LOCAL SALES TAXES AND INTERGOVERNMENTAL GRANTS IN FISCAL

FEDERALISM: DETERMINANTS, INTERACTIONS, AND BUDGETARY EFFECTS

THROUGH LOCAL HETEROGENEITY AND INTER-JURISDICTIONAL COMPETITION

by

JONGMIN SHON

(Under the Direction of Yilin Hou)

ABSTRACT

The U.S. Federalism has been concerned with how to best place functions and instruments in a decentralized system. Based on the highlights in the fiscal federalism literatures, this dissertation addresses three issues by focusing on two fiscal instruments in county governments – local sales tax and intergovernmental grants.

First, this dissertation examines the determinants of local sales tax adoption and rates considering both the internal condition of local heterogeneity and the external condition of fiscal interaction. The empirical examinations of the determinants provide strong evidence that fiscal interaction is important to the decision to adopt local sales tax and to set local sales tax rate. Moreover, the political conflicts of interests between the actors of representatives and voters-taxpayers are observed in the adoption and rate setting. Second, this dissertation examines the interactions between the two fiscal instruments that have different purposes. Assuming that local sales taxes are local authority and power, and that intergovernmental grants are the upper-level support for and control to the lower-level, this dissertation finds that the two fiscal instruments have reverse relationships. Third, this dissertation examines the budgetary effects of the two

fiscal instruments on property tax burdens, revenues, and own-source revenues in county governments. Both fiscal instruments are empirically shown to increase local revenues, while only local sales taxes statistically expand local own-source revenues. Moreover, local sales taxes reduce property tax burdens, while intergovernmental grants raise the burdens.

Unlike the existing literatures that focus on local jurisdictions within states, another contribution of this dissertation is a large data set that covers all U.S. county governments for a long-period. However, the empirical examinations clarify limitations that intra-jurisdictional competition matters in U.S. fiscal federalism. The contributions and limitations provide the foundation the future research that will handle intra-jurisdictional competition, and better tackle the details of fiscal federalism.

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DEDICATION

To my parents and sister

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CHAPTER 1

INTRODUCTION

"This Constitution, and the laws of the United States which shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the Constitution or laws of any State to the contrary notwithstanding (Article IV, the U.S. Constitution)."

1.1. The Statement of Knowledge

The Supremacy Clause in the U.S. Constitution establishes that the federal laws generally take precedence over state laws, and even state constitutions; however, this clause does not give the federal government free license. Since the virtue of American democracy has been its closeness to the people, local autonomy has contributed to the development of American democracy with exercising local police powers based on their residents (Brunori, 2007). The authority and powers of the federal government are limited by the Articles of Confederation, and assured by the Tenth Amendment. The U.S. Article IV and Amendments have prevented governmental authority and powers from being concentrated only on any of the federal, State and Local governments, and helped those governments keep checks and balance between each other.

While the federal government is a sole provider of some specific public services and goods such as national defense and postal services, its sub-levels of governments have more diverse functions for the provisions such as public safety, education, transportation, police, and

fire protections that are much closer to the residents. The federal government is hard to recognize the various demands of all local preferences. Thus, local governments have been granted autonomy to provide public services and goods, as well as the powers to collect revenues through taxation, user fees, and charges. Local governments are allowed to establish and to change their own taxations in order to improve the efficiency of the provisions of public services and goods by optimizing their revenues. However, the authority of how to administer the tax revenues differs among the various levels of governments.

Budgetary and non-budgetary decisions made by all levels of governments in the U.S. federal system affect the decisions of each other, and financial decisions in the various levels of governments are interdependent on each other (Lee, Johnson, & Joyce, 2007). The financial decisions lead public services and goods to be independently and cooperatively provided. Governments establish intergovernmental financial system and process for better implementation of the interdependence and cooperation of the financial decisions. Governments adjust levels and types of public service delivery as responses to "*the preferences of a heterogeneous population*" (Mikesell, 2007, p. 541). However, little research on fiscal federalism has studied the effects of local heterogeneity on local financial system, including taxation and budgets.

Since the 1970s, local governments have driven how to decrease their dependence on property taxes for local demands because of tax revolts including the initiation of '*Tax and Expenditure Limits* (TELs).' Some U.S. state governments, moreover, have allowed local governments to design other revenue sources, such as local sales and income taxes, and user fees, through the approval of local residents and/or the decision of council members (Zhao & Jung, 2008). In addition to the purpose that expands local own-source revenues, the federal system has allowed local governments to receive financial aids in the form of intergovernmental grants from

the upper levels of governments. How local governments spend their intergovernmental grants depends on strings placed by their upper-levels of governments that aim to match the policy priority of the upper-levels. Local taxations of property, sales and income, and intergovernmental grants from their upper-levels of government are used for the different purposes by the preferences of each level. Local taxes are the guaranteed power and authority of local governments by the federal-state governments, and intergovernmental grants are the federal-state support and control to local governments. However, few studies have simultaneously examined the two fiscal instruments that have different purposes.

This dissertation seeks to identify the effects of local heterogeneity in terms of politics, economy and socio-demographics on the decisions of taxation. Based on the results, this dissertation will empirically examine the interactions of local sales taxes with intergovernmental grants while focusing on the different purposes of the two fiscal instruments. Lastly, this dissertation will conduct empirical examinations of the budgetary effects of the two fiscal instruments and their interactions on local governments.

1.2.   Federal Government, Fiscal federalism and Fiscal Instruments

How government powers are distributed determines the type of a government whether it is a unitary, federal, or confederation system. While unitary government allows the national level to hold the whole constitutional authority like a monopolist, the lower levels of governments in a confederation possess the real power. Federal government is a hybrid form between the two forms, which divides autonomy and powers among two or more levels of governments. American-style federal system constructs the levels through independence, cooperation and mutual-influence, as well as distributes autonomy and powers among the three levels of the

federal, state, and local governments. However, the American-style federalism conditions that the same people and territory should be involved in more than two levels of governments, but local governments within a state government are not separate level (Kernell & Jacobson, 2008; Riker, 1964).

Oates (1972) wrote that fiscal federalism has helped governments to better recognize and to more efficiently satisfy local demands. His later paper asserted that fiscal federalism concerns not only how to best place fiscal functions and instruments among various levels of governments, but also how they are best centralized (Oates, 1999). Moreover, Americans have trusted that local governments have been able to best identify local preferences, and to best provide public services and goods for the residents than federal and state governments (Kincaid, 1991; Kincaid & Cole, 2001).

Two different arguments have been presented concerning the effects of fiscal federalism; 1) one side maintains that fiscal federalism stimulates economic growth by optimizing the provisions of public services and goods, but 2) the other side argues the increase of inter-jurisdictional competition that fiscal federalism reduces the effects of the governmental functions of redistribution and stabilization (Boadway & Shah, 2009; Inman, 2003; Inman & Rubinfeld, 1997a, 1997b; Musgrave, 1971; Stansel, 2005). However, the arguments for fiscal federalism have raised some problems of how to define, conceptualize and measure fiscal federalism, as well as how to statistically assess fiscal federalism.

Following the studies (Riker, 1964; Rodden, 2004; Weingast, 1995), Sorens (2011) has defined four elements[1] as the ideal type that can develop the arguments of fiscal federalism. The

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[1] The elements are 1) programmatic autonomy that differentiates the quality in local provisions of public services and goods, 2) hard budget constraints that local spending is limited for the provisions of public services and goods, 3) locally-owned common markets that any supplier of goods, capital and labor can

elements propose how to measure fiscal federalism with institutional approach for the political

and fiscal independence, and highlight both sides of revenues and expenditures in the whole

budget process of local governments. His definitions of the elements are applied to the

arguments for the decision-making process of the federal government with shared rule (Hooghe,

Marks, & Schakel, 2008), Tiebout model (Tiebout 1956), market-preserving federalism

(Weingast, 1995), and Leviathan model (Rodden, 2003).

However, his elements are limited to the analysis at the country level. Fiscal federalism

has been developed from the idea that political and fiscal autonomy should be allocated away

from the federal government to local governments and their components such as politicians,

bureaucrats and residents for the increase of efficiency in the provisions of public services and

goods (Besfamille, 2004; Boadway & Shah, 2009). Local governments consider how to increase

their revenues and how to diversify their revenue sources for increasing the efficiency in

providing public services and goods. Fiscal instruments at the perspective of public finance are

categorized into ten types[2] at both revenue and expenditure sides. While lots of local revenues

are collected from property taxes, local governments cannot reserve all the financial resources

mainly from their property taxes (Brunori, 2005, 2007; O'Sullivan, 2000). Local governments

aim to expand their revenues with taxation and user fees. The portions of local sales tax are

expanding in their revenues (Zhao & Hou, 2008; Zhao & Jung, 2008).

In addition to the local efforts for expansion and diversification, the federal government

has offered fiscal aids for state-local governments in order to stabilize the national economy. The

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enter jurisdictions, and 4) local own institutions that cannot be altered by its federal/central government, as well as allow inter-jurisdictional competition (Sorens, 2011, p. 208).

[2] The ten types of fiscal instruments are "*1) expenditures on goods and services, 2) transfers to individuals or households, 3) subsidies to firms, 4) transfers to other levels of government, 5) taxation, 6) user fees, 7) borrowing, 8) money creation through central banks, 9) regulation as a non-budgetary financial way, and 10) public corporations* (Boadway & Shah, 2009, pp. 9-11)."

aids for local governments are the transfers of intergovernmental grants from the upper levels.

The federal government has provided intergovernmental grants to its lower levels in order to promote its national policy and to execute its prior policies (G. A. Wagner & Sobel, 2006). Intergovernmental grants have helped local governments deliver public services and goods more efficiently to local residents. However, local governments are not involved in the decision-making process of intergovernmental grants, and the upper levels of governments cannot keep the consistency of the provision of the intergovernmental grants for local governments. Local governments should factor in the estimated amounts of intergovernmental grants that they will receive for the next fiscal year in the planning step of their budgetary process.

Fiscal federalism has guaranteed fiscal autonomy/power for local governments and provided the federal support/control to local governments. This dissertation focuses on two instruments that local governments are authorized to handle under fiscal federalism among the fiscal instruments: 1) local sales tax, and 2) intergovernmental grants. This dissertation regards local taxation as local autonomy and power, and intergovernmental grants as the federal control and support to local governments.

1.3.   Purpose and Potential Contribution of This Dissertation

Local governments tend to maximize their budgets, to seek to diversify revenue sources, and to increase the expenditures of public services and goods. Any changes in taxation among the revenue sources require the approval of local residents and/or the decisions of councils. The changes in taxations are requested not only by maximizing local abilities to match with the demands, but also by stabilizing the better position in inter-jurisdictional competition. State legislators, state and local bureaucrats, and their residents determine the changes in local

taxations. The changes in local taxations can be defined as the internal politics within the state-local jurisdictions (Brennan & Buchanan, 1980; Epstein & O'Halloran, 1999; Horn, 1995; Niskanen, 1971, 1975; Romer & Rosenthal, 1978, 1979; Wildavsky & Caiden, 2003; Williamson, 1985, 1999a).

The political activities of politicians and bureaucrats, as well as those between the two actors are based on the preferences of their electorates. Conflicts are observed in the political activities as politicians and bureaucrats are mostly self-interested. If any decisions are made in a more cooperative way, then strategic delegation via elections will produce excessive expenditures (Besley & Coate, 2003). Moreover, the outcomes of their political activities are not totally matched, but conflict with the preferences of the public (Borck & Owings, 2003; Chubb, 1985; Esteban & Ray, 1999; Ginsberg, 1976; Moe, 1984, 1990; Neary, 1997; Persson & Tabellini, 2000; Skaperdas, 1998). Two examples for these conflicts are that lobbyists of interest groups affect the activities and pork-barrels are involved in the political activities.

In addition to the internal factors on the decisions through local heterogeneity, the changes in local taxations are made through fiscal interactions vertically, and horizontally with other jurisdictions (Brueckner, 2000, 2004; Bucovetsky, 1991; Goodspeed, 1998; Hendrick, Wu, & Jacob, 2007; Jacobs, Ligthart, & Vrijburg, 2010; Kanbur & Keen, 1993; Kenyon, 1991; Wilson, 1986, 1999). The fiscal interactions have been approached by a variety of the alternative theories such as the Tiebout model, inter-, and intra-jurisdictional competitions including tax competition and yardstick competition. Although the actors within local jurisdictions make any decisions on the changes of local policies, they consider the fiscal interactions between the neighboring jurisdictions and the jurisdiction where they reside, and the fiscal interactions are as external factors to the decisions. Moreover, the theories of the fiscal interactions across

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jurisdictions have been developed combining the perspective of public choice theory such as Leviathan hypothesis, decentralization theorem, and organizational transaction costs.

Unlike the determinants on the changes in taxation, U.S. Congress members as representatives of states and local jurisdictions cannot determine grant size. The decision-making processes of intergovernmental grants are based on formulas that consider nationwide economy and the specified characteristics of local jurisdictions. Although the systems of local taxations are decided in terms of mainly cogitating local economic conditions, the determinations of intergovernmental grants are made with respect to macro-economy stabilization. Besides, the determinations of intergovernmental grants raise transaction costs across states and local politics and economy. The decisions on intergovernmental grants can be defined as the external politics to the local governments.

Another reason for the conflicts is the various fiscal behaviors of the public and the unified fiscal behaviors of the federal government despite the diversity of state and local governments (Aaberge & Langørgen, 2003; Bergvall, Charbit, Kraan, & Merk, 2005; Fisher, 1982; Fisher & Papke, 2000; Gramlich, Galper, Goldfeld, & McGuire, 1973; Slack, 1980; Zou, 1996). Local taxations and intergovernmental grants not only depend on local demands, but also affect the local budgets (Barnett, 1986; Follain, 1979; Gramlich, 1969; Grossman, 1990; Smart, 1998). Both internal and external factors should be considered for the determination of local taxations at one time; moreover, local fiscal instruments are interdependent and affect each other.

With the above reasons, this dissertation selects two fiscal instruments: local sales tax and intergovernmental grants. Local sales tax is relatively more elastic than the other taxes, and the purposes of the two fiscal instruments are opposite of each other. Fiscal federalism has allowed local governments to adopt local sales tax in order to increase their revenues. Local sales tax has

aimed to reduce property tax burden (Jung, 2001), and complemented local revenues that were lessened by tax and expenditure limitations (Hou & Moynihan, 2008; Mullins & Wallin, 2004). The property taxes, the main source of local own-source revenues, are inelastic and stable over the economic cycle. Besides, local residents are not able to evade the property taxes. Unlike the property taxes, local sales tax has been elastic and unstable over economic cycles, as well as pro-cyclical to fiscal capacity (Luna, Bruce, & Hawkins, 2007). Although all the local units, even within one state, have adopted local sales tax, they can decide whether they impose local sales tax on their residents.

Little research has considered taxes and intergovernmental grants simultaneously as well as the effects of both these instruments of fiscal federalism on budgets, while a number of studies have focused on the effects of either taxes or intergovernmental grants on budget systems (Abrams & Dougan, 1986; Burge & Rogers, 2011; Holtz-Eakin & Rosen, 1988; Jacobsen & McGuire, 1996; Lambright & Allard, 2004; Luna, 2004; Moffitt, 1984; C. L. Rogers, 2004; Zhao & Jung, 2008). In spite of the mounting importance of local autonomy of local sales tax, the existing literatures have generally analyzed the effects of local sales tax. Baicker (2005), Buettner (2003), and Case, Rosen and Hines (1993) examined the spillover effects of local sales tax. Rork (2003), Luna (2004), and Rork and Wagner (2008) adopted inter-jurisdictional tax competition models for the analysis of local sales tax. These studies, however, focused on the single-tiered level of state or local levels. Hill (2005), Luna, Bruce and Hawkins (2007), and Burge and Rogers (2011) investigated the interaction of local sales taxes between the multi-tiered levels of governments, but their studies were limited to one state and its local governments.

Many studies have analyzed local (option) sales taxes by focusing on Georgia (Hou & Seligman, 2010; Jung, 2001; Seligman & Hou, 2006; Sjoquist, Smith, Walker, & Wallace, 2007;

Zhao & Hou, 2008; Zhao & Jung, 2008) because Georgia is composed of a metropolitan area, greater counties, and a lot of rural areas. Moreover, Georgia's population has grown very fast in the past four decades, its local governments are in more devious competition than their counterparts in other states, and its residents are able to vote with their feet. Georgia seems to have many advantages for the studies of local sales tax, but it is not enough to draw a generalization about local sales tax examining Georgia because of the gaps of other states' legislatures. This weakness leads this dissertation to cover all U.S. states and their counties.

In addition to the widespread local sales tax, intergovernmental grants have been distributed to state and local governments for the purpose of the maximization of social welfare, and the research of intergovernmental grants has focused on the economic criteria of efficiency and/or equity, and political pragmatism (Grossman, 1990, 1994). Rich (1989, 1991) has assessed that the dynamics of politics and policy determined federal grant programs and the allocation of intergovernmental grants in terms of the programs. Some studies (Akhmedov & Zhuravskaya, 2004; Brender & Drazen, 2004; F. J. Veiga & Veiga, 2010; L. G. Veiga & Pinho, 2007) argued that the existing political budget cycle distributes intergovernmental grants to the sub-levels of governments, and changes even how to measure democracy through political forces. Besides, some scholars (Feldstein & Metcalf, 1987; Fisher & Papke, 2000; Gramlich et al., 1973; Knight, 2002) have asserted that the fiscal behaviors of state and local governments, and the federal policies including intergovernmental grants and tax deductibility mutually affect each other. Additionally, the types of intergovernmental grants changed their fiscal behaviors.

This dissertation aims to explore the two fiscal instruments of local sales tax and intergovernmental grants. Although both instruments affect government budgets, how they have influences on local budgets is not easily observed. Even before the effects are made, how to

determine sales taxation is not simple because local voters should approve any decisions on the adoptions and changes of local sales tax. The determinants of the two fiscal instruments are influenced by the internal and external complexity of governments (Kovach, 1995), and the complexity becomes diverse and uneasy to be observed by the heterogeneity in local jurisdictions.

Therefore, this dissertation will first explore how local sales tax is formed in terms of recognizing the local heterogeneity of politics, economy and socio-demographics, as well as considering fiscal interactions of local jurisdictions. For empirical examination of the determinants, this dissertation will investigate how local sales tax interacts with intergovernmental grants, and what budgetary effects both fiscal instruments have on local jurisdictions. The budgetary effects of the two fiscal instruments will lead this dissertation to consider those of the interactions of the two because various fiscal instruments are designed by the different purposes.

1.4.   Structure of This Dissertation

For the empirical analyses of the three main research questions, this dissertation consists of seven chapters, including this introduction chapter. Chapter 2 reviews the theoretical and empirical literatures on fiscal interactions focusing on inter-jurisdictional competition, and public choice theory concentrated on the heterogeneous actors in the policy-making process. Especially, the review of fiscal interaction includes the Tiebout model, inter- and intra-jurisdictional competition, tax competition, and yardstick competition. Another theoretical approach to fiscal interaction is the Leviathan hypothesis, but the Leviathan hypothesis is reviewed in the section of

the review of public choice theory including the sections that review decentralization theory and organizational transaction costs.

The first two sections of Chapter 3 provide the more detailed theoretical reasons why this dissertation is concentrated on the local sales tax, reviewing the U.S. fiscal federalism, and the overview of local sales tax in all U.S. states by investigating the State Statutes, laws, and tax code. Based on the investigations, Chapter 3 broadly categorizes the U.S. states to four types that show how to implement local sales tax, and present why local sales tax is important targets for the study of the U.S. fiscal federalism, which provide the detailed significance of this dissertation.

Chapter 4 develops the three research questions. Each research question is presented in the separate sections of Chapter 4, and the sections derive the hypotheses to be examined for each research question. The first section is about the determinants of local sales tax, the second section is about the interactions of local sales taxes with intergovernmental grants, and the third section is about their budgetary effects on local governments.

Chapter 5 specifies the empirical models that examine the hypotheses grounded in the theoretical and empirical literature reviewed in Chapter 2, the categorizations of local sales tax in Chapter 3, and the research questions in Chapter 4. Before introducing the empirical models, Chapter 5 provides the two preliminary empirical models that examine the presence of inter-jurisdictional competition through cross-sectional dependence in the panel data set, and the determinants of the adoption of fiscal instruments depending on the widely used empirical models without considering time effects in public finance area. Based on the preliminary empirical models, how to develop empirical models are presented. After the specifications, one section of Chapter 5 considers the potential econometric issues of endogeneity, and suggests how

to resolve the endogeneity issues in the empirical models. The final section of Chapter 5, then, explains how to measure the variables for the empirical models introducing the source of data.

Chapter 6 reports the empirical results on the three research questions and the related hypotheses, including the preliminary examinations of the presence of inter-jurisdictional competition and the determinants of the adoption of fiscal instruments without considering time effects. Based on these empirical results, Chapter 7 closes this dissertation by drawing out the conclusions including ones from the empirical results. Finally, Chapter 7 presents the limitations of this dissertation and suggests discretions for future research.

CHAPTER 2

ALTERNATIVE THEORIES FOR FISCAL FEDERALISM

Traditionally, fiscal federalism has aimed to construct an outline that places appropriate functions and instruments on the proper level of government, and has sought for the optimal level for the allocation of powers and authorities. Much research on fiscal federalism has been devoted to the questions of how to allocate powers and authorities of political-economic issues at the proper levels of governments. The works on fiscal federalism have been developed with much interest in the impacts of federal-Local governments on their fiscal policy-making process, as well as how the process affects the mobility of local residents, and raises any fiscal interactions[3] across jurisdictions and the tiers of governments (Banting, 1987; Braun, 2000; Braun, Bullinger, & Wälti, 2002; Gray, 1991; Wachendorfer-Schmidt & Wachendorfer, 2000).

Once a jurisdiction becomes aware of the introduction of a policy, internal characteristics of the jurisdiction determine whether and when the policy is adopted, which has been generally defined as innovation; thus, any policy in a jurisdiction is affected by the internal factors. Walker (1969, p. 881) defined the term of innovation as "*program or policy which is new to the states adopting it*," and the empirical studies of government innovations have explained that the innovations have been observed in terms of internal determinants and policy diffusion (F. S. Berry & Berry, 1999). As Berry and Berry claimed, policy diffusion is observed between more than two jurisdictions; thus, policy diffusion is external determinants for the adoption and the

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[3] The concern on fiscal federalism is based on the fiscal interactions, and the fiscal interactions across jurisdictions in this dissertation include competitions and coordination. The terms of competitions and coordination do not mean any positive and negative impressions on fiscal federalism. Therefore, this dissertation uses the three terms exchangeably based on the existing studies.

changes of any policy. The studies of fiscal federalism have mainly argued how and where a fiscal instrument is placed, and the decisions on the placements are affected by both internal and external factors. In fiscal federalism, the placement of a fiscal instrument is simultaneously influenced by internal and external factors, and this dissertation approach the internal factors with public choice theory and the external factors with fiscal interactions, also known as inter-jurisdictional competition in this section.

Fragmentations among the tiers of governments from the fiscal federalism lead to make relationships as inter- and intra-jurisdictional competition. The advantages of the fragmentations are based on the ideas that governments closer to their residents are much more efficient providers, but the fragmentations invigorate competition among governments. The rationale of fiscal interactions makes governments provide better public services and goods for all the residents. Policy-making process of government determines how to provide public services and goods, and the process within a government and a jurisdiction has a lot of actors such as politicians, bureaucrats and voters.

Fiscal interactions have external influences on policy-making process and its outcomes in a jurisdiction in terms of the relationships across more than two governments. The process and outcomes are internally affected within a jurisdiction and its actors such as representatives, bureaucrats and voters. This dissertation considers that the fiscal interactions across governments as inter-jurisdictional competition and their hierarchy as intra-jurisdictional competition are observed between more than two governments; that is, fiscal interactions existing out of a jurisdiction are external factors to policy-making process.

Policy-making is political process and considers all the situations within a jurisdiction. Moreover, policy-making process includes a lot of members who have different interests and

expect various benefits from a policy. The differences and varieties result in high transaction and

conformity costs for policy-making process, and the costs lead to the inefficiency of government

failure. For the approach to the internal factors for policy-making, this dissertation considers

public choice theory, assuming that all self-interested individuals are analyzed by economic tool.

Those two factors that affect policy-making process should be simultaneously recognized

for the analysis of policy. This chapter first provides the overview of fiscal functions in the U.S.

federalism, and reviews the theoretical and empirical literature on the five classical approaches[4]

for fiscal competition and on the public choice theory for fiscal federalism. Fiscal interactions

are observed across jurisdictions both horizontally and vertically, so the observations are out of a

jurisdiction as environmental factors that affect policy-making process. Policy-making process is

internally influenced between the members of a jurisdiction, unlike fiscal interactions, and the

internal influences are explained by public choice theory. Before the theoretical and empirical

reviews, this chapter provides the overview of the fiscal functions in federal government.

2.1.   Fiscal Functions in federalism

The three fiscal functions of the public sector from the economic perspective are

described as efficient allocation of resources, equitable redistribution of incomes, and

maintenance of economic stabilization (Musgrave, 1959). The functions are "*downsizing the*

federal budget and a devolution of fiscal responsibilities to states and localities," and carved out

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[4] The approaches to fiscal competition are six of the Tiebout model, inter-jurisdictional competition, tax competition, the Leviathan hypothesis, yardstick competition and intra-jurisdictional competition. Among the six approaches, the Leviathan hypothesis is also a cornerstone for decentralization theorem and organizational transaction costs; moreover, the Leviathan hypothesis has been developed with public choice theory. Therefore, this chapter provides the theoretical and empirical reviews on the five approaches except for the Leviathan hypothesis. The Leviathan hypothesis with public choice theory will be reviewed in the next chapter.

a fresh field of fiscal federalism to "*decentralization, intergovernmental competition and market discipline*" (Musgrave, 1997a, p. 65).

However, Oates (1968) stated that the studies based on Musgrave's theory of public finance are more limited to single-tier level of government. The federal government has focused more on the stabilization function, while state and local governments under fiscal federalism have played a key role for the efficient delivery of public services and goods. The three levels of governments have been significantly responsible for policy-making and economic development; however, the federal government has not been able to handle all the three functions. The lower levels of governments should be able to match local preferences to its circumstances, and public services and goods should be provided at the efficient level of economic welfare by the lowest level of government; the functions of stabilization and redistribution, however, have been asserted to remain in the federal government (Hallwood & MacDonald, 2005).

2.1.1. Allocation Function for Efficiency

Local budget balance is a prerequisite to efficient allocation of resource considered as the main function of budget policy; thus, local governments should arrange their fiscal instruments for both the efficiency and the balance, and the allocation function of governments should consider the public wants as "social wants" and "merit wants" of local preferences (Musgrave, 1959, pp. 6-13). However, governments cannot easily recognize the wants, and arrange any best resolution for the satisfaction of the wants. Governments need resources to satisfy the wants, and consider how to transfer the sources for the efficient allocation. Individuals that have their own wants select where to live after considering a pattern of the provisions of public services and goods, and taxes with their preferences; thus, Oates (1968) asserted that federal system is the

most appropriate to government type because each level of government possessed its own

authority of taxes and expenditures. The levels of taxes and expenditures in local governments

are determined when all individuals' marginal costs are equal to their marginal benefits.

Oates (1968), moreover, proposed that an optimal size of population in a community for

the taxes and expenditures should consider marginal gains and marginal costs of local residents

by the spill-over effects of fiscal federalism. The federal/central government in the federal

system satisfies the efficiency of allocation when it provides national public goods and services

like defense, and local governments are efficient when they produce various levels of public

goods and services in accordance with their wants. Therefore, the U.S. Federal government

should consider "*net spill-over benefit*" in producing public services and goods (Oates, 1968, p.

51). The optimal level of fiscal federalism is determined how to compromise specific public

services and goods that the federal or local government produces.

2.1.2. Distribution Function for Equity

The main goal of the distribution function is welfare maximization in taxes and transfers.

The distribution function, however, shares the expenditures for allocation function, and considers

the efficiency of allocation function because the efficiency is determined by the pricing system

of markets. The pricing system of markets for distribution function needs government's

adjustments through its political process; however, the political process has made distribution

function more complicated by different interpretation of equity for welfare (Musgrave, 1959).

The distribution function originated from Buchanan's paper (1950) that focuses on

horizontal equity. He asserted that all states do not have equally fiscal capacity, so the

differences of state fiscal capacity across states are resolved by intergovernmental systems. The

federal role to support the intergovernmental systems is to the adjustments, and its goal is to equalize inter-state fiscal capacity. However, he has justified the federal role for fiscal distribution through individualist-based perspective, and the gaps for individuals' fiscal capacity in terms of income exacerbate the inter-state fiscal inequity.

Oates (1968) asserted that the systems are chosen by state and local governments, but the high degree of mobility restricts the choices of the systems. In addition to the high-level government's control of the distribution function, the mobility of individuals and economic resources, and market structure deform distribution function. Moreover, the numbers of sub-levels of governments distort distribution function, and the taxation and transfer systems of the sub-levels of governments. The equity level through income distribution in local governments is determined by all the federal, state and local systems, and the distribution function and its equity responsibility become more complicated (Lucy, Gilbert, & Birkhead, 1977; Thurow, 1971).

Brennan and Pincus (2010) expanded Buchanan's work and concluded that the fiscal intervention of the federal government is inevitable for the better distribution to the individuals across states. Public expenditures are jointly consumed, and are differentiated by average incomes and taxes. In spite of the fact that a local jurisdiction has some of its own fiscal authority, the distribution function in local jurisdictions is much more influenced by its higher-levels of governments, and fiscal equalization is separated and isolated by a collection of individuals' taxes and incomes.

2.1.3. Macro-Economic Stabilization Function

The functions of allocation and distribution focus on the efficiency in terms of public and private markets and fiscal equalization with public expenditures in terms of incomes and taxes.

In spite of the importance of the two functions, markets have faced with macro-economic problems such as inflation, unemployment, and gross domestic products (GDPs). Macro-economic changes are fundamentally influenced by the other two functions. The nature of making profits by private markets and the increased levels of aggregate expenditures affect the changes. Moreover, the macro-economic changes affect the demands to both public and private expenditures, and governments adjust their fiscal policy of taxes and transfers.

Musgrave (1939, 1959) suggested that the only changes in government fiscal policy cannot satisfy the stabilization function. Stabilization function can be achieved by various policy improvements in monetary and debt policy that should rely on the nature of government budget, especially the planning process of budget cycle. Stabilization function works dependently and/or independently with both allocation and distribution functions because stabilization is functionalized by transfers of taxes and changes on the level of public expenditures. Oates (1968) raised the importance of stabilization function regarded as the role of the federal government on local government levels. Local governments are not able to stabilize with the monetary authority, but are able to access to stabilization function by controlling taxes and expenditure programs. One more constraint for stabilization function to local governments is the more strict balanced budget requirements (Hou & Smith, 2006).

Stabilization function, however, is much restricted at local levels. The primary goal of stabilization function is the elimination of any economic fluctuation over business cycles, which predicts straightforwardly efficient allocation and equitable distribution at the Keynesian economic perspective (Keynes, 1920). Thus, the most common way for stabilization function is completed by intergovernmental grants from the upper-level government to its lower-levels

2.1.4. Fiscal Functions in the federal Form of Government

Of the two polarized government forms of centralized and decentralized, a unitary form

of government, the most centralized, is effective for the functions of redistribution and

stabilization, while a decentralized form is effective for the recognition of the preferred interests

in its sub-level societies and for the allocation function. Governments have organized and

reformed its structure for its priority among the three functions in order to provide public

services and goods efficiently through the optimal equilibrium of the three functions. Moreover,

the reforms have responded to any policy failures of the past, and have been observed within a

government as well as at intergovernmental relations (Conlan, 1998).

Government reforms have been assessed as successful when the reforms are made

through decentralization that devolves central powers to subordinates (Jin, Qianb, & Weingast,

2005). Although decentralization is based on the idea of check and balance, their assessments are

not always true because the main goal of decentralization is to improve performance, not to

downsize the powers of the federal government. On the other hand, decentralization appeals the

proposition of 'the locals know best,' local governments sometimes cannot reserve their budgets

for local demands (Musgrave, 1997b). Thus, fiscal federalism is originated from how to assign

its fiscal instruments such as taxes and expenditures to the diverse levels of governments in order

to maximize both national and local welfare.

Williams (2005) asserted that the aims of each tier of government are various, but the

overall aims of governments are considered collectively. Fiscal federalism has concentrated on

how to use fiscal instruments for the provisions of public services and goods. The optimal form

of government for the three functions is the federal structure as a hybrid system because of the

polarized effectiveness of the functions between the two forms. The federal structure is a

combined form with the three functions by dividing the use of power and authority to sub-levels

for public decision-making. It should be simultaneously analyzed how to link between fiscal

decentralization, intergovernmental fiscal relations, and economic development across and

within jurisdictions (Quigley, 1997).[5]

2.2.   Tiebout Model and Inter-Jurisdictional Competition

First of all, this chapter explores the term of competition among governments. Kincaid

(1991) explained the typology of the competition in a federal system categorized as horizontal

and vertical competition. Horizontal competition describes competition between the same level

governments that possess equal powers, but different geographic jurisdictions. On the other

hand, vertical competition means competition between different levels of governments that

possess different powers in a federal system. Additionally, vertical competition, also known as

intra-jurisdictional competition, is observed among political jurisdictions with sharing equal

powers and same jurisdictions such as municipality and special districts. Competition among

governments is caused by the scarcity of resources. More specifically, inter-jurisdictional

competition happens through tax, regulation, welfare, and expenditures, while intra-jurisdictional

competition does through the share of same tax base and the overlapped provisions of public

services and goods (Kenyon, 1991).

Inter-jurisdictional competition was derived by the Tiebout model, and has been

approached by three prominent studies. First, Oates (1972) pointed out that the uniformed

provisions of public services and goods from the federal/central government causes inefficiency

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[5] While fiscal decentralization has replaced competition and increased the benefits from the efficiency allocation of resources (Israel, 1992), fiscal decentralization has been challenged by the question how to improve government actions in the reduction of poverty and unemployment for the stabilization of economy and the distribution of income (Tanzi, 1995).

across localities, assumed that no spillover effects are observed. Oates' theory has also been a cornerstone to decentralization theorem. Besley and Coate (2003) agreed on inefficiency with Oates, but emphasized legislative bargaining and strategic delegation of central and federal government. In addition to the provisions of public services and goods, they revealed the inefficiency through the unequal distribution of public expenditures. Lockwood (2002) attempted to compare the benefits from centralization and decentralization, and the analysis of his comparison revealed that legislative outcomes from the more centralized are not beneficial to within-localities, but across-localities.

Inter-jurisdictional competition in fiscal federalism has been approached with the concept of fiscal competition and tax competition. The review of the original studies revealed numerous problems of fiscal federalism, and the four issues[6] (Wildasin, 2003, p. 171) fundamentally caused the problems. Among the four issues, inter-jurisdictional tax competition means different tax systems across jurisdictions (Wilson, 1999). By depending on the Tiebout model, White (1975), Wildasin (1991), and Wilson (1999) asserted that tax competition between jurisdictions enhances the mobility of households and firms, and causes fiscal externality that affects the budgets of neighboring jurisdictions. In contrast to the Tiebout model, the economic externalities from inter-jurisdictional competition of tax policy causes the inefficiency in the provisions of public services and goods (Wilson, 1999). The Tiebout model has been the most important and influential model for the research of fiscal federalism among governments, especially of their competition to other jurisdictions. Therefore, this chapter reviews the Tiebout model with more details than other two classical approaches, and examines the other theoretical approaches to

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[6] The four issues are 1) advantages and/or disadvantages in the provisions of public services and goods, 2) the problems of benefit spillovers through local preferences, 3) tax competition and tax exporting in multi-arrangements of governments, and 4) efficiency of the distribution of intergovernmental grants.

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fiscal interactions. Table 2.1 briefly summarizes the reviews and examinations of fiscal

interactions in fiscal federalism.

2.2.1. Tiebout Model

The most useful and widespread model that explains inter-jurisdictional competition is

the Tiebout model.[7] Tiebout's paper (1956) responded to Samuelson's argument (1954) that

markets cannot recognize the demands for public services and goods, and the provisions of

public services and goods become inefficient without market mechanism. According to

Mieszkowski and Zodrow (1989), the Tiebout model introduced market-like efficiency to the

provisions of public services and goods of governments by considering the mobility of residents.

The primary concern of the Tiebout model is to find how to achieve allocation efficiency at

market-mechanism perspective in local governments. Thus, residents-voters have recognized the

perfect information of the packages and select where to live without any costs of mobility.

The origins of the Tiebout model are differently assumed from Musgrave and Samuelson

that federal expenditures have been smaller than the whole local expenditures, and the public

services and goods such as police and fire protection, education, hospitals and courts provided by

local governments are much closer to taxpayers (Tiebout 1956). The Tiebout model had

fundamentally started with the seven assumptions[8]. When these assumptions are satisfied, the

efficiency in the provisions of public services and goods can be obtained and the optimality for

community size and populations as voters can be attained with the bundles of public goods and

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[7] Since 1970, the Tiebout's paper, "A Pure Theory of Local Expenditures," has been cited by more than one-thousand articles and books (Dowding & John, 1994).

[8] The assumptions of the Tiebout model are 1) the mobility of local residents as consumers, 2) full information, 3) large number of local communities, 4) all income from dividends, 5) neither spillover effects nor externalities, 6) U-shaped costs for the provisions of public services and goods, and 7) communities with population size below/above the cost minimizing size seek to expand. The fourth assumption is exogenous, and the seventh assumption is also known as contract (Tiebout 1956).

taxes for policy-making. Therefore, individuals, as consumers for the public services and goods as well as local voters, consider their preferences for utility maximization and choose where to live. The equilibrium for the public services and goods at a various series of price is determined by the voters' preferences and choices.

In public finance, the Tiebout model has contributed to provide a solution to Samuelson's argument (1954) that the market cannot correctly identify demand for collective goods, as well as a mechanism that allows the efficient allocation of local collective goods. If jurisdictions compete with each other and taxpayer-consumers are able to vote with their feet, fairly strong pressures for local governments will respond to the wishes of the electorate. Competition between jurisdictions, moreover, can create pressures to increase productivity and reduce costs in order to avoid becoming uncompetitive, relative to other jurisdictions. In these regards, the Tiebout model has been regarded as the most accurate in suburban areas with many different independent communities. Moving between communities in these areas tends to have the lowest costs, and the set of possible choices is much diverse. In rural areas without the clusters of communities in geographic proximity, however, the original assumptions by the Tiebout model seem to have little correlation with reality.

Property taxes become inefficient by legal constraints on removal, collusions between local governments and capital owners, and short-term changes on taxes by local representatives (Zodrow & Mieszkowski, 1983). Additionally, Fischel (1992) asserted that the inefficiency of property taxes is caused by the more frequent amendments of state constitutions, and property taxation becomes more vulnerable by local voters' choices of school districts, which increases the deadweight loss of property taxes. In addition to Fischel's trial to apply the Tiebout's model to the mobility of firms, White (1975) wrote that property taxation affects the mobility of

households and firms, and the mobile firms have influences on the supply elasticity that varies public inputs in jurisdictions. The conclusions of both studies were that firms as well as households are beneficiaries of public services and goods.

2.2.2. Inter-Jurisdictional Competition

Since the introduction of the Tiebout model, many studies have devoted to fiscal federalism in terms of inter-jurisdictional competition (Break, 1967; Brennan & Buchanan, 1980; Musgrave, 1997a; Oates, 1972; Oates & Schwab, 1991; Wildasin, 1989; Wilson, 1986; Zodrow & Mieszkowski, 1986). Break (1967) and Oates (1972) applied the idea of the Tiebout model to the entrance of private firms. The main goals of private firms, maximizing profits, seek for the incentives of tax-cuts; thus, state and local governments keep their tax rates at the lower level than the requirements of public choice that finance their provisions of public services and goods. Their efforts to hold down their tax rates in order to enhance private investments lead to the progressivity of taxes.

Unlike the focus of the Tiebout model on individuals/households, Oates and Schwab (1991) extended inter-jurisdictional competition from the household level to capital flow by focusing on the mobility of businesses. They wrote that an abundant number of local governments compete each other in the private market. Local governments, aiming to maximize welfare subject to budget constraints, show efforts to enhance more business firms for their economic development. The enhancements determine a package of tax and services for and the bargains with the business firms. Thus, local governments provide tax benefits to business firms.

An informal model of 'disruptive competition' (McGuire, 1991) assumed that income and mobility lead a nation to be more heterogeneous, and it concluded that the optimality of

taxes and the provisions of public services and goods can be conquered only when neither individuals nor businesses are mobile. The mobility makes a jurisdiction lower its taxes, while it heightens the levels of the provisions of public services and goods in order to attract more residents and businesses with more wealth. The jurisdiction is supposed that the attractions result in the increase of revenues from the expansions of tax sources. One problem is observed, however, that other jurisdictions follow the attractions because the attractions let jurisdiction lower taxes and/or provide greater public services and goods beyond the ability of the jurisdiction. Thus, inter-jurisdictional competition for the attraction not only frustrates the optimal levels of taxes, and public services and goods, but also ignores horizontal and vertical equity. That is, the individuals and businesses, especially less mobile, are dissatisfied to their jurisdiction.

A jurisdiction aims to develop its economy, and provides subsidies to keep their current mobile and immobile firms from leaving the jurisdiction (Wolkoff, 1992), which has focused on the irrationality of policy itself. His game tree model explained that the information asymmetry, whether a firm leaves or not, raises a difficulty that the jurisdiction cannot distinguish the mobility of all firms within that jurisdiction. Therefore, the decisions on the subsidies create irrational engagements in strategic behavior between a jurisdiction and its firms. Two unexpected situations should be considered a firm that potentially leaves its jurisdiction receives no subsidy, and another firm that stays in its jurisdiction receives subsidies. Political and administration behavior conflicts in terms of the irrationality that threatens a jurisdiction, and expands the costs of the jurisdiction.

Besley and Case (1995, p. 36) examined the probability that a state increases or decreases its tax rate by twenty-cents when its neighboring state increases or decreases by one-dollar.

Moreover, their findings were relevant with election results that the tax rate increase of a jurisdiction lowers the probability that an incumbent in that state is re-elected while the increase of its neighbors heightens the probability. Their considerations of inter-jurisdictional competition emphasized the political tensions between politicians and voters stated that voters are much more changeable to tax rate changes, but not the quality of public services and goods. Therefore, politicians should strategically behave tax settings that influence voters' behaviors (Besley & Case, 1995).

Breton (1996) created a general model that can explain four types of competition[9], and mainly focused on the horizontal competition between governments at the same level as inter-jurisdictional competition. He considered the mechanisms of both the Tiebout and Salmon's yardstick competition, as well as emphasized the stability more than efficiency. He asserted that the federal government should observe its states and localities in order to improve their competition by creating national standards for their tax policies and providing intergovernmental grants for their development policies. Moreover, the observations with standards and intergovernmental grants should aim to achieve that the poorer jurisdictions are able to compete with others in more equal conditions.

The spillover effects of the Tiebout model produce the benefits of public services and goods, jointly consumed, differently distributed across jurisdictions. The benefits that local governments provide for the residents are efficient only when the demands are local. Local residents usually prefer one local area that offers more benefits, which results in inter-jurisdictional competition of fiscal federalism; moreover, the residents decide what public services and goods should be locally or nationally provided (Musgrave, 1997a).

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[9] The four types are competition for the governed, competition between government and its stakeholders, vertical competition, and horizontal competition.

Rauscher (1998) explained that the information asymmetry help politicians and bureaucrats better-off at the expenses of voters. Where the expenses become huge in one jurisdiction, the quality of public services and goods becomes worse, and the tax levies become more burdened. Thus, governments are irresponsible for the provisions of public services and goods, the consumers-taxpayers-voters move out of that jurisdiction, and income and employment are declined. Moreover, the population of mobile voters is important to the elections, especially re-elections. Therefore, mobile factors causing inter-jurisdictional competitions force governments to increase efficiency. According to his analysis at national level, inter-jurisdictional competitions help to expand discretions with more political supports, and to increase the revenues of governments through rent income.

Inter-jurisdictional competitions, however, lead to externalities more observed in metropolitan areas because of the multiplicity of political institutions by duplicating jurisdictions (Ostrom, Tiebout , & Warren, 1961). The duplications overlapping multi-jurisdictions result in the conflicts across governments, and external organizations such as courts become included to resolve the conflicts. The inclusions cause the increases of costs in providing public services and goods, and political institutions are threatened by a pressure of how to minimize the costs. Moreover, studies have focused on the externalities through inter-jurisdictional competition suggested by the Tiebout model, and researched how to correct the fundamental problems of fiscal federalism. They have supported the reasoning of fiscal federalism that provides local governments with more power in revenue collection and autonomy in the provisions of public services and goods (Berglas, 1976; Berglas & Pines, 1980, 1981; Brueckner, 2004; Henderson, 1985; Hochman, Pines, & Thisse, 1995; Scotchmer & Wooders, 1986; Wooders, 1978).

Although fiscal federalism had the aforementioned strengths in public finance, the Tiebout model failed to consider the heterogeneity of local demands as well as the mobility of local residents. Moreover, local politics, economy and socio-demographics are not specifically considered. The same level in the provisions of public services and goods results in the higher level of inter-jurisdictional competition and the reduction of the local tax base; thus, local governments become disinclined to levy much taxes and inefficiently provide public services and goods (Brueckner, 2004, pp. 133-134).

The research on the Tiebout model has been, however, limited to the analysis of mobility and local property taxes across jurisdictions. According to the U.S. Census Bureau, the portion of property taxes out of total taxes has decreased from 80.52% in 1977 to 71.70% in 2006, while that of total sales and gross receipts out of total taxes has increased from 11.06% to 16.34%, respectively. Unlike the concerns of the Tiebout model on property tax, the importance on other taxes such as sales and income tax in local governments has increased. According to the U.S. Census Bureau, all U.S. state and local revenues from property taxation have occupied 40.33% of all the revenues in 1970 and 35.80% in 2010, and those from general sales and gross receipts have occupied 18.42% and 23.36%, respectively.

In sum, inter-jurisdictional competition helps local governments to develop their own way that attracts more residents and provides better public services and goods. However, the inefficiency for the provisions of public services and goods results from the increase of inter-jurisdictional competition. Currently, local governments have been allowed to collect sales and income taxes, which has diversified their revenue sources. The revenue diversification requires that the Tiebout model should be necessarily analyzed and developed by including other local taxes as well as property taxes.

2.2.3. Tax Competition

The researchers of the Tiebout model have, especially, studied the tax competition across jurisdictions in terms of property taxes. Their studies have concentrated on how to set the tax rate and how to diminish local expenditures for welfare maximization. Wildasin (1988) asserted that the fiscal structures of local expenditures become inefficient with property taxation and raised the problems of fiscal externalities. The inefficiency of local property taxation is that any change in the taxation causes the same changes in its other areas within its same upper-level jurisdiction. The changes in more than two local areas are based on inter-jurisdictional competition. Alternative internal and external sources, such as subsidies, should be provided to local areas in order to correct the inefficiency problems (Wildasin, 1989). However, inter-jurisdictional competition results in the alteration of local tax policy, including tax rate and base. The inefficiency of inter-jurisdictional competition in public finance as the weakness of fiscal federalism has also been studied by many researchers (Bucovetsky, 1991; Mintz & Tulkens, 1986; Wildasin, 1988, 1989, 2003; Wilson, 1986, 1991, 1999; Zodrow & Mieszkowski, 1986).[10]

Under fiscal decentralization, the lower-level governments have considered how to develop the stability of their expenditures for the provision. Keen and Marchand (1997) examined the impact of fiscal competition on the level and composition of public expenditures. They claimed that the pure fiscal competition across jurisdictions, assumed by the previous studies before their examination, did not consider coordination. The competition without coordination resulted in the systematic inefficiency of aggregate public expenditures and the composition of the expenditures (Keen & Marchand, 1997).

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[10] The inefficiency can be observed in the two cases as following: 1) a local jurisdiction that does not need to alter tax rate follows the rate changes of its neighboring jurisdictions, and 2) state litigations cause any local jurisdictions within the state to alter unnecessary changes of their tax policy. The inefficiency of local tax policy results from the two simple cases, and causes local budgets weak. Moreover, the inefficiency raised by the alteration of local tax policy imputes burdens to the upper-level governments.

Tax competition was fundamentally rooted in one proposition of the Tiebout model that local efficiency in the provisions of public services and goods is obtained through the mobility of local residents. This prediction was empirically analyzed, and the analysis has suggested that local public expenditures have positive influences but local property taxes have negative influences on property values (Oates, 1969).

Moreover, Oates (1972) suggested another argument that local capitals are mobile under the condition of the immobile residents. The mobility of local residents, also known as consumers and voters, in the Tiebout model not only induced competition among governments, but also shifted their tax base. The shifts generate the arguments of tax competition that leads to the under-provisions of public services and goods by enhancing more business investments. Tax competition seeks for the equilibrium of tax rates and expenditures. Unlike the Tiebout model, Oates (1972) assumed that immobile local residents have identical preferences, but local governments are financed with taxes on mobile capital. Therefore, local efforts to enhance more investments of business capitals cause local governments to set low tax rate, and negative effects of tax competition are observed to raise potential disadvantages from fiscal federalism. Moreover, the lower tax rate for the enhancement of more businesses increases competition among governments, and fiscal decentralization that reduces jurisdiction sizes harms local economies of scale.

Zodrow and Mieszkowski (1986) and Wilson (1986) examined theoretical models for the initial idea of tax competition of Oates. Assuming that numerous identical small-sized jurisdictions exist, both works affect and are affected by the national economy and its capital. According to Zodrow and Mieszkowski (1986), public services and goods financed with taxes on the mobile capital are consumed by local residents for their welfare maximization. Governments

help their residents for the welfare maximization by setting tax and limiting expenditures. In the process of the setting and limiting, the disincentives with higher tax rates prevent capitals from being invested; thus, governments will set lower tax rates, which leads to under-provisions of public services and goods.

Wilson (1986) followed the work of Zodrow and Mieszkowski (1986). Local expenditures are financed by property taxes, and tax competition also results in the under-provisions of public services and goods. Both works provide the externalities of spillover effects by tax competition of fiscal federalism. In accordance with the studies of local property taxation that result in the slight decrease of efficiency of local public expenditures (Wilson, 1986; Zodrow & Mieszkowski, 1986), Wildasin (1988) researched the spillover effects through inter-jurisdictional competition that are positive to adjacent jurisdictions. He expanded the competition to both taxes and expenditures, and found in that the spillover effects lead to capital shifting to its neighboring jurisdictions after an increase of property tax rate, and the increase of revenues. He confirmed that competition of taxes and expenditures causes the inefficiency of tax rates and the provisions of public services and goods through a two-stage model. Moreover, expenditure competition leads to the greater inefficiency than tax competition. Unlike the two works of tax competition (Wilson, 1986; Zodrow & Mieszkowski, 1986), Wildasin (1989) offered positive spillover effects that the neighboring jurisdictions resolve the inefficiency in that jurisdiction with an internalized subsidy. Therefore, a jurisdiction does not lower its tax rate to enhance more investments, but strategically chooses to change tax rate or to adjust expenditures by considering the decisions in its neighboring jurisdictions.

Hoyt (1991) focused on the number of jurisdictions adjacent to a jurisdiction, and examined the changes of taxes and expenditures as the numerous changes. His model following

the Willdasin's model (1989) assumed a jurisdictional strategy that jurisdictions respond to tax and expenditure changes in other jurisdictions by altering the levels of their public services and goods, not tax rates. His research provided strong evidences that the greater number of adjacent jurisdictions expands the under-provision and lowers the welfare of their residents. Therefore, Hoyt suggested that consolidation between jurisdictions should be a solution for the inefficiency by competition. The two works (Hoyt, 1991; Wildasin, 1991) approached the strategic decisions of tax competition that each local jurisdiction makes, while the works (Wilson, 1986; Zodrow & Mieszkowski, 1986) emphasized tax competition among jurisdictions.

Bucovetsky (1991), moreover, developed the Wildasin's model to analyze tax competition between two jurisdictions with different populations that differentiate labor and capital. His main finding was that a smaller jurisdiction offers better off to its residents than larger jurisdiction. Larger jurisdictions have greater demands to capital market, so the supply of capital is less reactive to the tax rate; thus, larger jurisdictions do not less lower the tax rate to enhance more capital, but keep the rate higher than smaller jurisdictions. That is, the tax rate differentiated by jurisdiction size makes capital flow from larger jurisdictions to smaller ones, which enables smaller jurisdictions to provide more public services and goods to their residents.

The models for inter-jurisdictional competition have asked how to specify the strategic variables in the model-building process. Traditionally, tariff rates, tax rates, and public expenditures are used for trade policy models, fiscal competition models, and spill-over models, respectively (Wildasin, 1991). Wilson (1991) provided empirical evidence that a region with sufficiently small population wins tax competition and achieves the better off position in equilibrium than its neighbors. Unlike the original research that tax competition leads to the inefficiency with low tax rates, Wilson (1999) investigated the beneficial role of the competition

for mobile factors, including tax rates, assumed that inter-jurisdictional competition in public sector is similar to that in private sector. The political approach to the Tiebout model is considered as the middle ground between efficiency enhancement like profit generation of firms and environments characterized by market failures in private sector.

Theoretical review of tax competition questions whether the competition leads to the under-provisions of public services and goods in terms of tax rates and expenditure levels. Much research on tax competition has confirmed the Oates' perspective (1972) that higher tax rate prevents capital investment and reduce tax base, and governments reluctant to levy high taxes are faced with the inefficiency of the under-provision, termed as allocative efficiency. Moreover, the shift of capital between jurisdictions in terms of different setting of taxes and expenditures caused fiscal externalities of tax competition.

The theoretical review of tax competition provides two main points. First, the tax rate in a jurisdiction is influenced by its neighboring jurisdictions, and the jurisdiction strategically decides whether it changes or keeps its tax rate. Second, the increase of the tax rate in a jurisdiction has negative effects on its tax base, but positive effects on the neighbors.

2.2.4. Development of Inter-Jurisdictional Competition

Although the main concern of the Tiebout model was not the analysis of competition among jurisdictions, the competition is a key module of the Tiebout model, and the efficiency in the Tiebout model has been expended by other empirical research of competition, including tax competition. In addition to that Tiebout (1956) researched horizontal competition, Breton (1996) focused on the vertical competition for the inter-jurisdictional competition and Hunter (1977) researched vertical fiscal imbalance and dependence.

Moreover, Brennan and Buchanan (1980) combined both horizontal and vertical competition, and explained that the competition determines the optimal budget size. The competition of fiscal federalism helps the reduction of government size and the maintenance of efficiency. Testing the hypotheses of the Tiebout model (Bodenstein & Ursprung, 2005; Eberts & Gronberg, 1981; Kollman, Miller, & Page, 1997; Munley, 1982; Rhode & Strumpf, 2003; Wooders, 1978) has developed to adopt political institutions and heterogeneity within/across jurisdictions. Their studies have examined the efficiency properties of various types of the Tiebout model, and debated the role of politics in communities. Eberts and Gronberg (1981) suggested an alternative way to approach the decomposition of population inequity as heterogeneity of the real world through the Tehil's measure of income inequality. Their empirical analysis of the thirty-four Standard Metropolitan Statistical Areas for two hypotheses[11] of the Tiebout model revealed that the expansion of the stratification in local jurisdictions as the number of school districts helps to encourage their homogeneity that supports the second hypothesis of the Tiebout model.

Wooders (1978, p. 328) asserted that jurisdiction structures as "a partition of the set of consumers" decide how to allocate public services and goods, and the choice of the type of a jurisdiction structure affects the aggregate utility of consumers/voters. She emphasized the number and the set of consumers in a jurisdiction, and they choose the agents in the jurisdiction for the Pareto-optimality. She adopted market-type equilibrium and divided a jurisdiction into two extremes: 1) pure public services and goods economies, and 2) pure private services and goods economies. According to her analysis, the Pareto-optimality is much more influenced by the number of consumers/voters of each type of those two extremes, and the difficulties of the

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[11] The two hypotheses of the Tiebout model are the net benefit capitalization effect of the market, and the homogeneity of income within jurisdictions.

Pareto-optimality are lessened by the decentralized equilibriums of the desirable optimality of the agents that consider the jurisdiction structure (Wooders, 1978).

Munley (1982) focused on education as public services and goods, and asserted that voters select where to live by considering housing market. In spite of the maximization of their utility, voters live in a community that minimizes the costs for public services and goods, which removes the inefficiency of the collective provisions of public services and goods. Moreover, the increase in number of the stratification of an area makes better responses to the demands of the voters by extensively distributing the options for their selections. In this regard, how an area is composed is decisive to its budget decisions.

Kollman, Miller, and Page (1997) approached the competition between jurisdictions, from the Tiebout model, and analyzed the effects of political institutions on the heterogeneity of voters. Their research was encouraged by Schelling (1978) that political-economic institutions affect organizational ability and voters behavior. Their analysis concentrates on the assumption of the Tiebout model that individuals select where to live by considering their preferences of public services and goods in a jurisdiction for their utility maximization. Political institutions in a jurisdiction arrange its agents of different abilities and the arrangement result in the difference of aggregate utility and performance in that jurisdiction. Moreover, a single-jurisdiction is not capable of increasing aggregate utility and achieving higher performance compared to multi-jurisdictions, able to reach multiple equilibriums. Therefore, the heterogeneity of voters is varied by the agents' abilities and their political institutions in decentralized conditions allowed.

A long-term analysis of the Tiebout model was conducted to show the Tiebout sorting that residential costless selection of where to live depends on their preferences of public services and goods (Rhode & Strumpf, 2003). By focusing on the county level including metropolitan

areas in 1850 through 1990, they assumed that mobility costs are observed and cause the heterogeneity across communities. During the periods of their research, they found out that the mobility costs have been declining with the technical development of public transportations; however, other factors not public services and goods affect the community choices unlike the Tiebout sorting. In the short-term period, the Tiebout model can explain that individual preferences for public services and goods are the core for their community choice, but the capacity for public services and goods become alike across communities. The decline of mobility costs can be said that individual community choice, especially in metropolitan areas, follows the Tiebout model. However, individuals will select where to live according to individual economic choice such as employment opportunities, and individual similarity of socio-demographic characters in the long-term trend because the heterogeneity in local polices becomes dimmer.

2.2.5. Yardstick Competition

Taxation is a political process, and elected representatives in each jurisdiction decide how to collect the revenues for the provisions of public services and goods with careful considerations of their voters' preferences because the considerations affect the probability of being re-elected. The yardstick competition has paid attention to the role of periodic elections and the elected that the Tiebout model, tax competition, and the Leviathan hypothesis have not considered. The Tiebout model and tax competition started with the assumption that the preferences are identical across jurisdictions, and the Leviathan hypothesis concluded that the constraints by elections are inadequately limit to the decision for government size.

The core of the yardstick competition is from an idea that the voter compares their incumbents' performance with other jurisdictions' elected official casting their votes. Elected

representatives concerned with re-election also review other jurisdictions' officials in order to make better performance than their competitors.[12] Voters become more familiar with the representatives in their adjacent jurisdictions for the comparison and the decision of voting. Because of the continuous comparison by the voters,[13] especially in the election periods, elected representatives are motivated to compete and keep themselves from rent-seeking behaviors[14], which lead to the efficiency of government's performance. That is, competition for the better performance than neighboring governments is a momentous way to resolve the information asymmetry between voters and representatives, and to make the representatives to have incentives to follow their voters' preferred interests (Salmon, 1987).

In addition to this general overview, the yardstick competition theoretically depends on the principal-agent model with information asymmetry of the costs and benefits of public services and goods between voters and representatives (Besley & Case, 1995). Much research on the yardstick competition has the interests on how to reduce the rent-seeking behavior of the representatives, especially the incumbents, and to balance the information asymmetry caused by the rent-seeking behavior between voters and representatives.

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[12] The retrospective voting asserts that incumbents try to show better performance for the re-election. The literatures in political science divide the types of voting into prospective and retrospective. Prospective voting is defined as that voters make decision with predicting what governments will do in the near future, while retrospective voting is that voters' decisions are based on what government has done in the past. According to Downs (1957), voters use the retrospective voting although they make decisions as prospective voting; thus, the yardstick competition is much relevant to the retrospective voting.

[13] Voters carefully consider the incumbents and their candidates for election because the voters delegate their rights to elected representatives in a representative democracy system. The 'delegate' allows an elected representative to obtain the power over public spending and taxes. The 'delegate' results to the relationship of principal-agent between voters and elected representatives.

[14] Rent-seeking is a term of the efforts to keep economic values of rents through the influences of political, social, and governmental environments on spending resources in order to gain without creating new wealth. The activities for the influences are government expenditures and political lobbying on the existing wealth. Thus, rent-seeking extracts unused resources of others and makes no contribution to productivity. Rent-seeking uses social institutions for the redistribution of wealth, while profit-seeking creates new wealth.

Besley and Case (1995) examined tax-decisions in local jurisdictions for the yardstick competition. They asserted that the incumbent representatives in a jurisdiction potentially do or do not rent-seeking, but the incumbents are able to recognize how much their jurisdiction needs the provisions of public services and goods better than their voters because of the information asymmetry. The incumbents who do rent-seeking will set the tax rate higher than the needed costs for the provision. However, the nature of the retrospective voting keeps the representatives from doing rent-seeking, and forces them to pay attention on the tax rates in other jurisdictions for their re-elections. They concluded that the yardstick competition helps voters to distinguish the incumbents who do not rent-seeking from those who do, and reduces the probability that the rent-seeking incumbents are re-elected.

Wrede (2001) explored the effects of the yardstick competition on the Leviathan behavior of politicians. Assuming that all politicians are Leviathans and do rent-seeking, he analyzed whether the yardstick competition tames the Leviathan behavior by comparing the multi-competitive model and the two-party model. In retrospect, his analysis showed that the voters' strategy tamed the Leviathan behavior of politicians in both models. Moreover, the probability that tames the Leviathan is higher in the multi-candidate model than the two-party model.

Based on those theoretical reviews, the yardstick competition model expanded the competition model to the policy-making process. Voters compare their representatives, as well as the policies of a jurisdiction made by elected representatives those with other jurisdictions. The main goal of politicians including the incumbents is the (re)election; thus, representatives compete with other jurisdictions in the process of policy-making, and the retrospective voting strategy of voters prevents the politicians from doing rent-seeking. Moreover, the literatures show that the retrospective voting strategy increases the efficiency of governments.

2.2.6. Intra-Jurisdictional Competition

As stated at the beginning of this chapter, competition has two types: horizontal and vertical. All the literatures above review the inter-jurisdictional competition. Fiscal interactions including competition and coordination are observed between the different levels of governments because of sharing the same tax base at the revenue side. Moreover, tax base is more frequently shared in the federal form of government[15], and another fiscal interactions arise in the expenditure side such as intergovernmental grants.

The interdependence of intra-jurisdictional competition affects tax policies as a level of government reacts to the tax policies in a different level of government and changes its own tax policy. The factors affecting local reactions are "an expenditure effect, a substitutability or complementary effect, a revenue effect, and a deadweight loss effect (Goodspeed, 2000, p. 496)." Boadway and Keen (1996) analyzed the first two effects in terms of federal and state labor taxes. Beseley and Rosen (1998) analyzed the intra-jurisdictional competition of tax settings in the U.S. Federal and states by incorporating the four factors. Keen (1998) examined the reactions of states to the change in the federal commodity tax rate.

According to those literatures of intra-jurisdictional competition (Besley & Rosen, 1998; Boadway & Keen, 1996; Keen, 1998), the effects on expenditures are that a government adjusts its expenditure level as a reaction to the increase of tax rate in the other levels of governments because their tax base is reduced, while the effects on revenues are that a government maintains its revenues because the increase of tax rate in the government results in the decrease of tax revenues of other levels of governments. Substitute and complement effects denote that a change of tax rate on one tax base affects the tax revenues from another tax base. However, the analysis

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[15] The U.S. federal form of government shares tax base between the federal and states, and between a state and its counties, municipalities and special districts.

of the tax rate on different tax bases becomes more complicated by deadweight loss[16]. In sum, the effects of intra-jurisdictional competition are theoretically ambiguous.

2.3.   Public Choice Theory for Fiscal federalism

Another necessary approach for fiscal federalism has been required in order to investigate fiscal federalism within a government and jurisdiction, especially policy-making process. Downs (1957) in *An Economic Theory of Democracy*[17] suggested that economic models, accurately controlled, should be applied into the analysis of policy making processes and political activities. Since the Great Depressions, the field of social welfare function literature has investigated the theories of market failure. More specifically, the increase of government purchases and receipts[18] in 1946 through 1974 not only raised the importance of the role of government in economy, but also gained the momentum for the development of the studies of collective action. Following a various series of changes, fiscal federalism has been faced with threats.

This dissertation will approach the policy-making process within a government by reviewing public choice theory. Like the yardstick competition[19], public choice theory focuses on collective decision-making, and uses economic tools for studying the political behaviors of self-interested politicians, bureaucrats, and voters; moreover, public choice theory considers how

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[16] The deadweight loss effects mean that a change of tax rate affects the tax burdens of a government or of all the governments that share tax bases.

[17] Even before Anthony Downs, Bergson (1938, 1954), Black (1948a, 1948b, 1986), and Samuelson (1954) had made contribution to the emergence of public choice theory, and the application of economic tools to political economy. Moreover, their contributions depend on social welfare function and market failures (P. J. Hill, 1999).

[18] During the period, the amount that the U.S. government purchased services and goods increased from 13% to 22% as a percentage of the U.S. GNP, and the U.S. total receipts grew from 28% to 40% as a percentage of the U.S. national income.

[19] As stated in the chapter two, the yardstick competition is actually originated from the Tiebout model. The yardstick competition sees that local residents as voters compare their various policies with other jurisdictions, especially with neighboring jurisdictions, and they reflect their interests of the comparison on their voting behavior for representatives in the policy-making process.

individuals[20] motivated by self-interests aggregate their diverse interests in the same jurisdictions. The second alternative theory for fiscal federalism is the Leviathan hypothesis that has been developed by public choice theory.

The Leviathan hypothesis originally grounding on the Tiebout model combines the model of the Niskanen's budget maximizing bureaucrats (1971) for the question how to allocate fiscal powers and authorities across governments. Therefore, this section provides the current threats to fiscal federalism, and reviews the theoretical and empirical literatures of public choice theory and the Leviathan hypothesis.

2.3.1. Threats to Fiscal federalism

Fiscal federalism has been faced with the challenges of insufficient information, the quality of local bureaucracies relative to federal ones, the change of technology, the increase of corruption through local capture, and the increase of mobility with the technology development of transportation (Murphy, Shleifer, & Vishny, 1991; Oates, 1994; Prud'Homme, 1995; Putnam, 1993; Rodden, Eskeland, & Litvack, 2003). A potential conflict of fiscal federalism, moreover, was observed in that federal and state governments cannot control the powers and authorities for taxing and spending that state and local governments owned, respectively (Cigler, 1993; Feiock, 2004; Wibbels, 2005).

Individual talents decide their wages and the production ability of markets with market size in a country (Murphy et al., 1991). Moreover, how to allocate individual talents properly for economic growth decides rent-seekers in a country, and has influences on the changes of

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[20] The individuals in public choice theory are politicians, bureaucrats, voters, and interest groups involved in policy-making processes. All is assumed that they are seeking their own self-interest as in market place. Public choice theory also includes all the interactions of their own self-interests, and regards policy-making process as a process that calculates the costs and benefits of a policy.

community quality. Therefore, governments should recognize the individual talents within their communities, allocate their functions among the individual, and expand their investments on them. However, the national level cannot easily recognize the individual talents, and the asymmetric information for the talents recognized by its sub-levels of governments distorts what investments the national level of government allocates its resources for.

Putnam (1993) pointed out that representative institutions are threatened by a series of different political, social, economic and cultural settings across regions. In addition to the question how to decide the allocation of fiscal functions, Oates (1994) addressed the two rising issues of the regulatory authority of the federal government and federalism with public choice; moreover, he asserted that federalism explains the effects of vertical structure on the drivers of government centralization or decentralization through public choice theory. Based on the two points of Putnam (1993) and Oates (1994), Prud'Homme (1995) examined the negative effects of fiscal federalism widespread all over the world in order to eliminate the threatens of fiscal federalism.[21] Thus, he asserted that centralization and decentralization cannot be approached as a dichotomy, but how to mingle the advantages of the two should be considered through the different treatment of taxes and expenditures, geographical differences, and different government sectors and their types of public services and goods.

The responsibilities of local governments have increased with the expansion of fiscal decentralization. The increases of local responsibilities lead local governments to become a key provider of public services and core policy-maker. However, the responsibilities are beyond the potential abilities of local governments. The imbalances between the responsibilities and the

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[21] The threatens are summarized as 1) the increase of disparities across jurisdictions, 2) the imbalance of stabilization in macroeconomic perspective, 3) the inefficiency of allocation function by misrecognizing the tastes in jurisdictions, and 4) the increase of corruption by expanding discretionary power (Prud'Homme, 1995).

abilities of local governments arouse fiscal threats to themselves, and the higher-levels of governments control the imbalances across local governments and block the threats for local governments. Therefore, the higher-levels consider how to allocate the powers to tax for abilities, and authorities to provide public services and goods for responsibilities (Cigler, 1993). The changes of status and responsibility in local governments demand all the levels of governments to transform their inter-relationships and organizational structures. Feiock (2004) argued that the degree of fiscal decentralization touches off how to arrange local governance and to collaborate institutional collective actions. Wibbels (2005) pointed out the potential conflict of inter-jurisdictional bargains among different local actors with ethnic differences.

The expansion of powers and authorities can cause fiscal crises at local levels and lead to the macroeconomic financial crises (Inman, 2003; Rodden, 2002; Rodden et al., 2003). Rodden (2002) asserted that the greater dependence of sub-national governments on intergovernmental transfers leads to budget deficits. Therefore, sub-national governments should be allowed to have both taxing and borrowing autonomy, as well as restricted when they receive intergovernmental transfers from their central government. Inman (2003) reported that the transition costs of bailouts and transfers from local governments to federal budgets can prevent local governments from providing public services and goods at the efficient level, and result in the inefficiency of resource allocation. Therefore, the threats to fiscal federalism are caused by the diverse heterogeneity in a jurisdiction.

2.3.2. Public Choice Theory

A. Founding of Public Choice Theory

Public choice theory has applied rational choice model to non-market decision-making process following the research of market failures. First of all, many studies on market failures (Arrow, 1963; Bator, 1958; Baumol, 1952; Samuelson, 1954) have contributed to the development of public choice theory. Especially, Downs (1957) in *An Economic Theory of Democracy* used the science of exchange and the self-interest model of economics for the analysis of collective action by focusing on the rationality for government's public policy choices, given the relevant incentives. Moreover, his economic theory is still regarded as the best approach that explains the motives of politicians and voters in policy-making also known as median voter theorem, and has provided twenty-five specific testable propositions in his book (Downs, 1957).

After the Downs' analysis of collective action, another classical book of public choice theory, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Buchanan & Tullock, 1962), explained how political decisions were made by a collection of individual rational choices, and began to apply economic models to political and non-market decisions. Their book focused on the tensions of the tradeoff between potential gains from constitutions and potential losses from individuals' self-interest seeking. They developed a mechanism on how collective action attains goals not achieved in markets.

Depending on the models of these two books (Buchanan & Tullock, 1962; Downs, 1957), Arrow (1963) defined a model of social choice as '*General Possibility Theorem*.' Combining social ethics and voting theory with mathematical and economic concepts, Arrow's model explained how the Constitution works with social values from the individual interests and their

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orderings. Moreover, the social choice of each voter communicates with the potential set of laws passed by the voters under the Constitution. Social welfare function with social choice becomes consistent with voting rule under the Constitution.

Olson (1965) began to focus on the utilities and benefits in political science with connecting to economic theories in his book, *The Logic of Collective Action: Public Goods and the Theory of Groups*. He developed the theory of group behavior, and explained why collecting individual interests for group behavior are difficult in order to achieve the well-being of the group not attained by each individual. Public services and goods achieve the collective benefits to the groups, and the size of the groups determines the efficiency and viability of the public services and goods. Moreover, Olson pointed out the problems that free riders decrease the efficiency and viability as the size of group is bigger, and that the individual rationales to reach their own-interests to group interests cause conflicts to the group behaviors.

Since 1965 when the *Public Choice Society* was established, political science has adopted and developed the economic tools of public choice theory. Public choice theory has been a useful solution that solves the conflicts in political process[22] between individuals seeking for utility maximization, and governments subject to institutional and budgetary constraints because the stable equilibrium for the supply and demands of public services and goods is not obtained by the same criteria of standard price mechanism in private markets. Public choice theory focuses on the perspective of the Tiebout model and Oates' decentralization theorem for the analysis of fiscal federalism.[23] Moreover, public choice theory views fiscal federalism as a solution for the increase of government accountability. The "factions" in *James Madison's federalist Paper #10*

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[22] The political process aims to achieve the maximization of Pareto efficiency when public choice theory emerged (Buchanan & Tullock, 1962; Tullock, 1965).

[23] According to Hills's review (2009), many peer-reviewed papers of the public choice view on fiscal federalism are based on the Tiebout model and Oates' decentralization theorem; however, his review revealed that few studies have focused on political activities.

should be considered of the heterogeneity of political activities; the homogeneity, moreover, can be accessed by the shrinkage of election districts. As an alternative approach for democracy, public choice theory has analyzed government failure in terms of economic externalities, and has offered a perspective of optimal size of government, as well as has applied the rational choice model to decision-making process in non-market fields (Tullock, 1969).

B. Further Developments of Public Choice Theory

Boyne (1996) developed a public choice model of competition across local governments. The public choice schools have asserted that competition results in better organizational performance in terms of improving allocative and technical efficiency. Competition is observed in all the self-interested members of governments, and the main types of the competition at the levels of local governments are observed within a local authority for power and resources, between a council and other organizations for service production, between councils themselves as party competition. Public choice theory has explained the conflicts not only between the outcomes from political decision-making process and general public voters, but also between the preferences of each voter and the aggregate preferences of all voters. According to public choice theory, policy-makers reflect the preferences of the median voters on their outcomes, also known as the median voter theorem. According to Hill (1999), public choice theory has developed voting issues, rent-seeking, theories of bureaucracy with ideology and efficiency of government, and constitutional political economy.

Voting Issues   Voting actions in a democracy depend on the expected utilities that voters receive, and the expected utilities determine whether voters will or will not participate at voting

with their interests and expectations by considering the costs generated by the voting actions. The participation of voters are strategic behavior motivated by the incentives that satisfy their expectations from their candidates because voters in most democratic countries see the voting actions as the purchase of services and goods in private markets. Blais (2000), Brennand and Hamlin (1998), Fishburn (1974) developed the median voter theorem that explains how to aggregate the demands of an individual voter into the whole demands of the voters' community. Holcombe (1989) argued the median voter theorem in public choice theory that the voting outcomes result from the equilibrium of the aggregate demands preferred by the median voters.

Other studies of voting have been applied by vote-trading/logrolling, demands-revealing process for voting and voting-with-the-feet because of majoritarian decision-making (P. J. Hill, 1999). The other studies have applied the public choice theory to their analysis. Although voter-trading and logrolling lead to the inefficiency of public policy outcomes, it cannot be ignored in the policy-making process. Demand-revealing process should consider how to deal with the voters who have different values on the voting outcomes because they are also taxpayers for public services and goods. 'Voting-with-the-feet' is actually developed by the Tiebout model, and policy decision-makers are threatened by the difficulty how to satisfy each voter's interests with a collective way.

Rent-Seeking   Tullock (1967) made the most significant contribution to the development of public choice theory in terms of rent-seeking, and developed the perceptions of rent-seeking following public choice theory. Tullock's other works (1971, 1975) extended rent-seeking to income redistribution. He asserted that individuals and groups utilizing scarce resources and seeking rents lead to the waste of wealth. The work (Tullock, 1967) measured the welfare costs

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of monopolies and tariffs; however, he asserted that the welfare costs of monopolies and tariffs

result in another social costs by the different functions of government and its markets. Actually,

government neither creates monopolies, nor imposes tariffs in the political market. Lobbying

activities in private sector with political actions presses the creation and the imposition in order

to protect their market of government. Rational sellers in the market spend their resources on

lobbying that is a complete waste of social costs. The other works (Tullock, 1971, 1975)

expanded his insight of the welfare costs in the federal and/or state governments, and focused on

the transfers to the organizations that have political influences out of the governments. The

transfers help the existing organizations to protect their privilege in the market, and prevent other

new organizations from entering to the market. Therefore, the existing organizations in the

market are the beneficiaries of profit gaining with the transfers of governments.

Theories of Bureaucracy   The scholars in public choice theory prefer bureaucracy for their

research area, especially government inefficiency, such as Tullock (1965), Downs (1967), and

Niskanen (1971). Bureaucracy in public choice theory has been actually developed with the

Leviathan hypothesis[24]. The scholars have focused on the inefficiency of bureaucracy and

government failure, and asserted that the inefficiency and failure are caused by the principal-

agent problems of bureaucratic structures and the inability to shrink the size of bureaucracy

because the size is controlled by the inside of bureaucracy (P. J. Hill, 1999).

Based on the potential problems of bureaucracy, the scholars in public choice theory have

analyzed the reasons of government inefficiency at the right side of political spectrum. Gwartney

and his co-authors (2010) pointed out three fundamental reasons for government inefficiency: 1)

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[24] The Leviathan hypothesis also grounds on the insights of inter-jurisdictional competition in the Tiebout model, and has updated by combining public choice theory. The more details of the Leviathan hypothesis will be reviewed in the next section.

rational ignorance effect, 2) special interest effect, and 3) shortsightedness effect. The rational

ignorance effect causes the inefficiency because voters are poorly informed and they seldom

seek for detailed information for their decisions, which leads to the biased result of voting with

information asymmetry. The biased result, however, still has influences on political process and

increases government inefficiency. The targets for benefits and costs cause the special interest

effect. The benefits are possessed by small groups of voters, but all other voters collect the costs.

Therefore, the outweighed costs over the benefits result in government inefficiency. The

shortsightedness effect suggests that government is in favor of policies, and recognizes the

benefits of the policies. However, government becomes biased by the two previous effects, and

hard to identify the costs in the future. The scholars in public choice theory are led to adopt

market solution for government inefficiency rather than the pure government action.

Constitutional Political Economy   Since Buchanan and Tullock's *Calculus of Consent* (1962)

explored the files of constitutional political economy, Buchanan (1990, p. 1) has made much

contribution to the development of constitutional political economy; especially, his paper defined

the term of constitutional political economy as "*a research program that directs inquiry to the*

working properties of rules, and institutions within which individuals interact and the processes

through which these rules and institutions are chosen or come into being. The emphasis on the

choice of constraints distinguishes the research program from conventional economics."[25] The

collective action aggregated by individual choices is first determined within the existing sets of

rules in Constitution, and limits or constraints are imposed on the collective action. The analysis

in traditional economics has focused on the limits and constraints, but the economic tradition has

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[25] This paper (Buchanan, 1990) was also adapted as the title, "*Constitutional Political Economy*," in *the Encyclopedia of Public Choice* (Rowley & Schneider, 2004) and reprinted in the *Readings in Public Choice and Constitutional Political Economy* (Rowley & Schneider, 2008).

shifted the attention of the analysis to the rules of political orders that affect individual choice rather than collective action because individual behavior chooses the imposition of the limits or constraints on the individual choice. Economists' views, moreover, have come to focus on politics because politics is the rules of game and produces policies by focusing on strategies whether individuals adopt or not, given the set of rules. Collective action should keep the balance of the balances among state as Constitution, society and individuals.

C. Taxation of Public Finance and Public Choice

Public finance studies government taxing and spending with the perspective of economics, and taxation is the core of public finance because taxation is the reasons for the functions of nation and its sub-levels of governments. Rather than macro-economy, modern public finance concentrates on the micro-economic function of government, and investigates how government allocates the scarce resources more efficiently and distributes the income more effectively (Rosen, 1995; Winer & Hettich, 2004). The functions of allocation and distribution aim to maximize Pareto-efficiency of welfare economics. The economists in the field of public finance have focused on how to reach at the optimality of taxation, and the optimality rests on the issues of efficiency and fairness. Because taxes generate excess burdens that distort economic activities in market, government is deliberate with the decision of taxation, and contemplates benefits to its society with the collections in terms of taxation. While local governments depend on property taxes, the recent trend of taxation is the diversification of taxation such as income taxes for individuals and corporations, sales taxes, wealth taxes, and other charges.

Assuming that individuals always make rational choices to satisfy self-interests, Ostrom and Ostrom (1971) have adopted public choice theory to the study of public administration.

Based on the rational choice theory that aims to maximize individual's utilities, individuals create representative organizations that reflect individuals' collective action on how and what to provide public service and goods for the individuals. Since individuals are able to maximize their utilities through these representative organizations, the representative organizations should construct a constitutional system that enables the organizations to determine the level of "*an optimal mix of different public goods and services,*" as well as to minimize both external costs and decision-making costs that are observed in the process of the creation of the organizations (Ostrom & Ostrom, 1971, p. 211). The costs are not limited to only one jurisdiction, but affect neighboring jurisdictions. The inefficiency of the overlapped jurisdictions within a single hierarchical authority system can be removed by multi-level arrangements of representative organizations and coordinated by the upper-level organizations.

In addition to the economists' views, Holcombe (1998) asserted that politics and its decision-making process has had influences on the taxes, especially tax structure. Unlike the views of economists on the issues of efficiency and equity in taxation, the scholars in public administration and political science focus on the distribution of powers, responsiveness and accountability, and tax competition and coordination. Fiscal federalism in many countries with federal system has the more complicated system of taxation because the federal countries should think taxation over the relationships across its different levels of governments. The economic analysis for tax policy takes a substantial role to support to the analysis of taxation by depending on politics. Political activities in tax policy making process has paid administrative costs and

compliance costs, and the political costs generate welfare costs in the tax policy making process (Holcombe, 1998; Slemrod, 1990).[26]

Thus, tax system includes welfare costs as political costs[27], but economists have not much recognized the costs. Politicians and their interactions with other actors such as other politicians, bureaucrats and voters shape tax policy. Moreover, rent-seeking causes lobbying activities that determine the degree of inefficiency in tax structure system. Public choice theory has designed more effective tax system by tracing the theory of taxation and requiring the agreement of taxpayers (Holcombe, 1998; Lindahl, 1967). Moreover, Santolini (2008) asserted that tax policy reflects the ideology of politicians on the decision of tax system. The study of public finance and taxation has been influenced by public choice theory because political process reveals the preferences of taxpayers in terms of paying costs and receiving benefits. The analysis of public finance and taxation are essentially comprehensive for the approach to collective action because the collective action determines how much public services and goods are provided with respect to how much revenues are collected in terms of tax system.

A function of tax system is the redistribution of incomes. Stigler (1970) asserted that income is redistributed from taxpayers having income and wealth to those who have political power. The taxpayers and the beneficiaries of redistribution are substantially in the intersection

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[26] The political costs for tax policy and its system have been approached by the public choice theory and are composed of "administrative costs" and "compliance costs" (Holcombe, 1998, p. 360). Since fiscal federalism should collect diversified local demands in various horizontal governments and each local jurisdiction generates its own political costs, the sum of the costs become much higher. Moreover, Slemrod (1991) asserted that welfare costs should be added to the political costs. The federal system is faced with higher political costs than the unitary system.

[27] Holcombe clarified the application of public choice theory to the analysis of tax system with the following paragraphs: "*Most obviously, because the tax structure is a product of politics, one must understand the political process to completely understand the tax system* (1998, p. 359)" and "*Taking a public choice perspective, one must recognize that redistribution is a product of a democratic decision-making process in which the beneficiaries of redistribution are more likely to be those who have political power than those who are really needy* (1998, p. 365)."

of the society, and the redistribution function is approached by public choice because of its properties of political system. Public choice theory has suggested that the redistribution function is stabilized by democratic-political institutions that satisfy the taxpayers with the outcomes of the redistribution (Weingast, Shepsle, & Johnsen, 1981). Moreover, legislation passed in the Congress is determined by voters' preferences. Because the preferences of voters are different across states and influenced by interstate spillover effects, Rose-Ackerman (1981) asserted that the preferences within a political system are varied and determined by the interests of voters, and the political system should consider the spillover effects on the voters in different states.[28]

Public choice theory regards fiscal federalism as a function that maximizes the utilities of public agencies; however, the political process has altered the utility maximization and has determined the extent of fiscal federalization. Public choice theory assumes that politicians and public bureaucrats, including the public voters, are self-interested; thus, the scholars in public choice theory always consider the general public voters, especially taxpayers, in the tax policy-making process. Moreover, public choice theory explains how any conflicts of policy and political issues affect the outcomes.

D. Intergovernmental grants of Public Finance and Public Choice

Although the autonomy and power to tax for other revenue sources are secured for local governments, the federal government has provided various types of intergovernmental grants politically characterized for local governments through state governments (Break, 1967; De Mello, 1999; Gramlich et al., 1973; Grossman, 1994; Mixon & Hobson, 2001; Volden, 2007). Moreover, the federal government has guided state and local governments with funding for

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[28] The interests and preferences of voters in Rose-Ackerman's paper (1981) were limited in the voting activities to the legislatures in federal and states. Individual voter support a national law that constrains the state's ability where the voter reside, given that the national law expands the benefits of the voter.

intergovernmental grants to reach the best efficiency in the provisions of public services and goods, as well as to succeed with the best solutions to their problems for the public (Manna & Ryan, 2011; Volden, 1999, 2007).

In spite of the local autonomy and power, local governments are limited to raise their own-source revenues. The limitations have bolstered the provision of intergovernmental grants by the federal government, and intergovernmental grants have been distributed among local governments to promote the federal policy priorities, which can be sometimes prevented by state and local inability for their resources (Lauth & Douglas, 1995). Although intergovernmental grants have the variety of characteristics and functions, this dissertation focuses on the size of intergovernmental grants that local governments receive. Figure 2.1 shows the mean size of intergovernmental grants in the fiscal years of 1970 through 2006.

According to the standard Musgrave theory, the federal government should spend more expenditures in bust years for its stabilization function (Musgrave, 1959; Oates, 1972); moreover, the lower levels of governments should adopt this countercyclical spending (Gramlich, 1987; Hou & Moynihan, 2008; W. Wang & Hou, 2012). The countercyclical patterns of the federal spending are assumed to provide more aids as intergovernmental grants to local governments in economic bust years. However, the federal and state governments have actually decreased the provision of intergovernmental grants to local governments because of the limited fiscal capacity of the two (W. Wang & Hou, 2012). The economic conditions among the three levels of governments would be different from each other, but any fiscal stress simultaneously affects the three levels; moreover, local governments are more threatened by the stress.

The allocation of intergovernmental grants has the three steps of policy-making process of intergovernmental grants, institutional mechanism and fiscal outcomes. Intergovernmental

grants are determined by policies including a decision-making process at the federal level with President and the U.S. Congress members. Although the U.S. Congress members are representatives of their own state and locality, the members have difficulty recognizing their state and local detailed conditions. Especially, the size of intergovernmental grants depends on the interrelation of political decision between the levels of governments, and how to provide intergovernmental grants is surrounded by politics (Volden, 2007).

Moreover, policies for the allocations of intergovernmental grants are determined by the three considerations of broad and normative guidance, voter's choices and political economy (Boex & Martinez-Vazquez, 2004). The guidance for the allocations aims to improve the efficiency and equity of the provisions of public services and goods normatively correcting the externalities such as spill-over effects, and aims to attain income redistribution because the main revenue source for the federal government is income taxes. Voter's choices affect the allocation of intergovernmental grants in terms of election systems for the representatives, the decision-makers of the allocation. The choices are strongly relevant to the median voter hypothesis, and politicians use intergovernmental grants as election strategy for re-election. Fiscal outcomes have verified whether the allocation of intergovernmental grants is appropriate to continue any policies through political-economic perspective, and intergovernmental grants are allocated by offering more benefits for more politically powerful and greater sized local jurisdictions.

Intergovernmental grants are a means of supporting and controlling localities with considering both national economy and local preferences; however, intergovernmental grants are challenged by two political interactions between the levels of governments: 1) raising transactions costs, and 2) used as election strategy (Besley & Coate, 2003; Borck & Owings, 2003; Ginsberg, 1976; Mixon & Hobson, 2001; L. G. Veiga & Pinho, 2007). The theory of fiscal

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federalism is more appropriate for the analysis of raising transaction costs, and provides a

normative framework that explains how fiscal instruments and functions are allocated, and how

the responsibilities and resources at each government level are balanced. In the decision making

process of the allocation, local governments make efforts of lobbying to the federal/central

government, and the lobbying efforts generate costs. Additionally, public choice theory is more

appropriate for the approach to that intergovernmental grants are used as election strategy

because the federal government seeks for the utility maximization of the whole population.

2.3.3. Leviathan Hypothesis

Public choice theory has developed the concept of inter-jurisdictional competition by

combining with the Leviathan hypothesis. The Leviathan hypothesis is originally based on the

combination of the Tiebout model with the model of the Niskanen's budget maximizing

bureaucrats (1971). Following Niskanen (1971), Brennan and Buchanan (1980) modeled that

government is a Leviathan who behaves to maximize revenues from whatever sources of

taxation. The monopoly power of government assures an ability to collect revenues of taxes from

citizens. The Leviathan hypothesis was originated to disagree with the traditional assumption in

public finance that governments are benevolent to maximize the utility and welfare of their

residents. However, the Leviathan hypothesis regarded government and its bureaucrats as those

who systematically maximize their budgets with constitutional ways for their own interests. The

constitutional ways of taxation rules are intended to constrain the Leviathan behavior, as well as

to satisfy the demands of the taxpayers' preferences.[29]

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[29] According to Brennan and Buchanan (1980, p. 185), "*[T]otal government intrusion into the economy should be smaller, ceteris paribus, the greater the extent to which taxes and expenditures are decentralized.*"

In addition to the constitutional constraints, the mobility of residents as taxpayers of inter-jurisdictional competition becomes resources that tame the Leviathan. Brennan and Buchana's sentence above in their book has become known as the Leviathan hypothesis in public finance. They suggested that inter-jurisdictional competition in terms of the mobility of residents be an indirect constraint to the Leviathan behavior. Thus, the greater level of fiscal decentralization is hypothesized to expand inter-jurisdictional competition, and to weaken the monopoly power for tax collection. The Leviathan hypothesis suggested that inter-jurisdictional competition should be helpful for the scarcity of mobile tax base by limiting the power to tax for revenue-maximizing governments.

Moreover, they emphasized the importance of how to arrange the fiscal institutions of powers and authorities among the different levels of governments that the taxpayers are able to choose by both moving their residence and considering their preferences. Therefore, the constitutional ways of taxation rules are hard constraints to the Leviathan, and inter-jurisdictional competition is soft constraints. It was also argued in that "*intergovernmental competition for fiscal resources and interjurisdictional mobility of persons in pursuit of "fiscal gains" can offer partial or possibly complete substitutes for explicit fiscal constraints on the taxing power* (Brennan & Buchanan, 1980, p. 184)." Inter-jurisdictional competition prevents governments from expanding their size and helps to reduce the waste of governments. Unlike tax competition as stated above, inter-jurisdictional competition is seen as effective ways for government efficiency in the Leviathan hypothesis.

The Leviathan hypothesis has combined inter-jurisdictional competition with budget-maximizing behavior of bureaucrats expanding the idea of the Tiebout model. Brennan and Buchanan (1980) rejected the traditional assumption in public finance area that bureaucrats aim

to maximize the welfare of their residents, and asserted that the combination is useful for the increase of efficiency by limiting the tax power of bureaucrats. Moreover, fiscal rules and institutions in constitution, and the mobility of residents can be inadequate constraints to the Leviathan behavior. Bureaucrats in the more decentralized and fragmented form of government have greater discretionary power. The decentralization hypothesis is that the more decentralized results in the lower level and the increase of efficiency of government, and the fragmentation hypothesis are that the number of governmental units is regressively relevant to the revenues and expenditures of government.

In sum, Brennan and Buchanan (1980) adopted the market logic into fiscal decentralization, and they assumed that central governments, including federal government, possesses monopoly power in the provisions of public services and goods as a Leviathan. The competition between decentralized governments, arising from fiscal decentralization, prevents the expansion of the expenditures in the public sector, which leads to shrinking the potential problems from the monopolistic central governments. Fiscal decentralization is able to substitute fiscal constraints that the federal government cannot obtain.

2.3.4. Further Issues with Public Choice Theory and Leviathan Hypothesis

In addition to the Leviathan hypothesis, the public choice view has developed decentralization theorem and organizational transaction costs in terms of the original question of fiscal federalism: "What is the best appropriate ways for the determination how to allocate the political and fiscal instruments at the levels of governments?" This question originally grounds on the idea that the central government is incapable to discriminate public policy on a regional basis as the bottom of government hierarchy, and organizational transaction costs observed in the

hierarchy among legislature and administrative agencies (Epstein & O'Halloran, 1999). This dissertation argues two alternative approaches for fiscal federalism with relevance to public choice theory and the Leviathan hypothesis.

Spatial differences ask various demands from the residents within a jurisdiction, and local governments are able to provide public services and goods more efficiently for the demands. Depending on the allocated authorities and powers, local governments independently determine how much they can expend for each unit of public service and good, and what types of and how much of taxes they collect for revenues from the preferred demands within their jurisdictions (Gordon, 1983). The changes of the revenues and expenditures through fiscal decentralization affects the size of government; especially, the vertical variation of government size changes the size of government (Oates, 1994). Public choice theory and the Leviathan hypothesis for fiscal federalism are approached two other views depending on the alternative theories of fiscal competition in federalism: decentralization theorem and organizational transaction costs. Based on the perspective of public choice theory and the Leviathan hypothesis, this chapter briefly provides the two views.

A. Decentralization Theorem

Decentralization theorem originally developed by Musgrave (1959) and Oates (1972) assumes that the central government cannot reflect its all regional demands on policy-making process; thus, local governments are recognized as the most efficient in the provisions of public services and goods in the decentralization theorem, and the increase of Pareto-efficiency levels. Moreover, local governments eliminate the externalities from inter-jurisdictional competition in terms of the decentralization theorem. Fiscal federalism helps governments recognize local

demands, and is more effective to meet their demands. These strengths of fiscal federalism have led many countries to decentralize the fiscal power and authority of their central government to their sub-levels of governments. The extent of fiscal decentralization is, however, still controversial because it affects government size and an increase the burdens of fiscal threaten on sub-governments.

Rothenberg (1970) provided four types of criteria[30] in evaluating the optimal size of governments by depending on "home rule" for the analysis of the optimality. His analysis focused on the distribution extent of political powers within a jurisdiction by considering the institutions between home-rule and inter-jurisdictional externalities. He discussed that a federal system helps to reduce the tensions between the homogeneity of populations in a smaller jurisdiction and the economies of scale in its adjacent larger jurisdictions; however, decentralization cannot achieve the efficiency in the provisions of public services and goods across jurisdictions. Thus, the optimality of government size affects economies of scale in the provisions of public services and goods.

Oates (1972) assumed two conditions for the satisfaction of the decentralization theorem: 1) the costs for the provisions of public services and goods by the federal government and state/local governments are the same, and 2) the provisions of public services and goods by local governments is more efficient and more satisfactory with the diversified demands. These two assumptions have expanded the decentralization theorem to three issues of fiscal federalism: 1) inter-jurisdictional spillover effects, 2) interrelation between mobile residents across jurisdictions

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[30] The four types of criteria are defined as "1) minimization of political externalities within each jurisdiction, (2) minimization of political externalities across jurisdictions, (3) minimization of the resource cost of providing public output, (4) maximization of the achievement of social redistributive goals (Rothenberg, 1970, p. 35)."

and the restrictions on the changes of the nature of public goods, and 3) the constraints on the uniformed level of the provision by the federal government (Oates, 2006).

The optimality of government size balanced the benefits of jurisdictional homogeneity and the scale of economies (Ellickson, 1977). Fundamentally assuming that a jurisdiction is not a producer, but a consumer in the market of public services and goods, Ellickson analyzed the market through a global Lindahl equilibrium. Unlike Rothenberg's work, he asserted that decentralization expands the grounds of allocation efficiency, but the optimal degree of decentralization is determined by economies of scale. Moreover, the number of fragmented jurisdictions changes the costs of collective decisions for the demands to the public services and goods, and affects and/or is affected by the politics of the jurisdictions (Ellickson, 1977).

By depending on the decentralization theorem, King (1984) researched the logic for the lay-outs of government functions, and McLure (1993) created a model that explained the assignments of powers. The optimal level of decentralization is determined by not only how heterogeneous local preferences are, but also how much inter-jurisdictional spillovers and the scale of economy a locality has. Still, researchers have continued to develop the logic and model for the changes of local finances (Alesina & Spolaore, 1997, 2003; Bolton & Roland, 1997; Breuss & Eller, 2004; Schakel, 2010).

Bolton and Roland (1997) asserted that the centralized form of government reduces the duplication costs in providing public services and goods, especially defense, law enforcement, transportation and communication networks. However, they analyzed the costs of trade-off between centralized and decentralized governments in European countries, and supported the idea that the centralized form of government is not appropriate for the growth of efficiency where the costs of conflicts through political decisions are observed between regions. Especially,

the centralized form increases the costs for fiscal and redistributive policies. Their conclusion was that decentralization by fragmenting nations guarantees political and economic benefits.

Alesina and Spolaore (1997) sought for the equilibrium on the size and number of nations by considering the trade-off benefits between political jurisdictions, and their heterogeneity and diversity of population. They asserted that the increase in the number of countries is observed in democratic world, but the democratic process causes inefficiency in the number of countries. Their economic analysis proved that the economic integration is strengthened where the number of countries is fixed at the equilibrium level.

Iimi (2005) provided another study that supports decentralization helps to grow national economy. He analyzed the expenditures of cross-country data for five years, focusing on the late 1990s, and showed a result that the more decentralized is likely to increase GDP growth as per capita. The GDP growth by the more decentralized is due to that local provisions of public services and goods result in the rapid economic development. However, this study leaves a question how local governments secure the efficient provisions.

A centralized system has difficulties in reflecting local preferences on the provisions of public services and goods, while a decentralized system is able to grow welfare gains through the more homogeneity and unitary preferences in local levels. According to the decentralization theorem, local governments provide public services and goods at higher levels of Pareto-efficiency even in the same jurisdictions than the central governments, although the costs of the provision are same for both governments (Oates, 1972, p. 35). The decentralization theorem emphasizes the allocation of powers and authorities across government tiers, and the increase of welfare by providing public services and goods, and collecting taxes. Many literatures have looked into the effects of and causes to the decentralization theorem. The heterogeneity of

preferences through regions and populations determines the degree of the decentralized from the decentralization theorem.

B. *Organizational Transaction Costs*

Another issue on fiscal federalism is the research of organizational transaction costs (Breton & Scott, 1978). Fiscal federalism decreases mobility and signaling costs, while it increases administrative and coordination costs. Governments have concerned of how to maximize the outputs, and fiscal decentralization has concerned of how to minimize the four costs by decreasing "information costs for local citizens, the lack of accommodation and near usage as well as control costs" charged to the federal government (Breuss & Eller, 2004, p. 36). The point at which the sum of the four costs is minimized is the optimal level of fiscal federalism (Breton & Scott, 1978).

The transaction costs of fiscal federalism are explored with the Leviathan hypothesis (Brennan & Buchanan, 1977, 1980) that public sector and its bureaucrats seek to maximize their revenues and expand government size; thus, the more fiscal decentralization, however, has reduced the total government spending. The Leviathan hypothesis is supposed to shrink government size through limiting tax competition and fiscal decentralization prevents bureaucrats from maximizing their budgets as determinants of government size. From the Leviathan hypothesis, homogeneity/heterogeneity is a significant factor of changing the transaction costs and a main target necessarily investigated in fiscal federalism. The Leviathan hypothesis was also empirically supported by the studies (Grossman, 1989, 1990; Kau & Rubin, 1981; Marlow, 1988; Rodden, 2003).

The analysis of transaction costs examines structure, especially focusing on the networks of organizations, and compare different structural forms in terms of a common measure. Williamson (1999b) termed this as the "remediableness criterion," an attempt to generate a relative comparison of the strengths of the public and private sectors for undertaking a function. The criterion has held that "*where no superior feasible alternative can be described and implemented with expected net gains is presumed to be efficient*" (Williamson, 1999b, p. 1092). Government intervention could be determined on this basis, rather than on the basis of market failure. By comparing market failure with a stated ideal that assumes the efficiency of the public sector, masking governmental failures and prescribing government intervention enhances the propensity for government intervention.

Inman and Rubinfeld (1997a) examined the economization of transaction costs for fiscal federalism by jurisdictions and their policies. Having the federal political institutions divided into confederate and compound republic types.[31] They analyzed each republic type in politically and economically. Confederate republic politically protects individual rights and fosters public virtue, as well as helps to economically achieve the efficiency by competing for mobile residents in fully decentralized institutions through bargaining between city-states. Unlike confederate republic, compound republic keeps the stabilization that reaches its national agreement. However, the weak power of the central government and the extended competition between city-states lead to market failures and externalities through significant spillovers. Therefore, they asserted that the federal form of government structured as federal, state and local levels is the

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[31] According to Inman and Rubinfeld (1997a), the type of confederate republic allows city-states to have sovereign authority against the central government, while the type of compound republic expands the central government's responsibility. They asserted that the trade-off of tensions is observed between these two republic types, and analyzed the political-economic costs in the assignments of the representatives in city-states or central government that helps to calculate organizational costs.

most appropriate to reduce organizational costs and to ensure the political-economic advantages of confederate republic.

Bednar, Eskridge, and Ferejohn (2001) have considered how to reduce the organizational transaction costs through the credible arrangements of the optimal division of powers at the political-economic perspectives. Their research provided a result that fiscal federalism leads to the decrease of the transaction costs across government tiers, but the increase of efficiency. How to keep the proper ranges of national and local authorities ensures the stability of fiscal arrangements. The organizational transaction costs are controlled by political parties and institutions; thus, decentralized institutional arrangements vary the costs across the multi-levels of governments (Bednar et al., 2001).

2.4.   Empirical Research Relevant to the Theories Above

Numerous empirical scholars and their studies have researched the following four topics tax competition, the Leviathan hypothesis, yardstick competition, and intra-jurisdictional competition as competition across governments originated from the Tiebout model of inter-jurisdictional competition.[32] The reviews of empirical research are summarized on Table 2.2.

2.4.1. Empirical Research on Tax Competition

Empirical research of tax competition first has examined whether jurisdictions are faced with competition and tax competition, and what reactions a jurisdiction makes to the changes of tax rates in its neighboring jurisdictions as its competitors. For the analysis whether there is tax competition or not, Brueckner (2003) asserted that the direction of the effects of tax rate in

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[32] The issues of decentralization theorem and organizational transaction costs have been fundamentally researched based on the four topics of fiscal federalism. Therefore, this dissertation reviews the empirical research of the four topics.

neighboring jurisdictions is ambiguous, but suggested that the significant slope coefficient should be an evidence for tax competition.

By aggregating property values, Deller (1990) examined the allocative efficiency in the provisions of public services and goods in Illinois counties in 1983. His empirical analysis depending on the Brueckner's two studies (1979, 1982) regressed property values on the number of governments per 1,000 capita within a county and other variables such as expenditures on education, transportation and public safety of police. He showed that the expenditures on transportation and public safety result in the under-provision of those public services and goods. Moreover, his result suggested that the number of governments that have positive impacts on property values improves the allocation of public services and goods.

At the level of state governments, tax competition also exist by analyzing a panel dataset, especially capital income tax and state excise tax (P. Egger, Pfaffermayr, & Winner, 2005; Hernández-Murillo, 2003). Ladd (1992) examined the presence of tax competition with a data set of 248 large U.S. counties in two years of 1978 and 1985. All the tax variables aggregated for all localities of a county and deflated by personal income are geo-spatially lagged by standard metropolitan statistical area (SMSA). Tax competition for the burdens of total taxes, property taxes and residential property taxes are positive and statistically significant, and his analysis followed the theory of tax competition. His analysis confirmed that inter-jurisdictional competition is observed at the three taxes.

Luna (2004) focused on the inter-jurisdictional competition of local sales tax in Tennessee counties in 1977 through 1993, and analyzed the reaction functions of a county to its bordering counties. For the analysis, she weighted tax rates and bases of the bordering counties by population. Her empirical result observed the inter- and intra-jurisdictional tax competition of

sales taxes. The tax rate in a county has negative effects on its tax base, but positive effects on its bordering counties'. Also, the mean of the sales tax rates of the bordering counties positively affect the sales tax rate in the county. Moreover, the intra-jurisdictional tax competition is statistically significant and positive for tax rate setting between states and counties.

Egger, Pfaffermayr, and Winner (2005) approached to the tax competition with spatial analysis among the U.S. states by focusing on excise taxation, and estimated the effects of tax cut of a state on the excise tax rates of its neighboring states. They confirmed consistent results to the previous studies that had confirmed the tax competition among jurisdictions. According to their estimates, a state adjacent to other states with higher excise tax rates is more positively affected, and its size has effects on the changes of tax rates. Based on their empirical results, they suggested that tax competition should consider how to weigh competing jurisdictions.

In addition to the empirical research on counties, two empirical studies (Bates & Santerre, 2006; Hendrick et al., 2007) analyzed tax competition and its effects on the efficiency of the provisions of public services and goods at the level of municipality. Focusing on municipality governments in Connecticut, Bates and Santerre (2006) analyzed the effects of inter-jurisdictional competition on the allocative efficiency by using aggregate property value. They confirmed that inter-jurisdictional competition helps local governments allocate their resources better. Hendrick, Wu and Jacob (2007) defined competitors as all local governments based on contiguity and distance in Chicago metropolitan area. Their empirical analysis through data set of 238 municipality governments in 1998 through 2000 supported the theory of tax competition that inter-jurisdictional competition is observed when municipalities decide their property tax rate. Moreover, their result showed that intra-jurisdictional competition arises between municipalities and counties.

Jacobs, Ligthart and Vrijburg (2010) focused on consumption taxes for the empirical analysis of tax competition. Their empirical analysis grounded on the spatial characters of the U.S. states (except for Alaska and Hawaii) such as size, geographic position and border length in 1977 through 2003. By using the panel dataset, they tested the hypotheses of tax competition shown in the previous literatures in terms of static and dynamic tax reaction function. They provided strong supports the strategic tax competition in the U.S. states, and found out that the strategic tax competition was shown much stronger in 1980s than 1990s. Moreover, population density and location of the US states have stronger influences on the extent of tax competition. The states located in the oceans and Mexican Gulf set their consumption taxes higher, but the states with higher population density along the border region have lower tax rates.

2.4.2. Empirical Research on the Yardstick Competition

Few empirical studies of the yardstick competition in the U.S. counties were found, but the yardstick competition has been studied in local levels of other countries. The yardstick competition actually asks two questions of the effects of inter-jurisdictional competition on: 1) election, especially the probability that an incumbent is re-elected, and 2) the taxation process in a jurisdiction whether it mimics its neighboring jurisdictions or not. This section provides the empirical studies of each question, and reviews the studies that focus on the U.S. states and the local jurisdictions in other countries.

Case contributed to the two empirical studies of the yardstick competition in the U.S. forty-eight States but the States of Alaska and Hawaii (Besley & Case, 1995; Case, 1993). In her first study (Case, 1993), she estimated the probability of the incumbent governors' defeat by considering the income tax changes in neighboring states from 1979 to 1988. Her empirical

analysis provided a result that an incumbent governor is more likely defeated by the increase of income tax rate in the state, but less likely defeated by that in the neighboring states. Moreover, another result was shown that a change of taxation in a state is positive to that in its neighboring states; thus, governors become more sensitive to the tax behavior in their neighboring states.

In another study, Besley and Case (1995) expanded the time period of the panel data set from 1960 to 1988, and estimated the probability of the both issues in her first study (Case, 1993). The probability of tax changes in a state relevant to its neighboring states in their study considered the characteristics in the state. The findings in their study are consistent with her first study. The probability that an incumbent governor is re-elected is positive to the tax increase in the neighboring states, but negative to the tax increase in the state. Moreover, the governors who are ineligible for the re-elected are less sensitive to the tax changes in their own state and neighboring states, while the governors who are eligible are more sensitive to the tax changes. The findings of the two studies provided empirical evidence consistent to the yardstick competition, but were not able to merge the yardstick competition to tax competition.

The yardstick competition has interests in behaviors of a representative for policy mimicking. Heyndels and Vuchelen (1998) focused on the income and property taxation in the Belgium municipalities. They analyzed the neighboring municipalities by the first and the second order contiguity with the distance, and defined them as the second order contiguity exclusive to the first order. The rates of both taxes in the neighboring municipalities have positive and statistically significant impacts on the mimicking behavior.

Revelli (2001) examined the mimicking behaviors in the 296 English non-metropolitan districts, and estimated their property tax rate with reaction function that considers horizontal competition across districts, and vertical interactions between districts and counties. His

empirical analysis confirmed that the English non-metropolitan districts are faced with horizontal competition, but not vertical interaction.

In addition to the empirical studies of the probability that an incumbent is re-elected and the behavior that a jurisdiction mimics its neighbors, Revelli (2002) examined the yardstick competition, and estimated the vote share of the incumbent's political party through property tax rate in the U.K. districts by dividing two groups: 1) by-third election every year, and 2) all-out election every four years. He actually failed to provide empirical results that fully support the yardstick competition, but the property tax rates in a district of the first group has negative impacts on the vote share before controlling his model with national politics.

An empirical research, however, provided strong supports to the yardstick competition (Bosch & Solé-Ollé, 2007). They constructed a panel data set of municipalities of Spain in four separate years (1991, 1995, 1999 and 2003). Like Revelli (2002), they also considered property tax rates in the municipalities, but defined the neighboring municipalities through distance, not contiguity in Revelli's study. Their empirical results showed that an increase of property tax rate in one municipality has statistically significant and negative impacts on the vote share, and that in its neighboring municipalities has statistically significant and positive impacts.

Except for one study among the studies above, all the empirical studies have supported the theory of the yardstick competition. Those empirical studies do not reconcile the theory of tax competition, so it is still hard to discriminate the yardstick competition from the tax competition. However, inter-jurisdictional competition is helpful to weaken the rent-seeking behavior of politicians, and to constrain the inefficiency of governments.

2.4.3. Empirical Research on Intra-Jurisdictional Competition

The empirical studies on intra-jurisdictional competition assumed that the efficiency in the layers of government structure should be affected by the share and co-occupation of same tax base. The two studies (Besley & Rosen, 1998; Goodspeed, 2000) stated in the previous section explored intra-jurisdictional competition; however, they showed contradictory empirical results: 1) the positive reactions of the U.S. states to the federal excise tax rates of gasoline and cigarettes (Besley & Rosen, 1998), 2) but the negative reactions of local governments to the central/federal income tax revenues in OECD countries (Goodspeed, 2000).

Based on the controversial contradiction of the two empirical studies, recent empirical studies have examined the vertical interaction of intra-jurisdictional competition in tax policies between the different levels of governments, controlling the horizontal competition of inter-jurisdictional competition. Moreover, the recent studies on intra-jurisdictional competition become interested in how to test the robustness of the other empirical results in the fields of horizontal competition. The reaction of states' income tax to the federal income tax changes was examined through a panel data set of the forty-one U.S. states, adding the average tax rates of neighboring states as contiguity that controls the horizontal competition (Esteller-Moré & Solé-Ollé, 2001). Their empirical analysis supports the intra-jurisdictional competition. The increase in the federal income tax rate shows statistically significant and positive effects on the rates of state income tax and its combined with general sales tax; moreover, the both tax rates in the neighboring states have statistically significant and positive effects on the rates. Therefore, their empirical analysis confirmed that both horizontal and vertical competition in tax rates exist (Esteller-Moré & Solé-Ollé, 2001).

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Besley and Rosen's study (1998) were extended to allow horizontal competition among states for the test of robustness in the study (Devereux, Lockwood, & Redoano, 2007). They estimated the reaction of states for cigarette and gasoline taxes. The horizontal competition of the tax rates in the neighboring states was controlled, and the tax rates in the neighboring states were weighted by population density. Their empirical evidence also shows the vertical competition in gasoline taxes, but not in cigarette taxes.

2.4.4. Empirical Research on Public Choice Theory

A. Taxes and Public Choice Theory

Public choice theory has been adopted to analyze public expenditures and redistribution function through taxation, and the analysis of the effects of taxes on government size like the Leviathan hypothesis. The analysis of political systems sheds light on the importance of the effects of institutional changes on policy-making process and political costs. The relevance of taxes to public expenditures leads to adopt public choice theory for the analysis of taxes, especially tax structure and taxation. Tax system not only considers the efficiency and equity of taxation as the view of economists, but also is created as a product by political process.

In spite of the widespread adoption of public choice theory, this dissertation focuses on the empirical research of public choice theory on tax policy and intergovernmental grants. In the analysis of tax policy, public choice theory has not been solely adopted, but linked to the other theories of taxes such as fiscal competition, tax competition, and yardstick competition stated in the previous sections, even including the Leviathan hypothesis, decentralization theorem and organizational transaction costs in this section. Competition is observed across jurisdictions, and public choice theory considers the members of a jurisdiction. Therefore, it can be said that the

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theories based on competition identify external factors to policy decisions and public choice theory does internal factors in a jurisdiction.

Before the introductions of empirical research of public choice theory, this chapter pints out Brennan's analysis (1977). He analyzed the effects of the progression in tax structure on government size at the perspective of public choice theory. His perspective was that the greater progression causes cost-sharing arrangements and more burdens to the higher-incomers. The tax liability of the median voter is smaller, given that median income is less than the mean income, and the demands for public services and goods are progressive to income level.

The median voters have the key to decide the level of public spending, and this section focuses on the empirical analysis of the median voter theorem and tax policy decisions. Because the greatest revenue source for local governments is property tax, much research of public choice theory and tax policy has concentrated on property taxes. Therefore, reviewing the research of public choice and property tax policy is supposed to help us see how to apply the research to the sales tax policy.

Boyne (1987) tested the median voter hypothesis that the various preferences of median voters decide the variation of political systems and policies. Because the preferences between median voters and mean voters differ from each other, he conducted an empirical analysis of the effects of the preferences on tax policy. He defined the dependent variable as the annual percentage changes in local property tax rate in England municipalities, and defined the two main independent variables as local tax price of the median voter and the mean voter. The local tax price of the median voter is measured by the ratio of domestic ratepayers to electors, and is equal to 0 when the ratio is less than 50%. Total domestic revenues measure that of the mean voter over total registered electors. His empirical analysis showed the group difference between

mean and median voters, and provided supports to the median voter hypothesis that median voter has greater but not strong influences on the determination of tax rate.

Public choice theory links government size to tax structure through the two approaches of fiscal illusion and fiscal stress[33]. Misiolek and Elder (1988) aimed to distinguish the two approaches from each other, and to investigate the relationship between government size and tax structure. Their empirical analysis through panel dataset, without Alaska and Wyoming showed that the salary of government employees has positive effects on tax revenues and expenditures, and per capita income has positive effects on only tax revenues, while the tax and expenditure limits have negative effects. The empirical analysis supported the fiscal stress hypothesis that explains the effects of revenues and income on the variability of government size.

Inman (1989) asserted that local tax structure determines fiscal performance. He investigated the institutional, political, and economic determinants of local tax by focusing on the forty-one U.S large cities in 1961 through 1986. He considered local politics and resource mobility as the determinants of local taxation. Because the focus of his research are the large U.S. cities, representative mayors are responsible for the coordination of competing interests over local taxes and fees, and the relative size between counties and rural areas threatens the higher mobility of resources. He found out that local taxes are significantly determined by redistributive policies, and how local governments remove the effects of their taxes on the federal tax deductibility.

Santolini (2008) tested his hypothesis that tax settings and expenditure decisions in a jurisdiction share similar political ideology. By depending on the three alternative theories of

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[33] Fiscal illusion hypothesizes that the growth of government revenues mists up a taxpayer's perception of government costs, referring to the misconception of government costs by taxpayers. Fiscal stress approach identifies tax diversification as a way to minimize the deterioration of public service and the costs for revenue variability.

fiscal competition, yardstick competition and budget spill-over, he empirically investigated the political trend in Italian municipality governments. He measured political and heterogeneous coalitions, and socio-demographics in a jurisdiction, and then regressed property tax rate and public expenditures on the variables of the coalitions. His empirical analysis found out that the same political coalition according to the ideology of politicians tends to set the similar tax rates as fiscal interactions of mimicking behavior.

Delgado, Lago-Peñas and Mayor (2011) examined the strategic interactions as the determinants of property tax rate and motor vehicle tax rate in terms of tax mimicking, yardstick competition and political trend[34] through spatial models in Spain municipalities. They used property tax rate and its amount, as well as motor vehicle tax rate as dependent variables, and placed the independent variables of local politics, indicating incumbent's ideology, political fragmentation and election result, and intergovernmental grants from the upper-level to the lower-level governments. Controlled by economic and socio-demographic variables. Their empirical analysis first proved the mimicking behavior, and then showed yardstick competition and political trend. The incumbent weakly supported show stronger mimicking behavior to the decision of tax rates, and incumbents mimic the tax policies in the neighboring jurisdictions where their same political party incumbents hold office.

B. Intergovernmental grants and Public Choice Theory

Much research on intergovernmental grants with the perspective of public choice theory focuses on the national level in terms of the degree of fiscal decentralization and political economy. Moreover, the studies focusing on local levels of governments have examined the

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[34] In the tax setting of local governments, Santolini (2009) defined political trend as social interactions between politicians. The politicians within the same party have similar preferences and inferences from their ideology, so they tend to make similar decisions in policy-making process.

effects of political economy based on public choice theory on intergovernmental grants in European countries with different welfare system. Therefore, this section introduces two empirical results of both the U.S. national and local cases.

Borck and Owings (2003) studied the effects of politics on the allocation of intergovernmental grants in terms of lobbying activities of local governments to the central government. Unlike the Oates' norms (1972, 1999) that intergovernmental grants maximize local welfare, they are concerned of the optimality of policy with grants, and the spill-over effects of intergovernmental grants. They emphasized political failure as an important factor that leads to market failure. For the empirical analysis for their emphasis, they draw a data set of Californian counties for 1977, 1982, 1987 and 1992 every five years. They measured the per capita size of intergovernmental grants from the Californian state government as dependent variable, and added the political variables of political party of Governor, Assembly and Senates to their regression model controlled by the socio-demographic features of counties such as size, crime rate and population density for spill-over effects, and physical distance between a county and Sacramento of California's capital. They found out evidence that the lobbying efforts of local government to the California state government increases the marginal costs by geographical and political distance; moreover, spill-over effects were found out from their empirical results.

Abbott and Jones (2013) applied public choice theory to the analysis of decisions on the allocation of intergovernmental grants by describing how political powers are distributed across the different levels of governments. Politicians as decision makers of the allocation have electoral incentives for economic control with grants. They focused on the pro-cyclical pattern of government spending over business cycle in the twenty OECD countries between 1995 and 2006. Their empirical analysis through 3SLS model found out the pro-cyclical pattern of

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government expenditure in sub-central governments, and public choice theory suggests another test of voracity effects and normative implication of pro-cyclical pattern.

The empirical studies have examined the effects of local status of politics, economics and socio-demographics on policy-making process and its outcomes, especially on tax policies. Moreover, they have also found out that the preferences and interests of the median voters in a local jurisdiction reflect more on the decision of tax policy. Public choice theory has also developed fiscal federalism through the application of fiscal competition and interactions.

2.4.5. Empirical Research on the Leviathan Hypothesis

The empirical research of the Leviathan hypothesis has mainly focused on the effects of inter-jurisdictional competition on fiscal performance, and been much relevant to the decentralization theorem. The degree of inter-jurisdictional competition is measured by the degree of fragmentation and concentration.[35] Many empirical studies support the Leviathan hypothesis that inter-jurisdictional competition is negatively associated with the size of governments and public sector.

Nelson (1986) tested the Leviathan hypothesis using the revenue structure in the U.S. states and the degrees of decentralization of taxing and spending decisions. The tax base on the revenue side limits the Leviathan hypothesis that a bureaucrat, a state, with the behavior of budget-maximization has discretionary power for the revenue resources, but the discretionary power. On the expenditure side, the bureaucrat is restricted to impose tax levy limit, tax rate limit, and expenditures. His empirical results did not actually support the Leviathan hypothesis;

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[35] Fragmentation is usually measured by the ratio of total number of governmental units over public market in terms of contiguity, geographical distance and political jurisdictions. The general measurements for the degrees of concentration are the share of a government's revenues of total government revenues and the share of market of the total government revenues.

rather, the discretionary power of a bureaucrat generates budget surplus. Bureaucrats, however, tend to extend revenue resources in terms of tax base, and finance greater expenditures.

By focusing on the 2,900 counties and 290 SMSAs, Eberts and Gronberg (1988) analyzed the relationships between the degree of inter-jurisdictional competition and the size of public sector. The degree of inter-jurisdictional competition was defined as the three types of the number of governments, governments per capita, and governments per square mile. The degree of inter-jurisdictional competition was, moreover, divided into two types of governments as general-purpose and special-purpose. The size of public sector is measured by the ratio of expenditures per personal income. Their empirical analysis at the level of counties and SMSAs concluded that the degree of the competition for general-purpose reduces the size of public sector, while that for special-purpose expands the size. Therefore, the purpose of government is shown to have different effects on the size of public sector.

Wallis and Oates (1988) examined the degree of the U.S. fiscal decentralization through the patterns of state-local sector during the twentieth century in 1902 through 1982. They measured the degree by the state-local share of revenues and expenditures. Their findings provided proof that the growth of population, the more urbanized areas, and the income growth have expanded the degree of fiscal decentralization. Their examination suggested that more fiscal decentralization increases the size of state and local governments, but decreases that of the federal government. Some functions and responsibilities of the higher government should be transferred to the lower government, and the matched expenditures to the preferences are able to save the overall government spending (Shadbegian, 1999; Wallis & Oates, 1988).

Zax (1989) focused on the degree of local hierarchical decentralization as competition, and its effects on the size of local public sector size. He measured the size as local own-source

revenues per personal income and tax revenues per personal income in the U.S counties in 1982. The competition is measured by the number of governments per square mile and the county share of total revenue, and he divided the competition to general-purpose and special-purpose like Eberts and Gronberg (1988). His empirical result also supported the Leviathan hypothesis that competition in general-purpose government reduces the size of public sector, but that in special-purpose government has ambiguous effects on the size. That is, more concentrated government leads to the expansion of the size of public sector.

Following the model of standard tax competition (Zodrow & Mieszkowski, 1986), Edwards and Keen (1996) assumed that governments neither totally work to maximize the welfare of their residents, nor fully seek for Leviathan, and compared the two contrasting view of competition in tax competition and the Leviathan hypothesis. Their model focused on the internationally mobile capitals at countries that have their own completely immobile representative consumers as a resident in each country. The taxes in those countries are source-based and levied on mobile capital across countries. The revenues from the taxes are partially spent for the welfare of those representative consumers, as well as for the utilities for policy-makers. They found that competition for the mobile capitals among countries twists the efficiency of allocation between private and public, but the competition does not harm the waste of tax revenues in governments. Therefore, they finally confirmed both theoretical views for tax competition and the Leviathan hypothesis (Edwards & Keen, 1996).

Rauscher (1998) explored the main concept of the Leviathan hypothesis that inter-jurisdictional competition for mobile factors of production enhances efficiency and tames the Leviathan behavior in governments. He assumed that governments have the immobile factors of production such as infrastructure and institutional capitals, and the mobile factors of private

capitals. Governments collect lump-sum and benefit taxes, and produce their public goods as outputs for consumers and inputs for public sectors. Based on the Leviathan hypothesis, governments seek to maximize rent as the part of tax revenues spent for government itself, not for the production of public goods. His findings were that the rent generated by the benefit taxes such as user charges is used for the welfare of taxpayers who force governments to redistribute the rent for the rest of society in terms of the inter-jurisdictional competition for mobile factors. However, lump-sum taxes are not influenced by the inter-jurisdictional competition, but distorted to cause the inefficiency. Thus, Rauscher (1998) partially confirmed the Leviathan hypothesis.

Stansel (2006) examined the relationships between inter-jurisdictional competition and the size of public sector through a panel data set of the 314 SMSAs for 1962 through 1992. He measured the competition by the number of governments per 100,000 capita for general-purpose and special-purpose, and public sector size by the growth of expenditures per capita and share of income. The central city share of population in the SMSAs was also measured for the proxy variables for his model. Unlike Zax's findings (1989), his empirical analysis concluded that special-purpose government increases the both growths as the size of public sector, but general-purpose government has ambiguous impacts. The proxy variable of the central city share was also shown to increase the both growths.

The three empirical three studies focusing on the U.S. counties followed the Leviathan hypothesis that inter-jurisdictional competition shrinks the size of public sectors and governments. Some studies, however, have failed to support the view that fiscal decentralization prevents the expansion of government. As to this issue, Inman and Rubinfeld (1997b) have emphasized the political process and its impacts in fiscal federalism, and named the new model for this fiscal decentralization as 'economic federalism.' However, their studies of fiscal

decentralization and government size have been conducted by focusing on countries. The extent of fiscal federalism in a federal country, as a hybrid form between confederation and unitary system, is influenced by the internal fiscal federalism of subnational governments, and the extent can be separately analyzed from other unitary government countries.

Therefore, inter-jurisdictional competition necessarily helps to prevent the governments and bureaucrats from expanding their size of their budget-maximizing behavior. Unlike the three studies that centered on the total size of governments and public sectors, Forbes and Zampelli (1989) tested the relationships between inter-jurisdictional competition and individual government size. Their focus is an individual government size; thus, they measured inter-jurisdictional competition by the number of counties in a SMSA. Individual county government size was measured by taxes and own-revenues in a county as per capita and per dollar of income for the both. Their findings failed to support the Leviathan hypothesis because the greater level of fragmentation shrinks the economy of scale and the local governments are required to spend more costs for the provisions of public services and goods.

2.4.6. Empirical Research on Decentralization Theorem and Organizational Transaction Costs

Marlow (1988) and Grossman (1989, 1990) supported for the Leviathan hypothesis by empirically analyzing the assumption that all the fiscal characteristics of the states are identical. They provided an empirical model that analyzes the relationships between fiscal decentralization and government size measured as state and local government spending relative to total government spending. Marlow (1988) built a model for the effects of fiscal decentralization on government size in terms of government expenditures in the federal, state and local governments.

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He asserted that fiscal decentralization lowering the monopoly power of centralized government form expands competition and relatively lessens tax burdens in the public sector. Shifting the federal government power to its low-level governments is shown to slowly decrease the size and growth of public sector. According to Marlow's analysis, fiscal decentralization serves as a constraint on revenue-maximization behavior.

In addition to Marlow's model, Grossman (1989, 1990) focuses on intergovernmental grants as intergovernmental collusion. His first empirical analysis (1989) provided a result that intergovernmental grants as fiscal centralization grow the size of public sector and weakens the competition between lower-level governments which result in the fading from own-source taxes. Moreover, intergovernmental grants encourage the central government to expand the range of its monopoly and taxing power. In addition to his first work, he analyzed the impacts of intergovernmental grants from the both federal and state governments on local governments (Grossman, 1990). He asserted that the greater intergovernmental grants from their upper-level governments to local governments haze the local perception of the costs for public services and goods by separating taxing and spending powers. The income and price effects of intergovernmental grants affect local demands and expand local government size with the increase of intergovernmental grants from its upper-levels.

Nelson (1990) empirically addressed how the homogeneity of local preferences have influences on the optimal sizes of governments in metropolitan areas, and how state regulations determine the patterns of local government structures. His analysis divided local governments to the three types of all local governments with taxing authority, general-purpose local governments and special-purpose local governments. He found out that local governments have responded to the changes of their own populations, and changed to their structure. Moreover, his empirical

analysis supported the idea that the greater variety of local demands result in the increase of the number in both general- and special-purpose local governments.

Joulfaian and Marlow (1990) and Shadbegian (1999) added another points to that the Leviathan hypothesis is not appropriate to the federal system because the differences of fiscal functions, rules and institutions in state and local governments cannot be controlled by various revenue and expenditure behaviors. Especially, the institutionalization of taxes and expenditures limits (TELs) has clarified their points. Unlike the previous research including an aggregated time-series data, Joulfaian and Marlow (1990) disaggregated the federal expenditures by state level, and excluded the federal expenditures. Their new cross-sectional data set supported for that fiscal decentralization is relevant to organizational costs, as well as determines government size. However, they failed to prove that fiscal decentralization is a constraint to the growth of government size.

Shadbegian (1999) tested the Leviathan hypothesis and the Wallis hypothesis of fiscal decentralization. In addition to test the two hypotheses, he focused on the collusion among the government-levels, and the relationships between fiscal decentralization and the size of the all the levels of governments. The panel data set of states in 1979 through 1992 provided a result that fiscal decentralization results in the less spending at the federal, but the more at state and local levels. Moreover, the collusions among the three levels of governments lead to expand their total spending, which implies that fiscal decentralization is not only one factor to the constraint on the increase of government size.

The extents of fiscal decentralization are determined not by any single-level of government, but by the political bargains within and between national and local legislatures (Congleton, 2006). The political bargains are a series of negotiations between the legislatures,

and decide the details of policies and regulatory and fiscal powers. Congleton (2006) asserted that the negotiations create the organizational transaction costs and the costs are politically-economically manipulated across local governments by granting the fiscal and regulatory powers for local governments. Moreover, the central government differentiates the marginal costs to each local government, and local governments purchase the regulatory and fiscal powers by paying the costs with the considerations of local demands in terms of its political, regional and/or ethnic organizations.

2.5. Summary of Theories Above

This chapter has reviewed the theories of fiscal competition among governments, and several empirical studies relevant to the theories. The fiscal competition in federal government form is shown to horizontally and vertically exist, and they affect government performance and local politics. For the theoretical and empirical reviews, this dissertation focused on the two types of fiscal competition: 1) the Tiebout model, inter-jurisdictional competition, tax competition, the Leviathan hypothesis and the yardstick competition, and 2) Intra-jurisdictional competition.

The theoretical and empirical reviews of fiscal competition are based on the Tiebout model. The origins of the Tiebout model, however, did not concern the inter-jurisdictional competition, but a market-like mechanism for the more efficient allocation in public sectors. The concept of inter-jurisdictional competition from the Tiebout model has been elaborated to tax competition and the Leviathan hypothesis. It has not considered the political institution as a source of competition until the yardstick competition was introduced. The developments of the

Tiebout model to the alternative theories on inter-jurisdictional competition have raised the decentralization theorem and organizational transaction costs among governments.

Moreover, the inter-jurisdictional competition brings another type of competition to the federal form of government. The federal government and its lower levels of governments have been always faced with intra-jurisdictional competition. The intra-jurisdictional competition is also a significantly important issue in federalism because the various layers of governments co-occupy the same tax base on the revenue side and co-provide the public services and goods to the same targets. Without the recognition of the vertical relationship of intra-jurisdictional competition, the co-occupants and co-provisions decrease the inefficiency of governments.

Federal system fragments governments by a tier, and allocates political and economic power and authority among the tiers. The fragmentations among the tiers result in intergovernmental relationships, and fiscal interactions are observed between governments horizontally and vertically. This chapter has reviewed inter- and intra-jurisdictional competition of fiscal interactions. The fiscal interactions have external influences on policy-making process and its outcomes in a jurisdiction in terms of the relationships of more than two governments out of the jurisdiction; the process and outcomes are internally affected within a jurisdiction and its members such as representatives, bureaucrats and voters.

The analysis of the internal affections is approached by public choice theory in this dissertation. Public choice theory assumes that all individuals are self-interested, and analyzes the political behaviors of the individual interests by economic tools. The analysis considers the interactions of the political behaviors in a social system. One significant theorem from public choice theory is the median voter theorem that policy-makers mostly reflect the preferences of

the median voters. Many empirical studies prove that the median voters consider tax policy at the perspective of public choice theory.

Another alternative theory associated with public choice theory is the Leviathan hypothesis that bureaucrats as a Leviathan behaves to maximize revenues from whatever sources of taxation with their monopoly power of tax collection. The Leviathan hypothesis combines the inter-jurisdictional competition from the Tiebout model with Niskanen's budget-maximizing model, and asserts that governments and their bureaucrats are not benevolent to maximize the welfare and utility of their voters. The greater level of fiscal decentralization is hypothesized to expand inter-jurisdictional competition, and to weaken the monopoly power for tax collection. The Leviathan hypothesis suggested that inter-jurisdictional competition is helpful for the scarcity of mobile tax base by limiting the taxing power of revenue-maximizing governments. These two theories for the functions of fiscal federalism lead to the introduction of decentralization theorem and organizational transaction costs that decide government size.

The reviews of the four alternative theories of fiscal federalism have theoretically and empirically proved that the actors of a local government such as representatives, bureaucrats and voters compare their government with others, especially neighboring governments, and reflect the neighboring governments on their tax policy and outcomes. Moreover, their own preferences and aggregate preferences decide government size by changing all the fiscal functions in their jurisdictions because the tiers of federal governments share a lot of bases for revenues and expenditures. However, most studies have been concentrated on property taxation because the most sources of local revenues had been property taxes. However, local governments have made efforts for their revenue diversification, and many of them have adopted local sales tax. It is currently suggested to approach to the analysis of local sales tax.

Table 2.1:   Summary of Theories on Fiscal Interaction

Competition	Inter-Jurisdictional Competition			Intra-Jurisdictional Competition
Theory	Tiebout Model[*]	Tax Competition	Yardstick Competition	
Reason for Competition	Mobility of residents, voters, citizens	Mobility of capital	Evaluation on government and politicians performance	Sharing same tax base and targets for public services and goods
Assumptions on government[**]	WM	WM	BM and/or WM	BM and/or WM
Results of Competition	Decrease tax rate and government size			Increase tax rate and government size
Effects on Government Efficiency[***]	TE & AE	AE	TE & AE	AE
Remarks		PSG[****]		PSG[****]

*: The Tiebout model includes inter-jurisdictional competition.

**: WM means that government and bureaucrats maximize the welfare of local residents without self-interests, while BM means that they maximize the budgets for their interests.

***: TE denotes technical efficiency; AE denotes allocative efficiency.

***: Potential over-provisions of public services and goods

Table 2.2:   Summary of Empirical Studies Relevant to Fiscal Interaction

Author(s)	Unit of Analysis	Model[1]/Data	DVs[2]	IVs[2]	Findings[3]
Tax Competition					
Deller (1990)	County, IL	OLS/CS	Property value	NIGP	P
Ladd (1992)	US Counties	IV/CSTS	Property tax burden Sales tax burden Other tax burden	GSL-SMSA	P NS NS
Luna (2004)	County, TN	OLS/CS	Sales tax rate	GSL-C	P
Egger, Pfaffermayr, and Winner(2005)	US States	GMM/PD(25)	Excise tax rate	GSL	P
Bates and Santerre (2006)	Cities, CT	OLS/CS	Property value	MS-C HHI-C	P P
Hendrick, Wu, and Jacob (2007)	Metropolitan Areas, Chicago	IV,ML/PD(3)	Property tax rate Sales tax rate	GSL-C GSL-D PTR-C STR-C	P NS P (IV-D) NS
Jacobs, Ligthart and Vrijburg (2010)	US States	OLS/PD(25)	Sales tax rate Excise tax rate	GSL-C	P
Yardstick Competition					
Case (1993)	States, US	PM/PD(10)	Re-election probability[*]	ITC-C,O,N	NS
Besley and Case (1995)	States, US	PM/PD(29)	Re-election probability[*]	ITC-C,O,N	N (ITC-N)
Heyndels and Vuchelen (1998)	Municipalities, Belgium	IV/CS	Property & Income tax rate	GSL-C	P
Revelli (2001)	Districts, England	GMM/PD(8)	Property tax rate	GSL-C	P
Revelli (2002)	Districts, England	IV/PD (12)	Incumbent vote share	PTR-C,O,N	NS
Bosch and Solé-Ollé (2007)	Municipalities, Spain	IV/PD (13)	Incumbent vote share	PTC-D,N	

(Continued)

Author(s)	Unit of Analysis	Model[1]/Data	DVs[2]	IVs[2]	Findings[3]
Intra-Jurisdictional Competition					
Besley and Rosen (1998)	States, US	OLS/PD(15)	Tax rate of cigarettes and gasoline (TCG) in states	TCG-F	P
Goodspeed (2000)	OECD countries	TM/PD(10)	Income tax rate (ITR) in local jurisdictions	ITR-N	N
Esteller-Moré and Solé-Ollé (2001)	States, US	IV/PD(12)	Income and sales tax rate (ISTR)	ISTR-C	P
Devereux, Lockwood, and Redoano (2007)	States, US	IV/PD(21)	Tax rate of cigarettes and gasoline (TCG) in states	TCG-C	NS
Public Choice					
Boyne (1987)	Municipalities, UK	OLS/CSTS(3)	Annual changes of LPT rate	LTP-Median Voter LTP-Mean Voter	PS
Misiolek and Elder (1988)	States, US	OLS/PD(18)	Tax Revenues per Capita State-Local Expenditures per Capita	PCI POPS AMW VAR-R,E,PI	P N P N(R)
Inman (1989)	Cities, US	OLS/PD(25)	OSR User Fees SST	RCSI PCR PCP	NS N N
Borck and Owings (2003)	Counties, CA	2SLS/TS(4)	Grants per Capita	REP-G,A,S SE	N(G) P
Santolini (2008)	Marche region municipalities, Italy	CS	Property tax rate Public expenditures	GSL-C POL SD	P P P
Delgado, Lago-Peñas and Mayor (2011)	Municipality, Spain	ML/CS	Property tax rate Vehicle tax rate	GSL-C POL SD	P P
Abbott &Jones (2013)	20 OECD Countries	3SLS/PD(12)	GE/National Income (%)	CGE/TGE OV	N N

(Continued)

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Author(s)	Unit of Analysis	Model[1]/Data	DVs[2]	IVs[2]	Findings[3]
Leviathan Hypothesis					
Oates (1985)	States, US	OLS/CS	State-Local tax revenues	GSN-R,E	NS
Nelson (1986)	States, US	OLS/CS	State-Local taxes per capita	All taxes-B CSR	V
Eberts and Gronberg (1988)	Counties, US	OLS/CS	Expenditures/PCI**	GSN-G,P,M GSN-S,P,M	N P
Wallis and Oates (1988)	States, US	OLS/PD(81)	State-Local share of Expenditures and Revenues	Land Size POPS Urbanization PCI	P P P
Forbes and Zampelli (1989)	Counties, US	OLS, ML/CS	Tax revenues/PCI Own-source revenues/PCI	GSN	P
Zax (1989)	Counties, US	OLS/CS	OSR/PCI** (OS) Tax revenues/PCI** (TR)	GSN-G,P,M GSN-S,P,M CSR-P	P(TR; P) P(P); N(M)
Nelson (1990)	SMSA, US	OLS/CS	Number of local governments	TDL-G,S	P
Nord Hughes and Edwards (2000)	Counties, MN	TM/CS	Efficiency by Data Employment Analysis	GSN-P	P
Stansel (2006)	SMSA, US	OLS/PD(31)	Growth in expenditure per Capita Growth in expenditure share of income	GSN-G,P GSN-G,P CSR-P	N P NS
Crowley and Sobel (2011)	Local jurisdictions, PA	OLS/PD(10)	Real property tax revenues per Capita through Leviathan ratio	SD	P
Decentralization Theorem and Organizational Transaction Costs					
Marlow (1988)	US Government	OLS/TS(40)	GE/GNP*** Annual growth rate of GE/GNP	SSL ΔSSL	N N
Grossman (1989)	US Government	OLS/TS(40)	GE/GNP*** Annual growth rate of GE/GNP	SSL, SGL ΔSSL, ΔSGL	N,P N,P

(Continued)

Author(s)	Unit of Analysis	Model[1]/Data	DVs[2]	IVs[2]	Findings[3]
Grossman (1990)	Counties & cities, VA	OLS/CS	Local government total expenditures	UGT UGF UGS CGT	P P P P
Nelson (1990)	SMSA, US	OLS/CS	GSN-L	PH	P
Joulfaian and Marlow (1990)	States, US	OLS/CS	GE/GSP***	RG DEC	N N
Shadbegian (1999)	States, US	OLS/PD(14)	Fiscal decentralization degree	GE-F GE-S,L	N P

1. OLS: ordinary least squares; IV: instrumental variables; ML: maximum likelihood; TM: tobit model; PM: probit model; GM: generalized methods of moments; CS: cross section; CSTS: cross section and time-series (not continuous time series, the number in parenthesis indicates the time periods of the dataset); PD: panel dataset with continuous time series, the number in parenthesis means the time period of the dataset; TS: time-series

2. DVs: dependent variables; IVs: independent variables; B: dummy (binary) variable; NIGP: number of independent governments per capita (or 1K); GSL: geospatially lagged variable *(after hyphen, C for contiguity, D for distance, and SMSA for standard metropolitan statistical area; MS: market share of governments)*; HHI: Herfindahl-Hirschman Index of market concentration; CSR: county share of total revenues; ITC: income tax changes *(after hyphen, C: neighboring jurisdictions geospatially lagged by contiguity; O: own income tax; N: tax changes in neighboring jurisdictions)*; PTR: property tax rate *(after hyphen, same with ITC)*; STR: sales tax rate *(after hyphen, same with ITC)*; PTC: property tax changes *(after hyphen, same with GSL)*; TCG: tax rate of cigarettes and gasoline *(after hyphen, F: the federal level; C: neighboring jurisdictions geospatially lagged by contiguity)*; ISTR: income and sales tax rate *(after hyphen, same with TCG)*; LPT: local property tax; LTP: local tax prices; POPS: population; AMW: average monthly wage in state-local government employees; VAR: variability *(after hyphen, R: revenues; E:expenditures; PI: personal income)*; RCSI: potential elasticity of city revenue schedules; PCR: percent of the electorate who are poor; PCP: percent of the electorate who are poor; IGG: intergovernmental grants; OSR: own-source revenues; SST: selective sales taxes; GSL: geospatially lagged variable; POL: politics; SD: socio-demographics; GSN: government size as the number of units *(after hyphen, R: share of revenues; E: share of expenditures; G: general purpose government; S: special purpose government; P: GSN per capita; M: GSN per square miles)*; CSR: county share of total revenues; TDL: tax and debts limitations; GR/E: government revenues/expenditures *(after hyphen, F: federal level; S: state level; L: local level)*; GSL: geospatially lagged variable; SSL: share of state and local expenditure in total government expenditure; SGL: share of federal intergovernmental grants to state and local governments in total state and local receipts; UGT: total unconditional intergovernmental grants from the federal and state to local; UGF: unconditional intergovernmental grants from the federal to local; UGS: unconditional intergovernmental grants from state to

local; CGT: total categorical intergovernmental grants to local; PH: preference heterogeneity; RG: ratio of federal intergovernmental grants to state and local government revenues; DEC: ratio of state and local government expenditures to total government expenditures; REP: political party of G (governor), A (Assembly) and S (Senate) as Republicans; CGE: central government expenditure; SE: spill-over effects; TGE: total government expenditure; OV: output volatility

3. NS: statistically not significant; P: positive relationship between dependent and independent variables; N: negative relationship between them; V: various estimates

*: The probability that the incumbent governors are not re-elected.

**: PCI denotes per capita income.

***: GE, GNP and GSP denote general expenditure, gross national product, and gross state product, respectively.

Figure 2.1: Changes of the Mean of Intergovernmental Grants (1970 through 2006)
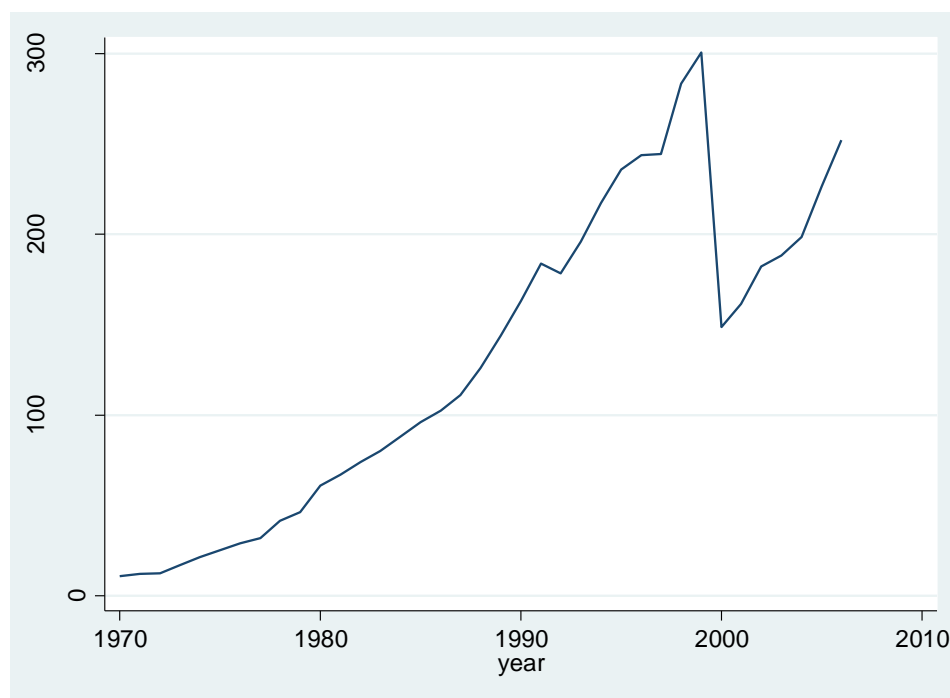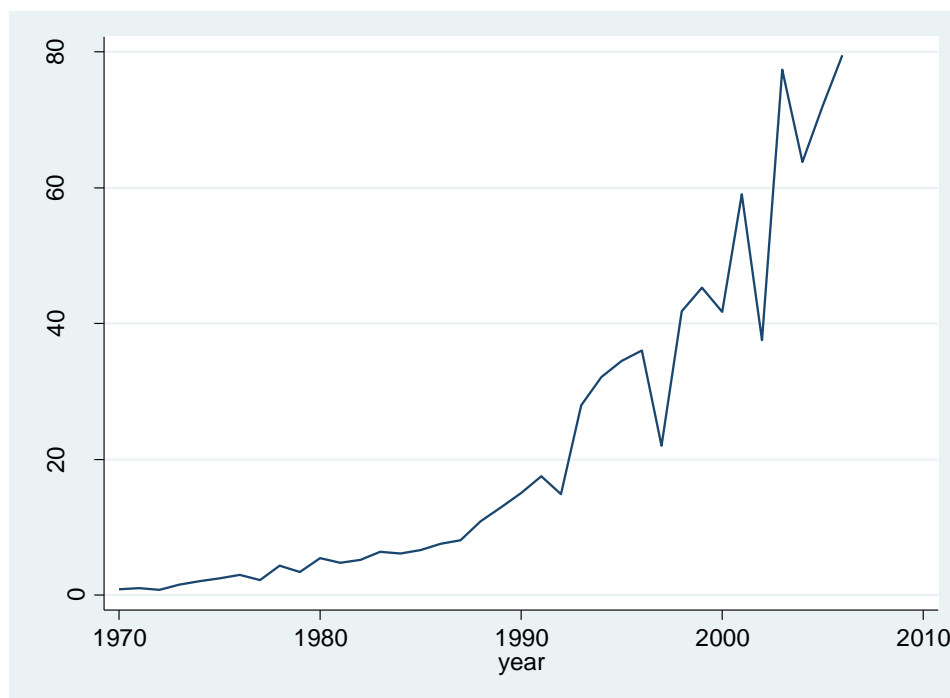
Note: The grant size is converted to 2000-year real dollars in both graphs. The upper graph shows the total grant size (unit: $1,000,000) and the lower graph shows the grant size as per capita (unit: $).

Source: U.S. Census Bureau

CHAPTER 3

TARGETS AND PURPOSE OF THIS DISSERTATION

This chapter elaborates on why this dissertation has selected local sales tax and intergovernmental grants on the targets of the empirical analysis. All local governments have collected their revenues mainly from property taxes, but the revenues from property taxes are not enough for the local governments to efficiently respond to the demands of their tax-payers. Local governments have made a lot of efforts to diversify their revenues, and the diversification helps local governments increase the efficiency in their responses to local demands. Local sales tax is designated for the diversification.

Therefore, this chapter provides a broad and general overview of the current status of local sales taxes in all U.S. states. Based on the recent categorization of local sales tax condition by Bland (2005) and Mikesell (2010), their categorization has been verified by contacting all U.S. State Departments of Revenues and Taxations, and reviewing all U.S. State Statutes and Tax Codes. The reviews of all U.S. state Statues and Tax Codes result in some changes on their categorization of local sales tax condition because this dissertation focuses on the type of fiscal interactions. Based on the broad overviews, this chapter finally provides the purposes and significances of this dissertation.

3.1.   Targets of Fiscal Instruments for This Dissertation

Fiscal federalism essentially concentrates on how to allocate not only the sets of fiscal instruments among the lower levels of governments, but also the authorities of political powers

for the fiscal instruments (Boadway & Shah, 2009).[36] This dissertation selects the two of ten

fiscal instruments: 1) local sales tax, and 2) intergovernmental grants. The three main types of

taxes such as income taxes, sales taxes, and property taxes have been the main revenue source

for the federal government, for state governments, and for local governments, respectively.

Traditionally, local governments have collected their revenues from property taxes. Local

sales tax has allowed local governments for their autonomy and power, while intergovernmental

grants offer the fiscal and monetary supports to the lower-level of government and control the

stabilization of national macro-economy from the upper-level. Intergovernmental grants are

allocated from the federal through state to local governments. The federal governments

politically characterize the allocation, and political characterization determines the types of

intergovernmental grants. Public choice theory provides the guideline that understands the

determinants of the allocations of intergovernmental grants, and explains the allocations in terms

of electoral mechanism of voter-choice models as a response to local demands for public services

and goods. Moreover, the broad normative public finance literatures and the non-electoral

concerns of political economy have approached the allocations with the perspectives how to

improve the efficiency and equity, and the incidence of intergovernmental grants (Boex &

Martinez-Vazquez, 2004).

Recently, many local governments including counties, municipalities, and special

districts are allowed to levy their own sales taxes by state legislatures. However, they are able to

adopt their sales taxes, given that their state made the legislature of the local sales tax. Whether a

jurisdiction adopts local sales tax or not considers the internal conditions of politicians,

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[36] The sets of fiscal instruments for federalism are 1) expenditures on goods and services; 2) transfers to individuals or households; 3) subsidies to firms; 4) transfers to other levels of government; 5) taxation; 6) user fees; 7) borrowing; 8) money creation; 9) regulation; and 10) public corporations (Boadway & Shah, 2009, pp. 9-11).

bureaucrats and voters in the jurisdiction, because the state legislature of local sales tax is required to ask the approval of local voters and/or council members. If any municipalities and/or special districts within a county have adopted local sales tax, a county authorized to adopt local sales tax should consider the condition of the municipalities and/or special districts because all they have same tax base and same taxpayers as a decision maker in the voter approval process, referred as intra-jurisdictional competition in the previous chapter. The legislature of local sales tax is affected by the intra-jurisdictional competition between state and local governments. Moreover, the adoption by the approval of local voters considers the sales taxes of their neighboring jurisdictions for inter-jurisdictional competition.

Therefore, the decision-making process of local sales tax adoption within a state and local jurisdiction is faced with internal and external factors for the decision of local sales tax adoption. Whether a jurisdiction adopts sales taxes or not is determined by the three main theories of inter-jurisdictional competition including tax competition, intra-jurisdictional competition and public choice. Before stating the purpose and significance of this dissertation, this chapter reviews the detailed legal conditions of the local sales taxes in the U. S. states, including the status of local sales tax in each state.

3.2.   Local Sales Tax in the States

Local sales tax has been regarded as dynamic policy tools that grow local economy, intensify local capacity, and diversify local revenue structure effectively (C. L. Rogers, 2004; Zhao & Hou, 2008; Zhao & Jung, 2008). The more significant importance of local sales tax is transparency. Americans do not identify the standard of federal personal income tax and the variation of income tax rates from 10% to 35%, while they recognize how much is pulled out

more directly from their pockets and distinguish sales tax rates with more easiness. The directness and easiness make sales taxes "*the most transparent way*" for the revenue collection (Drenkard, 2011, p. 53).

It was only 1934 that local governments had adopted local sales tax, and increased their revenues through sales taxes mainly depending on property taxes. Currently, numerous counties, cities and special districts in the thirty-six states have added sales taxes to their revenues (Mikesell, 2010),[37] as well as stabilized their diversity of their revenue structures. The number of local governments that had adopted local sales tax[38] was under 3,000 in the early 1970s, but it becomes over 9,000 today (Luna et al., 2007). Table 3.1, categorized by Bland (2005) and Mikesell (2010), describes the current status of local sales tax. Based on their categorizations, I have contacted to all the State Departments of Revenues and Taxation for this dissertation, and have reviewed all of the State Statutes in order to verify their categorizations.

However, this dissertation has started with different perspectives on the categories of the local sales tax status. This dissertation focuses on internal demands in terms of public choice theory and external demands in terms of fiscal interactions between jurisdictions for local sales tax decision. Based on the theoretical reviews done in Chapter 2, the changes on tax policy from both internal and external demands depend on the Statutes of each State. Table 3.1 lists six groups of the U. S. States by state statutes and types of local sales taxes.

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[37] Mikesell (2010) pointed out that the thirteen States have not adopted local sales tax. They are Connecticut, Delaware, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Montana, New Hampshire, New Jersey, Oregon, and Rhode Island. In addition to the thirteen States, the State of West Virginia authorized local sales tax for cities, counties, and regional transit authorities, but no cities in West Virginia have adopted local sales tax. Washington D. C. was excluded from the list.

[38] Local sales tax in this dissertation includes local option sales tax (LOST),' *Transaction Privilege Sales Tax*' in the State of Arizona,' *Discretionary Sales Surtax*' in the State of Florida,' *County Surcharge*' in the State of Hawaii. This dissertation excludes use tax.

The second difference on the categorization between the existing analysis and this dissertation is the States of Georgia, Idaho, and Pennsylvania. The States of Georgia and Idaho have authorized municipalities and special districts, including counties, to impose their own local sales taxes, but only special districts are allowed for the levying of local sales taxes by the different chapters on their Statutes; thus, all the municipal jurisdictions cannot be said to have autonomy to adopt local sales tax. The State of Pennsylvania is also included in this group of States levying state sales tax and local sales taxes only in counties, because only the two counties of Allegheny County and Philadelphia county have adopted local sales tax.

First of all, West Virginia is seen as a state with state and local sales taxes in the previous studies. Article 15B, Chapter 11 (§11.15B) of the West Virginia Code defines state sales tax, and Article 13C, Chapter 8 (§8.13C) defines local sales tax. Local sales tax is applied to retail sales made and taxable services provided within the local taxing area, as well as to the same items that West Virginia sales and use tax law has outlined. The West Virginia local sales tax was first enacted in 2005 and its rate is fixed at 1%. Only two cities in the state, Williamstown and Huntington, have, however, started to impose local sales taxes at 1% in 2011 and 2013, respectively. The time period for the empirical analysis in this dissertation is from 1970-2006, so the local jurisdictions in the State of West Virginia cannot be said to actually impose local sales tax. Therefore, West Virginia is in the group of the states with state sales tax, but no local sales taxes on Table 3.1 are listed because no local jurisdictions in West Virginia had adopted any local sales tax until 2011.

Based on the two differences above, the forty-five states levy state sales taxes, and the thirty-six states have authorized local jurisdictions to impose local sales taxes by their Statutes, Tax Code and Tax Regulation as of 2013. Among the fourteen states having not authorized local

sales taxes for local jurisdictions, the four states do not levy any sales tax; therefore, they levy only state sales tax. The other thirty-seven states are categorized to four groups by the condition of state legislature of local sales tax. Table 3.1 describes the six groups from the considerations of the status of state sales tax and local sales tax. The standards for Table 3.1 of this dissertation's categorization are whether intra-jurisdictional competition is observed or not.

From Table 3.1, the first group is the four states that have authorized neither state sales tax, nor local sales tax. The second group is local jurisdictions allowed to impose local sales taxes in their jurisdictions without state sales tax; only the State of Alaska is in the second group. The third group, including the nine states plus West Virginia, indicates the states that impose state sales tax, but do not authorize local sales tax. The fifth group includes the four states that authorize state sales tax, and local sales taxes only in municipalities: Mississippi, Nebraska, South Dakota, and Vermont. The fifth group includes eight states plus four states that authorize state sales tax, and local sales tax only in counties. Unlike Bland and Mikesell, this group includes the four States of Georgia, Idaho, Pennsylvania and Virginia. The last group includes the twenty states that authorize state sales tax, and local sales taxes in both counties and municipalities. The detailed explanations of the standards are stated at the following sub-chapters.

State legislators have expanded their state sales tax and local sales tax rates on tangible goods (Bruce & Fox, 2001; Merriman & Skidmore, 2000). Currently, the five states of Alaska, Delaware, Montana, New Hampshire and Oregon, do not have statewide sales taxes, but the State of Alaska has authorized local sales tax. Comparing to other states that authorized statewide and local sales tax, Alaska local sales tax rate is much higher than other states (5% through 6%); moreover, the highest rate of local sales tax is observed 7% in Wrangell, AK. In

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2004, the highest combined sales tax rates, state and local sales taxes, were 11% in Alabama, and the shares of state and local sales taxes revenues was almost half of total tax revenues, including sales, income and property taxes. The five states of Louisiana, Alabama, Colorado, New York and Oklahoma show that their average rates of local sales taxes are top-five ranked as 4.84%, 4.64%, 4.58%, 4.48% and 4.16%, respectively (Drenkard, 2011). According to the Tax Foundation, the average rates of state sales tax, local sales taxes, and combined sales tax except for Washington, D. C. are 5.62%, 1.79%, and 6.90% as of 2011, respectively. The share of local revenues from sales taxes is 52.2% in Louisiana, 47.7% in Arkansas, and 40.0% in Oklahoma, but the share in local governments such as Florida, Minnesota, Nevada, Pennsylvania, Vermont, and Wisconsin is still under 5% (Mikesell, 2010). Table 3.2 shows the changes of the average rate of state sales tax and local sales taxes for 1970-2006.

Figure 3.1 and 3.2 has mapped the average rates of local sales taxes of the U.S. counties by dividing four groups every decade.[39] In the 1970s, most counties in the eastern and western states such as the States of California, New York, North Carolina, and Washington levied local sales taxes, and some counties in the States of Colorado, Florida, Georgia, Kansas, Oklahoma, Utah, and Wyoming imposed local sales taxes. As shown on Figure 3.2, the counties close to the states, which had already levied local sales taxes, have begun to adopt local sales tax. In the recent years, most counties in the southern states have imposed local sales taxes compared to northern states. Moreover, the counties around metropolitan areas are shown to impose higher local sales tax rate.

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[39] Because of the long-time period of local sales tax rate history in this dissertation, the two States of Illinois and Louisiana are impossible to mine their history. Especially, some of the Louisiana local jurisdictions lost their history of local sales tax rate due to the Hurricane Katrina. The Figure 3.1 does not include the local sales tax and its rate of municipalities and special districts; therefore, the four states of Mississippi, Nebraska, South Dakota and Vermont are blank.

Chapter 3 aims to explore the current conditions of and restrictions on local sales taxes, as well as to compare the local sales taxes state-by-state. For the explorations, all the U.S. State Constitutions, Statues, Tax Code and/or documents published by State Department of Revenues and taxations are reviewed. Based on the categorization on Table 3.1, this section describes the conditions and strings of the U.S. states in details, especially those that have authorized local sales taxes. Table 3.3 summarizes the legal grounds for local sales tax and shows the first effective year when local sales tax was imposed. More details in each state are reviewed at the following sub-sections.

3.2.1. States with Local Sales Tax, but without State Sales Tax

The first group includes the states that do not adopt state sales tax, but allow their local governments to adopt local sales tax. The state of Alaska is the only state that does not levy state sales tax, but levies local sales tax. The State of Alaska Department of Revenues introduces that Articles IX and X of the Alaska Constitution and Title 29 of the Alaska Statutes establish the legal framework for municipal taxation. The Alaska Constitution allows delegation of the State's taxation power to local governments, but limits the power to only cities and boroughs (Article X, Section 2),[40] but limits the power of local governments at Article IX, Section 6 as "*No tax shall be levied, or appropriation of public money made, or public property transferred, nor shall the public credit be used, except for a public purpose.*" As of 2010, sixty-two municipalities in the State of Alaska levy general sales taxes, and their rates are between 1% and 7%. Currently, the fourteen boroughs out of the whole eighteen boroughs levy property taxes, and the eleven cities located outside of borough levy property tax. In addition to the property taxes, the Alaska

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[40] According to the Article X, Section 2 of the Alaska Constitution, local government powers are defined as "*[A]ll local government powers shall be vested in boroughs and cities. The State may delegate taxing powers to organized boroughs and cities only.*"

Statutes (§29.45.650-710) have authorized the boroughs and cities to levy sales and uses taxes at the local level, and provided broad taxing power to them on sales, rents and services provided within the municipality. According to "*Alaska Taxable*," annually published by the Alaska Division of Community and Regional Affairs, the local governments in the State of Alaska have been allowed to levy sales taxes for their revenues up to 3% before 1970.Whether a local government adopts its local sales tax is decided by the voting of all qualified electors. According to the Alaska Statutes (§29.45.670), "*a new sales and use tax or an increase in the rate of levy of a sales tax approved by ordinances does not take effect until ratified by a majority of the voters at an election.*" Before 2005, only boroughs are authorized to impose local sales tax, but Alaska Statutes (§29.45.700) changed its sales tax that allows a borough to except any source for sales tax if a city within the borough levies sales tax on the source in 2005. Therefore, the State of Alaska was in the third groups, but now in the first group in this dissertation category. The Alaska Statutes do not limit the rate of sales and use taxes, but allows interest charges on sales taxes if not paid; the interest cannot exceed 15%.

3.2.2. States with Both State and Local Sales Taxes, but Allowing Local Sales Tax only for Municipality Level

The second group includes the states that allow both state and local sales taxes, but only municipal governments, not counties, are allowed to impose local sales tax. The States of Mississippi, Nebraska, South Dakota, and Vermont are included in this group. The states in this group is actually excluded for the empirical analysis because this dissertation focuses on county governments.

A.   *Mississippi*

Mississippi Administrative Code (§IV.35) regulates sales and use tax, and Chapter 65, Title 27 of Mississippi Code (§27.65) authorized the levy of sales taxes at municipal level in 1972, and has required voter approval before levying taxes. Cities and towns can implement an additional tourism tax on restaurant and hotel sales. The municipal level is defined as any municipality in the State of Mississippi with more than 150,000 populations. The sales taxes levied by municipalities are called "*municipal special sales tax*" including tourism and economic development local sales tax. Before asking the voter's approval for municipal special sales tax, municipalities should declare the intention of the tax, and set forth the amount of the tax imposed, the purposes for which the revenue collected pursuant to the tax levy may be used and expended, and the effective date of the tax. Municipalities with the more than 60% of the qualified electors in favor of "*For the Local Sales Tax*" are approved to adopt the municipal special sales tax.

B.   *Nebraska*

Nebraska Statutes (§77) and Nebraska Regulation (§316.1) defines statewide sales tax and its rate, and Nebraska Regulation (§316.9) regulates local option sales and use tax. Counties and cities are authorized to levy local option sales tax; however, this regulation is based on the *Local Option Revenue Act* of Nebraska Statutes (§13.319-326; §77.27.142-148), and it regulates only cities to levy local option sales tax. The rate of local option sales tax is also fixed at 0.5%, 1% and 1.5%, and the local option sales tax is collected and administered by the Nebraska Department of Revenue. The local option sales tax in the State of Nebraska became effective from 1967 in accordance with the *Nebraska Revenue Act of 1967*. Any city in the State of

Nebraska is required for approval of local option sales tax by Nebraska Statutes (§77.27.142.03), and the city cannot ask the approval to the voters again for at least twenty-three months.

C. *South Dakota*

Chapter 45, Title 10 of South Dakota Codified Laws (§10.45) defines statewide sales tax, and Chapter 52 and 52A, Title 10 (§10.52; §10.52A) defines municipal tax and municipal gross receipt taxes. The State of South Dakota currently imposes a 4% state sales tax. An additional 1.5% sales tax is added during the summer season on sales occurring in tourism-related businesses and dedicated to the office of tourism of the State of South Dakota. Municipalities are allowed a maximum of 2% local sales tax for use by the local government. Tribal districts are allowed to charge a higher rate of local sales tax, as they have a special agreement with the State of South Dakota. Municipalities can impose a gross receipts tax on things like lodging, alcohol, restaurants, and admissions. These gross receipts are passed on by the business as a tax and could be considered a sales tax. Municipalities in the State of South Dakota have been authorized to impose local sales taxes in 1969, and have the option of imposing additional sales or use taxes. These taxes apply if a transaction occurs within a city imposing a tax, and if an item is subject to the state sales/use tax. The Department of Revenue and/or Taxation collects and administers these taxes for the cities. 'Municipal Sales/Use Tax' is applied to all sales subject to the state tax and is reported on the same tax return. The municipalities should ask the voter approval, and the ordinance for the approval should include the purpose and rate of local sales tax. Local sales tax in South Dakota is collected by the South Dakota Department of Revenue and Regulation, and filed and paid simultaneously. Only municipalities in the State of South Dakota are authorized to currently impose sales tax up to 2%.

D. Vermont

Section 138, Chapter 5, Title 24 of the Vermont Statutes (§24.5.138) defines local option sales tax (LOST), and authorizes any municipality to levy LOST. Vermont LOST was enacted with the purpose of affording municipalities as an alternative method of raising their revenues to facilitate the transition and reduce the dislocations that may be caused by reforms to the method of financing public education under the *Equal Education Opportunity Act of 1997*. Vermont municipalities are able to adopt their own LOST only when their education property tax rate and the equalized grand list value is less than the standards of the state, Vermont. The Vermont LOST rate is fixed at 1% on sales in addition to the statewide sales tax, and collected a destination sales basis, and the State of Vermont has granted municipalities three options to impose local option sales tax on general purpose, meals, and rooms. Therefore, an item delivered to non-local option sales tax city is not subject to the LOST.

3.2.3. States with State and Local Sales Taxes, but Allowing Local Sales Tax only for County Level

The third group originally includes the eight States authorized to impose both state sales tax and local sales tax (Bland, 2005; Mikesell, 2010), but their Statutes have authorized only their counties to adopt and impose local sales tax. Although any county in these eight States has its own sub-level government, any intra-jurisdictional competition for tax rate setting is not observed between counties and cities. The decision on whether a county or a city adopts local sales tax grounds on its own combined sales tax rate and the rate of its neighboring jurisdictions. If a county already levies local sales tax, a city that shares same tax base is considerable to make

decision to adopt its local sales taxes because the adoption by a city increase sales tax rate, but makes more residents move out of the city; vice versa.

Therefore, this second group indicates the States without any intra-jurisdictional competition. The states in this group are Florida, Hawaii, Nevada, North Carolina, Ohio, South Carolina, Wisconsin and Wyoming. Moreover, this group includes some other states such as the States of Georgia, Idaho, Pennsylvania, and Virginia. The states in this group do not have any fiscal intra-jurisdictional competition between counties and municipalities. Although the states have authorized their municipalities to adopt local sales tax, no intra-jurisdictional competition are observed when any municipality has not adopted local sales tax, and the authorizations are limited to municipalities with different lines of State legislature. Virginia uniformly administrates local sales tax. Georgia, Idaho, Pennsylvania, and Virginia are categorized to the fourth group that authorizes counties and their sub-level jurisdictions to adopt local sales tax (Bland, 2005; Mikesell, 2010). However, this chapter explains why this section includes the eight States plus these four States.

A.   Florida

Florida has '*Discretionary Sales Surtax* (Surtax)' also called a local option county sales tax that applies to most transactions subject to the sales and use tax. Chapter 212, Title 14 of the Florida Statutes (§14.212.054-055) defines the Surtax. The first effective implementation of the Surtax was in 1976. The Surtax is imposed by most Florida counties and applies to most transactions to sales tax in addition to the statewide sales tax of Florida. Florida counties are currently authorized to the Surtax rate from 0.5% to 1.5%, and most counties impose the Surtax. State sales tax and the Surtax (referred to local sales tax) are calculated on each taxable

transaction. The State of Florida uses a 'bracket system' for calculating both sales taxes when the transaction falls between two whole dollar amounts. The revenues from state sales taxes and surtaxes are obtained through multiplying the whole dollar amount by the tax rate (state sales tax rate plus the Surtax rate) and using the bracket system to figure the tax on the amount less than a dollar. The Surtax is collected by the Florida Department of Revenue, and the collected revenues are distributed back to the counties by the Department of Revenue. The options of the Surtax are *Charter County and Regional Transportation System Surtax, Local Government Infrastructure, Small County Surtax, Indigent Care and Trauma Center Surtax, County Public Hospital Surtax, School Capital Outlay Surtax, Indigent Care Surtax, Emergency Fire Rescue Services and Facilities Surtax*. Moreover, counties in Florida can decide the tax rate of *Local Option Tourist Development*, and *Convention Development*. Although the two taxes are not classified as the Surtax, counties can decide the rate, so this dissertation regards the two taxes as local tax power.

B. Hawaii

Hawaii does not have statewide sales tax, but has general excise tax, also known as gross receipts tax, imposed on the businesses instead of on the customers. Chapter 237, Title 14 of the Hawaii Statutes (§14.237) and Chapter 237, Title 18 (§18.237) of Hawaii Administrative Rules define '*General Excise Tax Law*.' Rent, medical services and perishable foods are subject to the excise tax, and businesses are not required to show the tax separately on the receipt. The Hawaii Department of Taxation states that county surcharge is imposed on transactions attributable to the county, but only city and county of Honolulu opt to implement the tax of county surcharge. In 2005, Act 247 authorized Hawaii counties to levy a county surcharge on state tax to fund public transportation system, and amended Chapter 46, Title 6 of Hawaii Statutes (§6.46-16.8).

The county surcharge could not be levied prior to the fiscal year of 2007, and a county must an ordinance before it is adopted before 2006. The Hawaii Department of Taxation rules that counties impose 0.5% for county surcharge by the Hawaii Administrative Rules (§18.2.37-8.6). The levy of county surcharge is limited to only city and county of Honolulu. Moreover, the use of county surcharge cannot be spent to the public transportation system in existence before August, 2005, and to the building and repairing of roads, highways and bicycle paths.

C.   Nevada

Chapter 372, Title 32 of the Nevada Statutes defines "*Sales and Use Tax*," and the sales and use tax in the State of Nevada have 5 components of taxes: '*State Sales and Use Tax, Local School Support Tax (LSST), Basic City County Relief Tax (BCCRT), Supplemental City County Relief Tax (SCCRT) and County Optional Sales Tax* (COST).' State sales tax, LSST, BCCRT and SCCRT were enacted in 1955 (§32.372), 1967 (§32.374), 1969 (§32.377) and 1981 (§32.377), respectively. The four types of taxes are statewide sales taxes, and the Nevada Department of Taxation collected and distributed to each local government. The current rates of those taxes are 2% by state sales tax, 2.6% by LSST, 0.5% by BCCRT, and 1.75% by SCCRT. The State of Nevada authorizes only counties to adopt local sales tax; however, Carlson City, NV is a special district to adopt local sales tax. Therefore, Nevada is categorized to the third group. The local option sales tax in Nevada, also called as *County Optional Sales Tax* (COST), was enacted 1981 (§32.377A.020, 377A.030, 543.600), and the options have been the result of local governments wanting a dedicated revenue source besides property tax for a specific purpose. The range of COST rate varies from 0.125% to 1% for each option. The options of COST are allowed for mass transit, infrastructure and facility construction such as hospital,

library, airport, road, water, and solid waste, promotion of tourism, flood control and flood plain management, support for local financial difficulty and revenues, and railway commission. Counties are required to voter approval in most cases of the levy of new taxes, but some cases are not necessary to ask the voter approval by the Nevada Statutes (§32.354.705, 377B, 387).

D.   North Carolina

Chapter 105, Article 5 of the North Carolina Statutes (§105.164-183) defines "*Sales and Use Tax*," and Chapter 105, Article 39 (§105.463-514) defines local sales tax, alternative local sales tax, and local sales tax for public transportation. The local sales tax in North Carolina was enacted in 1971. Voter approval is pre-requisite for counties to adopt local sales tax, and local sales tax in North Carolina has three categories: 1% for general purpose of financial needs, 0.5% for the reduction of property tax burden, and 0.5% for the reduction of federal revenue sharing. Sales of tangible personal property not subject to a reduced rate of tax are subject to the statewide sales and use tax. The items subject to the general rate are also subject to local sales and use tax rate at county levels. Local sales tax rate applies to retail sales and purchases of qualifying items, and additional local sales tax is imposed by Transit County such as Mecklenburg County for public transportation. However, the purchases of non-qualifying items are subject to the statewide sales tax and the applicable local tax such as electricity and telecommunications, video programming service, and liquor. The rate of general local sales tax is currently 2% including the three categories, and the additional tax in Transit County is 0.5%. In addition to these rules, some counties[41] are allowed to impose 2.25% for general local sales tax.

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[41] The counties are other counties except for Buncombe, Cabarrus, Catawba, Cumberland, Duplin, Durham, Halifax, Haywood, Hertford, Lee, Martin, Montgomery, New Hanover, Onslow, Orange, Pitt, Randolph, Robeson, Rowan, Sampson, Surry, and Wilkes Counties.

E.   Ohio

Chapter 39, Title 57 of Ohio (§57.39) defines "Sales Tax," and counties were allowed to adopt local sales tax as 1% in 1982 (§57.39). In 1986, the Ohio General Assembly further authorized the extinction of local sales tax rate for counties subject to voter approval for the following purposes: (1) payment of bonds issued for a convention facility; (2) revenues for a transit authority; (3) additional county general revenues; (4) revenues for permanent improvements; (5) implementation and operation of a 9-1-1 system. Only Ohio Counties are authorized to levy a permissive sales tax from 0.25% up to 1.5%. In 1987, transit authorities were allowed to impose additional local sales taxes for public mass transit systems (§306.57.39-41). Transit authorities, also known as mass transit districts usually centered on one primary county, are authorized to levy local sales tax from 0.25% up to 1.5%. Ohio collects the both state and local sales taxes, and returns local shares directly to the counties and transit authorities. The range of local sales tax levied by counties and transit authorities is from 0.25% to 1.5%,

F.   South Carolina

Chapter 36, Title 12 of the South Carolina Code of Laws (§12.36) defines "*The South Carolina Sales and Use Tax*." Chapter 10, Title 4 (§4.10) defines "*Local Sales and Use Tax*." In addition to the statewide sales and use tax, counties may impose an additional 1% local sales tax when voters have approved. The local sales and use tax in South Carolina was effective in 1990. As of June 1, 2007 counties and some cities may impose an additional 1% to 3% at local sales tax rate. As of mid-2005, thirty-five of forty-six counties do so. South Carolina local sales tax is imposed as five-options by voter approval: local option (§4.10.10), transportation (§4.37.30), capital projects (§4.10.300), school district and education capital improvement, and tourism

development (§4.10.910). The rate of each option is either 0.5% or 1%. The option of local option aims to reduce the property tax burden in the counties. The option of transportation aims to develop local transportation projects such as roads and bridges, and was effective in 1997. The option of capital projects aims to defray the debt service on bonds issued for various capital projects in the counties, and is used to fund specific capital projects such as facility construction, water and sewer projects, and infrastructure construction. The option of school district/education capital improvement similar to the option aims to pay debt services on general obligation bonds and the cost of capital improvements. The last option is tourism development imposed by a municipality when its revenues from the state accommodations tax are at least 14 million dollars in a fiscal year. The collected taxes from the option are used for tourism advertisement and promotion at non South Carolina residents.

G.   Wisconsin

Chapter 77 of the Wisconsin Statutes defines "*Sales and Use Taxes*" (§77.51-67) and "*County and Special District Sales and Use Taxes*" (§77.70-79). The first use of state and local sales taxes were in 1962 and 1986, and sixty-two out of the seventy-two counties have recently levied local sales taxes at the rate of 0.5%. The sales tax is imposed on the sales of all tangible goods. Counties, professional football stadium districts and professional baseball park districts are allowed to impose local sales and use taxes on the same tax base as the state sales tax. Currently, the sixty-two counties in the State of Wisconsin have imposed county sales tax of 0.5% for general purpose of property tax burden reduction. The special district denotes the local professional baseball and football stadium district, and levies 0.1% baseball park tax and 0.5% football stadium tax.

H.   Wyoming

Chapter 15, Title 39 of the Wyoming Statutes defines both state sales tax (§39.15.1) and local sales taxes (§39.15.2). The first effective year of state and local sales taxes were 1935 and 1973, respectively. In 1973, Wyoming granted counties the four options to impose an additional 1% county sales tax on each option through voter approval. General-purpose county option tax aims to reduce property tax burdens, and special purpose county option tax aims to improve the infrastructure of a county. The counties are authorized to impose economic development county option tax and lodging county option tax. However, the lodging county option tax is not imposed on the sales in the whole county, but imposed only in some cities or towns in a county.

I.   Georgia

Chapter 8, Title 48 of the Georgia Statues defines both state sales tax (§48.8.1) and local sales tax (§48.8.2, 3). Local sales tax in Georgia, referred as local option sales tax (LOST), is authorized all special districts and the boundaries of the districts are same as those of the 159 counties in Georgia. LOST first enacted in 1975 are imposed on the sale of motor fuels, food and alcoholic beverages in the majority of counties. LOST is currently one of the most significant sources of revenue for municipal governments, and LOST had provided property tax relief and assisted local governments in funding all or any portion of the services. Groceries are exempt from state sales tax, but still subject to tax by LOST rate. Counties may impose LOST of 1%, 2%, or 3%, consisting of up to three 1% LOST. The options are LOST for general purpose, E-LOST for education purpose, SP-LOST for special purpose of infrastructure development, and HOST for a homestead exemption. Many existing studies of Georgia LOST have asserted that the State of Georgia has authorized both counties and municipalities to impose LOST; however,

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this dissertation has different opinions for that. LOST is jointly levied by counties and their municipalities, and another Article defines "*Special District Transportation Sales and Use Tax* (§48.8.5)" which authorizes the City of Atlanta to impose T-LOST, also known as '*Municipal Option Sales Tax (MOST),*' as another option of SPLOST. The Georgia counties are fundamentally allowed to impose LOST, ELOST, SPLOST, and HOST. In addition to the three options, the counties including the boundary of Atlanta impose another 1% LOST on their residents. Therefore, this dissertation categorizes Georgia in this group.

J.   Idaho

Chapter 36, Title 63 of the Idaho Statutes (§63.36) defines state sales tax, and Chapter 26, Title 63 of the Idaho Statutes (§63.26) defines "*County Sales Tax.*" Moreover, Chapter 10, Title 50 (§50.10) authorizes resort cities to adopt local sales tax, and Chapter 49, Title 67 (§67.49) authorizes auditorium districts to adopt local sales tax. Local sales tax in Idaho is referred to as local option tax (LOT), and decided by voter approval of a county or city such as resort community. Based on these four chapters, Idaho seems to authorize all the local jurisdictions to adopt local sales tax. The Idaho municipalities able to adopt local sales tax are limited to some specific cities and auditorium districts in terms of different chapters of Idaho Statutes. Currently, thirteen resort community cities, and three auditorium districts adopt local sales tax, and the local sales tax rate in the cities and the auditorium districts is high from 2% to 5%. However, the only Nez Perce County has adopted local sales tax, and its rate is 0.5% now. The Idaho State Tax Commission administers this tax.

K.   Pennsylvania

Chapter 31, Title 61 of the Pennsylvania Statutes (§61.31) defines state sales tax, and

Chapter 16, Title 60 (§60.16) defines local sales tax. Local sales taxes ground on the provisions

of sections 501-509 of the Pennsylvania Intergovernmental Cooperation Authority Act for Cities

of the First Class (53P.S.§§12720.501-12720.509), and the sections 3150B-3157B of the Second

Class County Code (16P.S.§§6150B-6157B). Vendors collect local sales tax that is the tax

payable if the vendor is not required or fails to collect the proper amount of local sales tax.

Currently, Philadelphia County levies sales, use, and hotel occupancy taxes at the rate of 1%

effective from October 1, 1991 under the Pennsylvania Intergovernmental Cooperation Authority

Act for cities of the first class (Act 6-1991). The provisions of Act 6 parallel those under the

sales, use, and hotel occupancy tax except that it is a point-of-sale tax. In addition, the Act 44 of

2009 increased the Philadelphia county sales and use tax rate from 1% to 2% from October 8,

2009 to June 30, 2014. Under the Second Class County Code, Allegheny County is authorized

(Act 77-1993) to levy sales, use, and hotel occupancy taxes at the rate of 1% to be administered

in the same manner as provided in the Act 6 of 1991 (the Philadelphia 1% local sales, use, and

hotel occupancy tax). The implementation date for the Allegheny County tax was July, 1994.

One more significant difference of local sales tax in Pennsylvania is that the Pennsylvania

Department of Revenue does not administer local sales tax. The local jurisdictions are authorized

to collect and administer local sales taxes by themselves.

L.   Virginia

Chapter 6, Title 58 of the Virginia Statutes (§58.1.603) defines state sales tax, and the

same Chapter defines local sales tax (§58.1.605). The first effective year of the local sales tax

was 1966. Currently, Virginia levies 5% of statewide sales tax, but the 5% rate is distributed as 4% state portion and 1% local portion. The distribution grounds on the Code of Virginia when sales tax was enacted in 1966. The Virginia counties and cities are authorized to enact additional sales tax on the sale of prepared foot, called a meals tax. Moreover, the Virginia counties and cities are authorized to impose the use tax at a rate of 1% (§58.1-606), but the use tax does not apply to transactions on tangible goods to which the sales tax applies. The use tax adoption is accomplished by adopting a resolution if the sales tax has been previously adopted. Otherwise, the Virginia local use tax is imposed by ordinance together with local sales taxes in the manner set forth in the Virginia Code (§58.1-605). However, the Virginia local sales tax is uniformly administered by the Virginia Department of Taxation, as well as imposed at its 1% rate that the Virginia counties and cities nor make decisions on the rate changes, neither decide whether they adopt local sales tax. The counties and cities are not threatened by intra-jurisdictional competition in the decision making process of their local sales tax. Therefore, Virginia is categorized to this group although both counties and cities are allowed to impose local sales tax.

3.2.4. States with State and Local Sales Taxes

The last group includes nineteen states that allow state, counties, and municipalities to adopt sales taxes. The two types of competitions, inter-jurisdictional and intra-jurisdictional competitions are observed in this group.

A. *Alabama*

The Article 1, Chapter 23, Title 40, the Alabama Statutes (§40.23.1) defines state sales tax, and local sales tax is defined under three different lines of the Alabama Statutes (§40.12.1;

§11.3.1; §11.51.2-3). Sales tax is a privilege tax imposed on the retail sale of tangible personal property sold in Alabama by businesses located in Alabama. The tax is collected by the seller from their customer and remitted directly to the state. All sales of tangible personal property are retail sales except for those defined as wholesale sales. The first impose of local sales tax was in the municipality of Orrville, and in the counties of Chilton and Franklin in 1959. In addition to the state sales tax, local sales tax is also due, and its rates vary. Alabama administers over 200 different city and county sales taxes, not all county or city sales taxes.

B. Arizona

Chapter 5, Title 42, the Arizona Statutes (§42.5.001-404) defines state sales tax, and Chapter 6, Title 42 (§42.6.001-112) defines local sales tax; however, both sales taxes are referred as '*Transaction Privilege Tax (TPT).*' The TPTs are imposed on persons engaged in certain business classifications, including retail sales, and mean that various business activities are subject to state, county and/or city TPTs. The TPTs imposed by counties and cities are pursuant to Chapter 7, Title 11 (§11.7.3), and Arizona makes agreements with their local jurisdictions that levy transaction privilege and affiliated excise taxes to provide for unified or coordinated licensing, collection and auditing programs for such taxes levied by cities and towns and taxes levied (§11.5). The Arizona Department of Revenue collects the tax for the counties and cities; however, some of the cities license and collect their tax independently. TPT rates vary depending on the type of business activity, the city and the county. According to the Arizona Department of Revenue, it was not shown before 1986 that city TPT was separately imposed from state TPT, and before 1990 that county TPT was so. The recent Arizona archives show that the TPT

imposed by counties have various options for general fund, road construction, jail, capital improvement, and health development, but the archives before 2010 have not shown them.

C. Arkansas

Chapters 52, Title 26 of the Arkansas Statutes (§26.52) defines state sales tax, and Chapters 74, Title 26 (§26.74) defines local sales tax. Arkansas has authorized both counties and cities to impose local sales tax on their jurisdictions, but the cities and counties are required to voter approval in their jurisdiction. Local sales tax is collected by the state, and the collections are monthly distributed back to the cities and counties. The collections by local sales tax are not only used for capital improvements that aim to construct a public nature, but also distributed to counties for the purpose of capital improvements of a community college, and to the cities for the purpose of their infrastructure improvements. Moreover, cities are authorized to impose temporary tax that aims to acquire, construct or improve parks.

D. California

The California Statutes defines state sales tax (§6001-6172) and local sales tax (§7200-7226; §7285). The counties and cities in California have been authorized to collect their own local sales tax. California has many special taxing jurisdictions collecting taxes through sales (transactions) and use tax rate that is added to the standard statewide rate. The tax rates for these districts range from 0.10% to 1.00% per district. Therefore, California now has a state sales tax of 7.50%, and the total sales tax rate in a jurisdiction is up to 10.00% plus local sales tax. While some areas have more than one district tax in effect, others have no district tax in effect. It was 1955 when local sales tax was first authorized, but the first effective impose year of local sales

tax was 1962 in California. Since 1965, all California counties have adopted ordinances for the board of Equalization to collect local sales tax. Partly this rate compensates for the much reduced property tax revenue brought on by Proposition 13. California sales and use taxes are collected by the publicly elected Board of Equalization; whereas, income and franchise taxes are collected by the Franchise Tax Board.

   E.   Colorado

   Chapter 26, Title 39 of Colorado Statutes (§39.26) defines both state sales tax and local sales tax. All local jurisdictions of counties, cities and special districts are authorized to impose local sales tax. Colorado sales taxes are administered in the same manner as state sales tax. If the sale is subject to state sales tax, it is also subject to state-collected local sales tax. The 330 Colorado counties, cities and special districts impose their own local sales tax on purchases and transactions, and the Colorado Department of Revenue collects taxes on behalf of the 330 jurisdictions. These jurisdictions are referred to as "state collected," and include all Colorado counties that impose local sales tax with the exception of Denver and Broomfield counties, which collect their own. Colorado cities that have enacted a "home rule" charter and have elected to administer and collect their own local sales and use taxes are referred to as "self-collected" or "self-administered." Local sales tax imposed by counties and cities is general purpose, but special districts have six options for the collection of local sales tax: 1) Local Improvement District Tax (LID), 2) Mass Transit District Tax, 3) Multi-Jurisdiction Housing Authority (MHA), 4) Public Safety Improvement (PSI), 5) Rural Transportation Authority (RTA) and 6) Local Marketing District Tax.

F. Illinois

Chapter 170, Title 35 of Illinois Statutes (§35.110, 115, 120, 170-171) defines state sales tax, and Chapter 5, Title 65 (§65.5) defines local sales tax. The first year was 1955 for state sales tax and 1959 for local sales tax. The term of 'sales tax' includes service occupation tax and retailers' occupation tax. Retailers' occupation tax rate, the amount collected by the retailer matches the amount the retailer must submit to the Illinois Department of Revenue. Service occupation tax is imposed upon the privilege of engaging in service businesses and is measured by the selling price of tangible personal property transferred as an incident to providing a service. Moreover, sales tax means any local sales tax levied under home rule and non-home rule county and municipality local sales tax. The term of 'sales tax' is the combination of all state, local, mass transit, water commission, home rule occupation and use, non-home rule occupation and use, park district, county public safety and facilities, county school facility tax, and business district taxes. Units of local government may impose taxes or fees, which the Illinois Department of Revenue does not collect. Local sales tax has various options for counties such as county public safety, public facilities or transportation, school facility, and flood prevention district. Madison County and St. Clair County are authorized to impose other options of local sales taxes including metro-east mass transit district. The municipalities out of the metro-east mass transit districts are not able to impose this option of local sales tax.

G. Iowa

Chapter 421, Title X of the Iowa Statutes (§421) defines state sales tax, and Chapter 423B, Title X (§423B) defines local sales tax (also referred as LOST). Local sales tax is imposed when a majority of voters at an election approve the local sales tax. However, the rate imposed

by counties and school districts is limited to 1%. A local sales and services tax shall be imposed on the same basis as the state sales and services tax. Iowa Counties are authorized to impose local sales taxes, but cities are not authorized. A county may impose by ordinance of the board of supervisors local option taxes authorized, and a city whose corporate boundaries include areas of two counties may impose by ordinance of its city council a local sales and services tax. Another local sales tax is imposed by school district referred as SILO (school local option sales tax). However, SILO does not exist any longer as a separate tax after 2008.

H. Kansas

The Section 3, Article 36, Chapter 79 of the Kansas Statutes (§79-3603) defines state sales tax and the Section 87, Article 1, Chapter 12 (§12.187) defines local sales tax. Both counties and cities are authorized to impose local sales tax, and the first year when any county and city imposed local sales tax was 1970. However, any city shall not impose local sales taxes under the provisions of this act without the governing body of such city having first submitted such proposition to and having received majority approval of the city voting. No county and city levying local sales taxes can collect and administer the taxes, and the Kansas Department of Revenue is authorized to collect local sales tax. Currently, more than 700 jurisdictions within the state impose local sales tax.

I. Louisiana

Chapter 301, Title 47 of the Louisiana Statutes defines state sales tax (§47.301) and Chapter 337, Title 47 defines local sales tax (§47.337.5.1). State sales tax includes Louisiana tourism district tax. Unlike the other States, Louisiana has parishes equivalent to counties.

Parishes are authorized to impose local sales taxes up to 5%, while local jurisdictions within parishes add more. Any political jurisdictions of parishes, municipalities, school boards, and other governing authorities, authorized by the Louisiana Constitution to impose local sales tax which proposition is approved by a majority voting, can levy, administer, and collect local sales tax by local ordinance. The chapter (§47.337.5.1) states that majority vote of police juries is required to levy any parish tax or to make any appropriation.

J. Minnesota

The Section 62, Chapter 297A of the Minnesota Statutes (§297A.62) defines state sales tax, and the Section 99, Chapter 297A (§297A.99) defines local sales tax. All the local jurisdictions of county, municipality, and special districts are authorized to impose local sales tax. The first year when state and local sales taxes were imposed is 1967 and 1997, respectively. After a governing body of political subdivision should pass legislative enactment, a local jurisdiction is allowed to adopt local sales tax. The Minnesota Statutes require the Commissioner of Revenue to administer and collect local sales tax, and all local sales taxes have been administered and collected by the state except for the City of Duluth. Local sales tax applies to retail sales made and taxable services provided within the local taxing area. The tax applies to the same items that are taxed by the Minnesota state sales tax. Moreover, Minnesota administers Special-local sales taxes for transit improvement imposed only in Detroit Lakes, Mankato, Minneapolis, Rochester, St. Cloud, and St. Paul.

K.   Missouri

Chapter 144, Title X of the Missouri Statutes (§144.010-525) defines state sales tax, and local sales tax is defined at various lines of the Missouri Statutes (§66; §67; §70; §92; §94; §162; §190; §205; §221; §238; §321; §573; §644; §650). The first year when local sales tax was imposed was 1979. All counties, cities, and special and school districts are authorized to impose local sales tax, and the amounts of tax sellers collect from the purchaser depends on the combined the rate of state sales tax and local sales taxes at the location of seller. Among all U.S. states, Missouri has the most complicated local sales tax system with the purposes and rates of local sales taxes. The various purposes of local sales taxes in Minnesota are museum, capital improvements, law enforcement, regional recreation, storm water, economic development, community improvement, tourism community enhancement, metropolitan culture, transportation, emergency services, hospital, fire protection, and water quality. The rates of all the local sales tax types differ from the purposes.

L.   New Mexico

The Article 9, Chapter 7 of the New Mexico Statutes (§7.9) defines state sales tax as "*Gross Receipts and Compensating Tax,*" and the Article 1, Chapter 7 defines local sales tax for municipalities under the Section 7.19D, and for counties under the Section 7.20E, referred to local option gross receipts taxes. Rather than imposing a sales tax, New Mexico levies a gross receipts tax on receipts from selling property, from leasing or licensing property employed and granting a right to use a franchise employed in New Mexico, and from selling services performed outside New Mexico. All such receipts are subject to the gross receipts tax unless a statutory exemption or deduction, applies to a transaction. The seller is legally liable for reporting and

paying the tax, but the law does not prohibit passing the tax to the customer by adding the tax amount to the sale price at the time of the transaction. Municipalities were first authorized to impose a sales tax in 1955 (revised in 1957 to include all municipalities). Counties were first authorized to impose a sales tax in 1968.

M. New York

The Article 28 of the New York Statutes (§28) defines state sales tax as "*Sales and Compensating Use Taxes*," and the Article 29 (§29) defines local sales tax as "*Taxes Authorized for Cities, Counties and School Districts*." All counties, cities and special districts are authorized to impose local sales tax on taxable tangible personal property, taxable services, amusement charges, a hotel or motel, and restaurants, taverns, and other establishments that sell food and drink. Local sales tax in New York reflects a combined state sales tax (as 4% as of 2012) and local sales taxes in effect in the local jurisdictions where the sale, other transaction, or use occurs. All counties are authorized to collect a 3% sales tax on top of the state levy; under the state's home rule laws, counties and other local municipalities may only levy a higher sales tax if it is approved by the New York State Legislature, and this approval must be repeated every two years. Moreover, additional sales taxes (currently as 0.375%) apply to taxable sales made within the '*Metropolitan Commuter Transportation District* (MCTD).' Another difference with other local jurisdictions in the State of New York is the New York City local sales tax. Local sales tax in the New York City is imposed only within its jurisdiction on some specified services and sales performed/delivered in the city. Most MCTDs are involved in the New York City, so local sales taxes imposed by the New York City include those taxes. Based on the reviews of local sales taxes in all U.S. states, the New York City is the first jurisdiction that is authorized to impose

local sales taxes and actually imposes effective local sales tax. However, even other local

jurisdictions within the New York City are not authorized for local sales tax.

N.   North Dakota

Chapter 39, Title 57 of the North Dakota Statutes (§57.39.2) defines both state and local

sales taxes. Chapter also defines local governments as incorporated cities, counties, school

districts and townships that are all authorized to impose local sales tax; however, only

government entities in North Dakota that have home rule are authorized for local sales tax.

Currently, four counties and 126 cities are imposing local sales taxes, and the first year when a

local jurisdiction effectively imposed local sales tax was 1985. The North Dakota Office of State

Tax Commissioner administers local sales tax collections. The local sales tax rate that local

jurisdictions in North Dakota are able to impose is up to 2%, and the local jurisdictions are also

able to pick up sales, use and/or gross receipts taxes. Therefore, some counties and cities

imposing use and/or gross receipts taxes do not impose sales taxes.

O.   Oklahoma

Chapter 65, Title 68 of the Oklahoma Statutes (§68.65) defines state and local sales tax.

All the Oklahoma counties and cities are authorized to impose local sales tax whose rate varies,

but is generally 3-4%. The current state sales tax rate in Oklahoma is 4.5%, and the total sales

tax rate can be as high as 11% by depending on local sales tax. The first effective year when a

local jurisdiction imposed local sales tax was 1981. Under provisions of Oklahoma law and the

Streamlined Sales Tax Agreement, local sales tax rate changes shall become effective on the first

day of the calendar quarter through voter approval. Local jurisdictions may provide for a later

date by the ordinance that shall also be on the first day of a calendar quarter. If any local

jurisdiction levies both a sales and use tax, the rates must be identical.

P.   Tennessee

Chapter 6, Title 67 of the Tennessee Statutes defines state (§67.6) and local sales taxes

(§67.6.701-716). Local sales tax was enacted by the '*1963 Local Option Revenue Act*.' All the

Tennessee counties and cities are authorized to impose local sales tax. The total sales tax rate is a

combination of state and local sales taxes (referred to LOST in the State of Tennessee). The first

effective year when local sales tax was imposed was 1963. Any county or incorporated city

levies a tax on the same privileges that are subject to the state's sales or use tax. All counties and

some incorporated cities have adopted a local option tax of up to 2.75%. The tax is imposed in

the locality where water and telephone services are delivered to the consumer or where the dealer

of other tangible personal property or services is located. Local sales tax is applied to the gross

sales of any business, organization, or person engaged in retail sales, including the selling,

leasing, or renting of tangible personal property and the selling of certain taxable services

specified in the law.

Q.   Texas

Chapter 151, Title 2 of the Texas Statutes (§2.151) defines state sales tax, Chapter 323,

Title 2 (§2.323) defines local sales tax for Texas counties, and Chapter 321, Title 2 (§2.321)

defines local sales tax for Texas municipalities. State sales tax is imposed on all retail sales,

leases and rentals of most goods, as well as taxable services. Moreover, Texas counties, cities,

transit authorities and special purpose districts have the option of imposing additional local sales

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tax to state sales tax. The first effective year for local sales tax was 1968, but the first effective year for local sales tax imposed in the Texas counties was 1988. The current local sales tax rate varies 0.5% through 1.5% in counties, 0.25% through 2% in cities, 0.25% through 1% in transit authorities, and 0.125%-2% in special purpose districts. The special purpose districts include county assistance and improvement districts, health service districts, hospital districts, emergency services districts, library districts, crime control and prevention districts, fire control districts, municipal development districts, and management districts. Local sales tax in Texas counties aims to relieve property tax, and the Terrell County imposes local sales tax with the purpose of *Sports and Community Venue*.

R.   Utah

Chapter 12, Title 59 of the Utah Statutes (§59. 12) defines both state and local sales taxes. The first effective year for local sales tax was 1960, and the enactment year of local sales tax was 1959 in Utah. All Utah counties, cities and towns are authorized to impose local sales tax of 1% of the purchase prices of transactions that the Utah state sales tax is applied to. Local sales tax is required to ask voter approval and adopted by local ordinance. The Utah Tax Commission has exclusive authority to administer, operate, and enforce local sales taxes, and the collected revenue by local sales tax is returned to participating local jurisdictions. The rate of local sales tax has been fixed; historically, the rate was 0.5% in 1960 through 1975, 0.75% in 1975 through 1983, 0.875% in 1983 through 1985, 0.906% (29/32 of 1%) in 1986 through 1989, and 1% thereafter. The purposes that collect local sales taxes in local jurisdictions are tourism, recreation and convention facilities, rural county hospitals, botanical, cultural and zoological, long-term care centers, and arts and recreation.

S.   Washington

Chapter 8, Title 82 of the Washington Statutes (§82.08) defines state sales tax and Chapter 14 of the same Title (§82.14) defines local sales tax; more specifically, local sales tax is stated for cities at §82.14A and for counties at the chapter (§82.14B). The first effective year when local sales tax was imposed was 1970. Local sales tax rate in Washington varies in localities, and the variety of the rate is much greater because of the large number of Native American sovereign nations. Local sales tax is used for the development of public transportation system, for the equalization payments from local transit taxes, and for public facilities districts including public sports facilities like baseball stadium and exhibition center. Some localities spend their own local sales taxes for regional centers, and zoo, aquarium and wildlife facilities.

3.3.   Significance of This Dissertation

Fiscal federalism has been developed with the idea that fiscal autonomy should be distributed away from the central/federal government to local governments and their components such as politicians, bureaucrats and residents (Besfamille, 2004; Boadway & Shah, 2009). This dissertation focuses on the two fiscal instruments that local governments are authorized to handle under fiscal federalism: 1) local sales tax as local autonomy and power to tax, and 2) intergovernmental grants from the upper-levels of governments to local governments as the upper-level supports and controls to localities.

Fiscal federalism has allowed local governments to adopt local sales tax in order to increase their revenues. Local sales tax was designed to reduce property tax burden and complements local revenues that were lessened by tax and expenditure limitations (Hou & Moynihan, 2008; Jung, 2001; Mullins & Wallin, 2004). The property taxes, the main source for

local revenues, are regarded as inelastic and stable over the economic changes; besides, local residents are not able to evade the property taxes. A local government whose main revenue sources are property taxes is stabilized, but cannot well-respond to any sudden threatens to more spending; thus, local governments make efforts to diversify revenue sources. Unlike the property taxes, local sales tax has been elastic and unstable over economic cycles, as well as pro-cyclical to fiscal capacity (Luna et al., 2007). Although all the local units such as counties/parishes, cities, boroughs, and special districts, a local jurisdiction, even within one state, have adopted local sales tax is able to decide whether the units introduce local sales taxes to their residents.

Furthermore, local governments tend to maximize their budgets and to demand more sources for the expenditures of public services and goods (Brennan & Buchanan, 1980; Epstein & O'Halloran, 1999; Horn, 1995; Niskanen, 1971, 1975; Romer & Rosenthal, 1978, 1979; Wildavsky & Caiden, 2003; Williamson, 1985, 1999a). Any changes in local taxation require the approval of local voters and/or council members, and the changes are requested not only by maximizing what local voters demand, but also by stabilizing the better position in inter-jurisdictional competition. State legislators and council members, state and local bureaucrats, and their voters determine the changes in local taxes. The changes in local taxations can be defined as the internal politics within the local jurisdictions.

Numerous local jurisdictions have currently become adopted local sales tax under their State Statutes because local sales tax has been regarded as dynamic policy tools that grow local economy, intensify local capacity, and diversify local revenue structure effectively (C. L. Rogers, 2004; Zhao & Hou, 2008; Zhao & Jung, 2008). In addition to the three strengths, the more significant strength of local sales tax is to increase transparency (Drenkard, 2011). While Americans do not identify the standard of federal personal income tax and the variation of

income tax rates from 10% to 35%, they recognize how much is pulled out more directly from their pockets and distinguish sales tax rates with more easiness. The directness and easiness make sales taxes the most transparent way for the revenue collection.

Although the autonomy and power to tax for other revenue sources are secured for local governments, the federal-State governments have provided local governments the various types of intergovernmental grants, more politically characterized without local participation (Break, 1967; De Mello, 1999; Gramlich et al., 1973; Grossman, 1994; Mixon & Hobson, 2001; Volden, 2007). The federal government has guided state and local governments with funding for intergovernmental grants to reach the best efficiency in the provisions of public services and goods, as well as to succeed with the best solutions to their problems for the public; moreover, the intergovernmental grants are distributed for the policy compromise driven by the federal government (Manna & Ryan, 2011; Volden, 1999, 2007).

Unlike the determinants of the changes of taxation, the U. S. Congress members as representatives of states and local jurisdictions cannot determine the size of intergovernmental grants for themselves. The determinants of intergovernmental grants are based on formulas that the federal government considers nationwide macro-economy and the specified characteristics of local jurisdictions because the federal government more concentrates on the function of stabilization other than the functions of allocation and equity. Although local taxations are decided in terms of cogitating local economic conditions, the determinations how to allocate intergovernmental grants are made with respect to macro-economy stabilization, and local governments are much limited to the determination. Moreover, intergovernmental grants raise transaction costs across states and local politics and economy.

According to the public choice theory, the political activities of politicians and bureaucrats, as well as those between the two are based on the preferences of their electorates. Conflicts may be observed through the political activities because politicians and bureaucrats are mostly self-interested. Besley and Coate (2003) additionally asserted that if any decisions are made in a more cooperative way, strategic delegation via elections will produce excessive expenditures. The outcomes of their political activities are not totally matched, but conflict with the preferences of local voters. Two examples for these conflicts are that lobbyists of interest groups affect the activities and pork-barrels are involved in the political activities (Borck & Owings, 2003; Chubb, 1985; Esteban & Ray, 1999; Ginsberg, 1976; Moe, 1984, 1990; Neary, 1997; Persson & Tabellini, 2000; Skaperdas, 1998).

Another reason for the conflicts is the various fiscal behaviors of the public and the unified fiscal behaviors of the federal government in spite of the diversity of state and local governments (Aaberge & Langørgen, 2003; Bergvall et al., 2005; Fisher, 1982; Fisher & Papke, 2000; Gramlich et al., 1973; Slack, 1980; Zou, 1996). Like local sales taxes, intergovernmental grants not only depend on local demands, but also affect the local budgets (Barnett, 1986; Follain, 1979; Gramlich, 1969; Grossman, 1990; Smart, 1998). As stated in the previous chapters, the decision-making process of intergovernmental grants observed in the upper-levels of governments also has influences on the fiscal conditions of local governments.

Both internal and external politics in this dissertation are regarded as factors to affect both local sales taxes and intergovernmental grants. Few studies, however, have simultaneously considered taxes and intergovernmental grants, as well as the effects of both instruments of fiscal federalism on budgets, while a number of studies have focused on the effects of either taxes or intergovernmental grants on budget systems (Abrams & Dougan, 1986; Burge & Rogers, 2011;

Holtz-Eakin & Rosen, 1988; Jacobsen & McGuire, 1996; Lambright & Allard, 2004; Luna, 2004; Moffitt, 1984; C. L. Rogers, 2004; Zhao & Jung, 2008).

Moreover, the studies that have examined local sales taxes and/or intergovernmental grants just pay attention to one or some States by focusing on some specified aspects of local sales taxes and intergovernmental grants. In spite of the mounting importance of local autonomy of local sales taxes, the existing literatures have generally analyzed the effects of local sales taxes at single-tiered dimensions (Burge & Rogers, 2011). Baicker (2005), Buettner (2003), and Case, Rosen and Hines (1993) examined the spillover effects of local sales tax. Rork (2003), Luna (2004), and Rork and Wagner (2008) adopted tax competition models and analyzed the effects of local sales taxes on tax competition. These studies, however, focused on the single-tier of state and its local governments. Hill (2005), Luna, Bruce and Hawkins (2007), and Burge and Rogers (2011) investigated the interaction of local sales taxes between the multi-tiered levels of governments, but their studies were limited to one state and its local governments.

In addition to the widespread local sales taxes, intergovernmental grants have been distributed to state and local governments for the purpose of the maximization of social welfare, and the research of intergovernmental grants has focused on the economic criteria of efficiency and/or equity, and political pragmatism (Grossman, 1990, 1994). Rich (1989, 1991) assessed that the dynamics of politics and policy determined federal grant programs and the allocation of intergovernmental grants in terms of the programs. Some studies (Akhmedov & Zhuravskaya, 2004; Brender & Drazen, 2004; F. J. Veiga & Veiga, 2010; L. G. Veiga & Pinho, 2007) argued that the existing political budget cycle allocates intergovernmental grants to the sub-levels of governments and changes even how to measure democracy through political forces.

Besides, some scholars (Feldstein & Metcalf, 1987; Fisher & Papke, 2000; Gramlich et al., 1973; Knight, 2002) asserted that the fiscal behaviors of state and local governments, and the policy of intergovernmental grants in the upper-levels of governments, including tax deductibility, mutually affect the fiscal behaviors; vice versa. Additionally, the types of intergovernmental grants changed the fiscal behaviors of local governments when they make any policy decision. The upper-level decisions on intergovernmental grants point to the local demands for through understanding local budgetary decisions.

This dissertation focuses on local autonomy and power to tax in fiscal federalism. Moreover, this dissertation aims to first explore the determinants by considering local external environments in terms of fiscal interactions to the neighbors of a local jurisdiction, and internal environments in terms of local political-economic-socio-demographic characteristics. Based on the determinants, this dissertation will expand the first empirical analysis of local autonomy and power into the interaction to the federal supports and control through the distribution of grants. Finally, this dissertation aims to analyze the effects of local autonomy and power, the federal supports and control, and the interactions of the two fiscal instruments on local government budgets. Abundant theoretical and empirical studies by political scientist, public administrators, and economists have examined the fiscal instruments, but this dissertation has a significant strength that covers all the county governments for more than thirty-years. The following chapter will state research questions for the purpose of this dissertation, and provide hypotheses for empirical analysis on the two fiscal instruments.

Table 3.1:   Status of the U.S. Sales Taxes (As of 2010)

Sales Tax Allowed					States
State	**County**	**City**	**Group**	**#**	
No	No	No	1	4	DE, MT, NH*, OR
	Yes	Yes	2	1	AK**
Yes	No	No	3	9(1***)	CT, IN, KY, ME, MD, MA, MI, NJ, RI, WV++
		Yes	4	4	MS, NE, SD, VT
	Yes	No	5	8(5***)	(AK**) FL, HI, NV, NC, OH, SC, WI, WY, GA+, ID+, PA+ ,VA+
		Yes	6	19	AL, AZ, AR, CA, CO, IL, IA, KS, LA, MN, MO, NM, NY, ND, OK, TN, TX, UT, WA

Source: By depending on the categorization of Bland (2005) and Mikesell (2010), I have contacted to all U.S. state Department of Revenues and county governments, and verified their categorization and made some changes on theirs.

* denotes that the State of New Hampshire has sales taxes, but the sales taxes are levied only on some specified goods such as cigarettes and groceries. This dissertation focuses on the general sales taxes, so New Hampshire is categorized in that group

** denotes that the State of Alaska had not authorized cities to impose local sales taxes until 2005.The Statutes of Alaska 2005 authorized cities to impose local sales taxes and boroughs to wholly or partially exempt a source from a borough sales tax under (§29.45.700). Therefore, the State of Alaska is currently included in this group (Group 2), but the State of Alaska before 2005 is included to the group of the States that have authorized only county governments to levy local sales taxes (Group 5).

*** indicates the States categorized into that group of this dissertation, unlike the other existing studies.

+ denotes that the States of Georgia, Idaho, and Pennsylvania actually authorize municipal levels to levy local sales taxes, but their conditions differ from the categorization (Bland, 2005; Mikesell, 2010). Unlike the categorization of Bland (2005) and Mikesell (2010), the categorization of this dissertation grounds on the type of fiscal interactions between inter- and intra-jurisdictional competition. The Statutes of those States cannot be said to have intra-jurisdictional competition. As stated on **, the State of Alaska before 2005 is included in this group.

++ denotes that the State of West Virginia authorizes their localities to impose local sales taxes, but no local jurisdictions have not imposed local sales taxes until 2011. Therefore, the State of West Virginia is categorized into the group.

Table 3.2:   Status of the U.S. Sales Taxes and Average Rates (1970 through 2006)

State	State Level	County Level	City Level	State	State Level	County Level	City Level
Alabama	4.000	0.902	Yes	Montana	−	−	−
Alaska (1)	−	0.381	Yes	Nebraska	3.878	−	Yes
Arizona	4.514	0.539	Yes	Nevada (3)	5.081	0.621	−
Arkansas	4.051	0.253	Yes	New Hampshire (4)	−	−	−
California	6.095	1.351	Yes	New Jersey	5.595	−	−
Colorado	2.986	0.910	Yes	New Mexico	4.473	0.271	Yes
Connecticut	6.595	−	−	New York	3.986	2.872	Yes
Delaware	−	−	−	North Carolina	3.432	1.575	−
Florida	5.189	1.424	−	North Dakota	4.608	0.009	Yes
Georgia (2)	3.486	1.302	Yes	Ohio	4.743	0.384	−
Hawaii	4.000	0.000	−	Oklahoma	3.297	0.775	Yes
Idaho	4.284	0.002	Yes	Oregon	−	−	−
Illinois	5.196	0.027	Yes	Pennsylvania	6.000	0.011	Yes
Indiana	4.622	−	−	Rhode Island	6.189	−	−
Iowa	4.054	0.234	Yes	South Carolina	4.622	0.222	−
Kansas	4.007	0.419	Yes	South Dakota	4.622	−	Yes
Kentucky	5.459	−	−	Tennessee	5.284	0.944	Yes
Louisiana (1)	3.514	2.215	Yes	Texas	5.166	0.128	Yes
Maine	5.216	−	−	Utah	4.510	0.942	Yes
Maryland	4.811	−	−	Vermont	4.108	−	Yes
Massachusetts	4.730	−	−	Virginia (5)	3.419	1.000	Yes
Michigan	4.595	−	−	Washington	5.857	0.845	Yes
Minnesota	5.541	0.004	Yes	West Virginia (6)	5.162	−	−
Mississippi	4.595	−	Yes	Wisconsin	4.676	0.167	−
Missouri	3.776	4.856	Yes	Wyoming	3.351	1.388	−

Note: If a state has state sales tax and allows its counties to adopt local sales tax, the table shows their mean in the year of 1970 through 2006.

(1) Instead of the jurisdictions of county, Alaska has boroughs and Louisiana has parishes.

(2) Georgia has actually allowed all local governments to adopt local option sales taxes (LOST) with four different types of General-LOST, Education-LOST, Special Purpose-LOST, and Transportation-LOST. However, Atlanta is the only metropolitan municipality that adopts T-LOST.

(3) Nevada does not allow cities to adopt local sales tax except for Carlson city.

(4) New Hampshire allows counties to adopt local sales tax, but the local sales taxes are levied only on special goods. Therefore, New Hampshire is marked as a state without state and local sales taxes.

(5) Virginia allows cities to adopt local sales tax, but the cities are independent cities exclusive from counties. However, the State of Virginia uniformly administers local sales taxes without any discretions of local governments.

(6) West Virginia allows counties and cities to adopt local sales tax, none have adopted their local sales taxes yet.

Figure 3.1: Average Combined Sales Tax Rate (FY 1970 through 2006)
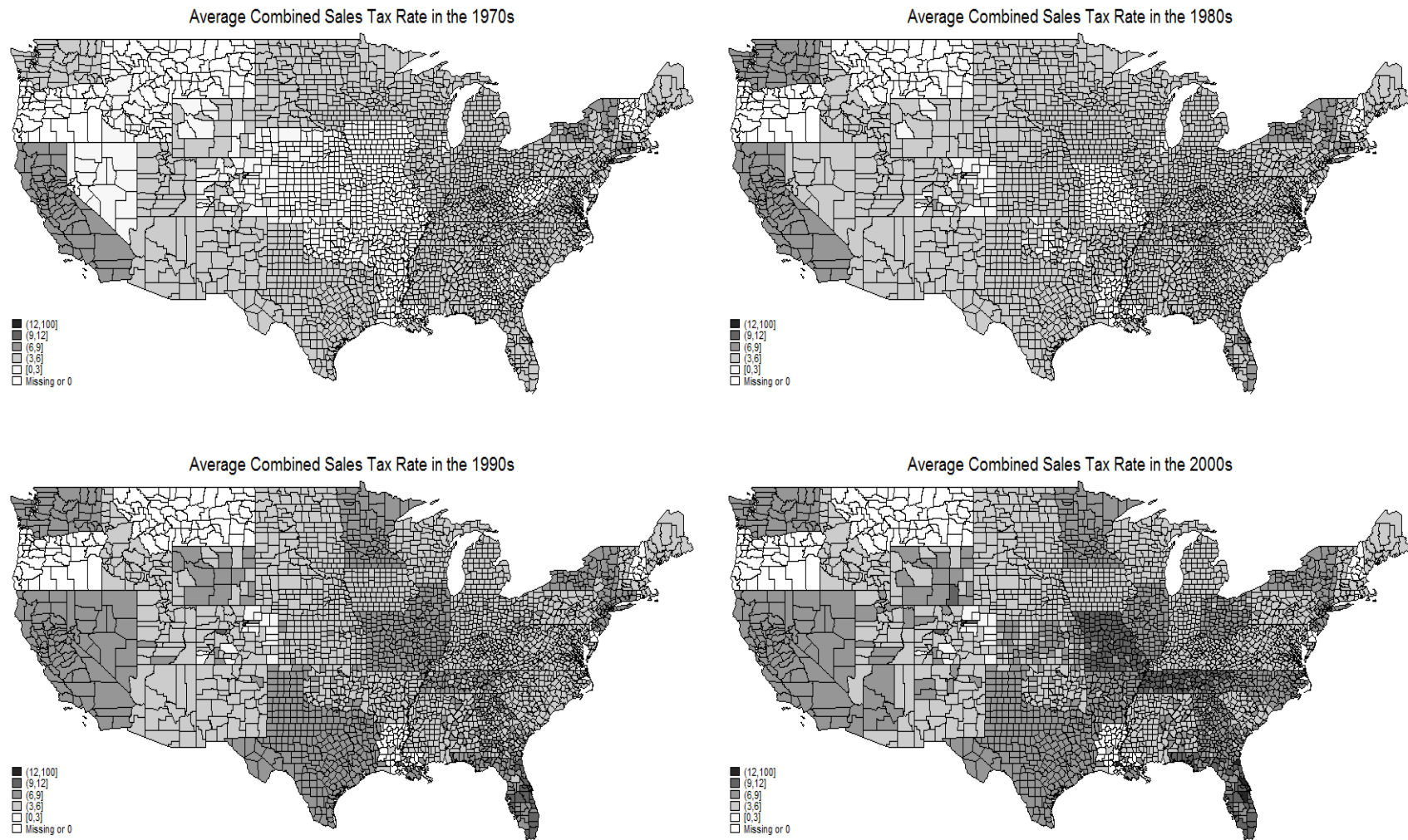
Source: All the U.S. Departments of Revenues and their county governments. The State of Alaska and Hawaii are excluded.

Figure 3.2: Average Local Sales Tax Rate by Counties (FY 1970 through 2006)
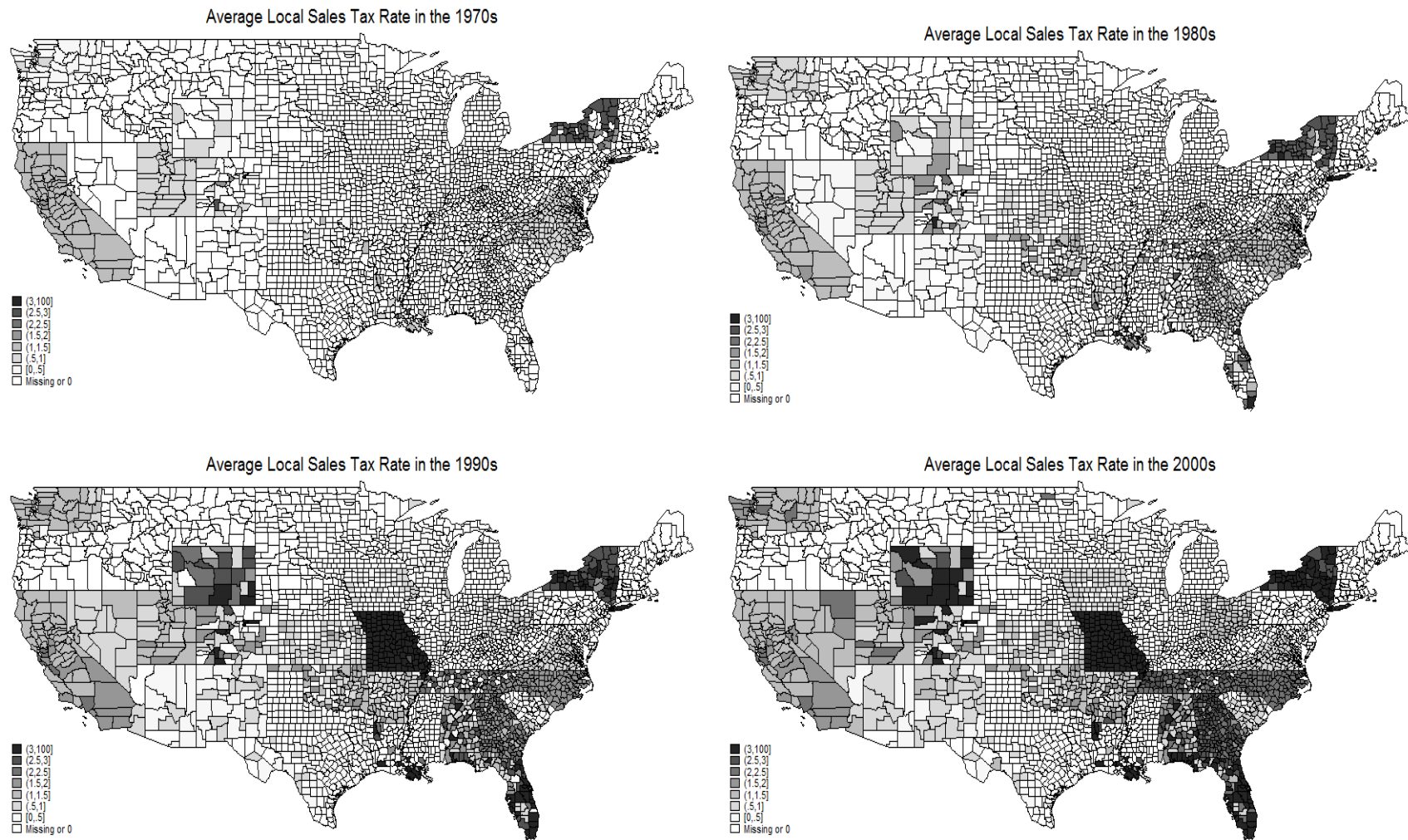
Source: All the U.S. Departments of Revenues and their county governments. The State of Alaska and Hawaii are excluded.

Table 3.3: Local Sales Taxes in the State Statutes

State	Legal Ground	Year[*]	Department of Revenue	Remarks
States with local sales taxes, but without SST				
Alaska	§29.45.650-710	1958	http://www.revenue.state.ak.us	Only boroughs, equivalent to counties, had been authorized to levy local sales taxes until 2005.
States with state and local sales taxes, but local sales taxes only in Municipalities				
Mississippi	§27.65.241	1972	http://www.dor.ms.gov	Municipal special sales tax Tourism and economic development sales tax
Nebraska	§77.27.142-148	1967	http://www.revenue.state.ne.us	
South Dakota	§10.52,52A	1969	http://dor.sd.gov	
Vermont	§24.5.138	1997	http://www.state.vt.us/tax	
States with state and local sales taxes, but local sales taxes only in Counties				
Florida	§14.212.054-055	1976	http://dor.myflorida.com/dor	Referred as "Discretionary Sales Surtax"
Hawaii	§14.237	2007	http://www.state.hi.us/tax	
Nevada	§32.377A	1981	http://tax.state.nv.us	Only Carson City is authorized for local sales tax
North Carolina	§105.463-514	1971	http://www.dornc.com	1% for general purpose of financial needs 0.5% for the reduction of property tax burden 0.5% for the reduction of federal revenue sharing
Ohio	§57.39,41	1982	http://www.tax.ohio.gov	Various options for local sales taxes were authorized by §3.06
South Carolina	§4.10,37	1990	http://www.sctax.org	Local option, transportation, capital projects
Wisconsin	§77.70-79	1986	http://www.revenue.wi.gov	Professional football and basketball stadium areas are authorized for local sales tax
Wyoming	§39.15.2	1973	http://revenue.wyo.gov	General & special purpose
Georgia	§48.8.2,3	1975	https://etax.dor.ga.gov	LOST, E-LOST, SP-LOST & T-LOST (only for Atlanta)
Idaho	§63.26.02	2004	http://tax.idaho.gov	Authorizing local sales taxes for resort cities (§50.10) and auditorium districts (§67.49)

(Continued)

State	Legal Ground	Year*	Department of Revenue	Remarks
Pennsylvania	§60.16	1991	http://www.revenue.state.pa.us	Collected and administered by local jurisdictions by themselves. Currently, two counties impose local sales tax.
Virginia	§58.1.605	1966	http://www.tax.virginia.gov	1% of the SST is uniformly distributed to the Virginia localities. The State of Virginia uniformly administers local sales tax; thus, the Virginia local governments are not allowed for any discretion

States with state and local sales taxes, and local sales taxes in all the levels of local governments

State	Legal Ground	Year*	Department of Revenue	Remarks
Alabama	§40.12.1;§11.3.1; §11.51.2-3	1959	http://www.revenue.alabama.gov	
Arizona	§42-5038	1985**	http://www.azdor.gov	Referred as 'Transaction Privilege Tax (TPT).' Currently, county TPT has 5 options by imposing different rate
Arkansas	§26.74	1981	http://www.dfa.arkansas.gov	Cities are authorized to impose temporary tax for acquisition, construction or improvement of parks
California	§7200-7226; §7285	1962	http://www.taxes.ca.gov	
Colorado	§29.2	1948	http://www.colorado.gov/revenue	The City of Denver was the first local jurisdiction that imposed local sales tax.
Illinois	§65.5	1959	http://www.revenue.state.il.us	In 1955, local sales tax was enacted and effective, but the dataset before the year of 1990 are not available.
Iowa	§423B.1	1985	http://www.iowa.gov/tax	Counties and school districts are only authorized for local sales tax
Kansas	§12.187	1970	http://www.ksrevenue.org	
Louisiana	§47.337.5.1	1964+	http://www.rev.state.la.us	Much historical records of local sales taxes were lost by Katrina
Minnesota	§297A.99	1997	http://www.revenue.state.mn.us	Also, Special-local sales tax is imposed in some cities
Missouri	Various Chapters	1979	http://dor.mo.gov	The chapters are §66;§67;§70;§92;§94;§162;§190; §205;§221;§238;§321;§573;§644;§650.
New Mexico	§7.19D; §7.20E	1955	http://www.tax.newmexico.gov	County was authorized for local sales taxes in 1968.

(Continued)

State	Legal Ground	Year*	Department of Revenue	Remarks
New York	§29	1965	http://www.tax.ny.gov	
North Dakota	§57.39.2	1985	http://www.nd.gov/tax	
Oklahoma	§68.65	1981	http://www.tax.ok.gov	Generally local sales tax rate in cities is higher than counties
Tennessee	§67.6.701-716	1963	http://www.state.tn.us/revenue	1963 Local Option Revenue Act
Texas	§2.321; §2.323	1968	http://www.window.state.tx.us	§2.321 for Texas Municipalities; §2.323 for Texas Counties
Utah	§59.12.203	1960	http://tax.utah.gov	
Washington	§82.14	1970	http://dor.wa.gov	§82.14A for cities; §82.14B for counties
West Virginia	§8.13C	2005[++]	http://www.revenue.wv.gov	No counties and cities adopt local sales tax before 2011

* denote the first year when local sales taxes becomes effectively imposed.

** denotes that the first year in the State of Arizona when local sales tax was imposed is not clear, but the archives of the Arizona TPT did not show any local TPT of counties and cities before 1985.

+ denotes the assumed year from the review of Louisiana local sales taxes published by parishes that I have collected for this dissertation. The Hurricane Katrina in 2005 resulted in the loss of many archives of local sales taxes information in the State of Louisiana.

++ denotes the year that local sales tax was enacted, but no counties and cities in the State of West Virginia have actually imposed and levied local sales tax. Therefore, the State of West Virginia is categorized to the group of states with SST, but without local sales taxes on Table 3.1.

CHAPTER 4

RESEARCH QUESTIONS AND HYPOTHESES

This dissertation aims to analyze fiscal federalism through two fiscal instruments in terms of the theoretical approaches of inter-jurisdictional competition and public choice. For the empirical analyses of three issues stated in the previous chapters, this chapter provides the details of three research questions. This chapter derives the hypotheses for the three research questions. The next three sections identify each research question and the hypotheses that are testable using data on all U.S. county governments. All research questions and the hypotheses are summarized on Table 4.1.

4.1.   Determinants of Local Sales Tax Adoption and the Tax Rate Setting

The first research question seeks for the determinants of local sales taxes, and considers the internal and external factors theoretically approached by inter-jurisdictional competition and public choice.

Research Question 1: What are the determinants of the adoption of local sales tax and its rate in terms of local politics-economy-demographics?

Rainey (2009) wrote that organization environments[42] change organizational structure and decision-making process. Political conditions are comparatively more important among the conditions because government executives should consider the relationships with elected

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[42] Organizational environments were categorized into seven types (Rainey, 2009): technological condition, legal condition, political condition, economic condition, demographic condition, ecological condition, and cultural condition.

officials. Local political conditions have important influences on the policy-making process and its outcomes. In addition to the importance of political conditions, Roemer (2001) provided an integrated theory of political competition between parties. According to Beck (1974), a number of studies have researched political parties in analyzing the U.S. political process which affects the decision-making of government process.

Cox and Mccubbins (1994) described that political parties deliver public policy benefits to the public through democratic procedures, and the procedures of political parties result in competition. In the current U.S. bicameral system of political parties, it is easy to observe party competition. Rogers and Rogers (2000) examined government size through the implications of political competition theory. They asserted that the political competition between Democrats and Republicans in the U.S. is a factor to determine the government size of expenditures and revenues. Both Democrats and Republicans have their own political goals of election wins, policy, and publicity, as well as compete with each other in order to achieve these goals. The political goals of both parties have influences on the decision-making process, and both parties need to interact with government and the public to carry out the goals. One common strategy of both parties is to occupy more seats in the Congress. The more occupation alleviates the process by which a bill becomes a law. Whether local governments adopt or eliminate local sales taxes, and change local sales tax rate is required to ask approval of local residents.

Decreases in the number of local voters, also regarded as tax-payers, result in the reduction of local jurisdiction, which is one threaten to government capacity. Local governments should recognize what their residents' need and how much the residents are willing to pay for the needs. In spite of the preference for lower tax rate, local residents also have concerns of how to develop their areas and communities. The concerns demand their representatives to expand their

revenues and investment of infrastructure for the development that lead to the increase in the government revenues. If many residents in a local jurisdiction are satisfied with any development and investment plans of their government, they agree with the increase of tax rate. Moreover, local voters to Republicans do not want to adopt local sales tax because the voters are regarded as being against any new taxes (Nice, 1985). Based on that these three actors are assumed to have different interests and perspectives when each sees taxes, this dissertation has created the hypotheses for local politics as the followings.

> *H1a: Counties controlled by Republicans are less likely to adopt local sales tax because the Republican representatives aim to shrink government size.*

> *H1b: In opposition to the policy goals of the Republicans, counties with more local voters in favor of Democrats are more likely to adopt local sales tax because of the different interests of local voters.*

> *H2a: Counties controlled by Republicans is less likely to increase local sales tax rate because Republicans aim to shrink government size.*

> *H2b: In opposition to the policy goals of Republicans, counties with more local voters in favor of Democrats are more likely to increase local sales tax rate because of the different interests of local voters.*

In addition to political conditions surrounding government, Rainey (2009) wrote in *Understanding and Managing Public Organizations* that economic condition should be considered. Firestone (1960) asserted that economic cycle and fluctuations change the decision of government financial management.

H3: The better the economic conditions of a county is, the more the county is likely to

  adopt local sales tax.

H4: The better the economic conditions of a county is, the more the county is likely to

  increase local sales tax rate.

In addition to the influences of local economic conditions on local sales tax and intergovernmental grants, local demands to government depend on the socio-demographic compositions of jurisdictions. First, any changes in population determine the level of the demand for public services and goods. Moreover, local socio-demographic structures affect the local demands and the financial capacity of local governments (Borge & Rattsø, 1995; Montén & Thum, 2010; Seitz & Kempkes, 2007). Local governments should change their expenditure styles in order to respond more economically and effectively to the local demands, which in turn will modify the revenue structure of local governments.

Tax rate setting of a jurisdiction grounds on its characteristics. Kanbur and Keen (1993) and Ohsawa (1999) have verified that jurisdiction size matters in tax rate setting. The smaller sized jurisdictions supposed to have smaller populations attract more cross-border shoppers in order to generate extra revenues from other shoppers including their populations. In the two empirical analyses, population density is used for the correlations between jurisdiction size and the fiscal behavior of tax rate setting.

H5: A county with higher population density is more likely to adopt local sales tax

  because it does not need to attract more cross-border shoppers, while a county with

  lower population density is less likely to adopt local sales tax in order to attract

  more cross-border shoppers.

H6: A county with higher population density is more likely to increase local sales tax rate because the local jurisdiction should maximize its revenues from the existing populations, while a county with lower population density is more likely to increase its local sales tax rate in order to attract more cross-border shoppers.

The hypotheses stated above consider the internal condition of a local jurisdiction. Through the literature review in Chapter 2, it is theoretically and empirically concluded that local jurisdictions and governments engage in competition regardless of what is the source of such competition and that, in general, competition does affect fiscal behaviors of local governments. Based on the reviews of theoretical and empirical literatures in Chapter 2, especially tax competition areas, a jurisdiction is shown to increase its tax rate if its neighboring jurisdictions have set higher tax rate. Governments are assumed to set the rates of their various tax rates in order to maximize their revenues while they consider the tax rates of other jurisdictions. Many studies of tax competition have supposed that the tax reaction function of a jurisdiction is a linear function in considerations of the characteristics of its neighboring jurisdictions. The fiscal behavior of a jurisdiction for tax rate setting results in the strategic interactions across jurisdictions that lead the tax rate to upward (Kanbur & Keen, 1993).

H7: When more of its neighboring counties have adopted their local sales taxes, a county is more likely to adopt local sales tax.

H8: A county neighboring to counties that had adopted local sales tax and has set the higher sales tax rate is more likely to increase its local sales tax rate.

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4.2.   Interactions Between Local Autonomy/Power and Upper-Level Control/Support

The second research question seeks to the interaction between two fiscal instruments. As stated at the previous chapters, this dissertation has selected local sales taxes for local authority and power to tax, and intergovernmental grants as the federal control and support to local governments. However, they have been theoretically and empirically proven that the two fiscal instruments have different characteristics over economy cycle. Therefore, the second research question is written as the below.

Research Question 2: What are the interactions of the federal support/control of intergovernmental grants and the local autonomy/power of local sales tax?

Federalism depends on the constitutional and legal structures of multiple levels of governments. The *Decentralization Theorem* for fiscal federalism theory helps governments to better recognize and more efficiently satisfy local demands because local governments are much closer to the people (Oates, 1972). Fiscal federalism has allowed them to provide public goods and services, and has financed local governments with intergovernmental grants provided by the upper-levels of governments, sometimes without local responsibility. A more decentralized system has been regarded to provide public goods and services more efficiently because local levels and their policy-makers are able to recognize the preferences of their people. However, the decentralized system under federalism has been asserted to threaten the efficiency through the complex administrative system for tax sharing and intergovernmental grants that increases transaction costs, lacks taxing and spending responsibilities, as well as expands the deadweight loss of taxation (Bröthaler & Getzner, 2011).

Regarding the first research question discussed above, local governments are more influenced by their own economic conditions than their upper-levels of governments, and the revenues from taxes and intergovernmental grants will affect the local capacity for the provisions of public services and goods. In the economic boom years, governments are able to collect more revenues from sales taxes in terms of more sales in market. Local economic conditions are expected to affect the local revenues from taxes; especially, the cycles will change the local decisions of whether local governments adopt or eliminate the whole or a part of their own sales taxation, and whether they increase or decrease their local sales tax rate.

The federal government is responsible for macro-economic stabilization and redistribution functions, while lower level governments avoid implementing them due to the lack of macro-economic tools in addition to highly mobile economies and the subsequent Tiebout sorting by voters moving to match their preferences. Local governments decide how much and what types of public services and goods are provided, but they depend on their taxes to use funding the provisions. In addition to taxes, local governments receive intergovernmental grants from their upper levels of governments. The allocation of intergovernmental grants depends on the formulas established by the Congress with respect to the financial function of national and local economic stabilization. The determination of grants, however, cannot recognize local detailed conditions, which results in the expansion of transaction costs across states and local jurisdictions (Borck & Owings, 2003; Chesney, 1994; Grossman, 1994; Volden, 1999).

The macro-economic cycles result in the changes of the federal decisions on the distributions of intergovernmental grants. While the autonomy and power for other revenue sources are secured for local governments, the federal government has provided various types of intergovernmental grants politically characterized for local governments through state

governments (Break, 1967; De Mello, 1999; Gramlich et al., 1973; Grossman, 1994; Mixon & Hobson, 2001; Volden, 2007). Moreover, the federal government has guided state and local governments with funding for intergovernmental grants to reach the best efficiency in the provisions of public services and goods, as well as to succeed with the best solutions to their problems for the public (Manna & Ryan, 2011; Volden, 1999, 2007). The federal-local per capita intergovernmental grants averaged $21 and the state-local per capita intergovernmental grants averaged $151 in 1973 through 2004 as the year 2000 dollars (Hou, 2010, p. 7).

Many studies have explored the effects of the extent of fiscal federalism on the federal budgetary efficiency and equity by distinguishing revenues and expenditures from taxes and/or intergovernmental grants (Abrams & Dougan, 1986; Burge & Rogers, 2011; Holtz-Eakin & Rosen, 1988; Jacobsen & McGuire, 1996; Lambright & Allard, 2004; Luna, 2004; Moffitt, 1984; C. L. Rogers, 2004; Zhao & Jung, 2008). Little research, however, has focused on local governments, and investigated the interactions of fiscal instruments for local autonomy and the upper-level control. Local heterogeneity has enhanced both academics and practitioners to have interests in how to raise and to diversify local revenues under federal system. A problem of intergovernmental grants provided by the upper-level governments is that local governments are not able to expect the size of intergovernmental grants. Intergovernmental grants are designed to keep the balance of the provisions of public services and goods, especially welfare, education, and highway construction. Intergovernmental grants from the federal government aim to stabilize macro-economy and the provisions of public services and goods. In the economic boom years, local governments are able to effectively provide their services with the revenues of their taxations, while local governments cannot satisfy their plans for revenues from taxations and do

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expect more intergovernmental grants from their higher-level governments because they cannot collect the expected amount of revenues from taxations in economic bust years.

The logics of intergovernmental grants from upper to lower are that the central/federal government should make investments in state and local governments in terms of federal grants, especially in infrastructure, when they are faced with economic downturn fluctuations. Local governments have more continued to rely on the federal intergovernmental grants as "a partial solution to their revenue woes (Carroll, Eger III, & Marlowe, 2003, p. 1497)." Intergovernmental grants have helped local governments to efficiently provide public services and goods to local jurisdictions, especially, in the recession period and economic crises. Neither how a local government chooses to manage grants, nor how intergovernmental grants affect local government budgets are observed. Local governments, however, alter their tax policy with expecting how to meet the formulas of intergovernmental grants (Buettner, 2006; Peter Egger, Koethenbuerger, & Smart, 2010; Inman & Rubinfeld, 1997a; Koethenbuerger, 2011; Smart, 1998). The alterations on tax policy are political process, and the alterations will affect the size of intergovernmental grants that local governments will receive. Therefore, the interactions between the two fiscal instruments should consider local tax policy.

> *H9a: Because they have their own source for revenues leading to the expansion of total revenues, counties having adopted their own sales tax are more likely to receive smaller amounts of intergovernmental grants.*

> *H9b: A county having levied local sales tax, plus state tax rate, at higher rate is less likely to receive more intergovernmental grants because the county is regarded as a jurisdiction that has more own source for revenues.*

The federal government has provided various types of intergovernmental grants

politically characterized to local governments through state governments (Break, 1967; De Mello,

1999; Gramlich et al., 1973; Grossman, 1994; Mixon & Hobson, 2001; Volden, 2007).

Intergovernmental grants are provided to local governments for cooperative federalism that the

federal resolve problems together with state and local governments, as well as often provided

with the attachments of strings and mandates, which results in competition between the federal

and local governments (Elazar, 1962; Grodzins, 1961; Volden, 2007). The competition is

observed by elected representatives' determinants on how to provide public services and goods

for constituents and to implement any policy areas, as well as where to move the areas by

considering the spending levels of the policy areas (Volden, 2007).

The ideology of political parties have been ordered on a left-right horizontal scale that

sets the cornerstone point of voters' decision, and the parties compete to each other for the

maximization (Andre Blais, Blake, & Dion, 1993). The studies analyzing countries and the U.S.

states showed that governments expand their expenditures, especially on welfare policies, when

more democratic representatives and legislators are elected (W. D. Berry & Lowery, 1987; Dye,

1984; Garand, 1988; Heller, 1981). Intergovernmental grants relatively focus more on welfare

and education; thus, the next hypotheses for the size of intergovernmental grants and local

politics are the followings.

Intergovernmental grants have, moreover, guided local governments how to reach at the

best efficiency in the provisions of public services and goods, as well as how to succeed with the

best solutions to their problems for the public (Manna & Ryan, 2011; Volden, 1999, 2007). The

determinants of intergovernmental grants are based on the interrelation of political decision

between the levels of governments and how to provide intergovernmental grants is surrounded

by politics. Intergovernmental grants are a means of supporting and controlling local governments with considering both national economy and local preferences, but are threatened by two challenges: 1) raising transactions costs and 2) being used as election strategy. Political interactions between the levels of governments have altered the challenges (Besley & Coate, 2003; Ginsberg, 1976; Mixon & Hobson, 2001; L. G. Veiga & Pinho, 2007).

> *H10: Intergovernmental grants are used as an election strategy; counties where the political party of representatives and voter's political ideology are the same as a politically unified jurisdiction will have smaller intergovernmental grants as election strategy for the reelection of representatives.*

Firestone (1960) asserted that economic cycle and fluctuations change the decision of government financial management. Rafuse (1965) found that the amount of general fund balance (GFB) increases in the economic boom years and decreases in the bust years. The economic condition has impacted the organizational behavior of government financial management. Intergovernmental grants to local governments depend on the federal government fiscal capacity influenced by economic as well as political conditions (Holcombe & Zardkoohi, 1981). Alperovich (1984) described that economic conditions and campaign finances affect the behavior of both voters and policy makers.

Ruppel (2004) observed that governments have accumulated the budget stabilization fund (BSF) in order to maintain the stability of their programs. Hou and Moynihan (2008) identified a clear pattern of financial management over the business cycle. Tax base expands in boom years but reduces in bust years. Based on the decision-making on tax base in state and local governments, the federal government will expand the amount of intergovernmental grants in

order for state and local governments to stabilize their provisions of public services and goods. The macro-economy stabilization function is the main role of the central/federal government, and the local revenues from taxations are shrunken in economic bust years and threaten the quality in providing public services and goods to local voters. Theoretically and empirically, it is assumed that the federal intergovernmental grants are more distributed to its lower-levels of governments in economic bust year.

> *H11: Because the federal government plays a key role in economic stabilization, especially macro-economy stabilization, counties are more likely to receive greater sizes of intergovernmental grants when its economy is in bust years.*

4.3. Budgetary Effects of Local Sales Tax and Intergovernmental Grants

The final research question seeks to identify the budgetary effects of the two fiscal instruments and the interactions between the two on local governments. The research question investigates the budgetary effects considering the theoretical and empirical studies of the two main approaches. Through the authorizations of State governments, the adoption of local sales tax by local governments aims not only to reduce the property tax burdens, but also to expand their revenues through revenue diversification (Deran, 1968; Jung, 2001; Sjoquist, Walker, & Wallace, 2005). The third research question is written as the below.

> *Research Question 3: What are the budgetary effects of intergovernmental grants, local sales taxes, and their interactions on local governments?*

The revenues of local governments are from the three sources: taxes, non-tax revenues, and intergovernmental grants, and the taxes and non-tax revenues are called as own-source

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revenues (OSRs). The dominant portion of tax revenues in local governments is property taxes.

In addition to property taxes, local governments have collected sales, income and other

miscellaneous taxes. The debate on taxes and intergovernmental grants among the sources for

local revenues has been continuous on what they are intended to finance. As discussed above,

local governments aim to maximize their revenues from a variety of fiscal instruments, but the

budgetary effects of fiscal instruments are supposed different, as well as dynamic. Moreover, the

authority and power to tax, and the upper-level supports and control are assumed to bring

tradeoff across the tiers of governments. Therefore, this section not only provides a research

question about the budgetary effects of the two fiscal instruments, but also creates hypotheses for

the empirical analysis of the research question.

The two fiscal instruments of local sales tax and intergovernmental grants are regarded as

a means that extend local revenues. However, the tax revolts in the late 1970s and the early

1980s has occurred by targeting property tax the major source for local revenues. Many U.S.

states have enacted various property tax relive programs as responses to the tax revolt. The tax

and expenditure limits (TELs) and the use of alternative local revenue sources have aimed to

reduce property tax burdens (Gold, 1979). State governments mandate the TELs, and the

mandates become hard to relieve property tax burdens for local governments by simply

improving the efficiency and limiting the size of local governments. Thus, local governments

should seek for alternative sources of local revenues that ground on non-property taxes such as

local sales and income taxes. Both alternative sources of local sales and income taxes aim to

reduce property burdens in two ways. The first way enables to reduce property tax burdens when

the alternative sources, especially income taxes, are enacted for other purposes (Deran, 1968).

The second way is to earmark the property tax relief program (Jung, 2001).

The adoption of local sales tax in the most U.S. states and their counties has been used to roll back property taxes, and has expanded the purposes of the use of local sales tax such as investment for infrastructure, transportation development, local industry improvement, and education and welfares (Zhao & Hou, 2008). Local revenues collected from sales taxes in the economic boom years are much more than the economic bust years, and the revenues especially expand the own-source revenues of local governments exclusive including the revenues of non-property taxes. Unlike the elasticity of sales taxes, property taxes that local governments heavily rest on for their revenues are inelastic (Cornia, Grimshaw, Nelson, & Walters, 2010). The inelasticity of property taxes are able to stabilize local government revenues, while the elasticity of sales taxes help local governments collect higher levels of expenditures. Moreover, sales taxes have been adopted in local governments, and sales taxes are less volatile than other taxes of income and property that shows low volatility (Cornia & Nelson, 2010).

> *H12a: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to reduce the burdens of property taxes for local voters.*

> *H12b: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to expand their revenues.*

> *H12c: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to expand their own-source revenues (OSRs).*

Intergovernmental grants are a major revenue source to U.S. local governments. Intergovernmental grants are widely divided to four types by the providers of the federal and states, and the characteristics of general revenue sharing (GRS) and categorical grants. The fiscal impacts of intergovernmental grants on local budgets basically agree with the expansion of local

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revenues and expenditures, but the types have dynamically determined the fiscal impacts because intergovernmental grants are shown to have income and substitution effects, as well as spending effects. The effects of intergovernmental grants are not consistent in terms of the characteristics of the types. The studies of the federal intergovernmental grants have been examined by focusing on local expenditures or revenues as the dependent variables in the econometric models, while the studies of state intergovernmental grants have concentrated on local revenues rather than local expenditures (Bell & Bowman, 1987; Benton, 1992; Gramlich, 1998; Gramlich et al., 1973; Ladd & Yinger, 1989; Nathan, Adams, Juneau, & Fossett, 1977; Simonsen, 1994; Stine, 1994). The effects of intergovernmental grants on local government revenues and/or expenditures, however, have shown one consistent finding with theoretical expectations that intergovernmental grants have effects on local expenditures rather than revenues. While local sales tax aims to help local governments to expand their own-source revenues, intergovernmental grants are expected to make no changes in the own-source revenues of local governments.

> H13a: *Intergovernmental grants that counties receive from their upper-levels of governments will help them reduce the burdens of property taxes for local voters.*

> H13b: *Intergovernmental grants that counties receive from their upper-levels of governments will help them expand their revenues.*

> H13c: *Intergovernmental grants that counties receive from their upper-levels of governments will not help them expand their own-source revenues.*

Compared with property taxes, sales taxes are much elastic to local revenues. Local governments are able to have more benefits by combining both inelastic and elastic taxes. The inelasticity of property tax helps to stabilize local government revenues; additionally, the

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elasticity of sales taxes leads local governments that have adopted local sales tax to collect more revenues and to expand their financial capacity[43], especially in the economic boom years. Thus, local revenues from sales taxes are assumed positive to the business cycle.

Intergovernmental grants, the other fiscal instrument in this dissertation, are distributed by federal and state governments without the direct participation of local governments at the decision-making process. The traditional Keynesian perspective had asserted that fiscal policy should have surpluses in order to prevent the deficits in the economic bust years. As the key role of the federal government, the macroeconomic stabilization function grounds on the counter-cyclicality. State and local governments can expand their financial capacity during economic boom years, and save surplus funds for the unexpected and uncertain economic fluctuation (Hou, 2006). This fiscal behavior is more observed in the federal/central government; moreover, the fiscal behavior in most developed countries has been a-cyclical and counter-cyclical, while those of developing countries are pro-cyclical (Lane, 2003). According to the theory of subnational countercyclical fiscal policy, intergovernmental grants are distributed to the subnational governments in order for the federal government to stabilize their economic threatens in the recessions.

In terms of the economic conditions, the two fiscal instruments help to expand the financial capacity of local governments, but the budgetary effects differ in terms of economic conditions. Local sales tax is assumed to have greater revenues, especially own-source revenues, as well as intergovernmental grants are so. However, the revenues from both fiscal instruments are difficult expected how much local governments have because of the different characteristics in terms of economic conditions. Based on the opposite characteristics, this dissertation suggests

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[43] The financial capacity is a term that includes the fiscal condition stated in the hypotheses 12 and 13. Thus, the financial capacity in this dissertation is composed of the burden of property taxes, and the revenues and own-source revenues (OSRs) of counties.

four commonly assumed scenarios regarding the revenues from both fiscal instruments on Figure 4.1. Figure 4.2, moreover, adds four more alternative scenarios that show the hypotheses of this dissertation through the combined effects of local sales taxes and intergovernmental grants.[44]

First of all, local jurisdictions that have adopted local sales tax have more revenues from local sales taxes in addition to the revenues from intergovernmental grants. In this case, the revenues from both fiscal instruments remain stable. Alternatively, the revenues from local sales taxes substitute the loss of the revenues from intergovernmental grants after a local jurisdiction has adopted its sales tax (Scenario II). In Scenario II, the total revenues from local sales taxes and intergovernmental grants cannot exceed the projected revenues from intergovernmental grants, given that a local jurisdiction has not adopted local sales tax. However, Scenario II indicates that the adoption of local sales tax in a local jurisdiction have effects on the drops of the revenues from intergovernmental grants. The last commonly assumed scenarios (Scenario I-a, and Scenario I-b) are originated from Scenario I and Scenario II. The adoption of local sales tax in a local jurisdiction lowers the revenues from intergovernmental grants. Scenario I-a describes that the revenue losses from intergovernmental grants are less than the gains from local sales tax. The total revenues from the both fiscal instruments are still lower than the total revenues in Scenario I, but the adoption of local sales tax is shown to help a local jurisdiction to extend its financial capacity. The revenue losses from intergovernmental grants are greater than the revenues gains from local sales taxes; thus, the financial capacity of local revenues is shrunk by the adoption of local sales tax.

---

[44] All the scenarios on Figure 4.1 and 4.2 assume that the revenues from local sales taxes and intergovernmental grants are consistent in local governments. For the better description of the scenarios, the revenues from local sales taxes and intergovernmental grants are described as linearly increased with consistency.

Figure 4-2 illustrates three alternative specified hypotheses for the combined effects of local sales taxes and intergovernmental grants in this dissertation. The scenarios assumed that the adoption of local sales tax results in no drops of the size of intergovernmental grants unlike the effects of fiscal illusion[45]. Scenario A hypothesizes that the adoption of local sales tax in a local jurisdiction has effects on the revenues from intergovernmental grants that the local jurisdiction receives. After a local jurisdiction adopts its sales tax, the size of intergovernmental grants from the upper-levels of governments may become gradually shrunk. However, the revenues from local sales taxes are still greater than the shrinks in the local jurisdiction that has adopted its sales tax. Therefore, the total revenues from the two fiscal instruments are still greater than the projected revenues from intergovernmental grants, given that the local jurisdiction has not adopted its sales tax. Scenario A hypothesizes that the adoption of local sales tax in a local jurisdiction results in the shrinkage of the size of intergovernmental grants, but helps the local jurisdiction expand its financial capacity. Unlike the hypothesis of Scenario A, the hypothesis of Scenario B is based on the different assumption. The revenues from local sales taxes become smaller than the changes in intergovernmental grants; thus, it is hypothesized that the adoption of local sales tax will lead a local jurisdiction to lose its financial capacity.

> *H14a: The adoption of local sales tax will gradually shrink the size of intergovernmental grants, but the two fiscal instruments will expand the financial capacity of a local jurisdiction that has adopted local sales tax because the revenues from local sales tax is greater than those from intergovernmental grants (Scenario A).*

> *H14b: The adoption of local sales tax will shrink the size of intergovernmental grants, but the revenues from local sales tax are not greater than those from*

[45] According to Miller and Pierce (1997), the adoption of new policy causes a drop of the government's spending for the target of the new policy at the next year of the adoption, but the spending on the target of the new policy is eventually increasing as the year has been passed.

intergovernmental grants. Thus, the total revenues from the two fiscal instruments

will be smaller than the projected revenue line, and the financial capacity of a

local jurisdiction that has adopted local sales tax will be eventually threatened

(Scenario B).

Unlike the previous two hypotheses (Scenarios A and B), the hypotheses of Scenario C

and D assume that the adoption of local sales tax will not have any influences on the size of

intergovernmental grants. Scenario C hypothesizes that a local jurisdiction is able to expand their

local sales tax revenues after the adoption of the local sales tax, given the assumption of the no

effects is satisfied. Scenario D grounds on the previous two hypotheses (H14a and H14b);

however, Scenario D considers a long-term perspective. As soon as a local jurisdiction adopts

local sales tax, the size of intergovernmental grants for the local jurisdiction is not changed, but

the expanded revenue capacity through local sales tax in a county will lead to the changes of

intergovernmental grants. The effects of financial capacity are assumed to shrink

intergovernmental grants that a local jurisdiction receives.

> *H14c: The adoption of local sales tax will not have any effects on the size of*
>
> *intergovernmental grants; therefore, a local jurisdiction adopting local sales tax*
>
> *is able to have alternative source for its financial capacity, and expand their*
>
> *financial capacity without any changes on the size of intergovernmental grants*
>
> *(Scenario C).*
>
> *H14d: The adoption of local sales tax will not have simultaneous effects on the size of*
>
> *intergovernmental grants, but shrink the size in the long-term perspective.*
>
> *Moreover, the effects that shrink the size of intergovernmental grants are greater*

than the revenues from local sales tax. Therefore, the adoption of local sales tax

will threaten a local jurisdiction expand its financial capacity (Scenario D).

The financial capacity of a local jurisdiction mainly indicates the revenues of the local jurisdiction. The greater revenues enable a local jurisdiction to expand their provisions of public services and goods; thus, the greater revenues follow the expansion of the expenditures. The financial capacity of a local jurisdiction includes revenues, own-source revenues, and expenditures in this dissertation. Moreover, the burdens of property taxes as a main source of local revenues are measured by the ratio of the revenues from property taxes out of the total revenues. If the revenues from local sales taxes and intergovernmental grants expand, the burdens of property taxes will be reduced because property taxes are relatively inelastic. The term of financial capacity of the hypotheses (H14a through H14d) include the burden of property taxes, as well.

Table 4.1:   Summary of Research Questions and Hypotheses in this Dissertation

RQ1: Determinants of Local Sales Tax

What are the determinants of the adoption of local sales tax and its rate in terms of local politics-economy-demographics?

H1a: Counties controlled by Republicans are less likely to adopt local sales tax because the Republican representatives aim to shrink government size.

H1b: In opposition to the policy goals of the Republicans, counties with more local voters in favor of Democrats are more likely to adopt local sales tax because of the different interests of local voters.

H2a: Counties controlled by Republicans is less likely to increase local sales tax rate because Republicans aim to shrink government size.

H2b: In opposition to the policy goals of Republicans, counties with more local voters in favor of Democrats are more likely to increase local sales tax rate because of the different interests of local voters.

H3: The better the economic conditions of a county is, the more the county is likely to adopt local sales tax.

H4: The better the economic conditions of a county is, the more the county is likely to increase local sales tax rate.

H5: A county with higher population density is more likely to adopt local sales tax because it does not need to attract more cross-border shoppers, while a county with lower population density is less likely to adopt local sales tax in order to attract more cross-border shoppers.

H6: A county with higher population density is more likely to increase local sales tax rate because the local jurisdiction should maximize its revenues from the existing populations, while a county with lower population density is more likely to increase its local sales tax rate in order to attract more cross-border shoppers.

H7: When more of its neighboring counties have adopted their local sales tax, a county is more likely to adopt local sales tax.

H8: A county neighboring to counties that had adopted local sales tax and has set the higher sales tax rate is more likely to increase its local sales tax rate.

RQ2: Interactions Between Local Autonomy/Power and the Control/Support of the Upper-Levels of Governments

What are the interactions of the federal support/control of intergovernmental grants and local autonomy/power of local sales tax?

H9a: Because they have their own source for revenues leading to the expansion of total revenues, counties having adopted their own sales tax are more likely to receive smaller amounts of intergovernmental grants.

H9b: A county having levied local sales tax, plus state tax rate, at higher rate is less likely to receive more intergovernmental grants because the county is regarded as a jurisdiction that has more own source for revenues.

H10: Intergovernmental grants are used as an election strategy; counties where the political party of representatives and voter's political ideology are the same as a politically unified jurisdiction will have smaller intergovernmental grants as election strategy for the reelection of representatives.

H11: Because the federal government plays a key role in economic stabilization, especially macro-economy stabilization, counties are more likely to receive greater sizes of intergovernmental grants when its economy is in bust years.

RQ3: Effects of Local Sales Taxes, Intergovernmental Grants and Their Interactions on Local Budgets

What are the budgetary effects of local sales taxes, intergovernmental grants, and their interactions on local governments?

H12a: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to reduce the burdens of property taxes for local voters.

H12b: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to expand their revenues.

H12c: Counties that have adopted local sales tax and set a high rate of local sales tax are more likely to expand their own-source revenues (OSRs).

H13a: Intergovernmental grants that counties receive from their upper-levels of governments will help them reduce the burdens of property taxes for local voters.

H13b: Intergovernmental grants that counties receive from their upper-levels of governments will help them expand their revenues.

H13c: Intergovernmental grants that counties receive from their upper-levels of governments will not help them expand their own-source revenues.

H14a: The adoption of local sales tax will gradually shrink the size of intergovernmental grants, but the two fiscal instruments will expand the financial capacity of a local jurisdiction that has adopted local sales tax because the revenues from local sales tax is greater than those from intergovernmental grants (Scenario A).

H14b: The adoption of local sales tax will shrink the size of intergovernmental grants, but the revenues from local sales tax are not greater than those from intergovernmental grants. Thus, the total revenues from the two fiscal instruments will be smaller than the projected revenue line, and the financial capacity of a local jurisdiction that has adopted local sales tax will be eventually threatened (Scenario B).

H14c: The adoption of local sales tax will not have any effects on the size of intergovernmental grants; therefore, a local jurisdiction adopting local sales tax is able to have alternative source for its financial capacity, and expand their financial capacity without any changes on the size of intergovernmental grants (Scenario C).

H14d: The adoption of local sales tax will not have simultaneous effects on the size of intergovernmental grants, but shrink the size in the long-term perspective. Moreover, the effects that shrink the size of intergovernmental grants are greater than the revenues from local sales tax. Therefore, the adoption of local sales tax will threaten a local jurisdiction expand its financial capacity (Scenario D).

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Figure 4.1: Basic Scenarios for the Combined Effects of Local Sales Tax and Intergovernmental Grants
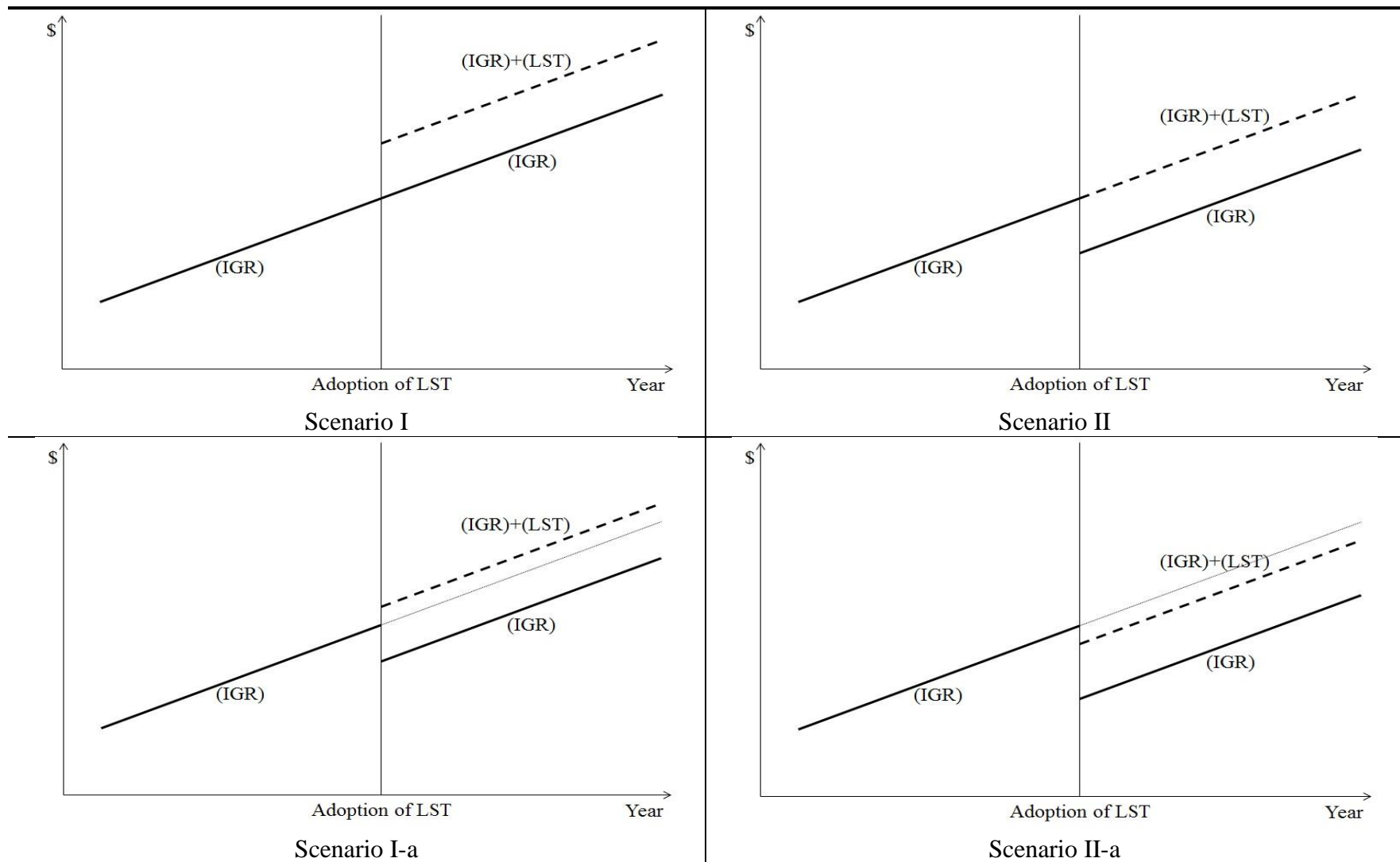
Note: (IGR) denotes the revenues from intergovernmental grants, and (LST) denotes the revenues from local sales tax. The dot line indicates the projected revenue from intergovernmental grants, given that local sales tax is not adopted.

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Figure 4.2: Alternative Scenarios for the Combined Effects of Local Sales Tax and Intergovernmental Grants

Scenario A (H14a)

Scenario B (H14b)

Scenario C (H14c)

Scenario D (H14d)
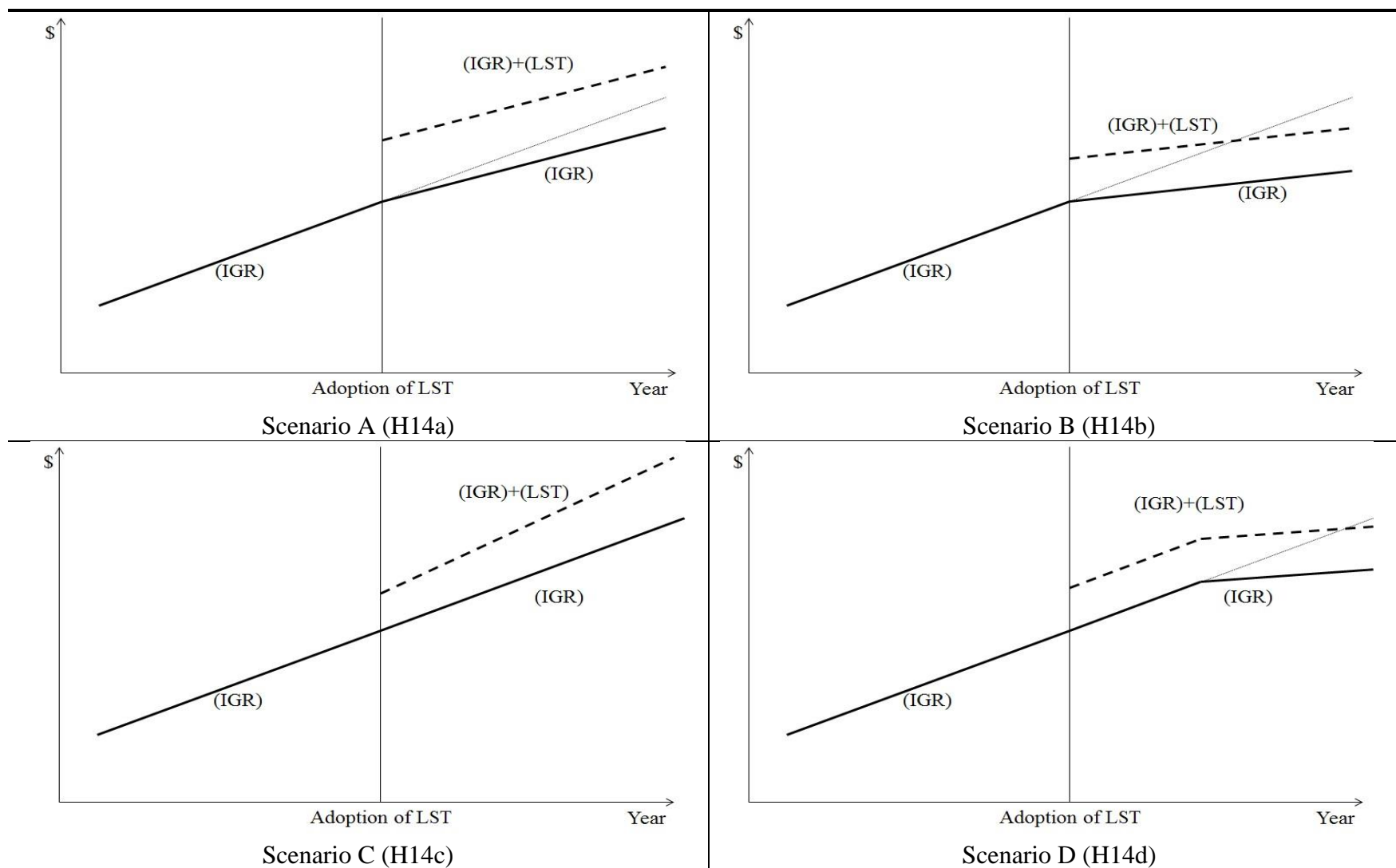
Note: The abbreviations of (IGR) and (LST), and the line types are same with those on Table 4.1

CHAPTER 5

EMPIRICAL MODELS AND DATA DESCRIPTION

The previous chapter has provided three research questions, and developed the relevant hypotheses. The hypotheses aim to empirically examine 1) the determinants of local power to sales tax with considering inter-jurisdictional competition, 2) the interaction between local power of local sales tax with intergovernmental grants as the upper-level control and supports to local governments, and 3) the effects of local sales taxes, intergovernmental grants and their interactions on local budgets such as property tax burdens, revenues, and own-source revenues (OSRs). This chapter is devoted to specifying empirical models for the examination of the hypotheses. The empirical models are built on the reviews of theoretical and empirical literatures in Chapter 2, and on the understanding of local government authority and power to levy taxes especially local sales taxes in all U.S. counties as reviewed in Chapter 3.

5.1.   Empirical Models

All the empirical models specified in this dissertation are conducted with a set of panel data that covers all U.S. 3,042 counties for thirty-seven years (1970 through 2006). The empirical models employ ordinary least squares (OLS), logit, and probit regressions with fixed-effects because the independent variables change across times. Although it is assumed that fixed-effects models are more efficient for the estimates, this dissertation conducts all the empirical models with random-effects, and examines which one is more appropriate without bias on the

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estimates. This section will provide each empirical model that examines the three research questions and their hypotheses in its sub-sections.

5.1.1. Cross-Sectional Dependence for Inter-Jurisdictional Competition

As hypothesized in the previous section, empirical models should consider geo-spatial autocorrelation for fiscal interaction across county governments. Although the Tiebout model, tax competition theory, and yardstick competition theory, as well as the Leviathan hypothesis and the public choice theory have different perspectives and mechanisms on the interactions across jurisdictions, their common prediction is that the fiscal behavior for tax rate setting of a jurisdiction has been influenced by the tax rates of its neighboring and/or competing jurisdictions. Numerous studies on sales taxes have provided both theoretical and empirical evidences that inter-jurisdictional competition are observed. Moreover, many empirical studies on sales taxes have concentrated on the tax competition in the U.S. (Besley & Rosen, 1998; Devereux et al., 2007; P. Egger et al., 2005; Haufler, 1996; Jacobs et al., 2010; Kanbur & Keen, 1993; Lockwood, 1993, 2001; Luna, 2004; Luna et al., 2007; Mintz & Tulkens, 1986; Nelson, 2002; Nielsen, 2001, 2002; Ohsawa, 1999, 2003; Ohsawa & Koshizuka, 2003; Rork, 2003; Trandel, 1994; Y. Q. Wang, 1999; Wilson, 1999).

Based on the theoretical and empirical arguments stated in Chapter 2, this dissertation developed the hypotheses (H8) in the previous section. Based on the empirical model of tax reaction function (Jacobs et al., 2010), this dissertation builds an empirical model that examines whether inter-jurisdictional competition is observed or not in setting the local sales tax rate in counties. The tax reaction function (Jacobs et al., 2010) of county i in year t is developed as:

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$$STR_{it} = \alpha_0 + \rho \sum_{j=1}^{N} \omega_{ij} STR_{jt} + \theta X_{it} + \mu_i + \delta_t + \varepsilon_{it} \qquad (C)$$

where, the dependent variable (STR_{it}) denotes the sales tax rate of a county is a function of tax rate setting by its neighbors j, which is represented by the "spatial lag" term $\sum_{j=1}^{N} \omega_{ij} STR_{jt}$, where ω_{ij} is an element of a represented $N \times N$ matrix of spatial weights, denoted as W_S (where $\omega_{ij} = 0$ for i = j). α_0 is a constant, δ is the slope parameter, X_{it} denotes control variables with θ as vectors of parameters. The terms of μ_i, δ_t, and ε_{it} denote a county-specific fixed effects, the year-specific fixed effects, and error terms, respectively.

The weighting matrix (ω_{ij}) reflects the degree to which neighboring counties affect a county's setting of sales tax rate. While the most studies on inter-jurisdictional competition at the municipal level constructed the matrix using distance, The matrix is constructed using the contiguity of counties because the sizes of the U.S. counties are pretty big enough to follow the study on inter-jurisdictional competition across the U.S. states (P. Egger et al., 2005; Jacobs et al., 2010). The elements of the neighboring counties matrix (ω_{ij}) are:

$$\omega_{ij} \equiv \begin{cases} \dfrac{b_{ij}}{\sum_{j=1}^{N} b_{ij}} > 0 & for\ i \neq j \\ 0 & for\ i = j \end{cases} \ (denoted\ as\ W_{NR}), \qquad (I)$$

where, b_{ij} is a border dummy which equals normalized value when county *i* and *j* = *1, ..., N* share a common border and zero otherwise. The rows are normalized, so the spatial lag represents the average sales tax rates of the neighboring counties (*j*) of a county (*i*). The normalized weighting matrix (W_{NR}) is described as[46]:

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[46] The description of the matrix (W_{NR}) is a part from the sample of this dissertation.

$$W_{NR} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.167 & 0 & 0.167 & 0.167 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0.143 \\ 0 & 0.143 & 0 & 0 & 0 & 0 & 0.143 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

The control variables are composed of three broad categories: political, economic and demographic variables. Following the previous studies (Devereux et al., 2007; P. Egger et al., 2005; Jacobs et al., 2010), the political condition of a county is composed of three variables: 1) governor's political orientation, coded as 1 when the governor of a state is Republican, and 0 otherwise, 2) Senators' political orientation, coded as 1 when the Senators of a state are Republicans, and 0 otherwise because local sales tax can be adopted by the authorization of State Statutes, and 3) the political ideology of local voters to Democrats in terms of election results[47] in order to see the differences of the political orientations across elected representatives and voters. This dissertation hypothesizes that Republicans prefer a smaller size of the public sector; thus, they are more likely to set lower tax rates than Democrats. The economy of a county is measured by per capita income as the real dollars of the year-2000 because unemployment rate is usually used to measure business cycle, but the data at the county level is not provided. The demographic variables include population (as logged) and population density in order to capture the potential economies of scales that enable to expect the provisions of public services and goods.

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[47] The results include all the elections for President, Governor and the U.S. Congress Members of Senators and House of Representatives. If a county i does not have an election, the values are coded as the same values with the previous election result (Adams, Clark, Ezrow, & Glasgow, 2004; Levitt, 1996; Pierce, 1970).

The empirical model (Equation C) is constructed following the literatures (Case, 1993; P. Egger et al., 2005; Jacobs et al., 2010; Kanbur & Keen, 1993; Lockwood, 2001), and aims to test spatial autocorrelation. The widely used tests for spatial autocorrelation are 1) Moran I tests (Moran, 1950), and 2) Lagrange-Multiplier (LM) and robust LM tests (Anselin, 1988; Breusch & Pagan, 1980). However, those two tests are limited to the spatial autocorrelation through OLS regressions including only cross-sectional data. Instead of the two widespread tests, this dissertation will conduct the tests for cross-sectional dependence (CD) in panel data regression models (Baltagi, Bresson, & Pirotte, 2007; De Hoyos & Sarafidis, 2007; Pesaran, 2004, 2006). The Pesaran's CD test is based on Breusch and Pagan's Lagrange-Multiplier (LM) statistic (Anselin, 1988), but the only LM statistic is valid for small sample size in the long-term periods, while the Pesaran's CD test is applied to long-term panel data set that this dissertation has constructed to cover all U.S. counties for more than thirty years. Moreover, the Pesaran's CD test is appropriate to test the bias of the standard fixed-effects (FE) and random-effects (RE) estimators in terms of the homogeneous/heterogeneous dynamic models and nonstationary models; moreover, the Pesaran's tests is more valid to the unbalanced panel models, especially given that the panel data is enough big in the long-term periods (De Hoyos & Sarafidis, 2007). Thus, this dissertation selects the Pesaran's CD test whether any spatial autocorrelation is observed in the data set of this dissertation.

5.1.2. Determinants of Local Sales Tax Adoption and Its Rate Setting

The first research question is about the determinants on the adoption of and the rate setting of local sales tax in a county jurisdiction. The theoretical and empirical existing literatures have shown that jurisdictional internal conditions such as politics, economy, socio-

demographics and fiscal institutions jointly and/or separately affect an adoption of new policy

and change the new policy. The internal factors will examine the hypotheses (H1 through H5). In

addition to the internal factors, this dissertation considers the external factors to the adoption of

new policy stated as inter-jurisdictional competition in Chapter 2. The external factors of inter-

jurisdictional competition are theoretically predicted to lower tax rates. However, little empirical

research has examined the predictions, while much research has focused on the effects of inter-

jurisdictional competition on government size and public sector size. Due to the limitations of

existing research, this dissertation focuses on the external factors to the adoption of local sales

tax for the hypothesis (H7), as well.

A. *Wagner and Sobel's (W-S) Model for a New Policy Adoption*

The basic empirical model grounds on Wagner and Sobel's (W-S) model (2006) that

explored the influences on the joint probability of adopting budget stabilization fund in the U.S.

states. Their model aimed to capture the influences of local characteristics ignoring the

influences in the post-adoption periods. The W-S model for county (i) and the year (t) is

constructed as:

$$\Pr(LSTA_i = 1 | STR, X, CON) = \alpha + \rho \sum_{j=1}^{N} (\omega_{ij} STR_j) + \theta X_i + \varphi CON_i + \mu_i \qquad (WS)$$

where, the dependent variable ($LSTA$) denotes whether a county adopts local sales tax, coded as

1 if a county adopts local sales tax, and 0 otherwise. The variables of X denote local

heterogeneity in terms of politics (POL), economy ($ECON$), and socio-demographics (DEM) and

the coefficients of each variable is referred as θ, the variables (CON) denote control variables

such as fiscal institution and functions in a county, and β_0 is a constant, μ_i is an error-term.

The sales tax rates of the neighbors (STR_j) are obtained through the spatial lag term of standardized weighting matrix (W_{NR}), reflecting the degree to which neighboring counties affect a county's setting of sales tax rate, as stated on Equation C and Matrix I. The politics of a county (POL) is defined by three variables. The two variables measure the political orientations of Governor, Senators, and local voters, same with the variables in Equation C. The State legislature is the legislative body of all U.S. states; however, all the State Statutes and legislatures are various in state-by-state, and it is difficult to collect and code the long-term dataset. Therefore, the dummy variable of Senators in a state is added to this empirical model in order to control the politics of a county.

The economy of a county ($ECON$) is defined as per capita income (PCI)[48] instead of unemployment rate. Gross domestic product (GDP) and unemployment rate have generally been used to measure business cycle, but they are not appropriate for the research of local governments because the economic condition of local governments is influenced by macro-economic policy of their upper-levels of governments, and local governments are assumed not to be big enough to have influences on GDP. Moreover, local sales tax as the main object of this dissertation is more influenced by the potential consumer's power of any sales activities assumed that the higher income level is the much more influential factor to.

The socio-demographics of a county (DEM) ground on Equation C, including population size and population density in order to capture the economies of scale. The empirical model (Equation WS) includes the variables of demographic structure such as the ratio of white and African-American populations, the ratio of those who are under 20 and over 65, and the ratio of

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[48] PCI is collected as nominal dollars, thus; it is adjusted into real dollars through Consumer Price Index (CPI) with the year of 2000 dollars. The real dollars of PCI in a county *i* are transformed into natural logarithm form in order to resolve the skewness for normal distribution and to facilitate interpretation.

women in order to capture the difference of socio-demographic structure by race, age, and gender. Because the socio-demographic structure decides what types of public services and goods a county demands, and how much the income-level in a county is, this dissertation adds the detailed variables of those socio-demographics to the empirical model (Equation WS).

The control variables (CON) are classified into three categories: jurisdiction size, fiscal institution, and fiscal functions. County size is measured with two dummy variables of metropolitan and micropolitan statistical areas defined by the U.S. Census Bureau. The variable of fiscal institution depends on the line of local sales tax in the State Statutes. State Departments of Revenues or Taxations have fundamentally administered local sales tax, but some of the States allow their local governments to administer local sales tax by themselves. The allowances lead their counties to have more discretion for tax policies. This dissertation assumes that local sales tax is more likely adopted and its rate is more likely changed, if counties are authorized to adopt and to administer their sales tax. Therefore, the variable for fiscal institution is measured as a dummy variable coded when counties can administer local sales tax, and 0 otherwise.

Another variable for fiscal institution is whether a county has adopted its income tax for its revenue expansion, coded 1 when a county adopts income tax, and 0 otherwise. The variables of fiscal functions are composed of the 8 dummy variables that indicate whether a county spends any expenditure for each function. The fiscal functions assigned to a county[49] follow the definitions of the *National Association of Counties (NACo)*. According to Equation 1, it is assumed that a county is more likely to adopt local sales tax given that the neighbors of the county has higher sales tax rate.

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[49] The *National Association of Counties* has defined the functions of higher education, health, hospitals, judicial and legal, fire protection, policy protection, library and welfare.

B. Developments of W-S Model for Local Sales Tax

The W-S model (Equation WS) is appropriate for the assumption that a new policy stays in place permanently, once adopted; however, local sales tax does not so. Burge and his co-authors have considered the time effects on the adoption of local sales tax, and developed empirical models (Burge & Piper, 2012; Burge & Rogers, 2011). The assumption of the W-S model is rarely satisfied with local sales tax policy because many counties where local sales tax has been enacted have adopted local sales tax, and fully terminated or partially removed it through the referendum of their voters' approval and/or the council's decisions. Based on the two empirical models (Equation C and WS), this dissertation suggests two empirical models with the considerations of time effects that will examine all the hypotheses of the research question 1 (H1 through H8). The odd-numbered hypotheses (H1-a, H1-b, H3, H5 and H7) are about the adoption of local sales tax by counties, while the even-number hypotheses (H2-a, H2-b, H4, H6 and H8) are about the local sales tax rate. Because of the different dependent variables, two empirical models suggested in this section are a panel regression models (Equation 1 and 2).

$$Pr(LSTA_{it} = 1 | NLA, STR, POL, ECON, DEM, CON)$$

$$= \beta_0 + \gamma \sum_{j=1}^{N} (\omega_{ij} NLA_{jt}) + \rho \sum_{j=1}^{N} (\omega_{ij} STR_{jt}) + \beta_1 LSTA_{it-1} + \beta_2 POL_{it}$$

$$+ \beta_3 ECON_{it} + \beta_4 DEM_{it} + \beta_5 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \qquad (1)$$

where, the dependent variable ($LSTA$) denotes whether a county i at fiscal year t adopts and imposes local sales tax, and the other independent variables (POL, $ECON$, DEM, and CON) denote the politics, economy, socio-demographics and other control variables for counties. The independent variables are same with those in Equation C. β_0 is a constant, and the terms (μ_i, δ_t, and ε_{it}) denote a county-specific fixed effects, the year-specific fixed effects, and error terms,

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respectively. Lastly, the empirical model (Equation 1) is controlled 1-year lagged dependent variable ($LSTA_{it-1}$).

As hypothesized (H7) in the previous section, this dissertation assumes that a county is more likely to adopt and to impose local sales tax, if its more neighboring counties have adopted local sales tax. The variable (NLA_{jt}) denotes whether the neighboring counties have adopted local sales tax or not, coded as 1 when a neighboring county adopts and imposes local sales tax, and 0 otherwise. This empirical model considers time-effects, so the local sales tax rate of the neighboring counties are written as STR_{jt}. The hypothesis (H7) does not consider sales tax rate for the probability that adopts local sales tax, but it is supposed that the neighboring counties having levied higher sales tax rate have affected the rate of a county. This empirical model (Equation 1) is controlled by sales tax rate for estimating the probability of the adoption.

The weighting matrix (W_{NR}) in Matrix I is inappropriate for this empirical model (Equation 1) because the normalized rows obtain the average values; therefore, the weighting matrix for Equation 1 is obtained without normalization, and denoted as W_C. The elements of the neighboring counties matrix (ω_{ij}) are:

$$\omega_{ij} \equiv \begin{cases} b_{ij} > 0 & for\ i \neq j \\ 0 & for\ i = j \end{cases} (denoted\ as\ W_C), \tag{II}$$

where, b_{ij} is a border dummy coded as 1 when county i and j = 1, ..., N share a common border, and as 0 otherwise. The spatial lag represents a weighted sum of the neighboring counties that have adopted local sales tax. The elements (ω_{ij}) of the weighting matrix (W_C) is described as:

$$W_N = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

The empirical model (Equation 2) for the changes of local sales tax rate is a panel-regression model is constructed as:

$$LSTR_{it} = \beta_0 + \rho \sum_{j=1}^{N} \omega_{ij} STR_{jt} + \beta_1 LSTR_{it-1} + \beta_2 POL_{it} + \beta_3 ECON_{it} + \beta_4 DEM_{it}$$

$$+ \beta_5 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \tag{2}$$

where, the dependent variable ($LSTR_{it}$) denotes the local sales tax rate in a county i at the fiscal year t, and other variables and terms are same with those in Equation 1. Moreover, the elements of the weighting matrix (ω_{ij}) in this empirical model (Matrix I) ground on the matrix (W_{NR}).

The dependent variable of local sales tax rate in a county i at the fiscal year t ($LSTR_{it}$) is modified because the counties authorized to adopt local sales tax are allowed to make changes on their local sales tax policy. Counties have been also authorized to decide when their local sales tax rate becomes effective. The local sales tax rate is changed with voter's approval in a county (i); thus, the time points when the changes are observed are not constant. Therefore, the dependent variable ($LSTR$) is modified by the ratio of effective days in a fiscal year (t), and is described as:

$$LSTR_{it} = \frac{d \times LSTR_{it}^* + (D - d) \times LSTR_{it-1}^*}{D} \tag{3}$$

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where, $LSTR_{it}^*$ denotes the local sales tax rate in a county i at the fiscal year t, D denotes the days in one fiscal year that are 366 days every four years and 365 days otherwise, and d denotes the effective days between before and after the new local sales tax rate becomes effective in the fiscal year. The accuracy of local sales tax rate ($LSTR_{it}$) is obtained using effective days of the new local sales tax rate.

5.1.3. Interactions between Local Autonomy/Power and Upper-Level Control/Support

The second research question is about the interactions between the two fiscal instruments of local sales tax and intergovernmental grant. The theoretical approaches to the two fiscal instruments depend on the economic bust and boom years from the business cycle. When the economic conditions of counties are in the boom years, per capita income and employment rate are supposed to increase, as well as consuming activities become stimulated. This dissertation assumes that the revenues from sales taxes are expanded and the higher rate of sales tax regarded more elastic than property tax helps counties to collect more revenues in economic boom years. Based on the assumption, the revenues from sales taxes become shrunk in economic bust years, and counties need the alternative sources for their revenues in responding to the demands of public services and goods. Many theoretical and empirical studies depending on the theory of subnational counter-cyclical fiscal policy have provided the evidence that the greater size of intergovernmental grants have been provided for the lower-levels of governments. Intergovernmental grants are supposed to be distributed to the local governments when their economy is in the bust years. Therefore, the local revenues from sales taxes and intergovernmental grants are assumed to have inverse relationships over business cycle.

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For the empirical examination of the inverse relationships between the two fiscal instruments, this dissertation provides the hypotheses (H9, H10 and H11), and suggests an empirical model based on panel-regression model. The empirical model is constructed as considering separately the independent variables of the adoption of local sales tax and local sales tax rate in order to satisfy non-collinearity in the regression models:

$$GRT_{it} = \beta_0 + \beta_1 GRT_{it-1} + \beta_2 LSTA_{it} + \beta_3 POL_{it} + \beta_4 UNI_{it} + \beta_5 ECON_{it} + \beta_6 DEM_{it}$$
$$+ \ \beta_7 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \tag{4}$$

$$GRT_{it} = \beta_0 + \beta_1 GRT_{i\square-1} + \beta_2 LSTR_{it} + \beta_3 POL_{it} + \beta_4 UNI_{it} + \beta_5 ECON_{it} + \beta_6 DEM_{it}$$
$$+ \ \beta_7 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \tag{5}$$

where, the dependent variable (GRT_{it}) denotes the per capita size of intergovernmental grant that a county i receives at the fiscal year t, the independent variables ($LSTR_{it}$, $LSTA_{it}$, POL_{it}, $ECON_{it}$, DEM_{it} and CON_{it}, and the terms of μ_i, δ_t and ε_{it}) are defined as same with the previous empirical models (Equation 1 and 2). Unlike the previous empirical models, the other two variables to politics and economy of counties are added in order to control these empirical models (Equation 4 and 5). The distributions of intergovernmental grants are determined following the decision-making process at the U.S. Federal level, and Republicans have a tendency to shrink government size (Borck & Owings, 2003). Therefore, the political orientation of the President is added to this model, coded 1 when the President is Republican and 0 otherwise. One more variable added to the empirical model (Equation 5) is state sales tax rate in order to control the empirical model.

The variable of national unemployment rate is added in order to control this empirical model because the decision-making process of the federal government is influenced by the national unemployment rate as macro-economy condition. Because the federal decision on

intergovernmental grants is influenced by the national unemployment rate, the empirical models (Equation 4 and 5) include the variable for the national unemployment rate. Intergovernmental grants are used as an election strategy hypothesized (H10-d); thus, the variable (UNI_{it}) denotes the political homogeneity of a county across its upper-levels of governments as unified government form. The variable of political homogeneity is coded 1 when the political orientations of the three elected representatives and the voters in a county[50] are same across the four actors; otherwise, coded as 0. Therefore, the political unification is equal to 1 when all the three representatives and the majority of voters are Republicans or Democrats.

5.1.4. Budgetary Effects of Local Sales Taxes and Intergovernmental Grants on Counties, and Their Interactions

The last research question is about the effects of the two fiscal instruments and their interactions on the budgets of a county. As reviewed in Chapter 2, the two fiscal instruments - local sales tax and intergovernmental grants - help local governments to increase their revenues, but their characteristics are regarded as inversed-relationships over the business cycle that lead to unexpected effects on the budgets of local governments. A higher local sales tax rate enables county governments to collect greater revenues, especially own-source revenues (OSRs), but a county that has adopted local sales tax and collected greater revenues are assumed to receive the smaller size of intergovernmental grants. Moreover, it has been asserted that local sales tax helps local governments decrease the burdens of local property tax, and the collections of greater revenues enable them to expand their expenditures (Jung, 2001, 2002; Luna, 2004; Zhao & Hou,

[50] The political orientations of the voters in a county are measured as percentage from the election results. Therefore, the political orientations of the voters are transformed to the dummy variable when the voters to Republicans are more than 50% or less than 50%, which means the voters to Democrats are more than 50%.

2008; Zhao & Jung, 2008). Based on the hypotheses (H12, H13 and H14) and the eight

Scenarios, this dissertation suggests an empirical model that examines the hypotheses including

an interaction term. The interaction term will be a determinant of which Scenario explains the

separate and joint budgetary effects of the two fiscal instruments.

$$BUD_{it} = \beta_0 + \beta_1 BUD_{it-1} + \beta_2 GRT_{it} + \beta_3 LSTR_{it} + \beta_4 GRT_{it} LSTA_{it} + \beta_5 POL_{it}$$
$$+ \beta_6 ECON_{it} + \beta_7 DEM_{it} + \beta_8 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \qquad (6)$$

where, the dependent variable (BUD_{it}) is categorized into the three types of fiscal capacity in a

county i at the fiscal year t. This dissertation concentrates on property tax burdens, revenues, and

own-source revenues for the examination of the budgetary effects. The dependent variables of

revenues and own-source revenues are obtained as per capita size and total size.

Local sales tax has two main goals of the reduction of property tax burdens, and the

expansion of revenues. Regardless of the way to administer the revenues of local sales tax by

state and/or local governments, the revenues can be used for local governments. Although some

U.S. states have mandated their local governments to spend the revenues from local sales taxes

for a specified purpose such as transportation, infrastructure, and education, it is no doubt that

the revenues of local sales taxes expand the revenues of local governments, especially their own-

source revenues. Following the expansion of revenues and the options lead local governments to

expand their provisions of public services and goods. Therefore, this dissertation picks up the

three types of budgets as the dependent variable (Equation 6). The independent variables (GRT_{it}

and $LSTR_{it}$) are the same as those in Equation 4, and the interaction term ($GRT_{it} \times LSTA_{it}$) is

composed of a continuous variable that denotes per capita size of intergovernmental grants and a

dummy variable that denotes whether a county has adopted local sales tax or not.

The adoption of local sales tax is selected for the interaction term for the easiness to the interpretations of the empirical results. Assumed that the two coefficients (β_2 and β_4) have different signs, the differences between the absolute values of the two coefficients will decide which Scenario on Figure 4.2 is more convincing. Because the dependent variable of Equation 6 is limited to county governments, the political variable (POL_{it}) is composed of the political orientation of Governor, Senators, and voters, as well as the economy variable ($ECON_{it}$) is per capita income in a county. The other variables ($ECON_{it}$, DEM_{it}, and CON_{it}) and the terms (μ_i, δ_t, and ε_{it}) are same with those in Equation 4 and 5.

5.1.5. Econometric Issues of Endogeneity

A.   *Endoeneity Issue of Intra-Jurisdictional Competition*

As theoretically and empirically reviewed in Chapter 2, fiscal interactions are observed across jurisdictions, and affect a jurisdiction itself and its neighboring competitors. Many theoretical and empirical studies, including Tiebout model, tax competition, Yardstick competition and Leviathan hypotheses, have provided supportive evidence that fiscal interactions have influences on tax policy. Moreover, fiscal interactions have horizontal and vertical influences on policy-making process, referred to as inter- and intra-jurisdictional competition. The intra-jurisdictional competition are observed between the central and local jurisdictions, especially between the federal, State and local governments including under federalism.

However, this dissertation has taken all U.S. counties for empirical examination, and intra-jurisdictional competition between counties and municipalities, school districts and special districts even within a state result in potential econometric issue of endogeneity in this dissertation. Due to the limitations of data collection at all the levels of governments from the

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federal government to school and special districts, this dissertation decides to separately examine

the hypotheses through the empirical models by dividing the U.S. states to four categories, based

on the discussions on Table 3.1 of Chapter 3: 1) all U.S. Counties, 2) the U.S. counties excluding

the Counties in the fourteen States that have not authorized local sales tax to local governments,

3) the U.S. counties excluding the Counties in the twenty-five States where intra-jurisdictional

competition are observed, and 4) the U.S. counties that have authorized local sales tax for only

County governments. The groups of States for the separate examination of the empirical models

are summarized on Table 5.1.

B.   *Endoeneity Issue of the Types of Sales Taxes*

The second econometric issue of endogeneity is the variable of sales tax rate of a county i

(STR_i), and that of its neighboring counties j (STR_j). Because sales tax rate of a county is

composed of state sales tax and local sales tax that share the same tax base, any changes on state

and/or local sales tax lead a county to impose different rates of sales taxes. Moreover, how a

county is neighbored to other counties causes potential endogeneity issue.

According to Figure 5.1 that maps the six states around the state of Georgia, the shaded

counties share the borders with other States. Figure 5.2 that maps the six states around the state

of New York with two shades shows another case for this endogeneity issue. The shaded

counties share borders with other states like Figure 5.1.The darker-shaded counties in the States

of New York, Pennsylvania, and Vermont share their borders with the States that have

authorized local sales tax, while the lighter-shaded counties in the States of Connecticut,

Massachusetts, and New Jersey share them with the States that have not authorized local sales

tax. The darker-shaded counties neighboring to the lighter-shaded counties are influenced by only state sales tax.

Cross-border shoppers recognize how much they actually pay to any sales activities in terms of combined sales taxes, and the shoppers between the darker- and lighter-shaded counties (Figure 5.2) recognize the same way (Figure 5.1); especially, cross-border shoppers do not recognize how much they pay for state and local sales taxes. Assumed that all goods are same prices, cross-border shoppers decide where to buy goods considering the sales taxes that they will pay. Unlike the recognitions of the shoppers, tax policy of a state does not consider the shaded and the non-shaded counties, separately. Rather, the tax policy is thought to consider the sales tax rate of neighboring States. Given that inter-jurisdictional competition is actually observed, the non-shaded counties (Figures 5.1 and 5.2) are influenced by only local sales tax because state sales tax is flat to those counties, while the shaded-counties are separately influenced by state and local sales taxes because the States shown on Figure 5.1 have both state and local sales taxes, and the differently shaded-counties are influenced by combined sales tax on Figure 5.2.

A potential endogeneity problem here is that the different types of sales taxes affect many counties within one state, and across states as well. If inter-jurisdictional competition really exists from Equation C, the variable of sales tax rate (STR_j) should be modified considering separately state and local sales taxes. In order to resolve this endogeneity issues, this dissertation decides to divide the combined sales tax rate into state and local sales tax separately. Therefore, it is described as following:

$$STR_{jt} = \beta_0 + \rho_1 \sum_{j=1}^{N} \omega_{ij} SSTR_{jt} + \rho_2 \sum_{j=1}^{N} \omega_{ij} LSTR_{jt} + \beta_1 STR_{jt-1} + \mu_i + \delta_t + \varepsilon_{jt} \qquad (7)$$

where, the dependent variable (STR_{it}) denotes the combined sales tax rate in county i at the fiscal year t, the independent variables ($SSTR_{jt}$ and $LSTR_{jt}$) denote state and local sales tax rate, respectively, the variables ($\sum_{j=1}^{N} \omega_{ij}(SSTR_{jt})$ and $\sum_{j=1}^{N} \omega_{ij}(LSTR_{jt})$) denote the tax rates of neighboring counties to control the effects of local sales taxes of the neighboring counties in terms of inter-jurisdictional competition, and the terms (μ_i, δ_t, and ε_{jt}) are denoted as county-specific fixed effects, the year-specific fixed effects, and error terms, respectively. This variable in Equation 7 is controlled by one year lagged dependent variable.

C. Endoeneity Issue of Reverse-Causality

The last endoeneity problem in the empirical models is reverse-causality. Given that inter-jurisdictional competition exist in sales tax rate setting, a county (i) decides whether the county (i) adopts sales tax or not, and increases, keeps or decreases sales tax rate by considering its neighboring counties (j, when $\omega_{ij}>0$). However, one of the neighboring counties (j) also considers its own neighbors including the county (i). The mutual influences between a county (i) and its neighbors (j) cause an endogeneity issue of reverse-causality to potentially threaten all the empirical models. Therefore, the variable (STR_{it}) on Equation 6 should be controlled by the internal characteristics that affect the tax rate setting of the neighboring counties (j). For the elimination of this endogeneity problem, the variable (STR_j) is instrumented by the internal conditions of neighboring jurisdictions themselves. Adding the variables of internal conditions in the neighboring jurisdictions control the reverse causality, and the variables of internal conditions are obtained through the geospatial matrix because the internal conditions of the neighboring jurisdictions affect each other. Based on Equation 7, the variable is modified including more variables as following (Equation 7a):

$$STR_{jt} = \beta_0 + \sigma_1 \sum_{j=1}^{N} \omega_{ij}SSTR_{jt} + \sigma_2 \sum_{j=1}^{N} \omega_{ij}LSTR_{jt} + \sigma_3 \sum_{j=1}^{N} \omega_{ij}POL_{jt}$$

$$+ \sigma_4 \sum_{j=1}^{N} \omega_{ij}ECON_{jt} + \sigma_5 \sum_{j=1}^{N} \omega_{ij}DEM_{jt} + \beta_1 STR_{jt-1} + \mu_i + \delta_t + \varepsilon_{it} \quad (7a)$$

where, all the variables are same with the previous empirical models. The variables of the politics (POL_{jt}), economy ($ECON_{jt}$) and socio-demographics (DEM_{jt}) of the neighboring counties are obtained through the normalized weighting matrix (W_{NR}). Equation 7a is also controlled by the lagged variable of the dependent variable (STR_{jt-1}). If a variable is dummy variable, it is impossible to obtain the average characteristics of neighboring counties, for example, the political orientations of representatives. Thus, those dummy variables are excluded for the characteristics of neighboring counties.

D. Endoeneity Issue of Variation of Local Sales Tax Rate

This dissertation has developed an empirical model that examines the determinants of the adoption of local sales tax and the changes of local sales tax rate. The models have basically grounded on regression analyses, especially when its dependent variable is continuous in linear-models rather than dichotomous in non-linear models, aims to predict the value of the dependent variable from all the independent variables added to the model. The continuous variable should have variances for the prediction through the regression analysis.

Although State Statutes has allowed local government's discretion to adopt local sales tax, local governments have been still constrained to change its local sales tax rate; moreover, the local governments are mandated to ask the approval of local voters as taxpayers. After a county has adopted local sales tax and/or changed its sales tax rate, the county will keep its local sales

tax rate at the same level for the next couple of fiscal years from the approval of local voters. When a county changes its local sales tax rate is flexible, but how long the local sales tax is imposed has been decided when the voters in the county are asked to approve. Therefore, local sales tax guarantees the discretion of local jurisdictions, but the changes of its rate is rather in constancy. Moreover, state sales tax rate is less frequently changeable, and keeps at the same rate for the longer period than local sales tax rate. That is, the frequency of any changes in the combined sales tax rate of local jurisdictions is determined by the frequency of changes in local sales tax.

The constancy of local sales tax rate for a couple of years, and the longer constancy of state sales tax rate is regarded as an endogeneity how many lagged dependent variables should control the empirical models. Moreover, sales taxes are more elastic than other taxes, especially property taxes as the main revenue sources for local governments (Cornia et al., 2010; Cornia & Nelson, 2010; Groves & Kahn, 1952; Mullins & Wallin, 2004; Sobel & Holcombe, 1996). In order to resolve this endogeneity and to obtain consistent estimates, this dissertation adjusted the variables of sales tax rates by applying the concepts of the first differences that Weber (2010) proposed. Her alternative method using the concepts of the first differences help to decrease standard errors with minimal effects on estimates. Moreover, the method using the concepts of the first differences are more efficient to the panel data of a large cross-sectional group (Donald & Lang, 2007). Based on the concepts of the first differences, the empirical models including the variables (STR, $SSTR$ and $LSTR$) of sales tax rates (Equations 1, 2 and 7a) are re-written considering the changes of state and local sales taxes as followings:

Equation for the determinants of the adoption of local sales tax (Equation 1)

$$Pr(LSTA_{it} = 1 | NLA, POL, ECON, DEM, CON) = \beta_0 + \gamma \sum_{j=1}^{N} \omega_{ij} NLA_{jt} +$$

$$\rho \sum_{j=1}^{N} \omega_{ij} \Delta STR_{jt} + \beta_1 LSTA_{it-1} + \beta_2 POL_{it} + \beta_3 ECON_{it} + \beta_4 DEM_{it} +$$

$$\beta_5 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \qquad\qquad (1a)$$

Equation for the determinants of the changes of local sales tax rate (Equation 2)

$$(\Delta LSTR_{it}) = \beta_0 + \rho \sum_{j=1}^{N} \omega_{ij}(\Delta STR_{jt}) + \beta_1(\Delta LSTR_{it-1}) + \beta_2 POL_{it} + \beta_3 ECON_{it} +$$

$$\beta_4 DEM_{it} + \beta_5 CON_{it} + \mu_i + \delta_t + \varepsilon_{it} \qquad\qquad (2a)$$

Equation of a variable for removing enodogeneity (Equation 6 and 6a)

$$STR_{jt} = \beta_0 + \sigma_1 \sum_{j=1}^{N} \omega_{ij}(\Delta SSTR_{jt}) + \sigma_2 \sum_{j=1}^{N} \omega_{ij}(\Delta LSTR_{jt}) + \sigma_3 \sum_{j=1}^{N} \omega_{ij} POL_{jt}$$

$$+ \sigma_4 \sum_{j=1}^{N} \omega_{ij} ECON_{jt} + \sigma_5 \sum_{j=1}^{N} \omega_{ij} DEM_{jt} + \beta_1 STR_{jt-1} + \mu_i + \delta_t + \varepsilon_{it} \quad (7b)$$

5.2. Source of Data and Descriptive Statistics

This section provides information on the sources of all the variables used in the empirical analyses, on any modification of the original data, and the descriptive statistics for all the variables. Table 5.2 presents the names, descriptive statistics, and sources of all variables. For the empirical analyses, this dissertation assembles data from diverse sources including 1) all State Departments of Revenues, 2) all State Legislatures and Secretaries of State, 3) CQ Voting and Election Collection, 4) the U.S. Bureau of Census, 5) the U.S. Bureau of Economic Analysis (BEA), 6) the U.S. Bureau of Labor Statistics, 7) National Governors Association, and 8) the U.S.

Senates, 9) the Economic and Social Research Institute (ESRI). The assembled data set will be constructed as panel data, including 3,060 counties[51] from 1970 to 2006.

The numbers of observations in all the variables differ from each other because of the missing variables of diverse data sources. All the monetary variables are first converted into the real dollars as the year of 2000 depending on consumer price index provided by the U.S. Bureau of Labor Statistics. Only the variable of per capita income (PCI) among all the monetary variables is not converted to real dollars because the PCI is not actually added to any empirical models. The 4 dependent variables such as revenues from intergovernmental grants, total revenues, total own-source revenues (OSR), and total expenditures in a county are per capita.

The variables 'Sales Tax Rate of Neighbors' are obtained through the two geospatial matrices (W_{NR} and W_N). National unemployment rate is used in order to control the empirical model (Equation 8). Figure 5.2 draws the national unemployment rate in 1970 through 2006 compared with the state unemployment rate in 1976 through 2006. As seen on Figure 5.2, both the national and state unemployment rate look similar to each other

This dissertation obtains population density through the total population over county size as squared miles, and the group of county size including metropolitan and micropolitan areas is obtained from the '*Metropolitan and Micropolitan Statistical Areas*,' defined by the U.S. Census Bureau. The revenues from local income tax (LIT) have been still slight, so it is coded as 0 if a county does not have any revenues from local income tax at all; otherwise, 1. The group of fiscal functions is coded like the variable whether a county imposes LIT. Each fiscal function is coded as 0 if a county does not spend any expenditures on the function at all; otherwise, 1. However,

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[51] According to the National Association of Counties, the United States of America has 3,132 counties, including the District of Columbia, in 2011. Of all the counties, 42 cities – one city in Maryland, Missouri and Nevada and 39 cities in Virginia – are defined as counties.

the descriptive statistics shows that the counties in all the groups (G1 through G4) have police protections. The variable of police protection function results in the multi-colleniarity issues in the empirical models; thus, the variable will be considered whether it will be omitted in running empirical models.

Based on the descriptive statistics, the number and the ratio of the counties that have adopted local sales tax is displayed on Figure 5.3, and the mean of combined, state and local sales taxes are drawn on Figure 5.4. The number and the ratio of the counties have dramatically increases during the thirty-seven years. The counties were 285 (9%) in 1970, while those were 1696 (56%) in 2006. The increase is about six times greater between the beginning and ending year of the data set in this dissertation. Following the number and the ratio, the local sales tax rate has not increase that much according to Figure 5.4. This is caused by the two reasons: the first reason is the strings on local sales tax by states, and the data set does not include local sales tax rates of municipalities, although the half States have authorized their municipalities, and school and/or special districts to adopt local sales tax.

Table 5.1:   Groups for Separate Examination of Hypotheses

Group[A]	States	Remarks[B]	Remarks
G1 (50)	All the 50 U.S. states		
G2 (35)	AK	(1) LST	Excluding the States that have not authorized local sales tax
	AL, AZ, AR, CA, CO, IL, IA, KS, LA, MN, MO, MS*, NE*, NM, NY, ND, OK, SD*, TN, TX, UT, VT*, WA	(23) SST+LST	
	FL, GA, ID, NV, NC, OH, PA, SC, VA, WI, WY	(11) SST+LST-C	
G3 (27)	AK	(1) LST-2005	Excluding the States that intra-jurisdictional competition are observed
	CT, DE, HI**, IN, KY, ME, MD, MA, MI, MT, NH, NJ, OR, RI, WV***	(15) SST	
	FL, GA, ID, NV, NC, OH, PA, SC, VA, WI, WY	(11) SST+LST-C	
G4 (12)	AK	(1) LST-2005	Including the States that have authorized local sales tax for only Counties
	FL, GA, ID, NV, NC, OH, PA, SC, VA, WI, WY	(11) SST+LST-C	

Note: The Table categorizes the States to the 4 groups based on Table 3.1. The number in the parenthesis indicates the number of the States in the line.

(A): the number of the parenthesis indicates the total number of States in this group.

(B): SST: a state imposes state sales tax; LST: a state allows local sales tax (*after hyphen, C indicates that only Counties are allowed to impose local sales tax, not municipalities, and 2005 indicates that the counties of a state are included in this group before the fiscal year of this number*). The number in the parenthesis is the number of states included in each sub-group.

* denotes the States that allows only their municipality and school/special district to impose local sales tax.

** denotes that the State of Hawaii has not allowed its local jurisdictions to adopt local sales tax until the fiscal year of 2007. Therefore, the State of Hawaii is regarded as a state that does not allow local sales tax.

*** denotes that the Counties of State of West Virginia have not adopted local sales tax until 2011.

Figure 5.1: Counties Bordering with Other States around the State of Georgia
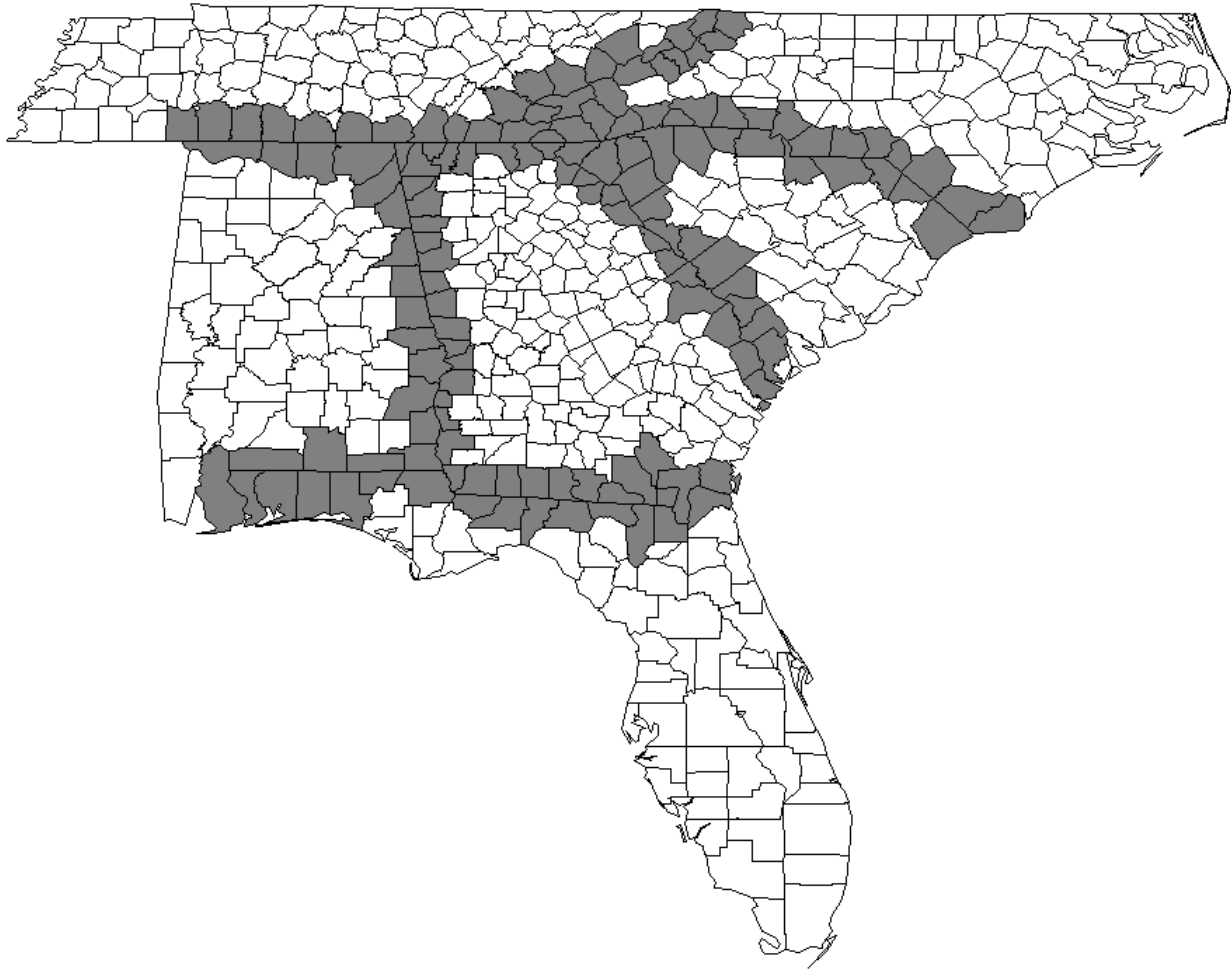
Figure 5.2: Counties Bordering with Other States around the State of New York
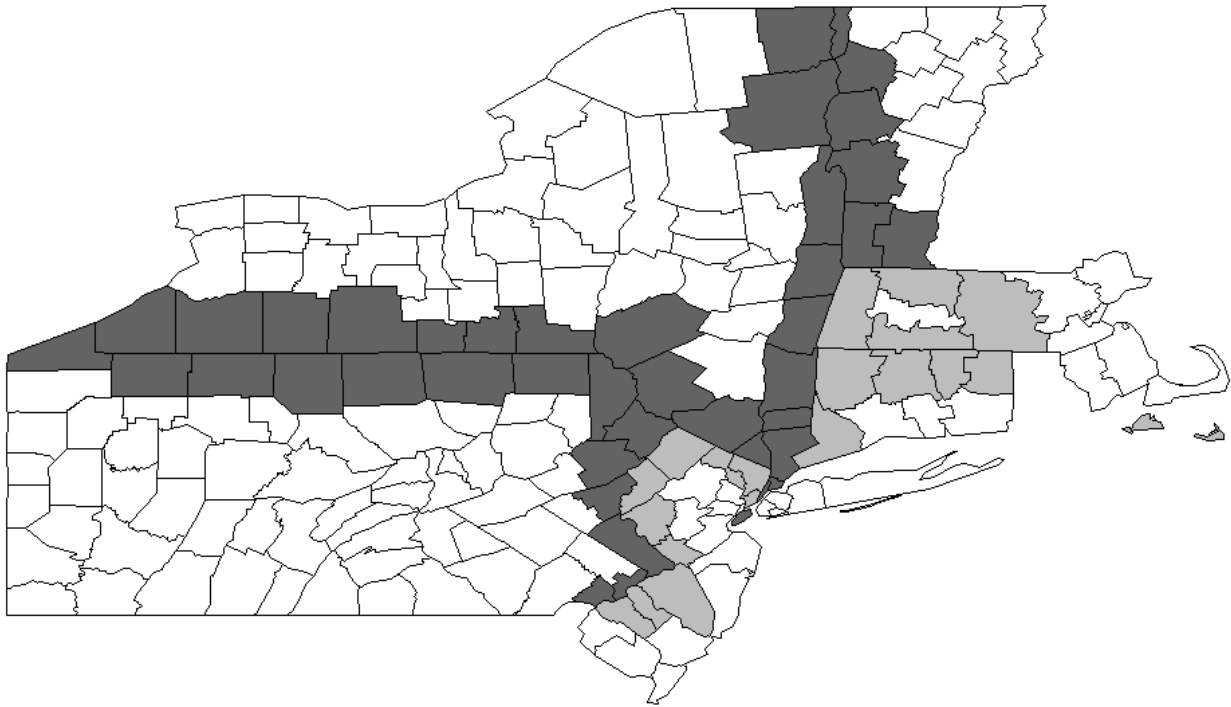
Table 5.2: Source of Data and Descriptive Statistics

Group[1]		G1					G2				
Variable[2]	Source[3]	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Dependent Variables											
County adopts LST (D)	DR	112,554	0.34	0.47	0.00	1.00	92,315	0.41	0.49	0.00	1.00
STR of County (%)	DR	109,133	4.89	1.77	0.00	13.00	89,079	5.09	1.60	0.00	13.00
State STR of County (%)	DR	112,369	4.33	1.43	0.00	8.00	92,315	4.40	1.20	0.00	7.00
Local STR of County (%)	DR	109,318	0.54	1.00	0.00	8.50	89,079	0.66	1.07	0.00	8.50
Revenue from IGR ($)*	CB	78,324	146.60	280.00	0.00	11,571	63,735	152.80	295.35	0.00	11,571
Property Tax Burden (%)	CB	78,324	118.62	537.13	0.00	36,352	63,735	122.12	590.36	0.00	36,352
Total Revenues ($)*	CB	78,323	288.30	815.60	0.00	47,988	63,734	289.91	870.30	0.00	47,988
Total OSR ($)*	CB	78,323	434.88	991.96	0.00	55,046	63,734	442.70	1057.47	0.00	55,046
Total Expenditures ($)*	CB	78,324	426.76	944.57	0.00	56,617	63,735	434.55	1005.36	0.00	56,617
Politics of Counties											
Voters to Democrats (%)	CQ	112,089	48.71	13.15	6.20	98.38	91,943	48.39	13.54	6.20	98.38
President (D)**	CQ	112,480	0.68	0.47	0.00	1.00	92,241	0.68	0.47	0.00	1.00
Governor (D)**	NGA	112,480	0.45	0.50	0.00	1.00	92,241	0.47	0.50	0.00	1.00
Two Senators (D)***	USS	112,554	0.29	0.45	0.00	1.00	92,315	0.31	0.46	0.00	1.00
Political Unification (D)	CQ	112,554	0.15	0.36	0.00	1.00	92,315	0.14	0.35	0.00	1.00
Economy of Counties											
Per Capita Income ($)+	BEA	111,328	14,489	8,744	1,330	124,899	91,126	14,431	8,660	1,330	124,899
Per Capita Income (logged)+	BEA	111,328	15.80	1.16	12.61	18.80	91,126	15.79	1.16	12.61	18.80
National Unemployment Rate	BEA	112,554	6.17	1.35	3.97	9.71	92,315	6.17	1.35	3.97	9.71
State Unemployment Rate	BEA	94,302	5.89	1.96	2.20	17.40	77,345	5.73	1.80	2.30	13.10
Socio-Demographics of Counties											
Total Population (person)	CB	111,328	79,380	265,258	55	9,793,263	91,126	76,243	278,346	55	9,793,263
Total Population (logged)	CB	111,328	10.13	1.37	4.01	16.10	91,126	10.07	1.36	4.01	16.10
Population Density (%)	ESRI	111,328	191.63	1463.43	0.04	56565.27	91,126	176.00	1556.24	0.04	56565.27
Ratio of White Population	CB	112,397	89.37	15.22	4.62	100.00	92,158	88.28	16.01	4.62	100.00
Ratio of Black Population	CB	112,397	8.24	14.04	0.00	86.90	92,158	9.29	15.00	0.00	86.90

(Continued)

Group[1]		G1					G2				
Variable[2]	Source[3]	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Ratio of Female Population	CB	112,397	50.70	1.73	11.31	57.47	92,158	50.69	1.81	11.31	57.47
Ratio of Under 20 Population	CB	112,397	28.13	18.58	0.56	74.52	92,158	28.07	18.73	0.56	74.52
Ratio of Over 65 Population	CB	112,397	8.29	5.03	0.06	35.42	92,158	8.36	5.15	0.06	35.42
County Size											
Metropolitan Area (D)	CB	112,554	0.27	0.44	0.00	1.00	92,315	0.26	0.44	0.00	1.00
Micropolitan Area (D)	CB	112,554	0.49	0.50	0.00	1.00	92,315	0.49	0.50	0.00	1.00
Fiscal Institutions of Counties											
County imposes LIT (D)	CB	106,125	0.14	0.35	0.00	1.00	86,980	0.10	0.30	0.00	1.00
State Administers LST (D)[++]	SL	112,369	0.67	0.47	0.00	1.00	92,315	0.82	0.39	0.00	1.00
County Administers LST (D)	SL	112,369	0.04	0.19	0.00	1.00	92,315	0.04	0.20	0.00	1.00
Fiscal Functions of Counties											
Higher Education Function (D)	CB	106,125	0.16	0.37	0.00	1.00	86,980	0.16	0.37	0.00	1.00
Health Function (D)	CB	106,125	0.96	0.20	0.00	1.00	86,980	0.95	0.21	0.00	1.00
Hospital Function (D)	CB	106,125	0.51	0.50	0.00	1.00	86,980	0.53	0.50	0.00	1.00
Judicial-Legal Function (D)	CB	106,125	0.71	0.45	0.00	1.00	86,980	0.71	0.45	0.00	1.00
Police Protection Function (D)	CB	106,125	1.00	0.03	0.00	1.00	86,980	1.00	0.03	0.00	1.00
Fire Protection Function (D)	CB	106,125	0.98	0.14	0.00	1.00	86,980	0.98	0.14	0.00	1.00
Library Function (D)	CB	106,125	0.89	0.31	0.00	1.00	86,980	0.89	0.31	0.00	1.00
Welfare Function (D)	CB	106,125	0.90	0.30	0.00	1.00	86,980	0.90	0.30	0.00	1.00
Neighboring Counties											
Number of Neighbors Adopting LST	DR	112,554	1.85	2.31	0.00	10.00	92,315	2.20	2.39	0.00	10.00
CSTR of Neighbors (%)	DR	109,133	4.87	1.65	0.00	12.50	89,079	5.03	1.52	0.00	12.50
State STR of Neighbors (%)	DR	109,133	4.34	1.35	0.00	8.00	89,079	4.39	1.17	0.00	7.00
Local STR of Neighbors (%)	DR	109,133	0.53	0.86	0.00	8.50	89,079	0.64	0.92	0.00	8.50
Voters to Democrats (%)	CQ	112,089	48.43	11.81	0.00	96.62	91,943	48.27	12.18	0.00	96.62
Per Capita Income (logged)[+]	BEA	111,365	15.71	1.62	0.00	18.34	91,163	15.72	1.55	0.00	18.34
Total Population (logged)	CB	111,328	10.12	1.27	0.00	15.00	91,126	10.06	1.21	0.00	15.00
Population Density (%)	ESRI	111,328	169.13	898.34	0.00	22,091	91,126	141.09	813.51	0.00	21,573

(Continued)

Group[1]		G1					G2				
Variable[2]	Source[3]	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Ratio of White Population	CB	81,322	88.68	14.52	0.00	99.93	66,580	87.63	15.04	0.00	99.93
Ratio of Black Population	CB	81,322	8.17	12.67	0.00	68.27	66,580	9.18	13.60	0.00	68.27
Ratio of Female Population	CB	81,322	50.45	3.81	0.00	54.25	66,580	50.49	3.52	0.00	54.25
Ratio of Under 20 Population	CB	81,322	32.42	19.90	0.00	72.34	66,580	32.46	20.00	0.00	72.34
Ratio of Over 65 Population	CB	81,322	9.46	4.88	0.00	30.17	66,580	9.56	4.98	0.00	30.17

Group[1]		G3					G4				
Dependent Variables											
County adopts LST (D)	DR	49,564	14.27	7.45	1.00	27.00	29,325	6.29	3.18	1.00	12.00
STR of County (%)	DR	49,564	0.33	0.47	0.00	1.00	29,325	0.55	0.50	0.00	1.00
State STR of County (%)	DR	49,379	4.60	1.89	0.00	13.00	29,325	4.99	1.52	0.00	13.00
Local STR of County (%)	DR	49,379	4.10	1.67	0.00	8.00	29,325	4.15	1.19	0.00	6.50
Revenue from IGR ($)[*]	CB	49,564	0.50	0.88	0.00	7.00	29,325	0.84	1.01	0.00	7.00
Property Tax Burden (%)	CB	35,492	178.02	340.32	0.00	11,571	20,903	218.86	406.74	0.00	11,571
Total Revenues ($)[*]	CB	35,492	134.98	730.48	0.00	36,352	20,903	157.08	941.64	0.00	36,352
Total OSR ($)[*]	CB	35,492	325.22	1074.57	0.00	47,988	20,903	355.92	1332.40	0.00	47,988
Total Expenditures ($)[*]	CB	35,492	503.24	1295.58	0.00	55,046	20,903	574.77	1600.37	0.00	55,046
Politics of Counties											
Voters to Democrats (%)	CQ	49,362	49.94	12.76	13.58	92.25	29,216	49.78	13.82	13.58	92.25
President (D)[**]	CQ	49,564	0.68	0.47	0.00	1.00	29,325	0.68	0.47	0.00	1.00
Governor (D)[**]	NGA	49,564	0.40	0.49	0.00	1.00	29,325	0.40	0.49	0.00	1.00
Two Senators (D)[***]	USS	49,564	0.26	0.44	0.00	1.00	29,325	0.29	0.45	0.00	1.00
Political Unification (D)	CQ	49,564	0.16	0.36	0.00	1.00	29,325	0.14	0.35	0.00	1.00
Economy of Counties											
Per Capita Income ($)[+]	BEA	48,432	14,666	8,955	1,411	124,899	28,230	14,605	8,845	1,636	124,899
Per Capita Income (logged)[+]	BEA	48,432	15.80	1.17	12.67	18.80	28,230	15.80	1.18	12.82	18.80
National Unemployment Rate	BEA	49,564	6.17	1.35	3.97	9.71	29,325	6.17	1.35	3.97	9.71
State Unemployment Rate	BEA	41,524	6.09	2.07	2.20	17.40	24,567	5.72	1.69	2.30	12.70

(Continued)

Group[1]		G3					G4				
Variable[2]	Source[3]	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
Socio-Demographics of Counties											
Total Population (person)	CB	48,432	84,947	176,361	490	2,669,498	28,230	78,805	161,425	572	1,946,646
Total Population (logged)	CB	48,432	10.39	1.31	6.19	14.80	28,230	10.39	1.26	6.35	14.48
Population Density (%)	ESRI	48,432	208.35	746.82	0.04	13641.53	28,230	169.85	574.19	0.04	13641.53
Ratio of White Population	CB	49,484	87.58	16.21	9.56	100.00	29,245	82.91	18.13	9.56	100.00
Ratio of Black Population	CB	49,484	10.28	15.10	0.00	79.61	29,245	15.02	17.39	0.00	79.61
Ratio of Female Population	CB	49,484	50.68	1.85	11.31	57.47	29,245	50.65	2.16	11.31	57.47
Ratio of Population Under 20	CB	49,484	27.74	18.58	0.65	72.86	29,245	27.29	19.04	0.65	72.86
Ratio of Population Over 65	CB	49,484	7.67	4.71	0.06	35.42	29,245	7.44	4.89	0.06	35.42
County Size											
Metropolitan Area (D)	CB	49,564	0.35	0.48	0.00	1.00	29,325	0.36	0.48	0.00	1.00
Micropolitan Area (D)	CB	49,564	0.48	0.50	0.00	1.00	29,325	0.48	0.50	0.00	1.00
Fiscal Institutions of Counties											
County imposes LIT (D)	CB	46,769	0.25	0.43	0.00	1.00	27,624	0.20	0.40	0.00	1.00
State Administers LST (D)[++]	SL	49,379	0.43	0.49	0.00	1.00	29,325	0.72	0.45	0.00	1.00
County Administers LST (D)	SL	49,379	0.01	0.11	0.00	1.00	29,325	0.02	0.14	0.00	1.00
Fiscal Functions of Counties											
Higher Education Function (D)	CB	46,769	0.18	0.39	0.00	1.00	27,624	0.20	0.40	0.00	1.00
Health Function (D)	CB	46,769	0.98	0.12	0.00	1.00	27,624	0.99	0.11	0.00	1.00
Hospital Function (D)	CB	46,769	0.45	0.50	0.00	1.00	27,624	0.45	0.50	0.00	1.00
Judicial-Legal Function (D)	CB	46,769	0.71	0.45	0.00	1.00	27,624	0.71	0.45	0.00	1.00
Police Protection Function (D)	CB	46,769	1.00	0.02	0.00	1.00	27,624	1.00	0.02	0.00	1.00
Fire Protection Function (D)	CB	46,769	0.98	0.14	0.00	1.00	27,624	0.98	0.13	0.00	1.00
Library Function (D)	CB	46,769	0.90	0.30	0.00	1.00	27,624	0.88	0.32	0.00	1.00
Welfare Function (D)	CB	46,769	0.93	0.25	0.00	1.00	27,624	0.97	0.17	0.00	1.00
Neighboring Counties											
Number of Neighbors Adopting LST	DR	49,564	1.82	2.39	0.00	10.00	29,325	2.91	2.53	0.00	10.00
STR of Neighbors (%)	DR	49,379	4.63	1.74	0.00	12.08	29,325	4.95	1.47	0.00	12.08

(Continued)

Group[1]		G3					G4				
Variable[2]	Source[3]	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max
State STR of Neighbors (%)	DR	49,379	4.12	1.53	0.00	8.00	29,325	4.14	1.15	0.00	6.75
Local STR of Neighbors (%)	DR	49,379	0.50	0.78	0.00	6.08	29,325	0.81	0.88	0.00	6.08
Voters to Democrats (%)	CQ	49,362	49.39	11.75	0.00	88.19	29,216	49.54	12.84	0.00	88.19
Per Capita Income (logged)[+]	BEA	48,469	15.66	1.88	0.00	18.21	28,267	15.66	1.87	0.00	17.93
Total Population (logged)	CB	48,432	10.37	1.40	0.00	13.90	28,230	10.35	1.33	0.00	13.48
Population Density (%)	ESRI	48,432	209.53	800.22	0.00	22,091	28,230	147.92	239.19	0.00	3,326
Ratio of White Population	CB	35,406	86.72	16.34	0.00	99.92	20,664	81.95	17.93	0.00	99.92
Ratio of Black Population	CB	35,406	10.24	13.65	0.00	62.21	20,664	14.98	15.74	0.00	62.21
Ratio of Female Population	CB	35,406	50.29	4.87	0.00	54.25	20,664	50.28	4.84	0.00	54.25
Ratio of Under 20 Population	CB	35,406	31.90	20.00	0.00	72.34	20,664	31.68	20.38	0.00	72.34
Ratio of Over 65 Population	CB	35,406	8.80	4.58	0.00	30.17	20,664	8.64	4.73	0.00	30.17

1: The groups are based on Table 5.1.

2: LST, STR, OSR, and LIT are the abbreviations of local sales tax, sales tax rate, own-source revenues and local income tax, respectively

3: DR denotes all the States Departments of Revenues and Local Departments of Taxations and/or Treasurers; CB denotes the U.S. Census Bureau; CQ denotes CQ Voting and Election Collection via the library system of the University of Georgia; NGA denotes the National Governors Association; USS denotes the U.S. Senates; BEA denotes the U.S. Bureau of Economic Analysis; ESRI denotes the Economic And Social Research Institute; SL denotes all the State Legislatures and Secretaries of State.

* denotes that the amounts are converted to real dollars as the year of 2000 based on the consumer price index (CPI) from the U.S. Bureau of Labor Statistics and divided by the population size of a county.

** denotes that the dummy variable is coded as 1when the political orientation of the elected representative is Republicans; otherwise 0.

*** denotes that the dummy variable is coded as 1 when the political orientation of the both Senators are Republicans; otherwise 0.

+ denotes nominal dollars but the logarithm values of per capita income are obtained after converting the nominal dollars of per capita income to the real dollars for empirical analysis.

++ denotes in order to show how many counties are not allowed to administer their local sales tax.

Figure 5.3: Number and Ratio of the Counties that Have Adopted Local Sales Tax
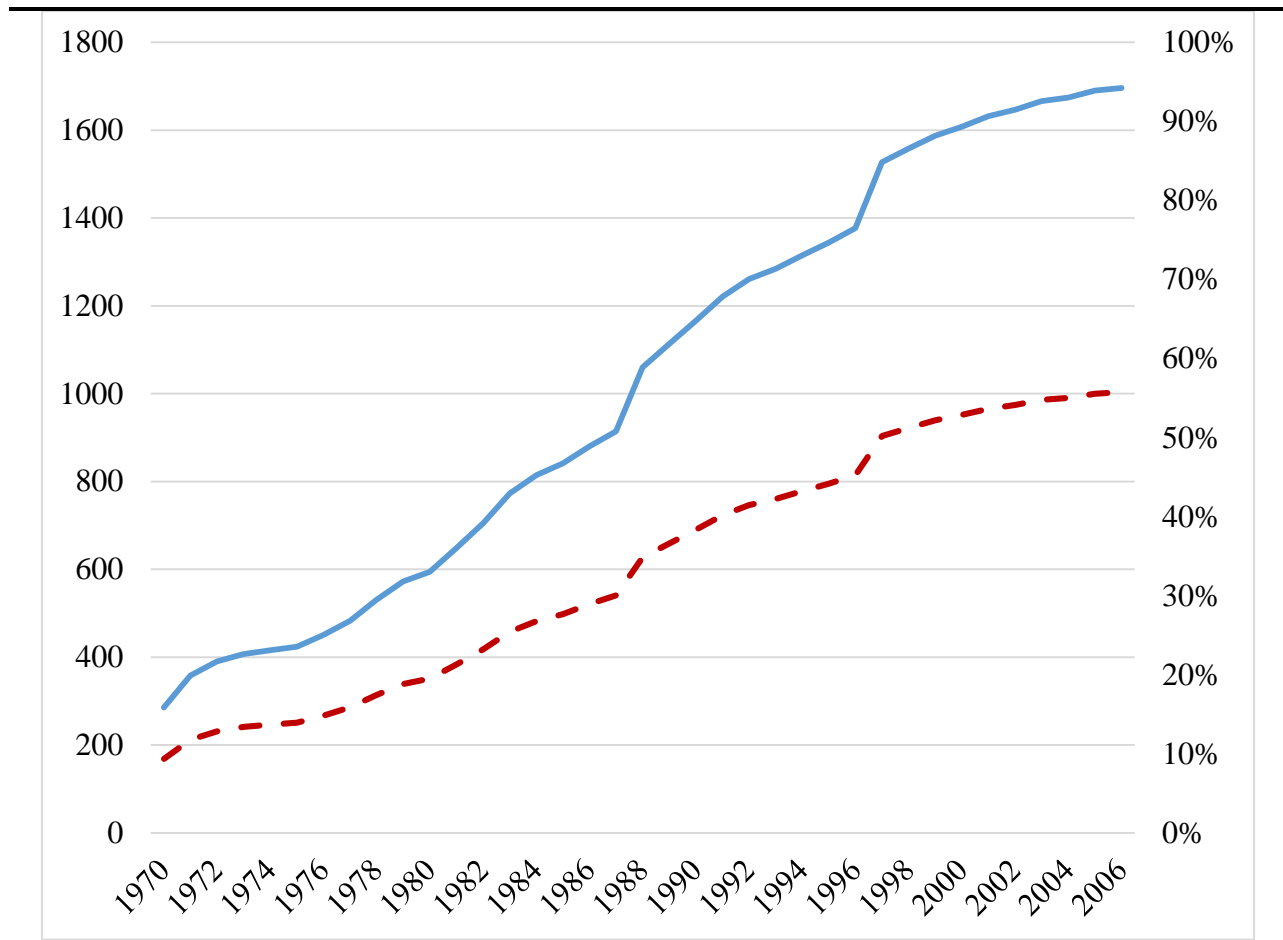
Note: The lines of solid and long-dash indicate the number and the ratio of the counties that have adopted local sales tax, respectively. The left Y-Axis is the number of the counties for the solid line, and the right Y-Axis is the ratio of the counties for the long-dash line.
The total number of counties in the data set of this dissertation is 3,042.
Source: All the U.S. Departments of Revenues and their county governments.

Figure 5.4: Mean of State and Local sales tax rates (1970 through 2006)
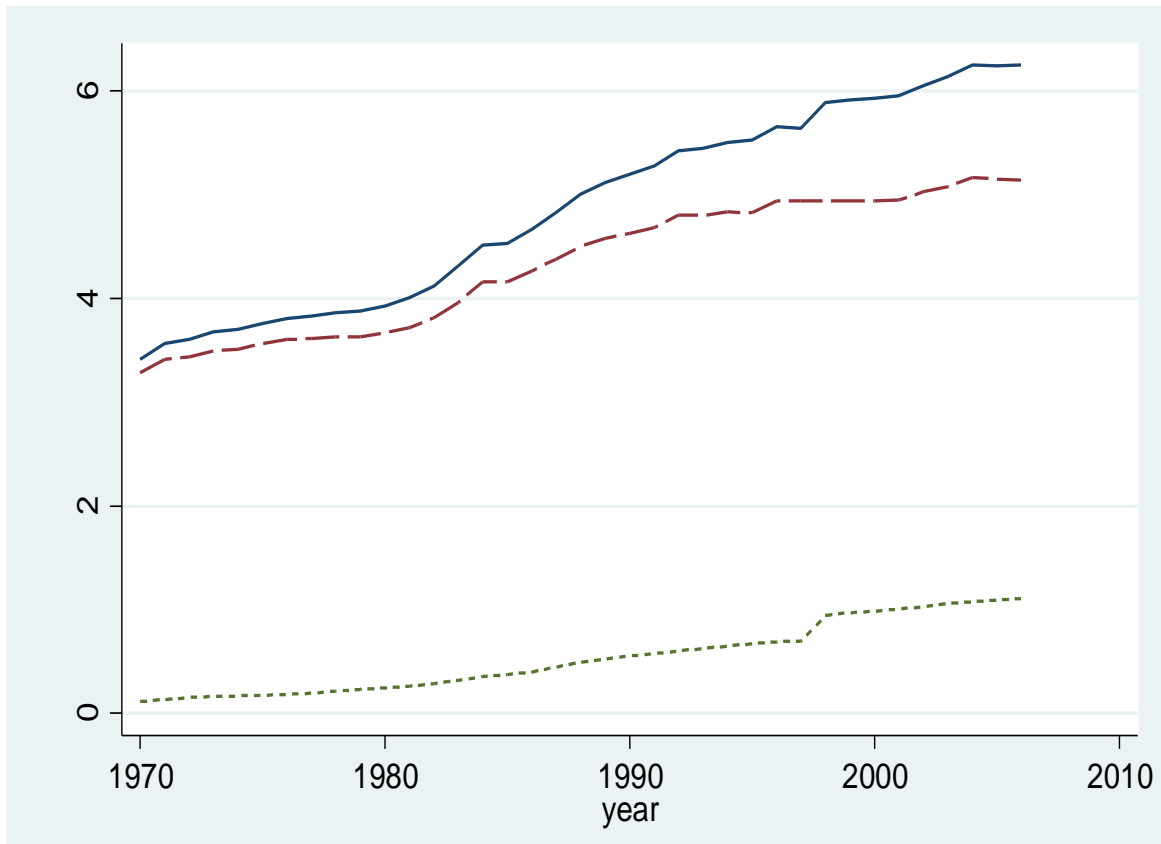
Note: All rates are the mean of sales tax rate. Line type draws the combined sales tax rate.
Long dash type and short dash type indicate the sales tax rates of state and local governments, respectively.
The lines of solid, long-dash and dot indicate the mean of combined, state and local sales tax rates, respectively.
Source: All the U.S. Departments of Revenues and their county governments.

CHAPTER 6

EMPIRICAL RESULTS

The previous chapter has specified six empirical models that examines the hypotheses for the research of this dissertation. This chapter presents the results of statistical analysis of the six research models. Each research empirical model is estimated using various multiple regression methods, not only including logit, probit, two-stage least squares (2SLS), and panel OLS, but also dividing the same regressions model into the four models in terms of the groups of sample States in the dataset. The empirical results of all the regressions are summarized on the tables at the end of this chapter.

6.1. Cross-Sectional Dependence for Inter-Jurisdictional Competition

According to the two maps on Figure 3.1 and 3.2 that have not included the sales tax rate of municipality levels, the States of California, Georgia, New York, and Texas including the metropolitan areas of Los Angeles, Atlanta, New York City and Dallas, are shown to set the higher rates of both combined and local sales taxes at the top rows from the 1970s to the 1980s. The States between those four States are shown to increase their sales tax rate from the maps. Another notable state is Missouri in the 1990s that is shown to use a higher rate of local sales tax in the bottom row on Figure 3.2.[52] Based on the five States as base points, the other States between those five States have expanded their local sales tax adoption, and have increased the rates of both sales taxes. The expansions and increases provide a perspective of fiscal

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[52] The data of local sales tax in Missouri is also available from the 1990s.

interactions across jurisdictions. However, the theory of inter-jurisdictional competition has

asserted that fiscal interactions across jurisdictions results in the decrease of tax rate in order to

enhance the influx of more residents. Unlike the theoretical expectations, the maps on Figure 3.1

and 3.2 have provided the circumstances of coordination rather than competition.

One main purpose of this study is to test whether U.S. counties compete or coordinate

with each other when they are authorized to levy local sales tax and set their local sales tax rate.

Whether fiscal interactions across jurisdictions are competition or coordination asks this

dissertation to test spatial autocorrelation. For the prerequisite test for cross-sectional dependence

in the data (Equation C), this dissertation has considered the Pesaran's Cross-Sectional

Dependence (CD) test whether inter-jurisdictional competition are existing in terms of the spatial

autocorrelation of the dataset in this dissertation. This empirical test is prerequisite to this

dissertation because all the three questions and their hypotheses have been constructed assuming

that inter-jurisdictional competition are observed. This empirical model is separately conducted

dividing the whole counties of the data to the four groups as stated in Chapter 5, and all the four

models are also controlled with state fixed-effects.

6.1.1. Pesaran's CD Test for Combined Sales Tax Rate of a county – I

Before showing the results of the empirical model (Equation C), the Hausman

specification tests were conducted in order to confirm which one is more appropriate for the

efficiency of the empirical analysis between fixed- and random-effects. The results of the

Hausman specification tests indicate that regressions with fixed-effects are more appropriate to

this model. Table 6.1 provides the panel OLS regression result with fixed-effects of the simply

constructed empirical model, based on the study of Jacobs, Ligthart and Vrijburg (2010), and the

estimates of the Pesaran's CD test. The Hausman specification tests indicate that fixed-effects model are efficient for the four empirical models. The results of the columns (A) on Table 6.1 provides the strong evidence of spatial autocorrelation that inter-jurisdictional competition exist across the U.S. Counties; however, the signs of the coefficients show not competition based on the theory, but coordination as fiscal interactions. According to the Table 6.1, the 1% increase of average combined sales tax rate of neighboring counties of a county is more likely to rise about 96.0% of the combined sales tax rate of a county. Explaining in more details, the 1% increase of the combined sales tax rate of neighboring counties is likely to grow 96.2% (p-value=0.000) of a county of the group 1 (G1A) including all the 50 U.S. states; 93.9% (p-value=0.000) of a county of the group 2 (G2A) excluding the States that have not authorized local sales tax; 99.1% (p-value=0.000) of a county of the group 3 (G3A) excluding the States that have authorized local sales tax for their all sub-levels of governments of counties, municipalities, and special and school districts; and 94.7% (p-value=0.000) of a county of the group 4 (G4A) including only the States that have authorized local sales tax for county governments. Based on the four panel regression results, it is supported that spatial autocorrelation is existing in the samples of the Group 1 through 4; therefore, the null hypothesis for the Pesaran's CD test "the cross section data is independent" is rejected (p-value=0.000 for all the Groups).

Although the combined sales tax rate of any county is changed through its local sales tax given that the sales tax rate of its State is not changed, the results of the columns (A) on Table 6.1 do not show the separate effects of state and local sales tax rates of neighboring counties on those of a county. For the detailed empirical analysis, this dissertation has conducted the same empirical model dividing the combined sales tax to state and local sales taxes. The results are shown in the columns (B) on Table 6.1. The regression results in the columns (B) follow the

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same conclusions in both columns (A), and also provide the strong evidence that the spatial autocorrelation of inter-jurisdictional competition as coordination type is observed. The 1% increases of state and local sales tax rate of the neighboring counties are more likely to grow 102.1% and 88.8% of the combined sales tax rate of a county, respectively. Explaining with more details, the 1% increase of the state and local sale tax rate of neighboring counties is likely to grow 102.9% (p-value=0.000) and 85.9% (p-value=0.000) of the combined sales tax rate a county of the group 1 (G1B), respectively; 100.9% (p-value=0.000) and 84.6% (p-value=0.000) of the combined sales tax rate of a county of the group 2 (G2B), respectively; 103.9% (p-value=0.000) and 93.4% (p-value=0.000) of a county of the group 3 (G3B), respectively; and 100.7% (p-value=0.000) and 91.1% (p-value=0.000) of a county of the group 4 (G4B). The null hypothesis of the Pesaran's CD test in the columns (B) is all rejected (p-value=0.000 for all the groups).

6.1.2. Pesaran's CD Test for Local Sales Tax Rate of a county – II

For an alternative way, this dissertation replaces the dependent variable with local sales tax rate of a county. Table 6.2 reports the result of regressions and Pesaran's CD test that regress local sales tax rate on the independent variables, and the results are divided into the two columns like the Table 6.1. According to the reports in the columns (A) on Table 6.2, fiscal interactions are observed in setting local sales tax rate in a county. The 1% increase of the combined sales tax rate of the neighboring counties is more likely to grow local sales tax rate in a county by 33.2% (p-value=0.000) in group 1 (G1A), by 35.3% (p-value=0.000) in group 2 (G2A), by 43.0% (p-value=0.000) in group 3 (G3A) , and by 57.7% (p-value=0.000) in group 4 (G4A). Moreover, the Pesaran's CD test indicates that spatial autocorrelation as cross-sectional dependence across

counties is clearly observed. As done in the previous chapter (Table 6.1), this empirical model has regressed local sales tax rate of a county on separately state and local sales tax rate of neighboring counties. According to the reports in the columns (B) on Table 6.2, the 1% increase of local sales tax rate of the neighboring counties is more likely to grow the local sales tax rate of the county by 84.4% (p-value=0.000) in group 1 (G1B), by 83.3% (p-value=0.000) in group 2 (G2B), by 93.0% (p-value=0.000) in group 3 (G3B), and by 90.7% (p-value=0.000) in group 4 (G4B). Unlike the results on Table 6.1, the state sales tax rate does not statistically affect the changes of local sale tax rate, but all the results of the Pesaran's CD Test are statistically significant.

6.1.3.   Summary of Pesaran's CD Tests

The panel regression results and the Pesaran's CD test on Table 6.1 and 6.2 point out that the fiscal interactions (also known as, inter-jurisdictional competition) exist across jurisdictions. The different coefficients explain that intra-jurisdictional competition and the different fiscal institutions, whether local sales tax is authorized or not in this dissertation, are supposed to have influences on the tax rate setting in counties. Without the endogenous effects of intra-jurisdictional competition and differences in fiscal institutions, the results from the Group 4 still provide strong evidence that a county coordinates its sales tax rate setting with its neighboring counties.

Separately considering state and local sales taxes, an increase of state sales tax grows the combined sales tax rate of neighboring counties within a state, as well as in other States as shown on Figure 5.2. Since an increase of state sales tax rate grows the combined sales tax rate of all the counties within the State, the effects of state sales tax rate are comparatively greater than those of

local sales tax rate because the increase of state sales tax rate grows the combined sales tax rate of the neighboring counties outside of the State. According to the result of the Group 4 (G4B) on Table 6.1 that does not have endogeneity in terms of intra-jurisdictional competition and differences in fiscal institutions, the impacts of state sale tax rate is 10.54% greater than those of local sales tax rate on sales tax rate setting of a county.

The other control variables are not discussed in this section because the results have been obtained from the simple regression empirical models, and the control variables are used for the empirical models that this dissertation has suggested. The main statistical findings from these two regression results are that inter-jurisdictional competition are existing when a county sets its sales tax rate, and this dissertation should consider inter-jurisdictional competition in terms of the sales tax and its rate of neighboring counties as this dissertation has created an instrumental variable (IV) for the empirical analysis. Depending on the regression results, this dissertation use the instrumental variable suggested (Equation 1a and 1b) for the empirical analysis that examines the research questions and their hypothesis.

The very statistically significant results from the Pesaran's CD test has led this dissertation to consider an instrumental variable for the empirical examination of the determinants of the adoption of local sales tax and local sales tax rate. The regression results using the instrumental variables are shown at the following sections.

6.2. Result 1: Determinants of Local Sales Tax Adoption and Its Rate Setting

The first research question of this dissertation is about the determinants on the adoption of local sales tax and the changes of local sales tax rate recognizing internal and external conditions such as local politics, economy and socio-demographics, and inter-jurisdictional

competition. Before showing the results of the empirical models (Equation WS, 1, 1a, 2, and 2a), the Hausman specification tests were conducted in order to test which one is more appropriate for the efficiency of the empirical analysis between fixed- and random-effects. The results of the Hausman specification tests indicate that regressions with fixed-effects are more appropriate to this model.

6.2.1. Wagner and Sobel's Model

The empirical model that examines the determinants on whether a county adopts its local sales tax grounding on the Wagner and Sobel's (W-S) Model (2006) that does not consider time effects because the W-S model has assumed that the adoption of a new policy is maintained without elimination, and that the analysis of the maintenance is separate. Based on the W-S model, this dissertation empirically examines the determinants on the adoption of local sales tax in counties without considering time effects. Before running the W-S Model, the Hausman specification tests were conducted and fixed effects model is more appropriate. Table 6.3 reports the marginal effects of the regression results with the instrumental variable of the combined sales tax rate of neighbor counties following the W-S model (Equation WS).

As discussed in the previous chapters, the Probit regression results with instrumental variable (IV) for the combined sales tax rate of neighboring counties do not provide clearly consistent evidence that inter-jurisdictional competition are observed. The 1% increase of the combined sales tax rate of neighboring counties is more likely to lead to the higher probability that a county adopts local sales tax in the three Groups; the probability of the adoption of local sales tax increases 13.8% for the Group 1, 10.5% for the Group 2, and 16.5% for the Group 3 (p-value=0.000 for G1, G2 and G3). However, those groups are described that the counties are also

threatened by intra-jurisdictional competition, and include the counties not authorized to adopt

local sales tax. The Probit regression result fails to show evidence that inter-jurisdictional

competition are observed in the Group 4 (p-value=0.175).

The political variables do not show any clear impacts on the adoption of local sales tax,

except for the political orientation of Senators. When their two Senators are both Republicans,

the counties is less likely to adopt local sales tax. The probability for the adoption of local sales

tax decreases 22.2% for the Group 1 (p-value=0.000), 27.7% for the Group 2 (p-value=0.000),

40.5% for the Group 3 (p-value=0.000), and 82.5% for the Group 4 (p-value=0.000). Without

any constraints on the other impacts on the adoption of local sales tax, the Probit regression

result of the Group 4 (G4) strongly supports the hypothesis (H1b) that more local voters to

Democrats in a county is more likely to increase the probability of the adoption of local sales tax

by the county at 1.3% (p-value=0.000).

The next independent variable is local economy condition. Except for the Group 1 (G1),

the county with the higher income level is more likely to adopt local sales tax; the 1% increase of

per capita income (PCI) in a county improves the probability that a county adopts local sales tax

at 82.7% (p-value=0.000). Moreover, the per capita income improves the probability in the result

of the Group 1 (G1) and Group 2 (G2), but their probabilities[53] are still less than that of the

Group 4 (G4).

As hypothesized in Chapter 4, population changes affect whether a county adopts local

sales tax or not, and this dissertation considers the two variables of population size and density,

controlled by demographic structure, because they have influences on the demands of public

services and goods. However, population changes are shown to have little effects on the adoption

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[53] The probability of the adoption of local sales tax to the increase of per capita income in a county is 10% (p-value=0.066) in the Group 2 (G2), and that is 18.1% (p-value=0.020) in the Group 3 (G3).

of local sales tax. One interesting finding from the results, a county that has the greater ratio of population under 20 years old is shown less likely to adopt local sales tax. The probability shows that the 1% increase of population ratio under 20 years old results in the lower probability of 0.9% for the Group 1 and 2 and 0.14% for the Group 3 and 4 (all p-values=0.000).

Among the control variables of fiscal institution and functions in a county, a county that has adopted its own income tax is less likely to adopt local sales tax with 8.4% for the Group 1 (p-value=0.021), 9.0% for the Group 2 (p-value=0.039), 18,5% for the Group 3 (p-value=0.000), and 27.3% for the Group 4 (p-value=0.000). Moreover, a county has the discretion that administers local sales tax is more likely to adopt local sales tax with 54% for the Group 1 (p-value=0.000), 36.3% for the Group 2 (p-value=0.000), and 126.2% for the Group 3 (p-value=0.000).

The last test from these results of the four groups is the Wald test for exogeneity of the instrumental variable (STR_{jt}). According to the Wald test result, the instrumental variables in the three groups (G1, G2 and G4)[54] are statistically significant by a test of error correlation in the fist- and the second-stage, and the instrumental variable obtained by Equation 7 can be used for this empirical model (Equation WS). However, the instrumental variable is shown not statistically significant in G2 that exclude the States that have not authorized any sub-level governments of theirs to adopt local sales tax, but include only the thirty-five States that have authorized local sales taxes for counties and/or other local jurisdictions. This result of the G2 on Table 6.3 suggest that intra-jurisdictional competition as well as inter-jurisdictional competition have influences on the adoption of local sales tax by Counties; thus, the instrumental variable is

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[54] The p-values for the Wald test of exogeneity are 0.076 for G1 (statistically significant at the level of 90%), 0.004 for G3 (statistically significant at the level of 99%), and 0.058 for G4 (statistically significant at the level of 90%).

regarded as endogeneous through the correlation between the two error terms of the first and second stage. The empirical result through the Wagner and Sobel's model has agreed with the econometric issue of endogeneity that this dissertation has argued in Chapter 5.

6.2.2. Determinants of the adoption of local sales tax

The Probit regression results with fixed-effects (Equation 1) and with first-differences (Equation 1a) including an instrumental variable (Equation 7 and 7a, respectively) of the W-B model has empirically analyzed the determinants of whether a county adopts local sales tax without recognizing the time effects, but failed to provide clearly constant results and support the hypotheses. Unlike the assumptions of the W-B model that adopting and maintaining should be separately analyzed, this dissertation has assumed that local sales tax can be established or abolished by local voters, and the establishments and/or abolitions are more frequently observed in terms of local dynamics than the U.S. states (Dilorenzo, 1983; Eberts & Gronberg, 1990; Ostrom & Ostrom, 1971; C. L. Rogers, 2004; R. E. Wagner & Weber, 1975). Because of the local dynamics, this dissertation has also examined the determinants of local sales tax and its rate with the considerations of adopting and maintaining jointly by adding time effects.

However, the empirical models (Equation 1 and 1a) have been conducted by dividing the sample of this dissertation's data set to the four groups. The combinations of panel data set and instrumental variables (IV) of empirical models with a binary dependent variable result in the impossibility in obtaining the results.[55] An alternative way for the panel data set including an instrumental variable would be generalized method-of-moments (GMM) estimators (Arellano &

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[55] STATA, the statistical package for this dissertation, has Logit/Probit models for panel data set (-xtlogit- and -xtprobit-), and for instrumental variable (-ivprobit-); however, the current version of the STATA does not provide Logit/Probit models for the panel data set with instrumental variable (such as -xtivlogit- and/or -xtivprobit-).

Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998; Holtz-Eakin, Newey, & Rosen, 1988), but this way is appropriate for large N and small T (Roodman, 2006). Angrist and Pischke (2008), however, have supported that non-linear econometric models can be analyzed as linear forms if data set has '*large both N and T*' by comparing the efficiency of estimators obtained by the two regression forms. Before running the empirical models in this section, the Hausman specification tests were conducted and fixed effects model is more appropriate.

A. Panel Logit Regression Result with Fixed-Effects

Based on the different approaches to an instrumental variable panel regression model with fixed-effects, this dissertation empirically analyzes separating the empirical model (Equation 1) to two forms. In order to obtain the marginal effects for the binary dependent variable ($LSTA_{it}$), this dissertation runs a panel Logit regression model with fixed-effects by omitting the instrumental variable of the combined sales tax rate in the neighboring counties (STR_{jt}), and runs an instrumental variables and two-stage least squares (2SLS) panel regression model with fixed-effects. Table 6.4 reports the results of marginal effects in terms of a panel Logit regression model with fixed-effects. The Counties that has not been authorized local sales tax within a state and that have not adopted local sales tax are automatically dropped from the sample because of all positive or all negative outcomes within a county that have no-variance of the dependent variable. Therefore, the results are shown on two columns for G1 and G2, as well as for G3 and G4. Moreover, the variable of fiscal institution whether a county administers local sales tax is dropped because of collinearity in G3 and G4.

According to Table 6.4, that another county adopts local sales tax, neighboring to a county (i), is likely to increase the probability that the county adopts local sales tax by 162.8%

(p-value=0.000) for the first combined group (G1 and G2), and by 181.2% (p-value=0.000) for the second combined group (G3 and G4). Among the variables of local politics, a county where the 1% increase of voters to Democrats is more likely to adopt local sales tax by the higher probability of 3.9% (p-value=0.000) in G1 and G2, and of 6.4% (p-value=0.000) in G3 and G4. Like the behavior of the voters, a county within a state whose two Senators are both Republicans is less likely to adopt local sales tax by the higher probability of 88.2% for G1 and G2, and of 122.4% for G3 and G4. The next independent variable is local economy measured by per capita income. The 1% increase of per capita income is likely to result in the higher probability that a county adopts local sales tax by 268.3% (p-value=0.001) for G1 and G2, and by 397.4% (p-value=0.004) for G3 and G4. Unlike the three previous groups of independent variables, local socio-demographics do not show any uniformed marginal effects on the adoption of local sales tax by a county.

Based on the results on Table 6.4, the fiscal interactions across counties are observed as the form of fiscal coordination, not as that of fiscal competition (H7 is accepted). If the more neighboring counties (*j*) have adopted local sales tax, a county is more likely to adopt local sales tax. The political orientations of voters and elected representatives, especially Senators, in a county have different influences on the probability whether a county adopts local sales tax (H1a is partially supported, and H1b is supported). When local economy is in the boom years, a county is more likely to adopt local sales tax (H3 is supported). Among the control variables, the counties in metropolitan areas are less likely to adopt local sales tax than other areas, while the population density is not statistically significant to the dependent variable.

B. Instrumental Variables and 2SLS Panel Regression Result with Fixed-Effects

Table 6.5 reports the results of instrumental variables and the 2SLS (Two-Stage Least Squares) panel regression with fixed-effects (Equation 7a and 7b). The first four columns, including G1 through G4, are the regression results of whether a county adopts local sales tax on the independent variables of local internal conditions and inter-jurisdictional competition, while the last four columns, including G1Δ through G4Δ, are the regression results of whether a county adopts local sales tax on the independent variables. At the last four columns, the instrumental variable is obtained by the first differences (Equation 7b). Both empirical models are controlled by one-year lagged dependent variable. Following the Pesaran's CD Test (Equation C), and the Wagner and Sobel's model (Equation WS), the results also provide strong evidences of fiscal interactions across jurisdictions as inter-jurisdictional competition or coordination.

Before the conductions of the empirical models, this dissertation tried to confirm whether the instrumental variable is exogenous by the two tests of Hansen J statistic and C statistic. When the combined sales tax rate of the neighboring counties is instrumented by their state and local sales taxes, and internal conditions, the C statistic tests supports that the instrumental variable is exogenous, while the Hansen J statistic tests fail to support that, especially for the group 3 and 4 (G3 and G4). However, both tests support that the instrumental variable is exogenous when the variable of the combined sales tax rate of the neighboring counties is instrumented by the first-difference conditions. Therefore, the instrumental variable in terms of the first-difference is more appropriate for the empirical model.

First, the more a county neighbors to the counties that have adopted local sales tax, the more the county is likely to adopt local sales tax. If the number of counties (j) having adopted local sales tax increases, the probability that a county (i) adopts local sales tax increases by 3%

(p-value=0.000) in G1 and G2, and by 3.6% (p-value=0.000) in G3 and G4. If one more county

(j) newly adopts local sales tax (Δ) comparing the current year (t) with the previous year *(t-1)*, a

county (i) around the counties (j) is more likely to adopt local sales tax by the higher probability

of 3% (p-value=0.000) in G1Δ and G2Δ, and of 3.5% (p-value=0.000) in G3Δ and G4Δ. That is,

a county (i) more likely to adopt local sales tax if one more neighboring county (j) of the county

adopts local sales tax than its last year (*t-1*). Based on these findings from the different

instrumental variables, the hypothesis (H7) is strongly supported.

　　　As mentioned in Chapter 5, the empirical models (Equation 1 and 1a) are controlled by

the average rate of combined sales tax in neighboring counties (j). One interesting finding from

this control variable is that a county (i) is less likely to adopt local sales tax if it is neighboring to

the higher rate of the combined sales taxes. All the signs of the variables for the combined sales

tax rate of the neighboring counties are negative in the whole groups (G1 through G4Δ). Due to

the endogeneity issues of intra-jurisdictional competition, this part concentrates on the Group 4

and 4a (G4 and G4Δ). The combined sales tax rate of neighboring counties, and its changes from

the last year (*t-1*) are shown to decrease the probability that a county (i) adopts local sales tax by

1.3% (p-value=0.000) in G4, and by 3.4% (p-value=0.013) in G4Δ, respectively. The combined

sales tax rate of the neighboring counties is statistically significant and negatively associated

with a county (i). Unlike the results of the W-S model at the previous section, the adoption of

local sales tax by neighboring counties (i) is positively associated with the adoption of local sales

tax by a county (i), the sales tax rate (j) is negatively associated with the adoption (i). That is, the

number of counties that have adopted local sales tax results in fiscal interactions as the type of

fiscal coordination, while the average rate of combined sales tax of the neighboring counties

results in fiscal interactions as the type of fiscal competition.

Focusing on the two groups (G4 and G4Δ), the variables of the politics in a county are statistically significant and positively associated with the adoption of local sales tax and its changes. The more voters to Democrats are statistically significant and positive, but their impacts are almost nothing. When the political orientations of Governors and both Senators are Republican, a county is more likely to adopt local sales tax by 0.9% (p-value=0.000) and 0.7% in G4 (p-value=0.027), respectively. When the political orientations of both elected representatives are switched from Democrats to Republicans, moreover, a county is more likely to adopt local sales tax by 0.9% (p-value=0.000) for Governor and by 0.7% (p-value=0.028) for both Senators. From these two results, the hypothesis (H1a) is rejected, but still has statistical significance on the adoption of local sales tax with different signs. The hypothesis (H1b) is supported, but its statistical significance is almost nothing; more peculiarly, the coefficients in G4 is 0.0003 (p-value=0.032), and those in G4Δ is 0.0005 (p-value=0.001), which means that the 1% increase of the voters to Democrats leads a county more likely to adopt local sales tax by 0.03%, and the 1% changes of the voters to Democrats does so by 0.05%.

While the results on the previous empirical models shown on Table 6.1 through Table 6.4 have statistically significant and positive effects on the adoption of local sales tax, including the changes of the adoption, the economic conditions of a county measured by per capita income are shown to have no effects on the adoption of local sales tax in the empirical models (E1 and E1a). The two independent variables for the demographics of a county are shown to have no effects on the adoption of local sales tax, although the variable of population density has statistically significant and negative effects on the dependent variables. The increase and changes of population density has statistically significant and negative effects and on the adoption of local sales tax by -0.0005 (p-value=0.059) and -0.00007 (p-value=0.011).

Among the control variables, a county that has not only adopted local income tax, but also been authorized to administer local sales tax is more likely to adopt local sales tax. However, the variable whether a county administers local sales tax is automatically dropped because of the multi-collinearity that only the State of Alaska has authorized county governments to administer local sales tax.

C. *Summary of Result*

This dissertation has developed the W-S model (G. A. Wagner & Sobel, 2006) adding the year binary variables, and considered the time effects on whether a county adopts local sales tax or not (Equation 1 and 1a). Due to the limitations of the software, this dissertation has conducted the empirical analysis with two different ways. The results on Table 6.4 and 6.5 provide supports some of the hypotheses in Chapter 4.

First of all, a county is more likely to adopt local sales tax given that the more neighboring counties of the county have adopted local sales tax; moreover, when another neighboring county adopts local sales tax, the county is more likely to adopt local sales tax. This finding supports the hypothesis (H7) showing inter-jurisdictional coordination, but the variable of the average combined sales tax rate of the neighboring counties provides the evidence of inter-jurisdictional competition that the county is less likely to adopt local sales tax given that the higher combined sales tax rate of its neighboring counties result in the lower probability that the county adopts local sales tax. All the effects are shown to have same signs on the adoption of local sales tax considering the external factors.

Because of the endogeneity issues that intra-jurisdictional competition would be observed, the group 4 (G4 and G4Δ) are concentrated for the examination of internal factors in terms of

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local politics, economy and socio-demographics. The result of the W-S model supports the

hypothesis (H1a) without considering the time effects, while the empirical models (Equation 1

and 1a) fail to support the hypothesis (H1a). However, the political orientations of elected

representatives of Governor and both Senators are statistically significant, but have different

signs for the effects on the adoption of local sales tax. As hypothesized (H1b), the W-S model

supports that the more voters to Democrats in a county leads the county to adopt local sales tax,

and the empirical models (Equation 1 and 1a) supports it but the effects are almost nothing. The

economic condition of a county is shown the same result that the economic condition is

positively associated with the adoption of local sales tax in the W-S model (Equation WS), but is

not associated with that in the empirical models (Equation 1 and 1a).

6.2.3. Determinants of Local Sales Tax Rate

The next empirical results are about the determinants of the local sales tax rate

considering both internal and external factors. Following Table 6.5, the empirical model has been

analyzed dividing the four groups including instrumental variable, and adjusting the independent

variable of the combined sales tax rate of the neighboring counties (j) as the changes of the

combined sales taxes (denoted as Δ) between the current year (t) and the previous year (t-1). First

of all, this dissertation has tested whether the instrumental variable is exogenous through

'Hansen J statistic' and 'C statistic.' According to both tests, the instrumental variable (IV) of the

combined sales tax rate of the neighboring counties is confirmed exogenous.

Fiscal interactions across Counties are observed from this result on Table 6.6, but the

type of fiscal interactions are fiscal coordination unlike Table 6.5. According to Table 6.5, the

fiscal interactions across counties are observed as fiscal coordination that the increase in the

number of counties having adopted local sales tax has positive effects on the adoption of a county, while the fiscal interactions are observed as fiscal competition that the higher rate of local sales taxes of its neighboring counties has negative effects on the county. The results of the empirical model (Equation 2 and 2a) on Table 6.6 have considered the changes of local sales tax rates. Table 6.6 also presents fiscal interactions across counties as the type of fiscal coordination. A county (i) is more likely to increase its local sales tax rate when it neighbors to the counties (j) that have levied the higher rate of combined sales taxes. Moreover, if the neighboring counties (j) set the higher tax rate in the year (t) than in the last year ($t-1$), the county (i) is more likely to increase its local sales tax rate.

Without considering the endogeneity issues of intra-jurisdictional competition, if a county (i) is neighboring to the counties (j) with the 1% higher sales tax rate, the county (i) is more likely to increase its local sales tax rate by 7.1%, 7.4%, 5.5% and 9.2% (all p-value=0.000) in G1, G2, G3 and G4, respectively. The result that has included the first-difference instrumental variable of the combined sales tax rate show the similar result. If the average combined sales tax rate of the neighboring counties (j) is set higher than the last year ($t-1$), the county (i) is more likely to increase its local sales tax rate by 3.5%, 4.1%, 5.5% and 9.0% (all p-value=0.000) in G1Δ, G2Δ, G3Δ and G4Δ, respectively. By focusing on the two groups (G4 and G4Δ) supposed not to violate endogeneity, fiscal coordination is observed across counties when they set their local sales tax rate, and this finding supports the hypothesis (H8).

The next variables are the politics of counties. An interesting finding focused on the two groups (G4 and G4Δ) is that the political orientations are shown to have opposite effects on the local sales tax rate to the result of Table 6.5. The voters to Democrats, and the Republican Governor and two Senators are shown to be positively associated with the adoption of local sales

tax; however, a county (*i*) that more voters to Democrats, and/or the two Republican Senators are included to is less likely to increase local sales tax rate in the two groups (G4 and G4Δ), while a county (*i*) with the Republican Governor is more likely to increase local sales tax rate in G4. A county (*i*) that has more voters to Democrats is less likely to increase local sales tax rate by 0.1% (p-value=0.001) in the two groups (G4 and G4Δ). This finding fails to support the hypothesis (H2b), but it has still statistical significance with the opposite sign. Moreover, the county (*i*) is less likely to increase its local sales tax rate by 3.8% (p-value=0.000) in G4 when the two Republican Senators are in offices, and by 3.2% (p-value=0.000) in G4Δ when the two Republican Senators become in offices. In opposite to the findings, the political orientation of Governors are shown to have positive effects on the local sales tax rate. The county (*i*) is more likely to increase its local sales tax rate by 2.5% (p-value=0.000) only in G4 when Republican Governors are in offices. Based on these findings, the hypothesis (H2a) is partially supported.

The next independent variables of local economy and socio-demographics are shown to have negative effects on the changes of local sales tax rate in only the group 4a (G4Δ). Unlike the hypothesis (H4), the 1% higher per capita income than the previous year (*t-1*) is negatively associated with the setting of local sales tax rate in a county (*i*). The county is likely to set its local sales tax rate lower than the previous year by 11.6% when the per capita income of the county increases by 1%. Instead of the population density, moreover, the 1% increase of populations in the county than the previous year result in that the county is likely to set its local sales tax rate lower than the previous year by 3.4% (H5 is not supported). Compared with the result of the adoption of local sales tax on Table 6.5, the adoption of local sales tax are negatively associated with the population density, while the local sales tax rate is negatively associated with the populations. Unlike the two hypotheses (H5 and H6) that the greater

populations and population density will lead a county more likely to adopt local sales tax and increase the rate because of the expansion of the beneficiaries for public services and goods, the results with opposite signs are regarded as the higher populations and populations density result in the expansions of the sources for tax collections. Therefore, a county government does not adopt local sales tax and/or lowers the rate in order to reduce the tax burdens and to enhance more sales activities in the markets.

6.3.   Result 2: Interactions Between Local Sales Taxes and Intergovernmental Grants

The two empirical models (Equation 4 and 5) have examined the interactions between two fiscal instruments, and their results are reported on Table 6.7. Like the previous empirical models (Equation 1 and 2) on Table 6.5 and 6.6, the empirical models (Equation 4 and 5) have separated the data set to the four groups recognizing the endogeneity issues of intra-jurisdictional competition. Both empirical models regressed per capita intergovernmental grants[56] on independent variables that include local sales tax, and the politics, economy and socio-demographics of counties. The first four columns report the result regressed on the independent variable whether a county adopts local sales tax, and the second columns on the independent variable of local sales tax rate of ac County.

From the first four columns (Equation 4), a county that has adopted local sales tax is likely to receive the smaller size of per capita intergovernmental grants, but the effects of local sales tax rate of a county on the intergovernmental grants are ambiguous across the groups. While a county that has adopted local sales tax in all the four groups is likely to receive the smaller grants, a county that has set the higher local sales tax rate will receive the smaller size of

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[56] The dependent variable of per capita income (PCI) is converted to real dollars of the year-2000.

intergovernmental grants focusing on the group 4 (G4) without intra-jurisdictional competition. Examining with more details, a county that has adopted local sales tax is likely to receive per capita intergovernmental grants less than a county that has not adopted local sales tax by $38.96 (p-value0.027). Moreover, the 1% increase of local sales tax rate in a county among the twelve States is likely to result in the decrease of the size of per capita intergovernmental grants by $9.02 ((p-value=0.077). Although the results in the three groups (G1, G2 and G3 in Equation 5) are still ambiguous because of the potential endogeneity of intra-jurisdictional competition, local sales tax in a county are shown negatively associated with the size of intergovernmental grants. Based on those findings, the hypotheses (H9a and H9b) for the interactions between the two fiscal instruments are supported.

The next findings are about the politics of a county hypothesized to affect intergovernmental grants. A county whose State Governor is likely to receive the smaller sizes of intergovernmental grants among all those eight groups in the two empirical models. Especially, the two group 4 in both empirical models are shown to receive smaller intergovernmental grants by $22.33 (p-value=0.011) in Equation 4 and $22.63 (p-value=0.012) when Republican Governors are in their offices (H10b is supported). Moreover, a county where both Senators are Republicans hypothesized (H10c) is likely to receive the smaller sizes of per capita intergovernmental grants by $5.64 (p-value=0.077) in Equation 4, and by $8.43 (p-value=0.012). Another variable of the politics in a county is the political unifications across all the levels of the federal, state and local governments. If a county is politically unified, Table 6.7 reports that the county is likely to receive the smaller sizes of intergovernmental grants as asserted that intergovernmental grants can be used as an election strategy for the re-election (Besley & Coate, 2003; Ginsberg, 1976; Mixon & Hobson, 2001; L. G. Veiga & Pinho, 2007). If a county is

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politically unified with its higher levels of governments, the county is likely to receive the smaller size of intergovernmental grants by $16.05 (p-value=0.002) in Equation 4, and by $17.99 (p-value=0.002) in Equation 5. According to the findings of the politics in a county on Table 6.7, the three hypotheses (H10b, H10c, and H10d) made in Chapter 4 are supported except for the political orientation of the U.S. President (H10a).

The hypotheses for the economic condition of a county stated that intergovernmental grants provided for local governments will be greater in the economic bust years. However, the results on Table 6.7 report support the hypothesis only in the group 3 (G3) that excludes the States that have authorized all the local jurisdictions to adopt local sales tax. Although all the signs of the independent variable indicating national unemployment rate are negative, all they are not statistically significant. Rather, a county that has the greater per capita income (PCI) is likely to receive the greater size of intergovernmental grants. Especially in the group 4 (G4), the 1% increase of per capita income in a county is likely to expand greater size of intergovernmental grants by $66.86 (p-value=0.069) in Equation 4, and by $72.71 (p-value=0.055) in Equation 5.

The last independent variable is the size of a county through population. The 1% increase of population density in a county is likely to provide the county the smaller size of intergovernmental grants by $0.09 (p-value=0.038) in Equation 4. That of population density and populations in a county is likely to provide the county the smaller size of intergovernmental grants by $0.07 (p-value=0.054) and $35.08 (p-value=0.10) in Equation 5, respectively. From these two findings, population density in a county is negatively associated the size of intergovernmental grants that the county receives.

Among the control variables focusing on the group 4, a county in both metropolitan and micropolitan areas is likely to receive the greater size of intergovernmental grants than the

counties in other areas. A county in metropolitan areas is likely to receive the greater size of

intergovernmental grants by \$34.75 (p-value=0.067) in Equation 4 and \$36.05 (p-value=0.060)

in Equation 5. A county in micropolitan areas is likely to receive that by \$31.48 (p-value=0.046)

and \$31.00 (p-value=0.042).

6.4.   Result 3: Budgetary Effects of the Two Fiscal Instruments, and Their Interactions

The last research question in this dissertation is the budgetary effects of the two fiscal

instruments and their interactions on the Counties. Among the various budgetary effects, this

section concentrates on the property tax burdens and revenues because the primary goals of local

sales taxes are to reduce property tax burdens and to expand revenues. However, the last research

question has started with the perspective that the purposes of each fiscal instrument differ from

each other, and each fiscal instrument has different effects on local budgets. Based on the eight

Scenarios suggested in Chapter 4, this section aims to examine the budgetary effects and reports

the empirical examination on Table 6.8 through Table 6.10.

6.4.1.   Budgetary Effects on Property Tax Burdens

The first result on Table 6.8 is about the effects of the two fiscal instruments on property

tax burdens. The dependent variable is measured as per capita property tax revenues in a county,

and the main independent variables are local sales taxes, per capita intergovernmental grant size,

and an interaction term composed of per capita grant size and the adoption of local sales tax by a

county. This dissertation has also controlled the empirical models by state sales tax rate and other

control variables of politics, economy, socio-demographics, and fiscal institutions and functions

of counties. The empirical model (Equation 5) is also divided to the four groups.

The first independent variable here is local sales tax, and the 1% increase of local sales tax rate reduces per capita property tax burdens by $1.77 (p-value=0.000) in group 1 (G1), by $1.92 (p-value=0.000) in group 2 (G3), by $1.96 (p-value=0.000) in group 3 (G3), and by $2.41 (p-value=0.000) in group 4 (G4). The second independent variable is per capita intergovernmental grant size. The $1 increase of per capita intergovernmental grant size is shown to also reduce property tax burdens, but the effects of intergovernmental grants are very small. The effects of per capita intergovernmental size on property tax burdens are statistically negative, which means the reduction of property tax burdens, but they are about 0.001 (p-value=0.000 in G1, G2 and G3, and p-value=0.005 in G4). These two findings provide the evidence to support the hypothesis (H12a), but to reject the hypothesis (H13a).

The interaction term of the two fiscal instruments are statistically positive, but the effects of local sales taxes are much greater on the reduction of property taxes than those of intergovernmental grants. Although the interaction term between intergovernmental grant size and the adoption of local sales tax is positively associated with the effects on property tax burdens, the effects of the interaction term are likely too small to distort the effects of the two fiscal instruments on the reductions of property tax burdens. Moreover, the effects of local sales tax rate on property tax burdens are greater than those of intergovernmental grants. Following the fundamental purpose of the adoption of local sales tax by counties, the results on Table 6.8 provide strong evidence to support that local sales tax and the higher rate result in the reduction of property tax burdens.

Other control variables of politics, economy, socio-demographics, fiscal institution and fiscal functions of Counties do not report any statistically constant effects on property tax burdens. However, one interesting finding out of the control variables is the effects of state sales

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taxes on the property tax burdens of a county. According to Table 6.8, the 1% increase of state sales tax is likely to add property tax burdens of a county by 16.1% (p-value=0.017) in group 1 (G1), by 13% (p-value=0.098) in group 2 (G2), by 45.3% (p-value=0.000) in group 3 (G3), and by 118.6% (p-value=0.000) in group 4 (G4). Although those three variables of intergovernmental grants, the interaction term and state sales taxes prevent a county from being reduced property tax burdens, the budgetary effects of local sales taxes on property tax burdens are still much greater. Therefore, it can draw a conclusion that local sales tax helps a county reduce property tax burdens much.

The interpretations of empirical results on Table 6.8, however, have limitations because the units of the two independent variables differ from each other: local sales tax rate and per capita intergovernmental grants. If the data set of this dissertation has obtained local sales tax revenues of all the counties, the empirical results will be more appropriate to compare the effects of the two fiscal instruments on the property tax burdens. Therefore, this dissertation goes to run the same empirical model with converting the two independent variables of per capita intergovernmental grants and the interaction term to natural logarithm forms. The empirical results are shown on Table 6.9.

Instead of looking over all the four groups, this section focuses on the group 4 (G4) not threatened by intra-jurisdictional competition. The 1% increase of local sales tax rate is likely to reduce per capita property tax burdens by $1.76 (p-value=0.000), while the 1% increase of per capita intergovernmental grants is likely to add property tax burdens by $1.42 (p-value=0.000). The effects on the reduction of property tax burdens by local sales tax rate can be said greater than those by intergovernmental grants. Even, the interaction term has the positive effects on the reduction of property tax burdens. The total effects of local sales tax rate and the interaction term

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are greater by 40% than those of intergovernmental grants. Therefore, a county having adopted local sales tax is statistically shown to receive the smaller amounts of per capita intergovernmental grants, but to reduce property tax burdens of its residents also as tax-payers and voters. Local sales tax is regarded as a fiscal instrument to reduce property tax burdens.

6.4.2. Budgetary Effects on Local Revenues

Table 6.9 reports the results of the effects of the two fiscal instruments and their interactions on the revenues of counties. The empirical model (Equation 5) divides the dependent variable to the two types of per capita and total revenues for the detailed examination, and the samples are divided to the four groups. The empirical analysis on Table 6.9 has regressed the two types of revenues of counties on local sales tax, intergovernmental grants, and their interactions controlled by state sales taxes, and the politics, economy, socio-demographics, and fiscal institutions and functions of the counties. The interaction term of the two fiscal instruments is differently composed in the columns (A) and (B) because of the different variables in the empirical model. The columns (A) includes per capita size of revenues and intergovernmental grant, so the interaction term in (A) combines a dichotomous variable whether a county has adopted local sales tax and a continuous variable of per capita intergovernmental grant. The columns (B) include total size of revenues and intergovernmental grant, so the interaction term in (B) combines the dichotomous variable and a continuous variable of logged size of intergovernmental grants.

The first independent variable is local sales tax rate. According to Table 6.9, the 1% increase of local sales tax rate expands both types of revenues strongly supporting the hypotheses H12b and H13b. The 1% increase of the rate expands per capita total revenues by $30.34 (p-

value=0.011) in group 1 (G1), by $32.88 (p-value=0.020) in group 2 (G2), by $43.97 (p-value=0.004) in group 3 (G3), and by $51.72 (p-value=0.002) in group (G4). Moreover, the 1% increase of the rate expands the total revenues by 2% (p-value=0.000) in group 1 (G1), by 2.1% (p-value=0.000) in group 2 (G2), by 2% (p-value=0.001) in group 3 (G3), and by 2.4% (p-value=0.001).

The second independent variable of intergovernmental grant size is also shown to statistically expand the revenues of counties. In the columns (A), the $1 increase of per capita intergovernmental grant size expands the per capita total revenues of counties by $0.78 (p-value=0.003) in group 1 (G1), by $0.83 (p-value=0.013) in group 2 (G2), by $1.03 (p-value=0.001) in group 3 (G3), and by $1.28 (p-value=0.001) in group 4 (G4). Moreover, the 1% increase of total intergovernmental grant size expands the total revenues of counties by 18% (p-value=0.000) in group 1 (G1), by 19.7% in group 2 (G2), by 19.0% (p-value=0.000) in group 3 (G3), and by 25.0% (p-value=0.000) in group 4 (G4).

These findings of local sales tax and intergovernmental grants support the two hypotheses (H12b and H13b). From these two findings, the two fiscal instruments help county governments to expand their total revenues, but the effects of local sales taxes are statistically much greater than those of intergovernmental grants. In addition to the two fiscal instruments, county governments are more likely to expand their per capita total revenues by state sales taxes in the columns (A). However, state sales taxes are shown to statistically negative effects on the total revenues of counties focusing on the group 4 (G4). Although state sales taxes are statistically significant for both types of revenues, their effects in the group 4 (G4) are still smaller than the effects of local sales taxes.

The last independent variable is the interaction term. The interaction term only in the

group 3 and 4 (G3 and G4) in the columns (A) is negatively associated to the per capita total

revenues. The effects of the interaction term are that the $1 increase of intergovernmental grants

in the counties having adopted local sales tax is more likely to decrease the per capita total

revenues by $0.35 (p-value=0.079) in group 3 (G3) and by $0.49 (p-value=0.075) in group 4

(G4). Based on these findings, the effects of the interaction term are smaller than those of

intergovernmental grants, and much smaller than those of local sales taxes. Therefore, the

statistical finding through the three independent variables on the group 4 in the columns (A)

provide an evidence that Scenario C for the hypothesis (H14c) is supported because the sum of

the coefficients of the two variables of per capita intergovernmental grant size and the interaction

term are still positively associated with the dependent variable of per capita total revenues of

counties. However, every the interaction term in the columns (B) is not statistically significant,

so it cannot be concluded that the total revenues sizes of counties are separately influenced by

local sales tax and intergovernmental grants, which both fiscal instruments are positively

associated with the total revenues.

Because of the different units of local sales tax rate and intergovernmental grants, this

section also regresses per capita revenues of a county on logged per capita intergovernmental

grants and other independent variables, and reports the empirical result on Table 6.11. This

section focuses on the group 4 (G4) on Table 6.11 not threatened by intra-jurisdictional

competition. The 1% increase of local sales tax is more likely to expand the per capita revenues

in a county by $3.14 (p-value=0.062); moreover, the 1% increase of per capita intergovernmental

grants is more likely to expand the per capita revenues of a county by $158.03 (p-value=0.000).

Unlike the two variables, the interaction term is not statistically significant. Based on this

empirical result on Table 6.11, the effects of intergovernmental grants are much greater than those of local sales tax rate.

6.4.3. Budgetary Effects on Local Own-Source Revenues (OSRs)

Table 6.10 reports the results of the effects of the two fiscal instruments and their interactions on the own-source revenues of counties. Like the results on Table 6.9, the own-source revenues (OSRs) of counties have been divided to two types of per capita and total, and then examined. The results on Table 6.10 are obtained by regressing the own-source revenues of counties on the three independent variables of local sales taxes, intergovernmental grants and their interaction term controlled by the variables of politics, economy, socio-demographics, and fiscal institutions and functions in counties. The columns (A) show the results regressing per capita own-source revenues, and the columns (B) show the results regressing total own-source revenues.

The first independent variable is also local sales tax rate in these empirical analyses. As hypothesized at H12c, local sales tax is more likely to expand the own-source revenues of counties. The 1% increase of local sales tax rate is statistically shown to expand the per capita own-source revenues of counties in the columns (A) by \$15.95 (p-value=0.043), by \$18.55 (p-value=0.060), by \$23.70 (p-value=0.039), and by \$30.71 (p-value=0.029) in group 1 through 4 (G1 through G4), respectively, as well as the total own-source revenues in the columns (B) by 2% (p-value=0.000), by 2.1% (p-value=0.000), by 1.5% (p-value=0.018), and by 1.7% (p-value=0.026) in group 1 through 4 (G1 through G4), respectively. The findings about the effects of local sales taxes on the own-source revenues in counties support the hypothesis (H12c).

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Unlike the findings on Table 6.9 above, the second independent variable of per capita intergovernmental grants is not statistically significant in the columns (A), as hypothesized at H13c. Total intergovernmental grants are positively associated with the total own-source revenues of counties in the groups 1 through 3 (G1 through G3) of the columns (B). However, the total intergovernmental grants in the group 4 (G4) not threatened by the endogeneity problem of intra-jurisdictional competition are not statistically significant. Thus, the interaction term is not statistically significant in all the groups. The insignificances of the two variables support the hypothesis (H3c).

Among the control variables, per capita income for the economy of counties is positively associated with the level of the two types of own-source revenues. The 1% increase of per capita income of counties, better economy quality of counties, is more likely to expand the per capita own-source revenues by $54.09 (p-value=0.027) in group 1 (G1), by $61.17 (p-value=0.020) in group 2 (G2), by $95.61 (p-value=0.077) in group 3 (G3), and by $207.79 (p-value=0.031). The 1% increase has statistically significant effects on the total own-source revenues of counties, as well. The effects of the 1% increase of per capita income are to expand the total own-source revenues of counties by 16.3% (p-value=0.000) in group 1 (G1), by 16.9% (p-value=0.000) in group 2 (G2), by 21.7% (p-value=0.000) in group 3 (G3), and by 26.9% (p-value=0.000) in group 4 (G4).

This section also regresses per capita own-source revenues on logged per capita intergovernmental grants and other variables, and reports the result on Table 6.13. Focusing on the group 4 (G4) not threatened by intra-jurisdictional competition, the 1% increase of local sales tax rate is more likely to expand own-source revenues by $7.46 (p-value=0.025), and the 1% increase of per capita intergovernmental grants is more likely to expand own-source revenues by

$40.37 (p-value=0.054). Unlike the result on Table 6.12 that per capita intergovernmental grants are not statistically significant, the variable of logged per capita intergovernmental grants are statistically significant; moreover, the effects of logged per capita intergovernmental grants are shown much greater than those of local sales tax rate and its rate.

Table 6.1: Pesaran's CD Test for CSTR of a county – I

Dependent Variable (DV)	Sales Tax Rate of a county (A)				Sales Tax Rate of a county (B)			
Variables \ Group[1]	G1A	G2A	G3A	G4A	G1B	G2B	G3B	G4B
CSTR[2] of Neighbor Counties	0.962***	0.939***	0.991***	0.947***				
	(0.011)	(0.014)	(0.015)	(0.025)				
SSTR[2] of Neighbor Counties					1.029***	1.009***	1.039***	1.007***
					(0.009)	(0.012)	(0.013)	(0.033)
LSTR[2] of Neighbor Counties					0.859***	0.846***	0.934***	0.911***
					(0.022)	(0.024)	(0.025)	(0.029)
Voters to Democrats	-0.000	-0.001	-0.001	-0.002**	-0.001*	-0.001	-0.002**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political Orientation of Governor	-0.012**	-0.013*	0.001	0.027**	-0.006	-0.010	0.012	0.032***
	(0.006)	(0.007)	(0.008)	(0.011)	(0.005)	(0.007)	(0.008)	(0.012)
Political Orientation of Senators	-0.005	-0.013	0.020*	0.023	-0.015	-0.025**	0.017	0.016
	(0.010)	(0.011)	(0.011)	(0.017)	(0.009)	(0.011)	(0.011)	(0.017)
Per Capita Income (logged)	0.058	0.033	0.126	0.081	0.128***	0.111**	0.173*	0.130
	(0.045)	(0.051)	(0.095)	(0.157)	(0.045)	(0.051)	(0.096)	(0.163)
Population Density	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	0.036	0.039	0.135**	0.140	0.104***	0.108**	0.165**	0.136
	(0.037)	(0.041)	(0.068)	(0.091)	(0.039)	(0.043)	(0.068)	(0.090)
Observations	107,622	87,698	48,104	28,180	107,622	87,698	48,104	28,180
R-squared	0.885	0.884	0.885	0.880	0.887	0.886	0.886	0.880
Number of Counties	3,005	2,465	1,308	768	3,005	2,465	1,308	768
CD-Test[3]	91.997***	86.435***	88.488***	96.458***	487.161***	308.966***	79.901***	101.903***

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses; All dummy variables of fiscal years are included in running this empirical model. Because of space limitations, the variable 'Constant' is not shown.
(1) denote that the groups are based on Table 5.1.
(2) denote combined sales tax rate for CSTR, state sales tax rate for SSTR, and local sales tax rate for LSTR.
(3) denote the Pesaran's test of Cross-Sectional Independence.

Table 6.2:   Pesaran's CD Test for LSTR of a county – II

Dependent Variable (DV)	Local sales tax rate of a county (A)				Local sales tax rate of a county (B)			
Variables \ Group[1]	G1A	G2A	G3A	G4A	G1B	G2B	G3B	G4B
CSTR[2] of Neighbor Counties	0.332***	0.353***	0.430***	0.577***				
	(0.011)	(0.013)	(0.017)	(0.023)				
SSTR[2] of Neighbor Counties					-0.002	-0.013	0.010	0.038
					(0.008)	(0.011)	(0.010)	(0.027)
LSTR[2] of Neighbor Counties					0.844***	0.833***	0.930***	0.907***
					(0.023)	(0.024)	(0.024)	(0.028)
Voters to Democrats	-0.004***	-0.003***	-0.007***	-0.003***	-0.001**	-0.001	-0.001	-0.000**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Political Orientation of Governor	0.039***	0.018***	0.117***	0.085***	0.009*	0.004	0.022***	0.035***
	(0.006)	(0.007)	(0.009)	(0.013)	(0.005)	(0.006)	(0.007)	(0.012)
Political Orientation of Senators	-0.061***	-0.075***	-0.033***	-0.081***	-0.012	-0.012	-0.005	-0.012
	(0.011)	(0.013)	(0.012)	(0.020)	(0.009)	(0.011)	(0.010)	(0.016)
Per Capita Income (logged)	0.483***	0.568***	0.571***	0.731***	0.136***	0.162***	0.166*	0.287***
	(0.051)	(0.058)	(0.096)	(0.145)	(0.041)	(0.048)	(0.086)	(0.150)
Population Density	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	0.443***	0.463***	0.368***	-0.001	0.107***	0.108***	0.108*	0.037*
	(0.044)	(0.048)	(0.070)	(0.085)	(0.034)	(0.038)	(0.055)	(0.073)
Observations	107,622	87,698	48,104	28,180	107,622	87,698	48,104	28,180
R-squared	0.405	0.440	0.546	0.672	0.613	0.620	0.729	0.746
Number of Counties	3,005	2,465	1,308	768	3,005	2,465	1,308	768
CD-test[3]	398.437***	207.531***	69.206***	30.044***	1139.278***	464.382***	369.230***	143.306***

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses; All dummy variables of fiscal years are included in running this empirical model. Because of space limitations, the variable 'Constant' is not shown.
(1) denote that the groups are based on Table 5.1.
(2) denote combined sales tax rate for CSTR, state sales tax rate for SSTR, and local sales tax rate for LSTR.
(3) denote the Pesaran's test of Cross-Sectional Independence.

Dependent Variable (DV)	Decision on the adoption of LST[3]			
Variables \ Group[1]	G1	G2	G3	G4
CSTR[2] of Neighbor Counties (IV)	0.138***	0.105***	0.165***	0.060
	(0.013)	(0.018)	(0.017)	(0.044)
Voters to Democrats	-0.001	0.004***	-0.002	0.013***
	(0.001)	(0.001)	(0.002)	(0.003)
Political Orientation of Governor	0.053*	-0.062**	0.244***	0.069
	(0.028)	(0.029)	(0.048)	(0.056)
Political Orientation of Senators	-0.222***	-0.277***	-0.405***	-0.825***
	(0.033)	(0.036)	(0.073)	(0.091)
Per Capita Income (logged)	0.005	0.100*	0.181**	0.827***
	(0.049)	(0.054)	(0.078)	(0.105)
Population Density	-0.000*	-0.000	-0.000*	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	0.006	0.038	-0.058	-0.089
	(0.028)	(0.027)	(0.044)	(0.056)
Ratio of White Population	-0.003**	-0.001	0.001	0.004
	(0.001)	(0.001)	(0.004)	(0.004)
Ratio of Black Population	0.004***	0.003*	0.019***	0.005
	(0.002)	(0.002)	(0.004)	(0.004)
Ratio of Female Population	-0.017*	-0.016*	-0.031**	-0.004
	(0.009)	(0.009)	(0.012)	(0.017)
Ratio of Under 20 Population	-0.009***	-0.009***	-0.014***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.003)
Ratio of Over 65 Population	-0.002	-0.005	-0.001	-0.007
	(0.003)	(0.003)	(0.006)	(0.007)
Metropolitan Area	0.105	0.100	0.011	-0.150
	(0.087)	(0.090)	(0.149)	(0.188)
Micropolitan Area	0.123**	0.168***	0.016	0.028
	(0.053)	(0.055)	(0.094)	(0.123)
County imposes LIT[4]	-0.084**	0.090**	-0.185***	-0.273***
	(0.037)	(0.044)	(0.052)	(0.076)
County Administers LST[3]	0.540***	0.363***	1.262***	0.091
	(0.075)	(0.077)	(0.299)	(0.388)
Higher Education Function	-0.036	-0.052	-0.068	-0.069
	(0.044)	(0.046)	(0.072)	(0.081)
Health Function	0.195**	0.231***	0.467**	0.124
	(0.078)	(0.080)	(0.272)	(0.299)
Hospital Function	0.071**	0.022	0.000	0.029
	(0.028)	(0.029)	(0.046)	(0.055)
Judicial-Legal Function	0.158***	0.116*	-0.079	-0.319***
	(0.055)	(0.060)	(0.080)	(0.107)
Fire Protection Function	0.711***	0.548**	0.798**	0.791*
	(0.240)	(0.261)	(0.364)	(0.415)

(Continued)

Dependent Variable (DV)	Decision on the adoption of LST[3]			
Variables \ Group[1]	G1	G2	G3	G4
Library Function	-0.049	-0.022	-0.232***	-0.119
	(0.050)	(0.053)	(0.078)	(0.089)
Welfare Function	-0.169***	-0.391***	0.410***	-0.099
	(0.043)	(0.049)	(0.092)	(0.144)
Constant	-2.328**	-3.978***	-4.820***	-14.951***
	(0.913)	(0.995)	(1.444)	(1.898)
Observations	47,196	32,655	22,176	7,635
Log Pseudolikelyhood	695998.04	476720.70	330604.11	110755.48
Wald Chi^2	416.28***	347.39***	484.72***	278.60***
Wald Test of Exogeneity	3.14*	1.89	8.40***	3.59*

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses.

(1) denote that the groups are based on Table 5.1.

(2) denote combined sales tax rate.

(3) denote local sales tax

(4) denote local income tax

Table 6.4: Marginal Effects of Panel Logit Regression Results with Fixed-Effects

| Dependent Variable (DV) | Decision on the adoption of LST[3] | |
Variables \ Group[1]	G1 and G2	G3 and G4
DV (lagged)	4.914***	4.507***
	(0.222)	(0.257)
Number of Neighbors Adopting LST	1.628***	1.812***
	(0.099)	(0.150)
Voters to Democrats	0.039***	0.064***
	(0.010)	(0.015)
Political Orientation of Governor	-0.193	-0.009
	(0.144)	(0.243)
Political Orientation of Senators	-0.882***	-1.224***
	(0.242)	(0.436)
Per Capita Income (logged)	2.683***	3.974***
	(0.825)	(1.391)
Population Density	0.003	0.000
	(0.002)	(0.002)
Total Population (logged)	-5.134***	-0.688
	(0.834)	(1.231)
Ratio of White Population	0.835***	0.751***
	(0.089)	(0.150)
Ratio of Black Population	0.922***	0.783***
	(0.129)	(0.179)
Ratio of Female Population	-0.066	-0.016
	(0.129)	(0.153)
Ratio of Under 20 Population	-0.182***	-0.236***
	(0.041)	(0.057)
Ratio of Over 65 Population	-0.056	0.018
	(0.052)	(0.084)
Metropolitan Area	-2.045***	-4.447***
	(0.784)	(1.029)
Micropolitan Area	0.054	-1.528**
	(0.521)	(0.704)
County imposes LIT[2]	0.947***	1.639
	(0.366)	(1.176)
County Administers LST[3]	13.610	
	(596.457)	
Higher Education Function	1.171***	1.234***
	(0.412)	(0.462)
Health Function	0.958**	0.573
	(0.438)	(0.856)
Hospital Function	0.468**	-0.211
	(0.220)	(0.328)

(Continued)

| Dependent Variable (DV) | Decision on the adoption of LST[3] | |
Variables \ Group[1]	G1 and G2	G3 and G4
Judicial-Legal Function	0.378	1.760
	(0.843)	(1.148)
Fire Protection Function	0.542	-0.129
	(0.865)	(1.025)
Library Function	-0.024	0.026
	(0.280)	(0.393)
Welfare Function	0.024	0.657
	(0.250)	(0.437)
Observations	46,238	16,673
Number of Counties	1,323	478
Log Likelihood	-1328.694	-578.282
LR Chi^2	46165.95***	15878.58***

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.
 (1) denote that the groups are based on Table 5.1.
(2) denote local income tax.
(3) denote local sales tax.

Table 6.5:   Instrumental Variable (IV) and Panel Logit Regression Results with Fixed-Effects (FE)

Dependent Variable (DV)	Adoption of Local Sales Tax (A)				Adoption of Local Sales Tax (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
DV (lagged)	0.793***	0.791***	0.776***	0.768***	0.792***	0.789***	0.774***	0.766***
	(0.004)	(0.004)	(0.008)	(0.008)	(0.002)	(0.002)	(0.003)	(0.004)
Number of Neighbors Adopting LST	0.030***	0.030***	0.036***	0.036***	0.030***	0.030***	0.035***	0.035***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
CSTR[2] of Neighbor Counties (IV)	-0.003***	-0.004***	-0.009***	-0.013***				
	(0.001)	(0.001)	(0.002)	(0.003)				
Δ{CSTR[2] of Neighbor Counties (IV)}					-0.018***	-0.031***	-0.021**	-0.034**
					(0.007)	(0.008)	(0.009)	(0.014)
Voters to Democrats	0.000	0.000	0.000	0.000**	0.000	0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political Orientation of Governor	0.001	0.000	0.006***	0.009***	0.001	0.002	0.006***	0.009***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Political Orientation of Senators	-0.003**	-0.003*	0.001	0.007**	-0.003***	-0.003**	0.001	0.007**
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
Per Capita Income (logged)	-0.006	-0.007	-0.003	0.001	-0.005	-0.006	-0.004	-0.004
	(0.006)	(0.007)	(0.011)	(0.018)	(0.006)	(0.007)	(0.009)	(0.015)
Population Density	-0.000	-0.000	-0.000*	-0.000*	-0.000	-0.000	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	-0.007	-0.008	0.006	0.004	-0.007	-0.008	-0.004	-0.013
	(0.006)	(0.006)	(0.009)	(0.014)	(0.004)	(0.005)	(0.006)	(0.010)
Ratio of White Population	0.002***	0.003***	0.000	-0.000	0.002***	0.003***	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Ratio of Black Population	0.003***	0.003***	0.001	0.001	0.002***	0.003***	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Ratio of Female Population	-0.001	-0.001	-0.002**	-0.003**	-0.001	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

(Continued)

Dependent Variable (DV)	Adoption of Local Sales Tax (A)				Adoption of Local Sales Tax (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
Ratio of Under 20 Population	-0.000*	-0.001**	-0.000	-0.000	-0.000**	-0.001**	-0.000	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ratio of Over 65 Population	-0.000	-0.000	0.001*	0.001	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Metropolitan Area	-0.002	-0.004	-0.003	-0.006	-0.002	-0.003	-0.002	-0.005
	(0.007)	(0.009)	(0.009)	(0.014)	(0.006)	(0.007)	(0.008)	(0.012)
Micropolitan Area	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.000
	(0.005)	(0.006)	(0.006)	(0.010)	(0.004)	(0.005)	(0.005)	(0.009)
County imposes LIT[3]	0.013***	0.018***	0.002	0.012	0.013***	0.018***	0.003	0.012
	(0.003)	(0.004)	(0.002)	(0.010)	(0.002)	(0.003)	(0.003)	(0.010)
County Administers LST[4]	0.072***	0.072***			0.076***	0.077***		
	(0.020)	(0.020)			(0.015)	(0.017)		
Higher Education Function	0.001	0.001	0.004	0.005	0.001	0.001	0.004	0.005
	(0.003)	(0.004)	(0.005)	(0.006)	(0.003)	(0.004)	(0.003)	(0.005)
Health Function	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.001
	(0.003)	(0.003)	(0.005)	(0.010)	(0.003)	(0.003)	(0.005)	(0.010)
Hospital Function	-0.002	-0.002	-0.007***	-0.011***	-0.002	-0.002	-0.007***	-0.011***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)
Judicial-Legal Function	0.001	0.002	0.002	0.009	0.001	0.001	0.003	0.010
	(0.004)	(0.005)	(0.005)	(0.011)	(0.004)	(0.005)	(0.005)	(0.011)
Fire Protection Function	0.013**	0.019**	0.013*	0.039**	0.013**	0.019**	0.013*	0.037**
	(0.006)	(0.008)	(0.007)	(0.016)	(0.006)	(0.008)	(0.007)	(0.016)
Library Function	-0.001	-0.002	0.003	0.005	-0.001	-0.002	0.003	0.005
	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)
Welfare Function	0.005**	0.006**	0.003	0.003	0.005***	0.006***	0.002	0.001
	(0.002)	(0.002)	(0.003)	(0.007)	(0.002)	(0.002)	(0.003)	(0.007)

(Continued)

Dependent Variable (DV)	Adoption of Local Sales Tax (A)				Adoption of Local Sales Tax (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
Constant	0.012	-0.016	0.064	0.098	-0.014	-0.055	0.200	0.326
	(0.110)	(0.131)	(0.176)	(0.315)	(0.111)	(0.132)	(0.176)	(0.313)
Observations	78,734	64,193	35,160	20,619	78,613	64,072	35,160	20,619
Number of Counties	3,001	2,461	1,308	768	3,001	2,461	1,308	768
F-Test	2.91***	2.74***	3.06***	2.51***	2.87***	2.70***	3.03***	2.46***
Hansen J Statistic	65.679 ***	60.130***	15.623	12.678	36.150***	36.363***	23.138**	24.126***
C Statistic	5.265**	7.684***	2.950*	0.903*	33.652***	34.395***	8.469***	13.653***

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.
 (1) Denote that the groups are based on Table 5.1.
(2) Denote the combined sales tax rate in counties.
(3) Denote local income tax.
(4) Denote local sales tax.

Table 6.6: Instrumental Variable (IV) and Panel Regression Results with Fixed-Effects (FE)

Dependent Variable (DV)	Local sales tax rate (A)				ΔLocal sales tax rate (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
DV (lagged)	0.720***	0.711***	0.870***	0.833***	0.023***	0.023***	-0.032***	-0.035***
	(0.015)	(0.015)	(0.009)	(0.011)	(0.008)	(0.008)	(0.026)	(0.026)
CSTR[2] of Neighbor Counties (IV)	0.071***	0.074***	0.055***	0.092***				
	(0.005)	(0.005)	(0.005)	(0.007)				
ΔCSTR[2] of Neighbor Counties (IV)					0.035***	0.041***	0.055***	0.090***
					(0.003)	(0.003)	(0.005)	(0.009)
Voters to Democrats	-0.000 *	-0.000	-0.001***	-0.001 ***	-0.000***	-0.000***	-0.000 ***	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political Orientation of Governor	0.004**	0.004	0.014***	0.025***	0.000	-0.001	0.004	0.004
	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)	(0.004)
Political Orientation of Senators	0.005**	0.001	-0.016***	-0.038***	-0.014***	-0.018***	-0.017***	-0.032***
	(0.002)	(0.003)	(0.003)	(0.006)	(0.002)	(0.002)	(0.003)	(0.006)
Per Capita Income (logged)	0.089***	0.109 ***	-0.013	-0.033	-0.013	-0.016	-0.061***	-0.116***
	(0.017)	(0.020)	(0.022)	(0.038)	(0.009)	(0.010)	(0.022)	(0.035)
Population Density	0.000**	0.000*	0.000	0.000	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	0.182***	0.210***	0.045***	-0.001	-0.011	-0.010	-0.020*	-0.034*
	(0.009)	(0.010)	(0.012)	(0.019)	(0.007)	(0.008)	(0.012)	(0.019)
Ratio of White Population	0.005***	0.007***	0.000	-0.001	0.002***	0.003***	-0.001	-0.003
	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.003)
Ratio of Black Population	0.008***	0.010***	0.001	0.001	0.003***	0.003**	-0.001	-0.003
	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.004)
Ratio of Female Population	-0.005***	-0.005***	-0.003**	-0.004	0.001	0.001	0.000	0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Ratio of Under 20 Population	0.003***	0.002***	0.002***	-0.001	-0.001*	-0.001*	-0.000	0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)

(Continued)

Dependent Variable (DV)	Local sales tax rate (A)				ΔLocal sales tax rate (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
Ratio of Over 65 Population	0.006***	0.005***	0.000	-0.003**	-0.002***	-0.002***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Metropolitan Area	-0.019*	-0.021	-0.021	-0.035	-0.000	-0.001	-0.012	-0.022
	(0.011)	(0.014)	(0.014)	(0.022)	(0.009)	(0.011)	(0.014)	(0.023)
Micropolitan Area	-0.004	-0.001	-0.021**	-0.034**	-0.001	-0.001	-0.014	-0.024
	(0.008)	(0.009)	(0.010)	(0.016)	(0.006)	(0.007)	(0.010)	(0.016)
County imposes LIT[3]	0.011**	0.018***	-0.003	0.016	0.005	0.008*	0.002	0.014
	(0.004)	(0.006)	(0.006)	(0.018)	(0.003)	(0.004)	(0.006)	(0.019)
County Administers LST[4]	-0.039	-0.052			0.033	0.033		
	(0.030)	(0.033)			(0.023)	(0.025)		
Higher Education Function	-0.009	-0.008	0.007	0.013	-0.001	-0.001	-0.005	-0.007
	(0.006)	(0.007)	(0.006)	(0.009)	(0.005)	(0.005)	(0.006)	(0.010)
Health Function	-0.004	-0.005	-0.007	-0.011	0.001	0.001	-0.004	-0.018
	(0.005)	(0.006)	(0.010)	(0.018)	(0.004)	(0.005)	(0.010)	(0.019)
Hospital Function	-0.000	-0.004	-0.005	-0.015***	-0.003	-0.003	-0.005	-0.008
	(0.003)	(0.004)	(0.003)	(0.006)	(0.002)	(0.003)	(0.003)	(0.006)
Judicial-Legal Function	0.004	-0.001	0.004	-0.008	-0.003	-0.006	0.002	0.007
	(0.008)	(0.010)	(0.009)	(0.019)	(0.006)	(0.008)	(0.010)	(0.020)
Fire Protection Function	0.018	0.027*	-0.008	-0.011	0.004	0.007	-0.005	-0.007
	(0.012)	(0.015)	(0.014)	(0.029)	(0.009)	(0.012)	(0.014)	(0.030)
Library Function	-0.011***	-0.014***	-0.001	-0.001	-0.003	-0.004	0.002	0.005
	(0.004)	(0.005)	(0.005)	(0.007)	(0.003)	(0.004)	(0.005)	(0.008)
Welfare Function	0.008**	0.012**	-0.005	-0.021*	0.005*	0.006*	-0.007	-0.024
	(0.004)	(0.005)	(0.005)	(0.012)	(0.003)	(0.004)	(0.005)	(0.012)
Constant	-3.755***	-4.465 ***	-0.258	0.611	0.096	0.109	1.250***	2.472***
	(0.223)	(0.265)	(0.321)	(0.566)	(0.170)	(0.203)	(0.327)	(0.582)

(Continued)

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Dependent Variable (DV)	Local sales tax rate (A)				ΔLocal sales tax rate (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1Δ	G2Δ	G3Δ	G4Δ
Observations	78,734	64,193	35,160	20,619	78,613	64,072	35,160	20,619
Number of Counties	3,001	2,461	1,308	768	3,001	2,461	1,308	768
F-Test	9.44***	9.15***	2.86***	2.87***	1.04*	0.91*	1.13***	0.78*
Hansen J Statistic	119.780***	120.798***	126.639***	121.095***	28.893***	25.445***	24.017***	21.490***
C Statistic	247.109***	244.128***	148.128***	90.438***	241.438***	230.727***	159.865***	116.889***

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.

(1) Denote that the groups are based on Table 5.1.

(2) Denote the combined sales tax rate in counties.

(3) Denote local income tax.

(4) Denote local sales tax.

Table 6.7: Panel Regression Results with Fixed-Effects for the Interactions of the Two Fiscal Instruments

Dependent Variable (DV)	Per Capita Intergovernmental Grant (Equation 4)				Per Capita Intergovernmental Grant (Equation 5)			
Variables \ Group[1]	G1	G2	G3	G4	G1	G2	G3	G4
DV (lagged)	0.872***	0.867***	0.824***	0.774***	0.870***	0.864***	0.826***	0.781***
	(0.051)	(0.058)	(0.077)	(0.102)	(0.051)	(0.058)	(0.076)	(0.100)
Adoption of LST[2]	-11.289**	-15.125**	-17.850*	-38.964**				
	(4.685)	(6.336)	(9.623)	(17.589)				
LSTR[3]					2.196*	0.834	-0.256	-9.020*
					(1.300)	(1.310)	(2.732)	(5.085)
SSTR[4]					-6.114***	-8.096***	-1.055	5.796
					(1.748)	(2.487)	(1.947)	(4.642)
Voters to Democrats	0.179***	0.354***	-0.051	0.528***	0.198***	0.379***	-0.051	0.454***
	(0.069)	(0.101)	(0.149)	(0.196)	(0.072)	(0.105)	(0.151)	(0.169)
Political Orientation of President	33.093	14.344	222.970**	6.899	10.047	-12.954	217.907**	5.651
	(31.731)	(41.627)	(97.581)	(11.755)	(32.673)	(44.806)	(95.621)	(11.930)
Political Orientation of Governor	-6.427***	-8.939***	-9.445***	-22.325***	-7.579***	-10.524***	-10.392***	-22.628**
	(1.694)	(2.736)	(3.400)	(8.768)	(1.968)	(3.145)	(3.793)	(9.003)
Political Orientation of Senators	-3.552***	-1.507	-5.764***	-5.636*	-2.903***	-0.526	-6.496***	-8.431**
	(1.045)	(1.090)	(1.964)	(3.180)	(1.011)	(1.193)	(2.060)	(3.346)
Political Unification in a county	-3.323***	-4.420***	-5.779***	-16.052***	-3.335***	-4.801***	-6.020***	-17.990***
	(1.235)	(1.667)	(1.941)	(5.101)	(1.277)	(1.815)	(2.044)	(5.913)
Per Capita Income (logged)	18.887**	19.743*	53.560**	66.864*	15.257*	14.983	51.660**	72.706*
	(9.215)	(10.417)	(23.919)	(36.660)	(8.966)	(10.120)	(23.296)	(37.764)
Unemployment Rate	-5.570	-5.745	-18.865*	-22.763	-3.122	-2.821	-18.410*	-27.280
	(4.031)	(4.563)	(10.537)	(16.349)	(4.032)	(4.615)	(10.283)	(16.896)
Population Density	-0.017	-0.027*	-0.025	-0.093**	-0.015	-0.023	-0.024	-0.074*
	(0.012)	(0.016)	(0.022)	(0.045)	(0.012)	(0.015)	(0.022)	(0.038)
Total Population (logged)	5.494	7.249	-9.230	-29.336	2.135	4.069	-14.066	-35.080*
	(6.141)	(6.136)	(13.705)	(19.337)	(6.041)	(6.003)	(13.980)	(21.089)

(Continued)

Dependent Variable (DV)	Per Capita Intergovernmental Grant (Equation 4)				Per Capita Intergovernmental Grant (Equation 5)			
Variables \ Group[1]	G1	G2	G3	G4	G1	G2	G3	G4
Ratio of White Population	-1.692*	-2.098*	-2.185	-13.694*	-1.637*	-2.021*	-2.462	-13.831*
	(0.890)	(1.154)	(2.186)	(7.745)	(0.886)	(1.135)	(2.230)	(7.828)
Ratio of Black Population	-2.636**	-3.428**	-2.825	-15.427*	-2.692**	-3.534**	-3.275	-15.825*
	(1.270)	(1.679)	(2.692)	(8.734)	(1.289)	(1.704)	(2.776)	(8.917)
Ratio of Female Population	1.840	1.334	6.582*	6.009	2.034	1.581	6.777*	6.294
	(1.364)	(1.518)	(3.921)	(4.695)	(1.430)	(1.610)	(3.919)	(4.708)
Ratio of Under 20 Population	0.717*	0.392	2.362***	1.083	0.713*	0.444	2.328**	1.413
	(0.406)	(0.450)	(0.899)	(0.889)	(0.413)	(0.460)	(0.923)	(0.972)
Ratio of Over 65 Population	1.461***	1.168**	2.783**	1.636	1.364***	1.143**	2.631**	1.877
	(0.515)	(0.514)	(1.200)	(1.125)	(0.495)	(0.514)	(1.130)	(1.161)
Metropolitan Area	6.179	8.300	16.243	34.750*	6.001	7.930	16.686	36.050*
	(6.157)	(6.603)	(13.101)	(18.964)	(6.206)	(6.652)	(13.149)	(19.124)
Micropolitan Area	6.162	9.757	12.733	31.484**	5.733	8.688	12.786	30.996**
	(5.253)	(5.944)	(10.547)	(15.718)	(5.239)	(5.816)	(10.547)	(15.180)
County imposes LIT[5]	-9.433***	-7.293***	-17.530***	12.625*	-10.159***	-9.366***	-15.911***	11.897
	(2.769)	(2.705)	(6.293)	(7.268)	(3.024)	(3.433)	(5.666)	(7.425)
County Administers LST[2]	7.670*	6.832			6.802	4.897		
	(4.564)	(4.754)			(4.257)	(4.280)		
Higher Education Function	2.947*	2.191	5.184*	5.180	3.521**	2.826*	4.790*	5.475
	(1.510)	(1.591)	(2.796)	(3.645)	(1.577)	(1.660)	(2.754)	(3.802)
Health Function	4.686	5.105	16.220	24.049	5.022	5.341	16.205	22.839
	(3.308)	(3.675)	(16.107)	(24.173)	(3.437)	(3.795)	(16.110)	(23.840)
Hospital Function	-3.373**	-2.238	-4.028	1.006	-3.728**	-2.309	-3.466	3.041
	(1.611)	(1.636)	(2.824)	(3.413)	(1.686)	(1.684)	(2.664)	(3.460)
Judicial-Legal Function	-5.394	-7.157	-3.209	-8.563	-6.313	-8.236	-2.743	-7.808
	(6.981)	(8.368)	(16.970)	(29.125)	(7.313)	(8.839)	(17.169)	(29.709)

(Continued)

Dependent Variable (DV)	Per Capita Intergovernmental Grant (Equation 4)				Per Capita Intergovernmental Grant (Equation 5)			
Variables \ Group[1]	G1	G2	G3	G4	G1	G2	G3	G4
Fire Protection	13.173**	12.411*	19.509**	26.076	12.588**	12.140	19.561**	27.571
Function	(6.129)	(7.502)	(9.542)	(17.803)	(6.321)	(7.884)	(9.667)	(18.536)
Library Function	-2.448	-2.414	-2.749	-2.537	-1.847	-1.769	-2.534	-2.930
	(2.523)	(3.007)	(4.288)	(5.930)	(2.505)	(2.992)	(4.205)	(5.952)
Welfare Function	4.757**	3.949	4.449	-14.989	4.361**	3.231	4.131	-15.940
	(2.032)	(2.460)	(4.746)	(17.333)	(2.086)	(2.580)	(4.779)	(17.480)
Constant	-276.652*	-217.599	-946.424**	506.371	-178.134	-102.578	-846.027**	481.600
	(145.335)	(160.706)	(387.240)	(631.714)	(144.188)	(164.758)	(368.333)	(630.943)
Observations	63,451	51,449	29,514	17,512	62,108	50,106	29,514	17,512
R-squared	0.809	0.821	0.772	0.788	0.809	0.821	0.772	0.787
Number of Counties	2,971	2,445	1,287	761	2,926	2,400	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.

(1) denote that the groups are based on Table 5.1.

(2) denote local sales tax.

(3) denote local sales tax rate.

(4) denote state sales tax rate.

(5) denote local income tax.

Table 6.8: Budgetary Effects on Property Tax Burdens of a county – I

| Dependent Variable (DV) | Property Tax Burdens Per Capita | | | |
Variables \ Group[1]	G1	G2	G3	G4
DV (lagged)	0.756***	0.751***	0.733***	0.713***
	(0.008)	(0.009)	(0.012)	(0.015)
LSTR[2]	-1.765***	-1.916***	-1.964***	-2.406***
	(0.141)	(0.144)	(0.183)	(0.195)
SSTR[3]	0.161**	0.130*	0.453***	1.186***
	(0.067)	(0.079)	(0.091)	(0.148)
IGG[4]	0.001***	0.001**	0.001***	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Interaction Term[5]	0.001***	0.001	0.001***	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Voters to Democrats	0.010*	0.009*	0.003	-0.007
	(0.005)	(0.005)	(0.008)	(0.009)
Political Orientation of Governor	0.022	0.016	-0.205*	-0.336***
	(0.064)	(0.062)	(0.105)	(0.105)
Political Orientation of Senators	-0.304***	-0.230**	-0.768***	-1.090***
	(0.087)	(0.090)	(0.145)	(0.171)
Per Capita Income (logged)	-0.806**	-0.283	-2.104***	-0.710**
	(0.380)	(0.399)	(0.728)	(0.968)
Population Density	0.002**	0.003***	0.001	0.004**
	(0.001)	(0.001)	(0.001)	(0.002)
Total Population (logged)	0.314	0.313	1.521***	1.274**
	(0.354)	(0.378)	(0.568)	(0.639)
Ratio of White Population	0.099**	0.181***	-0.038	0.166*
	(0.039)	(0.047)	(0.059)	(0.100)
Ratio of Black Population	0.033	0.097	-0.084	0.094
	(0.053)	(0.061)	(0.077)	(0.119)
Ratio of Female Population	-0.061	-0.086	0.008	-0.001
	(0.066)	(0.072)	(0.111)	(0.138)
Ratio of Under 20 Population	0.063***	0.037*	0.142***	0.110***
	(0.020)	(0.021)	(0.027)	(0.029)
Ratio of Over 65 Population	0.091***	0.067***	0.149***	0.115***
	(0.025)	(0.026)	(0.039)	(0.040)
Metropolitan Area	-0.674	-0.785	-1.118*	-1.423*
	(0.459)	(0.512)	(0.676)	(0.818)
Micropolitan Area	-0.304	-0.172	-0.860	-0.648
	(0.332)	(0.358)	(0.524)	(0.591)

(Continued)

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Dependent Variable (DV)	Property Tax Burdens Per Capita			
Variables \ Group[1]	G1	G2	G3	G4
County imposes LIT[6]	-0.989***	-0.031	-2.199***	0.480
	(0.227)	(0.236)	(0.421)	(0.730)
County Administers LST[7]	-1.959**	-1.956**		
	(0.786)	(0.786)		
Higher Education Function	0.106	0.183	0.245	0.607***
	(0.147)	(0.147)	(0.214)	(0.227)
Health Function	-0.470*	-0.319	-1.672***	-1.478**
	(0.261)	(0.270)	(0.535)	(0.601)
Hospital Function	-0.040	0.039	-0.022	0.123
	(0.100)	(0.110)	(0.139)	(0.166)
Judicial-Legal Function	-0.521**	-0.873***	0.643	-0.151
	(0.251)	(0.264)	(0.412)	(0.516)
Fire Protection Function	0.154	0.397	-0.353	-0.058
	(0.316)	(0.357)	(0.434)	(0.529)
Library Function	0.061	0.130	0.051	0.227
	(0.138)	(0.137)	(0.241)	(0.268)
Welfare Function	0.311**	0.426**	-0.077	-0.216
	(0.158)	(0.195)	(0.208)	(0.406)
Constant	20.241**	6.798	37.605***	0.595
	(8.039)	(9.021)	(13.988)	(20.708)
Observations	61,935	49,952	29,390	17,407
R-squared	0.674	0.682	0.685	0.716
Number of Counties	2,926	2,400	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.

(1) denote that the groups are based on Table 5.1.
(2) denote local sales tax rate.
(3) denote state sales tax rate.
(4) denote per capita intergovernmental grant size converted to real dollars in the year of 2000.
(5) denote the interaction term of per capita grant size (continuous variable) and the adoption of local sales tax (dichotomous variable).
(6) denote local income tax.
(7) denote local sales tax.

Table 6.9: Budgetary Effects on Property Tax Burdens of a county – II

Dependent Variable (DV)	Property Tax Burdens Per Capita			
Variables \ Group[1]	G1	G2	G3	G4
DV (lagged)	0.751***	0.740***	0.731***	0.699***
	(0.008)	(0.009)	(0.012)	(0.015)
LSTR[2]	-0.930***	-0.991***	-1.359***	-1.762***
	(0.140)	(0.143)	(0.165)	(0.184)
SSTR[3]	0.137**	0.066	0.471***	1.336***
	(0.066)	(0.079)	(0.092)	(0.150)
IGG (log)[4]	0.658***	1.032***	0.491**	1.419***
	(0.121)	(0.120)	(0.199)	(0.222)
Interaction Term[5]	-0.500***	-0.666***	-0.383***	-0.667***
	(0.049)	(0.049)	(0.066)	(0.069)
Voters to Democrats	0.013**	0.015***	0.006	0.001
	(0.005)	(0.005)	(0.009)	(0.008)
Political Orientation of Governor	-0.084	-0.179***	-0.294***	-0.479***
	(0.066)	(0.065)	(0.107)	(0.103)
Political Orientation of Senators	-0.261***	-0.144	-0.616***	-0.717***
	(0.088)	(0.092)	(0.146)	(0.172)
Per Capita Income (logged)	-0.945**	-0.464	-1.720**	-0.229
	(0.380)	(0.397)	(0.737)	(0.981)
Population Density	0.001	0.001*	0.000	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Total Population (logged)	0.568	0.554	1.669***	1.345**
	(0.352)	(0.379)	(0.577)	(0.617)
Ratio of White Population	0.071*	0.145***	-0.026	0.133
	(0.038)	(0.045)	(0.059)	(0.116)
Ratio of Black Population	-0.013	0.044	-0.081	0.051
	(0.051)	(0.058)	(0.077)	(0.132)
Ratio of Female Population	-0.087	-0.125*	0.030	-0.012
	(0.065)	(0.071)	(0.104)	(0.127)
Ratio of Under 20 Population	0.074***	0.032	0.173***	0.105***
	(0.019)	(0.020)	(0.027)	(0.029)
Ratio of Over 65 Population	0.091***	0.048*	0.170***	0.089**
	(0.026)	(0.026)	(0.040)	(0.041)
Metropolitan Area	-0.553	-0.680	-0.897	-1.178
	(0.453)	(0.502)	(0.674)	(0.806)
Micropolitan Area	-0.163	-0.037	-0.666	-0.482
	(0.327)	(0.355)	(0.524)	(0.604)

(Continued)

Dependent Variable (DV)	Property Tax Burdens Per Capita			
Variables \ Group[1]	G1	G2	G3	G4
County imposes LIT[6]	-1.035***	0.173	-2.458***	0.655
	(0.235)	(0.240)	(0.440)	(0.797)
County Administers LST[7]	-1.118	-1.020		
	(0.783)	(0.796)		
Higher Education Function	0.134	0.192	0.301	0.655***
	(0.146)	(0.145)	(0.216)	(0.230)
Health Function	-0.449*	-0.330	-1.574***	-1.510**
	(0.260)	(0.272)	(0.547)	(0.647)
Hospital Function	-0.044	0.041	-0.079	-0.005
	(0.100)	(0.110)	(0.140)	(0.166)
Judicial-Legal Function	-0.549**	-0.968***	0.783*	-0.088
	(0.257)	(0.275)	(0.403)	(0.532)
Fire Protection Function	0.237	0.481	-0.164	0.297
	(0.316)	(0.359)	(0.449)	(0.552)
Library Function	0.084	0.151	0.084	0.263
	(0.141)	(0.141)	(0.249)	(0.287)
Welfare Function	0.295*	0.366*	0.009	-0.212
	(0.157)	(0.193)	(0.211)	(0.415)
Constant	22.682***	11.712	26.686*	-5.201
	(7.989)	(8.960)	(14.143)	(21.952)
Observations	61,861	49,892	29,373	17,404
R-squared	0.676	0.687	0.688	0.725
Number of Counties	2,925	2,399	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.

(1) denote that the groups are based on Table 5.1.
(2) denote local sales tax rate.
(3) denote state sales tax rate.
(4) denote per capita intergovernmental grant size converted to real dollars in the year of 2000, and taken as log.
(5) denote the interaction term of logged per capita intergovernmental grant size (continuous variable) and the adoption of local sales tax (dichotomous variable).
(6) denote local income tax.
(7) denote local sales tax.

Table 6.10: Budgetary Effects on Revenues of a county – I

Variables \ Group[1]	Per Capita Total Revenues (A)				Total Revenues (B)			
Dependent Variable (DV)	G1	G2	G3	G4	G1	G2	G3	G4
DV (lagged)	0.761***	0.747***	0.700***	0.663***	0.556***	0.533***	0.525***	0.433***
	(0.061)	(0.066)	(0.048)	(0.032)	(0.020)	(0.024)	(0.027)	(0.042)
LSTR[2]	30.338**	32.882**	43.973***	51.720***	0.020***	0.021***	0.020***	0.024***
	(11.967)	(14.167)	(15.394)	(16.887)	(0.004)	(0.004)	(0.006)	(0.007)
SSTR[3]	10.718***	11.752***	22.122***	36.077***	-0.001	-0.010***	0.014***	-0.020**
	(3.932)	(4.152)	(6.555)	(12.616)	(0.002)	(0.003)	(0.005)	(0.008)
IGG[4]	0.781***	0.834**	1.030***	1.278***	0.180***	0.197***	0.190***	0.250***
	(0.264)	(0.334)	(0.307)	(0.398)	(0.010)	(0.014)	(0.013)	(0.025)
Interaction Term[5]	-0.223	-0.246	-0.346*	-0.488*	-0.000	0.000	0.001	0.001
	(0.153)	(0.206)	(0.197)	(0.274)	(0.000)	(0.000)	(0.001)	(0.001)
Voters to Democrats	-0.323**	-0.491**	0.114	-0.139	-0.001***	-0.001***	-0.001***	-0.002***
	(0.162)	(0.228)	(0.264)	(0.325)	(0.000)	(0.000)	(0.000)	(0.000)
Political Orientation of Governor	5.202**	9.826***	3.808	16.046**	-0.015***	-0.007***	-0.024***	-0.011***
	(2.493)	(3.093)	(3.688)	(6.635)	(0.002)	(0.002)	(0.003)	(0.004)
Political Orientation of Senators	0.947	0.191	8.417	10.510	-0.009***	-0.018***	-0.004	-0.014***
	(5.851)	(4.650)	(12.265)	(10.861)	(0.003)	(0.003)	(0.004)	(0.005)
Per Capita Income (logged)	58.856**	70.498**	123.253**	255.574**	0.148***	0.143***	0.219***	0.245***
	(24.844)	(28.765)	(60.441)	(101.616)	(0.015)	(0.016)	(0.032)	(0.040)
Population Density	0.181***	0.181**	0.258**	0.356*	0.000***	0.000***	0.000**	0.000
	(0.066)	(0.083)	(0.107)	(0.192)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	-27.534	-30.985	22.287	48.595	0.281***	0.284***	0.328***	0.383***
	(17.016)	(19.221)	(42.201)	(64.736)	(0.021)	(0.023)	(0.033)	(0.044)
Ratio of White Population	6.865***	8.429**	9.389	38.788	0.010***	0.008***	0.014***	0.005
	(2.447)	(3.378)	(7.433)	(26.698)	(0.001)	(0.001)	(0.003)	(0.006)
Ratio of Black Population	8.473***	10.660**	10.350	42.824	0.010***	0.008***	0.015***	0.005
	(3.006)	(4.299)	(8.494)	(29.788)	(0.002)	(0.002)	(0.003)	(0.007)

(Continued)

Variables \ Group[1]	Per Capita Total Revenues (A)				Total Revenues (B)			
Dependent Variable (DV)	G1	G2	G3	G4	G1	G2	G3	G4
Ratio of Female Population	-2.496	-2.163	-9.053	-8.671	-0.001	-0.002	-0.000	-0.006
	(5.325)	(6.342)	(12.542)	(15.365)	(0.003)	(0.003)	(0.005)	(0.005)
Ratio of Under 20 Population	-1.503	-1.336	-3.866*	-3.867	0.001*	0.003***	-0.000	0.004***
	(1.079)	(1.139)	(2.089)	(2.663)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio of Over 65 Population	-1.499	-1.421	-2.674	-3.064	-0.001	0.001	-0.001	0.002
	(0.928)	(1.000)	(1.865)	(2.361)	(0.001)	(0.001)	(0.002)	(0.002)
Metropolitan Area	22.135	5.947	54.253	-3.129	0.041**	0.053***	0.030	0.042
	(22.993)	(20.482)	(53.983)	(36.767)	(0.017)	(0.019)	(0.026)	(0.031)
Micropolitan Area	27.077	10.397	59.276	1.437	0.036**	0.037**	0.020	0.004
	(22.102)	(19.116)	(50.009)	(32.049)	(0.015)	(0.016)	(0.022)	(0.027)
County imposes LIT[6]	10.736*	-0.530	38.048***	18.313	0.007	-0.027***	0.053***	0.023*
	(5.845)	(6.964)	(9.856)	(27.403)	(0.006)	(0.007)	(0.009)	(0.014)
County Administers LST[7]	-27.570***	-27.665***			-0.072***	-0.079***		
	(9.338)	(9.651)			(0.022)	(0.023)		
Higher Education Function	-9.527*	-8.942*	-15.051*	-15.044	0.003	0.000	0.013*	0.011
	(5.102)	(4.995)	(9.105)	(10.073)	(0.005)	(0.006)	(0.007)	(0.009)
Health Function	-12.115	-14.450	-32.410	-63.671	-0.010	-0.013*	-0.011	-0.024
	(8.729)	(10.327)	(32.368)	(51.333)	(0.007)	(0.008)	(0.017)	(0.019)
Hospital Function	24.039***	26.227***	26.226***	23.185**	0.038***	0.040***	0.030***	0.029***
	(5.891)	(5.563)	(6.757)	(9.295)	(0.004)	(0.005)	(0.006)	(0.007)
Judicial-Legal Function	10.833	10.219	37.148	61.435	-0.007	-0.011	-0.004	-0.026**
	(12.708)	(16.621)	(29.922)	(60.786)	(0.007)	(0.008)	(0.010)	(0.010)
Fire Protection Function	16.188	25.485	33.766	85.773	-0.029**	-0.006	-0.051**	0.016
	(19.042)	(25.262)	(49.560)	(97.461)	(0.014)	(0.014)	(0.023)	(0.028)
Library Function	3.227	1.793	-0.304	-4.975	-0.006	-0.005	0.000	0.003
	(6.185)	(6.420)	(10.282)	(11.877)	(0.005)	(0.005)	(0.008)	(0.009)

(Continued)

Variables \ Group[1]	Per Capita Total Revenues (A)				Total Revenues (B)			
Dependent Variable (DV)	G1	G2	G3	G4	G1	G2	G3	G4
Welfare Function	-15.374	-20.488	-4.785	17.138	-0.012*	-0.017**	0.005	0.007
	(11.349)	(13.232)	(20.071)	(36.648)	(0.006)	(0.007)	(0.011)	(0.024)
Constant	-1,133.301***	-1,422.648***	-2,532.857**	-7,645.621**	-1.971***	-1.620***	-3.633***	-2.876***
	(429.673)	(511.865)	(1,168.430)	(3,548.874)	(0.313)	(0.325)	(0.574)	(0.903)
Observations	62,106	50,104	29,514	17,512	61,944	49,967	29,436	17,459
R-squared	0.916	0.923	0.906	0.920	0.979	0.981	0.978	0.984
Number of Counties	2,926	2,400	1,287	761	2,925	2,399	1,287	761

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table.

(1) denote that the groups are based on Table 5.1.

(2) denote local sales tax rate.

(3) denote state sales tax rate.

(4) denote per capita intergovernmental grant size in group (A), and total intergovernmental grant size in group (B); both are converted to real dollars in the year of 2000.

(5) denote the interaction term of per intergovernmental capita grant size (continuous variable) in the group (A) with, and of total intergovernmental grant size (continuous variable) in the group (B) with the adoption of local sales tax (dichotomous variable).

(6) denote local income tax.

(7) denote local sales tax.

Table 6.11: Budgetary Effects on Revenues of a county – II

Dependent Variable (DV)	Per Capita Revenues			
Variables \ Group[1]	G1	G2	G3	G4
DV (lagged)	0.871***	0.861***	0.827***	0.794***
	(0.057)	(0.062)	(0.058)	(0.053)
LSTR[2]	11.280**	13.135**	2.621	3.135**
	(4.792)	(5.253)	(6.468)	(7.163)
SSTR[3]	-2.730	-5.491**	14.611***	34.886***
	(1.795)	(2.431)	(5.266)	(12.537)
IGG (log)[4]	67.069***	80.818***	86.118***	158.026***
	(12.183)	(17.680)	(18.648)	(41.931)
Interaction Term[5]	1.226	-0.648	5.212**	-2.979
	(1.461)	(2.224)	(2.569)	(5.538)
Voters to Democrats	-0.049	0.111	-0.497	-0.312
	(0.138)	(0.147)	(0.325)	(0.354)
Political Orientation of Governor	-10.455***	-12.216**	-23.302***	-36.312***
	(3.256)	(5.315)	(6.536)	(11.062)
Political Orientation of Senators	-12.321***	-7.015***	-12.931**	2.463
	(2.407)	(2.640)	(5.266)	(9.698)
Per Capita Income (logged)	74.554***	87.326***	133.304**	233.180***
	(28.847)	(33.097)	(57.636)	(88.481)
Population Density	0.066	0.033	0.119	0.059
	(0.054)	(0.067)	(0.091)	(0.136)
Total Population (logged)	-16.553	-21.876	14.708	-10.538
	(14.844)	(17.159)	(29.550)	(41.942)
Ratio of White Population	-0.376	-1.075	-6.237	-27.100***
	(1.536)	(1.843)	(4.786)	(9.313)
Ratio of Black Population	-1.850	-3.410	-8.570	-31.996***
	(2.031)	(2.409)	(5.590)	(10.352)
Ratio of Female Population	4.080	4.857	13.289*	17.415**
	(3.754)	(4.469)	(7.962)	(8.639)
Ratio of Under 20 Population	-0.060	-0.456	1.579	1.323
	(0.995)	(1.150)	(1.543)	(2.164)
Ratio of Over 65 Population	1.392	0.710	2.712	-0.891
	(1.153)	(1.038)	(2.113)	(1.703)
Metropolitan Area	39.529*	39.250**	70.118*	80.797**
	(21.670)	(18.417)	(42.181)	(34.387)
Micropolitan Area	36.677*	35.080**	60.677*	57.648**
	(19.398)	(16.313)	(35.533)	(23.270)

(Continued)

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Variables \ Group[1]	Per Capita Revenues			
Dependent Variable (DV)	G1	G2	G3	G4
County imposes LIT[6]	-15.339***	-25.961***	1.814	32.334*
	(5.651)	(8.086)	(7.280)	(17.121)
County Administers LST[7]	-32.453***	-33.182***		
	(10.071)	(10.677)		
Higher Education Function	-4.781	-7.299	-2.759	-7.566
	(4.098)	(4.584)	(7.145)	(9.052)
Health Function	-2.336	-3.096	30.196	37.586
	(7.329)	(7.777)	(29.195)	(32.933)
Hospital Function	7.290**	13.070***	3.904	15.916*
	(3.005)	(3.464)	(6.324)	(9.328)
Judicial-Legal Function	-9.175	-14.410	0.116	-12.440
	(10.054)	(12.285)	(24.831)	(38.870)
Fire Protection Function	36.668	49.737	47.780	112.120
	(29.209)	(38.709)	(59.559)	(119.337)
Library Function	-8.607	-11.744	-14.289	-22.480
	(10.761)	(11.683)	(18.138)	(20.284)
Welfare Function	-9.588	-19.394	-7.295	-61.549
	(9.824)	(13.702)	(23.724)	(70.752)
Constant	-1,180.322***	-1,282.203**	-2,365.637**	-1,827.474
	(448.991)	(526.528)	(996.717)	(1,539.034)
Observations	61,945	49,968	29,436	17,459
R-squared	0.893	0.899	0.865	0.869
Number of Counties	2,925	2,399	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.
(1) denote that the groups are based on Table 5.1.
(2) denote local sales tax rate.
(3) denote state sales tax rate.
(4) denote per capita intergovernmental grant size converted to real dollars in the year of 2000, and taken as log.
(5) denote the interaction term of logged per capita intergovernmental grant size (continuous variable) and the adoption of local sales tax (dichotomous variable).
(6) denote local income tax.
(7) denote local sales tax.

Table 6.12: Budgetary Effects on Own-Source Revenues (OSRs) of a county – I

Dependent Variable (DV)	Per Capita Own-Source Revenues (A)				Total Own-Source Revenues (B)			
Variables \ Group[1]	G1	G2	G3	G4	G1	G2	G3	G4
DV (lagged)	0.855***	0.847***	0.802***	0.772***	0.671***	0.657***	0.651***	0.596***
	(0.058)	(0.067)	(0.052)	(0.048)	(0.014)	(0.017)	(0.020)	(0.033)
LSTR[2]	15.945**	18.550*	23.699**	30.708**	0.020***	0.021***	0.015**	0.017**
	(7.885)	(9.840)	(11.458)	(14.058)	(0.004)	(0.004)	(0.006)	(0.008)
SSTR[3]	6.701*	8.015*	14.944**	27.590**	-0.010***	-0.019***	0.005	-0.032***
	(3.984)	(4.689)	(6.065)	(11.723)	(0.002)	(0.003)	(0.005)	(0.008)
IGG[4]	0.228	0.265	0.355	0.512	0.024***	0.034***	0.018**	0.031
	(0.161)	(0.208)	(0.222)	(0.316)	(0.008)	(0.011)	(0.009)	(0.019)
Interaction Term[5]	-0.065	-0.087	-0.126	-0.231	-0.000	0.000	0.001	0.001
	(0.089)	(0.123)	(0.131)	(0.196)	(0.000)	(0.000)	(0.001)	(0.001)
Voters to Democrats	-0.293*	-0.389	-0.199	-0.377	-0.001***	-0.001***	-0.001***	-0.001***
	(0.159)	(0.237)	(0.181)	(0.294)	(0.000)	(0.000)	(0.000)	(0.000)
Political Orientation of Governor	2.440	6.198*	-0.107	8.933	-0.015***	-0.008***	-0.023***	-0.009**
	(2.630)	(3.448)	(3.346)	(6.778)	(0.002)	(0.002)	(0.004)	(0.004)
Political Orientation of Senators	-1.662	0.917	1.391	9.836	-0.008***	-0.013***	-0.011**	-0.016***
	(3.997)	(3.302)	(9.058)	(9.630)	(0.003)	(0.004)	(0.005)	(0.005)
Per Capita Income (logged)	54.094**	67.176**	95.606*	207.788**	0.163***	0.169***	0.217***	0.269***
	(24.488)	(28.859)	(53.993)	(95.978)	(0.016)	(0.017)	(0.034)	(0.045)
Population Density	0.121**	0.120*	0.173**	0.230	0.000***	0.000***	0.000	0.000
	(0.055)	(0.068)	(0.086)	(0.153)	(0.000)	(0.000)	(0.000)	(0.000)
Total Population (logged)	-23.988*	-30.059**	16.462	22.920	0.303***	0.301***	0.350***	0.405***
	(13.293)	(14.779)	(26.591)	(41.245)	(0.019)	(0.021)	(0.032)	(0.043)
Ratio of White Population	3.086*	3.900	1.732	15.733	0.009***	0.007***	0.012***	-0.002
	(1.590)	(2.376)	(4.212)	(19.600)	(0.002)	(0.002)	(0.003)	(0.007)
Ratio of Black Population	3.982*	4.985	2.238	17.815	0.008***	0.006***	0.011***	-0.004
	(2.230)	(3.385)	(5.040)	(22.240)	(0.002)	(0.002)	(0.004)	(0.007)

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Variables \ Group[1] Dependent Variable (DV)	Per Capita Own-Source Revenues (A)				Total Own-Source Revenues (B)			
	G1	G2	G3	G4	G1	G2	G3	G4
Ratio of Female Population	-0.032	0.110	-2.577	-2.351	0.000	-0.001	0.001	-0.006
	(3.353)	(3.857)	(8.304)	(10.404)	(0.003)	(0.003)	(0.005)	(0.005)
Ratio of Under 20 Population	-1.979	-2.152	-4.218	-4.833	-0.000	0.001*	-0.001	0.002
	(1.388)	(1.410)	(2.854)	(3.416)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio of Over 65 Population	-0.809	-0.918	-1.633	-2.245	-0.001	0.001	-0.001	0.003*
	(0.589)	(0.620)	(1.183)	(1.523)	(0.001)	(0.001)	(0.002)	(0.002)
Metropolitan Area	22.134	14.447	43.304	14.828	0.037**	0.056***	0.012	0.034
	(13.909)	(11.415)	(35.356)	(24.371)	(0.018)	(0.021)	(0.026)	(0.031)
Micropolitan Area	24.445*	16.153	46.093	16.525	0.040**	0.043**	0.020	0.016
	(12.885)	(10.333)	(31.780)	(20.492)	(0.016)	(0.018)	(0.023)	(0.026)
County imposes LIT[6]	5.213	-3.288	27.308***	12.938	0.008	-0.025***	0.050***	0.021
	(5.206)	(5.307)	(9.781)	(20.378)	(0.006)	(0.007)	(0.010)	(0.017)
County Administers LST[7]	-21.493***	-19.670***			-0.078***	-0.084***		
	(6.307)	(6.501)			(0.025)	(0.026)		
Higher Education Function	-6.753	-7.352*	-10.413	-13.052	0.007	0.004	0.017**	0.015
	(4.511)	(4.452)	(8.357)	(9.127)	(0.005)	(0.006)	(0.008)	(0.010)
Health Function	-7.835*	-8.828	-7.363	-21.230	-0.012	-0.014	-0.008	-0.018
	(4.446)	(5.605)	(16.540)	(30.821)	(0.009)	(0.009)	(0.020)	(0.020)
Hospital Function	13.257***	15.278***	13.832***	13.792*	0.035***	0.039***	0.025***	0.027***
	(4.244)	(4.162)	(4.979)	(7.621)	(0.005)	(0.005)	(0.006)	(0.007)
Judicial-Legal Function	3.058	3.162	17.651	32.670	-0.011	-0.014	-0.011	-0.032**
	(8.251)	(10.780)	(19.477)	(41.124)	(0.008)	(0.009)	(0.011)	(0.013)
Fire Protection Function	14.899	19.761	25.079	58.238	-0.026*	-0.007	-0.043*	0.011
	(13.796)	(18.289)	(37.914)	(75.886)	(0.014)	(0.016)	(0.023)	(0.030)
Library Function	-2.886	-5.738	-5.363	-12.198	-0.008	-0.011*	0.002	-0.002
	(6.137)	(5.907)	(11.478)	(12.381)	(0.006)	(0.006)	(0.009)	(0.010)

(Continued)

Variables \ Group[1]	Per Capita Own-Source Revenues (A)				Total Own-Source Revenues (B)			
Dependent Variable (DV)	G1	G2	G3	G4	G1	G2	G3	G4
Welfare Function	-11.899	-18.109	-8.398	-14.949	0.003	-0.002	0.020*	0.023
	(11.478)	(13.970)	(21.094)	(40.660)	(0.007)	(0.008)	(0.012)	(0.025)
Constant	-813.272**	-1,007.666**	-1,583.455*	-4,632.568	-2.116***	-1.874***	-3.340***	-2.312**
	(344.660)	(441.441)	(839.609)	(2,888.056)	(0.327)	(0.349)	(0.610)	(1.007)
Observations	62,106	50,104	29,514	17,512	61,942	49,965	29,436	17,459
R-squared	0.890	0.902	0.871	0.890	0.970	0.973	0.970	0.977
Number of Counties	2,926	2,400	1,287	761	2,925	2,399	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table.

(1) denote that the groups are based on Table 5.1.

(2) denote local sales tax rate.

(3) denote state sales tax rate.

(4) denote per capita intergovernmental grant size in group (A), and total intergovernmental grant size in group (B); both are converted to real dollars in the year of 2000.

(5) denote the interaction term of per intergovernmental capita grant size (continuous variable) in the group (A) with, and of total intergovernmental grant size (continuous variable) in the group (B) with the adoption of local sales tax (dichotomous variable).

(6) denote local income tax.

(7) denote local sales tax.

Table 6.13: Budgetary Effects on Own-Source Revenues (OSRs) of a county – II

| Dependent Variable (DV) | Per Capita Own-Source Revenues | | | |
Variables \ Group[1]	G1	G2	G3	G4
DV (lagged)	0.876***	0.871***	0.831***	0.810***
	(0.049)	(0.056)	(0.042)	(0.036)
LSTR[2]	11.903***	12.743***	7.591	7.463**
	(3.123)	(3.445)	(4.885)	(5.494)
SSTR[3]	1.344	0.964	10.915***	24.570***
	(1.783)	(2.016)	(4.092)	(9.306)
IGG (log)[4]	9.114*	13.626*	15.148*	40.371*
	(5.255)	(8.091)	(8.378)	(20.915)
Interaction Term[5]	-0.280	-0.780	2.449*	-0.568
	(0.874)	(1.034)	(1.467)	(2.178)
Voters to Democrats	-0.147	-0.093	-0.421*	-0.342
	(0.122)	(0.131)	(0.242)	(0.306)
Political Orientation of Governor	-3.669***	-2.941	-11.502***	-14.294***
	(1.393)	(1.935)	(3.305)	(5.373)
Political Orientation of Senators	-5.555***	-0.964	-7.726*	3.593
	(1.900)	(2.204)	(4.218)	(7.509)
Per Capita Income (logged)	54.882**	67.586**	91.922**	176.508**
	(25.012)	(29.120)	(46.374)	(73.626)
Population Density	0.091*	0.077	0.128*	0.106
	(0.048)	(0.057)	(0.078)	(0.114)
Total Population (logged)	-19.015	-25.924*	15.198	-0.438
	(13.009)	(14.990)	(23.140)	(33.241)
Ratio of White Population	0.824	0.781	-4.360	-14.290**
	(1.115)	(1.322)	(3.124)	(5.625)
Ratio of Black Population	0.561	0.038	-5.174	-16.223**
	(1.405)	(1.566)	(3.549)	(6.353)
Ratio of Female Population	2.993	3.809	7.492	10.996**
	(2.879)	(3.236)	(5.186)	(5.324)
Ratio of Under 20 Population	-1.309	-1.714	-1.479	-2.164
	(1.153)	(1.251)	(2.013)	(2.515)
Ratio of Over 65 Population	0.266	-0.136	0.881	-0.938
	(0.774)	(0.700)	(1.330)	(1.102)
Metropolitan Area	30.061*	26.828**	53.525	49.188*
	(16.270)	(13.011)	(33.785)	(25.411)
Micropolitan Area	31.774**	28.028**	52.719*	43.237**
	(14.361)	(11.294)	(28.839)	(17.296)

(Continued)

| Variables \ Group[1] | Per Capita Own-Source Revenues | | | |
Dependent Variable (DV)	G1	G2	G3	G4
County imposes LIT[6]	-4.689	-13.558***	11.175**	15.446
	(3.199)	(4.932)	(5.501)	(15.820)
County Administers LST[7]	-20.132***	-19.244**		
	(7.310)	(7.654)		
Higher Education Function	-4.342	-5.946	-4.801	-9.014
	(3.511)	(3.877)	(6.160)	(7.613)
Health Function	-4.429	-4.891	19.586	24.682
	(5.216)	(5.503)	(16.073)	(18.588)
Hospital Function	8.976***	12.004***	7.266	13.248
	(2.478)	(2.656)	(5.360)	(8.329)
Judicial-Legal Function	-3.793	-6.478	4.770	-0.837
	(4.083)	(4.822)	(9.511)	(13.611)
Fire Protection Function	27.295	34.332	40.844	81.307
	(22.460)	(29.769)	(48.056)	(93.010)
Library Function	-6.798	-10.614	-10.259	-18.517
	(8.872)	(9.373)	(15.569)	(17.450)
Welfare Function	-7.868	-15.277	-6.209	-44.671
	(9.528)	(12.813)	(22.212)	(63.270)
Constant	-827.105**	-957.624**	-1,497.668**	-1,755.955
	(362.301)	(442.636)	(718.439)	(1,319.647)
Observations	61,945	49,968	29,436	17,459
R-squared	0.886	0.896	0.862	0.873
Number of Counties	2,925	2,399	1,287	761

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors in parentheses; All year dummies are included, but not shown on this Table; One control variable indicating whether Counties are authorized to administer local seals taxes or not is automatically dropped in the group 3 and 4 (G3 and G4) because of multi-colleniarity.

(1) denote that the groups are based on Table 5.1.
(2) denote local sales tax rate.
(3) denote state sales tax rate.
(4) denote per capita intergovernmental grant size converted to real dollars in the year of 2000, and taken as log.
(5) denote the interaction term of logged per capita intergovernmental grant size (continuous variable) and the adoption of local sales tax (dichotomous variable).
(6) denote local income tax.
(7) denote local sales tax.

CHAPTER 7

CONCLUSION

The main purpose of this dissertation is to explore whether fiscal instruments have different purposes under federalism in terms of fiscal interactions and local heterogeneity of politics, economy and socio-demographics. For this purpose, the dissertation has chosen local sales tax and intergovernmental grants, the former standing for local autonomy and power to levy tax, and the latter for upper-level support and control. For the detailed explorations, this dissertation has examined how local sales tax is determined at the level of county government in terms of inter-jurisdictional competition and local heterogeneity, how local sales tax interacts with intergovernmental grants under fiscal federalism, and what effects the two fiscal instruments have on local budgets. This dissertation has approached the empirical examinations with inter-jurisdictional competition and public choice theory. For these purposes, this dissertation has derived the fourteen groups of hypotheses that are applicable to county governments over the U.S. The hypotheses suggested in the previous chapters are tested through the estimates of various regression models. In this chapter, the empirical results not only are summarized and discussed to draw general conclusions, but also suggest some limitations that have future research and directions recommended.

7.1. Summary of Empirical Findings

Because this dissertation grounds on the two theoretical approaches of inter-jurisdictional competition and public choice theory of fiscal federalism, empirical findings are summarized

dividing the four sections: 1) the existence of fiscal interactions across local governments, 2) the determinants of local sales tax, 3) interactions between local sales taxes and intergovernmental grants, and 4) budgetary effects of the two fiscal instruments and their interactions.

7.1.1. Existence of Fiscal Interactions

Many existing studies have examined inter-jurisdictional competition focusing on property taxes in local governments. First, this dissertation has empirically examined the existence of fiscal interactions across the U.S. counties when the counties make a decision on the adoption of local sales tax and local sales tax rate. This dissertation has adopted the empirical models (Devereux et al., 2007; P. Egger et al., 2005; Jacobs et al., 2010; Kanbur & Keen, 1993) and tested the empirical examination of the existence of fiscal interactions by the Pesaran's Cross-Sectional Dependence (CD) test. The more widespread spatial autocorrelation tests are Moran I statistics, Lagrange Multiplier (LM) test, and spatial lag or error model by instrumental variable or maximum likelihood estimation methods. However, these spatial autocorrelation tests are inappropriate to panel data set. Therefore, the Pesaran's CD test was selected instead of Friedman's test and Free's test because the Pesaran's CD test can be applied to balanced and unbalanced panel data set (De Hoyos & Sarafidis, 2007).

The results of the Pesaran's CD test has confirmed that fiscal interactions for combined, state, and local sales taxes are observed across the U.S. counties. Moreover, the fiscal interactions focusing on sales tax rate are observed as the type of fiscal coordination. The effects of state sales tax rate is statistically greater than those of local sales tax rate on combined and local sales tax rate of a county. Based on this finding that sales taxes are affected by the external influences of fiscal interactions, this dissertation has developed the empirical models for the

determinants, interactions and effects of local sales taxes and intergovernmental grants on local budgets.

7.1.2. Determinants of Local Sales Tax in Counties

The existences of fiscal interactions across the U.S. counties lead this dissertation to consider an instrumental variable (IV) including fiscal interactions of sales tax rate for empirical examinations of the determinants of local sales tax. This dissertation has developed the Wagner-Sobel's (W-S) empirical model for the determinants recognizing the instrumental variable and time effects because of the autonomy to adopt, change, and/or eliminate local sales tax by counties. Moreover, the theoretical approach to the determinants of local sales tax makes this dissertation recognize the internal and external influences on the determinants.

The findings for the determinants provide two different perspectives on fiscal interactions. When a county neighbors to more counties that have adopted local sales tax, the county is more likely to adopt local sales tax. The fiscal interactions for the adoption of local sales tax are defined as fiscal coordination in terms of the positive relationships between a county and its neighboring counties. However, a county adopting local sales tax has set the lower local sales tax rate; that is, the sales tax rate of its neighboring counties are negatively associated with the local sales tax rate of that county. Thus, fiscal interactions are defined as fiscal competition when a county sets its local sales tax rate considering the sales tax rate in its neighboring counties.

Unlike the hypotheses, the internal conditions of a county are shown not to have clearly uniformed influences on the determinants. Local voters and their elected representatives are more likely to adopt local sales tax, but they are less likely to increase local sales tax rate in their

counties. Moreover, the higher levels of populations and population density in a county are shown to be negatively associated with the adoption of local sales tax and its local sales tax rate.

7.1.3. Interactions of Local Autonomy and the federal Support

The second research question of this dissertation is about the interactions of the two fiscal instruments assuming that local sales tax is local autonomy and power to tax, while intergovernmental grants are the federal controls and supports to local governments. Because of the potential multi-collinearity of the adoption of local sales tax and local sales tax rate, the empirical models are divided to the two forms (Equation 4 and 5).

According to the results on Table 6.7, the interactions of the two fiscal instruments are statistically shown negatively associated with each other. Although the empirical results in the groups including G1, G2 and G3 in Equation 4 are threatened by the endogeneity problem of intra-jurisdictional competition, all the signs of the independent variable whether a county has adopted local sales tax or not are negative; moreover, the local sales tax rate in the group 4 (G4) is negatively associated with per capita intergovernmental grant size that a county receives. The findings provide a perspective that the expansions of local autonomy and power result in the shrinkage of the federal controls and supports to local governments.

Moreover, noteworthy findings on Table 6.7 are observed from the variables of local politics. Intergovernmental grants are more distributed to a county with the more voters in favor of Democrats, while they are less distributed to a county in a state whose Governor is Republican. One more consideration for this empirical model is political unification across the federal, State and Local governments. If a county is politically unified with its higher levels of governments, the county is likely to receive the smaller size of per capita intergovernmental grants. This

finding is shown to correspond to the hypothesis grounding on that intergovernmental grants can be used as an election strategy.

Unlike the hypothesis, a county with a better economic condition is likely to receive greater intergovernmental grants. A dense county is likely to receive smaller size of per capita intergovernmental grants. This finding still leaves rooms to compare the effects of total size of and per capita size of intergovernmental grants considering the whole pie of the intergovernmental grants. Moreover, the future research on intergovernmental grants should consider the types, sources and restrictions of intergovernmental grants because of the complexity in the recent characteristics of intergovernmental grants.

7.1.4. Budgetary Effects of Local Sales Taxes and Intergovernmental Grants

For the empirical examinations of the budgetary effects of the two fiscal instruments, this paper concentrates on the property tax burdens, total revenues and own-source revenues of counties because the main purposes of local sales taxes are to reduce property tax burdens and to expand local revenues by diversifying revenue sources. As stated in the previous section, the opposite relationships between the two fiscal instruments are supposed that intergovernmental grants have negative effects on the three types of local budgets. It is assumed that the mingled budgetary effects of the two fiscal instruments distort the solo effects of each fiscal instruments; thus, this dissertation has hypothesized four basic and four new scenarios and added an interaction term to the empirical models in order to empirically examine their budgetary effects.

The first empirical result is about the budgetary effects of the two fiscal instruments and their interaction on property tax burdens. According to the reports (Table 6.8), local sales tax reduces property tax burdens, while intergovernmental grants expand the burdens; moreover, the

interaction term of local sales taxes and intergovernmental grants also expands the burdens. However, the budgetary effects of local sales taxes on property tax burdens are much greater than those of intergovernmental grants and the interaction term. The findings support that local sales tax helps a county to reduce property tax burdens as they are suggested. Another interesting finding from the empirical results is that state sales taxes expand the property tax burdens of a county in the group 4, not threatened by intra-jurisdictional competition.

The second empirical result is about the budgetary effects of the two fiscal instruments and their interaction on the revenues of a county. Local sales taxes and intergovernmental grants are statistically shown to grow the two types of revenues of counties, but their interactions are negatively associated with per capita revenues. However, the total effects of local sales taxes and intergovernmental grants on the per capita revenues are much greater than the interactions that are almost nothing. Even, the budgetary effects of the interaction term on the total revenues of counties are not statistically significant. Therefore, the findings on Table 6.9 support Scenario C (H14c).

The last empirical result is about the budgetary effects of the two fiscal instruments and their interaction on the own-source revenues of a county. As hypothesized, the reports on Table 6.10 show that local sales tax has positively associated with the two types of per capita and total own-source revenues, while intergovernmental grants do not have any statistical influences on any. Moreover, the interaction term has no statistical influences, either.

From the empirical findings in the two previous sections, a county having adopted local sales tax and set a higher local sales tax rate is likely to receive the smaller size of per capita intergovernmental grants. The reverse relationships between the two fiscal instruments are not able to motivate a local government to adopt local sales tax and to increase local sales tax rate.

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However, the budgetary effects of the two fiscal instruments and their interactions have statistically significant influences on why a county adopts local sales tax. The empirical findings of this dissertation provide evidence that local sales tax helps a local government not only to reduce property tax burden, but also to expand its revenues, including own-source revenues. Although intergovernmental grants help local governments to expand their revenues, the budgetary effects of intergovernmental grants are statistically shown very minor other than those of local sales taxes.

7.2.   Contribution to the Existing Literature

This dissertation contributes to the comprehensions of fiscal interactions across local governments and to the recognitions of internal condition within local governments in the policy-making process of local sales tax. Considering the comprehensions and recognitions, moreover, this dissertation has empirically not only examined the interactions of local sales tax with intergovernmental grants having different purposes from each other, but also their budgetary effects, of which both have been ignored and/or untouched.

Many existing studies of local sales tax have focused on single-tiered dimensions and/or multi-levels of governments within one state. Some existing studies have dealt with the fiscal interactions across the U.S. states, and only a few studies empirically explored local sales tax through inter-jurisdictional competition in the U.S. local levels. Moreover, they have investigated either the presence of or the effects of inter-jurisdictional competition on government size and efficiency. The first contribution of this dissertation have covered all U.S. county governments, and explored the fiscal interactions of inter-jurisdictional competition and coordination in the U.S. Federal contexts. Moreover, this dissertation simultaneously deals with

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the external conditions by presenting the fiscal interactions of inter-jurisdictional competition and coordination, as well as the recognitions of internal conditions of local governments.

Unlike the existing studies targeting on only local sales tax, this dissertation extends to the existing studies on local sales tax by adding another fiscal instrument that has different fiscal objectives, but affects local budgets. When local governments had mainly depended on property taxes for their revenue sources, they received intergovernmental grants from their upper-levels of governments. However, intergovernmental grants from the upper-levels are impossible to consider the detailed fiscal and budgetary conditions of local governments, and are distributed to the local governments with various strings attached for the priority of the federal policy. In addition to intergovernmental grants, local governments have made efforts to diversify the revenue sources for revenue maximization in terms of local sales and income taxes, user charges, and other fees. The expansion of local sales tax in the portion of local budgets should seriously consider the propensity of local voters because local sales tax requires the voters to approve the adoption of local sales tax and/or local council members decide the adoption. The simultaneous considerations of the two fiscal instruments having different fiscal objectives help local governments decide any fiscal policy.

The third contribution of this dissertation is based on the two previous contributions. For the empirical examinations of the three purposes, this dissertation has constructed a huge panel data set that covers all U.S. counties for pretty long period, and the data set includes the detailed heterogeneity of politics, economy, socio-demographics, and fiscal and budgetary within local governments, as well as geospatial characteristics across local governments. The accumulated information of local governments in the data set enables this dissertation to develop the existing

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literatures for multi-layers of state and local governments. Moreover, the data set can be used for other studies that compare local governments in a few U.S. states.

7.3.   Limitations and Recommendations for Future Research

This dissertation still leaves some limitations in the way of empirical examination of local sales tax, although this dissertation has contributed to the extension of existing studies on local sales tax.

The first limitation of this dissertation is the absence of intra-jurisdictional competition and coordination due to the time shortage for data mining. Among the fifty U.S. states, the twenty States have authorized both county and municipal governments, including school and special districts, the three States have authorized only municipal governments, and only the State of South Dakota has authorized municipal governments, including special districts, to collect their revenues by local sales taxes (Table 5.1). Especially, the local governments in the twenty States are threatened for the decision of local sales tax by intra-jurisdictional competitions, as well as inter-jurisdictional competitions because the local governments have equal power to tax, and share the same jurisdictions and tax base. Although this dissertation divides the States by considering the presences or absences of hierarchical interactions, it is still insufficient to draw out generalized conclusions.

The second limitation is about intergovernmental grants. As stated in the previous section, intergovernmental grants are distributed as various types with diverse strings attached. Moreover, the three biggest policy areas of intergovernmental grants distributed by the federal-State governments are highways, education and welfare. Intergovernmental grants are selected for the empirical examination because their properties are assumed to differ from local sales tax.

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Given that the detailed properties of intergovernmental grants are explored, the empirical examination will have greater dynamics by matching the specified purposes of local sales tax with those of intergovernmental grants.

This dissertation is limited to the empirical examinations with the broad and uniformed categorizations of local heterogeneity. The limitation prevents this dissertation from observing county governments in detail, which requires future research from this dissertation to develop the measurements of local heterogeneity. By the way this dissertation has been completed, the question of how to measure the dynamics in local governments is still present. Moreover, governments compete and/or coordinate with each other due to the financial resource scarcity through various fiscal policy tools, and local governments highly base their fiscal capacity on property taxes much. This dissertation should consider property taxes, and other fiscal policy tools together for the development of the studies on local finance and budgets.

In spite of the limitations stated above, the contributions and limitations provide a cornerstone for future research expected to handle intra-jurisdictional competition, as well as to better understand fiscal federalism with the detailed local conditions.

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