

The Pennsylvania State University

The Graduate School

College of Agricultural Sciences

THE ROLE OF GOVERNMENTAL ORGANIZATIONAL FORM
IN ECONOMIC GROWTH

A Thesis in

Agricultural, Environmental and Regional Economics

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

December, 2006

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Abstract

In the economic growth literature there have been numerous theoretical and empirical studies that examined a multitude of potential factors and policies affecting economic growth, primarily public policies such as infrastructure, education, and taxes. While we have some understanding of how these public policies affect economic growth prospects, we do not have a solid understanding of how different governmental organizational forms affect public policies and, ultimately, economic growth in the long run. The philosophical debate on how to best organize government units to encourage economic growth, a centralized versus a decentralized form of government, is long standing. More recently, the debate over the benefits and costs of a fragmented system of government has re-ignited this historical debate. While there have been great theoretical arguments both in favor of and against government fragmentation, there have been no real sophisticated empirical tests on the effects of different governmental organizational forms on economic growth. This dissertation seeks to address this shortcoming. In particular, this dissertation seeks to provide answers on whether a governmental organizational form encouraging competition among government units is beneficial or detrimental to economic growth. In order to accurately measure the multifaceted aspects of governmental organizational form a series of fragmentation indexes proposed and advanced in the literature are tested and expanded upon in a Carlino-Mills model on county economic growth over the period from 1992 to 2002. To accomplish this task, data from the Census of Government was used to extract and identify state and local government expenditures and revenues to create fragmentation indexes at the county and state level. How governmental organizational form is measured specifically has been shown to affect the regression results. State organizational form has greater implications for economic growth than organizational form at the county level, but the interaction between state and county government units is shown to be the most significant. Government units per capita, a common measure of government fragmentation, can bias the results in favor of more consolidation. The results from the dissertation do not provide any support to the contention that government fragmentation is harmful to the economic growth prospects.

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Acknowledgements

The writing of a dissertation is a unique experience in one's life. An often lonely and isolating experience, but yet a time to meet and build new friendships that last a lifetime. The writing of a dissertation is obviously not possible without the personal and practical support of numerous people. Thus, I would express my sincere gratitude to the many people whose love, support, and patience over the last few years have made this possible.

Many people on the faculty and staff of the Department of Agricultural, Environmental and Regional Economics Department assisted and encouraged me in various ways during my course of studies. I am especially grateful to Dr. Stephen M. Smith, Chair of the Department, for believing in my capabilities, offering me an assistantship, and being a great mentor, listener, advisor and department chair. I would also like to thank Dr. Martin L. Shields, who funded my research and served as my patient dissertation advisor for the past two years.

My graduate studies at the Pennsylvania State University would not have been the same without the social and academic interactions with all of my student-colleagues. I am particularly thankful to two of my friends in the department. LTC Kelly Ward PhD, United States Army, who has served as my inspiration to be the best I can be and strive for excellence in all of my endeavors while staying committed to honesty. I enjoyed the many open discussions on a daily basis and the friendship that developed over the years. Grigorios Emvalomatis, whose advice, patience and friendship has helped me through the difficult academic time at the early stages of the Ph.D. program. The gang in 312, whose friendship has been a wonderful support in the everyday life at Armsby.

Finally, and most importantly, I would like to thank my wonderful wife Lee Ann. Her love, support, encouragement, quiet patience and unwavering love were undeniably the bedrock upon which the past three years of my life have been built. My dissertation would not have been possible without my parents Gunter and Barbara Grassmueck in Austria, for their tremendous support and faith in me all these years and my extended families in the U.S.A., Lee and Barbara Wheaton as well as Gary and Pat DeHass.

Chapter 1 - Introduction

The question of how government should organize to promote the economic well being of its citizens goes back to the ancient philosophers of Greece. In *The Politics* Aristotle argues that each government unit should be limited in size to allow each constituent to know everybody else within the government unit. Later philosophers, such as Montesquieu in *The Spirit of the Laws*, take up this notion of small polity and its advantages for the economy. Aristotle's and Montesquieu's idea of small government units resurfaces in the ideas of the founding fathers of the United States. The philosophical debate in the *Federalist Papers* reflects the two different approaches to government organization, centralized versus decentralized. The philosophical differences in how government should be organized have not vanished since then, nor has the debate between proponents for large or small government units. Theoretical and empirical work has been published in journal articles and books promoting both views. More recently government consolidation has emerged as one of the most contentious reform ideas in government reorganization. Government fragmentation, the organization of larger government units, such as counties and metropolitan areas, into small government units, primarily townships, has been theorized to contribute to several pressing issues, such as urban sprawl and inefficient or unsuccessful economic development programs (Carruther 2003, Carruther and Ulfarsson 2002, Rusk 1993 2003, Brookings 2003).

Since the 1950s, research on government institutions and organizations, as well as governmental organizational form, in particular the theoretical works by Tiebout (1956), North (1990, 1991), Hayek (1960), Brennan and Buchanan (1980), Oakerson (1999, 2004), Oates (1972, 1999), and very recently by Alesina and Spolaore (2003) has

established and reconfirmed the strong link between government and economic growth and development. Governmental institutions provide households and firms with the rules and regulations for doing business and their enforcement. Good government institutions encourage the formation of effective and efficient government organization and organizational form. As a consequence, good government institutions and organizations provide households and firms with the right incentives for doing business, allowing for successful and continuous economic growth. In addition, good government units provide and produce public goods and services efficiently and equitably. But most importantly, government institutions and organizations are the reflection of people's preferences. In contrast, poor government institutions and organizations hinder economic growth by providing incentives to firms and households that are not in line with people's preferences, by creating government organizations that provide and produce public goods and services inefficiently, inequitably, and are unresponsive to constituents' needs. Furthermore, poor government structures encourage rent-seeking behavior by firms and households, or government structures develop that encourage rent-seeking behavior by government units themselves.

While theoretical work in the economics, political science, and public finance literature on governmental institutions, organizations, and organizational form is well advanced, the empirical work on testing these hypotheses has lagged behind. Few studies have specifically looked at the relationship between governmental organizational form and its implications for economic growth (Akai and Sakata 2002, Stansel 2005). Scholars have investigated a multitude of factors hypothesized to contribute to economic growth, such as roads, technology, innovation, natural resource endowments, and

artificial amenities with a multitude of different models. However, the role of government, especially the debate over governmental organizational form, including fragmented versus consolidated government organizations, has not been formally investigated in a rigorous manner. Previous researchers have included government variables in their models, but few have made a comprehensive effort to fully represent the multifaceted aspect of governmental organizational form. Past and present research in several academic fields has provided ample theoretical justifications on the benefits and costs of each reform idea, while at the same time empirical work has either not fully integrated these theories in their research efforts, or researchers incorporated new theories but did not fully instrumentalize these theories in their models.

The academic fields investigating the role of government in economic growth and development have influenced the literature on government competition. The economists' approach to competition among government units examines the role of government units analogous to the role of firms, and the role of citizens analogous to the role of households in a competitive market. Government produces and provides goods and services that are paid for and consumed by citizens, similar to the interaction between firms and households. Therefore, the economists' approach to competition is similar to the approach taken when investigating the competitive structure in the market for goods and services by firms.

In contrast, political scientists tend to analyze interjurisdictional competition within the principles established by the founding fathers on federalism. "A federal system can be defined as a government system in which there are two or more primary orders of government (e.g., state and federal), each of which possesses significant and

constitutionally independent powers” (Kenyon and Kincaid, 1991, pg. 7). The political science approach emphasizes the historical theories of government and the context in which government institutions and organizations have been formed.

This dissertation makes a comprehensive effort to answer the fundamental question on how government should organize to promote the economic well being of its citizens, and whether competition among local government units is beneficial or detrimental to economic growth. The link between organizational form and economic growth can only be established by indirectly linking organizational form with whether competition among government units is efficiency enhancing or detracting in the production and provision of public goods and services. Public goods and services are consumed and financed by local households and firms, whose objectives are to find the location allowing for utility and profit maximization, respectively.

The literature in economics and political science has advanced the field of governmental organizational form in several directions. This dissertation combines several of these theories to create new and modified indexes aimed at measuring the multifaceted aspect of governmental organizational form. A modified Carlino-Mills model is employed to rigorously assess the impact of differences in organizational form among counties in the eastern part of the United States. This study advances the current literature on governmental organizational form and economic growth by first, linking organizational form with economic growth, and second, by measuring organizational form with new indexes, and third, by testing these indices in well-known regression models used in the literature.

This study finds that government fragmentation does not hinder economic growth. But more importantly, this study reconfirms that the role of state organizational form in combination with state-specific rules and regulation has a significant impact on economic growth within a state. Furthermore, how a state delegates its power among competing local government units, and how much autonomy the state allows local government in its public policy decisions, is far more important than local governmental organizational form. The interaction between state organizational form and organizational form at the county level has far reaching implications on the economic growth prospects of the counties within a state.

Chapter 2 - Methodological Definitions

The fundamental question in the debate on how government should organize to promote the economic well being of its citizens is whether an institutional framework encouraging competition among government units is efficiency - and equity - enhancing or detracting. Proponents of government consolidation see competition among government units as the root of inefficiencies and inequities, while opponents see competition as a mechanism assuring efficiencies and equities. But before going deeper into the debate on consolidation versus fragmentation, I will define several important aspects of governmental institutional and organizational form as well as examine how competition has been defined in the literature.

In their book *Competition among States and Local Governments*, Kenyon and Kincaid (1991) define competition as “rivalrous behavior in which each government attempts to win some scarce beneficial resource or to avoid a particular cost” (pg. 1). This type of competition can also be labeled active rivalry. An alternative approach is called implicit competition, which is “the manner in which the free movement of goods, services, people, and capital constrains the actions of independent governments in a federal system” (footnote on pg. 30).

Kenyon and Kincaid (1991) further define two types of competition among government units in a federal system: intergovernmental and interjurisdictional competition. Intergovernmental competition, or *vertical competition*, can be defined as the competition between government units with *different* political powers, such as states, counties, municipalities, and special purpose governments like economic development and water districts. Examples of intergovernmental competition are states competing

with counties, counties competing with local government units, and local government units competing with special purpose governments. Intergovernmental competition is not the primary focus of the competition literature, however from an institutional economics perspective the political framework on how political power is initially distributed does have an impact on economic development and growth prospects.

Interjurisdictional competition, or *horizontal competition*, can be defined as the competition between government units with *similar* powers in the federal system (Kenyon and Kincaid, 1991). Examples of this type of competition are competition among states, counties, municipalities and special purpose governments. The level of intergovernmental competition in the U.S. is highly dependent on the initial distribution of power at the time of statehood designation. States distribution of power varies significantly within the regions of the U.S. While horizontal competition is the primary focus, the distribution of power between state and lower levels of government such as counties and municipalities may have significant effects on economic growth. From this point on, unless specified explicitly, the use of the term competition always refers to interjurisdictional competition.

In addition to the two types of competition in the literature, Kenyon and Kincaid (1991) classify theories on the relationship among government units as cooperative federalism, fiscal federalism, or competitive federalism. In cooperative federalism, the primary characteristic of the relationship is sharing and mutual accommodation through cooperation among government units and the allocation of authority. In the setting of *cooperative federalism*, government units cooperate to the mutual benefit of all parties involved in solving problems of resource scarcity. According to cooperative federalism

philosophy, federal and state governments should intervene in interjurisdictional competition that has reached a level that is detrimental to economic development and growth. The cooperative federalist literature is primarily concerned that too much competition among government units results in a zero or even negative sum game.

Fiscal federalism is based more on economic principles than cooperative federalism. Fiscal federalism establishes a rationale for an appropriate division of responsibilities among government units by focusing on the characteristics of public goods and services provided by government units. The theory of fiscal federalism takes into account the variation in demand for public goods and services, and the geographical distribution of their benefits so as to account for positive and negative externalities, and the cost of production and provision of these public goods and services. Fiscal federalism allows citizens to take advantage of economies of scale and scope in production without sacrificing the benefits of decentralization in the provision of public goods and services. A trade off between the costs and benefits of size therefore determines the optimal size and number of government units (Kenyon and Kincaid, 1991).

The third type of relationship between government units is *competitive federalism*, which is modeled in the economic tradition of competition among firms for consumers. In addition, scholars in competitive federalism are concerned with government failure to provide public goods and services efficiently and equitably, as well as government units being responsive to the needs of residents. Competitive federalism is concerned with the potential for collusion among government units to enhance the power of elected officials and revenue to maximize tax revenue. Hence, competitive

federalism stands in the sharp contrast to cooperative federalism. According to competitive federalism theory, competition among government units is efficiency enhancing by constraining the power of government and by preventing government failure. Fiscal federalism focuses on the efficient provision of public goods and services.

These three approaches to competition among government units, cooperative, fiscal federalism and competitive federalism, are the basis of my discussion of whether competition among government units is beneficial or detrimental. Cooperative federalism can be seen as the historical context of government organization. Fiscal federalism bridges the gap between political science and economics by introducing the trade off between size and heterogeneity. Finally, competitive federalism examines governmental organizational form in terms of economic principles borrowed from a competitive market equilibrium theory.

Both cooperative and fiscal federalism set the stage for later discussion of competitive federalism. First, I introduce the concepts of why government institutions and organizations form in the first place. At this point in the discussion, transaction costs are the primary basis for the discussion of the benefits and costs of governmental organizational forms. Opponents and proponents of consolidation base their critique of the current system of government on whether competition reduces or increases transaction costs.

Second, cooperative federalism is introduced. In the section on cooperative federalism, I introduce the historical debate on government organization. The Founding Fathers of the U.S. wrangled with similar issues that the current debate on governmental organizational form is concerned about. It is very important to understand the underlying

philosophical and theoretical assumptions that shaped the U.S. system of government because it allows for a broader vision of what the current system of government units was designed to accomplish.

In the third section the concept of fiscal federalism bridges the gap between political science and economics. The primary focus in this discussion is the trade off between the size of government and the heterogeneity of preferences. Based on the system of cooperative federalism, economic principles are introduced to better understand the inner workings of theoretically efficient government formation. This section provides an overview of the trade off between economic principles and individual preferences.

An extension of the fiscal federalism debate is the distinction of provision and production of public goods. Local government units have two distinct roles in the public economy, provision and production of public goods and services. Proponents and opponents of consolidation focus primarily on one of these two roles in critiquing the current system, without consolidating their views with the other role of government. In the section entitled “Local Public Economies” the concepts of provision and production of public goods and services is introduced followed by a discussion of the implications on the consequence of competition among government units.

Next I introduce fiscal decentralization, which provides an in-depth look into public finance and how government units finance the provision and production of public goods and services. Fiscal federalism provides an overview of the roles of government units; in contrast fiscal decentralization introduces important concepts in public finance that shape the discussion on the role of competition among government units in economic

growth and development. The discussion in the fiscal decentralization section focuses on whether competition among government units encourages efficient and equitable taxation. Alternative theories of intergovernmental grants are introduced to expand the discussion to include the Leviathan hypothesis.

The previous four sections frame the topics for discussion in the competitive federalism section. Competitive federalism examines competition among government units in the economic tradition of competition among firms for consumers. Opponents of consolidation apply competitive federalism theory to contend that competition among government units is efficiency enhancing by constraining the power of government to maximize revenue and to encourage government to be responsive to the needs of households and firms. Proponents of consolidation see competition among government units as encouraging market failure in public goods and services, for example externalities, market power, taxation, and imperfect information. In the section on competitive federalism I discuss the influence of externalities and the role of location and amenity rents. An important part of the discussion of competitive federalism will be the distinction between actual and potential exit by households and firms, whether the threat of households and firms leaving a government unit is sufficient to induce competition.

How government should organize to promote the economic well being of its citizens is the question whether an institutional framework encouraging competition among government units is efficiency - and equity - enhancing or detracting. The theoretical discussion begins by first examining the fundamental building blocks of governmental organization. With each section an additional layer of complexity is added to the discussion. In the section on competitive federalism, the entire set of governmental

roles is examined in the light of a competitive market for government goods and services. The discussion whether government competition is beneficial or detrimental is framed by applying economic principles to the discussion.

A critical distinction between local government competition and state competition is made in section on the effects of interjurisdictional competition. The results of the scholarly debate on benefits and costs of fragmentation versus consolidation are often blurred by the lack of distinction between state competition and local competition. In the section of the effects of interjurisdictional competition I discuss the fundamentally differences in the how competition affects states versus local government units.

In summary, proponents of consolidation primarily focus their critique of the current system on the theories of cooperative federalism and the existence of externalities, while opponents of consolidation use fiscal and competitive federalism to point out the inherent dangers of a more centralized system of governmental organization. In order to fully represent each viewpoint, I discuss each theory in detail in the following section and conclude each theory with an outlook on its implication for how government should organize to promote the economic well being of its citizens and the question of whether an institutional framework encouraging competition among government units is efficiency - and equity - enhancing or detracting.

A. Research Question

The fundamental question is whether competition among government units is beneficial or detrimental to economic growth. However, governmental organizational form and economic growth cannot be directly linked either in theory or practice. Government organizations affect economic growth only in an indirect form through the

success and failure of firms within governmental boundaries and the surrounding communities, and through the immigration of households into its boundaries. Population growth and employment growth are the two primary independent variables for which I will be testing the role of governmental organizational form. Therefore, households and firms are the principal actors in economic growth. Both households and firms are assumed to maximize utility and profits respectively, and are located in the government units that allow for utility and profit maximization.

The traditional approach to a firm's profit maximization function is to include labor and capital. However, governmental organizational form influences a firm's profits through multiple channels. The most direct influence on firms' profits is through taxation. Government units provide firms with public goods and services such as infrastructure, and charge firms taxes for this provision. Corporate taxes reduce profits directly, but more important are differential tax rates and systems, as each tax rate has intended as well as unintended steering effects on companies. A tax on capital may encourage firms to invest more heavily in labor, thus government units may influence economic growth prospects for certain sectors. An equally important aspect of governmental organizational form is rules and regulations. Rules and regulations affect how firms will be able to conduct business and how much additional costs are necessary to conform to rules and regulations. In summary, firms are located in the government unit that minimizes the cost of production, thereby maximizing the profit of the firm.

In contrast, households are assumed to choose government units that maximize their total utility. Households derive utility from income as well as goods and services consumed. However, traditional literature on household utility maximization has ignored

the utility derived from public goods and services received. Public goods and services provide additional utility to households. Thereby, households locate in the government unit maximizes their utility from both market and public goods and services. In return for the provision of public goods and services, however, government units collect taxes and fees to finance their production and provision. Ultimately, as Tiebout (1956) hypothesized, households locate in the government unit that provides the best bundle of market and public goods and services, thereby maximizing household utility.

Even though this dissertation formally investigates the relationship between governmental organizational form and economic growth, the connection of governmental organizational form and economic growth is through the efficient production and provision of public goods and services. The efficient functioning of government includes production efficiency, allocation efficiency, and efficient collection of taxes, as well as redistribution of income. However, the efficient production and provision of public goods and services is only revealed through firms' profits and households' utility and not directly. This study does not measure whether competition among government units is beneficial or detrimental to the efficient production and provision of public goods and services, but whether competition among government units encourages economic growth narrowly defined as employment, population, and per capita income growth.

The role of government in economic growth is manifold. The two primary areas of economic growth that units of government are able to influence are the location decisions of firms and the location decisions of households. There exists a substantial literature on both topics, analyzing a multitude of potential influences on the location decisions of households and firms. In the literature, three proxies for economic growth

have been introduced to measure successful economic growth -- employment growth, population growth and per capita income growth. While employment growth and population growth measure economic growth in a more direct way, per capita income growth measures the quality of economic growth. This dissertation measures economic growth in a narrowly defined form, primarily the growth of jobs and employment complemented by the quality of jobs. What this study measures is how a specific governmental organizational form in 1992 affects economic growth over the next 10 years. The model does not incorporate the continuous change in governmental organizational form as a response to economic growth or as a result of reform in organizational structure of local government units. Therefore, economic growth is measured on a status quo basis, or in other words, the model does not measure a dynamic change in economic growth. Furthermore, this study does not measure economic development or the creation of economic structures for a sustainable economy, using natural resources efficiently, endangering the environment in the least amount possible, and creating a living environment, which uses household's possibilities to its fullest. Therefore, there are many other ways and forms to measure economic growth that may be better suited for a particular study, but the primary focus of this study is to create a foundation for future work on governmental organizational form.

I hypothesize efficient government units are one of the building blocks of successful and continuous economic growth and development. However, natural resource endowments, natural and artificial amenities, as well as population characteristics are at least equally important for economic development and growth. The primary focus of this dissertation is on the role of government units and organizational

form in forming efficient government units that positively influence economic growth. Population characteristics and amenities serve as control variables to account for other outside influences. Therefore, in the following sections, I limit my discussion of the role of governmental organizational form and the competition among government units to the implications for efficiency enhancing and detracting mechanisms. Implications of governmental organizational form resulting in efficiency enhancement are hypothesized to foster economic growth, while governmental organizational forms lowering efficiency are hypothesized to discourage economic growth.

The first step in our discussion on the role of governmental organizational form on economic growth is to consider the question of why government units form in the first place.

Chapter 3 - The Formation of Gov. Institutions and Organizations

The discussion of whether competition among government units is beneficial or detrimental to economic growth and development is partially a debate about whether competition among government units increases or decreases the transaction costs of households and firms within the government unit. Transaction costs can take one of many forms and variations with multiple theoretical foundations. The primary transaction costs for households and firms are time and effort to search for buyers and sellers for labor, goods, and services, bargaining over price for these goods and services, and enforcing contracts. In addition, government units also incur transaction costs in terms of time and effort in making collective decisions, such as costs for elections, communications, meetings, and accountability. Furthermore, households and firms incur transaction costs in terms of time and effort in order to participate in official government actions, such as elections and meetings, as well as staying informed on public actions.

Reducing transaction costs is one of the primary motivations for the establishment of government institutions and organizations. The first step in this discussion of the role of competition among government units in economic growth and development is to introduce the principles of why government institutions, and later, government organizations are formed.

Government institutions and organizations are the two elementary building blocks of any modern society. Transaction costs both encourage and limit the formation of government units at the same time. Thus, understanding what motivates individuals to form government institutions and organizations provides the basis for subsequent discussions of their implications for households' transaction costs.

The United States of America often is called the greatest experiment ever conceived by human kind in terms of the interaction among humans. The Founding Fathers and the generation of people during and before independence set in place a revolutionary idea. Nothing represents the principles better than the famous credo in the declaration of independence “All men are created equal; that they are endowed by their Creator with certain unalienable rights: that among these are life, liberty and the pursuit of happiness.” Based on the principles of natural law, each individual owns himself; each individual is his or her own private property. From this initial premise, each individual is personally responsible for his or her actions and behavior. This initial premise establishes the foundation for my model and the cornerstone for most economic theories, the independent wealth-maximizing individual.

The first step in the formation of government units is the realization by wealth-maximizing individuals that cooperation allows for the expansion of the individual welfare. In the initial stage of the world, characterized by the complete lack of formal government institutions and organizations, each wealth-maximizing individual lives completely independent from other individuals. However, wealth-maximizing individuals find it efficient to create some form of cooperation in order to find solutions to problems that would be insurmountable without cooperation.

Cooperation among wealth-maximizing individuals lowers transaction costs. One reason for the occurrences of transaction costs in trade is when two wealth-maximizing individuals unknown to each other are set to trade goods or services, and they are unaware of each other’s intention in trade. In the case of dishonesty and threat to life, wealth-maximizing individuals will either not trade at all or include some sort of a

risk premium in the price of a good or service to compensate for the additional risks. Therefore, both trading partners' intentions in trade play an important role in determining the correct and market clearing price. Game theory has shown that wealth-maximizing individuals will usually seek cooperative solutions to allocation problems; when the trade is repeated, all parties possess complete information about others, and there are a small number of parties involved (North, 1990). However, in the real world, none of these conditions are met and cooperative solutions are difficult to come by. Norman Schofield summarized the problem eloquently by stating: "the fundamental theoretical problem underlying the question of cooperation is the manner by which individuals attain knowledge of each others preferences and likely behavior" (as quoted in North, 1990, pg. 14). He continues stating that in a small setting each individual may be able to correctly predict the other's behavior. But problems arise when the size of the community increases, and common beliefs and norms, as well as the close relationship between individuals, weaken, therefore making correct predictions of individuals' behavior more difficult. Transaction costs arise, as individuals are unaware of each other's intentions in trade of labor, goods, and services. As a consequence, trade between two wealth-maximizing individuals becomes inefficient due to high transaction costs. Here *governmental institutions and organizations* come into play. Government institutions are the constraints that human beings impose on themselves and therefore, government institutions can evolve and may be altered by individuals.

According to North (1990, pg. 4), "institutions include any form of constraint that human beings devise to shape human interaction. ... Institutional constraints include both what individuals are prohibited from doing and under what conditions some

individuals are permitted to undertake certain activities.” Therefore, governmental institutions are, as North states, similar to the rules of a game. In the case of the United States, one government institution is the Constitution of the United States. The Constitution defines the role of each player, constrains the power of the federal government and specifies the role of states.

In contrast to government institutions are *government organizations*. Government organizations also provide structure to human interaction, but government organizations are formed in response to the framework established by government institutions. North defines government organizations as “groups of individuals bound by some common purpose to achieve objectives.” According to North, organizations can include political bodies, such as the Senate and House of Representatives, and city councils; economic bodies, such as firms and households; social bodies, such as churches and clubs; mixed purpose bodies, such as zoning and planning commissions and trade unions; and educational bodies, such as schools and universities. What makes government organizations unique is that they are created as a consequence of the opportunities resulting from government institutions. Government organizations are the governance structure designed by individuals within the framework of the government institutions. Individuals’ preferences for how their freedoms should be limited and in what manner governmental control should be set up are formally expressed in both government institutions and organizations. As a result, governmental institutions and organizations are a reflection of constituents’ preferences.

Government institutions and organizations, or what I will call from now on, *government structures*, enable individuals to create a regularized means to identify and

resolve problems centered on a rule-based solution process, and later, being able to monitor the enforcement while being open to possible alterations. Government structures are highly dependent on the scope and scale of the problem. Government structure can range from a simple informal rule to an elaborate formal structure of government institutions and organizations. However, once government structures are designed and put in place, they will strongly affect the structure of governance. Oakerson contends that “the variable that connects governmental structure to governance structure is the cost of access to government – highlighting again the importance of transaction costs” (Oakerson, 2004, pg. 21).

A. Cooperative Federalism

The relationship between individuals and government structures, and consequently the relationship between distinct and independent government structures, defines the governmental organizational form and influences governance. Accordingly, centralized government structures would engender different governance structures than de-centralized government structures. In other words, consolidated government units will develop a distinctively different governance structure that is in contrast to fragmented governance structure. Michael Polanyi introduced the concept of polycentricity. “Polycentrism describes a process of decision making whereby multiple independent actors interact to produce an outcome that is commonly valued. In contrast to monocentrism, a model in which a single actor (or cohesive set of actors) provides direction to others. ... The models are mutually exclusive: Polycentrism depends on the absence of dominance among various centers of authority, whereas monocentrism depends on a single center attaining dominance.” (as quoted in Oakerson 2004, pg. 21)

Based on the idea of monocentrism, proponents of government consolidation contend that governance can only work through the direction supplied by a single dominant unit of government, even in the case where subordinate units of government exist. The concentration of ultimate authority in a single body of government allows the center to govern effectively. Proponents view consolidation as the mechanism by which the layers of government structure are eliminated to a single or a very small number of layers, resulting in a decrease in duplication in efforts and enabling more public visibility and electoral connection of the government center to the voter, and allowing voters to hold those in power accountable. All these effects make government units more efficient and responsive, thereby promoting economic growth as firms are able to maximize profits and households are able to maximize utility.

Advocates of a monocentric system of government believe a polycentric system of government with multiple centers of power will enable no one to govern on a larger scale. Savitch and Vogel (2000a, 2000b) argue precisely within the theory of monocentrism and propose a more regionally centered system of government to encourage economic development and growth. Jerry Paytas (2001) concludes, a more centralized form of governmental organization is more advantageous than a fragmented system. David Rusk (1993, 2003) concludes that only consolidation of cities with expanding suburbs, a system of elastic cities, encourages economic development and growth.

The arguments raised by Savitch and Vogel, Paytas and Rusk essentially go back as far as the founding fathers and their discussion over state versus federal power in the *Federalist Papers*. Because this dissertation looks specifically at the United States, it

seems appropriate to further investigate the principles at work at the time of the founding of the U.S. Many of the framers of the constitution were well versed in political philosophy and they were keenly aware of the advantages and dangers of several forms of government structure. Both Hamilton and Madison in their *Federalist Papers* were contemplating the advantages and disadvantages of a confederate republic in contrast to a consolidation of the States. James Madison, in Federalist Paper No. 10, on the topic of the union as a safeguard against domestic faction and insurrection, stresses the advantages of a republic over a pure democracy in dealing with minorities or majorities that are in conflict with the rights of other citizens or the permanent and aggregate interests of the community. In Federalist Paper No. 10, Madison concludes that a large republic rather than a small republic, or a Union over the States, is better capable of protecting the rights of its citizens. What does Madison's conclusion mean for the discussion of a polycentric versus a monocentric government structure?

I hypothesize that the discussion of state versus union power can be applied to the discussion on consolidated versus fragmented government. Madison is keenly aware of the inherent danger of both forms of government structure when he writes

“However small the republic may be, the representatives must be raised to a certain number, in order to guard against the cabals of a few; and that, however large it may be, they must be limited to a certain number, in order to guard against the confusion of a multitude.”

He continues that when representatives are chosen by a larger number of citizens, it will be more difficult for unworthy candidates to succeed. But he qualifies his statement by writing

“By enlarging too much the number of electors, you render the representatives too little acquainted with all their local circumstances and lesser interests; as by

reducing it too much, you render him unduly attached to these, and too little fit to comprehend and pursue great and national objects.”

...

“The smaller the society, the fewer probably will be the distinct parties and interests composing it; the fewer the distinct parties and interests, the more frequently will a majority be found of the same party; and the smaller the number of individuals composing a majority, and the smaller the compass within which they are placed, the more easily will they concert and execute their plans of oppression. Extend the sphere, and you take in a greater variety of parties and interests; you make it less probable that a majority of the whole will have a common motive to invade the rights of other citizens; or if such a common motive exists, it will be more difficult for all who feel it to discover their own strength, and to act in unison with each other. Besides other impediments, it may be remarked that, where there is a consciousness of unjust or dishonorable purposes, communication is always checked by distrust in proportion to the number whose concurrence is necessary.”

Madison, as well as Hamilton in Federalist Paper No. 9, concludes that a confederate republic or a large republic is more advantageous than a small republic. Both Madison and Hamilton are primarily concerned about the inherent danger of a small group taking control of the government to infringe the rights of the majority. The rights and freedoms established by the Constitution can only be secured by enlarging government to a certain size.

In the discussion on polycentrism over monocentrism, the Federalist Papers No. 9 and 10 provide theoretical reasoning in favor of a system of multiple independent actors,

various government units, over a single center of authority. Applied to my model, a more centralized system of government may be more susceptible to rent seeking behavior of a few connected insiders. The potential rewards in determining public policy in a centralized system of government are directly related to its size. In a monocentric system a few powerful firms and households may be able to change public policy in their favor, but often at the cost of public welfare. For example, large multi-national firms may receive subsidies and tax breaks for choosing a specific government unit, but smaller local businesses may end up paying the tab. The Federalists' remedy is to increase the number of government units to reduce potential rewards, and limit the negative effects to a smaller size, in case public policy is influenced by the few. Opponents of consolidation argue that a monocentric government structure specifically encourages destructive competition as fewer government units try to out-compete each other in attracting firms and households. The result is at least a zero-sum, but often a negative sum game. Oakerson (2004) comes to a similar conclusion for a monocentric system in which few connected insiders compete for dominance and influence over the few government officials for the purpose of obtaining rents.

An important term in the discussion that follows is governance. Oakerson (2004, pg. 19) defines governance "as the process by which human beings regulate their interdependencies in the context of shared environment. Each environment is a source of values shared by the members of a community. ... The full set of values shared in a given community is what classical republicans called *res publica* - the public realm. Governance is focused on the protection and enhancement of the public realm." The public realm includes both tangible as well as intangible values. However, the economics

of public goods has shown that sharing a common resource can be problematic in terms of free rider problems.

Every individual within the public realm of a government unit has multiple values and preferences. Hence, each government unit's actions are subjected to one major constraint; it is impossible to maximize each individual's values in a finite world. Trade-offs between individuals' preferences are necessary to form an effective governance structure, as defined by Oakerson (2004, pg. 20), "governance as a process is centrally concerned with making those trade-offs." Oakerson continues that the process of governance includes setting, invoking, applying, and enforcing rules upon which individuals have agreed. The process of governance brings us back to the concept of government institutions and organizations. Government institutions set the rules, while government organizations invoke, apply and enforce the rules and regulations. Both institutions and organizations define the tools of governance.

An important characteristic of governance is the fact that good governance structures are based on broad consent by wealth-maximizing individuals. One aspect of governance is the availability of coercion, the ability to invoke, apply and enforce the rules. Oakerson pinpoints a critical point in the use of coercion by stating, "the actual use of coercion through command and control is a highly ineffective instrument for undertaking many of the activities on which governance depends" (Oakerson, 2004, pg. 20). Applying transaction cost theory, the use of coercion will impose costs and harms to individuals. As a consequence, wealth-maximizing individuals will undertake and explore various avenues to avoid being coerced in the future, resulting in increasing transactions costs. Hence, to lower the transaction cost of governance and to facilitate the

process of governance, wealth-maximizing individuals find it most advantageous to create governance structures based on broad consent.

The theory of governance has important implications for the debate on governmental organizational form. Opponents of consolidation contend the broad consent to government actions is only possible in small and local government units, where wealth-maximizing individuals with similar preferences live. The provision and production of public goods and services for residents with different sets of preferences opens the door for confrontation, thereby increasing transaction costs. The increase in transaction costs to achieve consent on public policy issue detracts from the efficient functioning of government units. The economic principles involved in the trade-off between size of government and heterogeneity of preferences is the topic in the next section.

B. Fiscal Federalism

Fiscal federalism is a theory of federalism based on economic principles, which provides a rational federal system of government with an appropriate division of responsibilities among government units. Fiscal federalism looks at the provision characteristics of public goods and services. This section discusses the trade-off between size of government and heterogeneity of preferences in a formal way. The trade-off between size of government units and heterogeneity of preferences is important in understanding the inner workings of government formation. In the second section, I introduce another important aspect of fiscal federalism that has often been ignored in the literature and is the cause of much confusion in the literature, the distinction between provision and production of public goods and services.

1. Size of Government Units: The trade-off

After having established the theoretical foundation for government institutions and organizations, and introducing the concept of polycentrism, the question remains is there an efficient size of government; those independent centers of power as defined by Polanyi's theory of polycentric government. In the previous section I established the notion that governmental institutions and organizations are formed as a response to the wealth-maximizing individual's preferences for government control. In addition, each individual has a unique set of preferences for consumption, working hours, and public goods. In the analysis of governmental organizational form, I am primarily concerned with two preferences, the preferences for public goods and taxation. Because public goods are not costless, government units collect taxes to pay for the provision of public goods. In this section, I first argue that fundamentally there exists a trade-off between the benefits of size of a government unit and the costs of heterogeneity of preferences over public goods and policies. The analysis follows closely the Alesina and Spolaore (2003) methodology in their book *Size of Nation* as well as articles by Alesina and Spolaore (1997) and Alesina, Baqir, and Hoxby (2004). Second, I introduce a theoretical model to determine the efficient size of government units. I will follow up with a discussion on whether the efficient size of government units is achievable in the real world, primarily the United States.

When individuals come together and agree to form a government unit, they also agree to share the same public goods and policies provided by this government unit. By agreeing on sharing a public good, each person can take advantage of two key benefits of size, economies of scale and economies of scope. However, an increase in size, in the

number of individuals, also entails an increase in the heterogeneity of preferences by those individuals. Because individuals have to combine and compromise to ultimately agree on a common public policy, transaction costs to achieve a common public policy increase in direct relation with government unit size.

What are the benefits of a large government unit in terms of population size?

First, the production and provision of public goods and services is not costless. The majority of public goods and services can be characterized by large initial fixed costs. For example, a highway is very expensive to build, but once constructed the costs of maintaining the highway are significantly less. Projects with high initial fixed costs and small variable costs can be characterized by decreasing average cost. Hence, the per capita cost of a public good is lower in a larger government unit as more taxpayers are available to pay for the public good. This is commonly referred to as economies of scale. A second benefit of large government units is their ability to produce and provide public goods and services jointly with other goods and services. By centralizing the production of public goods and services within a single government unit one can take advantage of existing infrastructures and expertise without duplicating the effort for each separate independent government unit. This is commonly referred to as economies of scope; the cost of providing two goods separately is higher than the cost of providing the two goods in a joint production.

The benefits of small government units are primarily motivated by the heterogeneity cost of preferences. Different individuals have different preferences on how their tax money should be spent. Variation in preferences over how the tax money should be spent will increase as the size of the government unit increases. An increase in

the variation of preference increases the need for compromises in terms of finding a mutually acceptable public good policy. As a result, transaction costs in providing these public goods increase with the size of the government unit. A second benefit of small government unit size is a reduction in congestion costs. Public goods and services are often non-exclusive, allowing each constituent to consume their share at any time. Congestion costs arise as each additional consumer of the public good or service reduces the benefit of consumption.

This trade-off can be modeled more formally following Alesina and Spolaore (2003). Assume a county has a population of size M . In each county of population size M , there are T types of individuals. The types are located at a distance h from each other. Therefore, the number of individuals of each type is denoted m , so that $M = mT$. The density of population can be defined as $d = m/h$, where h is the geographical size of the county. If the population is uniformly distributed across the county, the left-most and right-most individuals are located at a distance of $h/2$ from the center of the county. At this point the distance is a general measure of the difference of each individual, which can be ideological, geographical, income and or taste based. For simplicity reasons I assume the difference is in a single dimension, which means the differences in all categories increase with distance from the center. Each point represents a unique set of preferences, and points in proximity to each other have approximately close preferences. Later on I relax this assumption to allow for both geographical and ideological differences, a better match with reality.

Each individual has the following utility function:

$$(1) \quad U_i = g(1 - at_i) + y - t_i \quad a > 0, g > 0$$

The public good g is located at one point on the segment, with utility from the consumption of the public good decreasing with the distance from the public good's location. Let l_i be the distance between the location of individual i and the location of the public good, for example town hall. So in the case, where the individual is located at distance zero from the public good, the decrease of utility would be zero. The parameter a is the marginal cost of distance from the public good, or a measures the loss in utility that an individual suffers when the public good is located far away.

In addition, each public good has to be financed by the population living in the county. For simplicity, Alesina and Spolaore (1997, 2003) assume a flat tax t_i , an equal amount for each individual. So the expression $y - t_i$ is then private consumption. The cost of providing the public good is given by

$$(2) \quad k = \bar{k} + k_1 Sm$$

where k is the total cost of the public good, \bar{k} is fixed cost, k_1 is variable cost, and S is the number of types of municipalities, so that Sm is the population served by a municipality. Because average cost is decreasing with the size of the municipality, the cost function has economies of scale. Assuming a balanced budget, taxes paid by all individuals in municipality S have to equal the cost of public goods, or formally:

$$(3) \quad \int_S t_i = \bar{k} + k_1 Sm$$

A social planner would maximize the sum of the individual utilities by locating the seat of municipality office in the middle of each municipality, where the average distance $\bar{l} = (h/4)S$. The social planner's problem is to maximize the average utility or

$$(4) \quad U(N) = g(1 - a\bar{l}) + y - (\bar{k} / Sm) - k_1$$

subject to $\bar{l} = (h/4)S$ and $N = T/S$

Because g , y , and k_I are fixed parameters, the maximization is as follows:

$$(5) \quad \max_N U(N) = -ga \frac{h}{4} \frac{T}{N} - \frac{\bar{k}}{m} \frac{N}{T}$$

Where g is a public good, a is the marginal cost of distance, h is the geographical size, T is the types of individuals, N is the number of government units, m number of individual of each type, and \bar{k} is the fixed cost of the public good. So ga is the for distance discounted value of the public good, $h/4$ is the average distance, and T/N is the types of individuals per government unit or how many different types of people are served by one government unit, an indicator of the heterogeneity of preferences within a government unit. In the second portion of the utility function, \bar{k}/m is the decrease in fixed cost with an increase in the number of individuals, and N/T is the inverse heterogeneity of preferences. The average utility is decreased by distance, an increase in government unit size, larger heterogeneity of preferences, and average fixed cost.

$$\text{First Order Condition: } \frac{\delta U(N)}{\delta N} = 0$$

The optimal number of municipalities is

$$(6) \quad N = \frac{T}{2} \sqrt{\frac{gahm}{\bar{k}}}$$

Comparative static results can be summarized by the following:

1. The optimal number of municipalities increases with the benefits from the public good g . The more individuals who value a separate public good provided by a municipality, the larger the number of municipalities within a county.

2. The optimal number of municipalities increases with the disutility of distance a . The higher the level of disutility by individuals for sharing the public good provided by the municipality with others, the larger the optimal number of municipalities, and the smaller their size will be.
3. The optimal number of municipalities decreases with the increasing value of economies of scale \bar{k} . The larger the decrease in the cost of the public good with each additional individual in the municipality, the smaller the number of optimal municipalities, and therefore their size increases.
4. The higher the heterogeneity cost h is, the larger the number of municipalities will be. The increase in the heterogeneity of the population results in an increase in the number of municipalities and a decrease in the size of each municipality.
5. The total number of municipalities increases with the population size m , but the number of government units increases with the square root of population size.
6. The total number of municipalities increases linearly with the number of types of individuals T .

The above results are in the case of a single public good, in our case, the establishment of a municipality. However, in the case of several public goods like education, roads, and sewage, the results would not change dramatically. The number of optimal jurisdictions or public goods provider would be:

$$(7) \quad N_j = \frac{T}{2} \sqrt{\frac{g_j a_j h m}{\bar{k}_j}}$$

What this means is that for a given boundary such as a county, the optimal solution for the organization of government units is a system of several subordinate

smaller government units, where each public good is produced and delivered by a separate and distinct government unit, within one larger government unit,. The end result of such a system would be a myriad of overlapping jurisdictions for each government unit. However, a system of overlapping jurisdictions, each producing and providing a distinct product or service, would only be efficient if there are no transaction costs between each public good producer and service provider. Generally, transaction costs do exist and in order to make the model more realistic, it is necessary to introduce economies of scope. I will demonstrate the effect of the economies of scope in a two-public-good scenario.

In the case of two public goods, which are provided by two separate government units, the cost of each public good would be k_1 and k_2 respectively. In the case where both public goods are provided by a single government unit and under economies of scope, the necessary condition must be $\bar{k}_c < \bar{k}_1 + \bar{k}_2$. What this means is that average

utility will be maximized by $N_1 = \frac{T}{2} \sqrt{\frac{g_1 a_1 h m}{k_1}}$ and $N_2 = \frac{T}{2} \sqrt{\frac{g_2 a_2 h m}{k_2}}$; but by contrast,

when both goods are provided by the same government unit, the average utility will be

maximized by $N_c = \frac{T}{2} \sqrt{\left(\frac{g_1 a_1 + g_2 a_2}{(k_1 + k_2)} \right) h m}$

When the cost of producing the public goods individually by separate government units is larger than the cost of producing the public goods within one government unit or formally:

$$(8) \quad \bar{k}_c < \sum_{j=1}^M \bar{k}_j$$

and we define \bar{k} as the costs of all public goods provided separately or formally:

$$(9) \quad \bar{k} = \sum_{j=1}^M \bar{k}_j$$

then we can define a new parameter λ as the measure of the extent of the economies of scope:

$$(10) \quad \lambda = \frac{\bar{k}_c}{\bar{k}} \text{ where } 0 < \lambda < 1.$$

The higher λ is, the more important economies of scope become in the provision of public goods.

If we introduce \bar{a} as the measure of total heterogeneity costs in the provision of different types of public goods (the cost of providing public goods by different government units):

$$(11) \quad \bar{a} = \sum_{j=1}^M a_j$$

and

$$(12) \quad \bar{g} = \sum_{j=1}^M g_j$$

then the optimal number of jurisdictions is then given by:

$$(13) \quad N = \frac{T}{2} \sqrt{\frac{\bar{g} \bar{a} h m}{\lambda \bar{k}}}.$$

The results from (13) imply that when economies of scope are taken into consideration, an increase in \bar{a} (the total disutility of distance) will increase the number of government units, while increase in economies of scope, λ , and economies of scale, \bar{k} , will lower the number government units.

One problem with a single dimension model is the case when total population is held constant. Here equation (13) implies that the number of government units decreases as density increases. Substituting M/m for T and m/d for h in equation (13) results in

$$(14) \quad N = \frac{M}{2} \sqrt{\frac{ga}{d\lambda k}}$$

Holding M and T constant (the number of types of individuals and the total population), an increase in the density d is equivalent to a reduction in h ; this implies that when the density increases heterogeneity of preferences decreases. However, in the real world, density increases for metropolitan areas, but generally metropolitan areas are more heterogeneous in preferences.

In this case our single-dimensional model is not able to represent reality.

Therefore, the single-dimensional model needs to be expanded to a bi-dimensional model. In order to make the model bi-dimensional, the mass of individuals in the county is subdivided into J categories of individuals, each part having a mass of population m_j and T_j types of individuals for $j = 1, \dots, J$. The total population is

$$(15) \quad M = \sum_{j=1}^J M_j = \sum_{j=1}^J m_j T_j.$$

Replacing M in equation (14) with the M from equation (15) and $d=m/h$ the optimal number of government units is

$$(16) \quad N = \sum_{j=1}^J N_j = \frac{1}{2} \sqrt{\frac{gah}{k\lambda} \left(\sum_{j=1}^J T_j \sqrt{m_j} \right)}$$

Equation (16) has the same comparative statics as equation (6) with the addition of economies of scope in equation (13). The theoretical implication from equation (16) is that the efficient number of government units, and therefore the efficient size of a

government unit depends on several characteristics, but more importantly, the efficient size of government can be determined.

Determining the optimal size of the government unit using the standard economic tool of optimization under constraints is only possible in theory. However, the purpose of this theoretical model is to gain insight into the inner workings of the trade off between the benefits of government size and the costs of heterogeneity of preferences. By understanding how certain aspects of the equation interact with each other, I am able to better represent reality in the role of governmental organizational form. In reality, the size of government units is hardly ever explicitly determined by a trade off between benefits and costs.

How government units are established is influenced by many factors such as colonial history, settlement pattern, topology, and natural resource endowments to name a few. Even in the Northeast, states vary in how government units are organized. In Pennsylvania each piece of land is part of some organized unit of government. Maine, by contrast, organized some parts of the state in a unit of government, while other parts are unorganized territories with such forms as villages and plantations. In the Midwestern states of North and South Dakota, the entire state was subdivided into townships. However, a closer look at the township level reveals that the majority (close to 90 percent) of townships do not have a full time equivalent employee. This statistic indicates that townships are not equally important across several states in determining local economic policy. Table 6-6 provides an overview of the share of townships in government expenditures across different regions of the country.

Even in the hypothetical case, when we assume an efficiently sized government unit was established considering the trade-off between benefits of size and costs of heterogeneity, demographic changes over the years may have altered the efficient size of government. For example, the population of government units has changed since the original government unit formation, while the number of government units has either not changed at all or only very slightly. Hence, once-efficient units of government have become inefficient, due to changes in population over time. Another important aspect is fiscal decentralization of government functions. Since the 1980s, the federal government has slowly distributed the functions of the federal government to the local level, such as counties and municipalities. Therefore, the original functions of government, such as infrastructure and education, have been expanded to include many social welfare functions. An increase in the public goods and services function of local governments allows for higher economies of scale and scope; therefore, theoretically, government units should increase in size to take advantage of the increased efficiencies.

The trade off between size of government units and heterogeneity of preferences introduces several important determinants of efficient government size. Proponents of consolidation focus their critique of the current system of fragmented government units on the inability of small government units to take advantage of economies of scale and scope in producing and providing public goods and services. Returning to the notion of transaction costs, a system of several small government units instead of a few large government units will necessarily entail larger amounts of coordination costs. In the case where separate government units provide distinctly different public goods and services to the public, the coordination of these provisions is more time consuming, resulting in

higher transaction costs. As a consequence, households and firms are paying more for public goods and services, reducing the total utility of households and total profits of firms within the government unit. Proponents of consolidation stress the importance of economies of scale and scope while at the same time downplaying the importance of heterogeneity of preferences in their analysis.

In contrast, opponents of consolidation argue that the heterogeneity costs of preferences outweigh the role economies of scale and scope play in the provision of public goods. Each increase in the variation of preferences increases the need for compromise in terms of finding mutually acceptable public goods and service provision. The need to find a compromise that satisfies the majority of preference groups increases the transaction cost, the time and effort to find a satisfying solution to the provision problem. Opponents of consolidation posit that smaller and more homogeneous government units lower transaction costs, while still being able to take advantage of economies of scale and scope. In addition, several smaller government units allow households and firms to choose the government unit that best fits their public goods and services preference bundle. Thereby households and firms are able to locate in the government unit that stands to maximize utility and profits, respectively.

2. Local Public Economics

So far I have established what government institutions and organizations are and their purpose in reducing transaction costs in the trade of labor, goods and services as well as in enforcing the rules and regulations set by the government structure.

Individuals willingly surrender some of their freedoms to form government structures to reduce this uncertainty in trade. In return, government units provide those public goods

which are in line with the constituents' preferences. Therefore, it can be said that government structure is a reflection of individual preferences. However, there is a trade off between the cost of heterogeneity in preferences and the benefits of size, such as economies of scale and economies of scope. Because there is a trade off between the benefit of size and the cost of heterogeneity of preference, the efficient size of a government unit can be determined theoretically. In reality, historical influences, changes in population and functional responsibility of government units discourage efficient formation of government units.

In his 1999 book *Governing Local Public Economies* Ronald J. Oakerson argues economists, political scientists, and other scholars have overlooked a very important aspect of government units. Local government units have a dual function: provision and production of public goods and services. Oakerson titles both functions of local government units as local public economies. The provision and production side of public goods and services in local public economies follow different sets of economic rules. Provision of public goods and services refers to the power to tax and subsequently to the power to spend, which is distinguished from the production and delivery of products and services. More specifically, the production of public goods and services is concerned with the technical transformation of resource inputs into products and services, where economies of scale and scope play an important role.

The production of public goods and services is subject to an important constraint. The production of almost all local public goods and services is very dependent on locale-specific requirements, such as neighborhood conditions. Therefore, cost effective production of public goods and services must consider that the scale and organization of

the production process is locale-specific. As a consequence, the scale of production may vary significantly across various government units, and would ultimately result in a myriad of different sized government units. In addition, many local public goods and services are distinct products in terms of inputs. Local public goods tend to be capital intensive, while local public services tend to be labor intensive. Therefore, economies of scale and scope for local public goods and services are quite different. Labor-intensive services, such as police, fire protection, and social services tend to exhaust economies of scale rather quickly, while capital-intensive good such as roads, water, and sewer have extensive economies of scale. Different economies of scale demand different scales of production. Small local units of government may most effectively produce labor-intensive goods, while combining multiple units of government into special districts may most effectively produce capital-intensive goods. The theoretical result would be a complex set of small and larger government units that overlap, providing each public good and service in the most efficient manner.

Based on the theoretical work of Oakerson (1999), proponents of government consolidation are primarily focused on the production side of public economies. A local public economy with a myriad of small and highly fragmented units of government necessarily implies a more complex system of individual government actors. As stated earlier, one role of government structures is to reduce transaction costs. A system of many differently sized and varied responsibilities decreases transparency of government responsibilities.

In addition, a complex system hinders economic development agencies from making a coordinated economic development effort that combines several units of

government, returning us to Madison's argument that by reducing the size too much, government units become too attached to local issues, while being unable to "comprehend and pursue great and national objects." Proponents of consolidation contend that smaller government units lack exactly this vision for a more regional approach to economic development and growth. In the proponent's view, overzealous government units disregard long-term regional approaches to economic growth in favor of short-term local approaches pitting one government unit against the other. In many cases, firms are able to extract tax concessions and subsidies from local government units that are in competition with each other. Ultimately, firms may choose a profit maximizing location, but often local public economies suffer. A more detailed discussion of the competitive federalism appears in a later section.

Government units create special districts to combine efficient provision with efficient production of a single public good or service. Special districts are often referred to as single-purpose units of government. Special districts have become the fastest growing unit of government, which some argue provides empirical evidence that government units will align provision and production to the efficient size. Zax (1989) argues that single-purpose governments are "especially well-suited to provide services, which are subject to economies of scale. Scale efficiencies are lost if single-purpose governments serve small populations." However, Nelson (1987) argues convincingly that a clear distinction between general-purpose and single-purpose government is very important in measuring government fragmentation. He continues by stating "the two types of districts [units of government] are not comparable and consequently should not

be lumped together.” He contends that special districts only provide minor services and consequently they are not too relevant in the competition among government units.

The creation and simultaneous outsourcing of public service production to special districts is primarily motivated by production efficiency consideration. Whether the formation of separate special districts is efficiency enhancing from a county or municipality perspective is controversial. Fully integrating the theory of special district formation is beyond the scope of this study. A separate study on special districts alone and in combination with general purpose government units would be necessary to fully integrate both theories into a single model.

Opponents of government consolidation use Oakerson’s (1999) theory of local public economies to primarily focus their attention on the provision side of local public economies. Theory contends that the American tradition of small self-governing units, as envisioned by the Founding Fathers, is the basic building block of any large-scale government. Political scientists generally agree that strong and small scale local government serves several important purposes such as a sense of community, accountability, civic engagement, true representation of preferences, and fiscal equivalence (Oakerson, 2004). Therefore, the provision of local public goods and services must confront separate issues in order to be efficient.

One of the pressing issues concerning provision of public goods and services is the preference revelation, which may result in non-provision or sub-optimal provision. Governmental institutions play an important role in this process by institutionalizing the collective choice of the people in the area (North, 1990). Therefore, the optimal size of the government unit should change with the good or service provided and therefore

reflects the scope of the provision problem. Consequently, a natural system of small and large provision units, commonly referred to as a Chinese Box, is theoretically the most efficient organizational form of government. Hence, individual preferences are more closely aligned with the public goods provided by small units of government. Critics of consolidation compare the presence of a large-scale single unit of government to a monopolist producer. Monopolistic producers can be expected to charge higher prices for public goods, while at the same time providing a standardized product. “Neither private nor public economic development is spurred by the provision of standardized goods and services in standardized ways. Rather, the key to development is variety. In a public economy, citizen choice ... creates citizens power vis-à-vis government” (Oakerson, 1999 pg. 5). The quote by Oakerson introduces a key argument of consolidation opponents, public choice.

Public choice advocates contend that government consolidation decreases competition among government units, and therefore, efficiency of provision will diminish. What this means for businesses and individuals is that the provision of public goods and services is not aligned with their preferences, thereby introducing rent seeking behavior. Rent seeking behavior may manifest itself by increased lobbying efforts by a select few, thereby transforming government institutions into a mechanism of a few businesses and individuals. As a consequence, a decrease in competition is hypothesized to decrease the broad economic development prospect of the area and to encourage businesses and individuals to change their location.

So far the majority of arguments in favor of and against consolidation are primarily based on efficiency gains and losses. However, local residents may be inclined

to forego efficiency gains in order to maintain a feeling of connection to the place and local government. Putnam (2000) introduced the notion of social capital. Residents of a place may be willing to trade efficiency in production and provision for maintaining local control. This sense of place and connection with locale is a non-market valued good that is difficult to define as well as quantify. However, empirical observations provide ample evidence of local residents rejecting consolidation in favor of maintaining local control. In addition, the comprehensive realignment of federal programs to give greater control to local governments in the distribution of federal welfare money supports the notion that local residents may be more effective in making locale-specific decisions.

Up to this point, the discussion on whether competition among government units is beneficial or detrimental is solely based on the provision and production of public goods and services. But, so far in the discussion, the financing of public goods and services was missing. How firms and households pay for the public goods and services received needs to be discussed next. In the next section I introduce fiscal federalism. Fiscal federalism builds on the theoretical model introduced in the previous sections and advances the theory to include public finance considerations.

C. Fiscal Decentralization

In 1972, Wallace Oates published his book *Fiscal Decentralization*, which formally introduced the concept of fiscal decentralization and its benefits. According to fiscal decentralization theory, the federal government has two roles in the economy: income redistribution and macroeconomic stabilization, in addition to providing public defense. In a government structure like the U.S., with highly open economies in terms of states and local government units, any expansionary fiscal policy by a local government

unit will spill over into neighboring government units, thereby causing positive externalities, and resulting in the provision at a below optimal level. In addition, any income redistributive system administered by a local government will likely be constrained by the mobility of households. Households with higher income will tend to relocate from government units with higher redistributive taxes to government units with lower redistributive taxes in order to avoid paying for redistributive government programs. In contrast, households that stand to gain from redistributive taxes will move to government units with a generous support mechanism and away from government units with less support.

The theory of fiscal decentralization contrasts two systems of government organization, centralized versus decentralized, that, as I hypothesize, correspond directly to the discussion of fragmented versus consolidated governmental organizational form. The decentralized system of government in the fiscal decentralization literature corresponds to the system of fragmented government, while the centralized system of government corresponds to a system of consolidated government units. In the next section, the term decentralized form of government directly refers to fragmented government and the centralized form of government refers to consolidated government in my discussion on competition among government units.

Decentralization of government functions is important in the provision of public goods and services. Local constituents primarily consume public goods and services. Therefore, there exists a call for specifically targeting the provision of public goods and services to the need of the particular preferences and circumstances of the locality. As a result, decentralized provision of public goods and services is in sharp contrast to the

more uniform provision of public goods and services of a central provision. The provision at the local level allows the public good and service to fully reflect the local differences in preferences as well as the locale-specific cost of provision. Hence, a system of decentralized provision of public goods is able to provide the efficient level of output of a public good, where the sum of marginal benefits equals the marginal cost. Only the variation of public good output locally ensures the social welfare maximization of constituents.

Oates (1999) summarizes the basic principle of decentralization when he states “the provision of public goods and services should be located at the lowest level of government encompassing, in a spatial sense, the relevant benefits and costs” (Oates, 1999, pg. 1122). The decentralization theorem states that “in the absence of cost-savings from the centralized provision of a good and of interjurisdictional externalities, the level of welfare will always be at least as high if Pareto-efficient levels of consumption are provided in each jurisdiction than if any single, uniform level of consumption is maintained across all jurisdictions” (Oates, 1972, pg. 54). The decentralization theorem makes a critical assumption by stating that any centrally-provided public good must be in nature uniform. What this means is that all public goods and services provided by the federal government or state government are of equal size and quality across all constituents. In a perfect world with perfect information, a benevolent central planner would be able to provide differentiated local public goods in an efficient manner. However, there does not exist a scenario of an all-knowing, omnipotent central planner. The reality of imperfection in information allows local government units that are much

closer to the constituents to provide the local public goods and services in accordance to local preferences.

A second important point in the decentralization theorem is the notion of a welfare gain in providing public goods locally versus a centrally planned provision. The magnitude of these welfare gains depends on two factors – (1) the heterogeneity in preferences across localities and (2) the differences in provision costs. Oates (1999) finds that “the potential gains from decentralization stemming from interjurisdictional differences in demand vary inversely with the price of elasticity of demand” (pg. 1123). Oates contends that even in the case where the cost of provision of public goods and services is similar across government units, the potential for welfare gain in a decentralized system of public goods and service provision increases with the price inelasticity of demand.

Both the public products and service differentiation and the local provision of public goods and services are important factors in the well-being of households and firms. Because each household and firm requires unique bundles of public services and goods, a decentralized system is hypothesized to be more capable to achieving this goal. The result for households and firms is a better match in the quantity and quality of public goods and services offered by government units, thereby contributing to households’ utility and firms’ profits.

Wallace Oates in his 1999 paper entitled “An Essay on Fiscal Federalism” reintroduces another important aspect of a decentralized system of governmental organization, experimentation with public policies. In particular, the recent transformation of welfare programs away from the federal government to local

government units has another important implication for my discussion on governmental organizational form and economic growth. In the case of imperfect information by government actors, the notion of learning by doing has important consequences. As early as 1888, James Bryce, in his study *The American Commonwealth*, introduced the concept of experimentation with public policies by local government units when he states “Federalism enables a people to try experiments which could not safely be tried in a large centralized country” (quoted in Oates 1999, pg. 1132). Oates, in his essay on fiscal federalism, posits that local government units and states are the perfect setting for experimentation with public policies, primarily in the social welfare field. He contends that without the state’s experimentation with important public policy regulations such as unemployment insurance and environmental policies, the federal government would not be as forthcoming in implementing them on a national scale. Massachusetts’ proposal for health insurance for every resident of the state is one example of a state government experimenting with social welfare policies (USA Today, April 4, 2006). Farrell (1996) supports the idea of local government units being the experimenter in public policy when he states concerning the war among states “States are experimenting, trying to see what works, acting as the laboratory of economic policy”. Several studies have formally investigated the diffusion of successful state policies and results generally tend to support the idea that states can act as public policy innovators.

In theory, experimentation by individual, independent actors will more likely result in a successful conclusion of the experiment than centrally designed experiments. Therefore, opponents of consolidation contend that local government units are in a better position to experiment with public policies, as states and local government units are more

familiar with the local aspect of a problem. In addition, local government units may be able to implement public policies specifically targeting the local problem. Opponents of consolidation posit consolidated government units encourage one size fits all solutions disregarding abnormalities in the local problem. Furthermore, proponents of a system of fragmented government units contend that the information that other local government units are able to extract from the experiments may provide additional incentives as well as information for further experimentation and improvement.

Similar to preference heterogeneity and central provision, a decentralized system is able to implement public policy experimentations that are targeted specifically to local characteristics. The result for households and firms is public policy innovation that is locale specific to the problem. Opponents of consolidation contend that households and firms will benefit more from decentralized public policy that targets individual problems instead of combining multi-jurisdictional and unrelated problems into a single uniform agenda.

Proponents of consolidated government units argue that information externalities can also hinder the willingness to experiment, as local government units are able to free ride, thereby lowering the experimentation incentives by local government units. In the section on market failures I discuss in more detail the implications of externalities.

1. Taxation

A problem with a non-competitive provision of public goods and services through consolidated government units is fiscal equivalency, or constraining the power to tax. When governmental institutions emerge, individuals and businesses receive the benefits of the institutions through lower transaction costs. In exchange for the benefits,

individuals and businesses grant government institutions the power to tax. However, once the power to tax has been granted to an institution, the question arises on how to prevent excessive taxation. Fiscal equivalency requires that businesses and individuals pay for the services and goods they have received and vice versa. Any outcome other than fiscal equivalency provides enormous incentives for both people and businesses to overstate their needs when they do not need to pay for the goods or services, or understate demand when they are required to pay for the goods and services.

A similar issue concerning taxation is what is known as the “tax-assignment problem” or the question “what type of taxes are best suited for use at the different levels of government” (Oates, 1999). A decentralized system with mobility of households and firms increasing among government units with each subsequent lower level of government has important implications for the design of taxation. In principle, there are two types of taxes. Benefit taxes are taxes where the amount levied is directly related to the benefit received by public goods and services. In the case of non-benefit taxes, there is no direct link between the benefit from public goods and services provided and the amount of taxes levies. Both Tiebout’s (1956) and Oates and Schwab’s (1991) perfect competition model assume benefit taxation. However, non-benefit taxation is an important and critical tax type in my discussion. Each increase in non-benefit taxation increases the cost of households to live and firms to operate within the government unit. In particular, non-benefit taxation on mobile inputs such as households, capital, and final goods will have a direct effect on the spatial location of household and firms. Taxes can be the source of distortions in resource allocation. Firms may shift inputs from heavily taxed to less taxed inputs to minimize cost, while households may shift consumption

away from heavily taxed goods and services. In a spatially decentralized setting with differences in non-benefit tax rates, households and firms will seek out government units where they may receive relatively more favorable tax treatment (Oates, 1999). Oates concludes that local government units in a decentralized system should avoid non-benefit taxation on highly mobile units. In the case where households and firms pay for the benefits that they receive from public goods and services, competitive pressure can only lead to efficient production and provision, as benefits are linked with costs. However, in the non-benefit case, where benefits are not linked to costs, government units may have an incentive to provide tax breaks for short-term economic gains.

Proponents of consolidation posit that the current system of local finance with a portion of revenue generated through non-benefit taxes encourages government units to compete with non-benefit tax breaks. In the case of non-benefit taxes, households and firms are unable to link benefits with costs. A government unit interested in attracting additional mobile capital may be induced to lower non-benefit taxes to attract new mobile capital. However, competitive pressure among government units forces other government units to offer similar tax breaks in order not to lose more mobile capital. As a consequence, local government units may have short-term gains but in the long run tax revenue will decrease. The result is often a zero-sum game, but often a negative-sum game, where non-benefit taxes collected for income redistribution to benefit the poor suffers. Proponents contend that consolidating smaller government units into a single larger unit eliminates destructive competition among government units. In the short run, primarily firms will be the losers from consolidated government units, as they are unable to extract spatial tax differentials by pitting government units against each other.

However, in the long run, proponents posit that households and firms will be the winner in a more equitable and simpler tax system. Opponents of consolidation refer to Tiebout's 1956 model, concluding that local government units are assumed to levy only benefit taxes. In addition, fiscal federalism theory states that non-benefit taxation is primarily reserved to the federal government, and local government units should not levy non-benefit taxes.

A particular concern in the taxation debate for opponents of government consolidation is the Leviathan hypothesis advanced by Brennan and Buchanan (1980). The Leviathan hypothesis posits that in the case where government's power to tax is not constrained through some mechanism, total tax revenue and total government expenditure will rise as government agents will follow the same principle of revenue maximization as businesses. In the case of government consolidation, the decrease in the number of independent government units reduces the competitive pressure and the constraints on the power to tax. As a consequence, the reduced competitive pressure allows government units to levy excessive tax rates to support unnecessarily large and inefficient government bureaucracies. Households and firms are thus burdened by excessive taxes and unresponsive government services that reduce household utility and firm profits, thereby hindering economic growth. Opponents of consolidation therefore argue that competition among government units will induce production and provision efficiency as well as fiscal equivalence. Opponents believe only efficient and effective government institutions guarantee fiscal equivalence, thereby ensuring equal treatment of businesses and individuals in terms of taxation.

Parks and Oakerson (2000), in an overview of the literature on local public economics, discuss two important issues in taxation: fiscal disparity and equity, as well as spillover effects. An important part of the discussion on fragmented versus consolidated governmental organization form is the issue of spillover effects from localized public policies. The existence and extent of the spillover effect is highly dependent on the local circumstances and the public good or service in question. In particular, in terms of fiscal equivalence, spillovers from local public goods and services violate the fiscal equivalence hypothesis, as some of the externalities from a public good provide benefits for households and firms outside the taxation base.

Advocates of government consolidation contend that increasing the size of government units and thereby internalizing all the benefits and costs of a public good and service, may provide a solution. The problem of free-riding from positive externalities by households and firms located outside a local government unit will be reduced by government consolidation, as the number of government units decreases. A decrease in the number of government units results in an increase in the tax base, unifying taxation across the regions. In addition, a unified tax system across a consolidated government units will allow for a more equitable tax system. However, the increase in size of government units will come at the cost of local public goods and service differentiation. There is a trade off between the internalization of the externalities of public goods and service provision and the local public goods and service differentiation.

A second issue in taxation is fiscal disparity, or the ability of local government units to collect taxes. Supporters of consolidation contend that a system of several separate small government units pits government units against each other. In many cases,

government units with different economic resources in terms of demographics are competing against each other. A common example is that inner cities competing against suburbs with vastly different demographic characteristics and public goods and service needs. Proponents contend that allowing “richer” households to flee the inner city drains inner cities of the necessary resources to compete effectively with suburbs. The proposed solution by advocates of consolidation is to combine inner cities with suburbs to tap into the tax base of suburbs.

However, Parks and Oakerson (2000) contend, “there is little evidence that poor and minority communities are better off under this approach” (pg. 174). They go even further to posit that under certain circumstances inequality may even be exaggerated. They contend that integrating a small minority into a single large government unit weakens their political power to influence public policy to the point where poor and minority residents may finance public projects that benefit primarily the wealthier part of the community. The problem of externalities and how to fiscally account for spillovers will be discussed next.

Unfortunately, the discussion in the literature on consolidation versus fragmentation of government units ignores a key component of fiscal federalism. Intergovernmental grants are designed as the remedy to fiscal disparity and spillovers of public goods and service provision. The discussion on whether government units need to consolidate has largely ignored the potential benefits of a well designed intergovernmental transfer system. As I hypothesize, intergovernmental grants may provide a useful resource in the eliminating, or at least alleviating, the negative effects of

fiscal disparity and spillovers. In the next section I discuss in detail the various theoretical aspects of intergovernmental transfer payments.

2. Intergovernmental Transfers

Parks and Oakerson (2000) see *intergovernmental grants* to achieve redistribution of resources as a more efficient and better suited *alternative to consolidation*. This is because intergovernmental grants allow resource distribution from larger overlying government units, while at the same time preserving the opportunity for public choice and provision differentiation. Theoretical support for this hypothesis comes from Parks and Oakerson (1994). Parks and Oakerson (1994) contend that the monopoly power by many central cities is one of the hurdles. Regional solutions to redistribution problem need to be coupled with localized approaches. Intergovernmental grants would allow local government units to focus the provision of public good and services on local characteristics without excessively burdening local taxpayers. In addition, intergovernmental transfer payments are a proposed and practiced solution to the problem of benefit spillovers of public goods and services.

Intergovernmental grants and revenue sharing is the system in public finance where one government unit, typically federal or state government, has an excess in revenues over expenditures and distributes the surplus to lower level government units to finance public projects. Intergovernmental grants are an important part of fiscal decentralization and the debate over whether competition among government units is beneficial to economic growth and development. Tiebout (1959) and Oates and Schwab (1991) explicitly assume that any form of redistribution is reserved for the federal government, or at least state government. Intergovernmental grants allows for the

correction of the negative effects of competing local government units. The level of intergovernmental grants and aids to local government units has increased significantly over the period from 1992 to 2002, both due to the increase in decentralization of public policy programs and the relative ease in collecting non-benefit taxes at a federal and state level. Intergovernmental grants have three potential roles in the public finance of government units: internalization of benefit spillovers, fiscal equalization across government units, and improved overall tax system (Oates, 1999). Oates (1999) distinguishes between conditional grants and unconditional grants depending on whether there are any stipulations attached to the money.

Proponents of government consolidation point to the market failure in private markets concerning benefits spillovers, resulting in sub-optimal provision of a good with positive spillovers. Similar to private markets, the provision of public goods and services may suffer from sub-optimal provision due to the fact of positive spillovers. Intergovernmental grants may be able to incorporate the positive externalities by compensating government units according to the extent of their positive spillover (Oates, 1999). Therefore, government units are more likely to invest at the efficient level in public projects that have positive spillovers on other government units. For example, the benefits from construction of roads is not limited to the residents within the boundary of the government unit, but residents from surrounding communities will benefit as well. Therefore, state and federal tax money is given to local government units in the form of intergovernmental grants to compensate for benefit spillovers.

Another role of intergovernmental grants is fiscal equalization of channeling funds from wealthier government units to poorer ones (Oates, 1999). Oates (1999, pg.

1127) observes, however that “fiscal equalization is a contentious issue from an efficiency perspective”. McKinnon (1997) goes so far as to contend that fiscal equalization may actually hold back the development of poorer areas. However, the primary justification for fiscal equalization is on equity grounds. Intergovernmental grants redistribute money on the basis of fiscal need and fiscal capacity to even the playing field between richer and poorer government units. Transfer payments allow government units with fewer financial resources to compete with wealthier government units. In the theory of fiscal competition, intergovernmental grants are an important part in equalizing the competitive playing field and encouraging competition among government units. Hence, opponents of consolidation see intergovernmental grants as a safeguard against market failure. Proponents of consolidation contend that consolidating government units would eliminate the need for intergovernmental grants, thereby inducing more efficiency in allocating necessary funds.

An additional role of intergovernmental grants, according to Oates (1999), is to “sustain a more equitable and efficient overall tax system” (pg. 1128), which would allow for non-benefit taxation with a single rate across all government units. As I discussed earlier, non-benefit taxes are extremely difficult to levy in local government units because of inefficiencies associated with varying non-benefit tax rates across local government units. Non-benefit taxes levied centrally by a federal or state government and redistributed according to need can be more progressive in nature without providing incentives for relocation of households and firms. Oates (1999), however, qualifies this by warning that intergovernmental grants should not be so large that they encourage excessive spending by local government units.

Opponents of consolidation see intergovernmental grants as a solution to the problem of fiscal equity, disparity and spillover effects. Both Tiebout's (1956) and Oates and Schwab's (1991) model, which I discuss later in more detail, assume that the federal and, to some degree, state governments assume the redistribution of income function. The role of intergovernmental grants in their model is to free local government units from the redistribution function, thereby allowing local government units to compete on efficiency grounds in the provision and production of public goods and services, and not in taxation for redistribution of income.

Proponents of government consolidation argue that only consolidation of government units may alleviate some of the negative effects of fiscal federalism. Theoretically fiscal federalism may provide a more efficient and more equitable solution to fiscal disparity and equity as well as externality spillovers. Households and firms are theorized to be able to gain more from a well-designed intergovernmental grant program than by simply "putting everyone in the same pot" and carrying out redistribution based on a one size fits all scheme.

Opponents of consolidation conclude that intergovernmental grants may cause more damage in certain instances than transfer payments provide relief. Critics of consolidation point to what is known in the literature as the "flypaper effect" – money sticks where it hits (Oates, 1999). Hines and Thaler (1995) in their study on the flypaper effect suggest that how money is raised for public projects in terms of taxation or intergovernmental grants has a significant effect on how the money is spent. Money received through intergovernmental grants is perceived to be "free" money and therefore, government units spent more freely on projects financed through grants. In contrast,

public projects financed through local taxes tend to be more stringent in terms of expenditures.

2.1 Alternative Theory of Government Grants

Critics of consolidation of government units point to Brennan and Buchanan's 1980 book "*The Power to Tax*", which offered an alternative view of intergovernmental grants, as a more pessimistic view of government. Brennan and Buchanan's (1980) theory starts at a similar point as my discussion above. Intergovernmental grants have three functions: interjurisdictional benefit spillovers, economies of scale in administering taxation, and interregional disparities in income (Brennan and Buchanan, 1980). Setting income disparities aside from the discussion, Brennan and Buchanan contend that the Leviathan theory of intergovernmental grants would generate a different outcome than the fiscal decentralization theory proposed above. The starting point of their discussion is the Tiebout (1956) model of competition among government units.

The Leviathan theory posits that intergovernmental grants are a mechanism by local government units to lessen the intergovernmental competition among local government units. Brennan and Buchanan (1980) argue, similar to the private market place, that government units are constantly on the lookout for mechanisms to decrease the competition among government units by trying to form cartels. One such arrangement to form a cartel is to arrange for a uniform tax system across all government units. They continue by stating the obvious government unit to administer such as cartel would be the federal and or state government. The federal government collects all the tax revenue and distributes the money, according to predetermined quotas, back to local government

units. This system allows local government units to raise revenue in excess of the necessary level, thereby allowing for revenue maximization of public officials.

Grossman and West (1994) provide empirical support for the collusion theory by stating “grants are more likely to be used to increase expenditures favored by interest groups with high benefits per member than to reduce general tax levels with low benefits per taxpayer” (pg. 29). In their study, Grossman and West test the collusion theory advanced by Brennan and Buchanan (1980) by regressing government own-purpose expenditure on federal grant-in-aids as a share of total government expenditure. Their results show increased grant-in-aids are positively correlated with government size and size of each separate level of government in Canada. They conclude that the benefits of fiscal decentralization are weakened by the increase in intergovernmental grants as intergovernmental transfer payments weaken the competitive pressure on government units.

Opponents of consolidation see intergovernmental grants as a blessing and a curse. Intergovernmental grants may provide an efficient and equitable solution to fiscal disparity and inequity, as well as externality spillovers, but at the same time intergovernmental grants may weaken the competitive pressure on local government units. However, the current system of intergovernmental grants and a consolidation of government units may be the most dangerous alternative to efficient and equitable production and provision of public goods and services. Households and firms are hypothesized to gain from an effectively and efficiently designed system of intergovernmental grants. A well-designed system of intergovernmental grants allows for income redistribution, but more importantly, intergovernmental grants distribute tax

money more evenly across beneficiaries from public goods and services. Households and firms are hypothesized to benefit from efficient production and the equitable provision of public goods and services.

D. Competitive Federalism

The starting and end point in the debate on how government should organize to promote the economic well being of its citizens is the question of whether an institutional framework encouraging competition among government units is efficiency and equity enhancing or detracting. Proponents of government consolidation see competition among government units as the root of the inefficiencies and inequities, while in contrast opponents to consolidation see competition as the mechanism assuring efficiencies and equities.

1. The Existence of Interjurisdictional Competition

The first step in understanding competitive federalism is to find support for the theory of competitive federalism by identifying competitive behavior by local government units. Breton (1991) in his study sees three forms of intergovernmental and interjurisdictional competition – (1) price rivalry or fiscal competition, (2) Public Policy Diffusion, and (3) Political Mobility.

1.1 Price Rivalry or Fiscal Competition

Price rivalry or fiscal competition is the most evident form of competition among government units. Proponents of consolidation often cite the destructive fiscal competition among government units as their primary motivation for consolidation. The widespread use of fiscal competition in the form of direct subsidies, tax incentives, provision of land, wage subsidies and other forms of price instruments to attract labor,

capital, and technology is probably some of the most convincing evidence for a competitive relationship among government units. Breton (1991) even goes so far as to include the provision of artificial recreational amenities such as concert halls, professional sports teams, and cultural amenities in the evidence for competition among government units. It is, however, important that price rivalry is predominantly evident in interjurisdictional competition and to a lesser degree in intergovernmental competition. In the case of interjurisdictional competition the primary players are states competing with other states.

Fiscal competition, or price rivalry, manifests itself in three forms: tax competition, financial aid, and employment assistance (Farrell, 1996). The first form of fiscal competition, tax competition, is the hot button issue that divides proponents and opponents of consolidation into two distinct groups. Proponents of consolidation view tax competition as the evil beast that creates inequities in income distribution, promotes “beggar-thy-neighbor” policies in terms of environmental standards and public policies, and puts local government units in undesirable positions. Critics of the current system of competition argue that the more local government units spend on tax incentives, the less money they have for public goods and services. The role of local government units, they contend, is to produce and provide public goods and services, such as education, infrastructure, and libraries and not actively engage in attracting households and firms. Critics conclude that government units “shouldn’t be chasing smokestacks, but concentrating on scarce resources” (Farrell, 1996) such as public goods and service. Proponents of consolidation posit that tax competition is both harmful and not necessary

and could be easily resolved by a more cooperative and/or consolidated approach to economic development.

Opponents of consolidation see tax competition as the most powerful tool to restrict government's powers and to ensure efficient use of public resources. Local government units are unable to outspend their neighbors in attracting households and firms due to the competition among government units. Opponents theorize that households and firms would act as watchdogs, weighing costs and benefits carefully, thereby ensuring close to efficient spending of public resources. In addition, opponents contend that tax competition keeps taxes minimal. Competing government units would be unable to raise taxes to finance unnecessary public policy projects, which in turn is beneficial to economic growth, as households and firms have a lower tax burden (Shannon, 1991).

Competition through financial aid and employment assistance can be summarized into expenditure competition. Expenditure competition is most evident in public policy programs such as worker education, subsidies, and social welfare. Once again, in the case of Massachusetts' health insurance program, other state governments might find it advantageous to copy Massachusetts' program to keep residents happy. Shannon (1991) calls this the "pacesetting phenomenon", where one government unit sets the pace and others are forced to follow in order to keep up with the leader. A second form of expenditure competition is what Shannon (1991) called the "catch-up" imperative. Shannon (1991) explains that in the area of economic development, many more conservative and often poorer government units have to catch up with more progressive

government units to keep the public goods and services offerings close to competitors' levels.

Whatever the literature on economic development aid concludes, the question remains whether a fragmented system of government units encourages economic development aid competition? Current literature on economic development aid and governmental organizational form can be interpreted either way. Paul Romer of Stanford University summarizes the key aspect of government units in the debate over economic development aid by stating “government should take an activist role in creating hospitable conditions for individuals, companies and industries to pursue new ideas and techniques” (as quoted by Farrell, 1996). I hypothesize that hospitable conditions include a skilled labor pool, good infrastructure, an effective and efficient legal environment, as well as high quality of life. I posit that all these key aspects of a hospitable environment for households and firms are determined by responsive and efficient government units, returning us to the fundamental question of this dissertation.

1.2 Public Policy Diffusion

The second form of evident competition is what Breton (1991) called diffusion of legislative and other public policy measures. Diffusion of public policy refers to how, over time, government units will adopt similar policy measures that have proven successful in the past. Diffusion of public policy measures is a continuation of the process described above in fiscal decentralization on policy innovation. One of the advantages of fiscal decentralization is the fact that it allows smaller government units to experiment with public policy instruments. Massachusetts' experimentation with health insurance for all residents might be the first step in the adoption of similar laws in other

states. However, is diffusion of public policies an indication of competition among government units?

One strand of thought aiming to explain knowledge diffusion is the theory that public officials are concerned about the well being of their constituents. In the public officials' quest for satisfaction of their constituents they search for new public policy ideas that increase households' well being (Breton, 1991). But, why would public officials care about the well being of their constituents? Public officials are elected by their residents and elections are a competition among several candidates with different ideas on how government should function and what role government should play in residents' lives. In two papers Salmon (1987a, b) sets out to show that public policy implementation in rivaling government units allows constituents to evaluate the performance of their own government unit in comparison to other government units. The successful implementation of public policies is positively related to the number of government units that have already implemented the policy.

The existence of public policy diffusion in combination with successful policy innovation by government units is directly related to the existence of multiple, independent, separate government units. Following public policy innovation theory and public policy diffusion theory, small, independent government units are more likely to experiment with and innovate public policy. Successful public policy innovators, I hypothesize, can be compared to successful innovators in the marketplace. These successful government units attract new households and firms, and deeply ground them in the local public politics, to ensure continuing policy innovation. Households and firms

will be more successful in an environment that constantly innovates and aims to provide and produce public goods and services as efficiently as possible.

In contrast, public policy innovation and policy diffusion are inversely related to the size of government units. An increase in size of government units entails an increase in the heterogeneity of preferences of different stakeholders within the community trying to achieve competing goals. Preference heterogeneity for public policies within a government unit requires public officials to achieve a compromise of various preferences to achieve a uniform, one-size-fits-all, public policy. Opponents of consolidation contend that uniform public policy may achieve equity within the community, but innovation is discouraged. But, more importantly, a uniform public policy may pit different preference groups against each other.

2. Political Mobility or the Tiebout's Model

Political mobility, the mobility of households and firms, is the third evidence of competition among government units. The term political mobility is often associated with the Tiebout Model (1956). Tiebout's model is a continuation of the previous two evidences of competition. It may be seen as a combination of the public policy diffusion as well as tax and expenditure competition.

Tiebout's 1956 hypothesis of "voting with your feet" is one of the most influential papers on governmental organizational form and its role in economic development and growth. In the center of Tiebout's model are citizens, whose mobility in combination with the competition among government units encourages efficiency in the provision of public goods and services. It is important to note that household mobility is Tiebout's primary tool to achieve a competitive market-like mechanism. However, Tiebout's

analysis revealed that competition among government units for households was a key component of that mechanism. Returning to the concept of polycentrism, a polycentric system of government is based on the existence of independent centers of power that are distinct from each other. In Tiebout's model there are two actors, individuals, whom Tiebout calls consumer-voters, and separate units of government. These units of government provide individuals with a variety of public goods. Parallel to perfectly competitive markets, Tiebout assumes that individuals have full knowledge of government finances and there are large numbers of government units to choose from. In addition, Tiebout assumes no spillover of benefits from local public goods and services. Tiebout's model posits that individuals will choose the government unit that best reflects the individual's preferences for public goods and services as well as government finances. According to Tiebout's theoretical model, all taxes to finance public goods and services are benefit taxes and not ability-to-pay taxes. His model explicitly implies that any redistribution of income is the federal government's responsibility. In the end, Tiebout's model of consumer-voter and competition among government units, public goods and services are efficiently distributed among individuals and they are produced at the least cost (Kenyon and Kincaid, 1991).

In Tiebout's model, firms are not considered. Oates and Schwab (1991) published an important extension of the Tiebout model in an explicit modeling of competition among government units for mobile capital stock. Government units compete for the mobile capital stock by lowering taxes and providing services, thereby encouraging firms to move to the local government unit or discouraging out movement of existing firms. Similar to Tiebout (1956), Oates and Schwab (1991) assume that there are

no positive or negative spillovers, large numbers of government units exist to choose from, and all taxes collected to finance public goods are benefit taxes. Consequently, Oates and Schwab arrive at a similar conclusion as Tiebout (1956), specifically that competition is efficiency enhancing and therefore government units provide the best combination of public goods and services for both individuals and firms at the lowest cost.

Both Tiebout's (1956) and Oates and Schwab's (1991) model depend crucially on the role of the federal government in redistributing income at an adequate level. Oates and Schwab (1991) conclude their paper by stating that Tiebout's and their model is primarily a model of local interjurisdictional competition dependent on the federal government adequately performing the redistributive function. But in the case that the federal government does not adequately provide redistributive functions, and local and state governments perform some of the redistributive functions, then competition among local government units may need to be limited (Oates and Schwab, 1991).

E. Limitations to Organizational Form Theories

1. Market Failure

Just as competition among firms does not ensure efficiency in private markets, competition among government units, both intergovernmental and interjurisdictional competition, may result in market failure in the public market.

1.1 Externalities

Analogous with private markets, externalities or benefit spillovers from the provision of public goods and services in one government unit may distort public policies in another government unit. One of the key motivations for the formation of government

organizations, besides reducing transaction costs, is the provision and production of public goods and services. A public good or service is a good or service that is characterized by non-rivalry, meaning the consumption of the good or service by one person does not reduce the amount available for another person, and non-excludable, meaning one cannot exclude a household or firm from consuming the good. In addition, public goods are often decreasing in the average cost of production. As a consequence, private markets do not provide public goods and services. In these cases, government units step in and produce and provide these goods and or services. Then, the public good or service is primarily funded through taxation and sometimes through subsidies to private producers. The quintessential problem in the provision of public goods is how to determine the amount of benefits received by each household and firm. Returning to the fiscal equivalence theory, each household and firm is required to pay for the total benefits received from public goods and services. In the case of local government units, the taxing authority of the local government uses general taxation formulas to distribute the cost of production and provision over the entire population of households and firms.

However, benefits from the provision of public goods and services are often not limited to the producing and taxing government unit. Households and firms in other government units seek to benefit from the public goods and services provided without remunerating the producing government unit. This phenomenon is often referred as the “free-rider“ problem. Because the producing government unit is unable to limit the benefits from provision to within its boundary, and other government units’ tend not to compensate for the benefits received, each government unit is inclined to produce and provide public goods and services at sub-optimal levels.

Consolidation theory's proposed solution of combining several smaller government units into a single larger unit is hypothesized to alleviate the benefit-spillovers problem in two ways. First, advocates of consolidation argue that combining the production and provision of public goods and services into a single government unit ensures the total amount of taxes being paid by households and or firms is approximately equal to the total actual benefit received. Hence, fiscal equivalence is satisfied. Second, a main criticism of competitive federalism is the tendency of local government units to engage in destructive competition over public goods and service. In the race of government units to attract new households and firms and to discourage current households and firms from leaving, local government units resort to public policy that either ignores the interests of current residents or burdens future generations with the cost. Consolidating government units, and thereby eliminating competition among government units, is hypothesized to reduce competitive pressures. Hence, government units are able to provide and produce public goods and services needed by households and firms to stay competitive in the marketplace.

1.2 Market Power

A second form of market failure is market power. Market power can be defined as one government unit having a substantial share of the market for a good or service (Oates and Schwab, 1991). Analogous with private markets, in public markets one government unit may hold substantial market power in terms of population size as well as expenditures. In the case of one government unit in the public holding substantial market power, competition among government units is theoretically possible, but in reality not effective. Larger government units are hypothesized to be able to out-compete smaller

government units due to their ability to take advantage of economies of scale and scope in producing and providing public goods and services more efficiently and their larger financial capabilities. Smaller government units are theorized to be forced to compete on an uneven playing field in terms of resources. They are put into a position to duplicate the large government unit's public policies in order to stay competitive in the market for households and firms. Consolidation theory proposes again to combine unequally size government units into a single government unit to alleviate the competitive pressure. Combined government units are hypothesized to reduce competitive pressure, thereby allowing government units to provide and produce public goods and services required by households and firms to maximize utility and profits respectively.

1.3 Taxation

Oates and Schwab (1991) identify a third potential source of market failure -- taxation of mobile capital. "If communities must rely entirely on taxes on mobile capital to fund public goods, the outcome will not be efficient" (Oates and Schwab, 1991 pg.137). Government units that must rely on taxes on mobile capital know in the case of an increase in the tax rate some of the mobile capital will leave. Therefore, government units are restricted to raising money to the extent where the cost of the public good plus the negative effect on mobile capital leaving equals the benefits of the public good. Hence, government units tend to provide a lower level of public goods in order to keep mobile capital within its boundary. This problem with the taxation of mobile capital is especially pronounced for public goods with a redistributive character. As a consequence, public goods and services that may have a net benefit to the community by attracting additional mobile capital to its boundary will be offered at sub-efficient level.

Some research by Knapp and White (1993), Fox et al. (1989), Herzog and Schlottman (1986) on migration within the United States has found that the level of household taxation and how tax money is being used may influence the location decision of households. They concluded that households tended to avoid paying for public goods and services by locating in government units close by.

1.4 Imperfect Information

A fourth cause of market failure in private markets and consequently in public markets is imperfect information (Oates and Schwab, 1991). Tiebout's (1956) theory on the benefits of competition among government units assumes perfect or near-perfect information on government finances as well as policies. In reality, however, the assumption of near perfect information is difficult to maintain. In Tiebout's model and much of the competitive federalism literature, information about different government units' finances and public policies is quintessential to the movement of households and firms. The lack of near-perfect information discourages competition, as both households and firms find it costly to monitor their government unit as well as other competing government units.

Proponents and opponents of consolidation have debated the issue of imperfect information and market failure in the public market for a long time. The theoretical literature on the benefits of consolidation is often based on imperfect information assumptions. Carr and Feiock (1999) provide a good summary of the arguments. Consolidation theory contends that consolidated government units are in a much better position, in terms of information on the regional level, to assess the regional economic growth problems. Fragmented government units lack comprehensive information on the

regional scale. As a consequence, consolidated government units are hypothesized to be able to better address and carry out regional development strategies. In contrast, small and fragmented government units may not have adequate economic and political power to carry out regional development strategies efficiently. Primarily, the small size of economic development agencies in fragmented government units does not allow for cost-effective economic development policy. Therefore, consolidation theory posits that a more centralized system of government is better equipped to carry out public policies that encourage economic growth through a system of centrally planned economic activity.

Another hypothesized benefit of consolidation is the increase in transparency in government policy. Consolidation proponents contend that myriad small government units make a transparent economic development policy impossible. First, a large number of government units will make it impossible to fully compare each government unit's finances and public policies effectively. Second, the potential myriad distinct rules and regulations by each government unit increases compliance costs for both firms and households. Consolidating government units would eliminate several layers of bureaucracy and thereby reduce transaction cost for government units as well as firms and households.

Opponents of consolidation argue that imperfect information is a bigger problem in consolidated government units as households and firms find it more difficult to penetrate the larger and often more complicated layers of bureaucracy. Empirical and theoretical work on imperfect information tends to contradict the consolidation argument. The empirical question, whether consolidated government is associated with larger or smaller government expenditures, supports the notion that consolidation is positively

related with higher government expenditures (Zax 1989, Schneider 1989, Eberts and Gronberg 1987).

One of the motivations for the positive relationship between consolidation and government expenditures is government bureaucrats' behavior. A seminal work that influenced the discussion whether competition among government units is beneficial or detrimental to efficient provision and production of public good and services is the topic of the next section.

1.4a. Bureaucracy and Public Economics

Niskanen's (1994) seminal book *Bureaucracy and Public Economics*, which he revised and updated in 1994, introduces an important concept in the discussion of the benefits of competition. Niskanen introduces a theory of the behavior of government officials, or what he calls bureaus, based on the economics of imperfect information. Originally in 1971, he concluded that "bureaus supply a larger than optimal output, but this output, ... , is produced efficiently" (pg. 273). In his reassessment in 1994, Niskanen concludes: "the budget of a bureau is too large, the output may be too low, and the production of this output is uniformly inefficient" (pg. 274). In addition, Niskanen posits that bureaus maximize the discretionary budget, which is the difference between the total budget and the minimum cost of producing output. But the budget of the bureau is constrained by the review and approval of politicians, the representatives of the voters and taxpayers. However, "the sponsor, [as Niskanen calls the politician] does not have sufficient incentive to monitor the bureau because it shares only a small part of any benefits accruing from a more efficient performance by the bureau" (pg. 272). More importantly, the sponsor uses his authority over the bureau in terms of accepting or

rejecting the budget to capture some of the surplus. But because the surplus cannot be claimed as personal income by the bureau or the sponsor, the surplus is spent on additional staff and capital to strengthen the position of the bureau and the sponsor. Therefore, Niskanen (1993) concludes that bureaus produce public goods and services inefficiently. In 1971, Niskanen's study on bureaus and politicians, he concludes that an increase in the monopoly power of government units will cause an increase in government expenditures. In addition, he concluded in the production inefficiency section that "cost can be reduced by contracting with private firms, by reducing the size of bureaus, and by increasing competition among bureaus" (pg. 263).

Niskanen's theory on public bureaus' behavior is in sharp contrast to consolidation theory. Niskanen's theory concludes that consolidation of government units and public bureaus will lead to increased inefficiencies in the production and provision of public goods and services resulting in sub-optimal provision at increased cost. In contrast, consolidation theory concludes that consolidation of government units and public bureaus will lead to increased efficiencies as duplicate layers of government are removed, thereby increasing transparency and accountability.

1.4b. Competition and efficient provision of public services and goods

One of the first attempts to study the connection of competition among local government units and government spending was Schneider's (1989) study on intercity competition and the size of the local public work force. His study relied heavily on Niskanen's initial theory, but he added important pieces. Schneider (1989) advances the theory by first assuming that public employees want a large work force and higher wages. Their ability to achieve this goal is limited by the degree of competition in the local

market for public goods. Similar to Niskanen (1971), Schneider (1989) contended only the bureau has knowledge of the production costs of public goods and services. The knowledge of the production cost is directly related to the degree of competitive pressure. Competition increases the ability of residents to control public spending by comparing competing alternative government units.

Schneider's (1989) empirical study investigated the effect of competition on work force size and wages. His results indicated that competition limits the relative size of the local work force, and more or less the wages. He concludes that "competition in the local market for public goods thus has a role enforcing efficiency and responsiveness in public sector labor policies: competition limits the unnecessary expansion of the public work force."

Zax's (1989) study on the effects of decentralization in local government on local public sector size is another attempt to measure government efficiency. In his research he continues to make the crucial distinction between general-purpose government and single-purpose governments. He concludes that a decrease in the number of government units reduces competition and as a consequence increases the local public sector size.

Eberts and Gronberg's paper in 1987 tests the hypothesis that an increase in the number of governmental units reduces local government spending as a percentage of personal income, and they conclude that competing general-purpose governments are associated with a statistically significant decreases in expenditure. However, they added that they find different behavior between general- and single-purpose governments. An increase in single-purpose government units is associated with an increase in expenditure.

An important empirical work is Grossman and West's (1994) study on federalism and the growth of government. In their model they test Niskanen's (1971) theory of bureaucratic behavior employed in Brennan and Buchanan's (1980) collusion theory. Grossman and West contend that the bureaucrat's ability to maximize his/her budget will be positively influenced by the ability of bureaucrats to collude to reduce tax competition. In their model they test this connection and find that the growth in collusion leads to growth in the size of government at the federal, provincial and local level.

In addition, Grossman and West (1994) test a second hypothesis advanced in the literature. Oates (1985) introduces a second theoretical argument for an increase in local government expenditures based on information theory and transaction cost. Oates quotes John Wallis by stating "since individuals have more control over public decisions at the local than at the state or national level, they will wish to empower the public sector with a wider range of functions and responsibility" Oates (1985, pg. 749). The underlying assumption in this theory is the ability of individuals to better control government expenditures in a local setting. The ability of bureaus to provide incomplete information is significantly reduced in a local setting. Residents of local government are in a much better position to gather information on the true cost of public projects and thereby ease the ability to hold government units accountable. The increase in the ease in gathering information lowers the transaction cost of government control.

In their study, Grossman and West (1994) find statistical support that decentralization with respect to lower level government may actually lead to more public expenditure. They hypothesize that decentralization of government units may allow households to hold government units more accountable. With the increase in

accountability, households and firms are willing to finance more public policy projects as they have better control on where and how much money is spent on a specific public good or service. Additional empirical support for this hypothesis comes from Hilber and Mayer (2003). The results in their study show “places that rely on local funding may provide greater funding than locations that rely on funding that comes from higher levels of government” (Hilber and Mayer, 2003, pg. 125).

Grossman and West (1994) conclude: “fiscal decentralization by itself may not be strong enough constraint on the behavior of revenue-maximizing governments since it may be substantially offset by simultaneous collusive agreements among all governments” (pg. 31). The empirical work on governmental organizational form and its implications of government expenditures is generally in support of fragmentation theory. With the exception of Grossman and West (1994), all other studies have provided evidence that fragmentation lowers government expenditures. The question remains whether lower expenditures imply higher efficiency or whether lower expenditures means lower levels in the provision of public goods and services.

2. Location Rents and Amenity Rents

Location rents or amenity rents are a second form in limiting the effects of competitive federalism. Tiebout’s model assumes that households are mobile and Schwab and Oates’s model assumes that capital or firms are mobile. However, Reschovsky (1991) as well as Oates and Schwab (1991), points out that both capital and people may be significantly less mobile. Capital is often linked to a specific location, either in its initial set up or because of historical reasons. For example, Pittsburgh’s rise as a steel producer was critically dependent on three sources of raw material -- iron ore,

coal and water. All three sources of raw material were initially abundant in western Pennsylvania, but over the years, iron ore and to a lesser degree coal are being transported from other states and even other countries. However, the steel industry in Pennsylvania has not moved to Australia or Wyoming to be close to iron ore or coal. Firms and households may not be as mobile as Oates and Schwab assumed in their model.

Empirical studies on the location decision of households have shown that location-specific amenities do matter in the location decision. For example, studies by McGranahan (1999), Rupasinga and Goetz (2004), and Deller et al. (2001) have shown that households are attracted by both natural and artificial amenities such as sunshine, temperature, recreational facilities, professional sports teams, and cultural establishments, while leaving areas with higher probabilities of cancer occurrences, superfund sites and other disamenities. Households and firms are attracted to areas with higher degrees of amenities and or specific qualities. Households and firms may be willing to accept lower wages and profits for higher degrees of amenities and quality of life. For example, one of the fastest growing metropolitan areas in the USA is the Las Vegas area. Without air-conditioning and a stable supply of water from water reservoirs in the mountains, Las Vegas would be an inhospitable place to live. In addition, Las Vegas may have one of the biggest concentrations of artificial amenities attracting even more households and firms to relocate to the desert. These scarcities of natural amenities and or specific qualities of a particular location will command higher prices that households are willing to pay in the form of higher living expenses coupled with lower wages (Oates and Schwab, 1991, Reschovsky, 1991). Government units in these high amenity areas are

able to collect location rents. Primarily households and to a lesser degree firms are willing to accept less efficient and more unresponsive government units in order to consume those location-specific amenities.

Brennan and Buchanan (1980) come to a similar conclusion on the Tiebout model in their theory on the power to tax, when they state “once we depart ever so slightly from this extremely restrictive model, however, the idealized Tiebout process will not fully substitute for constitutional tax rules or limits ...” (Brennan and Buchanan, 1980 pg. 201-202). Brennan and Buchanan even go so far to posit that location rents would allow government units to exploit residents of these government units. Brennan and Buchanan argue that the level of exploitation increases with the degree of potential location rents, however, government units with no potential for location rents would be incapable of exploiting location rents.

Location rents and amenity rents are hypothesized to diminish the competitive pressure on the behavior of local government units. Brennan and Buchanan even go so far as to argue government units in high amenity areas will be able to extract additional revenue from households and firms. The existence of location rents and amenity rents clearly diminishes the power of competitive pressure to ensure efficient production and provision of public goods and services, as well as the responsiveness of government units to the needs of households and firms to maximize utility and profits respectively.

3. Actual versus potential exit

A criticism of Tiebout’s and Oates and Schwab’s models on political mobility and competitive federalism is their assumption of household and firm mobility in choosing the government unit that best reflects their preference bundle for public goods and

services as well as public finance. Often Tiebout's and Oates and Schwab's models are misunderstood to purely reflect actual exits without considering the role of potential exit in the power equation between local government units and households and firms.

A very critical classification in competitive federalism is the distinction between actual and potential exit of households and firms in the assessment of benefits and costs of competition among government units. Breton (1991) states, "The threat of exit by people and or capital could change the net advantages of public officials. Actual exit, again in this context, is only the measure of the unwillingness or incapacity of a jurisdiction to compete effectively" (pg. 39-40). He continues by stating that in contrast to actual exit, potential exit can be compared to potential entry in monopoly and oligopoly theory. In monopoly theory, the potentially serious threat of entry causes the monopolist to set the price of their product or service closer towards the competitive price level in order to discourage entry. It is not the actual entry of another firm, but the effective threat of entrance that is causing the monopolist to change its pricing strategy. In public economies, it is not the actual exit, but the potential exit of households and firms that is sufficient, but not necessary, to cause changes in the behavior of government units.

The seminal work by Hirschman (1970) entitled *Exit, Voice, and Loyalty* adds an additional component to the discussion on whether actual exit is the only mechanism ensuring efficient production and provision of public goods and services. Parks and Oakerson (2000) point out in their discussion on the exit mechanism proposed by Tiebout that households and firms in a government unit may have an incentive to postpone exit as long as possible. Here, Hirschman's (1970) analysis of exit, voice and loyalty comes in

place. Essential to Hirschman's analysis is the existence of slack, the deviation from the maximum rate of profits for a satisfactory rate of profits. Hirschman further assumes that demand for goods and services depends more on quality than on price, and a decrease in the quality of a product is primarily caused by a lapse in efficiency and not by cost cutting. He continues when quality of a product or services declines, households can either accept the change or do something about it. But Hirschman contends the difference between perfect competition and nearly perfect competition is the mixture of inert and alert customers. In perfect competition, one assumes all customers will become aware of the change in quality and stop buying the good or service. In nearly perfect competition, there is a mixture of customers, who use the exit strategy and leave, and customers, who stay put and accept the change in quality. However, in the nearly perfect competition situation, the firm or government unit is able to recuperate from its lapse in quality, while in perfect competition, the firm or government unit will decline indefinitely. But Hirschman continues his analysis by inserting a third option into the analysis, the voice option. The voice option is only available to the inert group, who decided not to leave.

According to Hirschman, the voice option is the preferred alternative to exit. The voice option is different from exit, because it allows a firm or government unit to recuperate from its state of slack. While voice is an attempt by the inert group to encourage a change in practices and policies within a firm or government unit, the exit option in contrast is an escape without the potential benefit of recuperation. Hirschman sees the voice option as an alternative to exit, in effect postponing the exit option. Therefore, he concludes that voice is primarily used in the early stages of slack, while

exit is the second stage in the recuperation process if voice fails. However, it is important to note that once a consumer exited from the market, the consumer is no longer able to use his or her voice option. Therefore, Hirschman concludes similar to Brenton (1991) exit is the reaction of last resort.

Whether exit or voice is the dominant form of reaction depends on the circumstances. The choice between voice and exit depends first on whether consumers believe there is hope for recovery, second on the cost of switching, third on the availability of suitable alternatives, fourth level of loyalty, and fifth, the possibility to free ride on others voice option. Consequently, Hirschman distinguishes between the cost of exit in the case of products and the cost of exit in government units. While in the case of private markets the cost of exist, switching from one product to another, is minimal, in the case of public markets the cost of exit, switching from one government unit to another, is more substantial. He concludes that voice will function better with fewer buyers and higher stakes, but more important, the voice option is the most powerful, if the option of exit is available as the last resort. Therefore, Hirschman concludes voice is a better tool in maintaining efficient performance of government institutions, where stakes are high and consumers have fewer alternative options to choose from. In addition, whether the voice option is an important part in the mechanism of restoring efficiency in government units depends on the organizational framework of government units. Hirschman summarizes this point when he writes “while structural constraints are of undoubted importance in determining the balance of exit and voice for individual commodities, the propensity to resort to the voice option depends also on the general readiness of a population to complain and on the invention of such institutions and

mechanisms as can communicate complaints cheaply and effectively” (pg. 43).

Advocates of a fragmented system of government contend that smaller government units compared to larger more consolidated government units would allow households and firms to voice their opinions more easily and cheaply. Thereby, the local government unit has the ability to recuperate from their slack in public goods and services quality and restore efficiency and responsiveness.

Hirschman’s analysis of voice and exits reinforces the notion that Tiebout’s hypothesis of “voting with your feet” may be only explain a fraction of the mechanism at work in encouraging effective and efficient production and provision of public goods and services. Voice, in combination with the potential for exit, may be the second mechanism in the competition among government units. The competitive mechanism that Tiebout envisioned in ensuring efficient government units may be complemented by the less competitive mechanism of voice envisioned by Hirschman.

More recently, with the increase in the knowledge on game theory, several authors in the economic development literature have investigated how decentralization of government units and the relocation threats of firms can be explained through game theoretic models. For example, Oechssler (1994, 1997) and Wohlgemuth and Kilkenny (1995) develop a game theoretic models to analyze the role of potential threats versus actual threats and concessions government units make to retain firms. The game theory literature on potential versus actual relocation threats, as well as the implementations of concessions on future threats is beyond the scope of this dissertation. However, the role of potential versus actual exits in changing the strategy of government unit is important in considering Tiebout’s model.

4. Effects of Interjurisdictional Competition

The literature in economics and political science describes two forms of competition among government units, efficiency-enhancing competition and destructive competition. The first form of competition is generally associated with the Tiebout (1956) model. In the first view, mobility of households and firms encourages competition among government units based on the tax-expenditure bundles for public goods and services. Assuming there is enough variation in tax-expenditure bundle offering, the Tiebout model will result in both provision and production efficiency. Provision efficiency is achieved when residents allocate themselves among government units according to their heterogeneous preferences for bundles of public goods and services. Production efficiency is achieved as competing government units are constrained in their power to tax, hence providing public goods and services in an efficient manner. Therefore the equilibrium in public economies is characterized by government units being sorted according to preferences for public goods and services, where individual government units are homogeneous in terms of preferences for public goods and services, but government units are heterogeneous across government units (McGuire, 1991).

The other view of competition among government units, the destructive view of competition, is primarily based on game theoretic models of competition among firms in an industry (McGuire, 1991). Unlike the Tiebout model with benefit taxation, assuming a perfect connection between taxation and benefits received, the theory of destructive competition separates benefits from taxation. Because taxation is separated from benefits, each government unit will have an incentive to give tax incentives to mobile

capital owners in order to encourage immigration and discourage outmigration. The end result is the provision of public goods and services below the optimal level. Furthermore, in the destructive view of competition, government units do not have the ability to raise taxes to provide optimal level of public goods and services. The destructive model results in low taxes for the mobile residents and capital while providing sub-optimal provision of public goods and services.

In terms of income redistribution, the Tiebout model sees redistribution of income from an equity standpoint, delegating the redistributive function to the federal government and the existence of benefit taxation. The destructive model of competition sees the redistributive function of government both in the hands of local government as well as the federal government resulting in a mixture of ability to pay taxes and benefit taxes.

4.1 State versus Local government competition

An important aspect in the debate over whether competition among government units is beneficial or detrimental is the distinction between competition among states versus competition among local government units. In the literature, the results from the Tiebout (1956) model are generally applied to competition among local government units. Taxation by local government units in the form of property taxes tends to be benefit taxation, as public goods and benefits from optimal public good and service provision tend to be incorporated in housing values. Hence, scholars on competition posit that competition among local government units is efficiency-enhancing in both the provision and production of public goods and services.

On the other hand, the model of destructive competition is generally applied to competition among states. Destructive competition occurs when government units compete without regard to the potential harmful effects of competition. One potentially contributing factor in destructive competition is the state's role in the redistribution of income and social welfare programs. In order to finance social welfare programs and income redistribution states tend to rely on income and sales taxes in addition to intergovernmental transfer payments from the federal government. Both income and sales taxes are non-benefit taxes. In the case of non-benefit taxes the cost of public goods and services and their benefits are not directly linked. As a consequence, government may be tempted to compete with each other on the basis of non-benefit taxation. State incentives to attract new businesses in the form of subsidies, tax breaks and other incentives allows owners of large, mobile capital to play states against each other, resulting in a zero sum or even negative sum game. The remedy for destructive competition is government restrictions on the competitive position of government units. In the section entitled interaction between state and local government I discuss the empirical modifications necessary to control and account for the influence of state governments.

Chapter 4 - Literature Overview

The role of government in economic growth is manifold. The two primary areas of economic growth that units of government are able to influence are the location decisions of firms and the location decisions of households. There exists substantial literature on these topics, analyzing a multitude of potential influences on the location decision of households and firms. However, few studies have specifically investigated the relationship between government fragmentation and the location decision of households and firms. In the next two sections, the theoretical foundation for each relationship will be laid out and each section will be concluded with an overview of the hypothesis and the empirical questions to be analyzed.

A. Employment Growth

As I stated in the empirical question section, the basic premises of this study is the assumption that firms are maximizing profit. Whether firms are aiming at the highest possible rate of profits or maximizing profit to a satisfactory rate is irrelevant to the analysis. Firms choose a location that allows for the best overall profit maximization. In the simplest version of a profit function profit equals total revenue minus total cost. Total cost can be divided into fixed and variable cost. All in all there are three broad categories that influence the profit function of a firm -- price, quantity and the cost vector. Government units have the ability to influence any of the three categories in order to attract firms to the area and prevent firms from leaving for another government unit. However, the scope of influence by government units on these general categories of the profit function is severely limited by general market forces.

Especially in terms of pricing, government units may be able to provide tax breaks and subsidies that would lower the cost of production in a specific government unit, like enterprise zones. However, competitive forces in a marketplace with competing government units tend to erode price advantages rather quickly. A government unit offering tax incentives and subsidies to specific companies will be able to profit from their actions in the short run as firms may relocate or expand operations in this specific government unit. But in the long run, other government units within the area and other parts of the country will start to duplicate any tax incentives to prevent further outward migration of employment. In the worst case scenario, other government units will provide even greater tax incentives and subsidies to the firms to regain some of the lost employment. In the end, government units competing for firms may engage in a race to the bottom, draining the government units of vital resources that could be used much more effectively on other more beneficial public policy projects. Advocates of consolidating government units are primarily concerned about this form of competitive federalism resulting in destructive competition. The competitive forces in the market for firm relocation and expansion may not just erode any price advantages generated from local public policies, but in the long run deter local government units from engaging in effective growth generating public policies.

In terms of the second category, quantity, government's role is even more limited to short run than with production costs. Generally, the number of buyers in the market is limited. However, government units are able to increase the market size or demand for goods and services through government intervention. Local government units can engage in active fiscal policy through public spending. These policies generally involve

expanding and advancing public works projects to stimulate economic growth by increasing demand. The primary mechanism at work is the multiplier effect. An increase in demand through public works projects ripples through the economy in increasing overall demand for goods and services. However, government's role in increasing demand, quantity demanded, is limited to short-run starter effects, but long-term increases in the quantity side of the equation are difficult to accomplish and slow to achieve. Therefore, the remaining category of potential government influence on firm's profit function is through the cost of production term.

One aspect of a firm's production cost that has received significant attention is the role of space and transportation cost. Space and transportation costs are external to the firm. A firm's space and transportation costs are generally determined at the initial firm location decision. Research in this area is primarily concerned with attracting new firms to the area. In particular, the role of infrastructure on the success and failure of economic development of an area has been studied throughout various academic fields (See Fox and Porca, 2001 for an overview of the literature on rural infrastructure). Fox and Porca concluded, "at the margin expanding infrastructure investments is likely to have a modest effect on rural economic performance." The authors continue to state that infrastructure alone may not have large benefits besides short-term construction gains.

Another aspect of a firm's production cost that has received attention is cost directly associated with production through labor and capital costs. Capital costs can further be divided into site costs, utility costs, taxes, and legal or compliance costs. Local government units' influence on capital cost can range from non-existing to substantial depending on the state's rules and regulation and the local government unit's power to

regulate. But in general, local government units will have some influence on a firm's capital costs structure. Primary, local government's ability to regulate businesses through zoning and other rules and regulations may affect a firm's costs. Rules and regulation are theorized to influence a firm's cost structure directly and indirectly.

In the direct mechanism, rules and regulations prohibit certain business practices and production techniques, which would lower production costs, thereby reducing the competitive position of local firms. Here, the cost of being compliant restricts a firm's profit maximizing production. Thereby compliance cost can be directly related to production costs. An often hypothesized reason for the demise of manufacturing in the Northeast and Midwest are the stringent environmental rules and regulation put in place to protect nature and people. Arik Levinson (1996) investigated environmental regulations and manufacturers' location decision, and he concludes that environmental regulations do not have an effect on manufacturing start-ups and little effect on branch plant location.

A vast amount of literature exists on the role of taxation and a firm's location decision. Wasylenko (1997) provides a comprehensive overview and critique of the literature. Taxation of income, property, and corporate taxes as well as tax incentives has become a very important issue for policy makers in attracting and retaining firms in an area. The impact of taxation on a firm's location decision is very much dependent on the form of the tax. A tax on corporate capital may have a much greater impact on a capital-intensive industry than on a labor-intensive industry. High labor taxes or high local income taxes will have a much greater influence on industry with high qualified workers with a high wage rate than on an industry with a relatively low wage rate. It is generally

assumed that higher taxes will buy more public goods and infrastructure. This connection between higher taxes and more public goods and infrastructure is not necessarily supported by research. Zax (1989) and Schneider (1989) have shown that there exists a relationship between government organizational form and efficient public goods production. They conclude competition between government units lowers tax costs.

While the theoretical literature on linking taxation and economic growth prospects is generally undisputed, the empirical literature suffers from methodological shortfalls. Unlike most other countries in the western world, the U.S. system of fiscal decentralization allows local government units to raise money through taxes and fees. As a consequence, the American tax system is very complicated in terms of determining the effective tax rates for firms and households across states. In addition, differential tax laws across states make the comparison of tax structures empirically difficult. However, I am not interested in the effective tax rates across government units in the U.S.

The primary focus is not to identify what specific tax structure is beneficial to economic growth, but to identify what type of governmental organizational form allows firms to minimize costs. Cost, that is generally, associated with consumption of public goods and services by firms in their production process. In addition, firms have compliance costs, associated with rules and regulations for safeguarding people as well as the environment. Therefore, as I contend that economic policy makers should be more interested in how a state or regions should be organized to be an effective, efficient, and responsive producer and provider of public goods and services than in the rate of taxation. Following Oates and Schwab's (1991) hypothesis in the case of competitive

federalism differential tax rates across local jurisdiction would rather reflect different preferences for public goods and service bundles than differences in efficiencies.

Therefore, firms would pay less attention to tax rate and more attention to the cost-benefit analysis of specific public service and goods bundles.

Most studies of firm location theory use as an underlying model the basic profit or cost function. Firms are hypothesized to choose a location and to stay in a location that maximizes profits. Studies on the location decision of manufacturing firms tend to model the location decision independent of the local area demand, as for most firms local demand is a relatively small part of the national and often international market.

However, Wasylenko (1997) in his review of studies states that depending on the industry, certain firms may be more concerned about regional and local markets than firms in other industries.

Even though it is beyond the scope of this study, Wasylenko (1997) pointed research to an area that has not been investigated very rigorously. There exists a difference in a firm's location decision between manufacturing and non-manufacturing or service industry. Manufacturing firms may be less dependent on local area demand than service industries. Advancement in communications technology and the changes in the composition of the service industry require a much more sophisticated approach in modeling firm location. Especially advancements in communications technology have made firms less dependent on local area demand. However, Wasylenko's (1997) distinction between different sectors of the economy provides additional theoretical discussion on the benefits and costs of various organizational forms of government.

As discussed in previous sections, at the core of fragmented government theory is the belief that fragmented government units are better and more capable to provide and produce a more locally centered public policies. Expanding the hypothesis that firms in different sectors of the economy have distinctively different requirements for government services and goods, a more decentralized system of government will be better equipped to produce and provide this goods and services on a local level. What this means is a firm requiring a specific bundle of public goods and service is in a better position to be able to influence public policy in their favor. As a consequence, the firm will be able to minimize costs and increase profitability, which in turn encourages expansion at the present location. Advocates of a more fragmented system of government see the production and provision of locally centered government service and goods an increase in effectiveness of public goods and responsiveness to the local needs.

In contrast, in a consolidated form of government, each firm is competing against a multitude of other firms trying to achieve the same goal of affecting public policy in order to minimize cost. Strictly from an economic standpoint, competition among firms for public policy projects will ensure a more beneficial allocation of scarce public resources to the firm with the highest potential for public well-being. While fragmentation theory agrees that competition is efficiency enhancing, theory also contends competition for public policies in a consolidated government units may pit unequal groups against each other, such as small local firms competing against large multi-national corporations. As it is often the case, multi-national corporations are able to outshine any local, small business expansion by the sheer number of jobs created with a single large-scale business relocation.

The fundamental question to be investigated is what type of governmental organizational form allows small, local firms to have as much power in public policy initiative as large-scale multinational corporations. In other words, what is needed is to find the right combination between the benefits and costs of size, returning us to Madison's concerns of dangers of the few and inability to be concerned about local issues versus the confusion of the multitude and inability to comprehend the larger picture.

In summary, firms are hypothesized to choose a location and to stay in a location that allows the firm to maximize profits by employing the right combination of price, quantity and a cost vector. Public policies may affect each of the three categories equally, but local government units have the potentially biggest affect on the cost vector. Further it can be assumed that a firms' location decision directly affects employment growth in the respective area. As local government units provide effective, efficient, and responsive government services and goods, local firms will be able to compete effectively in the marketplace and achieve good rates of profits. Those successful government units will be either able to attract new firms to relocate operations within its boundaries or existing firms will be able to expand current operations. As a consequence, employment levels will be raising within those successful government units and declining in other government units. As employment growth within those successful government units, more employment opportunities will be available for job seekers within the area, increasing employment growth and lowering unemployment.

Therefore, I hypothesize, a firm's location and or expansion decisions, ultimately the employment growth rate, will be dependent on local specific qualities such as amenities, population characteristics, but in particular local government structures.

Therefore, as hypothesized earlier, local government structure may have a larger effect on the local employment growth rate than previously hypothesized by other authors.

Especially I hypothesize, economic growth is not just providing efficient government services and goods but being able to find the right combination of public policies that encourages a well balanced economic growth of various industry sectors.

I chose to measure a firm's economic growth through employment growth. Employment growth provides clear overviews of whether existing firms in the local government unit are expanding and or firms are relocating to the specific government units. However, a criticism of using employment growth as the dependent variable comes from Beauregard (1993) and Wasylenko (1997) in that measuring employment growth as the dependent variable, one places intentionally or unintentionally a bias towards favoring large firm relocation. Research by Beauregard (1993) has shown that employment growth in most areas is driven by small, local firms and not by large multinational corporations. However, one of the benefits of using county level data to analyze the role of governmental organizational form on economic growth is the limited impact of single large-scale firm relocation occurrences in the data set. A large Multinational Corporation's decision to relocate or locate in a particular area is generally not driven by small local areas but by state government programs. A county will have a significant change in employment growth over a ten-year period as a consequence of a large corporation building a new plant in the area, but these data points are outliers within a data set with over 2000 observations.

A particular problem with firm location decision models based on states is that labor costs tend to be measured through the average wage rate as a whole or for a sector.

Wasylenko (1997) points to a significant problem in using average wage rates. He states “average wages in the state probably do not represent the wages that firms actually face in choosing locations within the state.” He continues to state that wages typically vary by location throughout the state. Therefore, modeling the location decision on a local level avoids using average wage data for the entire state. Still, average wage data for the local unit, the county, is still required in order to measure labor cost, but local average wages rates tend not to fluctuate as much.

B. Migration or Household Location Decision

Economists and sociologists have studied the literature on household’s location decision and the migration decision over several decades. The majority of the work on migration is focused on factors that influence the migration decision. According to Clark and Hunter (1992), migration studies can be classified into three categories. In the first category are human capital models originating in Sjaastad’s (1962) work on migration and his view that migration is an investment in human capital. Clark and Hunter (1992) state that the other two categories have one aspect in common. Both categories are based on the assumption that humans migrate to consume location specific goods. One type of migration literature is based on Tiebout’s seminal work of local government competition and the importance of local government. The other type is the hedonic wage approach rooted in Rosen (1979) and later Roback’s (1982) model of hedonic wages, where migration eliminates wage rate differentials across regions or metro areas, based on a disequilibrium in the local labor market. Schachter and Althaus (1989) developed an equilibrium model showing that variations in gross migration across a region are

equilibrium responses to variation in levels of amenities, government policies and other non-market goods.

In the literature there has been a lively debate on whether an equilibrium or disequilibrium model is better suited to explain migration (See Graves and Mueser, 1993, and Evans, 1990, 1993). The equilibrium model assumes a closed economy with a large number of small regions and insignificant variation in moving costs. The large number of counties in the U.S., approximately 3300, and the relative lower cost of moving between counties or even states can easily support this assumption. In addition, Schachter and Althaus assume in their model that the capital is optimized by firms and therefore independent of the location of the owners. They continue by stating that even in equilibrium individual households will continue to move between counties for a variety of pecuniary and non-pecuniary reasons. As a consequence, a county may experience in and out-migration at all times (Schachter and Althaus, 1989).

Independently from Schachter and Althaus, Knapp and Graves (1989) developed a similar model of an equilibrium setting. Knapp and Graves (1989) based their model on a demand and supply side approach. The demand side approach is based on the work by Blanco (1966), Lowry (1966), and Mazek (1969) that assumes “that increases in the demand for goods produced in specific existing regions leads to increased labor demand in those regions. Hence, in-migration from other regions occurs” (Knapp and Graves, 1989). In order for the demand side approach to work, labor supply is assumed to be very responsive to changes in the wage rate. The supply side approach assumes that labor demand is perfectly elastic in all locations. Therefore, migration increases from

low wage regions to high wage regions, and the driving force may be demographic. The addition of amenity values as a driving force added significant value to the supply model.

I follow the model of Schachter and Althaus and the equilibrium approach, modified by the approach that Clark and Hunter took in their 1992 study on age specific migration rates. In the equilibrium approach, Schachter and Althaus state that at the equilibrium net migration will be close to zero, or gross in- and outmigration flows will be approximately equal. However, they agree that disturbances in the equilibrium may cause migration to occur continuously. An example of this continuous migration is Graves and Linneman's 1979 life cycle model of adult migration in the U.S. As individuals age and go through different stages in their life, different locale specific amenities become more or less important. For example, young families are theorized to value high school quality and low crime rates, while high income individuals are theorized to value low tax rates and high natural and artificial amenities. Therefore, at different stages in their life, households will move between local government units independent of the local governmental form. However, locale-specific amenities and fiscal policies may play an important role in the migration decision of households trying to maximize utility. For example, Fox et al. (1989) showed that taxes and local government spending might have an impact on the migration decision.

Households are assumed to choose government units that maximize their total aggregate utility. Households derive utility from income as well as private goods and services consumed. In addition, I hypothesize households derive additional utility from the consumption of public goods and services provided by local government units. Thereby, households are hypothesized to locate in the government units with the highest

potential for utility maximization. However, in return for the provision of public goods and services, each government unit collects taxes and fees to finance the production and provision. Ultimately, as Tiebout (1956) hypothesized, households locate in the government unit that provides the best bundle of market and public goods and services thereby maximizing household utility.

In general, government units at all levels play an important role in a person's life by providing infrastructure, services, and education to its residents. In particular, local government units are designed to be a reflection of local preferences for public goods and services. Local government units are able to influence people's life through their role in providing these basic public goods and services. In many cases, local government units through their zoning power are able to determine land development patterns within its boundaries, thereby influence the quality of life for residents. Specifically, local government policies may discourage the exploitation of natural resources and encourage conservation, or vice versa, thereby enhance or detract from natural and artificial amenity values. In addition, local government units are, since the move to decentralization the public goods and service provision and bring them closer to the people, the primary agents in many social welfare programs. It is the local government unit's power to produce and provide public services that is at the center of the debate over beneficial forms of governmental organizational form. Furthermore, local school districts often coincide with one or several adjoining local municipality boundaries, thereby allowing households to influence public school policy. All together, different levels of local government individually or combined have the power to affect a region's ability to retain and attract households to reside within its boundaries.

Considering the influence of local government units may have over each person's well being, how should government be organized? The effective organization of units of government is very important, because how well a government unit is organized may influence how efficiently scarce local assets are being employed in the economy, and how well it may respond to necessary changes in the production and provision of these public goods and services. The migration literature has identified several broad groups of analysis associated with population change. In the bundle of market and public goods and services households consider in their location decision to maximize utility, three specific categories are essential to my model.

One of the newest and increasingly important area of analysis in population change is the role of natural and artificial amenities. The seminal work by McGranahan (1999) on amenities and migration established a firm connection between amenities and migration. Other research on amenities showed that a broad group of amenities exists in determining migration that work as incentives and disincentives. For example, Rupasinga and Goetz (2004) showed that health-related amenities and disamenities such as cancer risk, superfund sites, and the Environmental Protection Agency's hazard ranking system has an influence on the migration decision of households. Porell (1982) finds that quality of life factors besides economic factors are significant determinants of immigration, but not important in determining outmigration. Herzog and Schlottmann (1986) conclude that recreation accessibility, besides tax rates and education, reduces outmigration. High crime rates however increase outmigration probability. An important theoretical and empirical analysis for my dissertation is Deller et al. (2001) paper on the role of amenities and quality of life in rural economic growth. Deller et al. (2001) use the

Carlino and Mills framework to investigate role of natural as well as artificial amenities in a three equation model similar to my model. Deller et al. conclude that rural areas endowed with high natural amenities may be able to capture these to promote economic growth in the future. However they caution, the linkage between amenities and economic growth are not well understood.

In summary, natural and artificial amenities as well as artificial disamenities may influence a household's location decision beyond the scope of local government units' power. But, this research confirms that households will respond to differences in amenities, thereby allowing for the possibilities of location rents and amenity rents. Tiebout's (1956) assumption that households are fully mobile may be offset by the additional utility that households may derive in high amenity areas. Households in high amenity areas may trade additional utility from high amenity areas for lower paying employment, higher housing cost, and less efficient government units. As a consequence, local governments are able to collect amenity and location rents from households. Location and amenity rents will therefore mitigate the competitive forces in the public market.

Highly contested and debated in the migration literature are the effects of taxes and public expenditure on in and outmigration of households. Graves and Linneman (1979) study on migration was one of the first to explicitly look at governmental influences on the migration decision. Fox et al. (1989) investigated the effect of fiscal structure on the decision to leave the metropolitan statistical area (MSA). Their findings are conclusive with respect to how different expenditures affect migration. They contend that tax money spent on education and parks reduce outmigration, while welfare expenditure encourages immigration of welfare seekers and outmigration of tax

payers. Fox et al. (1989) further investigated how the tax structure influences migration decisions. High own-source revenue percent of total revenue, a proxy for high taxes, discourages immigration. Schachter and Althaus (1989) concluded that high taxes encourage outmigration. In addition, public assistance payments have a strong negative effect on immigration, but no significant effect on outmigration. Knapp and White (1993) in their study concluded that a change in the level of local taxes is significant in determining household migration, but the level of taxes, or the initial and final tax rate is not significant in determining household migration.

Another highly contentious and debated issue in the migration literature is the effects of intergovernmental transfer payments and public assistance payments on the location decision of households. Oates' (1999) "An essay on Fiscal Federalism" summarizes the recent literature on the topic of efficient tax structure and design. Oates argues "central governments should have the basic responsibility for the macroeconomic stabilization function and for income redistribution in the form of assistance to the poor." Lower level of government like counties and townships are constrained in the power to redistribute income on the local level by the mobility of households. Counties that proceed with an aggressive redistribution program will attract welfare recipients and at the same time lose taxpayers. Studies by Schachter and Althaus (1989), Cebula (1974), and Cebula et al. (1973) support this conclusion. Feldstein and Wrobel (1998) go even so far to state "state government attempts to redistribute income are largely unsuccessful." Oates and fiscal federalism argues is that federal government should be responsible for revenue side of the redistribution equation, but local government units have a distinct advantage in the provision side. Oates argues that decentralized provision of welfare

programs is much more efficient due to the ability to provide goods and services tailored to the local needs compared to uniform levels of a national provision. Charney (1993) concludes that as a consequence welfare benefits vary substantially across states and counties. Therefore, real differences in the level may have a strong impact on the migration decision.

All these studies have shown that how local government units collect taxes and distribute public revenue across various government expenditure categories has important implication on the location decision of households. Advocates of a fragmented system of government organization contend that only small and local government units are able to produce and provide the public goods and services specifically targeted to the local needs. In contrast, in consolidated government units different population groups will compete for the limited public resources. Supporters of a consolidated form of government contend elected public official must compare the costs and benefits of each public policy, and choose the public good or service with the highest net benefit to society. As a consequence, consolidated government units are better equipped to make better-informed decision on a more regional matter. Fragmentation theory would suggest that in consolidated government units public officials need to find compromise solutions to appease several residents groups with opposing views on how public revenue should be spent. For example, households valuing education are pitted against households valuing low taxes or households with preferences for more income redistribution. Advocates of fragmentation posit a more local approach to local government allows households to locate in the local government unit that best reflects their preference for public goods and services without having to compete for public expenditures. Empirical

work by Hilber and Mayer (2003) on public expenditure on education supports another important aspect of a more local, fragmented, form of government. They found that public expenditure for education is not necessarily reduced by competitive pressure when control for expenditure on education is locally controlled. Households with a high preference and value for public expenditure on education are able to locate in the government unit that allows them to first, allocate additional resources, but secondly, allows for the control over these additional resources.

However, until now, no study incorporated the government fragmentation and polarization indicators in a study of county-to-county migration in the U.S. for all age groups. In the 2003 Brookings' Report, the authors tried to connect government fragmentation and outmigration of young adults. It is my hypothesis that government fragmentation and government polarization affects migration independently and as a combination of fragmentation and polarization. Grassmueck et al. (2005) and the study on the role of government fragmentation indexes on young adults outmigration decision from Pennsylvania was one study incorporating government fragmentation indexes. In their study Grassmueck et al. (2005) found evidence that government might have a significant role in the migration decision of young adults. They found that fragmentation of governments is an important element of the migration decision function. In particular, they found evidence that how government fragmentation is measured may have significant impacts on whether competition among government units is beneficial or detrimental to a household's ability to maximize utility in a specific local government unit.

For the empirical model, the change in population is the difference between immigration and outmigration of a specific government unit, $\Delta P_i = IM_i - OM_i$ (where IM_i is immigration and OM_i = outmigration) at location I , or the difference in the population count in location i at time t and population in location i at time $t-1$. Furthermore, I assume that deaths and births will be approximately equal in a given year, so the change in population can be attributed to in- or outmigration.

Rupasinga and Goetz (2004), Saltz (1997), Partridge and Rickman (1999), Clark and Hunter (1992), and Graves (1983) used net migration flows in their study. Partridge and Rickman (1999) used both net migration flows and gross migration flows. Gross migration flows measure the movement of people into or out of the county, while net migration is the difference between in- and outmigration. The net migration number is on a per 10,000 resident base. Counties with larger populations will have a higher likelihood of migration occurring. Therefore, the Census data that is provided in absolute values will be divided by the population times 10,000 to provide a gross migration figure that makes comparison between counties possible. Smith and Swanson (1998) and Greenwood et al. (1991) provide a good overview of the advantages and disadvantages of net versus gross migration flows.

Net migration as a measure of household's location decision has several conceptual and methodological problems (Smith and Swanson, 1998). One of the biggest problems with net migration as a dependent variable is the problem of misspecification. Smith and Swanson (1998) state that "some explanatory variables may have opposite effects on in- and outmigration, reinforcing their overall impact on net migration, whereas others have similar effects, which tend to cancel each other out." An additional

problem with a net migration model is that net migration may mask large gross migration movements, where large in- and outmigration numbers cancel out and therefore show a small net migration, making the researcher believe that migration is small for the county. The last problem with large in- and outmigration movements from the same county may be a particular problem of counties in an equilibrium stage. Schachter and Althaus (1989) state that at the equilibrium, net migration is close to zero because macroeconomic gains from moving are eliminated. Hence, in an equilibrium model of migration gross migration figures are better suited to investigate push and pull factors of migration. Smith and Swanson (1998) list other problems with net migration that are not as relevant for the proposed model.

C. Per Capita Income Growth

In Wasylenko's 1997 overview of the literature on taxation and economic development, he summarized that only a few studies used income as a dependent variable. He continues by stating that income levels, and income growth have been used less frequently in studies of state and local economic growth. Beauregard (1993) states that economic growth has an inherently political nature regardless of whether a government unit is directly involved or not. North (1990) provides the basic theoretical motivation for government's involvement in economic growth. Units of government are able to support and subsidize economic growth, but they are equally capable of detracting and jeopardizing future economic growth. However, economic growth has become a powerful political instrument of politicians to assure reelection by showing constituents that the local economy is doing well.

Many policy makers equate economic growth and economic development, as well as define economic growth as employment growth, especially job growth. Beauregard (1993) states that the economic growth process elevates job growth beyond capital investment and in particular is inattentive to the quality of jobs being produced. The American Economic Development Council defines economic development as “the process of creating wealth through the mobilization of human, financial, capital, physical and natural resources to generate marketable goods and services” (AEDC, 1984 pg.18). Nowhere in the definition does it state that economic development is job growth. Economic development means progress toward a system that enhances the capacity to act and innovate (Beauregard, 1993). Institutional structures through governmental units create the frame for the formal economy. Governmental units are able to contribute directly to employment, production and other business activities, but most important, governmental units are required to establish the framework that make investment and production possible and profitable. Only when the structural environment is favorable to productive behavior of households and firms will an area progress economically. Hence, a meaningful measure of economic development must be centered on wealth creation such as increase in per capita income. Nelson and Foster (1999) support the choice of per capita income by arguing “a better measurement of improvement from the perspective of individual welfare would be change in personal per capita income.”

A growing amount of literature is investigating the relationship between governmental structure and income growth. Works by Nelson and Foster (1999), Foster (1993), Nelson (1990), and Ward (1987) studied the link between the structure of government at the metropolitan level and income growth. However, so far no researcher

to my knowledge has investigated the connection between government structure and income growth at the local level or county level. In addition, previous research efforts have been limited by their methodology employed to measuring government structure. Nelson and Foster (1999) capture the problem by stating, “the daunting task is measuring metropolitan governance structure in ways that reveal potential influences on growth.”

The most common measure of fragmentation is government units per capita (Shields et al. 2004, Carruthers 2003, Carruthers and Ulfarsson 2002, Ebert and Gronberg 1987, Zax 1989, Schneider 1989). Research on government efficiency frequently uses government units per land area to account for the proximity of governmental units to compete with each other. Other researchers, in particular, Lewis (1996) and Miller (2002), use expenditure data by government units to calculate fragmentation indexes. Rusk (1993, 1995) measures fragmentation through elasticity measures that capture the level of ease of expanding metropolitan areas by taking into account population change and land area change over time. Nelson and Foster (1999) employ two measures of fragmentation by using an elasticity measure similar to Rusk’s in addition to a variable capturing central city dominance, which is defined as the percentage of metropolitan population residing in the central city.

One of the earliest examinations of government influence on regional growth is by Helms (1985). He incorporated the fiscal structure of government into a model of regional growth. The author concluded that regional growth is negatively associated with increases in taxes when those taxes are used for transfer payments, but tax money used for education at the expense of transfer may stimulate growth. However, Carlino and

Mills (1987) found that public policies in the form of taxes and industrial revenue bonds have little impact on either population or employment growth.

Another research effort is focused on the role of government and the regional adjustment process. In particular, research has focused on how intergovernmental transfers and equalizing grants affect the local economy. In Shaw's (1986) work on unemployment benefits and migration, the author concluded that government benefits such as unemployment benefits seem to lessen the impact of more traditional market variables. The author continues to argue that unemployment payments work as subsidies in the depressed area, as a consequence market forces that would induce an adjustment are being undermined. Courchene (1970) comes to a similar conclusion that government welfare programs may contribute to the continuous inequality among Canadian provinces. In terms of fiscal equalization, McKinnon (1997) argues that fiscal equalization may actually hold back the development of poorer areas by impeding the necessary regional adjustment. He argues that the South's reemergence as a dominant force in the U.S. can be attributed to the low wages and costs in the region.

Based on the previous outline, my hypothesis of a meaningful study of government structure on income growth can be formulated as follows: per capita income as the dependent variable is a function of government structure variables, as defined above, and several control variables. Control variables have to account for factors that influence per capita income but are not related to governmental organization. Local labor force characteristics, such as educational level and unemployment level, will have an influence as lower educational levels and higher unemployment rates will lower per capita income. In addition, the composition of the local economy in terms of dominant

sectors will influence per capita income. Several researchers, including Duffy-Deno (1998), have investigated the role of amenities in economic development. Therefore, variables controlling for the spatial location of the county are necessary to control for regional differences that are independent of governmental structures.

Despite the numerous measurements of government fragmentation, Nelson and Foster (1999) identify several problems with simple and singular measurements of fragmentation. One of the problems is the influence of special districts on income growth. Foster (1997) in her book on the political economy of special purpose governments identified several important aspects of special purpose governments that may require separate variables to control for special purpose government. Nelson and Foster (1999) created a variable for special district dominance that is defined as the ratio of special purpose to general purpose governments. In their study of metropolitan areas, an increase in the number of special districts has a negative effect on income growth.

In order to accommodate the criticism of Foster on simple and singular measurements of fragmentation, I employ several variables to measure fragmentation. In their study on young adult outmigration from Pennsylvania, Grassmueck et al. (2005) tested several fragmentation indexes and their explanatory power. The authors concluded that Miller's Metropolitan Power Diffusion Index, which is based on expenditure data, performed best next to the simple government units per capita measurement. However, in their study, fragmentation indexes emphasized the importance of small units of government over large units, but results also indicated that young adult outmigrants seem to prefer fewer units of government. The use of a polarization measure may add more insight into the competitive nature of government units in providing efficient public

services and goods. In addition, Clark's functional performance indicator of distinguishing between common and uncommon government functions may solve the problem with the heterogeneity of functions performed by counties.

Chapter 5 - Data Description

The primary source of data is the Census of Government for 1992, 1997, and 2002. Every five years the Census of Government collects information on expenditures, revenues, and inter-governmental transfers for every unit of government. The basic assumption is government spending can be used to approximate governmental power. I assume only active government units provide public goods and services. In contrast, inactive government units are political and or legal jurisdictions with authority, but not exercising it, or government units without any authority at all. In return for the provision and production of government goods and services government units collect taxes and fees. In addition, active government units have employees, who manage, supervise and carry out government services and products. The Census of Government provides all these pieces of information. More importantly, the data set contains information for states, counties, boroughs, townships, cities, towns as well as special districts, such as school, water, transportation and other special purpose governments. The clear distinction among different levels of government provides additional insight into government finances.

A. Expenditures

The basic assumption in using government expenditures is government units with economic power and influence are the government units that spend tax money for various government functions in providing public goods and services. I assume that a government unit with large expenditures will have more economic power and have more influence on economic development and growth than a government unit with little expenditures compared to other government units with the county.

Miller (2002) states that expenditures serve as a good indicator of how political power is divided up in any region. In the Census of Government all expenditure amounts are classified by function and by character and object. Expenditures are classified into two main categories: 1) Direct Expenditure and Intergovernmental Expenditure. Expenditure items in the direct expenditures category can be linked with direct economic activity by the government. In contrast, intergovernmental expenditures are expenditure items in support of either joint public projects or expenditures to compensate for externalities, fiscal equalization, and or income redistribution. Direct expenditures are further divided into three main categories. The first category is direct expenditures associated with every day operations, such as current operations, assistance and subsidies, and interest on debt. The second category is capital outlays for construction and purchase of land and equipment. Finally the third category is insurance trust expenditures for public employee retirement and other insurance expenditures.

Only expenditure category one and two are closely related to economic activity. I follow Miller (2002) by using only direct expenditures without insurance expenditures for calculating fragmentation indexes. Specifically I make use of the data on current operations (code E), assistance and subsidies (E-I-J), construction (F), purchase of land and existing structures (G), and purchase of equipment (K).

Direct expenditures are expenditures for “compensation of own officers and employees and for supplies, materials, and contractual services except any amounts for capital outlay” (Census of Government, 2000, pg. 202). Assistance and subsidies are “direct cash assistance to private individuals, and nongovernmental organizations (e.g., foreign aid, agricultural supports, public welfare, veteran bonuses, and cash grants for

tuition and scholarships), but not in return for goods and services nor in repayment of debt and other claims against the government”. Interests on debt are “amounts paid for the use of borrowed money” (Census of Government, 2000, pg. 202).

Capita outlay is defined as “direct expenditure for purchase or construction, by contract or force account, of buildings and other improvements; for purchase of land, equipment, and existing structures; and for payments on capital leases”. Some “classification is based on the circumstances surrounding each situation. If the term refers to activities that materially extend the life or add value to the property, then they are classified under construction; otherwise, they are classified under current operations” (Census of Government, 2000, pg. 203). Construction is expenditures for “production, additions, replacements, or major structural alterations to fixed works, undertaken either on a contractual basis by private contractors or through a government's own staff” (Census of Government, 2000, pg. 203). Purchase of land and existing structures are expenditures for “acquisition of these assets as such by outright purchase; payments on capital lease- purchase agreements or installment purchase contracts; costs associated with eminent domain (including purchase of rights-of-way) and tax or special assessment foreclosure” (Census of Government, 2000, pg. 203). Purchase of equipment is expenditure for the “purchase and installation of apparatus, furnishings, motor vehicles, office equipment, and the like having a life expectancy of more than five years” (Census of Government, 2000, pg. 203).

An important aspect of government finance is how government units choose to spend their revenue. In order to investigate the functional performance of government units I used the Census of Government classification to identify several expenditure

categories. In order to calculate the functional performance of counties, I included in my county expenditure dataset all government units, including special districts and school districts. I followed the Census of Government classification on assigning a special district to a county-specific FIPS code. This classification allowed me to calculate functional performance categories for a broad group of public goods and services provided and produced by either general purpose governments or single purpose governments.

A critical case in assigning special districts to a single government unit (county) is the joint activities of government units. The Census of Government assigns special districts to either the government unit that is solely responsible for administering the activity or splits the financial responsibility among the participating government units according to their share. In the first case, another government units' share in the financial burden is considered intergovernmental transfer to the respective government unit. In the second case, each government unit's share is reported separately for each government unit. Later I discuss intergovernmental transfer payments in more detail. But intergovernmental transfer payments between local government units are a very small part of local government finance. Therefore, I make the assumption that the primary classification of special district finance is the second case, each government unit reports its share of the total special district expenditure.

All together I created 15 separate categories of government expenditure with the expenditure code in parenthesis: Education (E9 – E21), Fire (E24), General, Health (E32 – E38), Housing (E50), Legal Services (E25, E26), Library (E52), Parks (E61), Natural Resources (E54 – E59), Police (E62) , Prison (E4, E5), Road (E44 – E47), Waste (E81),

Water (E80), Welfare Programs (E67 – E79). Classifying government expenditures by functional performance allows for specifically investigating the public goods and service bundle differentiation of government units. Tiebout's (1956) hypothesis that government units compete among each other over public product and service bundles can be tested by including these variables within the model. Government units with higher expenditures for education may attract young adults with children, while older person's may avoid these government units (Hilber and Mayer, 2003).

B. Revenue

Research in both political science and economics has shown that how government functions are financed has critical impacts on the economy. In contrast to expenditures, the method of how revenue is raised has direct implications on firms and households as taxes and fees directly reduce income or profits respectively. In particular, the link between benefits received from government products and services and the cost of provision is of critical importance. Because my primary data source for revenue data is the Census of Government I use their definition of revenue. "Revenue includes all amounts of money received by a government from external sources during its fiscal year, net of refunds and other correcting transactions. Under this definition, revenue excludes amounts transferred from other funds or agencies of the same government. Revenue comprises amounts received by all agencies, boards, commissions, or other government organizations" (Census of Government, 2000, pg. 150). The Census of Government categorizes revenue by government units into four distinct categories: general revenue, liquor store revenue, utility revenue, and insurance trust revenue. This allows me to

specifically investigate the hypothesis advanced in the political science and economics literature.

For my analysis I am particularly interested in the general revenue category. General revenue includes taxes, intergovernmental revenue, current charges, and miscellaneous general revenue. The most important general revenue category is taxes. The taxes are divided into five categories: property taxes, sales tax, license tax, income tax, and other taxes, such as death tax and gift tax. Sales tax includes taxes on items such as alcoholic beverages, petroleum products, tobacco, utilities, and insurances.

Tiebout's theory of government competition assumes benefit taxation as the only form of taxation by local government units. In the case of non-benefit taxation, benefits and taxation are separated. Destructive competition theory contends that households and firms would try to avoid non-benefit taxation by moving outside the government unit, thereby government units would have incentives to engage in the destructive competition by trying to attract mobile capital for short term gains. One form of benefit taxation identified in the literature is property taxes. Housing values are hypothesized to incorporate a large portion of the value of local public service and product provision.

Another form of benefit taxation in the government revenue category is current charges. "This category comprises charges imposed for providing current services or for the sale of products in connection with general government activities. Amounts designated as current charges are reported on a gross basis without offsetting the cost to produce or buy the commodities or services sold" (Census of Government, 2000, pg. 152-153). Current charges include revenue collected for highways, sanitation, natural resources, and education.

Utility charges are not reported in this category, but identified separately. “Utility revenue comprises receipts from sales and directly related services and by-products of the four types of state and local government utilities recognized by the Census Bureau: water supply, electric power, gas supply, and public mass transit systems. Utility revenue is reported on a gross amount without deducting its related expenditures” (Census of Government, 2000, pg. 153). In addition, I have included special assessments on property in the benefit taxation categories. Special assessments are defined as compulsory contributions and reimbursements from owners of property who benefit from specific public improvements; and impact fees to fund extension of water, sewer, roads, and other infrastructure facilities in new developments” (Census of Government, 2000, pg. 182).

All three revenue categories -- property taxes, current charges, utility charges, plus special assessments make up the benefit taxation of my equation. These four revenue streams allow for direct linkage between public goods and service provision and the associated cost. The specific revenue codes for each item included in the benefit taxation are the following T01, A91, A92, A93, A94, A36, A44, A45, A50, A60, A61, A80, A81, A87, U01. On average, benefit taxes account for approximately 50 percent of a county’s revenue. The range of benefit tax revenue as a percentage of total revenue ranges from less than 5 percent to over 90 percent in counties across the U.S.

In table Table 5-1 I present the average benefit taxes to total revenue ratio for states in the U.S. The benefit ratio across states is approximately 50 percent, with a range from 25 percent in the District of Columbia and 35 percent in Arizona to 75 percent in New Hampshire and Vermont. For more detail see Table 5-1.

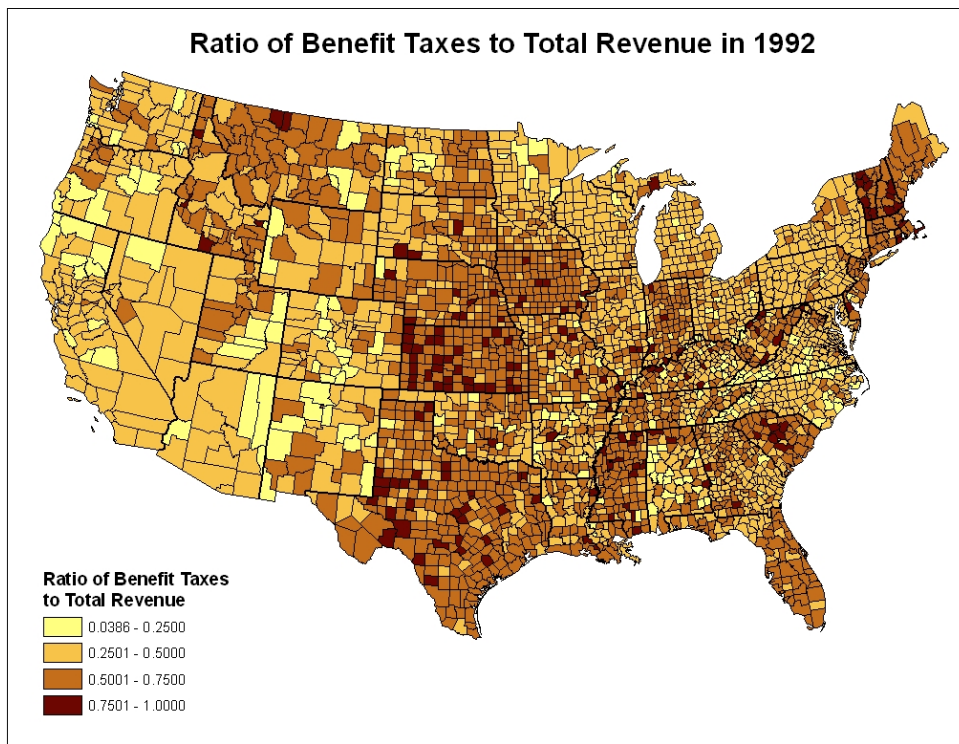
Table 5-1 State Government Revenue by Category

State	Avg. Pct of Benefit Tax of Total Rev.	Avg. Pct of Non-Benefit Tax of Total Revenue	Avg. Pct. of Intergov. Grant of Total Revenue	Avg. Pct of Intergov. Grant from Own State
Alabama	45.6%	28.9%	13.4%	76.1%
Arizona	34.7%	12.7%	32.6%	85.1%
Arkansas	48.6%	16.5%	18.7%	72.5%
California	36.7%	11.2%	38.2%	90.0%
Colorado	39.7%	22.3%	20.4%	78.9%
Connecticut	61.9%	0.7%	31.1%	96.3%
Delaware	63.8%	10.3%	8.6%	44.6%
District of Columbia	25.9%	33.6%	31.7%	0.0%
Florida	55.7%	10.2%	14.1%	66.4%
Georgia	50.9%	21.4%	12.0%	52.0%
Idaho	59.0%	2.4%	23.6%	83.0%
Illinois	42.3%	17.5%	24.1%	86.0%
Indiana	59.3%	7.3%	22.0%	83.3%
Iowa	62.7%	2.6%	21.0%	78.3%
Kansas	56.2%	11.6%	13.8%	61.4%
Kentucky	41.4%	18.0%	16.1%	68.5%
Louisiana	48.7%	22.3%	13.8%	50.1%
Maine	56.1%	0.9%	35.1%	93.7%
Maryland	39.0%	20.3%	29.7%	87.5%
Massachusetts	64.9%	1.4%	27.4%	94.1%
Michigan	44.6%	4.9%	34.8%	79.2%
Minnesota	46.6%	2.1%	30.2%	84.6%
Mississippi	67.4%	2.0%	19.2%	85.5%
Missouri	41.7%	31.3%	12.0%	58.0%
Montana	44.7%	2.3%	15.8%	61.4%
Nebraska	60.9%	11.0%	17.3%	80.7%
Nevada	36.7%	12.5%	28.9%	78.8%
New Hampshire	74.8%	0.9%	15.6%	85.4%
New Jersey	52.9%	1.6%	35.9%	94.0%
New Mexico	40.1%	16.7%	25.3%	84.9%
New York	36.5%	21.1%	34.9%	86.5%
North Carolina	39.0%	7.3%	41.7%	90.4%
North Dakota	49.9%	4.8%	24.5%	78.8%
Ohio	36.1%	22.0%	28.3%	82.5%
Oklahoma	49.1%	22.6%	10.9%	81.0%
Oregon	48.1%	7.8%	28.7%	79.2%
Pennsylvania	39.3%	19.9%	28.3%	85.2%
Rhode Island	67.7%	0.8%	26.2%	88.5%
South Carolina	67.1%	5.7%	14.5%	70.8%
South Dakota	50.1%	16.6%	13.2%	67.6%
Tennessee	58.0%	9.6%	24.9%	75.4%
Texas	60.5%	13.2%	8.3%	55.5%
Utah	49.0%	17.8%	12.7%	72.7%
Vermont	75.8%	1.4%	14.5%	86.8%
Virginia	46.4%	12.7%	30.9%	90.3%
Washington	47.6%	20.7%	18.9%	78.3%
West Virginia	49.5%	12.2%	5.9%	76.9%
Wisconsin	42.1%	2.6%	40.9%	88.9%
Wyoming	43.8%	8.4%	31.4%	76.9%

In Figure 5-1, a map of the U.S. with the ratio of benefit tax revenue to total revenue in the county provides some early indication on the role of government finance.

The role of states in local finance can be seen by the state-specific benefit ratios. States such as Kansas, Texas and New England states, have a higher benefit tax to total revenue ratio than states in the West, and New York or Pennsylvania.

Figure 5-1 Ratio of Benefit Taxes to Total Revenue



In contrast to benefit taxation, in the case of non-benefit taxes, residents are unable to link tax rate and benefit received. Theory contends that non-benefit taxation will increase the likelihood of destructive competition among government units. In my analysis I categorize non-benefit taxes as any type of sales or gross receipt tax, license tax, income tax, as well as death and gift taxes. Non-benefit taxes include all categories in the Census of Government classification of T with the exception of T01 (property tax). The average percent of non-benefit tax of total revenue ranges from less than 1 percent in

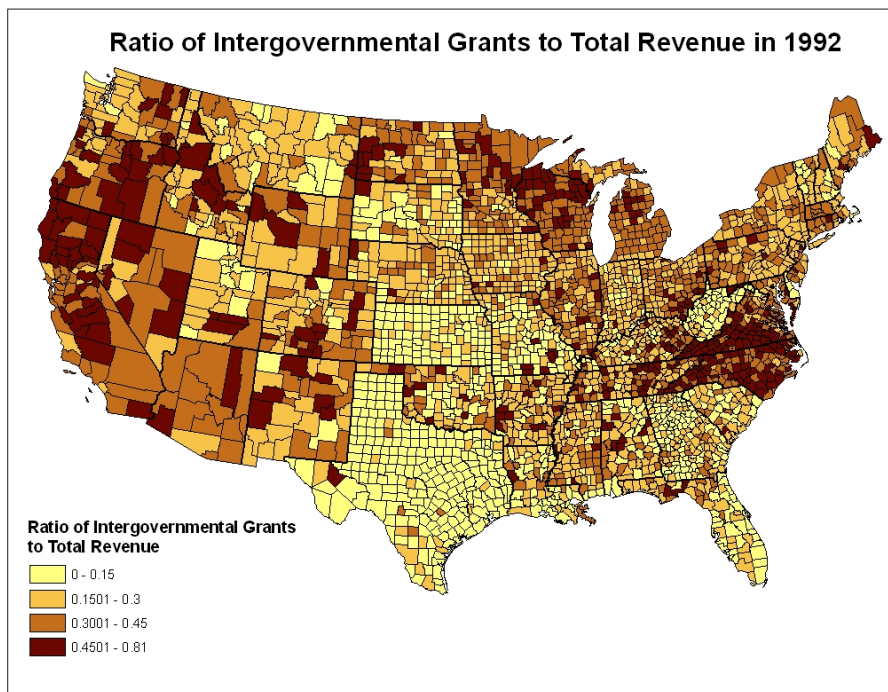
several states (New Hampshire, Connecticut, Rhode Island, Maine) to over 30 percent in Missouri.

Another important category in general taxes is intergovernmental revenue. “Intergovernmental revenue comprises monies from other governments; including grants, shared taxes, and contingent loans and advances for support of particular functions or for general financial support” (Census of Government, 2000, pg. 152). The intergovernmental revenue is subdivided by the transferring government unit. This classification allows for the distinction between federal, state and local intergovernmental grant. Each intergovernmental grant category has its own theoretical support. Following federalist theory, federal grants are best suited for income redistribution and equalization of public goods and service provision. In contrast, state grants are hypothesized to contribute to destructive competition among states. According to federalist theory, the primary function of local intergovernmental grants is to equalize local externality spillovers. The majority of intergovernmental grants to local government units (counties, boroughs, and townships) is grant money distributed by state governments. The majority of intergovernmental grants are transfer payments from state government to local government units. The percent of intergovernmental grants to local government units received from the state ranges from 44 percent in Delaware, to 95 percent in Connecticut. For more detail on each state see Table 5-1. This statistic provides an early indication of the interaction among states and local government units. In Connecticut, the state took over the roles that many counties in other states play. Connecticut’s small land area and the independent townships provide a classic example of the fiscal federalism structure

envisioned in theory. On average, state intergovernmental grants are about 77 percent of county's revenue.

In figure Figure 5-2, a map of the U.S. with the ratio of intergovernmental transfer payments to total revenue in the county provides some early indication on a state's organizational forms in terms of transfer payments.

Figure 5-2 Ratio of Intergovernmental Grants to Total Revenue



It is particularly interesting to examine the role of intergovernmental transfers from the federal government and intergovernmental transfers between local government units. The average federal intergovernmental grant is 16 percent of transfer payments, while local government transfer payments are about 8 percent of intergovernmental transfer payments to local government units. The use of intergovernmental transfer payments to compensate for externality spillovers on a local level is very small. In

addition, theory on fiscal federalism contends income redistribution is most efficiently accomplished on a federal level unifying the effort to compete inequality in income.

Intergovernmental grants for each subdivision, federal, state and local, are subdivided into specific functions of government such as education, general local support, health and hospitals, highways, housing and community development, public welfare, sewerage, water supply, electric power supply, mass transportation and others. This classification allows me to specifically investigate the role of specific intergovernmental grants in the competition among government units. I created four special categories for intergovernmental transfers: public welfare, housing and community development, general local support, and education. These four categories are hypothesized to have significant impacts on local economic growth and or public finance condition. General local support is transfer payments in accordance with a fiscal federalism system. Federal or state governments collect non-benefit taxes, which are distributed according to a predefined distribution scheme. The collusion hypothesis posits that a high percentage of general intergovernmental support in connection with a low degree of benefit taxation would be an indication of collusion of government units to lower competitive pressures.

The Census of Government has 13 separate categories for state and local intergovernmental grants. I identified five distinct categories of intergovernmental grants to control for specific government activity funded by intergovernmental grants. The majority of intergovernmental grants are for education, highway and general local support. In addition, I identified intergovernmental grants for utility functions of government, welfare, and housing and community development. The amount of

intergovernmental grants designated for housing and community development allows testing for the effectiveness of community development grants from the state government. Welfare grants from the state to local government units may influence household location, as theory predicts poor households would move to counties with higher welfare spending.

Holmes' (1998) paper on the effects of state policies on the location of manufacturing provided evidence that state policies are important to economic growth. Holmes (1998) used the "right to work" rules as an indicator of state friendliness towards businesses. Holmes concluded that states without "right to work" rules, in particular counties in states without "right to work" but on the border of "right to work" states, have statistically significant positive growth effects. Therefore, in my analysis I included the "right to work" designation as a control variable for variances in state employment rules and regulations.

In addition, I used data from the tax foundation on the business climate rank and business taxation to control for the effect of state tax laws on businesses as well as households. The business tax climate index is the ranking of states in five different categories. The categories for ranking are business tax, individual income tax, sales and gross receipt tax, unemployment insurance tax, and wealth and property tax. Unfortunately, the business climate index is not published for previous years. Therefore, I am using the 2006 index. The business climate in states has changed in some states dramatically, while other states did not change their tax laws.

The tax foundation provides a more detailed index for individual tax burden, with data available back to 1970. The individual tax burden considers both the federal tax as

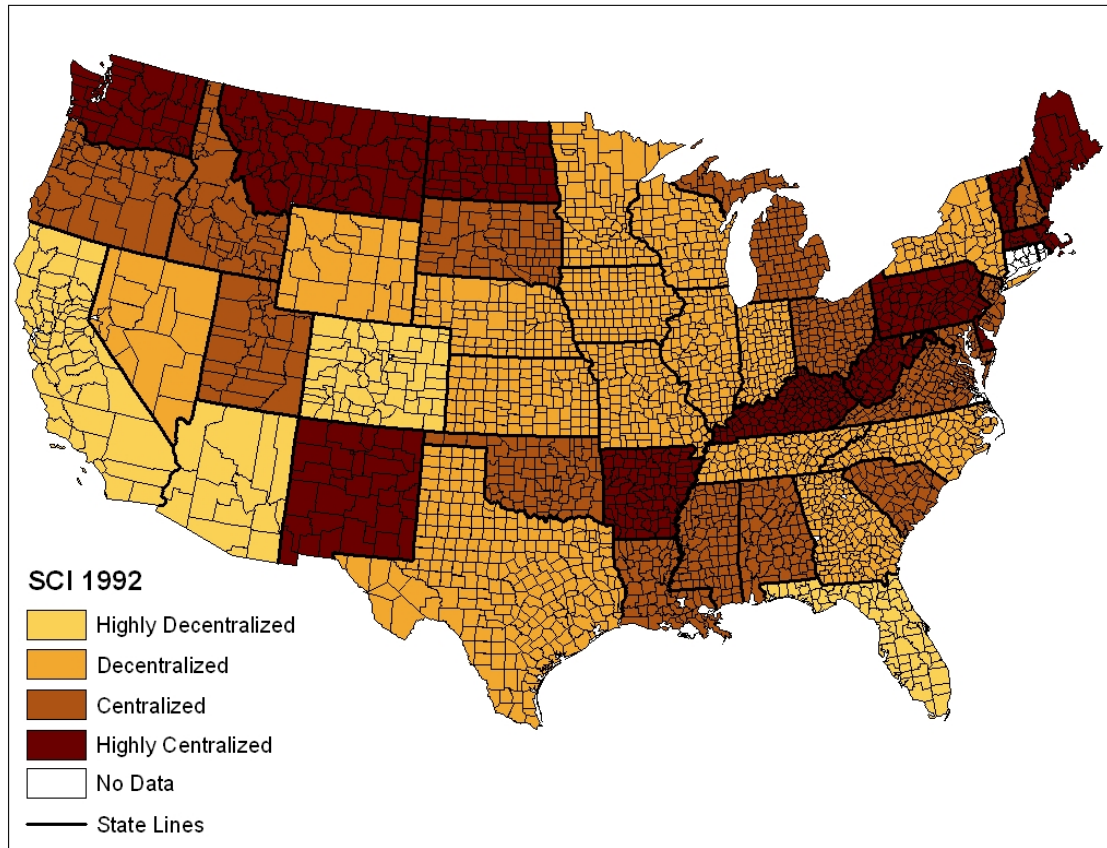
well as state and local tax burden on individuals. The state tax rate varies dramatically among states from zero in several states to a tax rate over 9 percent in others. In addition to state taxes, some local government units impose a local tax instead of the state tax, or on top of a local state tax. The tax foundation uses the different marginal tax rates in the state as well as at the local level to calculate a rate that is comparable among states.

The role of state organization, whether the state is centralized versus decentralized, is another important aspect on the consequences of competition among government units. Stephens and Wikstrom (2000) introduce the state centralization index. The SCI is calculated by considering own source revenue, own direct expenditures and number of full time equivalent employees to determine whether a state is centralized or decentralized. Own source revenue and expenditure measure the level of local government independence from state mandates on spending and revenue raising. Own source revenue is the revenue raised by local taxation. In addition, Stephens and Wikstrom (2000) measure the amount of full-time equivalent employees per capita as the third part of their state centralization index.

I calculated the state organizational form by making use of the Hirschman-Herfindahl Index and the Metropolitan Power Diffusion Index. I decided to use the fragmentation index based on the HHI, which seemed more in line with theory. Because the HHI uses the square of the percentages, the HHI places more emphasis on larger government units. In the case of state fragmentation, because I want to measure the state's role, the HHI's emphasis on large government units allows me to emphasize the larger government units. In order to calculate the state HHI, I use the state expenditures as well as local government units' (county, borough, and township) expenditure to

measure state fragmentation. To test whether the state fragmentation score using the HHI is a close substitute for the state centralization index, I calculated the correlation coefficient between state HHI to SCI, which is 0.71. Therefore, instead of using the SCI proposed by Stephens and Wikstrom (2000), I used the state fragmentation index.

Figure 5-3 State Centralization Rank (SCI) by Stephens and Wikstrom (2000)



Previous research on governmental organizational form did not consider the interaction between state organizational form and local organizational form. The exception is Paytas (2001), who included an interaction term in his analysis. He concluded “metropolitan governance must be viewed in the broader context of state-local government relations” (Paytas, 2001, pg. 17). The interaction between state and local government units defines a fiscal decentralized system of government.

In principal there are four cases of state-local government organization. Case one is the centralized state paired with a fragmented system of local government. Case two is the decentralized state paired with a fragmented system of local government. The third case is centralized state organization in combination with consolidated local government. The fourth and final case is a decentralized state government in combination with a fragmented local government structure.

Figure 5-4 State Organization vs. Local Organization

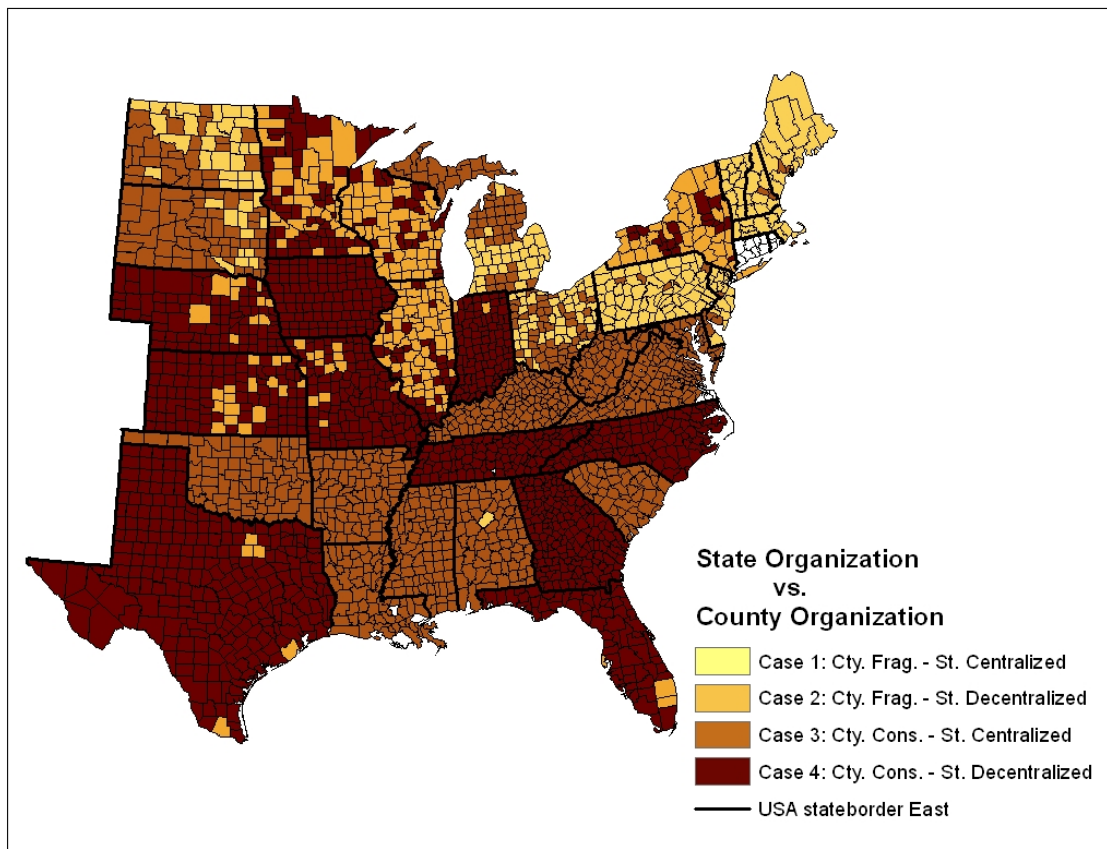


Table 5-2: State and County Organizational Form Interaction

	State Centralized	State Decentralized
County Fragmented	Case 1 ME, NH, VT, MA, PA, NJ (CT, RI not in data set)	Case 2 MD, VA, WV, KY, SC, AL, MS, LA, AR, OK, SD
County Consolidated	Case 3 NC, GA, FL, TN, IN, IA, MO, NE, KS, TX	Case 4 NY, IL, WI,
Mixed States	Case 1 & 2 OH, MI, DE, SD, ND	Case 3 & 4 MN

C. Unit of Observation

In my study, the unit of observation will be the county level. There are several reasons that warrant the study to be conducted at the county level. The data sources are the Census, Census of Governments, the Department of Labor and Department of Agriculture. All data is available at least for the county level. Estimating the firm location decision function at the county level will help me to avoid using averages for data across a state. Explanatory variables like wage rate, unemployment rate, and per capita income can vary significantly across a state. By basing the model on a county level data, variation across space is minimized significantly. In addition, Holmes (1998) identified a fundamental problem of firm location decision models based on state data. Just like economic variables, location characteristics can vary significantly as well. For example, geographic characteristics, such as climate and soil as well as topography may vary within states. Holmes contended, “It is difficult to distinguish the effect of state policies from the effect of state characteristics that have nothing to do with state policies” (Holmes, 1998).

Therefore, I chose as my unit of observation the county level. The county level allowed me to avoid the shortfalls from state data. In addition, county level data allows me to focus specifically on the differences between governmental organizational forms. However, using county level data also encompasses some shortfalls, in particular spatial dependence. I will be discussing spatial dependence and spatial econometric issues in a separate section. A second important identification issue in using county level data is to identify state-specific characteristics. In this model, I need to control for state policies that are unrelated to local initiatives. In my model, I am able to distinguish between state and local policies by adding a control variable for state policies. At the county level, the influences of state policies are approximately the same. Therefore, by comparing counties I will be able to examine what happens at the county level. Still, some counties are competing across state borders where state policies may vary significantly.

Holmes (1998) in his study on the effect of state policies on the location of manufacturing, investigated the change in employment share in manufacturing and employment growth in manufacturing for counties on the border between pro-business states and anti-business states based on the “right to work” classification, which he hypothesized as being one indication of business climate within a state. He found that there is a statistically significant difference in both employment growth and employment share between states with different business climates. In order to control for variation in business climate between states and for state-specific policies, I include a variable that accounts for the business climate in the respective state. Holmes (1998) found that right to work laws could be used as a good instrumental variable for business climate in the state. Another index measuring business climate is an index published by the Tax

Foundation. The Tax Foundation publishes each year a list of the business climate in each state based on tax rates and other tax incentives for companies. In addition, the tax foundation publishes a tax index for households, measuring the tax burden for households within a state. The tax burden for households and firms includes state, county and local taxes and fees.

In my analysis I further limited my observation by restricting my units of observation to the eastern part of the U.S. In my analysis I excluded all states west of the North Dakota to Texas line. States west of this line, such as California, Arizona, Nevada, Oregon, Washington, Colorado Utah, New Mexico, Montana, Wyoming and Idaho, are excluded from my analysis. There are two primary reasons for this exclusion. First, states west of this line do not have townships in their repertoire of potential government units from which households and firms may choose. Inclusion of western states without townships would lead to the comparison of two distinctly different governmental organizational forms. A county-centered form of government primarily dominates in the South, however they have provisions for more local government control. Second is the fact that counties in western states are very large. Some of the counties in the western U.S. are larger than entire states in the East. In addition, an increase in county size from a small county to a county of the size of the state of Rhode Island or Delaware reintroduces the data problem associated with state data of average data compared to more specific county level data.

The summary statistics are provided in Appendix 1.

Chapter 6 - Empirical Specification

A central point and advancement in the literature is to instrumentalize the various theories introduced in the previous section. The literature in political science and economics has advanced several theories on how to measure several aspects of governmental organizational form such as government structure, functional performance, government finance, and competition among government units. This section provides an overview of the different techniques to instrumentalize the multifaceted aspects of governmental organizational form. Until now, research on the role of government in economic growth, and in general research on governmental organizational forms has lacked a clearly defined measure. This has inhibited the study and debate on the potential economic effects and responses to different government structures. A clear and concise definition of governmental organization would give scholars more weight for their argument about the economic consequences and implications of various organizational forms and reform ideas. In particular, a useable and comprehensive indicator of the multifaceted aspects of governmental organizational form would enable scholars to measure it, track changes over time, and implement policies while monitoring the impacts.

In order to accomplish the task of measuring the multifaceted aspect of governmental organization, I employ several variables to represent the various aspects of governmental organizational form. In general, governmental organization can be described by answering the following set of descriptive questions:

- Is there competition by design or whether spatial proximity of government units encourages competition?
- Who makes economic policy decisions?

- Is there competition among government units? What is the form of competition?
- Do government units compete over the same government provisions?
- How are government functions funded?
- What is the relationship between state and local organizational form

One of the key features of governmental organization is that there are no set rules by the federal government on how a state or county must organize “lower levels” of government. Therefore there is tremendous variation in organizational form across the United States. In addition, as discussed in the previous section, broader economic decisions on the macro-economic level are primarily reserved for the federal government. The role of states also is primarily reserved for broader economic decisions as well, but they are well below the macro-economic level of the federal government. Some larger states, like California, have the economic size to influence the U.S. economy and maybe even parts of the world, but the federal structure of states bound together by the Constitution through interstate commerce regulations inhibits states from pursuing independent macro-economic policies. In addition, states interact with each other in the manner of open economies, where barriers to trade are non-existent. The role of states can be primarily characterized by their influence on the state economy through rules and regulations as well as incentive packages concerning households and firms. The role of states can be quite dominant and carefully instrumentalizing the several aspects of state influence is necessary.

In the following section I introduce several measurement techniques and instruments aimed at representing the multifaceted aspects of governmental organizational form. In the first part, I introduce instruments for the local government

unit level, such as county and municipalities, and in the second part, I introduce instruments to measure the role of state government and their rules and regulations.

Once differences in climate and endowment in resources are accounted for, governmental organizational form remains an unobserved variable explaining differences in economic development. In addition, historical influences from England and other European nations have shaped how states are organized and delegate power. As a consequence, governmental organizations across regions have distinct forms that represent the predominant philosophical influence of the earliest settlers. All states have the simple distinction between federal, state, and county in common. However, states' organizational forms vary in the power delegated to the county, and more so, in the power delegated to the municipal or township level.

Past research on government institution and economic performance has centered on answering, at most, one of the above descriptive questions. In most cases, research has used simple measures of governmental organization without completely assessing what a particular variable may measure, therefore ignoring the multifaceted aspects of governmental organization. Early studies on government efficiencies in the 1960s and 70s despite limited data sources may provide researchers with a solid foundation. Based on Tiebout's hypothesis that competition among government units is beneficial, research has been primarily focused on efficiencies and whether competition is possible. In the early studies the predominant government variable was the number of government units per square mile or any other land-area measurement.

The use of government units per land area provides the all important answer to the question, is competition among government units technically possible. In the case of a

state where there are so few government units per land area, competition among units may exist on paper, but realistically residents in this area may not have a true choice of government unit. Therefore, any meaningful analysis must be based on whether or not competition is possible. However, the biggest shortcoming of government units per land area is the exclusion of population. The number of government units increases, as the number of residents increases as higher population numbers tend to demand more and more specialized government services.

Therefore, another common variable employed in past research to describe government institutions is government units per capita (Shields et al. 2004, Carruthers 2003, Carruthers and Ulfarsson 2002, Ebert and Gronberg 1987, Zax 1989, Schneider 1989, Stansel 2005). In theory, government units per capita measures the number of government layers per resident, and this form of measurement avoids the disadvantage of government units per land area. Theoretically, one would expect that areas with a high number of government units per capita have the competition necessary to comply with Tiebout's hypothesis of government competition. Unfortunately, the government unit per capita measure suffers from two shortcomings. First, unlike government units per land area, government units per capita does not have a spatial component. This problem becomes more serious when analysis is based on county data. In particular, Western counties are extremely large when compared with counties east of the Rocky Mountains. A large county with a large metropolitan area in a mostly rural county may bias the number downward due to the fact that the metro area has proportionally more government units than the rest of the county. The second shortfall is the fact that government units per capita do not distinguish between forms of government units. By

simply adding up government units, a descriptive variable does not take into account that different levels of government may perform different functions. But more importantly, different levels of government may have different powers and therefore affect economic growth differently.

The question of who makes economic policy decisions may provide insight into what organizational form is better suited for successful economic growth. Few studies have specifically sought to answer this question, even though work in political science has given researchers tools to further advance their knowledge. The Metropolitan Power Diffusion index (Miller, 2002), and forms of the Hirschman-Herfindahl Index aim at providing researchers with a tool to evaluate political power distribution. Based on the assumption that government spending can be used to approximate governmental power, these indexes allow researchers to assess whether power across a government unit is fragmented or centralized. However, few researchers have made use of these measurements of governmental organization. The power of fragmentation indexes lies in their ability to identify what level of government exercises political and ultimately economic power. Indexes based on expenditures avoid the shortcoming of government unit per capita of not distinguishing between different levels of government. In addition, different procedures for how the index is calculated allow researchers to place different emphasis on what size of government may exert more influence. The primary shortcoming of fragmentation indexes is the lack of a spatial component.

The measurement of governmental fragmentation can take on several forms, and the basic unit of observation can vary depending on the study. Fundamentally, the unit of

observation could be the state, county, Metropolitan Statistical Area (MSA) or any other unit.

The majority of studies in the field of government fragmentation have either used government units per capita or per land area (Shields et al. 2004, Carruthers 2003, Carruthers and Ulfarsson 2002, Ebert and Gronberg 1987, Zax 1989, Schneider 1989, Stansel 2005). A major problem with counting government units is that each government unit is given equal weight (Lewis, 1996). What this means is that in the case of Pennsylvania, counties, boroughs, and townships are treated as equally important contributors to the well being of their respective citizens. Setting government units equal in their weight would mean that a county government would have the same influence on the economy as a township. A quick overview of the distribution of economic power in states across the USA reveals that states vary tremendously in how economic power is distributed. For example, in Connecticut and Rhode Island the role of counties is primarily in distinguishing areas on a map of the state. For these states, power is distributed between the state and municipalities, such as cities and townships. In contrast, in states in the western part of the country, counties are the dominant economic power next to the states. Municipalities may be formally established but few have any economic power. For example North Dakota, South Dakota, Nebraska, Iowa, and Minnesota are states where 89 percent of townships have no full-time equivalent employee, a reasonable indicator of the lack of political as well as economic power of townships. Therefore, in the second case, the simple counting of government units per capita would bias any regression results as these states. It may even be hypothesized that some of the studies using simple government units per capita measurements may have

introduced a bias towards centralized organization of government, as states in the second group have predominantly struggled economically over the past two decades. What is needed is a measure that takes into account the distribution of economic power among government units.

A. Fragmentation Indexes

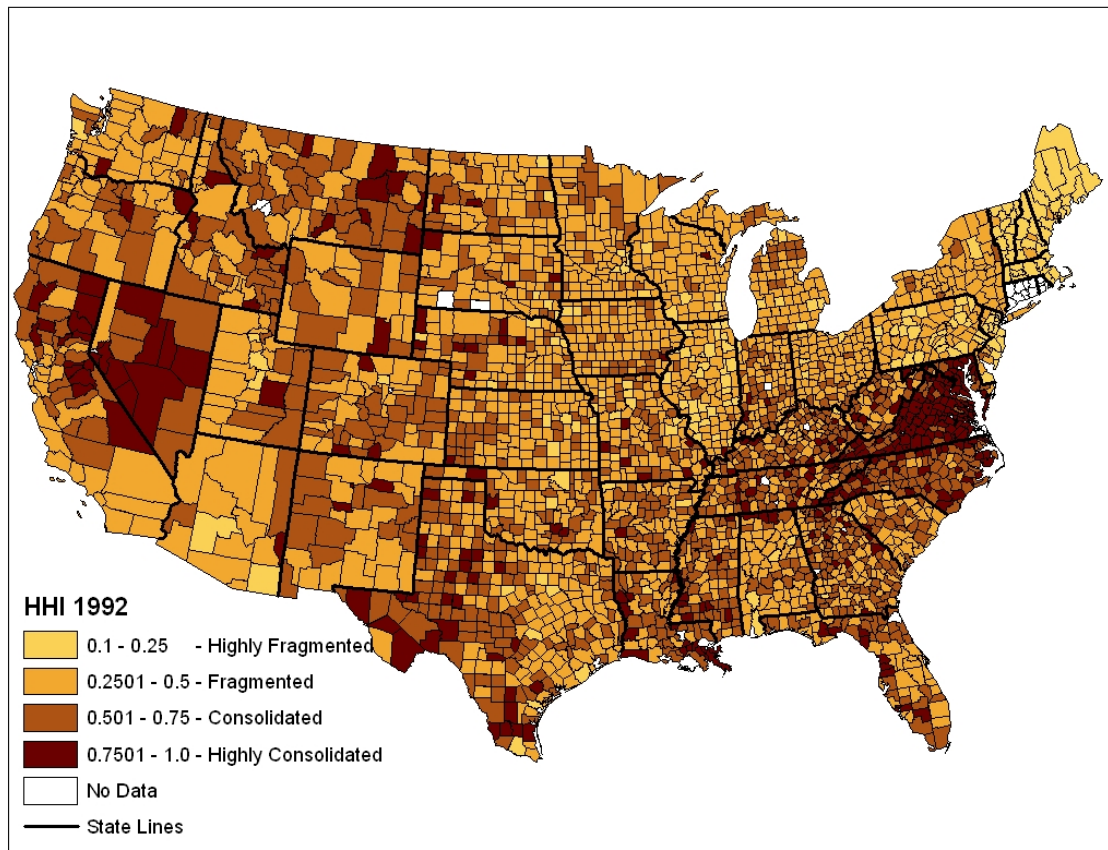
One of the possibilities to measure government fragmentation in a county is based on the proportion of expenditures per each unit of government in the county, which is an adaptation of the Hirschman-Herfindahl Index. The basic assumption in using government expenditures is that government units with economic power and influence are the government units that spend tax money for various government functions in providing public goods and services. It is assumed that a government unit with large expenditures will have more economic power and influence on economic growth more than a government unit with relatively low expenditures. The Hirschman-Herfindahl Index developed for the business world to measure the market power of a company through their market share in their respective markets can be applied to measure the “market power” of government units within a county. The fragmentation index follows the form:

$$Fragmentation_i = 1 - \sum_{j=1}^J \left(\frac{n_{ij}}{N_i} \right)^2$$

where n_{ij} is the expenditure in government unit i in county j , and N_j is the total expenditures in county j . Therefore, n_{ij}/N_i is the proportion of expenditure per unit of government j in county i . The fragmentation increases with the number of units of governments. The index of fragmentation can be interpreted as the probability that two dollars of expenditure in a county will come from two different units of government. The

fragmentation index increases with each unit of government. A fragmentation score of close to 1 would indicate that there are very few government units with economic power, an indication of a consolidated organizational form of government, while a fragmentation score close to 0 would indicate there are several government units with similar market power, an indication of government fragmentation.

Figure 6-1: Gov. Frag. measured by Hirschman-Herfindahl Index (HHI) 1992

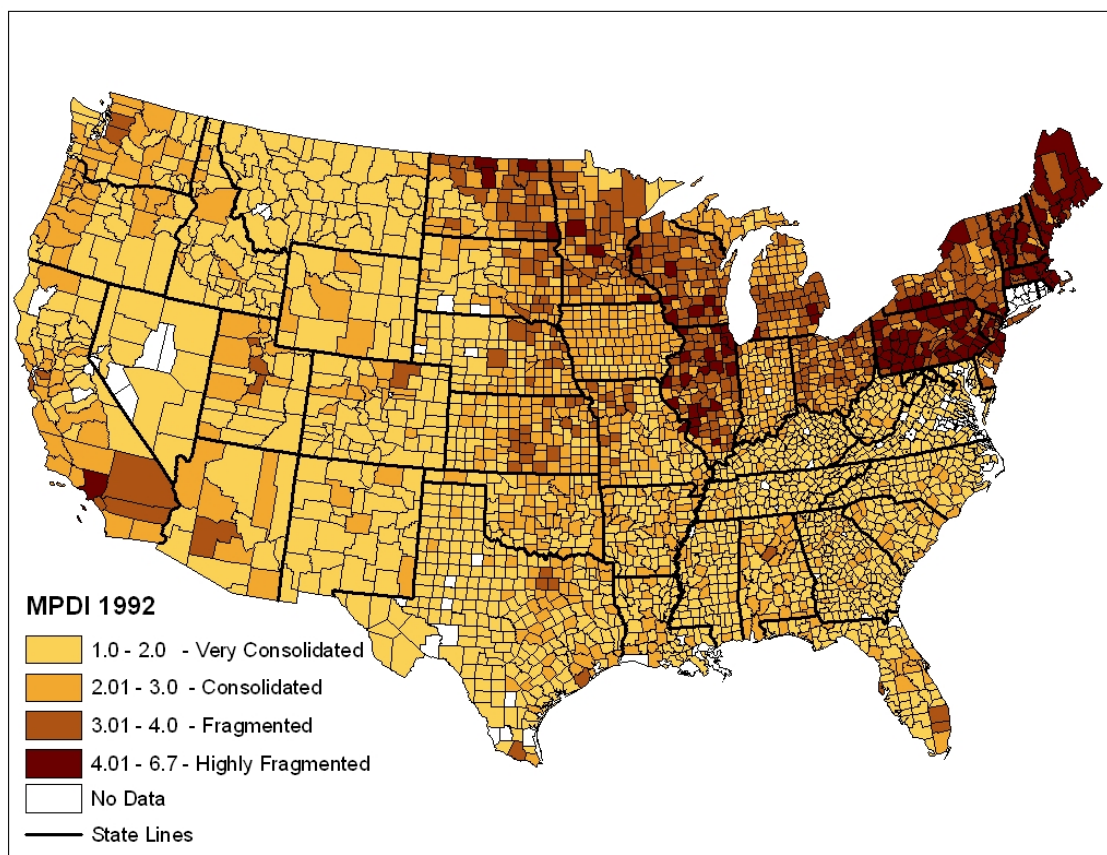


In 2002, David Miller introduced the Metropolitan Power Diffusion Index (MPDI), a similar index to the HHI. In contrast to the HHI, the MPDI is calculated by taking the square root of each government unit's expenditure in relation to the total spending.

$$MPDI_i = \sum_{j=1}^J \left(\frac{n_{ij}}{N_i} \right)^{\frac{1}{2}}$$

Jerry Paytas (2001) summarized very clearly the difference in his paper “Does Governance Matter”. The MPDI gives greater value to the smaller players in government, while the HHI gives greater value to the larger player in the government. Both indicators measure an important aspect of local governance, while larger units of government have more power in making decisions, small units of government may block development strategies across multiple municipalities.

Figure 6-2: Gov. Frag. measured by Metropolitan Power Diffusion Index (MPDI) 1992



B. Competition or Polarization Index

An alternative indicator of fragmentation is the index of polarization based on Montalvo and Reynal-Querol (2001). They state “the index of polarization captures how far the distribution of the groups are from the bimodal distribution” (Reynal-Querol, 2001, pg. 13). Therefore, the polarization index measures how far the distribution of economic power within the county is distributed from the case where two government units have approximately equal weight. However, all of the above measures of government fragmentation have one critical assumption in common; they assume that once government units are spatially close, they compete with each other for businesses and individuals.

Proponents of government fragmentation see competition among government units as the guarantor of efficient and effective government. However, research on firm competition has shown that there are several forms of competition, and each form of competition may result in a different outcome. Therefore, meaningful research on governmental organization and economic development needs to critically analyze the type of competition government units are engaged in. All the benefits of fragmentation are critically dependent on the assumption that government units are engaged in a beneficial form of competition. But, one can easily identify a situation where competition among government units may turn from beneficial to detrimental. Government units that are engaged in a competition for regional leadership may try to outdo each other without considering the negative consequences of government policies. Therefore, a measurement for governmental organization must include a variable that measures the level of competition among government units. One such measure of

competition is the polarization index. Polarization may be measured in two forms, polarization through population in the government unit or polarization through government expenditure. The polarization index allows further investigation of whether government units are in direct competition with each other, either through population or expenditure.

In their study of government structure and income growth in metropolitan areas in the U.S., Nelson and Foster (1999) provided the first indication that perhaps competition within a larger metropolitan area by a central city with a large suburb may actually enhance the competitive position of the metropolitan area as a whole. Therefore the form of competition among government units may be an important piece in the puzzle of what government form is better suited to enhance economic development. Thus, a key question is whether the form of competition within a county or metro area through different government units has implications on economic progress. Literature so far has only investigated the concept of fragmentation of ethnic and religious groups in explaining economic development (Montalvo and Reynal-Querol 2003, 2002, 2000, Easterly and Levine 1997, Mauro 1995, La Porta et al. 1999, Alesina et al. 2002, Alesina and La Ferrara 2000). In particular, recent literature on polarization has provided a new approach to study governmental organization and economic growth. As polarization may be the missing link in the debate over organizational form and its consequence on economic growth, the next paragraphs will briefly summarize some of the findings in the literature.

Esteban and Ray (1994) formalized the concept of polarization in their paper entitled "On the Measurement of Polarization". They state that "we see polarization as a

particular relevant correlate of potential or open social conflict, “mainstream” economics has thus far paid little attention to this last issue” (pg. 820). Recent work by Montalvo and Reynal-Querol (2003, 2002, 2000), Reynal-Querol (2002), Collier and Hoeffler (2000), Mauro (1995), Easterly and Levine (1997) and Alesina et al. (1999) have linked the concept of polarization, in terms of religious, ethnic, and social polarization, with economic development. Easterly and Levine (1997) argue that ethnic diversity transforms economic policies in a rent seeking mechanism, explaining partially the poor economic performance. Mauro (1995) argues that ethnic fractionalization has negative consequences on economic development through an increase in corruption and political instability. La Porta et al. (1999) argue that ethnic diversity leads to corruption and low efficiency governments that expropriate the ethnic loser. Of particular importance are the works of Montalvo and Reynal-Querol (2003, 2002, 2000) on methodological and empirical questions. They contend that the relevant measure of the impact of religious diversity is not a fragmentation index but a polarization index. In their study they concluded that religious polarization is a statistically significant explanatory variable for long-term growth.

Alesina et al.’s (1999) study on public goods and ethnic divisions investigated the relationship between ethnic fragmentation in cities, counties, and metropolitan areas and the supply of public goods. They concluded that “more ethnically diverse jurisdictions in the United States have higher spending and higher deficits/debt per capita, and yet devote lower shares of spending to core public goods like education and roads” (pg. 1274). They continue to state that polarized government units will value public goods

less, patronage more, and will be collectively careless about fiscal discipline. But, higher spending is financed in part by intergovernmental transfers and not by higher taxes.

In government units where residents are polarized according to some characteristic or politicians have a certain pre-characterized group of constituents, the democratic process of public policy making may result in less than efficient outcomes. Leaders of interest groups with different characteristics will overvalue the benefits accrued to their group and discount benefits to rival groups. In particular, Alesina et al. (1999) find when one group finances a public good or service, but provision is shared among other groups, the subsequent provision is less than optimal. The important mechanism is that group leaders and or politicians are careful in distributing the benefits from public policies not to benefit rival groups excessively. In addition, Alesina et al. (1999) contend that political actors compensate for the lower provision through more private patronage. Montalvo and Reynal-Querol (2003) summarize the implications of polarization eloquently by stating polarization in religion may cause potential conflict, which will erode social capital and also affect economic growth.

The role of fragmented versus consolidated governments and their contribution to economic growth and development is highly contested, and results from empirical models are ambiguous. Results tend to depend on the definition of the dependent variable and model specifications. Montalvo and Reynal-Querol's work on religious fragmentation versus religious polarization may point research on the role of governmental organization into a new direction. Further support for my hypothesis comes from the work of Alesina et al. (1999) who argue that fragmentation by racial groups in U.S. cities, metropolitan areas and urban counties reduces expenditures on productive public services and

increases rent seeking expenditure. In general, rent seeking models contend that social costs are higher, and social tensions emerge more easily, when the population is distributed in two groups of equal size or high polarization.

Previous research on polarization and fragmentation of ethnic and religious groups clearly points research on government fragmentation in a new direction. Fragmentation of government through measures based on expenditures may not provide sufficient insight into the dynamics of government spending. Research on religious and ethnic polarization may provide additional resources in explaining the implications of various forms of governmental organizations across the country.

Montalvo and Reynal-Querol (2000) propose the following polarization index.

$$Polarization_i = 1 - \sum_{j=1}^J \left(\frac{0.5 - \pi_{ij}}{0.5} \right)^2 * \pi_{ij}$$

where $\pi_{ij} = n_{ij}/N_i$ is the proportion of expenditure per unit of government j in county i , n_{ij} is the expenditure in government unit i in county j , and N_j is the total expenditures in county j . The polarization index values can range from 0 to 1. A polarization score of 1 indicates that two units of government are of equal size. The underlying assumption in this case is that the two units of government will be competing for dominance just as two firms in a duopoly will compete in the market. A polarization score of 0 indicates that there are many government units with different sizes and that there is little if any competition amongst them. Montalvo and Reynal-Querol (2003) explain that in contrast to what happens with the fragmentation index, polarization reaches a maximum when there are two units of government of equal size in terms of expenditure. In a polarization index not only does the number of units of governments matter, but also how big the

other units of government are in terms of expenditure. Polarization increases with the size of another unit of government relative to the other units. In the case where in a county two units of government have approximately equal amounts of expenditure, the polarization would be the highest.

Polarization of government units may be the missing link that connects fragmentation/consolidation with economic progress, population and income growth. Advocates of consolidating government units are primarily motivated by the destructive forces of competitive federalism. In particular, supporters of consolidation are concerned with the competitive race of government units to attract new household and firms to outgrow rival government units resulting in fiscal havoc and less than optimal provision of public goods and services. In addition, proponents of consolidation are concerned about the market power of larger or well-financed government units in forcing smaller government units to match public policies in order not to lose households and firms, thereby draining the later group of vital financial resources better spent on other more beneficial public policy project. In order to test these hypothesis of excessive competition leading to destruction, the polarization index may be a vital tool in distinguishing fragmentation from polarization or excessive competition issues.

Advocates of a system of fragmented government units contend fragmentation of government or the competition among government units assures efficient production and provision of public goods and services and the responsiveness of government units to local needs. Supporters of fragmentation see competition not as a destructive but a constructive mechanism. Introducing a measure of competition, like the polarization index, may provide researchers with an additional tool to assess the multifaceted aspect

of governmental organizational form. I hypothesize high levels of polarization will have a negative impact on economic growth, while lower levels of polarization are beneficial to economic growth. I hypothesize consolidation and fragmentation theories have missed an important aspects of governmental organization. The missing link in the discussion between consolidation and fragmentation is polarization.

Fragmentation indexes and the polarization indexes are dependent on the specific governmental organizational form. The following examples are designed to show how differential organizational forms influence the fragmentation index as well as polarization among government units.

Table 6-1 Fragmentation Index Example 1

Expenditure by Gov. Unit	HHI	MPDI	Polarization
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
100	0.01	0.316	0.064
1000	0.1	3.162	0.36

Example 1 is the case where there are several small units of government without a dominant government unit. The HHI is very low indicating a high degree of fragmentation. The MPDI is very high, indicating a high fragmentation. The polarization index indicates relatively low level of competition among government units.

Table 6-2 Fragmentation Index Example 2

Expenditure by Gov. Unit	HHI	MPDI	Polarization
500	0.25	0.707	0.5
500	0.25	0.707	0.5
1000	0.5	1.414	1

Example 2 is the extreme case of two government units of equal size that are competing with each other for dominance in the market. In this extreme case, HHI and MPDI do not allow for any conclusion to be drawn.

Table 6-3 Fragmentation Index Example 3

Expenditure by Gov. Unit	HHI	MPDI	Polarization
333	0.111	0.577	0.037
333	0.111	0.577	0.037
333	0.111	0.577	0.037
1000	0.333	1.732	0.448

In example 3, there are three competing government units. In this case, the polarization indicator is the weakest. It does not recognize that three government units may be competing with each other instead of two. The HHI and MPDI indicate a relatively higher level of fragmentation.

Table 6-4 Fragmentation Index Example 4

Expenditure by Gov. Unit	HHI	MPDI	Polarization
50	0.003	0.224	0.041
475	0.226	0.689	0.001
475	0.226	0.689	0.001
1000	0.454	1.602	0.957

In example 4, we have two large government units and one small unit. The polarization index indicates strong competition among government units. The HHI and MPDI show more and fewer fragmentation depending on the definition of whether large or small units of government are relatively more important.

Table 6-5 Fragmentation Index Example 5

Expenditure by Gov. Unit	HHI	MPDI	Polarization
150	0.023	0.387	0.074
350	0.123	0.592	0.032
150	0.023	0.387	0.074
350	0.123	0.592	0.032
1000	0.29	1.958	0.21

In example 5, the county is split into two larger government units and two small government units. The polarization index indicates low level of competition among the government units. However, the fragmentation index shows that fragmentation is high in both the HHI and MPDI case.

C. Interaction between State and Local Government

One of the most critical shortcomings in previous research on whether competition among government units is beneficial or detrimental to economic growth and development is the lack of formal analysis of the interaction between state and local government. The measurement of government fragmentation and polarization at the county level may explain the role of governmental organization in economic growth. However, it is equally important to measure the distribution of state-local power. Holmes' (1998) paper on the effects of state policies on the location of manufacturing provided evidence that state policies are, in many cases, even more important to economic growth than local policies. Competition among states has reached the level of intensity that some researchers talk about the war among states for big manufacturing plants (Farrell, 1996).

I hypothesize incorporating the role of state organization, whether the state is centralized versus decentralized, is very important to further assess the consequences of competition among government units. In the literature Stephens and Wikstrom's (2000)

have proposed the state centralization index (SCI). The SCI is calculated by considering own source revenue, own direct expenditures and number of full-time equivalent employees to determine whether a state is centralized or decentralized. Own source revenue measures the ratio of local government unit revenue raised by local taxation to the total revenue. This indicator allows for the measurement of the allocation of authority or fiscal independence of local government units in terms of taxation. The own source expenditure measures the fiscal independence in terms of local expenditure for public goods and services. The third indicator is the number of full-time equivalent employees. The census calculates full-time equivalent employees as “the actual number of full-time employees reported plus the number of employees that could have been employed if the reported number of hours worked by part-time employees had been worked by full-time employees instead” (Census of Government, 2000 pg. 136). The third indicator allows for the separation of government units in terms of active participation in the economy. A government unit that has no full-time equivalent employees can be assumed to have no economic power at all. The government unit serves as a political boundary, but no other function can be assigned to this government unit. Stephens and Wikstrom (2000), therefore, refer to many of the townships in the Midwest as “toy government.” In the table below I have calculated the number of counties, boroughs, and townships without full-time equivalent employees. In addition, I have calculated the number of townships without full-time equivalent employees by regions to provide further insight in the difference among regions in designating economic and political power. An interesting finding is the fact that townships in the northern Midwest are about 88 percent without a full-time equivalent employee, while

townships in the traditional townships states in New England are only 9 percent without full-time equivalent employees.

Table 6-6 Full time equivalent employment

Government Units	Gov. Units with Zero FTE Personnel	Total Number of Gov. Units	Pct. of Gov. Units with Zero FTE
Counties	3	3028	0.10%
Boroughs	3725	19130	19.50%
Townships	7678	16656	46.10%
Northern Midwest (ND SD NE KS MN IA)	5238	5927	88.40%
New England (CT ME MA NH RI VT)	128	1418	9.00%
Pennsylvania	178	1548	11.50%

Stephens and Wikstrom's (2000) state centralization index indicates that smaller states are more centralized than larger states. However, a closer look reveals that the spatial distribution of centralized and decentralized state organizations is not regional.

A second method in determining the organizational form of a state is to use fragmentation indexes such as Metropolitan Power Diffusion Index (MPDI) proposed by Miller (2002) and the Hirschman-Herfindahl Index (HHI) to calculate the distribution of economic power amongst government units within a state. While the SCI proposed by Stephens and Wikstrom (2000) focuses more in the independence of government units from central control, the fragmentation indexes focus on the economic power of government units derived from their power to spend. The advantage of the SCI is its emphasis on the independence of government units from transfer payments or own-source revenue raising power. In contrast, the fragmentation indexes put the emphasis in the analysis on the power of government units to determine economic growth through their spending power. Both, the SCI and the fragmentation indexes are preferred over the government units per capita and land area calculation, because they only consider

government units with real economic power. In other words, these two measures do not consider government units without full-time equivalent employees.

A quintessential part of the analysis of governmental organization form and its consequences on economic growth is the interaction between state and county organizational form. The interaction between state and local government units defines how a state incorporates the fiscal decentralization theory in reality. Why states use different implementations of the fiscal decentralization theory may be based on historical influences, like in New England, and on community preferences for a specific system of government. Paytas' (2001) study on the role of governance for economic development in metropolitan areas incorporated an interaction term between government fragmentation and state centralization. He concluded "metropolitan governance must be viewed in the broader context of state-local government relations" (Paytas, 2001, pg. 17).

In principal there are four cases of state-local government organization. Case one is the decentralized state paired with a fragmented system of local government. This is the case where states do not have a lot of economic power and the primary functions of government are carried out by the local government units. From a competitive federalism standpoint and the destructive competition model, this case is the least favorable. Local government units have to carry out all the functions of state government, and, in addition, the fragmented system of local government units allows for excessive competition among government units. Case two is the decentralized state paired with a consolidated system of local government. In this case, centralized local government units carry out all the government functions allowing for a monopolistic structure of government. I expect this form of government organization to encourage rent-seeking behavior in terms of larger

government expenditures, higher taxes and unresponsive government. The third case is centralized state organization in combination with fragmented local government. This type of government organization is predominantly in the New England area. State and townships are the two important actors in the government structure. Counties are either nonexistent, as in Connecticut and Rhode Island, or have no significant economic power. The third case is the closest form to the Tiebout model of perfect competition among local government units. The local government units are able to compete with each other, while state government is consolidated to allow for effective redistribution of income. The fourth and final case is a centralized state government in combination with a consolidated local government structure. This case is a close approximation of the feared Leviathan model. The state and the local powers are concentrated in the hands of a few actors, thereby allowing for considerable monopolization of economic power. Similar to case two, the monopolization of economic power in the hands of a few public officials is troublesome in terms of government expenditures and taxation as well as responsiveness of government units to firm and household needs. See table Figure 5-3 and Figure 5-4 for an overview of state classifications and interaction between state and local governmental organizational form.

D. Structural Model of Growth

In order to test whether competition among government units is beneficial or detrimental to economic growth, measured through employment, population and per capita income growth, I use a model first proposed by Carlino and Mills (1987). Deller et al. (2001) adapted the Carlino and Mills' models to investigate the role of amenities and quality of life in rural economic growth. I will follow the model outlined by Deller et al.

(2001). Deller et al. (2001) expanded the traditional two-dimensional Carlino and Mills model of population and employment growth to a three-dimensional model that includes per capita income growth as the third endogenous variable. The inclusion of the per capita income equation allows for the measurement of the quality of economic growth. The underlying assumption is that positive or high quality economic growth will increase income of the residents. In contrast, low quality growth can be characterized as growth, but growth in the low paying sector of the economy. The traditional Carlino and Mills model is based on the assumption that both households and firms are geographically mobile. Households maximize utility, where utility is a function of goods and services purchased as well as spatially varying nonmarket amenities, public goods and governmental organization. Households are subject to a conventional budget constraint equating income to the sum of spending on goods and services. Profit maximizing firms produce goods and services. Production cost varies by location because of regional comparative advantages such as variation in the regional labor supply, agglomeration economics, and spatial variation in governmental organization.

Of particular interest is the spatial variation in governmental organization. In Carlino and Mills 1987 study, they point to the spatial variation in government action as a source of variation in population and employment growth. The variation of governmental organization affects land use controls, state and local taxes, public expenditure efficiency, and productive and efficient public policies. As Carlino and Mills (1987), I assume that firms and households adjust to disequilibrium by distributed lag adjustment equations. Firms move in and out of counties until profits are equalized among them at a competitive level. Households migrate until utility levels are equalized

among alternative locations. In such a model, population, employment and per capita income are simultaneously determined. Therefore, it is necessary to make the assumption that other variables besides employment, population, and income are exogenous to the model. The three equations can be expressed as follows:

$$(1) E_i^* = f(P_i^*, I_i^*, D_i, L_i, G_i, A_i) \text{ or } E_i^* = \alpha + \alpha_P P_i^* + \alpha_I I_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i$$

$$(2) P^* = f(E_i^*, I_i^*, D_i, L_i, G_i, A_i) \text{ or } P_i^* = \alpha + \alpha_E E_i^* + \alpha_I I_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i$$

$$(3) I^* = f(E_i^*, P_i^*, D_i, L_i, G_i, A_i) \text{ or } I_i^* = \alpha + \alpha_P P_i^* + \alpha_E E_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i$$

where E^* , P^* , I^* are equilibrium levels of population, employment, and per capita income.

The subscript i indicates that all variables vary by county. The coefficient α is the endogenous variables, β is the coefficient for the exogenous demographic and labor market variable, γ is the coefficient for the set of government organizational form variables, and δ is the coefficient for the exogenous amenity variable. D , L , and A are a set of variables describing the demographic, labor market characteristics, and amenity values respectively, and G are a set of variables describing the governmental organizational form. The third equation expands the original Carlino and Mills model to include a separate equation for per capita income as a measure of economic development. Each of the three equations depends on the equilibrium value of the other two variables and the variables included in D , L , G and A .

Following Carlino and Mills, I assume that population, employment and income adjust to their equilibrium levels with a lag, which can be expressed as follows:

$$(4) E = E_{-1} + \lambda_E (E^* - E_{-1})$$

$$(5) P = P_{-1} + \lambda_P (P^* - P_{-1})$$

$$(6) I = I_{-1} + \lambda_I (I^* - I_{-1})$$

where the subscript -1 refers to the indicated variable lagged one period, a decade in our study. The λ is the speed of adjustment coefficient for the respective variable. The subscripts for counties are suppressed in equation (4) – (6).

Substituting equation (1) – (3) for E^* , P^* , and I^* in (4) – (6), and rearranging terms, results in the following equations:

$$(7) E = \lambda_E (\alpha + \alpha_P P_i^* + \alpha_I I_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i) + (1 - \lambda_E) E_{-1}$$

$$(8) P = \lambda_P (\alpha + \alpha_P P_i^* + \alpha_I I_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i) + (1 - \lambda_P) P_{-1}$$

$$(9) I = \lambda_I (\alpha + \alpha_P P_i^* + \alpha_I I_i^* + \beta_1 D_i + \beta_2 L_i + \gamma G_i + \delta A_i) + (1 - \lambda_I) I_{-1}$$

Equations (7) – (9) are simultaneous equations in the observable endogenous variables E, P and I. Each depends on the other two endogenous variables, a set of exogenous variables (D, L, G, and A), and its own lagged value.

The empirical estimation of equation (7) – (9) that is to be estimated contains the following variables:

$$(10) \Delta E = \alpha_0 + \alpha_{1E} E_{-1} + \alpha_{2P} P_{-1} + \alpha_{3I} I_{-1} + \alpha_{4E} \Delta P + \alpha_{5E} \Delta I + \beta_1 D + \beta_2 L + \gamma G + \delta A + \varepsilon$$

$$(11) \Delta P = \alpha_0 + \alpha_{1E} E_{-1} + \alpha_{2P} P_{-1} + \alpha_{3I} I_{-1} + \alpha_{4P} \Delta E + \alpha_{5P} \Delta I + \beta_1 D + \beta_2 L + \gamma G + \delta A + \varepsilon$$

$$(12) \Delta I = \alpha_0 + \alpha_{1E} E_{-1} + \alpha_{2P} P_{-1} + \alpha_{3I} I_{-1} + \alpha_{4I} \Delta P + \alpha_{6I} \Delta E + \beta_1 D + \beta_2 L + \gamma G + \delta A + \varepsilon$$

Chapter 7 - Empirical Results

In my model I used standard ordinary least squares estimation using SAS programming. One of the features of my model is that equations (10)-(12) are simultaneous by design. But since I am primarily interested in the role of government organizational form on economic growth, I estimated the reduced form of the equation.

Deller et al. (2001) use the percentage growth rates in employment, per capita income, and population as the dependent variables. In my model I am using the log of the absolute growth rate, defined as the $\log(X_{2002}/X_{1992})$, as the dependent variable. The benefit from using the log of the growth rate is a leveling effect. The unit of observation is the county. Counties in the U.S.A. vary in population size from 123 in Loving County in Texas, to 5.2 million in Cook County, Illinois. By using the log of the growth rate, the variation in the size is reduced.

In all four models I checked for multicollinearity by estimating the variance inflation factor. The variance inflation factor (VIF) measures the impact of collinearity among the X's in a regression model on the precision of estimation. It expresses the degree to which collinearity among the predictors degrades the precision of an estimate. Typically a VIF value greater than 10 is of concern (Gujarati, 1995). None of the variables had a VIF factor larger than 9.

In the literature, three proxies for economic growth have been introduced to measure successful economic growth -- employment growth, population growth and per capita income growth (Deller et al., 2001). While employment growth and population growth measure economic growth in a more direct way, per capita income growth measures the quality of economic growth. This dissertation measures economic growth

in a narrowly defined form, primarily the growth of jobs and employment complemented by the quality of jobs. What this study measures is how a specific governmental organizational form in 1992 affects economic growth over the next 10 years. The model does not incorporate the continuous change in governmental organizational form as a response to economic growth or as a result of reform in organizational structure of local government units. Therefore, economic growth is measured on a status quo basis, or in other words, the model does not measure a dynamic change in economic growth. Furthermore, this study does not measure economic development or the creation of economic structures for a sustainable economy, using natural resources efficiently, endangering the environment in the least amount possible, and creating a living environment, which uses household's possibilities to its fullest. In the next subsections and in the conclusion I be using the term economic growth as a term describing growth in all three variables, unless I specifically describe the relevant growth indicator.

A. Model 1: Government Units per 10,000 Square Miles

The first logical measure of governmental organizational form is to add up government units and divide the number by the land area of the government unit. The use of government units per land area provides the all-important answer to the question, is competition among government units technically possible. In the case of a state where there are so few government units per land area, competition among units may exist on paper, but realistically residents in this area may not have a true choice of government unit. Therefore, in model 1 I used government units per 10,000 square miles as the governmental organizational variable.

Table 7-1 Model 1: Gov. Units per 10,000 Sq. Mile

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.3257	0.0000	0.5594	0.0000	0.2872	0.0000
Employment in 1992	-2.44E-07	0.3886	2.72E-07	0.1533	1.04E-06	0.0000
PCI in 1992	-4.76E-06	0.0000	-1.18E-05	0.0000	-1.89E-06	0.0510
Population in 1992	1.22E-07	0.3625	-1.10E-07	0.2248	-4.90E-07	0.0000
Gov. Units per Sq. Mile 1992	0.0015	0.6552	0.0104	0.0000	0.0061	0.0358
Business Tax	-0.0003	0.0684	-0.0002	0.0456	-0.0003	0.0277
Individual Tax	-0.0008	0.0000	0.0003	0.0216	-0.0005	0.0003
Benefit Ratio	-0.0211	0.3735	0.0160	0.3159	0.0287	0.1585
Nonben. Ratio	0.0394	0.2634	-0.0258	0.2785	0.0536	0.0762
Right to Work	-0.0459	0.0000	-0.0387	0.0000	-0.0120	0.0779
Transfer Ratio	-0.0003	0.2672	0.0001	0.6673	0.0004	0.0615
Cdev Ratio	-0.0009	0.3765	0.0004	0.5242	0.0011	0.1756
Metro	0.0287	0.0000	0.0158	0.0001	0.0309	0.0000
Empl. Lead 92	0.1278	0.0000	0.0038	0.2167	0.0304	0.0000
PCI Lead 92	0.0037	0.3705	0.0936	0.0000	-0.0130	0.0002
Pop. Lead 92	0.0323	0.0000	-0.0035	0.2760	0.0867	0.0000
Northeast	-0.0775	0.0000	-0.0385	0.0000	-0.1014	0.0000
Midwest	-0.0382	0.0000	-0.0381	0.0000	-0.0490	0.0000
Northcentral	0.0028	0.7056	-0.0278	0.0000	-0.0429	0.0000
Gov. Exp. PC	-2.63E-07	0.2635	-5.47E-07	0.0006	-1.03E-06	0.0000
Pct. Poverty	-0.0035	0.0000	-0.0018	0.0000	-0.0049	0.0000
Pct. Over 65	-0.0039	0.0000	-0.0018	0.0000	-0.0056	0.0000
Pct. With Bachelor	0.0009	0.4956	0.0069	0.0000	-0.0033	0.0027
Pct. Nonwhite	-0.0008	0.0000	0.0003	0.0453	0.0001	0.6120
Amenity Scale	0.0144	0.0000	0.0023	0.0320	0.0148	0.0000
Adj. R-Squared	0.47		0.45		0.54	
F Value	98		88.4		126	
# of Observations	2592					

In contrast to Deller et al. (2001), initial conditions in the economy do not seem to play an important role in determining overall economic growth. In model 1, only the coefficient for initial per capita income is statistically significant in all three equations, while coefficients for initial levels of employment and population are statistically significant in the population change equation. The negative and statistically significant coefficients for the initial level of per capita income in 1992, all else constant, support Deller et al.'s finding that counties with a higher per capita income in 1992 tended to experience lower rates of economic growth over the next 10 years. The negative and statistically significant coefficient for initial population levels in 1992 further supports previous findings, all else constant that counties with higher initial levels of population experienced lower population growth in the next 10 years. In contrast, the positive and statistically significant coefficient for initial levels of employment in 1992 indicates that

counties with higher levels of employment tended to experience higher population changes in the next 10 years, all else constant. These results for the initial conditions in the local economy provide evidence that initial conditions are primarily important in determining future population changes.

The focus of this investigation is the performance of the governmental organizational form variable. In model 1, the coefficient for government units per 10,000 square miles is statistically significant and positive in two of the three equations. In the first equation, the log of the employment rate change, the coefficient for the government variable is not statistically significant. More important is the positive coefficient in the per capita income and the population change equation. The positive coefficients, all else constant, support the hypothesis that competition among government units (defined as the number of government units per 10,000 sq. miles) is beneficial to economic growth.

The underlying assumption in the measure of government units per 10,000 square miles is the spatial proximity of government units. Competition among government units will only be possible if government units are spatially close to allow households and firms to choose among government units. Generally, the cost of exit for households and firms to move from one government unit to another decreases with the distance between government units and increases with the size of each government unit. A higher level of government units per 10,000 square miles serves as an indicator of the close proximity of government units. Close proximity of government units allows households and firms to choose a government unit that maximizes utility and profits, respectively. Therefore, government units per 10,000 square miles may approximate the potential for competition among government units.

The positive sign of the coefficient, all else constant, indicates that counties with a higher density of government units per square mile at the beginning of the study period, in 1992, tended to experience higher rates of overall growth in population and per capita income. Following the above hypothesis, the positive coefficient supports the theory that competition among government units is beneficial to economic growth. In addition, the non-significance of the government units per 10,000 square miles coefficient in the change in employment equation does not support the consolidation theory that fragmentation is detrimental to employment growth.

Another important aspect of governmental organizational form is the way government units finance each other. Unfortunately, it was impossible to calculate the tax rate for firms and households on a county level by taking into consideration county and local taxes, but the Tax Foundation's measure of the state tax rate serves as a good substitute. As predicted and confirmed by many empirical observations, the coefficient for the business tax rate is statistically significant and negative in all three equations. The negative and statistically significant coefficients, all else constant, reinforce prior findings of the negative effect of high business tax rates on economic growth prospects. Counties in states with higher corporate tax rates in 1992 tended to experience lower rates of overall economic growth.

A second measure of the state tax rates is the individual tax rates. In equation 1, employment growth, and equation 3, population growth, the coefficient for individual taxes is negative and statistically significant. Once again, the negative and statistically significant coefficients, all else constant, reinforce prior results of the negative effect of high tax rates on economic growth prospects. Counties in states with higher individual

tax rates in 1992 tended to experience lower rates of overall economic growth. However, in equation 2, with the log of per capita income growth as the dependent variable, the coefficient is statistically significant and positive, indicating, all else constant, that higher individual tax rates have a positive effect on per capita income growth. One hypothesis to explain this result is the connection of higher per capita income with higher tax rates to finance a higher provision of public goods and services. Eberts and Gronberg (1988) tested for what is called “Wagner’s Law”, which contends that as income increases, the public sector increases as well. Households with higher income demand more specific public goods and services, which need to be financed through additional tax revenue. Hilber and Mayer (2004) find in their study on school funding and residential location that local control over tax money is not necessarily associated with lower taxes. Local control may actually lead to higher taxes for households as they are able to control spending and specifically target expenditures to necessary public policies.

Holmes’ (1998) paper on the effects of state policies on the location of manufacturing used the right-to-work classifications of states as an indicator of whether a state is probusiness or antibusiness. In another attempt to control for state policies influencing the county’s ability to attract and retain households and firms, I used the right-to-work classification to control for a state’s business climate. The negative and statistically significant coefficient for the right-to-work dummy variable in the employment and per capita income growth equation is contrary to theory and previous findings. The model result, all else constant, implies that counties in states with a right-to-work law tended to experience lower rates of economic growth. A cautionary flag needs to be raised in interpreting the result. The sign on the coefficient for counties in the

right-to-work states changed from positive to negative once I included regional dummy variables. This finding indicates that right-to-work laws have different influences by region as right-to-work laws vary across states in their protection of workers' rights. Therefore, the right-to-work classification may account for other state-specific factors unaccounted in the model.

In addition to the state tax rates, I included the percentage of local government revenue from benefit taxation and non-benefit taxation. Theory contends that benefit taxation should have a positive effect on economic growth, while non-benefit taxation should have a negative effect on economic growth. In the case of benefit taxation, the benefits of the provision of public goods and services and the cost of producing and providing these public goods and services is directly linked. In the case of non-benefit taxation there is no the link between cost and benefit. Theory contends benefit taxation should be beneficial, as households and firms are able to link costs and benefits. In contrast, non-benefit taxation is hypothesized to be detrimental to economic growth prospects. In all three equations, the coefficient for the percentage of benefit tax to total revenue is not statistically significant. This result seems to indicate that how government units tax households and firms has no significant impact on economic growth, holding all else constant. In contrast, the coefficient for non-benefit ratio or taxes to total revenue is statistically significant in the population change equation. But, the sign of the coefficient is positive instead of the theorized negative sign. Theory contends non-benefit taxation will increase the likelihood of destructive competition among government units. Non-benefit taxes are any type of sales or gross receipt tax, license tax, income tax, as well as death and gift tax. The results from my model do not support the theory that non-benefit

taxation encourages destructive competition as seen through slower economic growth. Counties with a higher percentage of non-benefit tax revenue to total revenue in 1992 tended to have a higher population growth rate over the next 10 years. One possible explanation for this result may come from Hilber and Mayers (2004) research findings that local control over government expenditures may have a positive impact on households' and firms' willingness to finance public policy projects that benefit the local economy through additional taxes.

A highly debated variable is the intergovernmental transfer payment variable. Brennan and Buchanan (1980) hypothesized that intergovernmental grants encourage collusion among government units. The consequence of the collusion by government units is higher taxes. Following this hypothesis, higher taxes should discourage economic growth. The coefficient for intergovernmental transfer payments as a percentage of total revenue is statistically significant and positive in the population growth equation, and not significant in the other two equations. The positive coefficient on the initial level of transfer payments as a percent of total revenue, all else constant, contradicts the collusion theory in at least the population equation. Counties with a higher initial level of transfer payments as a percent of total revenue tended to have higher population growth over the next 10 years.

In contrast to the collusion theory, fiscal federalism theory theorizes that intergovernmental grants serve an important role in equalizing fiscal disparity, promoting fiscal equity, and compensating government units for public policy externality spillovers. Therefore, fiscal federalism contends that a well-designed intergovernmental grants scheme promotes economic growth in two ways. First, intergovernmental grants transfer

financial resources to local government units with fewer economic resources, thereby allowing these units with a higher need for public goods and services to produce and provide these needed government services and goods to the public. Second, local government units are remunerated through intergovernmental grants for their public policy efforts reducing the cost of free riding in the public system. The positive and statistically significant coefficient for transfer payments as a percentage of total revenue, all else constant, provides support for fiscal federalism theory that intergovernmental grants serve as a tool to, first, encourage local government units to produce and provide those public goods and service needed by households and firms, and second, local government units are remunerated for the benefit spillovers from public goods and service provision.

The Census of Government categorizes transfer payments or intergovernmental grants into several classifications. One such classification of transfer payments is community development grants. In the regression model, one variable is the ratio of community development transfer money (Cdev-Ratio) to total revenue. Theory contends community development grants should promote economic growth by specifically targeting intergovernmental grants to public policy projects designed to promote economic growth and economic development. In model 1, the coefficient for the community development aid to total revenue is not statistically significant in any of the three equations.

My unit of observation is the county. Counties can generally be divided into two categories, metro and non-metro or rural. Metro counties are characterized by urban populations with higher population densities and other metro characteristics. Based on

Alesina and Spolaore's (2003) theory of the efficient size of government units and the trade off between economies of scale and scope with heterogeneity preferences, one would expect metro counties to have a larger number of government units. A larger number of government units within a small geographic area will increase competition among government units. In order to control for the difference in county characteristics between metro and non-metro county, I used the Beale code to create a dummy variable for metro counties within the dataset. The coefficient for the metro dummy variable is highly statistically significant and positive in all three equations. The positive sign for the metro dummy variable coefficient, all else constant, indicates that metro counties are growing faster than non-metro counties in all three indicators of economic growth; metro counties tended to experience higher overall rates of growth.

One of the problems with a model based on county data is the possible spatial dependence of the data. In principle there are two forms of spatial dependence. Either spatial dependence exists, where one observation at location i depends on an observation at location j , or there is a variation in the relationship over space. LeSage (1999) proposes several methods to allow and control for spatial dependence. I chose first an alternative method to control for spatial dependence in my model, but later I will be using spatial econometric tools to test my model incorporating spatial econometric tools.

My first approach to correct for spatial dependence in my model is to use the longitude and latitude data from the Census to calculate a radius around the county. Instead of calculating a contiguity matrix, which is multiplied with my entire model, and thereby controlling for spatial dependence in all variables, I am able to pick the three specific economic growth variables, employment, population and per capita income

growth, and control for their spatial dependence. I hypothesize that all three variables have spatial dependence. In order to control for spatial dependence, I calculated the average employment, population and per capita income growth rate for the radius around each county. Next, I compared the three economic growth variables for each county with the regional average to determine whether the county is a growth leader or not. The advantage of controlling for spatial dependence in this manner is the ability to specifically control for each spatial dependence, instead of a generic spatial dependency calculation. The benefit of calculating the contiguity matrix based on a radius is that counties within a certain distance from the center of the county may be included. An additional benefit is that large counties in the western part of the U.S. will likely show less spatial dependence. In addition, to the three spatial variables, I included as defined by the Bureau of Census regional dummy variables for the Northeast, Midwest, and Northcentral region, with the South being the base region.

In my model, I used several variables to control for spatial dependence. First, I developed three variables (employment, population, and per capita income leader in 1992) comparing the initial county with counties within a radius of 50 miles to identify the leading counties in terms of employment, per capita income, and population growth. Each of these variables is a binary variable, 1 for leading county and 0 for a laggard county. The coefficient for the employment growth-leading county is statistically significant and positive in the employment and population growth equation. The positive and significant coefficient, all else constant, supports the theory that growing counties attract additional employment. Counties with a higher initial employment growth rate than the average county within 50 miles in 1992 tended to experience higher employment

and population growth in the next 10 years. Higher employment growth in 1992 appeared to lead to higher employment growth in the subsequent years. Similar, the coefficient for population growth-leading counties was statistically significant and positive in the employment and population growth equation. The positive and significant coefficient, all else constant, supports the theory that growing counties attract additional employment. Counties with a higher initial population growth rate than the average county within 50 miles in 1992 tended to experience higher employment and population growth in the next 10 years. Both results from the employment and population variables tend to indicate growth may be self-perpetuating. Once a county's growth engine has started and firms and households are moving into the county, other households and firms are following. This result provides evidence for the beaten-path effect from the migration literature. Just like a wild herd in nature, households and firms are following in the footsteps of previous households and firms.

A slightly different result is the coefficient for the per capita income leading county. The coefficient for the per capita income-leading county is statistically significant in the per capita income equation and population equation. However, the coefficient is positive in the per capita income change equation and negative in the population change equation. The positive coefficient in the per capita income change equation conforms to theory; higher initial per capita income has a positive effect on per capita income change in the next 10 years, all else constant. The negative coefficient in the population change equation may indicate that counties with higher initial per capita income in comparison with other counties in the region tended to be avoided by population. One reason for this may be the possible connection between higher per

capita income and higher cost of living. Households in areas with higher costs of living may have either moved out of the county, because they cannot afford living in this area anymore, and in-migrating households may have avoided these counties in favor of less expensive neighboring counties.

In addition to the variables identifying leading and lagging counties in the region, I included regional dummy variables to control for regional differences. The base region is the South as identified by the Census Bureau. I created dummy variables for the Northeast, Midwest, and Northcentral regions with the South as the base region. The regional dummy variables are all statistically significant and negative in all three equations with the exception of the Northcentral dummy variable in the employment growth equation. The negative coefficient for all three dummy variables, all else constant, reinforces the findings from the literature of the southward migration of household and firms. All three regions are generally associated with a declining manufacturing sector and less favorable natural climate. Holmes (1998) acknowledges the “advent of air conditioning” as attracting households and firms to the South.

The coefficient for the general level of expenditure per capita of government units in 1992 is statistically significant and negative in the per capita income and population change equation. The negative coefficient on initial levels of expenditure per capita in 1992, all else constant, supports the theory that higher per capita government expenditures are not encouraging economic growth. One limitation of measuring expenditure per capita is the inability to separate government expenditures into several functional categories. For example, one would expect that government expenditures on education would positively influence economic growth. However, other functional

categories such as police and safety may be ambiguous in their expected sign. Counties with expenditures on police may have a crime problem and therefore higher expenditures would lead to lower economic growth. The debate over functional performance is beyond the scope of this dissertation and therefore I decided to control for expenditures by government units, but not for functional performance.

In order to control for the amenity factor in economic growth, I included the amenity scale value calculated by the U.S. Department of Agriculture. The coefficient for the amenity scale is statistically significant and positive in all three equations. The positive coefficient on amenity levels, all else constant, reinforces prior results by Deller et al. (2001) of a general move to high amenity counties in the U.S.A. Counties with higher amenity values tended to experience higher economic growth in the period from 1992 to 2002. Households and firms are attracted by higher amenity values.

The last category of variables includes variables describing population characteristic and demographics. The coefficient for percent of population in poverty, as defined by the Census Bureau, is statistically significant and negative in all three equations. All else constant, higher levels of poverty in a county tended to discourage economic growth in the county. This result seems to indicate that convergence of economic activity is reduced in counties with a high poverty rates. The coefficient for percent of population over the age of 65, as defined by the Census Bureau, is statistically significant and negative in all three equations. All else constant, higher levels of elderly population in a county tended to discourage economic growth in the county. The percentage of population over the age of 65 may serve as an indicator of counties being left with an older population as the younger population moves away. The coefficient for

percent of population with a bachelor's degree, as defined by the Census Bureau, is statistically significant and positive in the per capita income growth equations. All else constant, higher levels of education in a county tended to encourage per capita income growth in the county, while this result is no surprise, the coefficient for the percent of population with a bachelor's degree is not statistically significant in the employment growth equation and is negative in the population change equation. The percentage of population with a bachelor's degree seems to have no effect on employment growth, while population is negatively influenced by education. One possible explanation for the negative effect of education on population change is the outmigration of the educated part of the population for high amenity counties in the west and southwest.

B. Model 2: Government Units per Capita (per 10,000 residents)

A second common variable employed in past research to describe government institutions is government units per capita. In theory, government units per capita measures the number of government layers per resident. The biggest shortfall of government units per land area is the exclusion of population. Following Allesina and Spolaore's (2003) theory on the efficient size of government, the size of population has several implications on the efficient number of government units. Each increase in population removes the government unit from the households, increases the heterogeneity cost of preferences, and increases the disutility from distance. But most important, a larger population base allows for the formation of separate government units without sacrificing the benefits of economies of scale and scope, while avoiding diseconomies of size.

Therefore, government units per capita avoids the disadvantage of government units per land area of not accounting for the effect of population on the formation of government units. Theoretically one would expect that areas with a high number of government units per capita should have a higher degree of competition, complying with Tiebout's hypothesis of government competition.

However, in the literature, government units per capita is hypothesized to measure two competing theories of governmental organization form. A higher level of fragmentation, or more government units per capita, may serve as an indicator of competition among government units. Higher numbers of government units per capita can be hypothesized to allow for more competition among government units and easier relocation of both households and firms from one county to another to maximize utility and profits respectively. In contrast, a high degree of fragmentation may be an indication of excessive degree of competition resulting in destructive zero-sum or even negative-sum games. In addition, literature on consolidation contends that fragmentation reduces the ability of government units to produce and provide public goods and services efficiently, because government units are unable to take advantage of economies of scale and scope in their production. Furthermore, previous research by Carruther (2003) and Carruther and Ulfarsson (2002) has shown that government units per capita is generally associated with higher urban sprawl and less economic development, thereby supporting the hypothesis that fragmentation is harmful to economic growth.

Table 7-2 Model 2: Government Units per Capita (10,000)

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.3157	0.0000	0.5465	0.0000	0.2695	0.0000
Employment in 1992	-2.54E-07	0.3681	2.69E-07	0.1575	1.03E-06	0.0000
PCI in 1992	-4.48E-06	0.0001	-1.11E-05	0.0000	-1.23E-06	0.1916
Population in 1992	1.25E-07	0.3498	-9.99E-08	0.2674	-4.83E-07	0.0000
Gov. Units per Capita 1992	-0.0009	0.0000	-0.0009	0.0000	-0.0015	0.0000
Business Tax	-0.0004	0.0289	-0.0003	0.0145	-0.0004	0.0037
Individual Tax	-0.0008	0.0000	0.0002	0.0357	-0.0006	0.0000
Benefit Ratio	-0.0310	0.1914	0.0063	0.6951	0.0123	0.5408
Nonben. Ratio	0.0231	0.5125	-0.0370	0.1190	0.0285	0.3412
Right to Work	-0.0442	0.0000	-0.0406	0.0000	-0.0105	0.1112
Transfer Ratio	-0.0003	0.2058	0.0000	0.8089	0.0004	0.1071
Cdev Ratio	-0.0010	0.3234	0.0004	0.5642	0.0010	0.2273
Metro	0.0279	0.0000	0.0166	0.0000	0.0302	0.0000
Empl. Lead 92	0.1288	0.0000	0.0047	0.1281	0.0321	0.0000
PCI Lead 92	0.0030	0.4552	0.0934	0.0000	-0.0138	0.0001
Pop. Lead 92	0.0321	0.0000	-0.0041	0.1935	0.0861	0.0000
Northeast	-0.0724	0.0000	-0.0244	0.0005	-0.0892	0.0000
Midwest	-0.0340	0.0001	-0.0263	0.0000	-0.0389	0.0000
Northcentral	0.0127	0.0902	-0.0139	0.0060	-0.0248	0.0001
Gov. Exp. PC	-2.01E-07	0.3901	-5.23E-07	0.0009	-9.46E-07	0.0000
Pct. Poverty	-0.0033	0.0000	-0.0016	0.0000	-0.0046	0.0000
Pct. Over 65	-0.0030	0.0000	-0.0009	0.0224	-0.0042	0.0000
Pct. With Bachelor	0.0012	0.3322	0.0070	0.0000	-0.0028	0.0102
Pct. Nonwhite	-0.0009	0.0000	0.0003	0.0428	0.0000	0.8679
Amenity Scale	0.0131	0.0000	0.0008	0.4642	0.0125	0.0000
Adj. R-Squared	0.48		0.45		0.55	
F Value	100		90.2		133.2	
# of Observations	2592					

The primary focus in model 2 is on the government units per capita variables as all other variables stayed the same as in model 1. In general, results from Model 1 and Model 2 are quite similar and therefore I will limit the discussion of the results to the important variables in the model.

Similar to model 1, initial conditions in the economy in terms of per capita income play an important role in determining overall growth levels. The results in model 2 are very similar to the results in model 1. The negative and statistically significant coefficients for the initial per capita income in 1992, all else constant, support the theory that higher initial per capita income in 1992 slows down economic growth. Counties that had a higher per capita income in 1992 tended to experience lower rates of employment and per capita income growth in the next 10 years. The coefficient for initial population in the county is only statistically significant and negative in the population growth

equation. Counties that had a higher population in 1992 tended to experience lower population growth rates in the next 10 years. This result may be the result of two facts. First, a small population change in less populous counties has a large effect on the percentage change and vice versa, while second, population naturally moves from highly densely populated counties to less populated counties as part of the urban to suburban sprawl. Both theories are indicative for the strong economic growth of less populous counties outside of metro areas. Once again, the coefficient for the initial employment level is statistically significant and positive in the population change equation. This result seems to indicate that counties with high initial levels of employment attract new firms and households to the county. First, firms setting up business or expanding their operations in a county with high employment levels will find it less difficult to hire well qualified applicants as a larger potential applicant pool is available. Second, households will be attracted to counties with high employment levels as they find it less difficult to find potential employment possibilities in different sectors of the economy.

The coefficient for business taxes and higher individual taxes are statistically significant and negative in all three equations with the exception of the positive sign in the per capita income growth equations. The type of tax revenue, benefit, nonbenefit and transfer payment, is not statistically significant in any of the three equations. The right-to-work coefficient is negative and statistically significant in the employment and per capita income growth equation. The dummy variable for regional employment, per capita income, and population growth leaders have stayed the same from the previous model. Similar, the regional dummy variables for census regions as well as the metro counties have not changed either. The sign and magnitude for the coefficient for

population characteristics variables is similar to model 1. The lack of change in the direction of the coefficient sign and statistical significance points towards a stable economic model.

In model 2, I was primarily interested in the government units per capita variable. The coefficient for the government units per capita variable is statistically significant and negative in all three variables. The negative coefficient on the initial level of government fragmentation, measured by government units per capita, for each equation, all else constant, supports previous research findings of the detrimental effect of government fragmentation. Counties that had higher government fragmentation in 1992 tended to experience lower economic growth. Lower levels of consolidation appear to lower employment, per capita and population growth over the 10 year period. The results from the government units per capita model confirm previous findings of the negative effect of government fragmentation. The efficient size of government units is determined by the trade off between economies of scale and scope with the heterogeneity of preferences for government goods and services. The negative coefficient for government fragmentation, all else constant, supports consolidation theory that too much fragmentation does not allow government units to take advantage of the economies of scale and scope. Thus local government units do not produce and provide public goods and services cost effectively, thereby households and firms are unduly burdened by higher taxes to cover the additional cost. As a consequence, households and firms are unable to maximize utility and profits respectively, hence lowering economic growth within the county.

One of the main criticisms of using government units per capita as a measure of government fragmentation is its inability to distinguish between active and inactive

government units as well as layers of government. Government units per capita measures fragmentation by giving each government unit equal weight. What this means is that a county, borough, and township is given equal weight, thereby assuming each government unit contributes equally to economic growth. Government units per capita does not take into consideration the differential economic power distribution across states and regions. For example, counties in Connecticut and Rhode Island are technically in existence, however, they do not have any economic or political power. Townships, with support from state agencies produce and provide most public goods and services. In contrast, counties in South Dakota, with some exceptions are the primary economic agents, while townships and boroughs play minor roles in determining economic policy.

This method of simply counting government units regardless of the distribution of economic power and functional importance overstates the number of government units. This effect of upward bias is especially dominant in states with a high number of inactive townships and boroughs. See Table 6-6 for a detailed overview. What is needed is a measure that takes into account the distribution of economic power among government units.

C. Model 3: Government Fragmentation Index (County-MPDI & State-HHI)

In order to better measure government fragmentation and to account for the distribution of economic power among government units within a county, I use in model 3 the metropolitan power diffusion index (MPDI) introduced by Miller (2002), as well as the Hirschman-Herfindahl Index (HHI). The HHI measures government fragmentation as the sum of the squared proportion of expenditure per government unit to the total expenditure within the county. The MPDI is similar to the HHI, but instead of the sum of

the squared proportion of expenditures per government unit it is calculated as the sum of the square root of the proportion of expenditures per government unit. The main difference is the MPDI gives greater value to the smaller players in government, while the HHI gives greater value to the larger player in the government.

The basic assumption in using government expenditures is that government units with economic power and influence are the government units that spend tax money for various government functions in providing public goods and services. It is assumed that a government unit with large expenditures will have more economic power and have more influence on economic growth than a government unit with relatively low expenditures.

In model 3, I make use of both fragmentation indexes in measuring government fragmentation. First, I employ the MPDI method using government expenditures in 1992 for calculating fragmentation within a county. The MPDI method emphasizes the role of smaller government units within the county, therefore I am giving more power to smaller townships and boroughs versus larger government units, in particular counties. I hypothesize that smaller government units within a county are similar to niche players in private markets. In private markets, small firms are often the key innovators as they are closer to the customers, and they are able to adapt to changes in the market place more quickly. I hypothesize that small government units play a similar role in the competition among government units. Smaller government units are able to be more responsive to the needs of households and firms, and therefore, are more inclined to be innovative in public policies. Smaller government units also tend to have fewer resources available and therefore, I hypothesize, are more inclined to be efficient producers and providers of

public goods and services. Smaller government units have another advantage over larger government units, their small size allows households and firms to hold public officials more accountable, thereby reducing the possibility for collusion or bureaucratic inefficiencies as hypothesized by Niskanen (1994).

The second measure of government fragmentation is to measure the distribution of economic power within a state. I am using the HHI method with government expenditures in 1992 to calculate the state fragmentation score. As mentioned earlier, the HHI methodology by taking the square of the percentages, puts relatively more emphasis on larger government units within a state. By focusing on the larger players within a state, I am able to control for the “danger of the multitude” and emphasize the role of the larger contributors to economic growth. A higher level of HHI means a more centralized organizational form of state government. A high level of HHI means the distribution of political and economic power between state and local government units is in favor of the state. Holmes (1998) provides clear evidence that state organizational form, and in particular a state’s rules and regulations, play an important role in determining economic growth within the state. How a state is functionally organized, whether the political power and economic power is delegated to local government units or centralized in the state government unit, has important implications. Fiscal decentralization theory contends that a more centralized state has the ability to use its powers to engage in income redistribution and public welfare policies that local government units are unable to perform.

Table 7-3 Model 3: Government Fragmentation Index (MPDI)

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.4195	0.0000	0.5790	0.0000	0.3923	0.0000
Employment in 1992	-2.79E-07	0.3179	2.58E-07	0.1738	1.01E-06	0.0000
PCI in 1992	-5.07E-06	0.0000	-1.15E-05	0.0000	-1.96E-06	0.0369
Population in 1992	1.33E-07	0.3146	-1.06E-07	0.2393	-4.73E-07	0.0000
County MPDI 1992	0.0072	0.0504	0.0152	0.0000	0.0046	0.1470
State HHI 1992	-0.2065	0.0000	-0.0939	0.0000	-0.2233	0.0000
Business Tax	-0.0002	0.2044	-0.0002	0.0822	-0.0002	0.1477
Individual Tax	-0.0005	0.0033	0.0004	0.0007	-0.0003	0.0560
Benefit Ratio	-0.0377	0.1091	0.0132	0.4098	0.0091	0.6499
Nonben. Ratio	0.0408	0.2398	-0.0190	0.4203	0.0569	0.0547
Right to Work	-0.0582	0.0000	-0.0470	0.0000	-0.0274	0.0000
Transfer Ratio	-0.0010	0.0002	-0.0002	0.2673	-0.0004	0.0960
Cdev Ratio	-0.0003	0.7819	0.0007	0.2625	0.0018	0.0281
Metro	0.0265	0.0000	0.0156	0.0001	0.0295	0.0000
Empl. Lead 92	0.1265	0.0000	0.0026	0.3982	0.0291	0.0000
PCI Lead 92	0.0042	0.2991	0.0941	0.0000	-0.0122	0.0004
Pop. Lead 92	0.0328	0.0000	-0.0040	0.1994	0.0870	0.0000
Northeast	-0.0776	0.0000	-0.0514	0.0000	-0.0906	0.0000
Midwest	-0.0487	0.0000	-0.0463	0.0000	-0.0533	0.0000
Northcentral	0.0043	0.5679	-0.0289	0.0000	-0.0373	0.0000
Gov. Exp. PC	-7.44E-07	0.0020	-7.32E-07	0.0000	-1.59E-06	0.0000
Pct. Poverty	-0.0027	0.0000	-0.0014	0.0000	-0.0040	0.0000
Pct. Over 65	-0.0040	0.0000	-0.0021	0.0000	-0.0056	0.0000
Pct. With Bachelor	0.0011	0.3787	0.0066	0.0000	-0.0031	0.0039
Pct. Nonwhite	-0.0010	0.0000	0.0002	0.0913	-0.0001	0.6719
Amenity Scale	0.0132	0.0000	0.0021	0.0551	0.0132	0.0000
Adj. R-Squared	0.49		0.45		0.55	
F Value	99.6		87.7		130.2	
# of Observations	2592					

he results in model 3 are very similar to the results in the previous two models.

The discussion will focus on the fragmentation measures of the County MPDI and the State HHI. The coefficient for fragmentation at the county level is statistically significant and positive in the employment and per capita income growth equation, not statistically significant in the population growth equation. The positive coefficient on the initial level of county fragmentation in two equations, all else constant, supports the Tiebout hypothesis that fragmentation of government units at the county level is beneficial to economic growth. Counties that had higher government fragmentation in 1992 tended to experience higher economic growth over the next 10 year period.

The results for the county fragmentation coefficient support the hypothesis that the benefits of fragmentation outweigh the costs. Households and firms seem to value

the choice among different public goods and services more than the associated cost of efficiency in provision. Consolidation theory contends an increase in fragmentation reduces economies of scale and scope, thereby reducing efficiency. The results in model 3 do not support this hypothesis. However, the results in model 3 only indirectly contradict the consolidation theory, as they only confirm that fragmentation is associated with higher economic growth. I hypothesized that households and firms will stay in and move to government units that allow them to maximize utility and profits respectively.

The second important variable is the state fragmentation index, measuring the distribution of economic power among government units within a state. The coefficient for state fragmentation is statistically significant and negative in all three equations. All else constant, counties in states with a more centralized system of government in 1992 tended to experience lower rates of overall economic growth over the next 10 years. While county MPDI measures whether a county is fragmented versus consolidated, the state HHI measures whether a state is centralized versus decentralized. Both measures, county MPDI and state HHI, indicate that counties in states with a decentralized system of government tended to experience higher economic growth.

The hypothesis of proponents of consolidation that a system of fragmented government units leads to the duplication in efforts, discourages public visibility, and reduces accountability cannot be supported by the findings. In contrast, opponents of consolidation hypothesized that consolidation of government units will lead to a monopolization of the public sector resulting in unresponsive government, and inefficient production and provision of public goods and services. The positive coefficient for

county fragmentation and the negative coefficient for state consolidation support the hypothesis that fragmentation is beneficial to economic growth.

The results from model 3 generally confirm the fiscal decentralization theory of government. Local government units are better equipped to produce and provide the public goods and services needed to encourage economic growth by attracting and retaining households and firms. Fiscal decentralization theory posits that local government units are more efficient producers and providers of public goods than a centralized system of government organization.

Results from model 3 may not necessarily prove the notion that fragmented government units are more efficient in producing and providing public goods and services. But households and firms may forego additional gains in efficiency in production and provision for a more localized control over public policies. Public goods and services are primarily produced for local consumption. Oates (1999) hypothesized that a system of decentralized production and provision of public goods is at least pareto-efficient in the absence of cost-savings from a centralized production and provision. Local control over provision allows government units to specifically target public policies to local needs, thereby allowing households and firms to maximize utility and profits, respectively. Another benefit of decentralization is the ability of local government units to experiment with public policies to achieve better-suited solutions to local problems.

An important part of decentralization theory is taxation. The tax assignment problem, or what tax is best suited for financing public policies, is a hot topic in the debate over consolidated versus fragmented systems of government units. Brennan and

Buchanan's (1980) theory on taxation and the limitation of the power to tax is another hypothesis being tested indirectly. Once again, whether fragmentation is beneficial or detrimental to efficient taxation is only revealed through its consequences on economic growth. The positive coefficient for both county and state fragmentation, all else constant, tends to support the theory that fragmentation among government units is limiting the power to tax. Hence, households and firms are able to maximize utility and profits.

Last but not least, is the theory that a fragmented system of government units is promoting market failure. Consolidation theory contends that small local government units are unable to limit positive public policy spillovers and are not remunerated for their costs. In addition, proponents of consolidation contend that larger government units may be able to use their "market power" and force smaller government units into matching public policies regardless of financial capabilities. Because of the competition among government units for households and firms, smaller government units are the victims of the "pace setter phenomenon". The results from model 3 do not support these hypotheses.

D. Model 4: Government Fragmentation plus Interaction among county and state

One of the most critical shortcomings in previous research on whether competition among government units is beneficial or detrimental to economic growth and development is the lack of formal analysis of the interaction between state and local government. The measurement of government fragmentation at the county level and state level may explain only a limited aspect of how governmental organization form affects economic growth. In fiscal decentralization theory local as well as state

government units play important roles in determining economic growth, but as I hypothesize, an even more influential aspect of governmental organizational form in encouraging economic growth is the interaction between the two government units. As discussed in the theoretical section, there are four theoretical cases of interaction between county and state government. Each of these cases represents a different distribution of economic power between the two actors, conforming to a separate theory of government organization. The case of fragmented local government units with a centralized state government unit will conform closely with fiscal decentralization theory, while a consolidated county with centralized state government will conform closely with consolidation theory. Therefore, by including an interaction term in the model, I am able to test what specific form of governmental organizational form is beneficial as well as what type is detrimental to economic growth.

There are several methods to instrumentalize an interaction term. I decided to use a categorical approach in creating an interaction term, but later I will use a different approach to instrumentalize an interaction term. First, I divided the data into three categories. I sorted the data based on the MPDI score, and subdivided the data set into three equally-sized groups. Group one contains the counties with the highest fragmentation score, group three is counties with the lowest fragmentation score or highest consolidation, and in group two there are the remaining counties. Second, I sorted the data based on the state HHI score. I again subdivided the data set into three equally-sized groups. In the data set there are 35 states, so in group one there are the eleven states with the highest consolidation, in group three there are the eleven states with the lowest consolidation, and in group two there are the remaining thirteen states.

Next, I paired the counties with the states according to the predefined cases of – (1) county fragmented with state centralized, (2) county fragmented with state fragmented, (3) county consolidated with state centralized, and (4) county consolidated with state fragmented. For each case I created a dummy variable with a value of 1 if it represented the case and zero otherwise. Counties and states in the middle of the distribution of county fragmentation and state consolidation received a dummy variable of zero for all cases.

The primary motivation for creating these dummy variables is to represent the four different cases in state and county organizational form by measuring the interplay between state and local government. By measuring the interplay between states and counties, I am able to test the Tiebout and Consolidation theories more thoroughly. As discussed in the theoretical section, fiscal decentralization theory emphasizes the role of local government units as well as a centralized government unit. The distributions of economic power vary significantly among states, and together with the local distribution of economic power four principal cases of economic power distribution emerge.

Three cases of power distribution are important in my model. In case 1, both state and county are highly fragmented, thereby giving local government units significant economic power. Whether case 1 corresponds with the Tiebout (1956) and Schwab and Oates (1991) envisioned models of local economic autonomy and competition among states may be questionable. I hypothesize that case 1 corresponds more with the model of destructive competition envisioned by advocates of consolidation. In contrast, in case 2 state powers are centralized and county powers are fragmented. This system of governmental organizational form corresponds to the fiscal decentralization model, where

local government units are independent and allow firms and households to choose the government unit that best reflects their preference for a specific public goods and services bundle combined with taxation, while the state provides a centralized system of welfare programs and income redistribution. In case 3, both state and county are highly consolidated, thereby giving state government units and county government significant economic power. This case would correspond with the ideal consolidation scenario.

Table 7-4 Model 4: Fragmentation Index with Interaction Cases

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.4698	0.0000	0.6083	0.0000	0.4405	0.0000
Employment in 92	-3.42E-07	0.2179	2.39E-07	0.2339	9.58E-07	0.0001
PCI in 92	-4.16E-06	0.0002	-1.13E-05	0.0000	-1.23E-06	0.1935
Population in 92	1.65E-07	0.2087	-9.61E-08	0.3132	-4.50E-07	0.0001
County MPDI 92	-0.0030	0.4814	0.0121	0.0001	-0.0003	0.9405
State HHI 92	-0.2949	0.0000	-0.1544	0.0000	-0.3337	0.0000
Cty. Frag. St. Cons.	0.0302	0.0041	0.0086	0.2592	0.0136	0.1276
Cty. Frag. St. Frag.	0.0075	0.3435	-0.0091	0.1126	-0.0037	0.5817
Cty. Cons. St. Cons.	0.0014	0.8900	-0.0066	0.3760	0.0232	0.0082
Cty. Cons. St. Frag.	-0.0450	0.0000	-0.0212	0.0001	-0.0442	0.0000
Business Tax	-0.0003	0.1436	-0.0002	0.0753	-0.0003	0.0637
Individual Tax	-0.0006	0.0011	0.0004	0.0022	-0.0004	0.0209
Benefit Ratio	-0.0341	0.1462	0.0205	0.2269	0.0078	0.6962
Nonben. Ratio	0.0322	0.3537	-0.0068	0.7859	0.0498	0.0916
Right to Work	-0.0595	0.0000	-0.0556	0.0000	-0.0249	0.0004
Transfer Ratio	-0.0010	0.0005	-0.0002	0.2371	-0.0004	0.0947
Cdev Ratio	-0.0004	0.6548	0.0009	0.2088	0.0017	0.0343
Metro	0.0229	0.0001	0.0144	0.0008	0.0267	0.0000
Empl. Lead 92	0.1267	0.0000	0.0006	0.8522	0.0292	0.0000
PCI Lead 92	0.0042	0.2972	0.0955	0.0000	-0.0121	0.0004
Pop. Lead 92	0.0320	0.0000	-0.0023	0.4937	0.0866	0.0000
Northeast	-0.0798	0.0000	-0.0565	0.0000	-0.0859	0.0000
Midwest	-0.0522	0.0000	-0.0530	0.0000	-0.0539	0.0000
Northcentral	0.0000	0.9981	-0.0337	0.0000	-0.0397	0.0000
Gov. Exp. PC	-8.00E-07	0.0010	-6.57E-07	0.0002	-1.61E-06	0.0000
Pct. Poverty	-0.0025	0.0000	-0.0015	0.0000	-0.0039	0.0000
Pct. Over 65	-0.0041	0.0000	-0.0018	0.0000	-0.0057	0.0000
Pct. With Bachelor	0.0012	0.3306	0.0065	0.0000	-0.0029	0.0063
Pct. Nonwhite	-0.0011	0.0000	0.0002	0.1676	-0.0001	0.4100
Amenity Scale	0.0146	0.0000	0.0024	0.0392	0.0142	0.0000
Adj. R-Squared	0.49		0.43		0.56	
F Value	88.6		69.4		116.6	
# of Observations	2594					

Similar to models 1, 2 and model 3, initial conditions in the economy in terms of per capita income play an important role in determining overall growth levels. The results in model 4 continue to be very similar to the results in the previous three models, so only the governmental organizational form variables, county and state fragmentation and the four cases of interaction between state and county organizational form will be

discussed. First, county fragmentation (county MPDI) is only statistically significant in the per capita income equation. Counties with higher levels of fragmentation in 1992, all else constant, tended to experience higher per capita income growth over the next 10 years. However, the inclusion of the four interaction cases in the analysis reduced the significance of county fragmentation to one equation and non-significance in the two employment and population growth equations. The non-significant coefficient for initial levels of county fragmentation in the population and employment growth equation, all else constant, reinforces my hypothesis that the interaction between state and local governmental organizational form is even more important than previously anticipated. How local government units are organized has implications on economic growth. However, the significance of local government units is reduced when state organizational form is considered as well.

Holmes (1998) provided an early indication of the significance of state governments on economic growth prospects within the state. Therefore, by including the interaction cases in the regression model the significance of local government units in economic growth is reduced in favor of a combined measure of local and state organizational form. This result is not surprising, as local government units in general do not have the economic and financial resources to influence economic growth significantly. However, the combination of several smaller local government units with the state government has the political and economic power to affect economic growth. The regression results confirm the limited role of county fragmentation by itself in economic growth, but the significant impact when state and local government units are combined into a government system. Previous studies on governmental organizational

form have either ignored the potential implications of state and local government interaction or have focused on the role of state governmental organizational form without considering county organization.

The second variable of interest is the state organizational form variable, state HHI. The coefficient for state HHI is statistically significant and negative in all three equations. Counties in states with higher initial consolidation in 1992, all else constant, tended to experience lower rates of overall economic growth. The significant coefficient for initial levels of state organizational form with the inclusion of the interaction cases, all else constant, confirms Holmes (1998) results of the importance of state policies on economic growth.

The third variable of interest in model 4 is the cases of interaction between state and local governmental organizational form. The first case is the combination of a fragmented county in combination with a consolidated state. The coefficient for this dummy variable is statistically significant and positive in the log of employment and marginally statistically significant in the log of population growth equation. The positive and significant coefficient on the initial combination of state and county, all else constant, supports the fiscal decentralization theory of localized control in combination with a centralized state government. Counties that were fragmented and in consolidated states in 1992, all else constant tended to experience higher economic growth over the next 10 years, when measured by employment and population growth.

The second case is the combination of a fragmented county with a fragmented state. The coefficient for this dummy variable is only marginally statistically significant in the log of per capita income growth equation and statistically non-significant in the

other two equations. The third case is the combination of a consolidated county with a consolidated state, the ideal combination according to consolidation theory. The coefficient for this dummy variable is statistically significant and positive only in the population growth equation. The positive and significant coefficient on the initial combination of state and county, all else constant, indicates supports for the consolidation theory. Counties that were consolidated and in consolidated states in 1992, all else constant, tended to experience higher population growth over the next 10 years.

The fourth case is the combination of a consolidated county with a fragmented state. The coefficient for this dummy variable is highly statistically significant and negative in all three equations. All else constant, this provides clear evidence that the combination of fragmented state and consolidated county is the worst possible combination of governmental organizational form. Counties that were consolidated and in a fragmented state in 1992 tended to experience lower economic growth over the next 10 years in all three equations. The coefficients for the dummy variables in cases 3 and 4 may allow a hypothesis that once counties are consolidated the preferred option to encourage some economic growth is to have a consolidated state as well.

The coefficients for the fourth case, consolidated county with decentralized state, clearly point out the interaction case with the most detrimental effect on all three measures of economic growth. What makes the fourth interaction case so detrimental to economic growth is the combination of too much delegation of central authority to local governments and too little competition among local government units. In consolidated counties, households and firms do not have alternative location options available with little or not cost of exit. In the case where a county is consolidated, households and firms

may not have the option to leave the government unit for another more efficient and responsive government unit. Further strengthening the power of local government units and weakening the option of exit by the households and firms is the existence of a fragmented state government. By delegating significant powers to the county, the state strengthens the position of the local government as a monopoly producer and provider of public goods and services. We know from monopoly theory that monopolists are neither efficient nor responsive producers. Therefore, a system of fragmented state and consolidated counties is probably the closest to a monopolistic system where neither households nor firms are able to maximize utility and profits, respectively.

In previous research by Hilber and Mayer (2004), the authors found in their study on public expenditures on education a similar trend. In the case where school funding is locally controlled the level of expenditure is the highest, while in counties with a centralized system of school funding expenditures of public education are the lowest. The authors came to a similar conclusion that local control of government expenditure may increase school funding.

Results from model 4 provide interesting observations on the interaction between state and local governmental organizational forms. First, local fragmentation (MPDI) loses statistical significance when the model is controlled for the potential interaction between state and county government. Second, state organizational form (HHI) remains significant even when the model controls for the interaction between the state and local government. Third, the interaction between state and local governmental form is key to understand the role of governmental organizational form in the economic growth of a county. An important finding is the distinction between different organizational

combinations and how they influence economic growth. Dummy variables for all four cases seem to indicate that a centralized system of state government is overall more beneficial to economic growth than a decentralized system of government.

Theoretically, the results support several hypotheses. First, economic growth is clearly deterred by the combination of a consolidated county and a decentralized state. In the case of a decentralized state significant economic and political power is delegated to the local government unit. One would assume a more powerful local government unit in terms of economic and political power would be the preferred organizational form in competitive federalism. However, the competitive federalism theory has two key assumptions that may be violated in a decentralized system of state government. First, competitive federalism assumes no spillover of benefits from local public goods and services. Second, competitive federalism assumes that local government units only engage in benefit taxation to finance public goods and services. In a decentralized system of state government, state government units delegate significant powers to local government units in income redistribution and welfare programs. But, both functions of local government units in a decentralized system of state government may violate the two assumptions of competitive federalism. Income redistribution is generally financed through some variation of a non-benefit tax on households and firms. In the case of a decentralized state, local government units are forced to collect non-benefit taxes, thereby encouraging competition among local government units on the level of income redistribution. Counties will find it increasingly difficult to tax households and firms to support higher levels of income redistribution. In addition, local production and provision of public welfare programs often entails significant welfare spillovers, thereby

inducing free rider problems. Similar to the problem with income redistribution, counties providing public welfare programs must tax local residents with the benefits of public policies extending beyond the county lines. As a consequence, counties may find it increasingly difficult to finance welfare programs. Therefore, the violation of the two assumptions in competitive federalism will place local government units in a position where competition among government units is most likely to end in destructive competition.

A second hypothesis is that economic growth is primarily encouraged by the combination of a fragmented county and a centralized state. This combination, as envisioned by the fiscal decentralization theory, allows local government units to produce and provide public goods and services locally, while welfare programs and income redistribution are the responsibilities of state governments. This combination allows local government units to distinguish each other in the bundle of public goods and services provided, while being able to provide social welfare programs.

In summary, the combination of a consolidated county with a decentralized state seems to be the most detrimental to economic growth, while a fragmented county with a centralized state seems to be the most beneficial to economic growth. The two extreme cases, a completely fragmented system of government, fragmented county with a decentralized state, and a completely consolidated system of government, consolidated county with a centralized state, are either not statistically significant or only marginally significant. However, none of these results points towards the detrimental effect of a fragmented system of government. In both fragmentation county cases, the coefficients are positive and statistically significant or not significant at all. In addition, the

consolidation cases are either negative or not statistically significant as well. So therefore, the hypothesis that a consolidated form of government is better for economic growth cannot be supported by this study. But, a fragmented system of local government is either beneficial or at least not detrimental to economic growth.

E. Model 5: Gov. Fragmentation, State Centralization and Interaction Cases

In model 4, state organizational form remained a dominant variable in the regression model. The highly statistically significant coefficient for state HHI in model 4 reinforces the importance of state policies in economic growth. In model 4 I used the state fragmentation index to measure the distribution of economic power across the states. The next step is to include the State Centralization Index (SCI) proposed by Stephens and Wikstrom (2000). The benefit of the SCI is its focus on the independence of government units from central control, while the fragmentation indexes focuses more on the economic power of government units derived from their power to spend. The advantage of the SCI is its emphasis on the independence of government units from transfer payments and own-source revenue raising power. In contrast, the fragmentation indexes put more emphasis in the analysis on the power of government units to determine economic growth through their spending power. Therefore, in model 5 I re-estimated model 4 with the inclusion of the State Centralization Index.

Table 7-5 Model 5: Fragmentation Index, SCI and Interaction Cases

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.6620	0.0000	0.3833	0.0000	0.6468	0.0000
Employment in 92	-3.63E-07	0.1888	2.64E-07	0.1836	9.35E-07	0.0001
PCI in 92	-4.22E-06	0.0001	-1.12E-05	0.0000	-1.29E-06	0.1675
Population in 92	1.75E-07	0.1815	-1.07E-07	0.2540	-4.39E-07	0.0001
County MPDI 92	-0.0010	0.8205	0.0097	0.0015	0.0019	0.5961
State HHI 92	-0.1506	0.0009	-0.3233	0.0000	-0.1789	0.0000
SCI	-0.0045	0.0000	0.0052	0.0000	-0.0048	0.0000
Cty. Frag. St. Cons.	0.0432	0.0001	-0.0066	0.3933	0.0275	0.0026
Cty. Frag. St. Frag.	0.0050	0.5298	-0.0061	0.2801	-0.0064	0.3363
Cty. Cons. St. Cons.	0.0050	0.6273	-0.0108	0.1443	0.0270	0.0020
Cty. Cons. St. Frag.	-0.0381	0.0000	-0.0292	0.0000	-0.0369	0.0000
Business Tax	0.0000	0.9024	-0.0006	0.0000	0.0000	0.8818
Individual Tax	-0.0005	0.0091	0.0003	0.0440	-0.0002	0.1375
Benefit Ratio	-0.0363	0.1204	0.0231	0.1688	0.0054	0.7832
Nonben. Ratio	0.0144	0.6795	0.0141	0.5727	0.0306	0.2980
Right to Work	-0.0620	0.0000	-0.0526	0.0000	-0.0276	0.0001
Transfer Ratio	-0.0008	0.0067	-0.0005	0.0176	-0.0002	0.4579
Cdev Ratio	-0.0009	0.3203	0.0015	0.0310	0.0012	0.1533
Metro	0.0235	0.0001	0.0137	0.0013	0.0274	0.0000
Empl. Lead 92	0.1261	0.0000	0.0013	0.6932	0.0286	0.0000
PCI Lead 92	0.0037	0.3534	0.0961	0.0000	-0.0126	0.0002
Pop. Lead 92	0.0325	0.0000	-0.0028	0.3901	0.0871	0.0000
Northeast	-0.0949	0.0000	-0.0389	0.0000	-0.1021	0.0000
Midwest	-0.0661	0.0000	-0.0367	0.0000	-0.0689	0.0000
Northcentral	-0.0179	0.0308	-0.0127	0.0328	-0.0589	0.0000
Gov. Exp. PC	-1.13E-06	0.0000	-2.67E-07	0.1358	-1.97E-06	0.0000
Pct. Poverty	-0.0025	0.0000	-0.0015	0.0000	-0.0039	0.0000
Pct. Over 65	-0.0042	0.0000	-0.0018	0.0000	-0.0057	0.0000
Pct. With Bachelor	0.0020	0.1167	0.0057	0.0000	-0.0021	0.0483
Pct. Nonwhite	-0.0011	0.0000	0.0002	0.1187	-0.0002	0.3387
Amenity Scale	0.0139	0.0000	0.0032	0.0054	0.0135	0.0000
Adj. R-Squared	0.5		0.45		0.57	
F Value	87.3		71.1		115.9	
# of Observations	2594					

The results in model 5 do not change dramatically with the exception of the government organization variables. Therefore, I will only discuss the government organization variables in detail. Similar to model 4, the coefficient for the county fragmentation variable is only statistically significant in the per capita income growth equation. The coefficient for the state organization variable measured by the HHI is still statistically significant and negative. All else constant, the negative sign on the state HHI continues to confirm the detrimental effect of state consolidation. The coefficient for the second state organizational variable, the SCI, is statistically significant in all three equations. The sign of the coefficient is negative in the employment and population growth equation, but positive in the per capita income growth equation. The significant

coefficient for initial levels of state organizational form with the inclusion of the interaction cases, all else constant, once again confirms the importance of state organizational form on economic growth. Counties in states with higher initial consolidation in 1992, all else constant, tended to experience lower rates of overall employment and population growth. In contrast to the state HHI, the SCI measures how independent local government units are in respect to revenue raising power and determining government expenditures at the local level. Fiscal federalism and competition theories posit several benefits of a more decentralized system of government. First, a decentralized system of government allows local government units to target public policies specifically to the local needs. Second, local government units are more easily accessible, thereby reducing transaction and compliance costs. Third, local government units are theorized to be more accountable to households and firms as they are able to assess government expenditures more easily on a local level.

The advantage of using both state HHI and SCI in the models is the ability to measure different aspects of state organizational form. While the SCI measures how much of state authority is delegated to lower units of government, the state HHI measures how economic power in terms of expenditures is delegated. Both SCI and state HHI are better suited to measure organizational form. The simple correlation between state HHI and SCI is approximately .7 indicative of correlation, but below critical levels.

The results from the interaction cases in model 5 did not change significantly to warrant a separate discussion with one exception. In model 5 with the inclusion of the SCI as a second measure of state organizational form, the coefficients for case 1, county fragmentation with a centralized state, have higher statistical significance. The

coefficient for case 1 is statistically significant at the 1 percent level in both the log of the employment and population growth equation. Adding the SCI variable in model 5 helped to improve the identification of a beneficial case for economic growth. Results from model 5 support more strongly the fiscal federalism theory and my hypothesis of the beneficial case of a fragmented local government in combination with a centralized state government.

F. Model 6: Government Fragmentation and Polarization Index

One of the critical issues in the debate over the benefits and costs of fragmented versus consolidated forms of government is whether competition among government units is destructive or constructive. Research in private markets has shown that several distinctly different forms of competition among firms may exist. Therefore, meaningful research on governmental organization and economic development needs to critically analyze the type of competition in which government units are engaged. The discussion on fragmentation versus consolidation is critically dependent on whether government units are engaged in a beneficial form of competition. For example, consolidation theory is concerned that two government units may be engaged in a competition for regional leadership, thereby outspending themselves in attracting new households and firms.

Therefore, a measurement for governmental organization must include a variable that measures the level of competition among government units. One such measure of competition is the polarization index introduced by Montalvo and Reynal-Querol (2001). Polarization may be measured in two forms, polarization through population in the government unit or polarization through government expenditure. The polarization index

allows me to further investigate whether government units are in direct competition with each other, either through population or expenditure.

Table 7-6 Model 6: Government Fragmentation Index, SCI and Polarization Index

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.6564	0.0000	0.4148	0.0000	0.6455	0.0000
Employment in 92	-3.46E-07	0.2056	2.64E-07	0.1479	9.12E-07	0.0001
PCI in 92	-3.02E-06	0.0067	-1.20E-05	0.0000	-2.69E-07	0.7740
Population in 92	1.65E-07	0.2016	-1.03E-07	0.2341	-4.30E-07	0.0001
County MPDI 92	-0.0019	0.6593	0.0094	0.0010	-0.0002	0.9505
State HHI 92	-0.1453	0.0014	-0.3147	0.0000	-0.1606	0.0000
SCI	-0.0044	0.0000	0.0048	0.0000	-0.0046	0.0000
Cty. Frag. St. Cons.	0.0436	0.0000	0.0017	0.8077	0.0286	0.0015
Cty. Frag. St. Frag.	0.0073	0.3505	-0.0069	0.1900	-0.0029	0.6610
Cty. Cons. St. Cons.	0.0034	0.7466	-0.0140	0.0445	0.0233	0.0080
Cty. Cons. St. Frag.	-0.0400	0.0000	-0.0336	0.0000	-0.0365	0.0000
Pol. By Exp. 92	-0.0222	0.0545	0.0030	0.6936	-0.0307	0.0015
Pol. By Pop. 92	0.0025	0.7643	-0.0059	0.2902	0.0035	0.6195
Business Tax	0.0001	0.7598	-0.0005	0.0000	0.0001	0.6845
Individual Tax	-0.0006	0.0042	0.0004	0.0028	-0.0004	0.0265
Benefit Ratio	-0.0339	0.1455	0.0242	0.1185	0.0050	0.7986
Nonben. Ratio	0.0130	0.7086	0.0074	0.7503	0.0329	0.2588
Right to Work	-0.0613	0.0000	-0.0516	0.0000	-0.0249	0.0003
Transfer Ratio	-0.0008	0.0051	-0.0004	0.0220	-0.0002	0.3836
Cdev Ratio	-0.0008	0.3720	0.0013	0.0371	0.0012	0.1408
Metro	0.0233	0.0001	0.0133	0.0007	0.0254	0.0000
Empl. Lead 92	0.1249	0.0000	0.0041	0.1641	0.0285	0.0000
PCI Lead 92	0.0032	0.4152	0.0926	0.0000	-0.0127	0.0001
Pop. Lead 92	0.0320	0.0000	-0.0048	0.1147	0.0863	0.0000
Northeast	-0.0970	0.0000	-0.0418	0.0000	-0.1055	0.0000
Midwest	-0.0644	0.0000	-0.0357	0.0000	-0.0673	0.0000
Northcentral	-0.0154	0.0611	-0.0120	0.0285	-0.0590	0.0000
Gov. Exp. PC	-1.03E-06	0.0001	-5.36E-07	0.0015	-1.57E-06	0.0000
Pct. Poverty	-0.0024	0.0000	-0.0012	0.0000	-0.0040	0.0000
Pct. Over 65	-0.0042	0.0000	-0.0020	0.0000	-0.0060	0.0000
Pct. With Bachelor	0.0005	0.6702	0.0070	0.0000	-0.0033	0.0020
Pct. Nonwhite	-0.0011	0.0000	0.0001	0.3982	-0.0002	0.2645
Amenity Scale	0.0149	0.0000	0.0034	0.0016	0.0142	0.0000
Adj. R-Squared	0.5		0.49		0.58	
F Value	82		77.7		111.8	
# of Observations	2550					

Because the results are similar to the previous models I will discuss only the polarization variables. The results for the four cases of county-state interaction are similar to models 4 and 5. The coefficient for the polarization by expenditure is statistically significant and negative in the employment and population growth equations. The coefficient for polarization by population is not statistically significant in any equation. The negative and statistically significant coefficient for polarization by

expenditure, all else constant, provides some support that a high degree of polarization is detrimental to economic growth. Counties with high initial levels of polarization tended to experience lower rates of employment and population growth over the next 10 years.

Polarization by expenditure measures how closely the distribution of government expenditures is distributed from a bi-modal distribution. A high degree of polarization by expenditures is indicative of a county with two equally-sized government units in terms of expenditures. Theory contends two equally-sized government units may engage in a competition for regional dominance similar to an oligopoly in private markets, in which two companies are engaged in a battle for market dominance. So government units in a highly polarized county may try to outspend each other to attract new households and firms in their race for dominance. The coefficients for polarization by population are all statistically non-significant in model 6. Thus, the results from the polarization model have to be interpreted carefully, polarization by expenditure may measure some unaccounted variation in local governmental organizational form.

G. Spatial Model

While the Carlino-Mills (1987) and Deller et al. (2001) studies provided an empirical structure for testing whether competition among government units is beneficial or detrimental, they lacked the spatial structural detail to assess the role of governmental organizational form in the economic growth process. Bao et al. (2004) state, “specifically, potentially important spatial dependence in the error term between the counties is not considered by Carlino-Mills” (pg. 322). Spatial dependence is primarily caused by the spatial interaction of households’ and firms’ choices of local government units.

Using a standard linear regression model at the county level assumes the variance of the disturbance term is constant. However, LeSage (1999) contends that this type of a model may be biased and inconsistent. He states that two problems arise when sample data has a locational component. First, the Gauss-Markov theorem assumes that the explanatory variables are fixed in repeated samples. Second, the Gauss-Markov theorem assumes that a single linear relationship exists across the sample data observation (LeSage 1999). In the first case, spatial dependence exists where one observation at location i depends on observations at other locations j , where $j \neq i$. This means that spatial interaction and spillovers are present in the data. In the second case spatial heterogeneity exists, where there is a variation in the relationship over space. This means that the relationship between the variables varies with each location.

In principal there are two distinctively different approaches to allow for spatial dependence on a household's utility or a firm's profit maximization decision. The first method of estimating spatial dependence is through spatial lags. A spatial lags specification is relevant when the spatial dependence works through proximity to the county of observation and there is no spatial relationship through the error term. It can be specified as follows:

$$y = \rho W y + X \beta + \varepsilon$$

$$\varepsilon \sim N(0, \sigma^2 I_n)$$

The X matrix represents the explanatory variables specified in the model that are not spatially dependent. β denotes the parameters to be estimated by the model for the explanatory variables. The parameter ρ reflects the spatial dependence, measuring the average influence of neighboring counties j on observations in county i . W is the spatial

weigh matrix or contiguity matrix, and y is the dependent variable. In the spatial error model, the dependent variable is weighted by the spatial matrix and included as an explanatory term in the regression.

The second method of estimating spatial dependence is through a spatial error model, where the error term is spatially correlated but not the explanatory variables. The definition of variables is the same as above with the addition of the parameter λ , which denotes the scalar spatial error coefficient. Therefore, the spatial error model can be specified as follows:

$$\begin{aligned}y &= X\beta + u \\u &= \lambda Wu + \varepsilon \\ \varepsilon &\sim N(0, \sigma^2 I_n)\end{aligned}$$

In order to define and understand spatial dependence and heterogeneity, one needs to specify the spatial aspect of the sample data. There are several ways to specify spatial contiguity. I make use of the latitude and longitude information from the census. LeSage (1999) states that spatial dependence should conform to the theory in regional science that observations close to each other should have higher dependence than more distant observations. The matrix W reflects the contiguity of a county in the data set. The matrix W is a binary matrix with 1 for counties j next to the observed county i and 0 for counties not in proximity to the observed county i . However, there are several ways to construct the contiguity matrix. A common method to construct the W matrix makes use of triangles connecting the x - y coordinates in space, in general given by the census in the form of longitude and latitude, to deduce contiguous entities. In general, the matrix W is transformed to have row sums of unity. Rupasinga and Goetz (2004) generalize the form to the following expression:

$$W_{ij} = \frac{d_{ij}}{\sum_{j=1, i \neq j}^n d_{ij}} \text{ where } d_{ij} = 1 \text{ if connected to } j \text{ and } 0 \text{ otherwise}$$

The key to an unbiased and consistent estimation is the spatial contiguity matrix.

In the most common method, longitude and latitude data are used to deduce the contiguity of counties. LeSage (1999) presents several ways to define the contiguity matrix, of which all focus on a shared common border or point. In order to create the spatial contiguity matrix I used ArcMap and Geoda programming.

Geoda performs six tests to assess the spatial dependence in model 3. The first test is the Moran's I test assessing the spatial dependence in general. In addition, Geoda reports five more additional test scores to provide information on the specific spatial dependence present in the model. The Lagrange Multiplier (lag) tests for a missing spatially lagged dependent variable. The Lagrange Multiplier (error) tests for error dependence. The Robust LM (lag) tests for a missing lagged dependent variable in the possible presence of error dependence, while Robust LM (lag) tests the other way round.

First, I estimated the equation without my spatial variables, employment, population, and per capita income growth leaders within the region. The results from the OLS estimation are presented in Table 7-7.

Table 7-7 Model 7: Ordinary Least Square Estimation without spatial variables

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.8916	0.0000	0.5275	0.0000	0.7787	0.0000
Employment in 92	-7.52E-07	0.0256	5.08E-07	0.0328	9.49E-07	0.0005
PCI in 92	-5.43E-06	0.0000	-1.50E-05	0.0000	-1.93E-06	0.0729
Population in 92	3.06E-07	0.0555	-2.10E-07	0.0627	-4.81E-07	0.0002
County MPDI 92	0.0057	0.2768	0.0115	0.0018	0.0045	0.2773
State MPDI 92	-0.1520	0.0061	-0.3099	0.0000	-0.1829	0.0000
SCI	-0.0050	0.0000	0.0047	0.0000	-0.0047	0.0000
Cty. Frag. St. Cons.	0.0464	0.0004	-0.0007	0.9400	0.0285	0.0071
Cty. Frag. St. Frag.	0.0046	0.6313	-0.0101	0.1369	-0.0011	0.8913
Cty. Cons. St. Cons.	0.0009	0.9451	-0.0090	0.3096	0.0253	0.0123
Cty. Cons. St. Frag.	-0.0400	0.0000	-0.0283	0.0000	-0.0404	0.0000
Business Tax	0.0000	0.8506	-0.0005	0.0015	0.0001	0.6998
Individual Tax	-0.0004	0.1063	0.0004	0.0117	-0.0003	0.1701
Benefit Ratio	-0.0714	0.0123	0.0007	0.9704	-0.0101	0.6579
Nonben. Ratio	-0.0827	0.0508	-0.0057	0.8490	-0.0243	0.4756
Right to Work	-0.0576	0.0000	-0.0544	0.0000	-0.0189	0.0200
Transfer Ratio	-0.0014	0.0001	-0.0007	0.0027	-0.0005	0.0673
Cdev Ratio	-0.0016	0.1762	0.0016	0.0523	0.0009	0.3229
Metro	0.0327	0.0000	0.0262	0.0000	0.0312	0.0000
Northeast	-0.1143	0.0000	-0.0485	0.0000	-0.1087	0.0000
Midwest	-0.0786	0.0000	-0.0355	0.0001	-0.0721	0.0000
Northcentral	-0.0141	0.1643	-0.0083	0.2428	-0.0528	0.0000
Gov. Exp. PC	-1.99E-06	0.0000	-4.40E-07	0.0400	-2.54E-06	0.0000
Pct. Poverty	-0.0028	0.0000	-0.0022	0.0000	-0.0044	0.0000
Pct. Over 65	-0.0078	0.0000	-0.0020	0.0000	-0.0088	0.0000
Pct. With Bachelor	0.0042	0.0059	0.0086	0.0000	-0.0013	0.3027
Pct. Nonwhite	-0.0019	0.0000	0.0002	0.2627	-0.0006	0.0009
Amenity Scale	0.0177	0.0000	0.0048	0.0005	0.0169	0.0000
Adj. R-Squared	0.26		0.21		0.42	
F Value	33.4		25.4		71.4	
# of Observations	2595					

Results from the simple OLS model are similar to the results from model 5, therefore I will only discuss the governmental organizational variables.

The primary variables of interest were once again the governmental organizational form variables and the four cases of state-county interaction. Similar to models 4 and 5, the coefficient for county fragmentation is only statistically significant and positive in the per capita income growth equation. The coefficients for the state organizational form variables state HHI and SCI were statistically significant and negative in all equations with the continued exception of SCI in the per capita income equation. The coefficients for the four cases have the same signs and significance levels as in model 5.

The lack of significance of the county fragmentation variable, the continued significance of state fragmentation and organization, as well as the continued significance of the same interaction cases in models 4 and 5, the OLS model seem to indicate, all else constant, that county fragmentation is primarily a important in combination with state organizational form. State fragmentation and organizational form seems to be the primary motivator of economic growth in terms of governmental organizational form. The continuous positive and statistically significant case of county fragmentation with a centralized state together with the continued negative and statistically significant case of county consolidation with a fragmented state seem to indicate that county fragmentation is positive, while state fragmentation is negatively associated with economic growth.

In the OLS model without correction for spatial dependence the population characteristics variable, the government finance variables, and other explanatory variables have the same signs as in model 5. Therefore, I will not discuss the regression results in detail.

More important are the diagnostic results for spatial dependence in my model 3 without correcting for spatial dependence (See Table 7-8).

Table 7-8 OLS Diagnostics for Spatial Dependence

	Δ Employment (log)		Δ Per Capita (log)		Δ Population (log)	
	VALUE	PROB	VALUE	PROB	VALUE	PROB
Moran's I (error)	23.6376374	0	13.9494485	0	28.0402718	0
Lagrange Multiplier (lag)	554.5157482	0	239.480891	0	870.667062	0
Robust LM (lag)	41.0077808	0	68.965381	0	140.0765468	0
Lagrange Multiplier (error)	523.2748672	0	177.1264264	0	741.0619854	0
Robust LM (error)	9.7668998	0.0017768	6.6109163	0.0101356	10.4714702	0.0012123
Lagrange Multiplier (SARMA)	564.282648	0	246.0918074	0	881.1385321	0

The Moran's I scores are highly significant for all three equations. This indicates strong spatial autocorrelation of the residuals. The test for lag dependence and error dependence is statistically significant in all three equations. The Robust LM for lag and

error provides further insight into what type of spatial dependence is present. However, both are statistically significant, and therefore there is no clear indication what type of correction is needed.

In the literature, the debate over which spatial model is most appropriate for a Carlino-Mills model is still on going. Conceptually, the spatial error model tends to be the most appropriate when the spatial structure is explained in the residuals of the regression. Economic growth at the county level occurs for several reasons, but most factors underlying economic growth cannot be measured directly. Therefore, many factors contributing to economic growth are not included in the statistical model. But, when the statistical model is estimated without these factors, the unaccounted variability in economic growth is transferred to the residual or error term. In summary, if economic growth is more affected by an underlying mechanism than a direct link, the spatial error model is the most appropriate model.

In contrast, the spatial lag model is the most appropriate model when the spatial variability occurs in the predicted dependent variable itself, in my case growth in population, employment and per capita income. In the case where population, employment and per capita income growth affect each other directly; the spatial lag model is most appropriate. In reality a direct relationship would mean that economic growth in one county causes economic growth in another county. However, Bao et al. (2004), in their study on identifying urban-rural linkages, find evidence for a backwash effect for the hinterland, but a spillover effect for areas on the fringe of urban areas. More rapid population and employment growth in an urban area is associated with a slower growth in the rural hinterland, but a faster growth at the fringe. In addition, they

find that the relationship between urban areas and the fringe and hinterland is also dependent on the population size of the urban core and the fringe. In summary, the direct spatial relationship between dependent variables is not support by empirical evidence.

I chose to use the spatial error model to correct for spatial dependence. I hypothesize that economic growth is more affected by an underlying mechanism than a direct link between dependent variables. The Bao et al. (2004) study supports my hypothesis, as they do not find a clear one-directional link between urban, fringe, and the hinterland in their on urban-rural linkage.

In Geoda I re-estimated model 5 with a spatial error model. See Table 7-9 for the regression results.

Table 7-9 Model 8: Spatial Error Model

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.7392	0	0.4854	0	0.5203	0
Employment in 92	-1.19E-06	0.0000558	3.69E-07	0.1048959	1.54E-07	0.4901309
PCI in 92	-2.38E-06	0.072455	-1.33E-05	0	2.41E-08	0.9811421
Population in 92	4.87E-07	0.0005097	-1.53E-07	0.1569236	-1.43E-07	0.1752199
County MPDI 92	0.0078	0.1325672	0.0083	0.0304726	0.0021	0.5964885
State MPDI 92	-0.0781	0.2722423	-0.2653	0	-0.0878	0.1419616
SCI	-0.0043	0.0070785	0.0045	0.0000038	-0.0024	0.084338
Cty. Frag. St. Cons.	0.0137	0.3389262	-0.0001	0.9929669	0.0019	0.8624043
Cty. Frag. St. Frag.	0.0003	0.9763755	-0.0072	0.3639502	0.0083	0.3614532
Cty. Cons. St. Cons.	0.0081	0.4907853	-0.0024	0.7874126	0.0116	0.1948687
Cty. Cons. St. Frag.	-0.0111	0.2337159	-0.0151	0.027086	-0.0083	0.2432692
Business Tax	-0.0003	0.3552462	-0.0005	0.0135936	-0.0001	0.6643562
Individual Tax	-0.0002	0.5623974	0.0004	0.0431903	-0.0005	0.1072884
Benefit Ratio	-0.0766	0.0029902	-0.0101	0.6061288	-0.0157	0.4222227
Nonben. Ratio	-0.1213	0.0032325	0.0004	0.9891246	-0.0390	0.2158494
Right to Work	-0.0221	0.1321876	-0.0457	0.0000005	0.0125	0.3228232
Transfer Ratio	-0.0013	0.0000558	-0.0007	0.0060824	-0.0006	0.0189413
Cdev Ratio	-0.0021	0.0517789	0.0004	0.6612702	0.0008	0.3471484
Metro	0.0250	0.000204	0.0235	0.0000033	0.0245	0.0000016
Northeast	-0.0511	0.0233541	-0.0334	0.016931	-0.0442	0.0239516
Midwest	-0.0497	0.0051761	-0.0219	0.0490646	-0.0502	0.0009742
Northcentral	-0.0144	0.3206488	-0.0052	0.5630223	-0.0557	0.0000112
Gov. Exp. PC	-1.62E-06	0	-2.44E-07	0.2474933	-1.66E-06	0
Pct. Poverty	-0.0010	0.0903198	-0.0022	0.0000001	-0.0019	0.0000834
Pct. Over 65	-0.0080	0	-0.0015	0.0047338	-0.0083	0
Pct. With Bachelor	0.0015	0.3072052	0.0080	0	-0.0017	0.1259617
Pct. Nonwhite	-0.0027	0	0.0002	0.2670689	-0.0016	0
Amenity Scale	0.0129	0	0.0048	0.0025171	0.0103	0
LAMBDA	0.5504	0	0.3557	0	0.6495	0
R-squared:	0.41		0.27		0.6	
# of Observations	2595					

When model 5 is corrected for spatial dependence with a spatial error model, coefficients for governmental organization variables are weaker in their significance. The primary variables of interest in model 8, similar to the previous models, are the county MPDI, state HHI, and the interaction cases of county and state fragmentation. The coefficient for the county fragmentation variable is statistically significant and positive in the log of per capita income growth equation and marginally statistically significant and positive in the log of employment growth equation. The coefficient for the state fragmentation is statistically significant and negative in the per capita income equation, marginally statistically significant and negative in the log of population growth equation. The coefficient for the state organization is statistically significant and negative in the log of population and employment change equation as well as significant and positive in the log of per capita income equation. These results have not changed since the model has been controlled for spatial dependence. A larger change in coefficient significance is present in the coefficients for the four interaction cases. Controlling for spatial dependence with a spatial error model, the only significant coefficient is for case four, the consolidated county with a fragmented state. The negative sign of the coefficient, all else constant, provides the strongest evidence that economic growth is deterred by a combination of consolidated county government in a fragmented system of state organizational form. The coefficient on the spatially correlated errors (λ) has a positive effect and it is highly significant. By including a spatial error term in the model, the general model fit improved, as indicated in higher values of R-squared compared to the OLS model without correction for spatial dependence.

H. Alternative Measure of Interaction between State and County

In a previous section, I discussed in detail the justification for including an interaction term in my model. In summary, an interaction term allows me to test the different theoretical models of governmental organizational form. An alternative measure of the interaction between state and county organizational form to the previous case approach is to simply measure the interaction between state and county organizational form by multiplying state HHI with county MPDI. However, one danger in using multiplication in instrumentalizing the interaction term is the fact that multiplication does not take into consideration the commutative law of real numbers ($x*y = y*x$). In the calculation of the interaction term between state HHI and county MPDI, the interaction score cannot distinguish between a state HHI of 0.4 times a county MPDI of 2.5 and a state HHI of 0.25 times a county MPDI of 4. In the first case, the state and county are relatively fragmented, while in the second case both state and county are very fragmented. A careful overview of the data set revealed that most of the data falls within the above parameters of 0.25 to 1 in the state HHI and 1 to 4 in the county MPDI, thereby eliminating the extreme cases that would make an interpretation of the data impossible.

The advantage of using an interaction term based on multiplication is the fact that a multiplicative interaction term permits assessment of the impact of the interaction on a continuous case. In contrast to the discrete form of cases, where a county is either in case or not, the interaction term allows assessment of the trade off between state and local organizational form. In other words, what is the impact of a trade off from a fragmented local government with a centralized state government?

In order to assess the interaction between state and local government, I am using the MPDI method derived from government expenditures in 1992 instead of the HHI method to calculate the fragmentation within the state. I decided to use the MPDI to measure government fragmentation in the interaction case because I am more interested in the competition among local government units and not state economic policy. The MPDI places more emphasis on the smaller player in the economy, thereby allowing me to focus more thoroughly on county and municipal government units.

In addition, using the HHI method emphasizes the role of larger government units within the state in calculating the interaction between local and state fragmentation. There are two motivations for using the HHI in the interaction term. First, using the MPDI method in calculating all three fragmentation indexes I encountered correlation among the three variables. By substituting the HHI fragmentation index in the interaction term, I decreased the problem of correlation among my indexes. The simple correlation among county MPDI and the interaction term (State HHI * County MPDI) is still 0.85. The Variance Inflation Factor (VIF) is 9, which is below the critical limit of 10.

Second, in the interaction term I am interested in the interplay between state and local government organizational form. Measuring the interplay between state and local government units allows me test the Tiebout and Consolidation theory more thoroughly. In addition, by using the HHI as the measure of the state's distribution of economic power, I am giving more power to the state in the economic policy.

Table 7-10 Model 9: Fragmentation Index and Interaction term

	Log of Empl. Growth Rate		Log of PCI Growth Rate		Log of Pop. Growth Rate	
	Variable	P Value	Variable	P Value	Variable	P Value
Intercept	0.2958	0.0000	0.5419	0.0000	0.2722	0.0000
Employment in 92	-3.59E-07	0.1973	2.51E-07	0.1867	9.42E-07	0.0001
PCI in 92	-4.82E-06	0.0000	-1.13E-05	0.0000	-1.67E-06	0.0740
Population in 92	1.72E-07	0.1922	-1.04E-07	0.2489	-4.41E-07	0.0001
County MPDI 92	0.0268	0.0001	0.0292	0.0000	0.0304	0.0000
State HHI * Cty. MPDI	-0.0631	0.0000	-0.0374	0.0000	-0.0771	0.0000
State MPDI 92	0.0050	0.0000	-0.0002	0.8307	0.0037	0.0002
Business Tax	-0.0004	0.0243	-0.0002	0.0582	-0.0004	0.0155
Individual Tax	-0.0005	0.0046	0.0003	0.0051	-0.0003	0.0349
Benefit Ratio	-0.0276	0.2395	0.0152	0.3422	0.0178	0.3736
Nonben. Ratio	0.0305	0.3786	-0.0211	0.3725	0.0473	0.1091
Right to Work	-0.0515	0.0000	-0.0430	0.0000	-0.0195	0.0029
Transfer Ratio	-0.0008	0.0042	-0.0001	0.5667	-0.0001	0.5450
Cdev Ratio	-0.0004	0.6611	0.0007	0.2936	0.0017	0.0411
Metro	0.0263	0.0000	0.0153	0.0002	0.0290	0.0000
Empl. Lead 92	0.1267	0.0000	0.0028	0.3693	0.0294	0.0000
PCI Lead 92	0.0044	0.2723	0.0942	0.0000	-0.0119	0.0005
Pop. Lead 92	0.0326	0.0000	-0.0042	0.1799	0.0868	0.0000
Northeast	-0.0732	0.0000	-0.0466	0.0000	-0.0833	0.0000
Midwest	-0.0691	0.0000	-0.0453	0.0000	-0.0686	0.0000
Northcentral	-0.0069	0.3730	-0.0296	0.0000	-0.0464	0.0000
Gov. Exp. PC	-9.71E-07	0.0001	-7.36E-07	0.0000	-1.79E-06	0.0000
Pct. Poverty	-0.0029	0.0000	-0.0015	0.0000	-0.0042	0.0000
Pct. Over 65	-0.0041	0.0000	-0.0021	0.0000	-0.0057	0.0000
Pct. With Bachelor	0.0013	0.2881	0.0066	0.0000	-0.0029	0.0064
Pct. Nonwhite	-0.0010	0.0000	0.0002	0.0816	0.0000	0.7754
Amenity Scale	0.0127	0.0000	0.0021	0.0569	0.0128	0.0000
Adj. R-Squared	0.5		0.46		0.55	
F Value	97.4		84		126.8	
# of Observations	2595					

The primary variables of interest in model 9 are the County MPDI, State MPDI, and the interaction term of county and state fragmentation. The coefficient for fragmentation at the county level is statistically significant and positive in all three variables. The positive coefficient on the initial level of county fragmentation in all three equations, all else constant, supports the Tiebout hypothesis that fragmentation of government units at the county level is beneficial to economic growth. Counties that had higher government fragmentation in 1992 tended to experience higher economic growth over the next 10 year period.

This also supports the hypothesis that the benefits of fragmentation outweigh the costs. Households and firms seem to value the choice among different public goods and services more than the associated cost of efficiency in provision. Consolidation theory

contends an increase in fragmentation reduces economies of scale and scope, thereby reducing efficiency. The results in model 9 do not support this hypothesis, and indirectly contradict the consolidation theory, as the results only confirm that fragmentation is associated with higher economic growth.

The second important variable is the state fragmentation index, measuring the distribution of economic power among government units within a state. The coefficient for state fragmentation is statistically significant and positive in the employment and population growth equation, but statistically insignificant in the per capita income growth equation. Because I measure state organizational form with the MPDI instead of the HHI in the previous cases, a higher value in the state MPDI is indicative of a more fragmented system of state government compared to a more consolidated system of government in the HHI case. All else constant, counties in states with a more fragmented system of government in 1992 tended to experience higher rates of overall economic growth over the next 10 years. Counties in states with a higher initial fragmented distribution of economic power appeared to experience higher economic growth.

The third variable in model 9 is the interaction term between local and state fragmentation index. The statistically significant and negative coefficient for the interaction between county and state organizational form, all else constant, reinforces findings from models 4 and 5. Because the interaction term measures the current distribution of economic power between state and local government units, the coefficient for the interaction term measures the deviation from the existing distribution. The interaction term is a combination of state HHI and county MPDI. A higher score of HHI is indicative of lower levels of fragmentation within the state, while a higher score of

MPDI is indicative of higher levels of fragmentation within a county. The negative coefficients must be interpreted in the partial derivative way. In the case where the county MPDI score is high, indicative of a fragmented county, the negative coefficient indicates a preference for a more decentralized state organizational form. Fragmented counties in fiscally decentralized states in 1992 tended to experience higher economic growth over the next 10 years. Conversely, a combination of higher HHI score and higher MPDI, indicative of a centralized state but fragmented counties, is shown to be detrimental to economic growth. In the other case where the state HHI score is high, indicative of a centralized state, the negative coefficient indicates a preference for a more consolidated organizational form at the county level. Expressed in a different way, once a state is consolidated, economic growth is encouraged by a more consolidated form of county government. These results are similar to the findings from model 5, with the exception that in model 5 county fragmentation in combination with a consolidated state is beneficial to economic growth. Both models confirm that the worst case scenario is a consolidated county government in a fragmented state. This organizational form first delegates most economic and political powers to the local government units, thereby encouraging the destructive competitive behavior that advocates of consolidation project to occur. Second, because local government units are the sole producer and provider of government products and services, the exit cost for households and firms is substantially higher as the local government unit is a de facto monopolist producer. Monopolist producers are hypothesized to be less efficient and less responsive to the needs of households and firms, hence discourage economic growth.

Chapter 8 - Conclusion

The question of how government units should be organized to promote the economic well being of its citizens has been the topic of many discussions. The philosophers in ancient Greece were among the first to formally discuss the advantages and disadvantages of different forms of government. The founding fathers of the United States contemplated similar issues, a centralized versus a decentralized form of government, as today economists and political scientists are struggling to find answers for whether a fragmented system of governmental organizational form is beneficial or detrimental to economic growth.

The economic growth literature spans several decades of research on a whole range of potential influences on economic growth. Factors influencing labor or the location decision of households, such as education, taxes, demographics and most recently amenities have been investigated, in addition to factors influencing the location decision of firms, such as taxation, rules and regulations, and natural and artificial amenities. All these factors investigated by previous studies are in principal determined by government units at the federal, state and local level, with the exception of natural amenities and natural resource endowments. However, few studies have formally investigated the role of governmental organizational form in economic growth.

It is hardly controversial to assert that government units do matter in the economic growth prospects of local government units and regions. Government units set and enforce rules and regulations, produce and provide public goods and services, and determine tax rates for households and firms to finance official government functions. If government units are able to influence economic growth, then the variation in

governmental organizational form will provide additional information on what organizational form is best suited to encourage economic growth.

The U.S. has 50 distinctly different states, and more than 3000 different local government units. Each state, in combination with the variation in local government units, such as counties, boroughs, townships, and special purpose governments, represents an almost complete assortment of potential combinations of governmental organizational form. Based on this rich dataset and the assumption that governmental organizational form matters, this dissertation formally investigated first, whether competition among government units is beneficial or detrimental to economic growth, and second, what governmental organizational form encourages efficiency-enhancing competition. The role of competition follows directly from Tiebout's (1956) and Schwab and Oates' (1991) theory that citizens' and firms' mobility, in combination with the competition among government units, encourages efficiency in the provision of public goods and services.

The relationship between organizational form and economic growth is of indirect form. Good government units provide and produce the public goods and services needed by households and firms to succeed. Following Tiebout (1956), only competition among government units allows households and firms to compare and contrast different government units' production and provision efficiency as well as identifying the public goods and services bundle offered, which is closest to their own preferences. The government unit that succeeds in offering the most efficient, as well as the bundle of, public goods and services that allows for maximizing households' utilities and firms' profits will see an immigration of households and firms to within its boundaries.

In order to test whether competition among government units is beneficial or detrimental to economic growth, I employed the Carlino-Mills (1987) model, expanded to three equations, with employment, population, and per capita income growth as the dependent variables. The independent variables included variables characterizing the labor market and demographics as well as initial conditions. A central point in my dissertation and advancement in the literature was to instrumentalize the theories in cooperative federalism, fiscal federalism and decentralization, as well as competitive federalism, by creating new and better-suited indexes of governmental organizational form. Until now, research on the role of government in economic growth, and in general research on governmental organizational forms, has lacked a clearly defined measure of governmental organizational form. Simple measurements, such as government units per capita and land area, did not fully incorporate the multifaceted aspect of government units' influences on economic growth. I proposed and employed new techniques to measure governmental organizational form.

In order to measure the multifaceted aspect of government units, I employed several variables to represent the various governmental organizational forms. First, I measured governmental organizational form at the county level, assessing whether a county has a fragmented or consolidated form of government, by calculating the metropolitan power diffusion index (MPDI) proposed by Miller (2002). Second, I measured governmental organizational form at the state level by calculating the Hirschman-Herfindahl Index (HHI). Third, I evaluated whether states delegate some of their authorities to local government units by using the State Centralization Index (SCI) proposed by Stephens and Wikstrom (2000). Fourth, I assessed the interaction between

state and county organizational form by computing four distinctly different cases of state-county interaction – (1) fragmented county with a centralized state, (2) fragmented county with a decentralized state, (3) consolidated county with a centralized state, and (4) consolidated county with a decentralized state. All four cases represent different theoretical approaches to governmental organizational form. In addition to the governmental organizational form variables, I included variables measuring local government public finance options by measuring the percentage of benefit and non-benefit taxes as well as the ratio of intergovernmental grants to total revenue.

The first step was to estimate the Carlino-Mills model with governmental organizational variables previously used in economic growth models. Results for government units per land area confirmed previous findings that fragmentation is beneficial to economic growth. Results for the most commonly used measure of governmental organizational form in previous research, government units per capita, confirmed previous findings that fragmentation is detrimental to economic growth. Both measures of governmental organizational form suffer from a critical shortcoming. Government units per capita and land area do not distinguish between different levels of government, such as county and township, in terms of their power to influence the local economy. In addition, many smaller government units, primarily in the Midwest and Northcentral, do not have any political and economic power at all. Including these government units in a measure of governmental organizational form biases the regression results in favor of more consolidation.

In this study, I used a technique from industrial organization to measure a firm's market power and applied it to measure the economic and political power of government

units with a county. Based on the assumption that government expenditures are a good indicator and proxy for the economic and political power of a government unit, I measured governmental organizational form by employing the Hirschman-Herfindahl Index (HHI) and the Metropolitan Power Diffusion Index (MPDI). These two techniques are superior to government units per capita and land area techniques because they take into consideration that larger government units will have more potential influence on economic growth prospects than smaller government units. Therefore, the models based on MPDI and HHI are better and more capable of providing the necessary insight for future policy recommendation.

I estimated the Carlino-Mills models with a combination of governmental organizational form indicators based on the HHI and MPDI indicators. Regression results incorporating the MPDI for the county level and the HHI for the state level confirmed theories of the benefits of smaller, fragmented, and competitive government units over larger, consolidated government units for economic growth. Proponents of consolidation contended that the advantage of economies of scale and scope should motivate government units to consolidate. However, government units may forgo efficiency gains from consolidation for more local control over government finances and expenditures. Regression results from the interaction case model confirmed the significance of the state-county interaction in governmental organizational form.

Regression results clearly pinpointed the county-consolidated/state-decentralized case as the worst organizational form of state-county interaction. In the case where a county is consolidated, a centralized form of state government is preferred over a decentralized form of state government. Furthermore, in the case of a fragmented county

form, a centralized state government is preferred over a decentralized state government. The results from the interaction term confirmed the advantages of a fiscally decentralized system of government. While the inclusion of the interaction term reduced the significance of the county level variable, state level organizational form remained significant, thus confirming the relative higher significance of the state for economic growth than local government units.

In summary, the combination of a consolidated county with a decentralized state seems to be the most detrimental to economic growth, while a fragmented county with a centralized state seems to be the most beneficial to economic growth. The two extreme cases, a completely fragmented system of government (fragmented county with a decentralized state), and a completely consolidated system of government (consolidated county with a centralized state), are either not statistically significant or only marginally significant. However, none of these results point towards the detrimental effect of a fragmented system of government. In both fragmentation county cases, the coefficients are positive and statistically significant or not significant at all. In addition, the consolidation cases are either negative or not statistically significant as well. Therefore, the hypothesis that a consolidated form of government is better for economic growth cannot be supported by this study. In contrast, a fragmented system of local government is either beneficial or at least not detrimental to economic growth.

This result confirms Holmes' (1998) hypothesis that state economic policies have a significant impact on economic growth. Hence, state organizational form is an important contributor to economic growth. In the model, two different indexes were employed to measure and capture state organizational form. The state HHI measures

how much economic and political power has been delegated to local government units. In addition, the state centralization index (SCI), introduced by Stephens and Wikstrom (2000) measures how much independence local government units enjoy when pursuing economic growth policy. Both indicators, state HHI and SCI, are consistently significant and negative, reconfirming the hypothesis that all else constant, a centralized state organizational form is detrimental to economic growth. What this means is that all else even, a decentralized system of state government is better for economic growth than a centralized system of government, when county organizational form and the interaction between state and county organizational form is not considered.

Similar to production theory in private markets, the efficient size of government is determined between the benefits of economies of scale and scope and the costs of size and heterogeneity of preferences. Kohr's (1978) hypothesis of "diseconomies of size" and Schumacher's (1999) hypothesis of "small is beautiful" seem to be valid in governmental organizational form. Fiscal and competitive federalism envisions local government units as the cornerstone and foundation of an efficient and responsive form of governmental organizational form. The closeness of political and economic authority to households and firms ensures the close match of their preferences for government's public policies and the actual production and provision of needed public goods and services.

The discussion to this point on whether competition among government units is beneficial or detrimental to the efficient production and provision of public goods has implicitly taken as given a set of governmental units and its boundaries. Alesina and Spolaore's (2003) model on the size of nations provided us with the theoretical

underpinnings for determining the efficient size of government. However, in reality, boundaries of government units are largely historically determined. The earlier settlement of the eastern part of the U.S.A. and its implications for governmental organizational form are apparent in a three-level system of government with townships, boroughs, and counties. In addition, topology, climate and vegetation have influenced the shape and size of government units. For example, Pennsylvania's counties often follow the shape of the Appalachian Mountains, counties in plains states such as Nebraska are often rectangular, and counties in the desert Southwest can reach the size of an entire state in New England. Examining the map of the United States and its states, counties and municipalities, one will find that rivers and topology have influenced the shape and size of government units, particularly in the eastern U.S. Rivers were historically used to set boundaries for government units. Today, with a larger emphasis of government functions on public goods, such as pollution or transportation, boundaries defined by natural obstacles such as rivers or mountains are less appropriate. Oates (1999) concludes, "it would make much more sense to place such resources within a single jurisdiction" (pg. 1131). Unfortunately, political boundaries of counties and states have not changed to accommodate the new geographical considerations.

In addition, regression results confirmed the significant impact state organizational form as well as state economic policy has on economic growth. Economic growth in one county may be significantly influenced by economic policy in another county or even state. In statistical terms, a spatial dependence exists in the data. In order to control for this spatial variation in economic policies across counties and states, the model was expanded to include spatial control variables. A spatial error model was used

to control for spatial dependence. Results from the spatial error model reduced the significance of governmental organizational variables in the interaction case model, but are consistently significant in the interaction term model. Similar to the regression results from the ordinary least squares estimation, results from the spatial models do not confirm the detrimental effect of fragmentation on economic growth. However, the regression results do not provide clear evidence for the beneficial effect of government fragmentation.

Chapter 9 - Post Script

Regression results indicated that state organizational form might be the most important government variable in determining economic growth besides initial conditions, labor market characteristics, amenities, and demographics. These results did not come as a surprise. In general, local government units do not have the economic power and size to influence economic growth on a larger scale. However, local government units serve an important role in governmental organizational form as one of the foundations of a decentralized system of government. Fiscal federalism theory delegates significant powers to local government units in determining the appropriate level and direction of government programs. This brings us to a very important question on the role of local government units in the economic system: Are local government units mere distributors of state and federal public policies, only concerning themselves with petty local policies insignificant for the economy?

Two political economists, Hirschman (1970) and Kohr (1957, 1978) provide important insights into the role of local government and the role of size. Kohr, in his books *Breakdown of Nations* and *The Overdeveloped Nations*, attributes many of the failings of modern societies to their excessive size. The basic premise of his theory is that with an increase in size, the expanding problems of scale outpace the necessary advancement in human intelligence and technology to control the important aspects of the economy effectively. Kohr (1978) asserts

“from an individualistic point of view, society must fulfill a fourfold purpose: ensure to its members companionship, prosperity, security, and culture. For these are the only four blessings man cannot obtain except by joining society. We may therefore distinguish between four individualistic societies – the convivial, economic, political, and cultural society” (pg. 23-24).

Similar to biological systems, an economic system increases in complexity not linearly but exponentially. Beyond a certain critical size, which is dependent on technology, education, and organizational form, social difficulties increase faster than human talents and abilities necessary to cope and control the social and economic system. In order to sustain further growth, human resources previously employed in a productive form are delegated to keeping the economic system from collapsing and destroying itself. Kohr (1978) concludes that the originally individualistic society changes to a collectivistic society with the purpose being social health, power, or “anything pleasing to their collectivist ego” (pg. 24).

So what determines the optimal size of an economic system, such as a local government unit? Kohr (1978) states “as in the case of all things subject to choice, it is in the first place a matter of taste and temperament. ... no one can say objectively that one is better than the other” (pg. 47). Kohr (1978) attributes the governmental organizational form of the U.S., a union of 50 separate states with distinctly unique characteristics in terms of natural endowments, demographics, and historical influences, as one of the key economic drivers of its economic growth. Kohr (1978) believes that the decentralization of the United States into 50 different states and over 3000 local government units of different sizes and characteristics allowed for the reduction of social and economic problems associated with a well-developed nation into humanly manageable-sized problems instead of one enormous national problem managed in Washington, DC.

Advocates of consolidation contend that the economies of scale and scope of consolidated government units will outweigh any benefits from a more fragmented, local approach to government. However, what proponents of consolidation fail to

acknowledge are two shortcomings in their theory – (1) the human element and (2) diseconomies of size. The human element in consolidation theory is based on two unrealistic assumptions: omni-knowledge and benevolence of government bureaucrats. In the case where bureaucrats are omni-knowledgeable and benevolent, economies of scale and scope could outweigh many of the benefits of smaller scale. But, human knowledge, even with new technologies, cannot keep pace with the geometrical increase in economic and social problems associated with increasing size. Whether bureaucrats are benevolent or not is a philosophical question beyond the scope of this dissertation. In addition, economic theory on optimal size of firms has shown that there exists a critical level in any firm where diseconomies of scale set in and outweigh any potential gains in economies of scale and scope by an increase in size. I hypothesize that government units adhere to the same economic principles.

The critical mechanism of competitive federalism, and the mechanism that advocates of a fragmented system of government rely on, to encourage and ensure efficiency in production and provision of public goods and services as well as responsiveness of government units to the needs of households and firms is mobility among political entities. According to Tiebout's (1956) model, primarily households, and to a lesser degree firms, are assumed to be responsive to the changes in the quality of government goods and services. Oates and Schwab (1991) expanded the Tiebout model to include firms in the political mobility mechanism. However, the economists' and political scientists' perspectives of how responsive households and firms are, and to what degree they respond to changes, is quite different. Economists, including competitive federalists, typically assume that dissatisfaction with a local government unit is met by

withdrawal or outmigration, an exit strategy. In contrast, political scientists generally assume that households and firms use protest to voice their dissatisfaction with a government unit.

Hirschman, in his 1970 book *Exit, Voice, and Loyalty*, pulled together the two opposing views in a general theory of responses to the decline in the quality of products and services offered by firms, organizations, and states. Competitive federalism generally assumes that local government units react in the same manner as firms would react to a decline in revenue by refocusing energies to improve quality of public services offered. However, local government units, and to a lesser degree state governments, are less receptive to revenue changes than competitive federalism theorizes government units to be. There are several reasons for the lower level of response to outmigration of households and firms.

Unlike firms in a competitive marketplace, local government units are not entering and exiting the public market in a similar manner as firms are able to respond to changes in the private market. Local government units in the U.S. are often historical government organizations formed under different premises. While a firm's primary objective in a competitive market is profit maximization, the role of government units is to produce and provide certain public services and goods that wealth-maximizing individuals and private markets are unable to produce and provide separately. Government units are not primarily driven by profit maximization, but by providing and producing public goods and services to households and firms in response to their needs. In addition, the size of local government units was originally not determined by the trade off between the benefits of economies of scale and scope and the costs of heterogeneity,

but historical settlement patterns and, as Burns (1994) contends, the expression of private values in public government units. Lastly, and further complicating the potential responses of local government units, are the state-specific rules and regulations for the formation and disablement of government units.

Competitive federalism theory, similar to competitive market theory for firms, indirectly assumes the entry and exit of government units into the market for households and firms. This assumption is generally very restricted in the eastern states of the U.S. For example, in Pennsylvania the entire state is divided into townships where each tract of land falls within the jurisdiction of a specific government unit. Hence, the potential for exit of government units is limited to the merger and consolidation of government, while entry is limited to the splitting of an existing government unit. In contrast to the first example, states with large unincorporated areas within the boundaries of a county allow for easier entry of government units.

Following Kohr's (1978) and Alesina and Spolaore's (2003) theories, there is an optimal size of government, where the economies of scale and scope are exhausted and diseconomies of size have not set in. Similar to production theory, the cost curve of government production and provision of public goods and services is U-shaped. Beyond the critical level of size, the costs outweigh the benefits of size. But unlike in production theory where firms adjust up- or downward toward the optimally efficient size in the long run, government units are much more restricted in their adjustment process. In private markets, a firm's entry and exit decision is generally not subject to other influencing factors, while in contrast, local government units are subject to a whole set of mitigating factors.

Following Hirschman's (1970) hypothesis, households and firms have a substantial stake in their local government unit. Most households generally own some sort of real estate and, in addition, households with children and family have substantial personal ties to the government unit, and last but not least, households have jobs within the region. Similarly, firms within a local government unit have capital invested in the community and company-specific trained employees who are an important asset in their success. All these factors mitigate the potential mobility of households and firms among political entities by increasing the cost of exit.

Hirschman (1970) theorizes that households and firms have two options – exit and voice. But unlike in private markets, the exit option is substantially riskier and more costly in the market for government units than in private markets. The cost involved in the exit strategy, such as selling real estate, leaving family and finding a new job for households, and selling capital and finding well-qualified employees for firms, increases the threshold cost of exit. Hirschman (1970) concludes that households and firms have a second option, a complement to exit but with similar recuperating powers, *voice*.

The voice option has several characteristics that make it a better option in certain circumstances. First, voice is an attempt by households and firms to change the existing power structures, practices, and policies to better conform to one's preferences. Second, voice is a complement to exit. In contrast to exit, the voice option has net gains to society. In the exit option, households and firms leave without making an attempt to change the government unit, thereby not allowing for the recuperation from the lapse in quality. Once a household or firm leaves, the voice option is not available. In contrast, voice allows for the attempt to change the local government unit, but if unsuccessful, the

exit option is still available. Hirschman (1970) concludes that voice is the first option or stage; the second stage is exit, once everything else fails. It is important to note that the voice option is only a powerful tool if the exit option is available at some later point.

Following Hirschman's (1970) theory, competitive federalism and Tiebout's (1956) model of political mobility are still valid models of how competition among government units is beneficial to economic growth. Households and firms will still exit non-performing government units, however the time before the exit option is prolonged by the existence of the voice stage and by the trade off between the benefits of entry into a new government unit and the cost of exiting the exiting government unit. Hirschman's (1970) theory revealed several influential mechanisms in the exit-versus-voice choice by households and firms, but primarily households. The optimal household in the voice option is a household which is deeply involved in the community and wants to do something about the problems facing the government unit. Hirschman (1970) hypothesizes that the most likely candidates for the voice option are households which have a high stake in the community. They are the households that care most about the quality of public goods and services and are the most viable, active, and reliable members of the community. But, they are also the first to exit a government unit.

Why are the households with the highest stake in the community the first to exit. At this point, Hirschman's (1970) theory deviates from standard economic theory. Unlike in economic theory where the marginal consumer/producer drops out first, in the case where a decrease in quality cannot be expressed as an equivalent price increase and the consumer/producer is very sensitive to quality, the consumer/producer who is the most quality sensitive will drop out (exit) first. For local government units this means the

high quality consumer, who cares deeply about the policies pursued by local government units, will leave first.

The timing of the exit by what I call high quality households fully depends on the substitutability of local government units. In a highly fragmented system of government, high quality households have a larger variety of government units to choose from than in a consolidated system of local government, making the exit option less costly. In addition, the quality of local government units is not on a continuous scale, but on a discontinuous scale. High quality households, Hirschman (1970) hypothesizes, will tend to move to higher quality local government units, while the inert households stay put. Exaggerating this effect is the natural tendency of a lower density of households at higher levels of quality and higher density of households at lower levels of quality. Expressed differently, the number high quality households, who care about the community and are active and involved in the community, decreases continuously as the quality of households increases. Vice versa, the number of inert households increases as the quality of community involvement decreases. What this means is that once high quality households, who are the most viable source of economic growth for the community, leave, the remaining quality of households decreases significantly with each household exit.

In addition, the voice option entails a significant amount of benefits spillovers for the entire community. If high quality households change policies and practices that benefit the entire community, the voice option encounters public goods problems, mainly a free rider problem. Both high quality households and inert households benefit from a public policy change. Whether high quality households engage in the voice option

depends on who will accrue the highest amount of benefits from the change. In the case where benefits accrue in large portions to the inert households, high quality households will be less inclined to engage in the voice option and more inclined to invest more energy in ensuring the benefits primarily accrue to high quality households. Depending on the state organizational form, households in states with no unincorporated land may create separate special districts, while households in regions with unincorporated land will create new communities within the boundaries of the existing local government unit or county. In either case, only high quality households will benefit from the voice option, reconfirming Burns' (1994) hypothesis of private values in public places. In the case where neither option is available to high quality households, high quality households will invest their energy in finding the right alternative location for the exit option.

Hirschman's (1970) theory has important implications for the organizational form of local governments and the competition among government units. Following and expanding Hirschman's (1970) logic for local government units, there are, in principle, three types of local government units – (1) high quality government units, (2) mixed government units, (3) low quality government units, with each type of government unit incurring different levels and types of economic growth.

First, there are local government units with high quality households. These households care deeply about the quality of public goods and services, and they are active and involved in the community and reliable agents for ensuring quality. The leadership in the local government unit is open to critique and change, thereby ensuring efficient production and provision of public goods and services needed for utility maximization by households and profit maximization by firms. These government units will be the most

successful in attracting new households and firms. Florida's (2005) book on the flight of the creative class may be a symbolic expression of the change in attitude towards government by active, involved, reliable households. Households that are deeply interested in the community will eventually exit a non-performing local government unit in favor of a government unit more in line with their preferences.

Second, there are government units where high quality households are in the minority and their voice cannot be heard. In this case, a reform in local governmental organizational form towards a more fragmented system of government may provide high quality households with the platform on which to exercise their voice option. A system of consolidated government units may take advantage of economies of scale and scope and mitigate the problems with public goods and services, but with each increase in size households and firms lose their ability to voice. Similar to a group of people, when few people meet, everyone is able to hear each other, but with each additional person, the voice of one person is not loud enough to be heard, until several separate groups form with each group having a separate conversation. Therefore, one viable solution to increase the involvement of high quality households is to give them a platform for voice by decreasing the size of government units. The economic growth prospects of these government units depend on the organizational reforms being implemented to ensure the active involvement of households and firms in the local economy.

In the third case, high quality households have left the local government unit and the majority of households can be characterized as inert households. In this case, no governmental organizational form can ensure more caring, active, and reliable households. What has happened in these local government units is the worst case

scenario that Hirschman (1970) hypothesized. In the case where local government units are unresponsive to the voice by households and firms, and the threshold of exit is not high enough to keep the households and firms in place, the local government unit will experience an outflow of the highest and most valuable members of the community. With each exit, the threshold for future exit is lowered. The number of the high quality members, who would engage in voice, decreases to the point where the remaining majority of households can be characterized as inert. However, as I hypothesize, there is a certain point where the exit of households and firms stops. Either no firm is present in the local government unit and/or the exit option for households is no longer viable, as the cost of exit outweighs any future potential benefits from a new location.

Hirschman (1970) introduces the last concept in his theory, *loyalty*. Loyalty to a local government unit increases the cost of exit up to a point where exit is no longer an option. Loyalty attaches a household to a specific area regardless of the cost and consequences involved. In the third case, the households remaining in the local government unit have such high levels of loyalty that exit is not a viable option. In addition, outside factors such as amenities, demographic characteristics, and social welfare programs may increase the cost of exit as well. Local amenities such as climate and natural beauty provide households high amounts of utility so that households are either unresponsive to the change in quality of government, or the loss of amenity utility by exiting the local government outweighs any future benefits.

Furthermore, demographic characteristics may play an important role. In contrast to Hirschman's (1970) hypothesis of the "chance of voice option versus the certainty of exit" (pg. 39), I hypothesize in the case of local government units it is the opposite for

households. The staying and voice option is much more secure than the uncertainty of the exit option. Once again, high quality households have much more to lose than inert households by not exiting in terms of losing utility, because high quality households receive a significantly larger portion of their utility from the quality of local government. As a consequence, high quality households are more inclined to risk an exit than inert households, where the potential gain of utility at the new level may not outweigh the costs of exit. Hirschman (1970) recognized this phenomenon when he states “loyalty is at its most functional when it looks most irrational, when loyalty means strong attachment to an organization that does not seem to warrant such attachment because it is so much like another one that is also available” (pg. 81).

Last but not least in determining the costs of exit are public finance considerations. State governments have well-intended social welfare and intergovernmental transfer payments to equalize financial capabilities of local government units. However, in the third case, any transfer payment acts more like a subsidy in a private market. The transfer payment keeps a local government unit in business. It allows the local government to provide and produce public goods and services similar to any other local government unit, but without linking the benefit with the cost. As a consequence, local government units are not held responsible for their actions, but rewarded for their inability.

Chapter 10 - Public Policy

This study has shown that how a government unit, in our case a county, is organized has important implications for future economic growth. A county's and state's organizational form is statistically significant in the simple model without the interaction between state and county. In the model with interaction cases, a county's organizational form was less statistically significant, however, the interaction term and cases were highly statistically significant. This model has shown that a fragmented system of government is at least not detrimental and at the best beneficial to economic growth. Based on the results from this study, there are several possible public policy recommendation that could be made.

Based on Oates' (1972) decentralization theorem which states that in the absence of cost benefits from consolidation a decentralized system of government is at least as pareto optimal as a centralized system of government, a proposed consolidation of government units has to overcome a significant hurdle in convincing public policy officials. While this model has shown that a fragmented system of government is not detrimental to economic growth, the theoretically possible cost savings from consolidation are often hard to come by. The consolidation of government units and in particular the consolidation of existing government structures, such as townships and boroughs, into a single government structure is often associated with significant losses of political and economic power of existing public officials as well as constituents of these local government units. In these cases, approval for consolidation, often through a referendum, is only possible by ensuring each constituent group a say in the new consolidated government structure. The resulting government structure may be even

more complicated and unresponsive to the needs of households and firms, due to the fact that each previously independent constituent group of a local government unit is now engaged in a struggle to maintain and increase political power.

In order for competitive federalism to work properly, local government units must be allowed to enter and exit the market as freely as firms enter and exit in competitive markets. The long standing tradition in the eastern U.S. that each tract of land must fall under the jurisdiction of a local government unit besides the county does not allow for competitive forces to come into play. In states where large unincorporated tracts of land exist, the creation of new local government units encourages the formation of competitive forces in the public economy and thereby does not diminish the competitive position of the local economy. Economic forces are primarily hindered by oversized local government units that are unresponsive to the local needs, not representing the preferences of households and firms, and have outgrown the optimal size where economies of scale and scope are outweighed by the diseconomies of size. In order for local government units to function properly, households and firms must have both a voice and exit option available to them. Voice or exit by itself is not a viable recuperation mechanism in returning the local government to a quality producer and provider of public goods and services.

Local government units are the cornerstone and foundation of a prosperous economy. Local government units, like all forms of government, derive their power from the willing consent of its households. Households give up some of their freedoms in order for the production and provision of public goods and services that households by themselves and private markets alone would not be able to produce efficiently. As a

consequence, local government units are designed to be a representation of the preferences of its citizens (households).

In the competitive federalism theory, local government units are subject to the same economic principles as firms in private markets. In reality, however local government units are not subject to the full forces of competition. Unlike the generally unrestricted entry and exit of firms in private markets, local government units are subject to a very restricted environment for the entry and exit of government units. In order for competitive forces to come into play in ensuring a more efficient and responsive production and provision of public goods and services, states must allow local governments to enter and exit the public market with relative ease. Only when local government units are a close representation of the preferences for public policies by households and firms will households become high quality citizens, who are active, involved, and reliable as well as viable parts of the local economy.

Similar to production theory in private markets, there is a trade off between the economies of scale and scope and the diseconomies of size. Therefore, the efficient size of government units cannot be universally determined, but is highly dependent on the environment and local circumstances. In order for households and firms to maximize utility and profits respectively, the size of government units must be above the minimal size to ensure economies of scale and scope, but below the maximum size to avoid diseconomies of size. The trade off between the benefits and costs of size determines the question whether local government units should consolidate into a single large government unit or even split into several smaller government units.

There exists a range of potential policy recommendations. Depending on the size of the government unit, consolidation may be the best option, while for another government unit a more fragmented system of government may be even better. This study assumed a linear relationship between government fragmentation and economic growth. However, the relationship between fragmentation and economic growth can be better characterized by a non-linear relationship. Applying production theory to public economies, economies of scope and scale are the highest at the early stages of consolidation and decrease with an increase in size. At the same time, the benefits for a fragmented system of government are low for small government units and increase with the size of government units. Therefore, there exists a theoretical lower and upper bound for consolidation and fragmentation.

Similar to one of the conclusions in the Brookings Institution Report (2003), there is a need for consolidation in states with a high number of small independent government units. But unlike the authors of the Brookings Institutions Report, who advocate a more general consolidation of government units in Pennsylvania, the case for consolidation is limited to government units below a certain critical level of size. Therefore, there needs to be a stringent set of requirements that must be met before consolidation is the appropriate step to ensure a more efficient, but more importantly a self sufficient government unit.

Historically, many local government units were founded as a response to an increase in the population and to ensure local control of public policies. Declining populations in these government units have left the local government unit in a situation where the expenditures for basic public goods and services have outgrown the local

revenues-raising power. Thus, the local government unit has fallen below the critical level of sustainability. Only intergovernmental transfer payments from the state and the federal government allow the local government unit to provide the basic public goods and services. It is important to note that I am referring to the basic government services, such as infrastructure and education. Therefore, the question arises whether consolidation of government units may help alleviate the troublesome financial situation of the local government unit.

In these cases, besides the local resistance to be merged with another government unit and losing local autonomy, there should be no reason on why the local government units should be disbanded and merged to form one economically and financially sound government unit. This necessary reorganization of government structures is primarily hampered by state policies regarding the formation and disbandment of government units. In particular, rules concerning the disbanding of government units have hindered the necessary size adjustment process in government units.

In the same way the downward adjustment process in government units is necessary for the survival of small local government units, the adjustment process in the formation of new government units is necessary to encourage and promote economic growth in excessively large government units. In the case where a government unit has reached the upper bound in effective consolidation, an adjustment process to divide government units into smaller government units is necessary. When diseconomies of size outweigh the benefits of scale and scope there exists the theoretical foundation for the formation of new government units within an existing government units. Political scientists generally agree that many of the problems of inner cities in the U.S. are

indicative of a lack of local control over public goods and services. See Feiock (2004) for an overview of the arguments.

A special case in the discussion on whether government units need to consolidate or become more fragmented is the occurrence of amenity or location rents. Brennan and Buchanan (1980) point out that government units with no or very limited possibility for amenity rents are required to be the most efficient and most responsive government unit in order to stay competitive in the market for households and firms. In particular, households may receive a significant amount of utility from local amenities and locale-specific attributes that may compensate them for inefficient and unresponsive government units. In other words, households will tolerate unresponsive and inefficient government units and may even move to these government units with the expectation to be compensated with high amenity values and location rents. Local government units in areas with more sunshine and warmer temperatures have seen a significant increase in population, and research, on migration and amenities (McGranahan 1999, Shields et al. 2004) has confirmed a the significant contribution of amenity value differences to the migration decision of households. In contrast, local government units in regions with less sunshine and colder temperatures are at a comparative disadvantage. As a consequence, local government units with fewer amenity values and location rents are forced to compete primarily on the efficient production and provision of public goods and services. These local government units have to be very responsive to the needs of households and firms and try to produce and provide the public goods and services bundle ensuring high utility and profit levels, respectively.

An integral part of ensuring the competitive position of local government units in low amenity areas is to conform to the needs of household and firms. Therefore, a system of fragmented government units that is able to meet the specific local demand for public goods and services is preferred over a centralized system. However, local government units must find the delicate balance between local responsiveness and the efficiency requirement of economies of scale and scope.

Any discussion on reorganization of local government units must therefore include a broad discussion on both the necessary consolidation of small government units and the necessary fragmentation of large urban government units. Governmental organizational form obeys in principle the same economic theories and industrial organizations. There exists in theory an efficient size for each potential combination of natural endowments, amenities and demographics.

This study serves as the foundation for potential future work on governmental organizational form. Future research needs to, first, re-evaluate previous research on governmental organizational form to include more sophisticated measures of governmental organizational form, such as government fragmentation and urban sprawl, income inequality, and government efficiency. One key finding of this study is the fact that simple measures of government fragmentation may bias research findings in accepting the notion that fragmentation is detrimental to economic growth, therefore persuading public policy makers to see consolidation as a potential solution to many pressing issues local government units face today.

One area of research where future studies may have profound impacts on how government units at the sub-state level are best organized is at the metropolitan level.

Metro areas in the U.S. range from highly fragmented to very consolidated. Some of the most pressing issues concerning economic growth are especially important for metro areas in the Northeast and Midwest, where the decline in the manufacturing sector and the subsequent out-migration of people has had important effects. Future research needs to re-examine the role of governmental organizational form on economic growth in metro areas. Findings from this research may guide public policy makers in making the best reforms in metropolitan government structures.

An important long-term research project is to investigate whether amenities in the South, West, and Southwest are merely covering inefficiencies in current government structures. Future research needs to evaluate the potential interaction between amenities, such as topology and natural climate, and the efficient size of government units. Topology, especially may provide additional information on the efficient size of government units.

Economic growth is one of the most important foci of public policy makers. There have been numerous theoretical and empirical studies that looked at the factors and policies that could positively impact economic growth, such as infrastructure, education, taxes, etc. However, while there is a good sense of what government units might do or not do to affect economic growth, there is a clear lack of information on how governmental organizational form itself affects economic growth. This dissertation offered a comprehensive overview of the relevant literature in economics, political science, and public finance, as well as a robust and rigorous empirical test of the relationship between governmental organizational form and economic growth. An important key in studying this relationship between government units and economic

growth was to utilize several new measures of government fragmentation to accurately represent the multifaceted aspect of governmental organizational form. Simple measures of governmental organizational form may mask or bias regression results in favor of one theory on organizational form over the other. This study serves as the foundation for future research on governmental organizational form and economic growth by providing an overview of the relevant literature, introducing new techniques in measuring government fragmentation, and employing this new techniques in a well tested model on economic growth.

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Appendix 1: Summary Statistics

Variable	N	Mean	Std Dev	Minimum	Maximum
Log. Empl. Growth (1992-2002)	2619	0.1145291	0.1386085	-0.5108256	0.8819176
Log. PCI Growth (1992-2002)	2595	0.3613984	0.0947379	-0.8803168	0.9157892
Log. Pop. Growth (1992-2002)	2595	0.0738111	0.1267565	-0.6545323	0.8586904
Gov. Units	2620	13.5343511	13.6487591	1	151
County MPDI 1992	2620	2.2243358	0.8776021	1	6.6704073
State HHI 1992	2620	0.3588931	0.1008165	0.172824	0.6355413
SCI	2620	55.3343511	4.6347216	47.8	71.1
Pol. By Exp. 1992	2620	0.6937815	0.214574	0	0.9999994
Pol. By Pop. 1992	2573	0.4974736	0.2603122	0	0.9999093
Employment in 1992	2619	31755.21	89123.62	75	2387787
PCI in 1992	2595	16436.24	3388.63	6760	37699
Population in 1992	2595	67604.32	186006.98	127	5199839
Amenity Scale	2620	-0.5113511	1.7019152	-6.4	6.05
Business Tax	2620	25.1469466	14.592131	1	50
Individual Tax	2620	24.1251908	14.1596329	1	50
Right to Work	2620	0.6492366	0.4773001	0	1
Benefit Ratio	2620	0.4966701	0.1646302	0.041912	0.9011429
Nonben. Ratio	2618	0.1086692	0.0937578	0.00053749	0.665315
Transfer Ratio	2619	0.2527583	0.1529605	0.0028024	0.8085435
Cdev Ratio	2620	0.8565077	2.1005178	0	37.2837689
Empl. Lead 1992	2620	0.4648855	0.4988607	0	1
PCI Lead 1992	2620	0.4805344	0.4997163	0	1
Pop. Lead 1992	2620	0.4293893	0.4950835	0	1
Pct. Over 65	2595	15.0634609	4.4173734	1.5566156	32.0149133
Pct. Nonwhite	2595	12.199171	15.2482278	0	86.3054385
Pct. With Bachelor	2595	5.6593353	2.5511936	0	23.768711
Pct. Poverty	2595	16.2770898	7.8764114	0	55.5999032
Gov. Units per Capita	2595	7.7302644	14.3293933	0.014088	289.351852
Gov. Units per Sq. Miles	2620	0.8838206	0.9079506	0.0124688	11.7048338
StateHHI*Cty.MPDI	2620	0.81267	0.4249432	0.172824	2.8129941
Gov. Exp. PC	2595	25720.81	9932.29	1622.5	207380.59
Northeast	2620	0.0748092	0.2631334	0	1
Midwest	2620	0.1656489	0.3718361	0	1
Northcentral	2620	0.2354962	0.4243895	0	1
South	2620	0.5240458	0.4995168	0	1
Cty. Frag. St. Cons.	2620	0.071374	0.2574978	0	1
Cty. Frag. St. Frag.	2620	0.1351145	0.3419111	0	1
Cty. Cons. St. Cons.	2620	0.0660305	0.2483829	0	1
Cty. Cons. St. Frag.	2620	0.1656489	0.3718361	0	1
Metro	2620	0.2633588	0.4405394	0	1

Appendix 2: Spatial Error Model Interaction

Spatial Error Model	Δ Employment (log)		Δ Per Capita (log)		Δ Population (log)	
	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
Intercept	0.4003	0.000	0.6238	0.000	0.2977	0.000
Emp. Rate 92	-1.21E-06	0.000	3.32E-07	0.146	1.35E-07	0.544
PCI 92	-2.36E-06	0.074	-1.31E-05	0.000	-3.21E-08	0.975
Pop. 92	4.95E-07	0.000	-1.37E-07	0.206	-1.34E-07	0.202
County MPDI 92	0.0225	0.017	0.0206	0.002	0.0146	0.053
State HHI Cty. MPDI	-0.0421	0.038	-0.0278	0.038	-0.0346	0.038
State MPDI	0.0074	0.001	-0.0002	0.895	0.0060	0.002
Business Tax	-0.0008	0.013	-0.0003	0.199	-0.0005	0.087
Individual Tax	-0.0001	0.757	0.0004	0.042	-0.0003	0.326
Benefit Ratio	-0.0731	0.004	-0.0100	0.611	-0.0142	0.465
Nonben. Ratio	-0.1197	0.003	-0.0161	0.598	-0.0396	0.207
Right to Work	-0.0143	0.311	-0.0403	0.000	0.0147	0.227
Transfer Ratio	-0.0013	0.000	-0.0004	0.085	-0.0006	0.019
Cdev Ratio	-0.0019	0.068	-0.0001	0.944	0.0008	0.304
Metro	0.0259	0.000	0.0233	0.000	0.0252	0.000
Northeast	-0.0489	0.034	-0.0375	0.008	-0.0520	0.011
Midwest	-0.0686	0.001	-0.0312	0.012	-0.0700	0.000
Northcentral	-0.0145	0.304	-0.0230	0.008	-0.0605	0.000
Gov. Exp. PC	-1.58E-06	0.000	-4.13E-07	0.048	-1.62E-06	0.000
Pct. Poverty	-0.0011	0.070	-0.0024	0.000	-0.0019	0.000
Pct. Over 65	-0.0080	0.000	-0.0014	0.007	-0.0083	0.000
Pct. With Bachelor	0.0013	0.378	0.0084	0.000	-0.0017	0.125
Pct. Nonwhite	-0.0027	0.000	0.0002	0.230	-0.0017	0.000
Amenity Scale	0.0126	0.000	0.0040	0.013	0.0101	0.000
LAMBDA	0.5608	0	0.3811	0	0.6583	0
R-squared:	0.47		0.27		0.6	
# of Observations	2595					

