in 2000 by the Agricultural Economics Department of The Ohio State University and

National Association of Counties provides data at the county level, which is suitable for

studies on fiscal decentralization at the county level. I argued earlier that the county is an

important level of government. By focusing on county governments, this study will

contribute new insights to the literature on decentralization.

The aim of this dissertation is to analyze the relationship between fiscal

decentralization and economic growth in forty-six states in the U.S. All states with

functioning county governments are therefore included in the study. Thus, a little over

three thousand counties in the U.S. are surveyed. Counties in Hawaii and boroughs in

Alaska are not included in the study because they are geographically removed from the

continental United States. Similarly, counties in Connecticut and Rhode Island are left

out because they do not have functioning county governments. Louisiana parishes are

included in the survey. The response rate for the data used is 62%.

Data used are mainly from a County Government Survey conducted in 2000. Primary data on county characteristics, fiscal decentralization, and economic growth initiatives will be obtained from the survey. The county government data are obtained from key informants from the various counties. Key informants include county commissioners, administrators, managers, judges, development professionals, auditors, and clerks. Wolman and Spitzely (1996) suggest that the use of key informants is perhaps the only practical way to get county level primary data for many variables. The positions of key informants as well as an initial mailing list were obtained from the National Association of Counties (NACo). Additional details on the data are found in Lobao and Kraybill (2005).

Secondary data on employment, population, income, crime, and human capital will be obtained from the 1990 and 2000 U.S. Census of Population and Housing. County rurality status will be obtained from the rural-urban continuum codes developed by U.S. Department of Agriculture. The amenities scale used will be obtained from USDA-ERS. Economic characteristics such as employment in manufacturing share will be obtained from County Business Patterns data from the U.S. Census Bureau.

4.7 Conclusion

In this chapter, the methodology for this study is described. The specific model that will be estimated and the variables that will be used are described in this chapter. The justification for the variables in the estimation is also discussed. This chapter also includes a discussion of some empirical issues that will be addressed in the model

estimation process. Finally, data used for the empirical estimation and sources of the data

are provided in this chapter.

CHAPTER 5

RESULTS

This chapter discusses the results obtained in the study. The signs on the

regression coefficients and the level of significance for each variable will be provided for

both equations in the systems of equations estimated in this dissertation. Possible

explanations for the results are discussed in the first section of the chapter. The next

section of this chapter addresses the hypotheses that are tested in this study. Econometric

issues such as multicollinearity, endogeneity, as well as heteroskedasticity are tested and

the test results and discussions are presented in this chapter. The last section is a

concluding summary of the results.

5.1 Econometric Results

This section contains a description of the results from the simultaneous equation

models estimated in this study.

5.1.1 Model Without Interaction Variable

The first model was estimated using all the variables with the exception of the interaction term between decentralization and rural status. The results from this base model are discussed in the next two sections.

5.1.1.1 Population Equation

Table 5.1 shows the results obtained from the estimation of the base simultaneous equation model. The coefficient of employment growth is positive and significant at the 1% level. This indicates that employment growth is positively associated with population growth. Thus people are more likely to locate in counties with higher employment. This occurs because people are likely to get jobs in areas with higher employment growth.

The coefficient of population density is negative and significant at the 1% level. Population density is negatively associated with population growth. This is most likely due to congestion.

The coefficient of initial population is positive and significant at the 1% level. Counties with high populations in 1990 are likely to still have high populations in 2000.

The coefficient of median family income is positive as expected but not significant. Median family income was not found to significantly influence population growth.

The coefficient of crime rate is negative and significant at the 1% level. Crime rates are negatively related to population growth. Counties with high crime rates tend to have lower population growth.

The coefficient of manufacturing share and that of natural amenity factor are not significant. These two variables were expected to positively affect population growth.

The coefficient of county growth initiatives is negative and significant at the 5% level. Counties with higher numbers of growth strategies are negatively associated with population growth. It was posited that this variable will positively affect population growth. The negative relationship could be due to the potential effect of taxes. Higher numbers of growth initiatives could translate into higher taxes to help finance these projects thus decreasing population growth. A second possible explanation could be the notion that the city government needs to focus on a fewer number of growth strategies so that the outcome would be more efficient.

The coefficient of rural status is positive and significant at the 1% level. This shows that population growth is higher as one moves from more urban to less urban and more rural counties. Population growth in more rural counties could be due to two reasons. First, it could be due to retirees moving to more rural counties for the peace and quiet. Second, it could be due to people moving out of the city centers and relocating in the suburbs or adjacent rural areas and possibly commuting to work in the adjoining metro areas.

The coefficient of decentralization is not significant in this model. The intercept is not significant as well.

Variables	Population Growth	Employment Growth
Intercept	1116.80	764.40
	(0.21)	(0.31)
Employment growth	1.74***	
	(34.06)	
Population growth		0.54***
		(19.92)
Population density	-9.16***	4.90***
	(-14.22)	(10.40)
Population 1990	0.12***	
	(95.30)	
Employment 1990		-0.16***
		(-39.15)
Median family income	0.07	
	(1.09)	
Education		0.10***
		(3.99)
Crime rate	-1.03***	
	(-5.08)	
Manufacturing share	28.03	0.41
	(0.86)	(0.02)
County economic growth initiatives	-648.27**	264.67
	(-2.13)	(1.54)
Incentives		527.79
		(1.27)
Amenity factor	160.59	-46.70
	(0.34)	(-0.18)
Fiscal decentralization	-1164.05	794.25*
	(-1.34)	(1.68)
Rural status	1497.76***	-985.77***
	(7.90)	(-10.80)

*** Significance at 1% levels
** Significance at 5% levels
* Significance at 10% levels
The numbers in parenthesis are the t-values.

Table 5.1: Regression estimates for base model

5.1.1.2 Employment Equation

The results from this section are shown in Table 5.1 above. The coefficient of population growth is positive and significant at the 1% level. This means that population growth is positively related to employment growth. Employment tends to move to areas with higher population.

The coefficient of population density is positive and significant at the 1% level as expected. Population density is positively associated with employment growth. Higher population densities tend to provide labor for employers.

The coefficient of employment in 1990 is negative and significant at the 1% level. Thus, initial employment levels are negatively related to employment growth. This result could be attributed to the high loss of jobs by people especially those in the manufacturing sector. Another related reason could be the outsourcing of jobs in the U.S.

The coefficient of education is positive and significant at the 1% level. This is the expected result. Counties that are highly educated (have more bachelor degree holders) are positively associated with employment growth. This is because employers prefer to hire more educated and highly skilled individuals since this increases productivity.

The coefficient of manufacturing share of total employment is positive but not significant. It was posited that manufacturing shares would be positively associated with employment growth. The lack of significance could be associated with the loss of thousands of manufacturing jobs and the decline in the manufacturing sector in general in many U.S. cities and counties.

The coefficient of county growth initiatives is positive but not significant. Although growth strategies such as creation of industrial parks for example, tend to

attract employers into a county, it does not appear to significantly impact job creation in the model.

The coefficient of provision of business incentives is also positive but not significant. It was anticipated that incentives would positively influence economic growth in U.S. counties. Contrary to expectations that counties that provide business incentives are more likely to have higher employment growth, we do not find this to be the case. This could be because businesses consider other factors as more important in location decisions.

The coefficient of natural amenity factor is not significant. It was expected that amenities would influence location decisions of businesses. The lack of significance could be because natural amenities, although an important location factor in the past are not as important in location decisions in today's world. An exception could be businesses that need the particular amenities to function.

The coefficient of rural status is negative and significant at the 1% level. Thus rural status is negatively related to employment growth. Thus as we move from less rural counties to more rural counties, we are likely to experience lower economic growth. This could be due to rural areas having lower skills, lower education levels, and fewer public services. These characteristics could be the reason for the negative relation between rural counties and employment growth.

The coefficient of decentralization is positive and significant at the 10% level. This result shows that counties that administer welfare are more likely to experience employment growth. Thus county government efforts to retain and attract employers with

the aim of providing jobs for county residents and ex-welfare recipients may be showing some successes.

5.1.2 Model With Interaction Variable

Given that decentralization was not significant in the population model described above and the hypothesis of a varied effect on counties depending on their rurality, a second model was estimated to explore the potential effects of decentralization on economic growth depending on the rural-urban status of the county. It is posited that decentralization's effects on economic growth is moderated by how rural or urban a county is. An interaction term is constructed between decentralization and rural status and included in the model discussed above. The second model was therefore estimated using all the variables including the interaction variable. The results of the model are presented below.

5.1.2.1 Population Equation

Results for the population growth equation are provided in Table 5.2 found below. The coefficient of employment growth is positive and significant at the 1% level as expected. Employment growth has a positive effect on population growth. This supports the idea that people follow jobs.

The coefficient of population in 1990 has a positive sign and is significant at the 1% level. Initial population level has a positive effect on population growth. Counties with high populations are likely to have continued to grow through 2000.

The coefficient of population density is negative and significant at the 5% level. Population density is negatively associated with population growth. People tend to avoid moving to heavily congested areas due to the negative factors associated with congestion. Some common attributes of congestion that repel population are pollution, traffic, crime, and decrease in affordable housing.

The coefficient of crime rate has a negative sign and is significant at the 10% level. This result supports our expectations. Crime has a negative effect on population growth. Areas with high crime rates tend to act as population repellants since most people, given the choice, would not want to live in a high crime area.

Median family income is expected to positively affect population growth. In the estimation, the coefficient of income has the expected sign but is not significant. It was anticipated that counties with higher incomes would be positively related to population growth. Although population may still move to areas that hold the promise of higher incomes, that may not be the most important location determinant. People may consider availability of jobs, crime rates, quality of school district, and availability of public services as more important than median household incomes of an area before they make their location decisions.

The coefficient of the share of employment in manufacturing is positive but not significant. It was expected that higher manufacturing shares would positively influence employment growth. It is possible that manufacturing is not as important as it used to be in determining and driving growth.

The coefficient of county economic growth strategies is negative and significant at the 5% level. This result implies that higher numbers of economic growth strategies are

negatively associated with population growth. It was expected that counties with a higher number of economic growth strategies will have a positive effect on population growth since it would show evidence of county officials attempting to improve the economic health of the area. The negative relation could be due to the reason alluded to under the no interaction model. Higher numbers of growth strategies may be perceived as lack of focus by local governments. Also, if these initiatives lead to higher taxes it could result in a decrease in population.

The coefficient of natural amenities was found to be positive. The effect is, however, not significant. Amenity factor was hypothesized to positively affect population growth. The presence of natural amenities may still positively affect population growth especially among the wealthy and retirees. It may, however, be a less important location factor for the rest of the population. This could be the reason for the lack of significance of the coefficient of amenities in the model.

The coefficient on the variable for counties with devolved welfare is negative and significant at the 10% level. Since this is one of the variables used in the interaction term included in the regression its interpretation is slightly different from that of the normal regression coefficient (Jaccard and Turrisi, 2003). Here counties that administer welfare were coded as 1 and counties that do not administer welfare were coded as 0. Also, the rural-urban status of counties are coded from 0 to 9 with zero being large metropolitan counties and 9 being completely rural and remote counties. Refer to Appendix A for details on the rural-urban continuum codes.

Using partial derivatives from the estimated equations facilitate the interpretation of the coefficients of variables used in the interaction term. From the equations below:

$$P = \beta_0 + \beta_1 Rural + \beta_2 Decentralization + \beta_3 Rural * Decentralization + \ldots + \varepsilon$$
$$\frac{\partial P}{\partial Decentralization} = \beta_2 + \beta_3 Rural$$

Thus, the effect of decentralization on more urban counties is seen through the coefficient on decentralization, β_2, and the effect of decentralization on more rural counties is seen through the sum of the parameter estimates $\beta_2 + \beta_3$. The coefficient of decentralization therefore shows the effect of decentralization on population growth in more urban counties. This coefficient is negative and significant at the 10% level. In urban counties, decentralization results in a decrease in population of 4872 people on average. Decentralization is negatively associated with population growth in this case.

To evaluate the effect of decentralization on population growth for more rural counties, a joint test is done on the parameter estimates $\beta_2 + \beta_3$. The test statistics are shown below in Table 5.4. The joint test hypothesis reveals that the effect of decentralization on economic growth is affected by the rural-urban status of counties. The test shows significance at the 10% level. This result indicates that in more rural counties, the effect of decentralization on population growth is negative. Thus decentralized rural counties experience a decrease in population. The coefficient shows that more rural counties experience a decrease in population of 4180 people on average when counties are decentralized.

The coefficient of rural status is positive and significant at the 1% level. Thus rural non-decentralized counties are positively associated with population growth. Non-decentralized rural counties show a population increase of 1273 on average. While non-decentralized rural counties have increased in population, decentralized rural counties

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have decreased in population. These results support the hypothesis that decentralized rural counties are negatively related to economic (population) growth.

The results suggest that decentralization negatively affects population growth in both urban and rural counties and that these effects are significant. Decentralization therefore has a negative effect on population growth in U.S. counties.

Variables	Population Growth	T - Value
Intercept	2666.22	0.51
Employment growth	1.75***	5.50
Population1990	0.12***	12.29
Population density	-8.90**	-2.40
Median family income	0.07	0.43
Crime rate	-1.07*	-1.76
Manufacturing share	24.36	0.70
County economic growth initiatives	-624.42**	-2.02
Amenity factor	127.33	0.29
Fiscal decentralization	-4871.78*	-1.83
Rural status	1272.59***	2.75
Interaction between decentralization and rural status	690.65*	1.79

*** Significance at 1% levels
** Significance at 5% levels
* Significance at 10% levels

Table 5.2: Population growth in U.S. counties

5.1.2.2 Employment Equation

Results obtained from the estimation of the employment growth equation are presented in this section. The results discussed below are presented in Table 5.3.

For the employment equation, the coefficient of population growth is positive and significant at the 1% level. Population growth has a positive effect on employment growth. This supports the theory that jobs follow people.

The coefficient of employment in 1990 is negative and significant at the 1% level. Thus initial employment has a negative effect on employment growth.

The coefficient of population density is positive and significant at the 10% level. These are the expected results. Counties with high population densities are positively associated with high employment growth. A possible reason for this positive association is the location of employers in the area due to the higher availability of labor.

The coefficient of education is positive but not significant. It was anticipated that education would significantly affect employment growth in a county. The reason is that higher education is positively correlated with higher productivity so employers tend to locate in areas with high education levels. Hence counties with more educated people are likely to attract employers thus increasing employment in the county. The possible reason why education is not significant in this model is that other factors may be more important in location decisions of employers. For instance, more weight could be placed on the business environment, health of the economy, and tax rates of the county before businesses decide to stay in a county or move to a new locality. Measuring data variables has some limitations and this could also be the reason why these unexpected results are obtained.

The coefficient of provision of incentives is positive but not significant. Business incentives do not significantly influence employment growth. Since business incentives are offered by local governments to retain and attract businesses, it was anticipated that this variable would be positively related to increases in employment growth in counties. Although local governments continue to provide business incentives, it seems to be less important in business location decisions.

The coefficient of county economic growth initiatives has a positive sign as expected. The variable is, however, not significant. A possible explanation for this result is that a county with high numbers of economic growth strategies could be a signal to businesses that the county is in fiscal stress. It could also be interpreted by businesses as a county with poor economic health and the numerous growth initiatives as attempts to turn around the local economy. Given these possible reasons, it could be possible that counties with more growth initiatives would not significantly increase employment through business retention and attraction.

Similarly, the coefficient of share of employment in manufacturing is positive as expected. The coefficient is also not significant here. This result could be due to the decrease in manufacturing sectors of many local communities. Also, high manufacturing areas may not have population with the skills needed by some employers.

The coefficient of natural amenity factor is negative and not significant in the model. Natural amenities may not be very important to businesses that do not require the amenity the county possesses to operate. This could help explain why the variable is not significant.

For the employment equation, a similar process as used in the population equation is used to interpret the interaction variable and the components of the variable. Given the employment equation, partial derivatives of employment with respect to decentralization give the effect of decentralization for rural and urban counties.

$$E = \gamma_0 + \gamma_1 Rural + \gamma_2 Decentralization + \gamma_3 Rural * Decentralization + ... + \varepsilon$$

$$\frac{\partial E}{\partial Decentralization} = \gamma_2 + \gamma_3 Rural$$

The coefficient of decentralization shows the effect of decentralization on employment growth in urban counties. In more rural counties, the effect of decentralization on employment growth is seen through the joint parameter $\gamma_2 + \gamma_3$. As shown on Table 5.3 the coefficient of decentralization is positive but not significant. This indicates that decentralization does not significantly affect employment growth in urban counties. Although employment increases by 3323 on average, this increase is not significant.

The effect of decentralization on employment growth in more rural counties is an increase of 2900 jobs on average. This effect is, however, not significant from the joint test statistics provided in Table 5.4.

Decentralization does not significantly affect employment growth in more rural counties. It was hypothesized that there would be a negative relation between decentralization and employment growth as counties become more rural. This was not shown by the results.

The coefficient of rural status of a county is negative and significant at the 10% level. This result shows that for non-decentralized rural counties, there is a decrease in employment growth.

Variables	Employment Growth	T - Value
Intercept	-101.63	-0.02
Population growth	0.53***	3.02
Employment 1990	-0.16***	-5.37
Population density	4.67*	1.69
Education	0.11	0.92
Manufacturing share	3.07	0.18
County economic growth initiatives	234.67	0.82
Incentives	588.53	1.54
Amenity factor	-21.85	-0.10
Fiscal decentralization	3322.84	1.54
Rural status	-852.52*	-1.86
Interaction between decentralization and rural status	-422.61	-1.20

*** Significance at 1% levels
** Significance at 5% levels
* Significance at 10% levels

Table 5.3: Employment growth in U.S. counties

The joint test statistics discussed above for both the population and employment growth equations are given in Table 5.4. The p-values show that the joint effects are significant in the population equation. This shows that the effect of decentralization on population growth is significant at the 10% level in rural counties. The joint effects in the employment equation are not significant at the 10% level.

Variable	Population Growth		Employment Growth	
	F-value	P-value	F-value	P-value
Decentralization-rural status interaction	3.31	0.07	2.57	0.11

Table 5.4: Joint test statistics for the interaction variable

5.2 Hypotheses

In this section, the hypotheses outlined in the beginning of this document are addressed. The first hypothesis is that decentralization has a negative effect on economic growth in U.S. counties. Using the t-test statistics from the regression, it is noticed that decentralization is negatively associated with population growth in the U.S. Decentralization, however, has a non significant effect on employment growth in U.S. counties. The hypothesis is partially rejected. This is because decentralization was found to have a negative effect on population growth but not on employment growth.

Considering both equations, the results seem to support the intermediate perspective on decentralization where effects of decentralization may differ depending on the particular characteristics of the county.

The second hypothesis is that fiscal decentralization causes lower economic growth in rural counties compared to urban counties. The results obtained from the t-test from both simultaneous equations indicate that decentralized rural counties are associated with negative population growth. There is no significant relationship with employment growth. The results show the same relationship with urban counties. Decentralized urban counties also show a negative relation with population growth and a non significant relationship with employment growth. This hypothesis is rejected because although the results show a negative relation with population growth, first it shows no relation with employment growth and second, the relationship appears to be similar for both rural and urban counties. Considering that rural populations tend to be lower than urban populations, population changes of the same magnitude are likely to have a bigger impact on rural compared to urban counties. When this possible effect is considered, the hypothesis may be accepted with a caveat. Hence spatial marginalization may be occurring in population growth.

The third hypothesis is that employment growth has a positive effect on population growth. The regression results support this hypothesis. The positive and significant employment growth variable indicates that employment grew where population grew. We fail to reject this hypothesis. From the conceptual framework, it was seen that the process of agglomeration economies could lead to concentration of jobs and

labor. The finding that people follow jobs supports agglomeration economies as a driver of growth.

The fourth hypothesis is that population growth has a positive effect on employment growth. The regression results show that population growth is positively associated with employment growth as evidenced by the positive and significant coefficients. Thus counties with high population growth were associated with high employment growth as well. We fail to reject this hypothesis. These results also support the conceptual framework that agglomeration economies are a determinant of economic growth.

5.3 Endogeneity Test Results

For the models estimated in this study, it was anticipated that fiscal decentralization would be endogenous. To test for the endogeneity of this variable, a Hausman test was done. The null hypothesis for the test is that decentralization is exogenous and the alternative hypothesis is that the variable is endogenous. The Hausman test that was performed was significant. This means that decentralization is endogenous. As a result, fiscal decentralization was regressed on the exogenous variables and predicted values were obtained. These predicted values were then used in the model estimation to get the results presented in the first section of this chapter. The test statistics are shown below in Table 5.5.

Equation	Hausman Test Statistics	P-Value	Durbin-Wu-Hausman Test Statistics	P-Value
Population growth	164.32	0.00	153.67	0.00
Employment growth	62.75	0.00	62.37	0.00

Table 5.5: Hausman test statistics

5.4 Heteroskedasticity Test

The study uses cross sectional data and so it is most likely that the assumption of constant error variance does not hold. Since heteroskedasticity is likely to occur when using cross-sectional data (Greene, 2003), it is important to test for it in the model. According to Pindyck and Rubinfeld (1998), in the presence of heteroskedastic disturbances, more weight is placed on observations with larger error variances and less weight is placed on observations with small error variances. The estimates in this case are unbiased and consistent but they are not efficient.

The results of the test are shown below in Table 5.6. The null hypothesis of the test is that the disturbances are homoskedastic or have constant variance. The p-values from the test show a significance level of 1%. This indicates that heteroskedasticity is present in the model. To correct for heteroskedasticity robust estimates are obtained. This corrects for the inflation in the standard errors of the estimates.

Test	Population Growth		Employment Growth	
	$\chi^2_{(53)}$	P-value	$\chi^2_{(53)}$	P-value
Pagan-Hall general test statistic	353.74	0.00	500.73	0.00

Table 5.6: Heteroskedasticity test results

5.5 Dealing with Multicollinearity

During the estimation of the model, we experienced some problems with multicollinearity among some exogenous variables especially the state dummy variables. According to Motulsky (2002), the problem of multicollinearity is common in multiple regressions. He explains that if the aim of the model is to predict the dependent variable, multicollinearity is not a problem, however, if the aim is to explain how the independent variables affect the dependent variable, then multicollinearity is a big problem. Greene (2003) states that since nonexperimental data will never be orthogonal ($R^2 = 0$), multicollinearity cannot be completely eliminated. Multicollinearity is a problem when small changes in the data cause big changes in the regression coefficients or when coefficients have the wrong signs or unexplainable sizes. Another indicator of this problem is when the standard errors of coefficients are very high but the levels of significance are low and the overall fit of the model is good (that is high R^2).

Several corrections can be made to reduce this problem. One way is to decrease the dataset by deleting redundant variables caused by high relationship with another

variable(s). Another way, albeit infeasible in the case of this dissertation, is to increase the sample size thus increasing the data observations. Motulsky (2002) suggests including interaction terms to decrease the problem of collinearity. Other suggestions include converting variables into rates or centering data when it makes sense to do so. Greene (2003) also proposes the use of a ridge regression to reduce collinearity. Refer to Greene (2003) for more information on ridge regressions and additional references on this type of regression.

In this dissertation, multicollinearity was detected by finding the variance inflation factors of the variables. This helped to identify the variables that were highly collinear. Some of the solutions used to deal with multicollinearity in this dissertation were to center the data for initial population and employment levels. Also some variables such as per capita income were changed to median family income. Also, the population with bachelor degrees rather than high school degrees was used in the regression. For the state dummies, some neighboring states were combined as one to reduce the incidence of multicollinearity. The list of states that were combined is provided in Appendix E. One state (Wyoming) was also dropped to prevent collinearity problems thus avoiding the dummy variable trap.

5.6 Conclusion

In this chapter, the empirical results obtained from the estimation are provided. The econometric tests undertaken are discussed in this chapter.

We test for heteroskedasticity, endogeneity of fiscal decentralization, and multicollinearity. Different ways in which these econometric issues are addressed in this

study are discussed in this chapter. The results indicate that decentralization is negatively related with population growth in U.S. counties. A similar relationship was found for all counties irrespective of their rural-urban status. The decrease in population could be due to the effects of the anti-decentralization perspective which states that decentralization is negatively associated with economic growth.

These results support the hypothesis that decentralization has a negative effect on economic growth in terms of population at the county level. The results also show that decentralization does not significantly affect employment growth. Employment growth may thus be driven by other factors.

The classic results that population growth positively affects employment growth and employment growth positively affects population growth are also found in this study. The results also show population trends across America where people increasingly move from the urban centers to the suburbs.

Although a negative effect is shown between decentralization and population growth in rural counties, urban counties also show a negative relation. This could mean that an outright spatial marginalization hypothesis is not found. I, however, argue that the decrease in population in rural and urban counties is almost the same in magnitude and so the effect might be greater in rural counties. The argument is that since the population base in rural areas is smaller, the slow growth in population could also lead to a slow growth in the tax base compared to that of urban counties. The decrease in population also indicates that the share of total employment that is lost will therefore be greater in rural counties than in urban counties. This argument indicates that some degree of spatial marginalization may still exist.

CHAPTER 6

CONCLUSION

This chapter concludes the study. The first section contains a summary of the study. The second section is a summary of the key findings of the study. The third section provides some limitations of the study. The last section provides the importance of the study to policy makers. Some policy recommendations will be given in this section. This section also gives some areas for future research on decentralization and economic growth in the U.S.

6.1 Summary of Study

In this study, the implications of fiscal decentralization on economic growth are studied. Decentralization is seen to have diverse effects on economic growth in various countries and regions. Most of the studies use different measures of decentralization and so different effects and recommendations are provided. This study seeks to add to the literature on decentralization and economic growth by studying these relationships at the county level.

Economic growth is defined in terms of population and employment growth. Specifically, effects of decentralization on population and employment growth are studied at the county level in the U.S.

Several important factors led to the selection of counties as the study unit. In particular the increasing role of county governments in public service provision, economic growth initiative, and welfare administration led to the focus on county governments. In addition, the fast growth of counties prompted the focus of this study to be at the county level. County governments are also increasingly involved in the dealings between different levels of government and between governments and individuals. In addition, counties are studied because of the recent availability of U.S. county government data.

Numerous studies have been done on fiscal decentralization's effects. Most of the studies as discussed in the literature review section of this dissertation have, however, concentrated on government levels other than the county. Similarly, several studies have focused their attention on evaluating economic growth in various countries and at various government levels. Studies that have focused on growth at the county level considered other factors and do not include decentralization. Given the apparent gap in the literature on county governments, this study seeks to bridge this gap.

Given the lack of a unifying economic growth theory, this study presents a review of some prominent economic growth theories. Some of these theories such as cumulative growth theory and agglomeration economies are used as the framework upon which this study is based. The conceptual framework also serves as the source of hypotheses that are tested. It also assisted in variable selection for the estimation of the models.

To evaluate the relationship between county growth and fiscal decentralization, a model based on that by Carlino and Mills (1987) is estimated. The model consists of a 2SLS estimation with population and employment growth as the endogenous variables. The exogenous variables consist of county characteristics, economic characteristics, fiscal decentralization, and state dummies.

Both primary and secondary data are used in the estimation. Primary data are obtained from a County Government Survey. The survey provides information on county government characteristics, decentralization, and some growth initiatives. The results obtained from the econometric analysis are summarized in the next section. Secondary data are mainly from the U.S. Census Bureau, County Business Patterns, and USDA-ERS.

6.2 Summary of Results

The regression yielded both anticipated and non-anticipated results. Some anticipated results showed that counties with higher population growth were associated with higher employment growth and vice versa. These results are supported by the conceptual perspectives behind this study. Theories of agglomeration economies predict that growth occurs through concentration of economic activity. The growth and concentration of population spurs economic growth. Likewise the results indicate that the growth and concentration of employment leads to population growth.

Also, as should be expected, high population density counties were associated with higher employment growth and lower population growth. Here the increase in growth is also supported by the growth theories of agglomeration economies. The lower

population growth could be due to a greater congestion effect and higher employment growth could be due to the presence of a rich labor pool in the county.

The finding that decentralization is negatively related to population growth is supported by the anti-decentralization perspective. The lack of significance of decentralization on employment growth shows that another perspective, possibly the intermediate perspective on decentralization, might be in operation here. The negative effect of decentralization on population growth in rural counties leads to the conclusion that some degree of spatial marginalization may be occurring.

Counties with higher education levels were positively associated with higher employment growth in the base model. Other expected results were the effect of social county characteristics such as crime rate on growth. This variable was found to negatively affect economic growth in U.S. counties. County growth initiatives were found to be negatively associated with population growth and did not significantly affect employment growth.

Variables which were expected to affect economic growth but which were not significant in the study were income and amenities. Similarly, for all models, the manufacturing share of employment did not significantly affect economic growth. Accurate measurement of all variables used in a regression analysis is often difficult and may sometimes lead to unexpected results.

6.3 Limitations of Study

This study, like most research work is not without limitations. One of the potential limitations of this work is that it does not account for spatial spillovers in county

government decision making. It is possible that decisions by county governments to administer welfare, provide various incentives, and implement various economic growth initiatives are dependent on similar decisions by neighboring counties. In essence there could be spatial spillovers in decentralization decisions and their effect on county economic growth. Failure to account for spatial spillovers when they exist could lead to biased parameter estimates (LeSage, 1998). Also, Anselin (1988) establishes that parameter estimates using least squares are inconsistent when spatial dependence exists in the sample. This study could be extended by exploring spatial spillovers using spatial econometric methods.

In the models estimated, provision of incentives was not significant. The measure for this variable was obtained from the County Government Survey. The variable measures whether or not a county provides incentives for the retention and attraction of businesses. It is possible that a detailed list of the different types of major incentives provided or the number of different incentives provided could yield more significant estimates. This information is, however, not easy to obtain.

In this study, some of the results obtained are expected; others are not expected. One reason for findings that do not follow expected theoretical relationships is the limitations of accurately measuring variables. This could be the reason why some variables were not significant in the model.

6.4 Policy Implications and Further Studies

From this study, the effects of decentralization appear to differ depending on whether population growth or employment growth is used to measure economic growth.

It would be worthwhile to investigate the relationships when other measures of growth such as earnings or income are used as measures of economic growth. Further studies are needed to evaluate how the results are impacted when these alternative measures are used.

Since decentralization is associated with a negative effect on population growth in U.S. counties, decentralization may need to be re-evaluated by policy makers. Administration of welfare may thus be more beneficial at a higher level of government.

It is also recommended that policy be geared toward improving variables such as education levels and decreasing crime rates, since these effects on economic growth are more clearly defined and straightforward. Also, since population and employment growth are interrelated, policies that help retain and attract population may help increase employment and economic growth.

Areas for future studies include obtaining a more detailed description of the welfare programs administered by counties and comparing these programs across counties. Other measures of decentralization can also be explored in future studies. For counties that showed a decrease in economic growth, it would be worthwhile studying the potential influences that decentralization could have on the fiscal health of counties and poverty levels of U.S. counties.

Since the amenities variable was not significant, a scale that includes a wider range of factors could be used. An arbitrary count of county government economic growth strategies is used in this study. Future studies could explore how different measures will affect economic growth.

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APPENDIX A

RURAL-URBAN COUNTY CONTINUUM CODES

The Economic Research Service of the U.S. Department of Agriculture has classified U.S. counties into 10 codes ranging from 0 - 9. These codes are based on urban/rural population characteristics and location with respect to metropolitan areas. These codes are used in this dissertation as the rural status variable.

Metropolitan counties

0   Central counties of metropolitan areas of 1 million population or more

1   Fringe counties of metropolitan areas of 1 million population or more

2   Counties in metropolitan areas of 250 thousand to 1 million population

3   Counties in metropolitan areas of less than 250 thousand population

Nonmetropolitan counties

4   Urban population of 20,000 or more, adjacent to a metropolitan area

5   Urban population of 20,000 or more, not adjacent to a metropolitan area

6   Urban population of 2,500 to 19,999, adjacent to a metropolitan area

7   Urban population of 2,500 to 19,999, not adjacent to a metropolitan area

8   Completely rural or less than 2,500 urban population, adjacent to a metropolitan

area

9   Completely rural or less than 2,500 urban population, not adjacent to a

metropolitan area

These codes can be found on the Economic Research Service (USDA) website at:

http://www.ers.usda.gov.

STATISTICAL DESCRIPTION OF VARIABLES

Variable	Maximum	Minimum	Mean	Std Dev
Population growth	950048	-68027	11771.19	45820.11
Employment growth	418662	-264901	4913.38	18388.16
Population 1990	8786096	-76961	0.12	287244.50
Employment 1990	4186418	-36341	0.35	138786.50
Population density	11855.30	0.20	138.21	547.33
Income	80648	12692	35498.44	8644.81
Crime	20125	0	3176.58	2063.25
Education	1009682	0	9389.49	37117
Manufacturing	103.12	0	11.90	11.19
County growth initiatives	7	0	6.78	1.01
Incentives	1	0	0.74	0.44
Amenity factor	7	1	3.53	1.05
Rural status	9	0	5.66	2.70
Decentralization	1	0	0.32	0.47
Interaction	9	0	1.58	2.84

Total number of observations (n) = 1678
Number of rural counties = 1246
Number of non-rural counties = 432
Number of decentralized counties = 537
Number of non decentralized countries = 1141

Table A.1: Descriptive statistics of variables

APPENDIX C

COUNTY GROWTH INITIATIVES INDEX

The index used for county growth initiatives consists of the summation of the presence of the variables listed below:

Whether counties had done the following:

Developed a county strategic plan for economic development

Developed a county marketing plan for economic development

Developed an industrial park

Expanded an existing industrial park

Built special buildings to attract businesses

Maintained a business incubator

Had an economic development professional on staff

APPENDIX D

AMENITY INDEX

The amenity index used is calculated using six main factors. This scale was developed by USDA-ERS. The categories used in constructing the amenities scale are:

Warm winters (average January temperatures)

Winter sun (average January days of sun)

Temperate summer (low winter-summer temperature gap)

Summer humidity (low average July humidity)

Topographic variations (topography scale)

Water area (water as a proportion of total county area)

APPENDIX E

LIST OF COMBINED STATE DUMMY VARIABLES

The dummy variables for the following neighboring states were combined to reduce the problem of multicollinearity.

1. California and Oregon

2. Colorado and Utah

3. Maryland, Delaware, and New Jersey

4. Montana and North Dakota

5. New Hampshire and Vermont