

FISCAL DEVOLUTION AND U.S. COUNTY GOVERNMENTS, 1987-2002

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Lisa Ann Cimbaluk

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## **ABSTRACT**

Within the context of fiscal devolution or decentralization in the United States, states and localities are fulfilling redistributive functions previously under the responsibility of the federal government. Under fiscal federalism, the federal government generally implements redistributive policies while local government focuses on development. The theory of fiscal federalism argues that the potential for redistribution may be lower at the state and local levels than at the federal level due to developmental pressures. As a result, movement toward devolution could decrease redistributive activities and raise the potential for spatial inequality across the nation.

This study pays particular attention to the role of state policy under decentralization as more responsibility for redistribution and development is delegated away from federal government and down to state government. States are emerging as a critical component of the multilevel federalist governmental system by playing both redistributive and developmental roles. The states use two key policy tools to deal with the impacts of devolution: state aid and state centralization. The analysis explores the extent to which state aid is redistributive or developmental in its focus, after controlling for state centralization.

In order to conduct a complete study of decentralization at the micro, meso, and macro government levels, the federal and local government are also examined in addition to the state. The study analyzes government finance during 1987-2002 for all U.S. counties in the lower forty-eight states to answer the following research question: Are federal aid, state aid, and local government revenue effort redistributive, developmental, or both? In particular, the focus is on the changing roles and impacts of federal and state intergovernmental aid and state centralization of fiscal responsibility on local government revenue effort. By looking over the 1987-2002 time period, these evolving roles are tracked at three different governance scales:

federal, state, and local. The contribution of the work is to provide a global picture of governmental finance over a fifteen year period rather than focusing on specific programs. Using data collected from the U.S. Census of Population, U.S. Census of Governments, and U.S.D.A. Economic Research Service, three fixed-effect cross-sectional models are implemented for 1987, 1992, 1997, and 2002. In addition, three fixed-effect generalized estimation models are employed for the entire timeframe.

The results show that both state aid and state centralization have steadily increased throughout the period studied, demonstrating the trend of recentralization within decentralization. The study illustrates the emergence of the meso level state and its important roles for both redistribution and development. State centralization is a substitute for state aid and local effort. State aid is shown to be more redistributive in its focus, while federal aid and local effort are pro-cyclical and developmental.

The findings indicate that the classical theory of fiscal federalism is less applicable to a more decentralized governmental system since federal aid, state aid, and local effort are all found to fulfill functions of both redistribution and development. Instead of a simple dichotomy between redistributive vs. developmental policy objectives, there is a nuanced combination of both types of funding that reflects government support for growth poles as well as some interest in redistribution. The results suggest that these two policy aims, which may seem contradictory, can work together, not in opposition. Due to the economic and demographic disadvantages faced by rural areas, the analysis also takes on a spatial component by focusing on the spatial impacts of devolution in rural and urban counties. Federal and state aid do not specifically target rural or urban counties. However, redistributive federal and state aid is directed toward economic and demographic characteristics of rural counties. On the other hand, developmental federal and state aid is aimed at economic and demographic characteristics of urban counties.

## **BIOGRAPHICAL SKETCH**

Lisa Ann Cimbaluk earned her Bachelor of Arts degree in Sociology from the University of California, Irvine. She completed her Master of Science degree in Development Sociology at Cornell University.

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# **CHAPTER 1**

## **INTRODUCTION**

### **Objective**

The objective of this study is to analyze fiscal decentralization in the United States at the micro, meso, and macro government levels during 1987-2002. More specifically, the focus is on the changing roles and impacts of federal and state intergovernmental aid and state centralization of fiscal responsibility on local government revenue effort. By looking over the 1987-2002 time period, the analysis aims to track these evolving roles at three different governance scales: federal, state, and local. The research documents the emergence of the meso level state and its important roles for both redistribution and development under devolution.

As the United States faces its worst economic crisis since the Great Depression in the 1930s, policymakers are confronting important choices regarding the future of government finance at all levels. In an environment of constrained fiscal resources, how can governments effectively pursue both redistribution and development? How must the funding priorities of the federal, state, and local government change in order to adapt to this new economic era? This analysis contributes valuable insights to these questions by tracking the redistributive and developmental impacts of federal aid, state aid, and local effort over 1987-2002.

### **Research Question**

Within the context of fiscal devolution in the United States, states and localities are fulfilling redistributive functions previously under the responsibility of the federal government. Under fiscal federalism, the federal government generally implements redistributive policies while local government focuses on development. The theory of fiscal federalism argues that the potential for redistribution may be lower at the state and local levels than at the federal level due to developmental

pressures. As a result, movement toward devolution could decrease redistributive activities and raise the potential for spatial inequality across the nation. The study will answer the following research question: Are federal aid, state aid, and local government revenue effort redistributive, developmental, or both?

### **Design and Methods**

State- and county-level finance data were collected from the U.S. Census of Governments Finance Files for 1987, 1992, 1997, and 2002. Demographic data were retrieved from the U.S. Census of Population and Housing for 1980, 1990, and 2000. To answer the research question of whether federal aid, state aid, and local effort are redistributive or developmental, this study utilizes a fixed effect cross-sectional and generalized estimation modeling approach. Three fixed-effect cross-sectional regression models are run for 1987, 1992, 1997, and 1992. Next, three fixed effect generalized estimation models (GEM) are run including the data for all four model years in addition to significant interactions with a year variable to track trends over time.

### **Outline**

Chapter 2 reviews the rural sociology literature pertaining to fiscal devolution and outlines the research question. Chapter 3 describes the methodology implemented to conduct the study including data sources, unit of analysis, regression modeling techniques, variables, and descriptive statistics. Chapter 4 provides an analysis and discussion of the regression results, in addition to the wider theoretical and policy implications of the study. Chapter 5 is the conclusion and offers policy recommendations, challenges for future policy, and questions for future research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **Outline**

This chapter reviews the literature building the foundation for this study of fiscal devolution impacts on county government. First, the U.S. federalist governmental system and its division of responsibilities for redistribution and development functions are explained. Next, the historical patterns of centralization and decentralization of the U.S. government are discussed. Then, the rural sociology literature outlining the advantages and disadvantages of devolution is reviewed. Finally, the research question that this analysis sets out to answer is stated.

#### **Federalism**

Federalism is a governmental system in which powers are divided between higher and lower levels of government such that both levels have separate and autonomous responsibility for social and economic welfare (Peterson 1981). The theory of fiscal federalism lays out a general normative framework for responsibilities at different levels of government and the appropriate fiscal instruments for carrying out these functions (Oates 1999). Fiscal federalism sets forth an active and positive role for the central government in terms of correcting various forms of market failure, providing efficient output levels of national public goods, stabilizing the macro-economy at high levels of employment with stable prices, and establishing an equitable distribution of income by providing assistance to the poor (Oates 2005). The national level of government is in the position to pursue both redistributive and macroeconomic stabilization policies, with its broad and inclusive geographic scope. Localities face special difficulties in dealing with economic and social conditions that sprawl across jurisdictional boundaries (Pelissero and Morgan 1992). The federal government also has capacity for the collection and redistribution of progressive

income taxes, whereas state and local tax systems are typically more regressive (Oates 1999; Warner and Pratt 2005).

Under fiscal federalism, local government plays a critical role in maintaining quality of life by providing important services (education and public safety) and infrastructure (roads, sanitation, and water supply). The quality of such services and infrastructure depends on the economic capacity to generate revenues needed to accommodate spending demands (Johnson et al. 1995). Government poverty indicates a lack of local government spending on public services due to the shortage of financial resources. Where this condition occurs, government services are inadequate, adversely affecting the economy and standard of living (Reeder and Jansen 1995). To the extent that local public sector investments are deemed important to create a level playing field of basic services and infrastructure to promote economic development, rising inequality is an expected result of both market forces and widely divergent local government investment capacity (Warner and Pratt 2005).

Local government financial capacity is largely determined by two sources: the local labor market and government transfer payments. Larger macroeconomic forces determine the structure of local labor market opportunity, while demographic features determine the level of transfer income. As a result, local governments can do little to increase their economic capacity (Warner 1999). Fiscal disparities exist when local governments must levy different tax rates to provide the same level of public services. These disparities reflect differences in both the ability of local governments to raise revenues and in the costs of providing local public services. Cost disparities arise because economic, social, and demographic factors beyond the control of local governments make it more expensive to provide any given level of public services in some areas than in others (Bradbury et al. 1984).

Subject to balanced-budget constraints, state and local governments find that when their revenues decline during a recession, they must respond by cutting expenditures for a wide range of public services. In such a context, a role for the central government to provide fiscal assistance to states and localities is important so they can maintain prior spending levels (Oates 2005). State and local governments facing large budgetary shortfalls are often not able to fund redistributive programs for low-income populations. A result of decentralization is that states and localities reduce their fiscal commitment to the poor, particularly in times of fiscal stress (Chernick and Reschovsky 2003). The traditional justification for intergovernmental aid is to equalize the burden of providing standard quality public services, given unequal need and capacity (Warner and Pratt 2005; Warner 2001, 1999). State and federal aid, as political sources of revenue, can ameliorate or exacerbate unequal financial capacity across local governments (Warner 1999).

### **Redistribution vs. Development**

As relations between national, state, and local government have evolved over the last century, the three levels of government have taken on distinctively different domestic policy roles. Traditionally, state and local governments manage developmental policies that build the physical and social infrastructure necessary for economic growth. Such infrastructure includes police and fire services, mass transit systems, schools, roads and highways, public parks, and sanitation systems (Peterson 1995). On the other hand, the federal government historically has been responsible for redistributive policies that transfer economic resources from those who have gained the most from economic growth to those who have gained the least — the poor, unemployed, disabled, sick, elderly, and families headed by single parents. Historically, it levied higher taxes on businesses and the wealthy than on the poor, and then carried out redistribution through social welfare, healthcare, pensions, and other

programs aimed at needier places and populations (Peterson 1995). Globalization challenges redistribution as pressures for the federal government to become more developmental have led to an increased reliance on the taxation of labor over capital during the past few decades.

Inter-jurisdictional competition lies at the core of the federalist division of responsibilities. Public choice theory argues that competition between local governments drives them to more efficiently provide basic public services and promote economic development (Tiebout 1956). However, this same competition engenders a “race to the bottom” among state and local governments as they compete for development (Donahue 1997). In reality, there is some overlap between the roles of federal, state, and local government. This study aims to disentangle the redistributive and developmental effects of government policies at all three levels.

As a result of the limitations placed on local government, it typically concentrates on developmental objectives. Infrastructure development is a function that local government can perform because decentralization allows for a better match between the supply of public services and their variable demand (Peterson 1981). Local governments are close to their constituencies and possess knowledge of local needs, conditions, and circumstances that is not available to higher levels of government. It is impossible for a national government to determine the particular preferences of residents in the myriad of decentralized jurisdictions that make up the nation as a whole (Oates 2005). By taking geographic differences into account, developmental policies that are sensitive to particular local needs for infrastructure and human capital can be effective for promoting economic growth (Oates 1999). However, decentralization can also challenge regional integration and coordination of the infrastructure so critical to economic development, leading to fragmentation.



For the same reason that local government is suited to promoting economic development — the mobility of labor and capital — it faces difficulty redistributing wealth and income (Peterson 1995). Attempts by local governments to redress income disparities can result in the poor who reside in wealthier areas faring better than the poor who live in more deprived areas. Households in different localities having the same income before redistribution may have different incomes after redistribution, due to differing income levels and redistribution policies between local governments (Prud'homme 1995a).

The capacity of state and local governments to manage public assistance programs varies widely across jurisdictions. The mismatch between the need of a state or locality measured by its poor population, and its fiscal resources measured by per capita income, suggests the need for some redistribution at the federal level (Ladd and Doolittle 1982). Unlike the federal government, all of the states have either constitutional or statutory provisions requiring a balanced budget each fiscal year, constraining the deficits states can accumulate (Chernick and Reschovsky 2003; Ladd and Doolittle 1982; Stein and Hamm 1994, 1987). Local government is called the developmental state, unlikely to invest in redistributive expenditures because these generally do not promote economic growth, productivity, or the local tax base (Warner and Pratt 2005; Warner 2001). In their eagerness to promote economic development, state and local officials tend to hold down tax rates, and therefore outputs of public services, to reduce costs for businesses. Fear of losing local businesses and high income residents can lead to a “race to the bottom” with suboptimal outputs of public goods and services.

### **History of Centralization and Decentralization**

Throughout the nation's history, the distribution of responsibility across the various levels of government has not been static, but has evolved to meet the

challenges of the day and the public's needs (Sharp and Parisi 2003). Over the course of the twentieth century, tensions between federal and state-level authority have led to both decentralizing and recentralizing tendencies in U.S. public finance (Kodras 1997a; Warner and Pratt 2005). Federal authority expanded in the twentieth century during national economic, cultural, and social crises when state and local governments were unable or unwilling to address the essentials of these crises. During these times, states and localities were identified as part of the problem, not the solution (Swanson 2001b). Three general periods of expansion in federal authority may be identified: President Franklin Roosevelt's New Deal programs of the 1930s in response to the Great Depression, the planned war economy of World War II, and President Lyndon Johnson's Great Society programs of the 1960s in response to the Civil Rights movement (Kodras 1997a; Swanson 2001b). Economists often characterize the expansion of governmental power as a response to market failures. Each of these periods is characterized by the inability of the economy to provide market-based mechanisms that adequately addressed the crises, whether economic, cultural, or social (Swanson 2001b).

In the 1930s and 1940s, as a result of the Great Depression, the New Deal, and World War II, the federal government took on greater responsibility for economic and social welfare. Social security, unemployment assistance, and greater involvement in economic planning and regulation were roles taken on by the national government. There was also an expansion of federal fiscal and bureaucratic capacity (Sharp and Parisi 2003). Social equity across populations was pursued in two major ways: by increasing direct income transfers from government and by increasing the size of government services (Lobao and Hooks 2003).

During the 1950s and 1960s, the role of the federal government further increased with the development of additional social programs directed at eradicating

poverty, and the setting of national standards related to health and environmental quality (Sharp and Parisi 2003). The national government recognized that the high incidence of poverty among workers in low-level occupations, the elderly, children, minorities, and women could not be directly addressed by general economic growth, and thus expanded its role in social provision with a set of initiatives known as the War on Poverty (Kodras 1997b). Great Society legislation centralized social safety-net programs within the federal government. These social justice programs sought to address the considerable gaps confronted by citizens who are poor or of color to have rights guaranteed by the Constitution. Local areas and states were considered to have denied Constitutional rights to citizens, so the federal government was given the authority to secure these rights (Swanson 2001a).

The expanded role of national government resulted in a variety of positive outcomes, including reductions in poverty and improved civil rights protections. But there were problems associated with the federal government's increased programmatic responsibilities, including growing conflicts between federal and state or local governments, perceptions by some of an intrusive national government, ideological concerns about an activist federal government, and a preference for greater local authority. As a result of these administrative and philosophical concerns, a tendency toward devolution of governmental functions and responsibilities began to emerge in the 1970s (Sharp and Parisi 2003). Since the 1970s, responsibility for a broad range of policy activities has become increasingly decentralized, with state and local governments playing a growing role in policy formation and implementation. Changes in the organization and administration of many federal programs has shifted responsibility to state and local governments and in many cases reduced government regulation in favor of presumed market efficiencies (Deweese et al. 2003).

The decentralization that occurred during the administrations of Presidents Richard Nixon and Gerald Ford in the 1970s reflected a belief that federal government could play a role in targeting federal funding to people and places that were not prospering (Warner 1999). Federal aid to localities increased significantly, reaching its peak in 1977, in an effort to reduce inequality across local governments. General revenue sharing began in 1973, bringing direct federal aid to many local governments for the first time (Warner and Pratt 2005; Warner 2001). Local governments were also given the freedom to allocate funds within a single, broad policy arena through the Comprehensive Employment and Training Act of 1973 and Community Development Block Grants which began in 1974 (Warner 1999). These national programs provided local governments with substantial resources that they could use for economic development purposes (Sharp and Parisi 2003).

During the 1980s, under President Ronald Reagan's New Federalism, the federal government began transferring to states and localities many of the services it had funded since the 1970s, leaving lower levels of government to pay for them if they could (Johnson et al. 1995; Katz 2001; Warner 2006). These unfunded mandates restricted local government options and increased revenue pressure on already hard-hit local taxpayers (Johnson et al. 1995; Yinger 1990). General revenue sharing to states ended in 1980 and was phased out for localities in 1986 (Warner and Pratt 2005). Federal resources for local economic development began to diminish, resulting in local communities either relying more on state level resources, attempting to identify new local resources, or both (Sharp and Parisi 2003).

In the 1990s, states and localities called for relief from unfunded mandates as they struggled to meet the challenges of devolution. The administration of President Bill Clinton responded by allowing more state and local control over policy determination, particularly in areas such as welfare entitlement and service levels

(Warner and Pratt 2005; Warner 2006, 2001). Some direct federal programs were cut back and converted into fixed state block grants over which states and localities have wider discretion. Although such policies may reduce local government fiscal burden, they lead to a varied landscape of entitlement and social rights (Warner and Pratt 2005).

### **Devolution Pro vs. Con**

Devolution or decentralization refers to the process whereby federal government transfers some degree of responsibility for the control, development, and support of public policy to state and local government. This process is viewed as a means to increase the efficiency and flexibility of public policy to better serve diverse local populations (Sharp and Parisi 2003). There are two types of devolution: fiscal and administrative. Fiscal decentralization shifts financing responsibility to the level of government closest to the service delivery point, thus promoting efficiency through fiscal equivalence. On the other hand, administrative decentralization involves making decisions closer to the end beneficiary to increase diversity and responsiveness, but it requires a level of administrative and technical capacity that is sometimes lacking, especially in rural areas. Administrative decentralization can provide a cover for dismantling popular government services because it is often accompanied by fiscal decentralization.

In theory, administrative decentralization presents an opportunity for lower levels of government closer to the populace to design policies and programs tailored to local needs, preferences, and capacities (Deweese et al. 2003; Kodras 1997a; Lobao and Kraybill 2005; Oates 1999; Swanson 2001a; Tadlock et al. 2005). Increased local participation may make federal programs more locally appropriate (Swanson 2001b). However, even when local governments do respond to local preferences, policies enacted to serve the interests of the local majority may fail to protect the economically

and politically disenfranchised (Kodras 1997a). In a study conducted by Tadlock et al. (2005), county commissioners generally welcomed local control and responsibility for the design and implementation of programs. The commissioners viewed county governments as particularly well-situated for fostering locally-based democratic input. Nonetheless, the study concluded that many problems confronted by county commissioners such as persistent poverty, high unemployment, inadequate infrastructure, and a shortage of social services require structural solutions that are beyond the capability of county governments to resolve.

For localities with abundant resources and a history of civic engagement, devolution may result in enhanced community and resident well-being. But in areas with fewer resources and limited civic capacity, the shift of responsibilities to the local level may not achieve these intended goals (Sharp and Parisi 2003). Swanson (2001b) found that success of locality-based programs depends on local democracy and the quality of local social, economic, and physical infrastructures. In practice, decentralization has generally not passed down the resources necessary for program implementation, but only some programmatic autonomy. An unintended consequence of devolution is the creation of unfunded mandates for program development and delivery at the local level (Swanson 2001a). Many local governments experience a mismatch between devolved program responsibilities and resources, resulting in higher fiscal stress (Lobao and Kraybill 2005). If county governments are to successfully design and implement more policies under federal devolution, the states must provide counties with more resources commensurate with the newfound responsibilities (Tadlock et al. 2005).

The capacity to take on increasing fiscal responsibilities under decentralization is determined by the extent to which fiscal resources, expertise, infrastructure, and political will exist, or can be cultivated, within particular localities. Generally, areas

with the greatest need for services have the least resources, and often the least political will, to address those needs (Kodras 1997a). Decentralization works the best in contexts where inequality across jurisdictions is low. But in the U.S., spatial inequality is increasing more so within areas than between areas, in part as a result of decentralization itself (Warner 2006). Critics point out that the limited fiscal, technical, and civic capacity of many communities can pose a serious problem for meeting local needs. This outcome suggests the ongoing necessity for funding responsibility at higher levels of government to smooth out spatial inequality (Sharp and Parisi 2003). Sufficiently large transfers from the federal government to poorer state and local governments are a necessary corollary of fiscal devolution to compensate for differences in tax bases and resources (Prud'homme 1995b). In practice, devolution can create severe problems in policymaking and financing at the local level. Delegating problems to lower tiers displaces conflict away from the national government, which may engender local political battles and fiscal crises, especially for rural areas (Kodras 1997a).

As a consequence of the constraints faced by localities, the state plays a significant role in managing space on a larger scale than local government. If devolution is to promote efficiency without intensifying inequality, then the response of state policy is crucial (Warner and Pratt 2005). Although theory argues that redistributive spending is best made at the federal level of government, under devolution, state policy is becoming the more significant arena for redistributive activity (Warner 2001). Communities within a given state are more homogeneous than localities scattered across the nation, making it easier for state policymakers to design need-based formulas to guide aid allocation decisions (Pelissero and Morgan 1992).

Warner (2001) found that although redistribution cannot be sustained by local government, state government is a high enough level to allow for redistribution through state aid and state centralization. State centralization measures the degree of centralization in fiscal responsibility for governmental services. State aid and state centralization give local governments more programmatic flexibility in using own-source revenues, as the financing of some activities is shifted to state dollars (Johnson et al. 1995). Using U.S. Census of Governments data for 1977, 1982, and 1987, Johnson et al. (1995) found that greater state centralization and higher percentages of revenue from federal and state sources were significantly associated with lower fiscal burden among counties. The most influential factor on the level of fiscal burden was intergovernmental assistance from the state to local government. Drawing upon more recent U.S. Census of Governments data for 1987 and 1992, other researchers concluded that state centralization has the largest impact on relieving local fiscal stress of any variable, including state aid (Warner and Pratt 2005; Warner 2001).

This study focuses on rural areas, which are especially disadvantaged in confronting the challenges of devolution. In particular, decentralization strains the local capacity of nonmetropolitan governments, requiring poor rural areas with limited resources to design and implement programs that do not recognize unique rural problems. Lobao and Kraybill (2005) found that rural county governments are more likely to report significant problems under decentralization due to reduced federal revenues, mandates from higher levels of government, and a declining local tax base. The findings also indicate that nonmetropolitan governments are more likely to lack the capacity and resources required to successfully carry out the added functional responsibilities resulting from devolution. Johnson et al. (1995) discovered that the level of fiscal burden on taxpayers to support local government is higher in nonmetropolitan areas. Pronounced spatial clustering is apparent in the geographic



distribution of fiscal burden among nonmetropolitan counties as most counties experiencing high fiscal burden are proximate to other highly burdened counties.

By limiting federal aid to counties, devolution may lower the condition of social services in nonmetropolitan areas even further. Among unique rural problems are insufficient infrastructure, inadequate schools, and limited access to medical care and other basic public services such as clean drinking water and modern sewer systems (Lichter and Johnson 2007; Reeder and Jansen 1995; Sharp and Parisi 2003; Tadlock et al. 2005). The low quality of rural social services inhibits business attraction and makes it difficult to upgrade the human capital required for economic growth (Lobao and Kraybill 2005).

Analysts stressing the negative impacts of decentralization see it as symptomatic of broad institutional shifts in which governments at all levels have become less redistributive and more dominated by market relations. This changed institutional environment places greater pressure on localities to engage in competitive economic growth activities (Lobao and Kraybill 2005). Redistributive expenditures, which have never been a high priority for local governments, will be even less attractive in an environment focused on economic competitiveness and this will result in greater inequality across space (Warner and Pratt 2005). Redistributive programs are thought to create dependence, whereas policies that promote competition are assumed to stimulate local economic development (Warner 2003). Local governments engage in destructive competition to attract new businesses and investment through tax breaks that undermine the public infrastructure basis for long-term economic sustainability (Deweese et al. 2003; Prud'homme 1995a; Warner 2006). Dewees et al. (2003) found that rural counties are less likely to undertake economic growth activities, with the observed urban-rural differences largely attributable to county socioeconomic disadvantages. Rural areas constrained by lower education levels,

higher poverty levels, and a depressed economy struggle to compete in this new policy environment of increasing local fiscal responsibility and competition.

The expanding role of local government in economic development is attributed to the globalization of financial markets and the intensification of competition among localities for mobile capital (Brenner 1999a; Lobao and Kraybill 2005). Local governments feel pressured to focus on pro-growth objectives. In a globalized world where peripheral rural areas must compete with urban cores for capital investment, intensified forms of uneven geographic development and socio-spatial polarization are emerging (Brenner 1999b). Uneven development is no longer viewed as a limit to capital accumulation but rather as its very foundation (Brenner 2000). Fiscal decentralization passes greater responsibility onto local governments, many of whom are incapable of exerting power within a globalized economy. The geographic implications of this government restructuring differ considerably from place to place across the country, reflecting spatial variations in the resources and capacities of local governments to manage these changes (Kodras 1997a).

Due to the pressure to compete for economic growth, counties may provide fewer public services, particularly social services (Lobao and Kraybill 2005). Inter-local competition for economic growth can prevent local governments from adequately providing redistributive services. However, Lobao and Kraybill (2005) discovered a significant, positive correlation between economic growth and social service activities. This result suggests that in contrast to a tradeoff between redistribution and development, some counties can expand involvement in both domains of activities. Similarly, Lobao and Hooks (2003) concluded that county government remains important for both reducing economic inequality and promoting economic growth. Most government variables responsible for reducing income inequality also encouraged, or at worst did not significantly deter, income growth

across counties. These studies challenge the view that government's attempts to ensure social equity are incompatible with long-term improvement in mass incomes.

### **Research Question**

Within the context of fiscal devolution or decentralization in the United States, states and localities are fulfilling redistributive functions previously under the responsibility of the federal government. Under fiscal federalism, the federal government generally implements redistributive policies while local government focuses on development. The theory of fiscal federalism argues that the potential for redistribution may be lower at the state and local levels than at the federal level due to developmental pressures. As a result, movement toward devolution could decrease redistributive activities and raise the potential for spatial inequality across the nation.

This study pays particular attention to the role of state policy under decentralization as more responsibility for redistribution and development is delegated away from federal government and down to state government. States are emerging as a critical component of the multilevel federalist governmental system by playing both redistributive and developmental roles. The project will analyze the emergence of the meso level state and its important roles under devolution. State level action plays an increasingly important role in the context of fiscal devolution for addressing inequality in local government capacity. The states use two key policy tools to deal with the impacts of devolution: state aid and state centralization. The analysis explores the extent to which state aid is redistributive or developmental in its focus, after controlling for state centralization. As the meso level between the redistribution of the federal government and the development of local government, is the state capable of both functions?

In order to conduct a complete study of decentralization at the micro, meso, and macro government levels, the federal and local government are also examined in

addition to the state. The study seeks to discover if the classical theory of fiscal federalism is still applicable in a decentralized governmental system. Since federal aid has continued to decline since reaching its peak in 1977, is federal aid to county governments still redistributive? Under decentralization, some responsibility for redistribution is also shifted to local governments, even though the theory of fiscal federalism argues that this level of government is not capable of redistribution. With its increased responsibilities under devolution, is local government revenue effort still primarily developmental in its focus, or does it now have some redistributive features?

This research analyzes government finance during 1987-2002 for all U.S. counties in the lower forty-eight states to answer the following research question: Are federal aid, state aid, and local government revenue effort redistributive, developmental, or both? In particular, the focus is on the changing roles and impacts of federal and state intergovernmental aid and state centralization of fiscal responsibility on local government revenue effort. By looking over the 1987-2002 time period, these evolving roles are tracked at three different governance scales: federal, state, and local. The contribution of the work is to provide a global picture of governmental finance over a fifteen year period rather than focusing on specific programs. The analysis builds on the work of several rural sociologists: Dewees et al. (2003); Johnson et al. (1995); Lobao and Hooks (2003); Lobao and Kraybill (2005); Reeder and Jansen (1995); Swanson (2001b); Tadlock et al. (2005); Warner and Pratt (2005); and Warner (2001). All of these studies have a distinctively rural focus. Due to the economic and demographic disadvantages faced by rural areas, this study also takes on a spatial component by focusing on the spatial impacts of devolution in rural and urban counties. Under devolution, do spatial inequality and government poverty increase as poor rural areas face a lower tax base, higher needs, and more responsibility?

## **CHAPTER 3**

### **METHODOLOGY**

#### **Outline**

This chapter covers the methodology implemented to conduct the study. First, the data sources utilized for the analysis are described which include the U.S. Census of Governments, U.S. Census of Population and Housing, and U.S.D.A. Economic Research Service. Next, the implications of using the county area as a unit of analysis are discussed. Then, the regression models, variables, and descriptive statistics are detailed. The chapter concludes with an analysis of the modeling techniques employed for the project.

#### **Data Sources**

State- and county-level finance data were collected from the U.S. Census of Governments Finance Files for 1987, 1992, 1997, and 2002. Demographic data were retrieved from the U.S. Census of Population and Housing for 1980, 1990, and 2000. Three fixed-effect cross-sectional regression models were run for 1987, 1992, 1997, and 2002. Next, three fixed effect generalized estimation models (GEM) were run including the data for all four model years in addition to significant interactions with a year variable to track trends over time. Since the Census of Population is published decennially whereas the Census of Governments is published quinquennially, the cross-sectional models utilize the Census of Population data for the nearest year. Thus, the 1987 and 1992 models use the data for 1990, and the 1997 and 2002 models use the 2000 data. The 1980 data is employed to compute change variables measuring growth in population and employment from 1980 to 1990.

The year 1987 is chosen as the starting point for modeling because it is the first year in which state policy trends diverged from federal decentralization trends in that both state aid and state centralization increased while federal aid to localities

continued to decline since reaching its peak in 1977. The year 2002 is selected as the ending point for modeling since it is the most current year for which data are available. The analysis builds on the work of several rural sociologists: Dewees et al. (2003); Johnson et al. (1995); Lobao and Hooks (2003); Lobao and Kraybill (2005); Reeder and Jansen (1995); Swanson (2001b); Tadlock et al. (2005); Warner and Pratt (2005); and Warner (2001). The study by Warner (2001) pulled data from the 1992 Census of Governments and the 1990 Census of Population. No other scholars have published work drawing upon more recent Census data from the late 1990s or early 2000s. Therefore, this research contributes a new analysis up to the 2002 Census of Governments and the 2000 Census of Population.

By utilizing the most recent data available, this study expands knowledge concerning the effects of fiscal decentralization into the twenty-first century. Because the policy context has changed greatly since the early 1990s, an update to the literature is necessary to see how the results reported in prior studies compare to more current trends. The project includes all counties in the lower forty-eight states except Alaska, Hawaii, Washington, D.C., and Yellowstone National Park, which are excluded from the analysis. Independent cities in Virginia are treated as counties. The five boroughs of New York City are aggregated into one single case in the dataset.

To facilitate comparison across years, all data measured in dollars are converted to constant 2000 dollars on a per capita basis. Government finance data is deflated by the Implicit Price Deflator for Gross Domestic Product (U.S. Bureau of Economic Analysis 2007). Per capita income is deflated by the Consumer Price Index from the Statistical Abstract of the United States (U.S. Bureau of the Census 2007). In order to obtain a normal distribution, the natural log of population and per capita income is used across all models. For the cross-sectional models, the natural log of federal aid, state aid, and local effort is utilized. For the pooled generalized estimation

models (GEM), federal aid, state aid, and local effort are centered using the overall mean for the four years in order to facilitate interpretation of the interaction terms.

### **Unit of Analysis: County Areas**

In the U.S. Census of Governments County Finance Files, fiscal data for all local government units (school districts, towns, and villages) within a county are aggregated to the county area. This minimizes measurement error because ninety percent of local government service provision and revenue collection is confined to a single county, regardless of the state (Johnson et al. 1995). Special districts that cross county boundaries are counted within the county where the administrative headquarters is located.

County governments provide important services that promote local economic development, enhance human capital, and serve social safety net functions. Due to devolution, the scope of these activities has grown with the passage of time (Lobao and Kraybill 2005). Counties are an important part of the nation's local government apparatus, spending billions of public dollars every year to provide basic services to millions of residents (Deweese et al. 2003). As a significant administrative unit, the county implements local, state, and federal-level programs. Although benefits from federal public assistance such as Temporary Assistance to Needy Families are set at the state level, administration is usually done through county-based offices (Lobao and Hooks 2003).

County areas are a useful unit of analysis because they cover the range of social and economic landscapes in the nation, from entirely rural nonmetropolitan to dense metropolitan areas. They vary considerably in economic infrastructure, demographic profile, and level of prosperity (Lobao and Hooks 2003; Nielsen and Alderson 1997). Because county areas are smaller than states and labor market areas, they are less likely to obscure within-area differences and result in the loss of

information (Lobao and Hooks 2003). County areas are also helpful for the examination of changes over time for the same fixed area since their boundaries are generally more stable than cities or labor markets, except in the case of Virginia with its independent cities (Lichter and Johnson 2007; Lobao and Hooks 2003).

It is important to note that the states, not counties, are the constitutional units in the U.S. To a large extent, states make the rules under which local governments operate and these vary widely from state to state. For example, states require county governments to provide certain services and centralize responsibilities for other services from local governments to the state. States decide which taxes local governments are allowed to levy and may also place restrictions on county tax definitions and tax rates (Yinger 1990; Yinger and Ladd 1989). Some county governments operate under very favorable rules, whereas others have limited access to taxes and are assigned more extensive service responsibilities.

### **Regression Modeling**

To answer the research question of whether federal aid, state aid, and local effort are redistributive or developmental, this study utilizes a fixed effect cross-sectional and generalized estimation modeling approach. The purpose of statistical modeling is to explain variation in levels of the three dependent variables: federal aid, state aid, and local effort. The analysis of these three variables provides a thorough study of decentralization at the macro, meso, and micro government levels. Three fixed-effect cross-sectional regression models are run for 1987, 1992, 1997, and 1992. Next, three fixed effect generalized estimation models (GEM) are run including the data for all four model years in addition to significant interactions with a year variable to track trends over time. All three dependent variables (federal aid, state aid, and local effort) and three independent variables (state centralization, percent poverty, and percent employment growth) were tested for significant interactions with the year



variable. Only significant interactions were retained in the models. The continuous year variable is coded as 0=1987, 1=1992, 2=1997, and 3=2002 to enable interpretation of the results at five-year time intervals. The regression models disentangle the following factors: the redistributive vs. developmental nature federal aid, state aid, and local effort; the spatial distribution of these effects; economies of scale; local capacity; the role of state policy (state centralization); and substitutes. The three models may be stated as follows:

**Federal Aid** = f {redistribution (percent poverty, percent unemployment, percent dependent, percent white, percent old housing); development (percent population growth, percent employment growth, percent high school graduate); spatial effects (nonmetro nonadjacent, nonmetro federal land, percent urban, percent out-commuting); economies of scale (population, population density, population density squared); local capacity (per capita income); state policy (state centralization); and substitutes (state aid, local effort)}

**State Aid** = f {redistribution (percent poverty, percent unemployment, percent dependent, percent white, percent old housing); development (percent population growth, percent employment growth, percent high school graduate); spatial effects (nonmetro nonadjacent, nonmetro federal land, percent urban, percent out-commuting); economies of scale (population, population density, population density squared); local capacity (per capita income); state policy (state centralization); and substitutes (federal aid, local effort)}

**Local Effort** = f {redistribution (percent poverty, percent unemployment, percent dependent, percent white, percent old housing); development (percent population growth, percent employment growth, percent high school graduate); spatial effects (nonmetro nonadjacent, nonmetro federal land, percent urban, percent out-commuting); economies of scale (population, population density, population density squared); local capacity (per capita income); state policy (state centralization); and substitutes (federal aid, state aid)}

squared); local capacity (per capita income); income homogeneity (Gini coefficient); state policy (state centralization); and substitutes (federal aid, state aid)}

Previous studies of devolution have employed both quantitative and qualitative research methods. Swanson (2001b) analyzed case studies to assess the effectiveness of locality-based policy. Tadlock et al. (2005) conducted surveys and in-depth interviews of county commissioners to document their experiences with decentralization. Other researchers used surveys and then statistical modeling to interpret the survey results (Deweese et al. 2003; Lobao and Kraybill 2005). Some scholars obtained their data from the U.S. Census of Governments and the U.S. Census of Population and Housing to construct and run statistical models (Johnson et al. 1995; Lobao and Hooks 2003; Reeder and Jansen 1995; Warner and Pratt 2005; Warner 2001). Such modeling techniques include ordinary least squares (Johnson et al. 1995; Lobao and Kraybill 2005; Reeder and Jansen 1995), weighted least squares (Warner 2001), fixed effect and change models (Lobao and Hooks 2003), neural network and classification tree analysis (Warner and Pratt 2005), and logistic regression (Deweese et al. 2003). No previous devolution study has implemented a generalized estimation model to analyze pooled data for several years in a single model.

### **Variables and Descriptive Statistics**

Tables 1, 2, 3, 4, and 5 include data for the three dependent variables: federal aid, state aid, and local effort. Table 1 displays descriptive statistics for all counties included in the models and Tables 2, 3, 4, and 5 break this data down into rural and urban counties using Rural-Urban Continuum Codes. The U.S.D.A. Economic Research Service publishes Rural-Urban Continuum Codes after each decennial census to form a classification scheme distinguishing metropolitan counties by their population size and nonmetropolitan counties by their degree of urbanization and

proximity to a metropolitan area. The metropolitan and nonmetropolitan categories are subdivided into three metropolitan and six nonmetropolitan groupings, resulting in a nine-part county codification. Table 2 disaggregates the descriptive statistics for nonmetropolitan counties. Nonmetropolitan counties have the following Rural-Urban Continuum Codes: 4, 5, 6, 7, 8, and 9 (U.S.D.A. Economic Research Service 1993, 2003). Table 3 breaks down the nonmetropolitan counties further into nonadjacent counties, while Table 4 provides statistics for adjacent counties. The Rural-Urban Continuum Codes for nonmetropolitan nonadjacent counties are 5, 7, and 9, and the Codes for nonmetropolitan adjacent counties are 4, 6, and 8 (U.S.D.A. Economic Research Service 1993, 2003).

Table 5 presents descriptive statistics for metropolitan counties included in the study. Metropolitan counties have the following Rural-Urban Continuum Codes: 0, 1, 2, and 3 for 1993 and 1, 2, and 3 for 2003 (U.S.D.A. Economic Research Service 1993, 2003). In 1993, metropolitan areas of one million population or more were subdivided between central counties (Code 0) and fringe counties (Code 1). In 2003, the fringe distinction was dropped, and the previous Codes 0 and 1 were combined to create the new Code 1 which now represents all counties in metropolitan areas of one million population or more.

### **Dependent Variables**

The three dependent variables tested by this research are federal aid, state aid, and local effort. The federal aid variable includes all direct federal aid to governmental units in counties. It does not include payments to individuals or intergovernmental transfers, which are netted out. If federal aid is channeled through the state, then it is counted under state aid because decisions about how to redistribute the funds are made at the state level. Federal aid is a summation of the following

**Table 1: Descriptive Statistics for U.S. County Areas  
U.S. Census of Governments and U.S.D.A. Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Federal Aid Per Capita <sup>2</sup> (\$)	78.39 (99.24)	65.28 (97.74)	76.38 (143.80)	88.35 (132.06)
State Aid Per Capita <sup>2</sup> (\$)	748.76 (326.95)	917.66 (383.02)	992.25 (403.74)	1,130.36 (456.30)
Local Revenue Per Capita <sup>2</sup> (\$)	1,205.87 (798.53)	1,375.76 (890.64)	1,470.00 (926.80)	1,588.02 (900.72)
Local Effort Per Capita <sup>2</sup>	.08 (.06)	.09 (.06)	.08 (.05)	.09 (.05)
Low State Centralization <sup>2</sup>	.34 (.01)	.37 (.02)	.36 (.01)	.37 (.02)
Medium State Centralization <sup>2</sup>	.43 (.03)	.45 (.03)	.43 (.02)	.45 (.04)
High State Centralization <sup>2</sup>	.54 (.03)	.55 (.02)	.54 (.02)	.58 (.02)
Nonmetro Nonadjacent <sup>3</sup>	.41 (.49)	.40 (.49)	.31 (.46)	.31 (.46)
Nonmetro Federal Land <sup>3</sup>	.08 (.28)	.09 (.29)	.09 (.28)	.09 (.28)
N	3,059	2,876	2,990	3,014

Mean and Standard Deviation (in Parentheses)

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: <sup>2</sup>U.S. Census of Governments (1987, 1992, 1997, 2002); <sup>3</sup>U.S.D.A. Economic Research Service (1989, 1993, 2003)

Dollar values in constant dollars, 2000=100

**Table 2: Descriptive Statistics for U.S. Nonmetropolitan County Areas**  
**U.S. Census of Governments and U.S.D.A. Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Federal Aid Per Capita <sup>2</sup> (\$)	78.78 (103.44)	65.73 (106.61)	82.91 (168.55)	93.61 (152.12)
State Aid Per Capita <sup>2</sup> (\$)	771.58 (339.77)	945.83 (394.74)	1,047.35 (426.35)	1,170.03 (474.62)
Local Revenue Per Capita <sup>2</sup> (\$)	1,219.61 (879.59)	1,344.01 (976.07)	1,493.11 (1,035.01)	1,567.45 (957.12)
Local Effort Per Capita <sup>2</sup>	.09 (.06)	.10 (.07)	.09 (.06)	.10 (.05)
Nonmetro Nonadjacent <sup>3</sup>	.56 (.50)	.56 (.50)	.47 (.50)	.47 (.50)
Nonmetro Federal Land <sup>3</sup>	.11 (.32)	.12 (.33)	.11 (.32)	.11 (.32)
N	2,253	2,087	1,950	1,966

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan U.S. County Areas excluding Alaska, Hawaii, and Yellowstone National Park; N = 2,253 (1987), 2,087 (1992), 1,950 (1997), 1,966 (2002)

Nonmetropolitan counties have the following Rural-Urban Continuum Codes: 4, 5, 6, 7, 8, 9; U.S.D.A. Economic Research Service (1993, 2003)

Sources: <sup>2</sup>U.S. Census of Governments (1987, 1992, 1997, 2002); <sup>3</sup>U.S.D.A. Economic Research Service (1989, 1993, 2003)

Dollar values in constant dollars, 2000=100

**Table 3: Descriptive Statistics for U.S. Nonmetropolitan Nonadjacent County Areas**  
**U.S. Census of Governments and U.S.D.A. Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Federal Aid Per Capita <sup>2</sup> (\$)	90.73 (124.20)	80.69 (121.78)	95.58 (150.69)	107.27 (158.13)
State Aid Per Capita <sup>2</sup> (\$)	781.18 (376.71)	950.23 (422.30)	1,080.60 (460.86)	1,185.94 (491.59)
Local Revenue Per Capita <sup>2</sup> (\$)	1,414.97 (1,036.41)	1,507.43 (1,208.92)	1,652.41 (1,190.89)	1,712.31 (1,077.74)
Local Effort Per Capita <sup>2</sup>	.10 (.07)	.11 (.08)	.10 (.06)	.11 (.06)
Nonmetro Federal Land <sup>3</sup>	.14 (.35)	.16 (.36)	.15 (.35)	.14 (.35)
N	1,268	1,161	923	932

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan Nonadjacent U.S. County Areas excluding Alaska and Hawaii; N = 1,268 (1987), 1,161 (1992), 923 (1997), 932 (2002)

Nonmetropolitan Nonadjacent counties have the following Rural-Urban Continuum Codes: 5, 7, 9; U.S.D.A. Economic Research Service (1993, 2003)

Sources: <sup>2</sup>U.S. Census of Governments (1987, 1992, 1997, 2002); <sup>3</sup>U.S.D.A. Economic Research Service (1989)

Dollar values in constant dollars, 2000=100

**Table 4: Descriptive Statistics for U.S. Nonmetropolitan Adjacent County Areas**  
**U.S. Census of Governments and U.S.D.A. Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Federal Aid Per Capita <sup>2</sup> (\$)	66.70 (72.98)	50.32 (88.48)	65.65 (201.80)	72.91 (85.67)
State Aid Per Capita <sup>2</sup> (\$)	768.42 (313.34)	943.89 (355.58)	1,007.21 (364.62)	1,149.11 (424.09)
Local Revenue Per Capita <sup>2</sup> (\$)	1,098.00 (679.04)	1,239.08 (767.29)	1,354.84 (873.69)	1,442.38 (806.37)
Local Effort Per Capita <sup>2</sup>	.08 (.05)	.09 (.06)	.08 (.05)	.09 (.05)
Nonmetro Federal Land <sup>3</sup>	.06 (.24)	.06 (.24)	.06 (.24)	.06 (.24)
N	985	926	1,027	1,034

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan Adjacent U.S. County Areas; N = 985 (1987), 926 (1992), 1,027 (1997), 1,034 (2002)

Nonmetropolitan Adjacent counties have the following Rural-Urban Continuum Codes: 4, 6, 8; U.S.D.A. Economic Research Service (1993, 2003)

Sources: <sup>2</sup>U.S. Census of Governments (1987, 1992, 1997, 2002); <sup>3</sup>U.S.D.A. Economic Research Service (1989)

Dollar values in constant dollars, 2000=100

**Table 5: Descriptive Statistics for U.S. Metropolitan County Areas**  
**U.S. Census of Governments Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Federal Aid Per Capita (\$)	77.30 (86.47)	64.08 (69.01)	64.13 (77.28)	78.48 (81.30)
State Aid Per Capita (\$)	684.98 (278.53)	843.15 (339.27)	888.92 (334.02)	1,055.92 (409.74)
Local Revenue Per Capita (\$)	1,167.46 (524.89)	1,459.74 (601.95)	1,426.66 (677.25)	1,626.60 (783.04)
Local Effort Per Capita	.07 (.03)	.08 (.03)	.07 (.03)	.08 (.04)
N	806	789	1,040	1,048

Mean and Standard Deviation (in Parentheses)

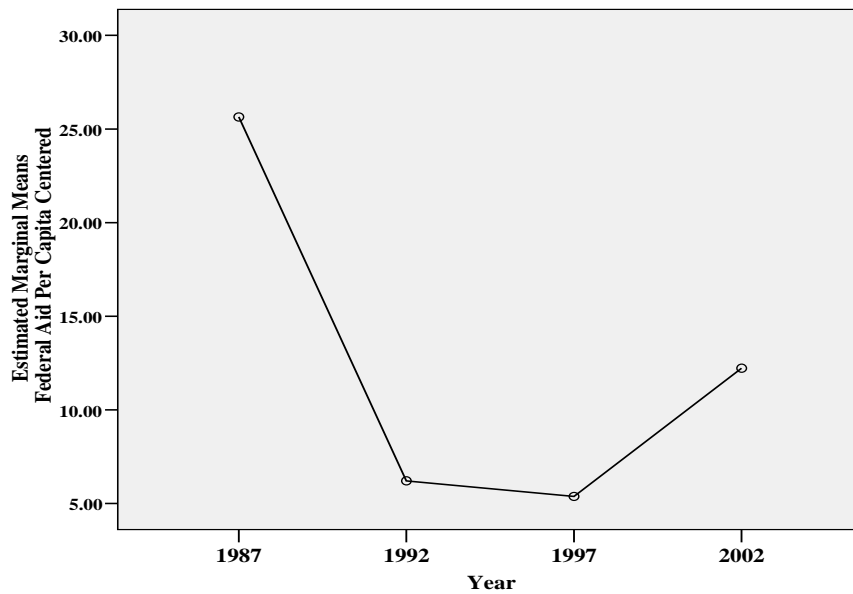
Metropolitan U.S. County Areas excluding Alaska, Hawaii, and Washington, D.C.; N = 806 (1987), 789 (1992), 1,040 (1997), 1,048 (2002)

Metropolitan counties have the following Rural-Urban Continuum Codes: 0, 1, 2, 3 (1993); 1, 2, 3 (2003); U.S.D.A. Economic Research Service

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Dollar values in constant dollars, 2000=100





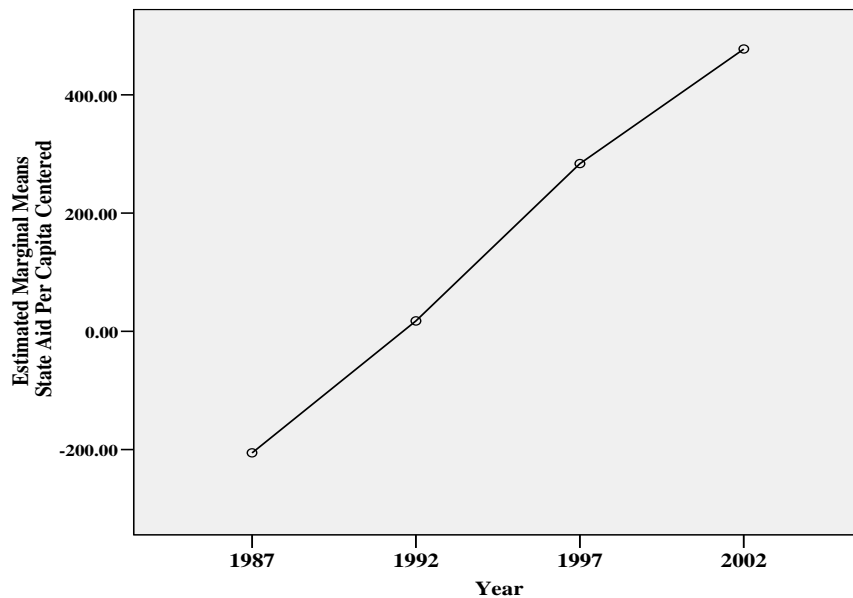
**Figure 1: Federal Aid Trends 1987-2002**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Based on GEM regression results

federal intergovernmental categories: agriculture, air transport, education, employment security, general revenue sharing, general support, health and hospitals, highways, housing and community development, other natural resources, public welfare, sewerage, and transit subsidies. The average federal aid per capita to all counties increased slightly from \$78.39 in 1987 to \$88.35 in 2002 in constant 2000 dollars (Table 1). Figure 1 shows the estimated marginal means of federal aid per capita centered based on the GEM regression results, but this graph is more reflective of the metropolitan trend than of that for all counties. The graph indicates a decline in federal aid and an increase starting in 2002. For all counties, the increase began in 1997, but it started in 2002 for metropolitan counties only. Federal aid is higher for nonmetropolitan counties, increasing from \$78.78 in 1987 to \$93.61 in 2002 (Table 2). Federal aid is lower in metropolitan counties which barely increased from \$77.30 in 1987 to \$78.48 in 2002 (Table 5). The highest level of federal aid is found in



**Figure 2: State Aid Trends 1987-2002**

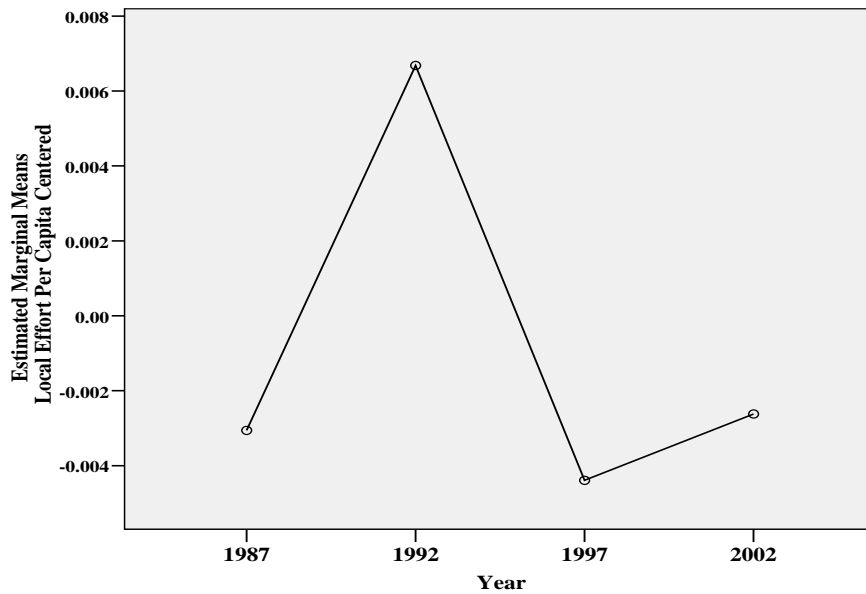
U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Based on GEM regression results

nonmetropolitan nonadjacent counties, where it increased from \$90.73 in 1987 to \$107.27 in 2002 (Table 3). The lowest level of federal aid is found in nonmetropolitan adjacent counties, where it increased from \$66.70 in 1987 to \$72.91 in 2002 (Table 4). Since most federal aid goes directly to individuals, direct aid per capita to places (the variable measured here) is relatively small.

The state aid variable includes all state aid to governmental units in counties and federal funds that pass through the state. State aid is a summation of the following state intergovernmental categories: education, federal welfare, general support, health and hospitals, highways, housing and community development, tax relief, transit subsidies, public welfare, and sewerage. The average state aid per capita to all counties increased in real terms from \$748.76 in 1987 to \$1,130.36 in 2002 (Table 1). Figure 2 provides the estimated marginal means of state aid per capita centered based on the GEM regression results. The graph demonstrates the increase in state aid over



**Figure 3: Local Effort Trends 1987-2002**

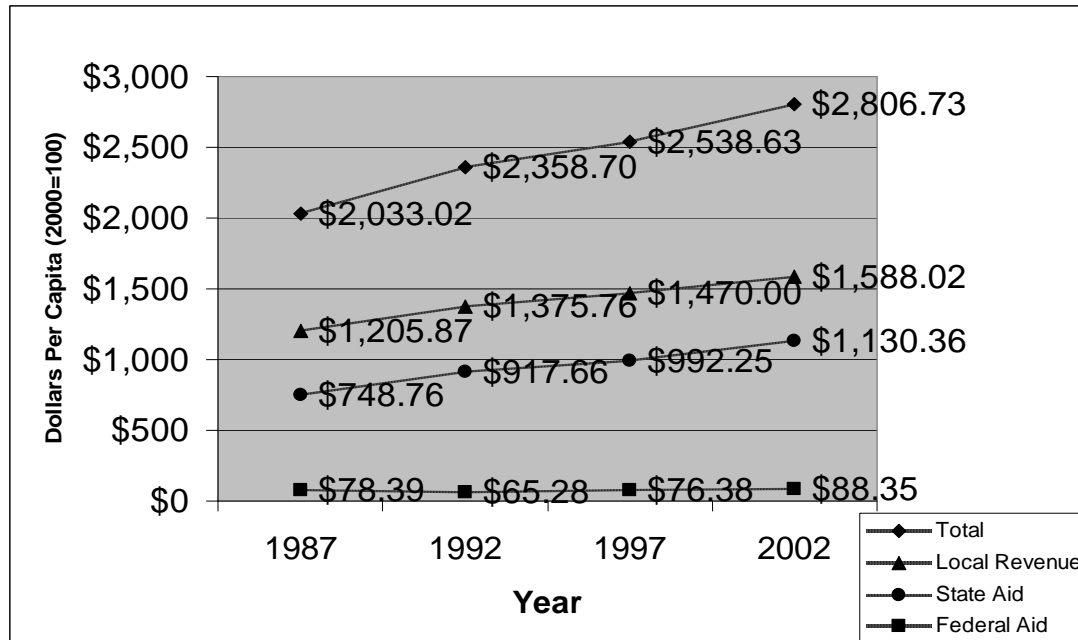
U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Based on GEM regression results

time for all counties. For metropolitan counties, however, state aid only slightly increased from 1992 to 1997. State aid is higher for nonmetropolitan counties, which increased from \$771.58 in 1987 to \$1,170.03 in 2002 (Table 2). State aid is lowest in metropolitan counties which had a smaller increase from \$684.98 in 1987 to \$1,055.92 in 2002 (Table 5). The highest level of state aid is in nonmetropolitan nonadjacent counties, where it rose from \$781.18 in 1987 to \$1,185.94 in 2002 (Table 3). State aid also increased in nonmetropolitan adjacent counties from \$768.42 in 1987 to \$1,149.11 in 2002 (Table 4).

The local effort variable is a relative measure of the tax burden and a proxy for fiscal stress, but it may also reflect preference for higher or lower levels of spending. The variable is calculated as the ratio of locally raised revenue per capita to per capita income. Per capita income measures local economic well-being and the fiscal capacity to raise revenues. Locally raised revenue includes local taxes, user charges,



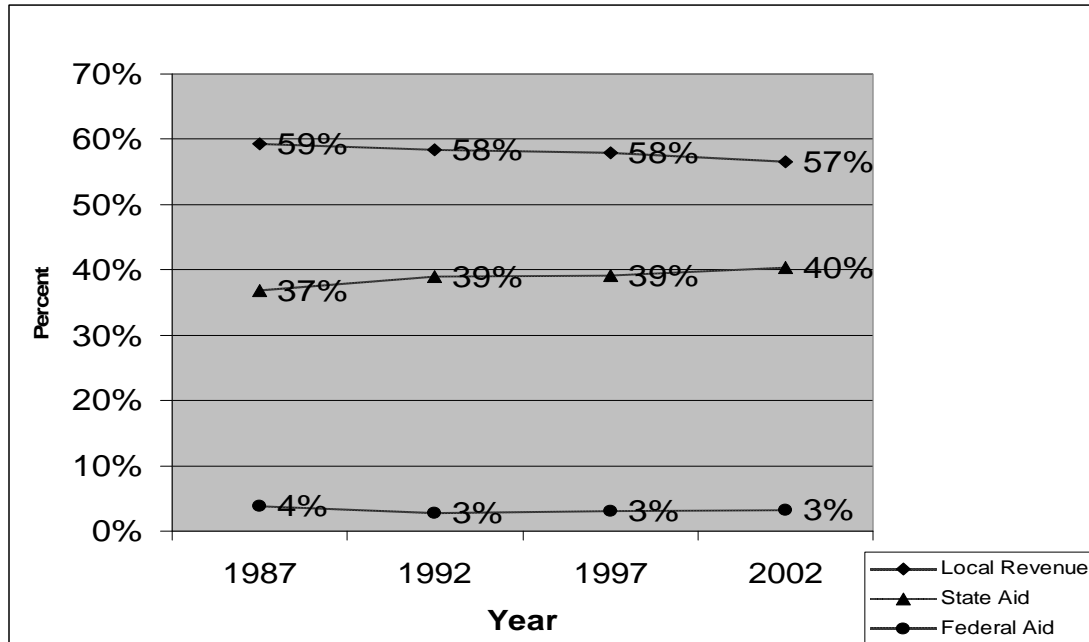
**Figure 4: Fiscal Devolution 1987-2002 (In Dollars)**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Dollar values in constant dollars, 2000=100

and miscellaneous revenue. Figure 3 displays the estimated marginal means of local effort per capita centered based on the GEM regression results. This figure illustrates how local effort is countercyclical and rose for all counties from .08 to .09 for 1987 to 1992 and 1997 to 2002 due to recessions in the national economy occurring between 1987 to 1992 and 1997 to 2002. Likewise, local effort fell slightly from .09 to .08 for 1992 to 1997 because of improved economic performance and growth (Table 1). Both nonmetropolitan and metropolitan counties follow the same national trend; however, effort fluctuates between .09 and .10 for rural areas and between .07 and .08 for urban areas, confirming higher and lower effort levels for these two respective areas (Tables 2 and 5). Local effort is highest in nonmetropolitan nonadjacent counties which vacillate between .10 and .11 (Table 3). It varies between .08 and .09 in nonmetropolitan adjacent counties (Table 4). Lower effort is found in urban areas



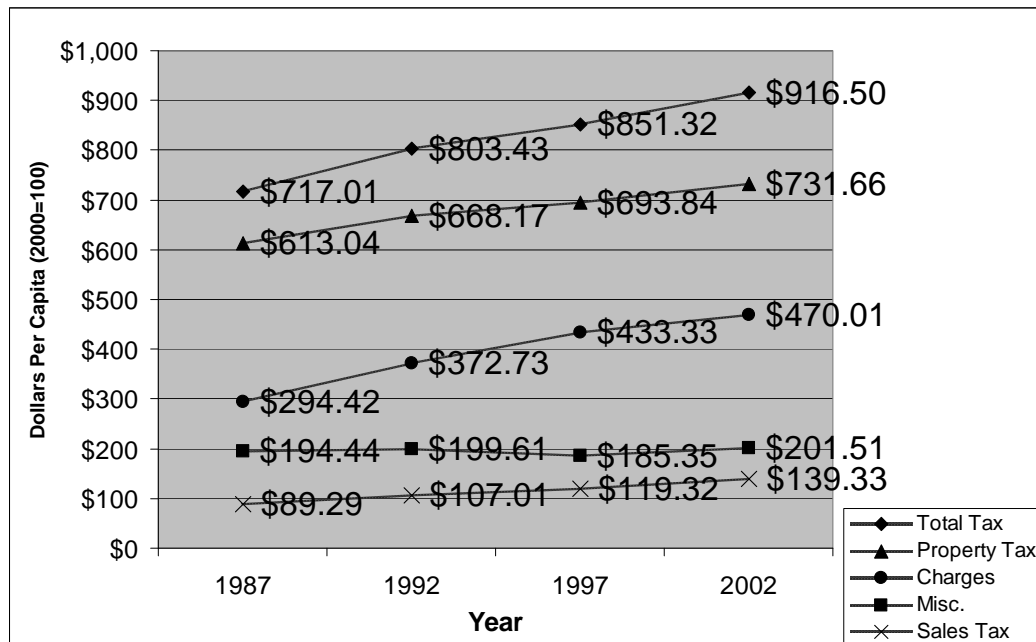
**Figure 5: Fiscal Devolution 1987-2002 (In Percents)**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

which have higher incomes and capacity so they can provide more services. For rural counties, higher effort reflects lower incomes in the face of minimum service-provision levels and the higher cost of providing essential services resulting from diseconomies of scale. To determine whether federal aid, state aid, and local effort are substitutes or complements to each other, these variables are included in each model.

Figures 4 and 5 demonstrate trends for the three components of county government revenue over the 1987-2002 period studied: federal aid, state aid, and locally raised revenue. Figure 4 presents the data in constant 2000 dollars and Figure 5 provides the same data in percents. Federal aid is the smallest source of local government revenue and has remained relatively stable in dollar terms but fallen slightly from 4 percent of revenue in 1987 to only 3 percent for the following years. State aid is the second highest source of revenue and has risen throughout the timeframe both in dollars and as a percentage from 37 percent in 1987 to 40 percent in



**Figure 6: Locally Raised Revenue 1987-2002 (In Dollars)**

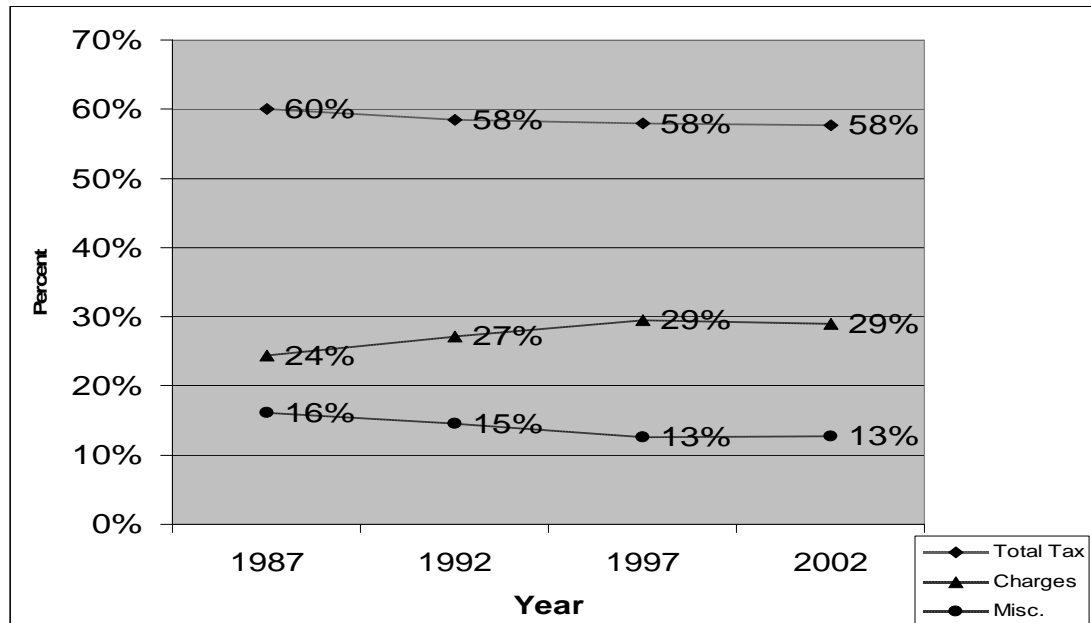
U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

Dollar values in constant dollars, 2000=100

2002. Locally raised revenue accounts for the largest share of revenue and has increased in dollars but declined as a percentage from 59 percent in 1987 to 57 percent in 2002. This slight decrease in the proportion of locally raised revenue is offset by the increasing importance of state aid.

Locally raised revenue consists of local taxes, user charges, and miscellaneous revenue. The level of locally raised revenue varies across counties according to need, the cost of service delivery, and the capacity to raise revenue (Warner and Pratt 2005; Warner 1999). Figures 6 and 7 show the trends for the components of locally raised revenue over 1987-2002. Figure 6 presents the data in constant 2000 dollars and Figure 7 provides the same data in percents. The highest source of locally raised revenue is local taxes which has grown in dollars but declined as a percentage from 60 percent in 1987 to 58 percent for the following years. Local taxes are composed



**Figure 7: Locally Raised Revenue 1987-2002 (In Percents)**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

primarily of the property tax, although sales taxes have also increased over time in dollars. User charges are the second largest source of locally raised revenue and have grown in both dollar terms and as a percentage and from 24 percent in 1987 to 29 percent in 2002. Miscellaneous revenue is the smallest source of locally raised revenue and has remained relatively flat in dollars but decreased as a percentage from 16 percent in 1987 to 13 percent in 2002.

### Independent Variables

Tables 6, 7, 8, 9, and 10 include data for the independent variables. Table 6 displays descriptive statistics for all counties included in the models. Table 7 disaggregates these descriptive statistics for nonmetropolitan counties. Table 8 breaks down the nonmetropolitan counties further into nonadjacent counties, while Table 9 provides statistics for adjacent counties. Table 10 presents descriptive statistics for metropolitan counties included in the study. The U.S. Census of Population is

**Table 6: Descriptive Statistics for U.S. County Areas**  
**U.S. Census of Population and Housing Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Population	80,007.05 (290,460.89)	84,416.17 (299,005.49)	92,542.88 (324,887.91)	91,887.10 (323,678.55)
Percent Population Growth	.04 (.17)	.05 (.17)	.11 (.16)	.11 (.16)
Population Density	157.91 (752.79)	166.43 (775.57)	177.73 (812.15)	176.68 (809.05)
Population Density Squared	591,446.88 (12,033,787.51)	628,999.29 (12,409,917.88)	690,957.86 (14,623,446.53)	685,560.85 (14,565,213.85)
Per Capita Income (\$)	14,610.53 (3,463.31)	14,673.21 (3,501.08)	17,475.74 (3,885.80)	17,473.95 (3,877.35)
Percent Urban	.36 (.29)	.37 (.29)	.40 (.30)	.40 (.30)
Percent Poverty	.17 (.08)	.17 (.08)	.14 (.07)	.14 (.07)
Percent Unemployment	.07 (.03)	.07 (.03)	.06 (.03)	.06 (.03)
Percent Employment Growth	.13 (.20)	.13 (.21)	.15 (.17)	.15 (.17)
Percent Out-Commuting	.28 (.17)	.27 (.17)	.33 (.18)	.33 (.18)
Percent High School Graduate	.70 (.10)	.70 (.10)	.77 (.09)	.77 (.09)
Percent Dependent	.42 (.04)	.42 (.04)	.40 (.04)	.40 (.04)
Percent White	.88 (.15)	.88 (.15)	.85 (.16)	.85 (.16)
Percent Old Housing	.41 (.14)	.41 (.14)	.36 (.16)	.36 (.16)
Gini Coefficient	.42 (.04)	.42 (.04)	.43 (.04)	.43 (.04)
N	3,059	2,876	2,990	3,014

Mean and Standard Deviation (in Parentheses)

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Source: U.S. Census of Population (1980, 1990, 2000)

Dollar values in constant dollars, 2000=100



**Table 7: Descriptive Statistics for U.S. Nonmetropolitan County Areas**  
**U.S. Census of Population and Housing Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Population	22,223.42 (20,845.97)	23,238.05 (21,154.82)	24,525.38 (22,760.99)	24,350.51 (22,756.63)
Percent Population Growth	.003 (.13)	.007 (.13)	.08 (.14)	.08 (.14)
Population Density	36.40 (40.79)	37.69 (41.67)	39.26 (39.96)	38.96 (39.94)
Population Density Squared	2,988.31 (16,147.67)	3,156.67 (16,758.48)	3,137.42 (7,182.46)	3,112.09 (7,158.21)
Per Capita Income (\$)	13,466.17 (2,392.43)	13,473.45 (2,391.64)	16,143.78 (2,802.93)	16,145.11 (2,786.72)
Percent Urban	.26 (.24)	.27 (.23)	.30 (.25)	.30 (.25)
Percent Poverty	.18 (.08)	.18 (.08)	.16 (.07)	.16 (.07)
Percent Unemployment	.07 (.03)	.07 (.03)	.06 (.03)	.06 (.03)
Percent Employment Growth	.08 (.16)	.08 (.16)	.12 (.15)	.12 (.15)
Percent Out-Commuting	.25 (.15)	.25 (.15)	.29 (.14)	.29 (.14)
Percent High School Graduate	.68 (.10)	.68 (.10)	.76 (.09)	.76 (.09)
Percent Dependent	.43 (.04)	.43 (.04)	.41 (.04)	.41 (.04)
Percent White	.88 (.16)	.88 (.16)	.86 (.16)	.86 (.16)
Percent Old Housing	.41 (.14)	.43 (.14)	.39 (.15)	.39 (.15)
Gini Coefficient	.43 (.04)	.43 (.04)	.44 (.04)	.44 (.04)
N	2,253	2,087	1,950	1,966

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan U.S. County Areas excluding Alaska, Hawaii, and Yellowstone National Park; N = 2,253 (1987), 2,087 (1992), 1,950 (1997), 1,966 (2002)

Nonmetropolitan counties have the following Rural-Urban Continuum Codes: 4, 5, 6, 7, 8, 9; U.S.D.A. Economic Research Service (1993, 2003)

Source: U.S. Census of Population (1980, 1990, 2000)

Dollar values in constant dollars, 2000=100

**Table 8: Descriptive Statistics for U.S. Nonmetropolitan Nonadjacent County Areas**  
**U.S. Census of Population and Housing Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Population	15,790.05 (15,405.27)	16,704.86 (15,714.27)	17,252.11 (16,606.02)	17,143.62 (16,590.67)
Percent Population Growth	-.03 (.12)	-.03 (.12)	.05 (.14)	.05 (.14)
Population Density	24.47 (27.96)	25.55 (28.54)	26.70 (30.55)	26.55 (30.53)
Population Density Squared	1,379.79 (3,653.69)	1,466.14 (3,809.86)	1,645.12 (4,430.60)	1,636.31 (4,413.98)
Per Capita Income (\$)	13,222.62 (2,457.34)	13,202.70 (2,448.37)	16,009.76 (3,001.96)	16,008.88 (2,966.89)
Percent Urban	.25 (.26)	.27 (.26)	.28 (.27)	.28 (.27)
Percent Poverty	.19 (.08)	.19 (.09)	.16 (.07)	.16 (.07)
Percent Unemployment	.07 (.04)	.07 (.04)	.06 (.03)	.06 (.03)
Percent Employment Growth	.03 (.15)	.04 (.15)	.10 (.16)	.10 (.15)
Percent Out-Commuting	.19 (.13)	.19 (.13)	.24 (.15)	.24 (.14)
Percent High School Graduate	.69 (.11)	.69 (.11)	.77 (.09)	.77 (.09)
Percent Dependent	.44 (.04)	.44 (.04)	.42 (.04)	.42 (.04)
Percent White	.90 (.15)	.90 (.15)	.88 (.16)	.88 (.16)
Percent Old Housing	.46 (.14)	.46 (.14)	.42 (.16)	.42 (.16)
Gini Coefficient	.43 (.04)	.43 (.04)	.44 (.04)	.44 (.04)
N	1,268	1,161	923	932

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan Nonadjacent U.S. County Areas excluding Alaska and Hawaii; N = 1,268 (1987), 1,161 (1992), 923 (1997), 932 (2002)

Nonmetropolitan Nonadjacent counties have the following Rural-Urban Continuum Codes: 5, 7, 9; U.S.D.A. Economic Research Service (1993, 2003)

Source: U.S. Census of Population (1980, 1990, 2000)

Dollar values in constant dollars, 2000=100

**Table 9: Descriptive Statistics for U.S. Nonmetropolitan Adjacent County Areas**  
**U.S. Census of Population and Housing Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Population	28,837.07 (22,829.77)	29,673.56 (22,924.06)	32,357.61 (25,255.24)	32,019.90 (25,338.27)
Percent Population Growth	.03 (.13)	.03 (.13)	.10 (.12)	.10 (.12)
Population Density	46.56 (38.54)	47.65 (38.76)	52.03 (42.42)	51.32 (42.57)
Population Density Squared	3,651.35 (6,644.44)	3,770.67 (6,760.07)	4,504.23 (7,980.46)	4,443.75 (7,956.73)
Per Capita Income (\$)	13,735.21 (2,249.10)	13,726.45 (2,241.97)	16,385.68 (2,477.56)	16,387.22 (2,473.14)
Percent Urban	.29 (.21)	.29 (.21)	.33 (.22)	.33 (.22)
Percent Poverty	.18 (.07)	.18 (.07)	.15 (.06)	.15 (.06)
Percent Unemployment	.07 (.03)	.07 (.03)	.06 (.02)	.06 (.02)
Percent Employment Growth	.10 (.15)	.10 (.15)	.14 (.13)	.14 (.13)
Percent Out-Commuting	.28 (.13)	.28 (.12)	.34 (.13)	.34 (.13)
Percent High School Graduate	.66 (.09)	.66 (.09)	.75 (.08)	.75 (.08)
Percent Dependent	.43 (.03)	.43 (.03)	.41 (.03)	.41 (.03)
Percent White	.86 (.16)	.86 (.16)	.84 (.17)	.84 (.17)
Percent Old Housing	.42 (.13)	.42 (.13)	.37 (.14)	.37 (.14)
Gini Coefficient	.43 (.04)	.43 (.04)	.44 (.04)	.44 (.04)
N	985	926	1,027	1,034

Mean and Standard Deviation (in Parentheses)

Nonmetropolitan Adjacent U.S. County Areas; N = 985 (1987), 926 (1992), 1,027 (1997), 1,034 (2002)

Nonmetropolitan Adjacent counties have the following Rural-Urban Continuum Codes: 4, 6, 8; U.S.D.A. Economic Research Service (1993, 2003)

Source: U.S. Census of Population (1980, 1990, 2000)

Dollar values in constant dollars, 2000=100

**Table 10: Descriptive Statistics for U.S. Metropolitan County Areas**  
**U.S. Census of Population and Housing Variables**

<b>Variable Name</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
Population	241,528.77 (532,737.78)	246,239.66 (537,468.24)	220,075.69 (526,989.59)	218,582.67 (525,253.60)
Percent Population Growth	.15 (.20)	.15 (.21)	.18 (.18)	.18 (.18)
Population Density	497.56 (1,411.12)	506.94 (1,424.79)	437.37 (1,338.30)	435.04 (1,333.51)
Population Density Squared	2,236,356.50 (23,375,775.64)	2,284,428.38 (23,624,258.28)	1,980,621.18 (24,751,524.93)	1,965,803.46 (24,657,362.04)
Per Capita Income (\$)	17,809.33 (3,954.97)	17,846.70 (3,960.23)	19,973.18 (4,373.55)	19,966.78 (4,376.40)
Percent Urban	.62 (.27)	.63 (.27)	.58 (.31)	.58 (.31)
Percent Poverty	.12 (.06)	.12 (.06)	.11 (.05)	.11 (.05)
Percent Unemployment	.06 (.02)	.06 (.02)	.05 (.02)	.05 (.02)
Percent Employment Growth	.26 (.25)	.26 (.25)	.21 (.19)	.21 (.19)
Percent Out-Commuting	.34 (.21)	.34 (.20)	.40 (.21)	.40 (.21)
Percent High School Graduate	.75 (.08)	.75 (.08)	.80 (.08)	.80 (.08)
Percent Dependent	.38 (.03)	.38 (.03)	.38 (.03)	.38 (.03)
Percent White	.87 (.12)	.86 (.12)	.83 (.14)	.83 (.15)
Percent Old Housing	.37 (.15)	.37 (.15)	.31 (.15)	.31 (.15)
Gini Coefficient	.41 (.04)	.41 (.04)	.43 (.04)	.43 (.04)
N	806	789	1,040	1,048

Mean and Standard Deviation (in Parentheses)

Metropolitan U.S. County Areas excluding Alaska, Hawaii, and Washington, D.C.; N = 806 (1987), 789 (1992), 1,040 (1997), 1,048 (2002)

Metropolitan counties have the following Rural-Urban Continuum Codes: 0, 1, 2, 3 (1993); 1, 2, 3 (2003); U.S.D.A. Economic Research Service

Source: U.S. Census of Population (1980, 1990, 2000)

Dollar values in constant dollars, 2000=100

published decennially whereas the U.S. Census of Governments is published quinquennially. Therefore, the cross-sectional regression models utilize the Census of Population data for the nearest year: the 1987 and 1992 models use the data for 1990, and the 1997 and 2002 models use the 2000 data. It should be noted that the Census of Population data used is not different between 1987 and 1992 or between 1997 and 2002, but some of the descriptive statistics show slight changes, reflecting a different sample size for each model year 1987, 1992, 1997, and 2002.

### **Redistribution**

To test for the redistributive effects of federal aid, state aid, and local effort, the following variables are included in the regression models: percent poverty, percent unemployment, percent dependent, percent white, and percent old housing. The county poverty level is an important determinant of need and a measure of redistribution. The national percent poverty decreased from 17 percent in 1987 to 14 percent in 2002 (Table 6). Both nonmetropolitan and metropolitan counties follow the same national trend; however, percent poverty decreased from 18 percent to 16 percent for rural areas, and from 12 percent to 11 percent for urban areas, confirming higher and lower poverty in these two respective areas (Tables 7 and 10). Percent poverty is the highest in nonmetropolitan nonadjacent counties where it dropped from 19 percent in 1987 to 16 percent in 2002 (Table 8). It lowered from 18 percent to 15 percent in nonmetropolitan adjacent counties (Table 9). For percent unemployment, the trends for the nation and for rural counties are identical: percent unemployment decreased from 7 percent in 1987 to 6 percent in 2002 (Tables 6 and 7). Urban areas have a slightly lower percent unemployment illustrated by the decrease from 6 percent in 1987 to 5 percent in 2002 (Table 10).

Young and old dependents require more government services and contribute less to the local economy than the working-age population, making the funding of

public services more difficult. The percent dependent variable represents persons younger than 18 and older than 64. The national percent dependent dropped from 42 percent in 1987 to 40 percent in 2002 (Table 6). Percent dependent declined from 43 percent to 41 percent for rural areas, but remained constant at 38 percent for urban areas (Tables 7 and 10). Nonmetropolitan nonadjacent counties have the highest percent dependent and saw a decrease from 44 percent in 1987 to 42 percent in 2002 (Table 8). Percent dependent also fell in nonmetropolitan adjacent counties from 43 percent to 41 percent (Table 9).

Counties with a lower percent white population also have a higher need for aid due to the history of racial discrimination and oppression in the U.S. The racial trends for the nation and for rural counties are approximately the same: the percent white decreased from 88 percent in 1987 to 85 percent in 2002 for the nation, and from 88 percent to 86 percent in rural areas (Tables 6 and 7). Urban areas have the smallest percent white population reflected in the decline from 87 percent in 1987 to 83 percent in 2002 (Table 10). Nonmetropolitan nonadjacent counties have the highest percent white which fell from 90 percent in 1987 to 88 percent in 2002 (Table 8). It dropped from 86 percent to 84 percent in nonmetropolitan adjacent counties (Table 9). Thus, racial minorities are growing as a percent of the population in both rural and urban areas, but they tend to be more highly concentrated in urban counties.

An older housing stock indicates that the public infrastructure, including water and sewers, is older and more costly to maintain and replace. The variable for percent old housing is measured as the percentage of housing built before 1960. The national percent old housing decreased from 41 percent in 1987 to 36 percent in 2002 (Table 6). Nonmetropolitan and metropolitan counties follow the same national trend, although percent old housing declined more modestly from 41 percent in 1987 to 39 percent in 2002 in rural areas, and from 37 percent to 31 percent in urban areas,

reflecting more new development in metropolitan areas over this period (Tables 7 and 10). Nonmetropolitan nonadjacent counties have the highest percent old housing, which dropped from 46 percent in 1987 to 42 percent in 2002 (Table 8). It fell from 42 percent to 37 percent in nonmetropolitan adjacent counties (Table 9). Percent white is the only redistributive variable for which urban counties are more disadvantaged in comparison to rural counties. The variables percent poverty, percent unemployment, percent dependent, and percent old housing all disadvantage rural areas more than urban areas. If federal and state aid are redistributive towards these variables, the sign will be positive for all of them except for percent white, which should be negative.

### **Development**

To test for the developmental effects of federal aid, state aid, and local effort, the following variables are included in the regression models: percent population growth, percent employment growth, and percent high school graduate. The variable for percent population growth captures in-migration and economic growth. Percent population growth increased for all counties from 4 percent in 1987 to 11 percent in 2002 (Table 6). Nonmetropolitan and metropolitan counties follow the same national trend, but percent population growth increased from less than 1 percent in 1987 to 8 percent in 2002 in rural areas, and from 15 percent in 1987 to 18 percent in 2002 in urban areas, confirming lower and higher percent population growth in these two respective areas (Tables 7 and 10). Percent population growth is the lowest in nonmetropolitan nonadjacent counties, where increased from negative 3 percent in 1987 to 5 percent in 2002 (Table 8). It grew from 3 percent to 10 percent in nonmetropolitan adjacent counties (Table 9).

Percent employment growth is a developmental measure that represents the creation of new jobs and a strong local economy. This variable increased for all

counties from 13 percent in 1987 to 15 percent in 2002, and for rural counties from 8 percent to 12 percent (Tables 6 and 7). Nonmetropolitan nonadjacent counties have the lowest percent employment growth but the highest rate of increase, which grew from 3 percent in 1987 to 10 percent in 2002 (Table 8). It rose from 10 percent to 14 percent in nonmetropolitan adjacent counties (Table 9). Percent employment growth decreased for urban counties from 26 percent in 1987 to 21 percent in 2002 (Table 10). Even though percent employment growth declined for metropolitan counties, their average is still well above the national and rural average.

The percent high school graduate variable is included because a county characterized by higher educational attainment will generally have a more skilled labor force with better job prospects. For all counties, the percent high school graduate increased from 70 percent in 1987 to 77 percent in 2002 (Table 6). Nonmetropolitan and metropolitan counties follow the same national trend, yet percent high school graduate increased more in rural areas from 68 percent in 1987 to 76 percent in 2002, than in urban areas which saw an increase from 75 percent in 1987 to 80 percent in 2002, though the rate is still higher in urban areas (Tables 7 and 10). Nonmetropolitan adjacent counties have the lowest percent high school graduate which rose from 66 percent in 1987 to 75 percent in 2002 (Table 9). It grew from 69 to 77 in nonmetropolitan nonadjacent counties (Table 8). The developmental variables of percent population growth, percent employment growth, and percent high school graduate favor urban counties over rural counties. If federal and state aid are developmental with respect to these variables, the sign will be positive for each of them.

### **Spatial Effects**

To capture the spatial distribution of federal aid, state aid, and local effort, the following variables are included in the regression models: nonmetropolitan



nonadjacent, nonmetropolitan federal land, percent urban, and percent out-commuting. The models include the following rural variables coded as dummy variables: nonmetropolitan nonadjacent counties from the Rural-Urban Continuum Codes (U.S.D.A Economic Research Service 1993, 2003) and nonmetropolitan federal land counties from the County Typology Codes (U.S.D.A. Economic Research Service 1989). The U.S.D.A. Economic Research Service published the County Typology Codes in 1989 to identify eleven types of nonmetropolitan counties according to either their primary economic activity or other themes of special policy significance. The typology includes six economic types and five policy types. When the County Typology Codes were updated in 2004, the federal land policy type was removed. Therefore, this study utilizes the County Typology Codes for 1989.

In nonmetropolitan areas, costs are higher for counties not adjacent to a city because they cannot benefit from tax exporting or service spillovers from neighboring urban counties (Warner and Pratt 2005; Warner 2001). Without the buffer of redistributive aid from federal sources, nonadjacent rural places may find it increasingly difficult to take on important responsibilities implicit with devolution (Warner 1999). 76 percent of federal land counties are located in the Western states and at least thirty percent of the county's land area is federally-owned land. The functions of these counties are primarily for recreational use and land management. This variable is included because federal land counties have a smaller land area to collect property taxes from due to the presence of federally-owned land. Most federal land counties are concentrated in nonmetropolitan nonadjacent counties (Table 3).

Percent urban indicates a greater demand for public services and higher costs of service delivery resulting from congestion. This variable increased for all counties from 36 percent in 1987 to 40 percent in 2002, and for nonmetropolitan counties from 26 percent in 1987 to 30 percent in 2002 (Tables 6 and 7). Nonmetropolitan

nonadjacent counties have the lowest percent urban which rose from 25 percent in 1987 to 28 percent in 2002 (Table 8). It grew from 29 percent to 33 percent in nonmetropolitan adjacent counties (Table 9). Percent urban decreased in metropolitan counties from 62 percent in 1987 to 58 percent in 2002 reflecting urban sprawl (Table 10). The expected sign for this variable is positive for a redistributive effect of intergovernmental aid.

To capture the effect of nonresidents and tax exporting, a percent out-commuting variable is included. Tax exporting is the ability to shift the tax burden to nonresidents through commuting, sales, and income taxes. Counties with a higher proportion of workers out-commuting benefit from the public service spillovers of nearby communities and they do not have to deal with the costly peak load problems that local employment centers experience. Peak load problems refer to the substantially higher number of people that must be served during peak business hours than during nonpeak, non-business hours. Counties with higher percentages of residents out-commuting benefit from reduced costs since those residents will not require the county's local government services while they are working outside the county. Due to the lower service costs, the expected sign for this variable is negative for the federal and state aid models, and positive for the local effort models.

Unfortunately, the U.S. Census of Population does not include a measurement of in-commuting which would provide a more direct measure of tax exporting.

Ignoring in-commuting can result in overstating the cost advantages of out-commuting. Percent out-commuting increased in all counties from 28 percent in 1987 to 33 percent in 2002 (Table 6). The variable also rose in nonmetropolitan counties from 25 percent in 1987 to 29 percent in 2002 and in metropolitan counties from 34 percent to 40 percent (Tables 7 and 10). Percent out-commuting is the lowest in nonmetropolitan nonadjacent counties, where it grew from 19 percent in 1987 to 24

percent in 2002 (Table 8), because these workers have the farthest commuting distance to travel. It increased in nonmetropolitan adjacent counties from 28 percent to 34 percent (Table 9).

### **Economies of Scale**

To test the response of federal aid, state aid, and local effort to economies of scale, the following variables are included in the regression models: population, population density, and population density squared. Population increased for all counties from 80,007 in 1987 to 91,887 in 2002 (Table 6). Population also increased in rural counties from 22,223 in 1987 to 24,351 in 2002, and from 241,529 in 1987 to 218,583 in 2002 in urban counties (Tables 7 and 10). Nonmetropolitan nonadjacent counties have the smallest population which grew from 15,790 in 1987 to 17,144 in 2002 (Table 8). It rose from 28,837 to 32,020 in nonmetropolitan adjacent counties (Table 9).

The population variable does not reflect higher public service costs at both ends of the population density spectrum. Theory and prior empirical analysis suggest a U-shaped cost curve in which service costs are higher for rural areas with low density (the cost of sparsity) and for urban areas with high density (the cost of congestion) (Reeder and Jansen 1995). The U-shaped curve implies that costs per capita decline up to a minimum-cost point, after which they begin to rise. There are economies of scale in the provision of public services, meaning that the per capita costs of providing public services fall as a place's population size and density rise and as it becomes more urban in character. Rural counties with smaller population densities are expected to experience diseconomies of scale resulting in higher per capita costs of public services. Urban counties with larger population densities are expected to benefit from economies of scale that reduce the per capita cost of providing public services, although it is possible costs may rise due to congestion for

the largest cities. Government poor counties face higher costs of providing public services due to smaller percentages of urban population, smaller populations and population densities, and diseconomies of providing services in such lightly populated places (Reeder and Jansen 1995).

Because the U-shaped cost curve is nonlinear, a squared version of population density is included in the models. However, the regression models used for this study analyze government revenue, not costs. The quadratic form of the curve is expected to show increasing economies of scale as population rises and the benefits of urbanization are realized, until the point of congestion is reached and decreasing economies of scale become evident. The variables for population density and population density squared are measured as population per square mile. Population density increased in all counties from 158 persons per square mile in 1987 to 177 persons per square mile in 2002 (Table 6). Population density grew in nonmetropolitan counties from 36 persons per square mile in 1987 to 39 persons per square mile in 2002, but decreased in metropolitan counties from 498 persons per square mile to 435 persons per square mile (Tables 7 and 10). Nonmetropolitan nonadjacent counties have the lowest population density which rose from 25 persons per square mile in 1987 to 27 persons per square mile in 2002 (Table 8). It grew from 47 persons per square mile to 51 persons per square mile in nonmetropolitan adjacent counties (Table 9). Population density is more than ten times higher in urban areas than in rural areas.

### **Local Capacity**

Per capita income measures local economic well-being and the fiscal capacity to raise revenues. Lower per capita income indicates a greater dependence on the public sector for basic goods and services. Per capita income increased in all counties from \$14,610.53 in 1987 to \$17,473.95 in 2002 (Table 6). It also rose in

nonmetropolitan counties from \$13,466.17 in 1987 to \$16,145.11 in 2002 and in metropolitan areas from \$17,809.33 in 1987 to \$19,966.78 in 2002 (Tables 7 and 10). Per capita income is the lowest in nonmetropolitan nonadjacent counties which grew from \$13,222.62 in 1987 to \$16,008.88 in 2002 (Table 8). It increased from \$13,735.21 to \$16,387.22 in nonmetropolitan adjacent counties (Table 9). If federal and state aid are redistributive toward per capita income, the sign will be negative. If they are developmental, the sign will be positive.

### **Income Homogeneity**

The local effort model includes a variable to measure income inequality, the Gini coefficient. Theory predicts that effort will be higher in places with more homogeneous income distributions because all residents use the services paid for by tax dollars and benefit equally. The service to benefit ratio, which is calculated as the value of a service to its tax cost, is primarily less than one for the higher income taxpayer and greater than one for the lower income taxpayer. In areas with greater income inequality, wealthier residents generally prefer not to pay taxes for services that mainly benefit poorer residents (Schneider 1989). Thus, counties with higher Gini coefficients are expected to have lower effort. The Gini coefficient for all counties increased slightly from .42 in 1987 to .43 in 2002 (Table 6). It also increased in nonmetropolitan counties from .43 to .44 and in metropolitan counties from .41 to .43, showing that rural areas have higher income inequality than urban areas (Tables 7 and 10).

### **State Policy**

State centralization measures the degree of centralization in fiscal responsibility for governmental services. It has the potential to relieve local governments of responsibilities they formerly held, thereby reducing their cost of providing services. Significant variation exists among states in the share of local

services paid for by state governments. Such variation is a major cause of differences in the local tax burden. State centralization can be either a complement or a substitute for the three dependent variables federal aid, state aid, and local effort. If it is a complement, then counties with a higher mean of the dependent variable will also have higher state centralization. If state centralization is a substitute, then counties with a higher mean federal aid, state aid, or local effort will have lower state centralization.

The state centralization variable is calculated as the ratio of state direct general expenditures to state and local direct general expenditures. Although this variable is continuous, running a regression model with state centralization as a continuous variable produces forty-seven coefficients, and requires the selection of a reference state. This study does not intend to discuss each state individually, but rather states grouped by their level of centralization. Therefore, a nominal state centralization variable was created by dividing the states into three groups: low, medium, and high centralization. Medium is the reference group, with the low and high groups outside of one standard deviation from the mean for the corresponding year. The nominal state centralization variable is run as a fixed effect for all versions of the model.

Table 11 displays the average state centralization for states categorized as either low or high centralization for all four model years. States that do not fall outside of one standard deviation of the mean state centralization for all four years are excluded from the low and high categories in Table 11. Five states are categorized low state centralization for all four years, nine states as high state centralization, and the remaining thirty-four states as medium state centralization. The average state centralization for the lower forty-eight states has risen from .45 in 1987 to .48 in 2002. Furthermore, state centralization rose for all states categorized as low or high centralization, except for Nevada which is a low centralization state and decreased

**Table 11: Average State Centralization 1987-2002**

	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>2002</b>
<b>Low States</b>				
California	.3292	.3275	.3351	.3547
Colorado	.3364	.3527	.3644	.3856
Florida	.3063	.3511	.3588	.3818
Nevada	.3437	.3479	.3231	.3237
New York	.3425	.3537	.3541	.3571
<b>High States</b>				
Connecticut	.5055	.5222	.5327	.5703
Delaware	.6065	.6321	.6399	.6365
Kentucky	.5438	.5724	.5592	.5928
Maine	.5319	.5424	.5522	.5864
North Dakota	.5634	.5772	.5603	.5731
Rhode Island	.5974	.6437	.5894	.6059
South Carolina	.4992	.5210	.5122	.5377
Vermont	.5950	.5970	.5986	.6234
West Virginia	.5385	.5576	.5776	.6186
<b>All States</b>	<b>.4476</b>	<b>.4700</b>	<b>.4649</b>	<b>.4807</b>

U.S. States excluding Alaska, Hawaii, and Washington, D.C.; N = 48

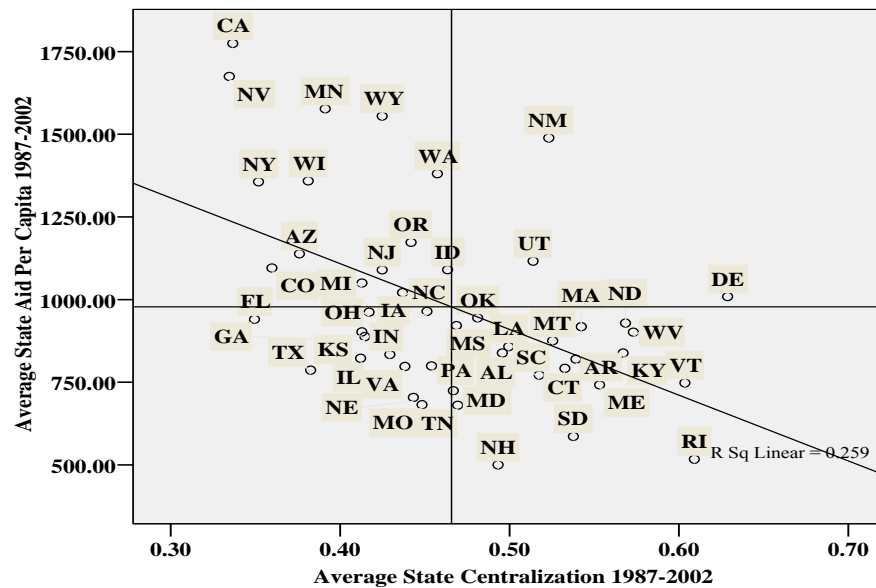
Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

State Centralization = state share of direct general expenditures by state and local government

Low and high groups are outside of one standard deviation from mean for corresponding year

Excludes states not in low or high groups for all four years

slightly from .34 in 1987 to .32 in 2002 (Table 11). Table 1 presents state centralization data for counties, not states. The average state centralization has risen for all counties regardless of their location in a state categorized as low, medium, or high centralization. From 1987 to 2002, state centralization increased from .34 to .37 in low states, .43 to .45 in medium states, and .54 to .58 in high states (Table 1). This data illustrates the trend of centralization within decentralization and the increasing importance of the state.



**Figure 8: Average State Aid and State Centralization 1987-2002**

U.S. States excluding Alaska, Hawaii, and Washington, D.C.; N = 48

Source: U.S. Census of Governments (1987, 1992, 1997, 2002)

State Centralization = state share of direct general expenditures by state and local government

Grid lines at state average for 1987-2002

Average state aid per capita in constant dollars, 2000=100

While both state centralization and state aid have been rising, they are negatively correlated with each other. States tend to be high in either centralization or state aid, but not both. Figure 8 is a graph of the average state aid to counties within each state and the average state centralization for the forty-eight contiguous states across the 1987-2002 period studied. The graph grid lines are located at the average value for each variable. Between 1987 and 2002, the average state centralization is .47 and the average state aid per capita is \$978.01 in constant 2000 dollars. Most states are concentrated in top-left quadrant (high state aid – low state centralization) and bottom-right quadrant (low state aid – high state centralization) of the graph. Many of the states located in the bottom-right quadrant (low state aid – high state centralization) are smaller states where it is easier to administer programs at the state level. The largest, most heterogeneous states in the in top-left quadrant (high state aid



– low state centralization) such as California and New York provide more state aid so that counties can administer programs.

Typically, states giving higher state aid have lower state centralization, and states with higher centralization give less state aid. The regression line fitted through the data verifies this relationship by passing through top-left and bottom-right graph quadrants. Three outlier states (New Mexico, Utah, and Delaware) are located in top right quadrant (high state aid – high state centralization). Many states are located in the bottom left quadrant (low state aid – low state centralization). Since so little aid is received from the state, these county governments must rely more heavily on locally raised revenue. Wealthier counties can make up the difference with higher effort but poorer counties are less able to increase effort to meet these needs. This stratification leads to increasing spatial inequality as counties are caught in virtuous and vicious cycles.

### **Modeling Techniques**

The analysis is interested in how counties are affected by state policy regarding local intergovernmental aid and state centralization of fiscal responsibility. Although county areas are the unit of analysis, county-level processes are influenced by higher government units, in this case, the state. As a result, the dataset has an unbalanced nested structure, with counties nested in states where the number of counties differs by state. Data of this type are amenable to estimation methods that correct for state heterogeneity bias: the confounding effects of unmeasured state-level variables that are county-invariant within a state and omitted from the regression model.

Heterogeneity bias can affect the independence of the error term and the ordinary least squares coefficient estimates (Nielsen and Alderson 1997). The value of a national model is to look at differences across counties and between states. Although state authorities may not concern themselves with the need, capacity, or fiscal effort of

jurisdictions in other states, competitive benchmarking between states and between metropolitan regions across states has increased over time.

Warner (2001) controlled for heterogeneity by state using weighted least squares modeling with state weights and found important differences in models testing the redistributive or developmental effects of state aid. Another option is to model the state-specific intercepts as either fixed or random effects (Lobao and Hooks 2003). The fixed effect model and random effect model are commonly used estimation strategies that correct for unmeasured county-invariant factors. Both methods address the state heterogeneity problem by simulating the unmeasured county-invariant factors as state-specific intercepts (Nielsen and Alderson 1997). The fixed effect model treats the state-specific intercepts as equivalent to regression coefficients of indicator variables for each state. In contrast, the random effect model treats the state-specific intercepts as a random component of the error term (Lobao and Hooks 2003).

This study implements fixed effects modeling for four reasons. The first reason is to correct the problem of state heterogeneity previously discussed. Second, random effects are more appropriate for studies involving a random sample of data from a larger population. From the random sample of cases included in the data, inferences are then made about the population. On the other hand, when inferences are confined to the effects in the sample only, then the effects are more appropriately considered fixed (Hsiao 1986:43). Inter-county comparisons may well include the full set of counties for which it is reasonable to assume the model is constant (Greene 1990:485). Since this study includes all contiguous counties in the U.S. for which data are available, it does not employ a random sample of counties from a larger population. Inferences cannot be made that apply to a larger population of counties, since such a population does not exist outside of the dataset. Alaska, Hawaii, Washington, D.C., and Yellowstone National Park were deliberately excluded from

the sample due to extreme values. Any other counties not included in the sample had missing data. Therefore, the dataset is not a random sample from a larger population.

Third, the random effects model has been criticized for neglecting the correlation that may exist between the effects and the explanatory variables, which can lead to biased and inconsistent estimation (Hsiao 1986:43). The random effects model may suffer from this inconsistency due to omitted variables (Greene 1990:495). Government policy-related variables are included in the models, so the covariates are not independent of the state. Because of the focus on the impact of state policy on county government, state-fixed effects are important to control for variations between policy regimes across states. This analysis therefore follows the technique of Lobao and Hooks (2003) who modeled the state-specific intercepts as fixed effects using the state centralization variable.

Quantitative models of cross-sectional data face the challenge that units may be more heterogeneous across space than through time. The use of any spatial unit, such as counties or states, raises questions about spatial autocorrelation. Spatial autocorrelation is the extent to which counties are interdependent or a function of conditions that result from proximity to other counties. Its occurrence can produce inefficient and biased estimates unless adjustments are made. For instance, when values are correlated geographically, the statistical assumption of independence is violated. One source of spatial autocorrelation is measurement error whereby data are aggregated and miscalculations in one spatial unit spillover to neighboring units. This problem is especially a risk for U.S. Census of Governments data aggregated at the county area level. Another cause is interdependence in space where high values in one unit are associated with low values in another unit creating a checkerboard pattern (negative autocorrelation), like values cluster together creating a lattice effect (positive autocorrelation), or values follow a gradient of diffusion.

To correct the problem of spatial autocorrelation, national studies of counties typically use either state-fixed effects or a spatial autocorrelation control variable, but not both. Empirically, a state variable and a spatial autocorrelation control variable cannot be jointly included in a model because they create severe collinearity. Both are redundant to a degree, since most counties are closest in proximity to others in their same state (Lobao and Hooks 2003). One problem with a spatial autocorrelation control variable is that it requires the researcher to stipulate, a priori, the nature of the spatial relation (Warner and Pratt 2005). This is the fourth reason why fixed effect modeling is used for this study. To address the impact of broader state policy variables, Warner and Pratt (2005) demonstrated how the use of Knowledge in Data Discovery techniques such as neural networks and classification trees can disentangle spatial effects and look specifically at differences in state policy and its impacts on localities. State centralization was found to be the most important variable differentiating effects across county areas.

Review of the strengths and weaknesses of methods pursued by other researchers suggests that a fixed effect cross-sectional and generalized estimation modeling approach is most appropriate for this study. The results will produce valuable new knowledge of the impacts of fiscal devolution at four recent cross-sections in time covering a fifteen year period. The prior empirical analyses are updated with the most current data. The descriptive statistics suggest that nonmetropolitan nonadjacent counties have the highest local effort and are in the most need of redistributive aid based on their demographic characteristics. Furthermore, local effort is countercyclical since it is higher during recessions. But the descriptive analysis does not indicate how federal and state aid are combining redistributive and developmental aspects. Therefore, multivariate regression modeling is necessary to answer the research question: Are federal aid, state aid, and local government revenue

effort redistributive, developmental, or both? The models will show if the findings indicated by the descriptive statistics are statistically significant when other variables are controlled.

## **CHAPTER 4**

### **ANALYSIS**

#### **Outline**

This chapter provides an analysis of the regression modeling results. The chapter begins with the model results for the federal aid, state aid, and local effort models. This section is followed by a discussion of the redistributive and developmental aspects of the three dependent variables. In conclusion, the wider theoretical and policy implications of the study are discussed.

#### **Modeling Results**

Table 12 presents the federal aid regression modeling results. This model performed more poorly than the state aid and local effort models, with the lowest R squared values ranging from 0.148 to 0.296. The per capita dollar amount of federal aid is so small that in reality, it has very little impact on local government revenue and thus is difficult to model. The year variable is negative, suggesting a decreasing trend for federal aid over 1987-2002. Federal aid is a complement to local effort (+) except in 2002 and to state aid (+), which is a developmental effect. Federal aid has become more of a complement to state aid through the years as shown by the positive interaction between year and state aid. Counties in low state centralization states received more federal aid (+) in 1987 than medium state centralization states. Counties in states with high centralization also received more federal aid (+) in 1987, 1997, and the GEM than medium state centralization states. Based on these results, federal aid is not a clear substitute or complement to state centralization. However, federal aid is developmental since it is higher for counties in high centralization states.

Federal aid is redistributive toward percent poverty (+) in 1992 and 2002, percent unemployment (+), and percent white (-). Federal aid is not redistributive with respect to percent dependent which is negative in 1992, or to percent old housing

**Table 12: Federal Aid Regression Modeling Results**

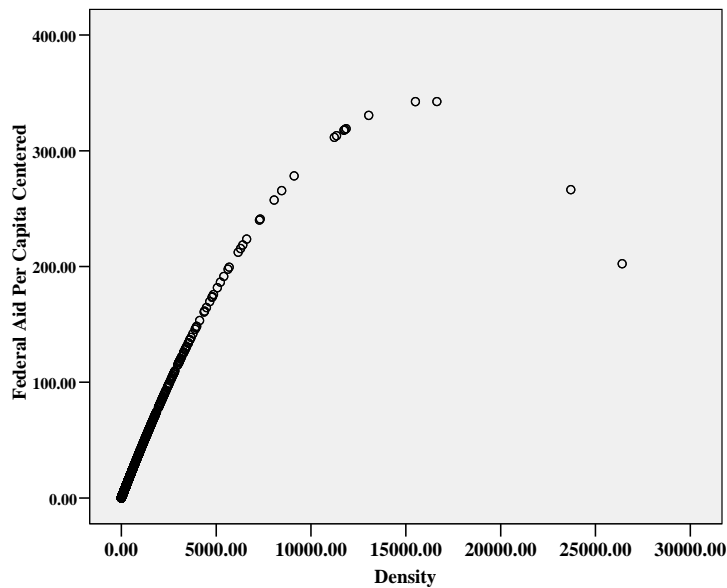
Variable Name	1987	1992	1997	2002	GEM
Intercept	3.888*	-0.399	-3.205	-4.760*	0.072
Low State Centralization	0.096*	-0.093	0.052	0.061	-0.025
High State Centralization	0.113**	-0.057	0.167**	0.075	0.149***
State Aid Per Capita	0.262***	0.464***	0.572***	0.473***	2E-04***
Local Effort Per Capita	0.233***	0.334***	0.271***	0.093	0.679**
Nonmetro Nonadjacent	0.019	-0.027	0.055	0.012	-0.015
Nonmetro Federal Land	0.410***	0.749***	0.510***	0.543***	0.267***
Ln Population	0.115***	0.132***	0.058	0.079*	-0.105***
Percent Population Growth	-0.831**	-0.026	-0.114	-1.141**	-0.121
Population Density	2E-04***	2E-04**	1E-04*	2E-04**	4E-04***
Population Density Squared	-9E-09***	-1E-08*	-5E-09	-6E-09	-1E-08***
Ln Per Capita Income	-0.321*	-0.010	0.279	0.450*	-0.004
Percent Urban	-0.137	-0.047	0.149	0.086	-0.148**
Percent Poverty	0.200	1.816*	1.317	2.119**	0.549
Percent Unemployment	4.736***	5.340***	2.911*	5.966***	5.697***
Percent Employment Growth	0.233	-0.121	-0.079	0.574	-0.055
Percent Out-Commuting	-1.173***	-1.593***	-1.309***	-1.558***	-1.016***
Percent High School Graduate	2.160***	2.372***	1.798***	1.773***	2.555***
Percent Dependent	0.040	-2.154**	-0.625	-0.292	0.171
Percent White	-0.682***	-1.032***	-1.200***	-1.351***	-1.047***
Percent Old Housing	-0.311	0.239	0.264	0.013	-0.327**
Year					-0.042***
Year * State Aid Centered					9E-05***
N	3,059	2,876	2,990	3,014	11,939
R Squared	0.296	0.207	0.214	0.250	0.148

\*\*\*  $p \leq .001$ ; \*\*  $p \leq .01$ ; \*  $p \leq .05$

Values are unstandardized coefficients: natural log units for cross sectional models and centered units divided by 100 for GEM

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)



**Figure 9: Federal Aid Density Curve 1987-2002**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002)

Based on GEM regression results

which is negative for the GEM. Population is positive (+) except in 1997 (insignificant) and the GEM (-). Federal aid is positive for population density (+) and negative for population density squared (-) except in 1997 and 2002. Figure 9 shows that the federal aid curve is upward sloping as population density increases except for New York City, which has the highest density in the sample and represents the two data points near the 25,000 persons per square mile density mark. The density of New York City is slightly under 25,000 in 1990 and grew to just above 25,000 in 2000. The inverted U-shape of the graph reflects the federal aid response to the measure for economies of scale. Federal aid initially rises at a faster rate for counties with a smaller density under 5,000 persons per square mile, and then rises at a slower rate for counties with a higher density between 5,000 and 15,000 persons per square mile.



Federal aid is developmental with respect to per capita income (+) in 2002 and percent high school graduate (+). Federal aid is not developmental toward percent population growth which is negative in 1987 and 2002, or percent employment growth which is insignificant. Per capita income reversed sign from negative in 1987 to positive in 2002. This result demonstrates the trend over time toward a more pro-growth focus of the federal government. Spatially, federal aid is higher for federal land counties (+), lower for urban counties (-) according to the GEM and for counties with a higher percent out-commuting (-), and insignificant for nonmetropolitan nonadjacent counties.

Table 13 displays the state aid regression results. This model performed better than the federal aid models but not as well as the local effort models, with the R squared values ranging between 0.217 and 0.346. The year variable is positive, confirming that state aid has steadily increased over the period studied. State aid is a complement to federal aid (+). State aid is a substitute for local effort (-) in 1987 but changes to a complement (+) in 2002. State aid is a substitute (-) for the GEM; however, it has become less of a substitute for local effort during the time-span, as demonstrated by the positive interaction between year and local effort. This finding illustrates the trend over time toward a more pro-growth focus of the state. As shown in Figure 10, state aid is a substitute for state centralization: counties in states with high centralization (-) receive less state aid than medium state centralization states except in 2002, and counties in states with low centralization (+) receive more state aid than medium centralization states. This relationship is expected since other researchers have come to the same conclusion. The positive interaction between year and low state centralization indicates that these counties are gradually receiving more state aid over the timeframe.

**Table 13: State Aid Regression Modeling Results**

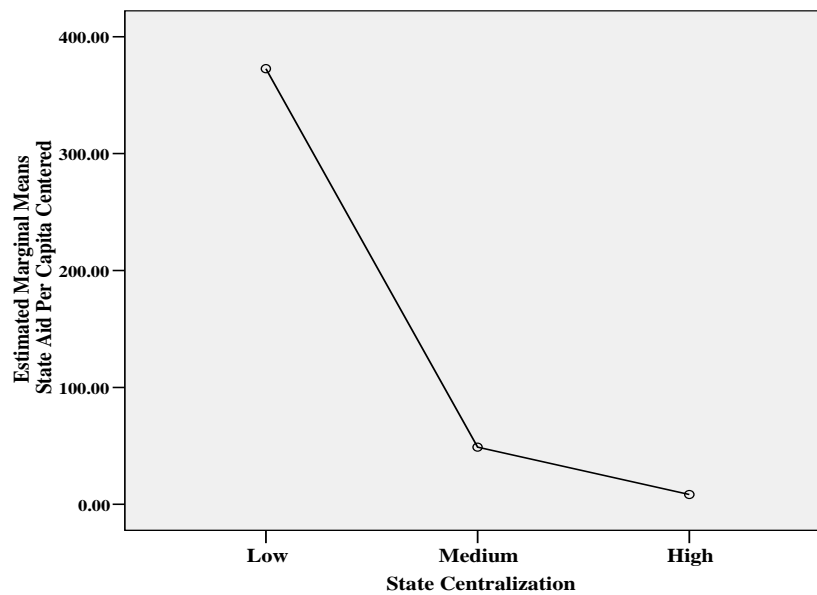
Variable Name	1987	1992	1997	2002	GEM
Intercept	8.259***	8.487***	9.476***	8.773***	0.665*
Low State Centralization	0.272***	0.332***	0.337***	0.275***	0.290***
High State Centralization	-0.088***	-0.076***	-0.126***	-0.030	-.077***
Federal Aid Per Capita	0.059***	0.026***	0.039***	0.039***	3E-04***
Local Effort Per Capita	-0.045**	0.001	-0.017	0.048**	-0.274**
Nonmetro Nonadjacent	0.020	0.001	-0.002	0.008	-0.001
Nonmetro Federal Land	0.258***	0.218***	0.179***	0.169***	0.209***
Ln Population	0.068***	0.032***	0.015	0.053***	0.004
Percent Population Growth	-0.694***	-0.340**	-0.581***	-0.237*	-0.450***
Population Density	-7E-06	-1E-05	2E-05	-2E-05	2E-05
Population Density Squared	1E-09	2E-09	-2E-10	1E-09	6E-10
Ln Per Capita Income	-0.303***	-0.253***	-0.328***	-0.268***	-0.123***
Percent Urban	-0.254***	-0.170***	-0.175***	-0.237***	-0.182***
Percent Poverty	-0.471*	-0.258	-0.805***	-1.054***	-0.643***
Percent Unemployment	1.891***	1.994***	3.334***	3.734***	3.263***
Percent Employment Growth	0.397***	0.342***	0.289***	0.145	0.370***
Percent Out-Commuting	0.037	-0.038	0.008	0.107*	-0.090***
Percent High School Graduate	-0.087	-0.101	-0.202	-0.115	0.023
Percent Dependent	0.333	0.507**	0.534**	0.550**	0.345***
Percent White	-0.273***	-0.246***	-0.070	-0.157**	-0.232***
Percent Old Housing	0.566***	0.532***	0.547***	0.532***	0.484***
Year					0.173***
Year * Low State Centralization					0.049***
Year * Local Effort Centered					0.209***
Year * Percent Employment Growth					-0.035*
N	3,059	2,876	2,990	3,014	11,939
R Squared	0.217	0.281	0.337	0.237	0.346

\*\*\*  $p \leq .001$ ; \*\*  $p \leq .01$ ; \*  $p \leq .05$

Values are unstandardized coefficients: natural log units for cross sectional models and centered units divided by 1,000 for GEM

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)



**Figure 10: State Aid and State Centralization Substitution Effect 1987-2002**  
 U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)  
 Source: U.S. Census of Governments (1987, 1992, 1997, 2002)  
 Based on GEM regression results

State aid is redistributive with respect to per capita income (-), percent unemployment (+), percent dependent (+) except in 1987, percent white (-) except in 1997, and percent old housing (+). State aid is not redistributive toward percent poverty which is negative (-) except in 1992. State aid is higher (+) in places with a larger population except in 1997 and the GEM, suggesting that the state rewards the lower costs in more populous counties due to benefits from economies of scale. However, population density and density squared are insignificant. State aid is developmental toward percent employment growth (+) except in 2002. State aid is not developmental with respect to percent population growth (-) or percent high school graduate (insignificant). The negative interaction between year and percent employment growth demonstrates that state aid is less developmental toward counties experiencing employment growth over the period studied, confirming the 2002 result. In regards to spatial effects, state aid is higher for federal land counties (+), lower for

percent urban (-) and counties with a higher percent out-commuting (-) for the GEM, and insignificant for nonmetropolitan nonadjacent counties.

Table 14 shows the regression results for local effort. This model performed better than the federal and state aid models, with the highest R squared values ranging from 0.280 to 0.468. Although none of the models run by this study were able to explain over half of the variance in the dependent variable, the purpose of much social science modeling is to learn more about relationships between variables, rather than to determine direct cause and effect relationships. The year variable is insignificant since local effort is countercyclical and does not show a uniformly positive or negative trend throughout 1987-2002. Local effort is a complement to federal aid (+) except in 2002 and to state aid (+) in 2002. The negative interaction between year and federal aid suggests that local effort is less of a complement to federal aid over the period studied. State aid changed from a substitute (-) in 1987 and 1997 to a complement (+) in 2002. It is a substitute (-) for the GEM; however, the positive interaction between year and state aid implies that local effort has become less of a substitute for state aid through the years.

Figure 11 confirms that local effort is a substitute for state centralization: counties in states with high centralization (-) have lower effort than medium state centralization states, while counties in states with low state centralization (+) have higher effort than medium state centralization states. This relationship was expected since other researchers have produced the same result. The negative interactions between year and both low and high state centralization indicate that counties in both types of states have a negative relationship with effort over time, in comparison to medium centralization states.

Local effort is higher with greater need including percent poverty (+), percent dependent (+), percent white (-), and percent old housing (+) in 1997 and 2002,

**Table 14: Local Effort Regression Modeling Results**

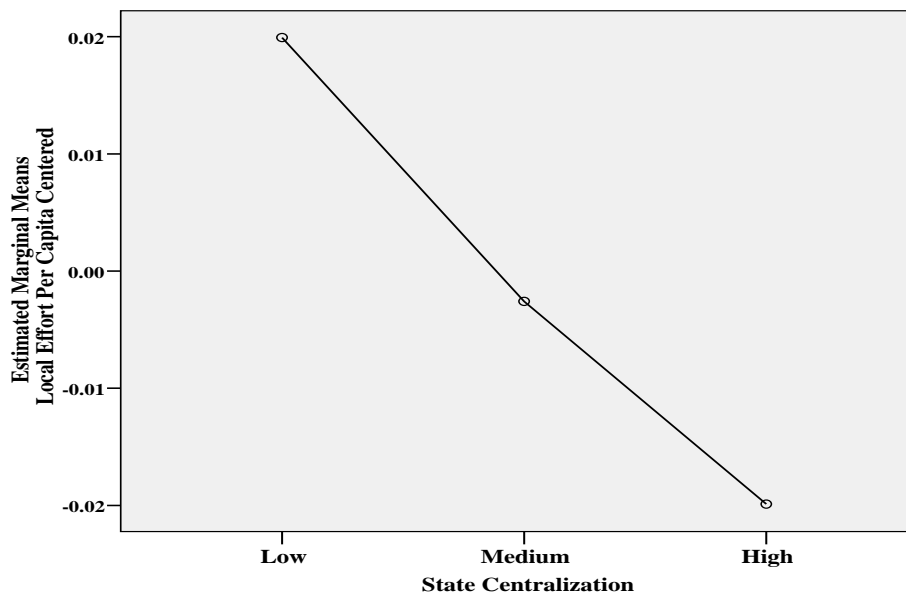
Variable Name	1987	1992	1997	2002	GEM
Intercept	-3.689***	-5.897***	-3.983***	-4.954***	-0.796
Low State Centralization	0.257***	0.219***	0.192***	0.189***	0.262***
High State Centralization	-0.178***	-0.206***	-0.163***	-0.263***	-0.131***
Federal Aid Per Capita	0.063***	0.027***	0.029***	0.012	3E-04***
State Aid Per Capita	-0.066***	-0.013	-0.044*	0.042*	-6E-05**
Nonmetro Nonadjacent	-0.019	0.010	-0.064***	-0.058**	-0.037***
Nonmetro Federal Land	-0.077**	-0.014	0.007	-0.043	-0.005
Ln Population	-0.130***	-0.113***	-0.182***	-0.181***	-0.197***
Percent Population Growth	0.587***	0.317*	-0.067	-0.035	-0.028
Population Density	1E-04***	8E-05***	1E-04***	1E-04***	1E-04***
Population Density Squared	-3E-09*	-2E-09	-3E-09**	-3E-09**	-4E-09***
Ln Per Capita Income	0.246**	0.514***	0.434***	0.522***	0.427***
Percent Urban	0.100*	0.071	0.346***	0.385***	0.230***
Percent Poverty	0.910**	1.151***	1.287***	1.368***	1.015***
Percent Unemployment	-0.095	-0.135	-0.183	-0.911*	-0.093
Percent Employment Growth	-0.899***	-0.293**	-0.183	0.068	-0.362***
Percent Out-Commuting	-0.904***	-0.947***	-1.041***	-1.058***	-0.993***
Percent High School Graduate	1.240***	0.761***	0.248	0.127	0.306***
Percent Dependent	1.486***	1.081***	1.068***	0.683**	0.275*
Percent White	-0.342***	-0.431***	-0.368***	-0.366***	-0.345***
Percent Old Housing	0.169	0.134	0.342***	0.196**	-0.088
Gini Coefficient	-2.169***	-2.282***	-2.584***	-2.734***	-3.011***
Year					0.009
Year * Low State Centralization					-0.024*
Year * High State Centralization					-0.021*
Year * Federal Aid Centered					-1E-04***
Year * State Aid Centered					2E-05*
Year * Percent Poverty					0.141**
Year * Percent Employment Growth					0.068**
N	3,059	2,876	2,990	3,014	11,939
R Squared	0.468	0.390	0.404	0.373	0.280

\*\*\*  $p \leq .001$ ; \*\*  $p \leq .01$ ; \*  $p \leq .05$

Values are unstandardized coefficients: natural log units for cross sectional models and centered units multiplied by 10 for GEM

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

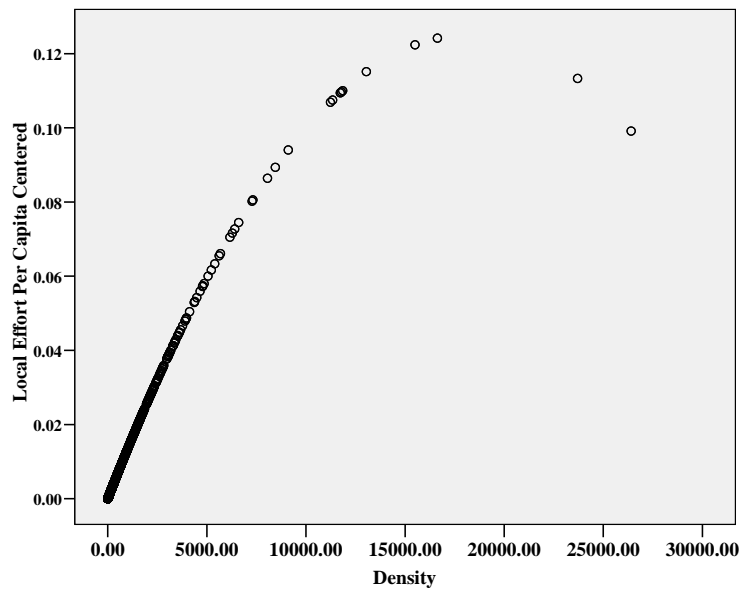
Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)



**Figure 11: Local Effort and State Centralization Substitution Effect 1987-2002**  
 U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)  
 Source: U.S. Census of Governments (1987, 1992, 1997, 2002)  
 Based on GEM regression results

suggesting redistributive effects. Local effort is not higher with respect to percent unemployment (-) in 2002 or to income inequality (-). Theory predicts that effort will be higher in places with more homogeneous income distributions because all residents use the services paid for by tax dollars and benefit equally. The service to benefit ratio, which is calculated as the value of a service to its tax cost, is primarily less than one for the higher income taxpayer and greater than one for the lower income taxpayer. In areas with greater income inequality, wealthier residents generally prefer not to pay taxes for services that mainly benefit poorer residents (Schneider 1989). This prediction holds since local effort decreases as inequality increases. The positive interaction between year and percent poverty shows that effort is more redistributive with respect to poverty from 1987-2002.

Places with a larger population have lower (-) effort. Local effort is positive for population density (+) and negative for population density squared (-) except in



**Figure 12: Local Effort Density Curve 1987-2002**

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002)

Based on GEM regression results

1992. Figure 12 shows that the local effort curve is upward sloping as population density increases except for New York City, which has the highest density in the sample and represents the two data points near the 25,000 persons per square mile density mark. The density of New York City is slightly under 25,000 in 1990 and grew to just above 25,000 in 2000. The inverted U-shape of the graph reflects the local response to the measure for economies of scale. Local effort initially rises at a faster rate for counties with a smaller density under 5,000 persons per square mile, and then rises at a slower rate for counties with a higher density between 5,000 and 15,000 persons per square mile.

Local effort has risen with respect to percent population growth (+) in 1987 and 1992, per capita income (+), and percent high school graduate (+) except in 1997 and 2002, suggesting a developmental effect. Local effort is lower (-) in counties

**Table 15: Summary of Federal Aid Modeling Results**

<b>REDISTRIBUTIVE</b>	<b>DEVELOPMENTAL</b>	<b>SPATIAL</b>
Poverty (+)	Per Capita Income (+)	Federal Land (+)
Unemployment (+)	Educational Attainment (+)	Urban (-)
Racial Minorities (+)		Out-Commuting (-)

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)

experiencing employment growth except in 1997 and 2002. The positive interaction between year and percent employment growth indicates that local effort is more responsive as counties experience employment growth over time. Pertaining to spatial effects, nonmetropolitan nonadjacent (-) counties have lower effort except in 1987 and 1992, federal land counties (-) have lower effort in 1987, counties with a higher percent out-commuting (-) have lower effort, and counties with a larger percent urban population (+) have higher effort except in 1992. These results are contrary to the descriptive statistics which suggested that nonmetropolitan nonadjacent counties have higher effort and metropolitan counties have lower effort. Multivariate regression is necessary to control for the effects of other variables.

## **Discussion**

Table 15 indicates that within the context of fiscal devolution, federal aid plays redistributive, developmental, and spatial roles. Federal aid is redistributive toward measures of need including higher poverty, unemployment, and racial minorities. Nonmetropolitan counties are higher in poverty and unemployment (Table 7). Nonmetropolitan nonadjacent counties have the highest poverty (Table 8). Both nonmetropolitan nonadjacent and adjacent counties have the highest unemployment (Tables 8 and 9). Metropolitan areas are the highest in racial minorities (Table 10). Federal aid is also higher for nonmetropolitan federal land counties which have a



limited local property tax base. Nonmetropolitan nonadjacent counties have the most federal land counties (Table 3). However, federal aid is not significantly different for nonadjacent rural counties after controlling for other variables.

Federal aid is developmental by supporting counties with a larger per capita income and educational attainment. The descriptive statistics show that metropolitan counties have the highest per capita income and educational attainment (Table 10). However, federal aid is lower for urban counties and for counties with higher out-commuting since they can tax export and have lower service requirements. Metropolitan counties have the highest percent urban and out-commuting (Table 10). It should be noted that the dollar amount of federal aid per capita may be too small to accomplish any of these objectives, and that this model performed the poorest of the three dependent variables.

Federal aid is highest in nonmetropolitan nonadjacent counties and lowest in nonmetropolitan adjacent counties (Tables 3 and 4). Although federal aid is insignificant for nonmetropolitan nonadjacent counties and lower for urban counties, it is directed toward specific economic and demographic characteristics of both rural and urban places. Concerning redistribution, most federal aid is targeted to attributes that define nonmetropolitan nonadjacent counties, and then equally distributed between characteristics of metropolitan and nonmetropolitan adjacent counties. In contrast, developmental federal aid mostly privileges traits of metropolitan counties. Since federal aid neglects both rural and urban counties spatially, it is crucial that federal aid is directed toward both redistributive and developmental policies in order to meet the special needs of needs of these two types of places. If redistributive aid declines, then rural places will feel the greatest burden. Similarly, if developmental funding declines, then urban places will suffer the effects.

**Table 16: Summary of State Aid Modeling Results**

<b>REDISTRIBUTIVE</b>	<b>DEVELOPMENTAL</b>	<b>SPATIAL</b>
Per Capita Income (-)	Employment Growth (+)	Federal Land (+)
Unemployment (+)		Urban (-)
Dependents (+)		Out-Commuting (-)
Racial Minorities (+)		
Older Infrastructure (+)		

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)

The overall federal aid model effects were calculated for 1987 and 2002 by multiplying the unstandardized regression coefficient for each variable by its sample mean. In both 1987 and 2002, the largest effect is for per capita income, although the sign reversed from negative (redistributive) in 1987 to positive (developmental) in 2002. This result demonstrates the strong trend over time toward a more pro-growth focus of the federal government. The second largest effect for both 1987 and 2002 is state aid, which is positive in both years showing that federal aid is a complement to state aid. The third largest effect in 1987 and 2002 is percent high school graduate, which is positive in both years. These findings are also reflective of a developmental federal government that generally helps those who help themselves.

As demonstrated by Table 16, state policy should not be viewed as a dichotomous choice promoting either redistribution or development; instead, a more nuanced approach is needed. State aid is redistributive toward many measures of need including lower per capita income and higher unemployment, dependents, racial minorities, and older infrastructure. The state aid directed to young and old dependents may consist largely of welfare payments. The funding targeted to counties with older infrastructure may be infrastructure payments. Nonmetropolitan counties are lower in per capita income, and higher in unemployment, dependents, and older

infrastructure (Table 7). Nonmetropolitan nonadjacent counties have the lowest income, the most dependents, and the oldest infrastructure (Table 8). Both nonmetropolitan nonadjacent and adjacent counties have the highest unemployment (Tables 8 and 9). State aid is also higher for nonmetropolitan federal land counties which have a limited local property tax base. Nonmetropolitan nonadjacent counties have the most federal land counties (Table 3). Metropolitan areas are highest in racial minorities (Table 10).

State aid is developmental in giving more support to counties with higher employment growth. The descriptive statistics show that metropolitan counties have the highest employment growth (Table 10). From a spatial perspective, state aid is lower for more urban counties and for counties with higher out-commuting, both of which are highest in metropolitan counties (Table 10). State aid is not significantly different for nonadjacent rural counties.

According to the descriptive statistics, state aid is highest in nonmetropolitan nonadjacent counties and lowest in metropolitan counties (Tables 3 and 5). The regression results indicate that like federal aid, state aid is lower for urban counties and not significantly different for nonmetropolitan nonadjacent counties. However, it is directed toward specific economic and demographic characteristics found in both rural and urban places. In regards to redistribution, most state aid is targeted to characteristics that define nonmetropolitan nonadjacent counties, followed by metropolitan counties and nonmetropolitan adjacent counties equally. On the other hand, developmental aid is aimed toward an attribute most common in metropolitan counties.

Examination of Table 16 suggests that although state aid is both redistributive and developmental, redistribution dominates. In both 1987 and 2002, the largest model effect is per capita income, which is negative for both years. This result

**Table 17: Summary of Local Effort Modeling Results**

<b>REDISTRIBUTIVE</b>	<b>DEVELOPMENTAL</b>	<b>SPATIAL</b>
Poverty (+)	Population Growth (+)	Nonadjacent (-)
Dependents (+)	Per Capita Income (+)	Federal Land (-)
Racial Minorities (+)	Educational Attainment (+)	Urban (+)
Older Infrastructure (+)		Out-Commuting (-)

U.S. County Areas excluding Alaska, Hawaii, Washington, D.C., and Yellowstone National Park; N = 3,059 (1987), 2,876 (1992), 2,990 (1997), 3,014 (2002)

Sources: U.S. Census of Population (1980, 1990, 2000); U.S. Census of Governments (1987, 1992, 1997, 2002); U.S.D.A. Economic Research Service (1989, 1993, 2003)

demonstrates the strong trend over time toward a more pro-redistribution focus of state government. The second largest effect for 1987 and 2002 is population, which is positive in both years. This finding suggests that state aid is responsive to the benefits arising from economies of scale at the county level. The third largest effect is percent white (-) in 1987 and percent dependent (+) in 2002. These effects are also reflective of a redistributive state that gives more to those places left behind.

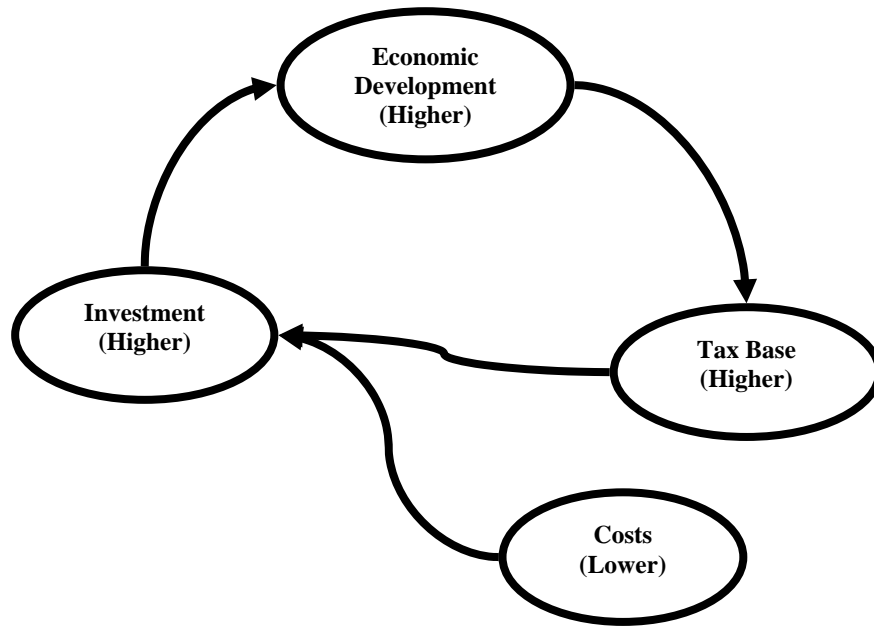
State aid is redistributive with respect to percent unemployment but it is also developmental towards percent employment growth. This result exemplifies the complementary state roles of redistribution and development. While state aid is higher for counties experiencing job growth (urban areas), it is also higher in counties where unemployment is high (rural areas). This finding supports other researchers who found that redistribution and development activities can increase together (Lobao and Hooks 2003; Lobao and Kraybill 2005). In contrast to a tradeoff between redistribution and development, state governments can commit to different policy aims in different areas. This is a benefit of state centralization: the state has the capacity to support both growth poles and lagging areas.

Table 17 summarizes how the impacts of local effort are also redistributive, developmental, and spatial. Local effort is redistributive toward various measures of need including poverty, dependents, racial minorities, and older infrastructure.

Nonmetropolitan counties are higher in poverty, dependents, and older infrastructure (Table 7). Nonmetropolitan nonadjacent counties have the highest poverty, the most dependents, and the oldest infrastructure (Table 8). Metropolitan areas are highest in racial minorities (Table 10).

Local effort is developmental by supporting counties with higher percent population growth, per capita income, and educational attainment. Metropolitan counties rank the highest for all of these variables (Table 10). Local effort is lower for counties with higher out-commuting since they can tax export and have lower service requirements, which is a characteristic of metropolitan counties (Table 10). From a spatial perspective, local effort is lower for nonmetropolitan nonadjacent and federal land counties, and higher for urban counties. Nonmetropolitan nonadjacent counties have the most federal land counties and metropolitan counties have the highest percent urban (Tables 3 and 10). Unlike federal and state aid, local effort has a distinct spatial dimension for both rural and urban areas. Local effort is most redistributive to attributes that define nonmetropolitan nonadjacent counties, followed by metropolitan counties. Developmentally, local effort privileges characteristics of metropolitan counties, although local effort is the lowest for these counties.

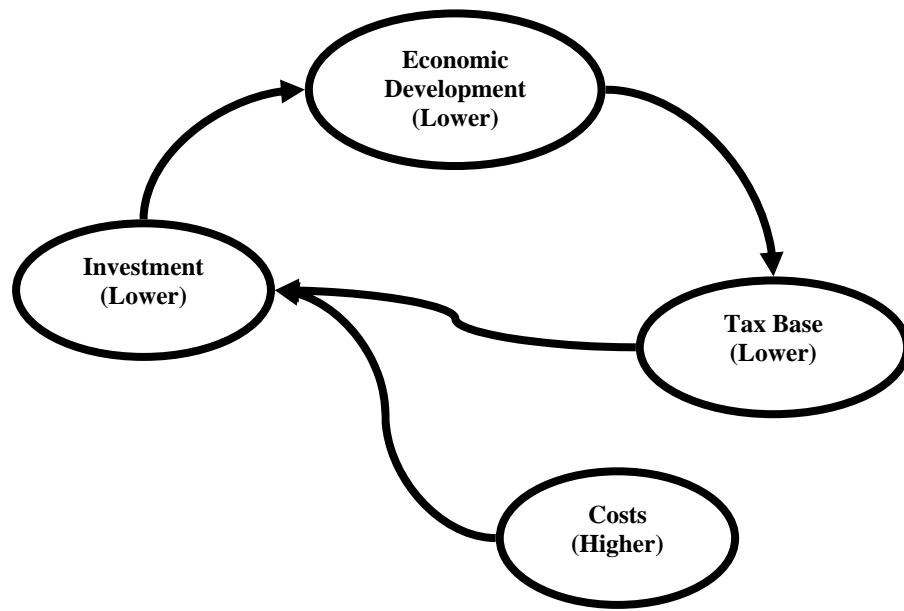
Similar to state aid, local effort is highest in nonmetropolitan nonadjacent counties and lowest in metropolitan counties (Tables 3 and 5). In both 1987 and 2002, the largest model effect is per capita income, which is positive in both years. This result demonstrates the pro-cyclical, developmental impact of local effort. The second largest effect for both 1987 and 2002 is population, which is negative in both years. Local effort is responsive to economies of scale at the county level. The third largest effect in 1987 and 2002 is the Gini coefficient, which is negative in both years. This result is neither redistributive nor developmental, but is regressive by confirming the theory that effort is lower in counties with more income inequality since wealthier



**Figure 13: Virtuous Cycle**

residents generally prefer not to tax themselves to provide services for poorer residents (Schneider 1989). These effects show that overall, local effort is a mixed bag of development, economies of scale, and regressivity. Although redistributive variables are significant as well, they are swamped by these larger effects.

Warner (1997) discovered that federal aid, state aid, and local effort can lead to virtuous and vicious cycles among local governments. This finding has been confirmed by later analyses (Warner and Pratt 2005; Warner 2006, 2003, 1999). Figure 13 shows the virtuous cycle found in wealthier jurisdictions that have a larger tax base with tax rates that are either the same or lower than poorer jurisdictions. These places will have lower costs and invest more, leading to stronger economic development, yielding more government revenue to invest in further development. As a result, these wealthier localities will be preferred by businesses and households, enlarging the tax base and increasing the wealth gap between regions.



**Figure 14: Vicious Cycle**

Figure 14 illustrates the vicious cycle found in poorer jurisdictions that have a smaller tax base with tax rates that are either the same or higher than wealthier jurisdictions. These places will have higher costs and invest less, leading to weaker economic development, yielding limited government revenue to invest in further development. Under decentralization, the places most likely to be caught in these vicious cycles are high-poverty rural and inner-city areas. It is this vicious cycle that increases effort in poor nonmetropolitan counties. Local government is caught in these virtuous and vicious cycles, and the federal government is amplifying this effect with its pro-cyclical, developmental focus. Since state aid is more redistributive, it can help to break the vicious cycle. Although local effort has some redistributive attributes and is countercyclical, the regression results suggest that the developmental effects dominate.

Federal aid, state aid, and local effort are lower for counties with higher out-commuting; and federal and state aid are lower for more urban counties due to their ability to tax export. Metropolitan counties have the highest percent urban and out-

commuting (Table 10). Urban areas can export part of their tax burden to people living outside the county by shifting taxes to nonresident commuters, shoppers, and tourists (Chernick and Reschovsky 1995; Ladd and Bradbury 1988; Warner and Pratt 2005; Yinger and Ladd 1989; Yinger 1990). Tax exporting enhances fiscal capacity because it allows a portion of the cost of public services to be paid for by nonresidents (Chernick and Reschovsky 1995; Chernick 1998). By giving less aid to these counties, the federal and state government recognize that they benefit from tax exporting.

### **Theoretical and Policy Implications**

Federal aid is found to be both redistributive and developmental, with a stronger emphasis on pro-cyclical development. However, its per capita dollar amount is too small to be significant. Increasing federal aid to county governments would be a good start to fully realize the redistributive and developmental potential of federal aid. With its large tax base and lack of balanced budget requirements, the federal government is capable of increasing aid to county governments.

Due to declining revenue from federal government, the state is now responsible for more redistributive and developmental functions, although its focus is more on redistribution. Since state government is at a high enough level for redistribution and a low enough level for development, the state is up to this task. This study has shown the emergence of the meso level state and its important roles for both redistribution and development. However, state policy differences concerning state aid and centralization create a very uneven landscape for local government well-being. While states can address spatial inequality within their own borders by increasing aid or fiscal centralization, they cannot reduce interstate inequality in local government revenue. This factor also suggests that a stronger role is needed for the federal government to supplement the efforts of states to address spatial inequality



across the nation as a whole. Because federal and state aid are complements and more so over time, any increase in federal aid should recognize this and be careful to assess whether it is complementing the redistributive or developmental aspects of state aid. The choice will depend on the policy goal.

Finally, local government revenue effort follows federal and state aid by taking on both redistributive and developmental roles, with a greater emphasis on development. Nonetheless, the county level may be too low of a level of government to successfully implement both types of policies effectively, especially in counties with lower tax bases. Government poor counties facing a smaller revenue base and demographic disadvantages are not capable of promoting effective redistribution or development.

The results suggest that fiscal devolution has impacted functions of the federal and local government such that there is far more overlap between the traditional roles prescribed by fiscal federalism. In a policy context that has seen a decline in federal funding to localities, the federal government no longer solely handles redistribution and local government does not focus only on development. The complexities of today's policy climate require that the micro, meso, and macro levels of government each fulfill functions of redistribution and development to the best of their resources and capabilities.

## **CHAPTER 5**

### **CONCLUSION**

#### **Policy Recommendations**

This study recommends an increase in redistributive federal aid to local government since only the central government is capable of ameliorating inequality in local revenue capacity across the entire nation. In its current form, federal aid per capita is too small to be effective. Compared to state aid, federal aid is more pro-cyclical and developmental. As a result, federal aid can exacerbate inequality among local governments that are prospering and those that are lagging. However, given the greater revenue tax base and revenue flexibility of the federal government, it has the potential to become redistributive and countercyclical, especially now during a time of recession.

In comparison to federal aid, state aid is more redistributive. While some redistributive functions have been devolved to the state level, these functions should not be decentralized further to the local level. States are equipped with state aid and state centralization to mitigate the negative impacts of fiscal devolution. To better address both redistribution and development, the states must continue the trends illustrated by the data of increasing state aid and state centralization. Local governments can only pursue redistribution and development to the extent that their tax base will allow. At the local level, counties with higher income inequality spend less on services benefiting the poor. Therefore, federal and state aid to county governments must be more redistributive since local effort will not be in places with the highest income inequality.

Local government is caught in virtuous and vicious cycles which the federal government is amplifying with its pro-cyclical, developmental focus. The strongest effect for all three of the dependent variables is per capita income. At both the federal

and local level, the result is pro-cyclical and developmental. Federal aid is higher for counties with higher incomes and local governments with higher incomes have higher effort. At the state level, the strongest effect is redistributive in that counties with higher incomes receive less state aid. Because both federal aid and local effort are predominately developmental, the state role in redistribution has become even more important. Since state aid is more redistributive than developmental, it can help to break the vicious cycle reinforced by federal aid and local effort.

The result that local effort is redistributive and countercyclical with respect to poverty and more so over time is theoretically unexpected since the theory of fiscal federalism proposes that local governments are incapable of redistribution. By spending more on poverty, county governments can escape the vicious cycle. However, to do this, they need more aid from both the federal and state government to better achieve the functions of redistribution and development which are so critical to their residents' well-being and quality of life. The analysis also highlights the need for both federal and state aid to explicitly target both rural and urban areas to help with their higher service costs. In particular, the data has shown that nonmetropolitan nonadjacent counties are often the most disadvantaged on demographic measures of need.

### **Challenges for Future Policy**

The challenge for future government finance policy at all levels is first to generate the revenue needed for the promotion of both redistribution and development, and secondly to generate the political will to apply this funding toward implementing policies that fulfill both of these important functions. Given that the United States is currently facing its worst economic crisis since the Great Depression in the 1930s, the danger is that not enough revenue will be available at all government levels to fully support both redistribution and development. Furthermore, the focus of government

finance policy may shift more strongly toward generating economic development, possibly at the expense of redistribution since funds are so low.

After the Great Depression, the federal government took on greater responsibility for both economic and social welfare. For example, the government became more involved in economic planning, regulation, and the provision of a stronger social safety-net. In the present context, it remains to be seen whether the national government will assume a bigger role in both development and redistribution. In response to the economic crisis, the banks, businesses, and citizens affected are turning to the central government for solutions and assistance. The government has continued its pro-cyclical trend by distributing billions of dollars in developmental aid to banks, lending agencies, and the automobile industry. However, no redistributive funding has been provided to employees who lost their jobs or to homeowners who lost their homes.

Meanwhile, the states face balanced-budget requirements and will also be focused on strengthening their economies during a recession, at the expense of redistribution. Finally, local governments, who are facing economic decline, lower tax bases, and higher unemployment, will be forced to reduce spending in this context. This pro-cyclical effect will exacerbate the negative impacts of the economic downturn at the local level.

### **Questions for Future Research**

Future research could follow up on the fiscal devolution trends during the economic crisis, especially when the 2007 and 2012 U.S. Census of Governments data and the 2010 U.S. Census of Population data become available. It will be interesting to see how the policies of President Barack Obama confront the financial challenges facing governments at all levels. In addition, an analysis using spatial modeling or neural network modeling could further explore the impacts of decentralization in

urban and rural areas. A study of the redistributive and developmental impacts of specific programs such as education and health care would also be useful to the policy community.

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