THE EFFECTS OF FISCAL DECENTRALIZATION ON LOCAL PUBLIC FINANCE IN KOREA: PUBLIC SPENDING, FUNCTIONAL RESPONSIBILITY, AND FISCAL INDEPENDENCE

by

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(Under the direction of Thomas P. Lauth)

ABSTRACT

In recent years, fiscal decentralization has been advocated worldwide. The common motive is that fiscal decentralization is considered to have the potential to improve the performance of the public sector. However, some recent studies hold that the conventional argument that fiscal decentralization will increase economic efficiency in the public sector may not be applicable in developing countries. Also, the conventional argument regarding functional assignment has been challenged on several grounds.

The recent development of local autonomy and fiscal decentralization in Korea provides an excellent opportunity for empirical investigation of this subject. Because Korea represents the borderline between developed and developing countries, a decentralization study of such a country will contribute to testing the contention that there is no efficiency gain in developing countries, as well as investigating the issue of functional assignment outside developed countries. To date, there have been few efforts to systematically analyze the actual effects of decentralization on the overall public sector in Korea.

This study asks three questions. First, has fiscal decentralization affected the size of the public budget in Korea? Second, what changes occur in functional responsibility after the onset of fiscal decentralization? Third, what are the effects of decentralization on the fiscal independence of local governments?

The study employs regression analysis to test three hypotheses. We find decentralization improves economic efficiency and accountability in the Korean public sector. The levels of developmental and redistribution expenditures increase as decentralization proceeds in Korea. Finally, the degree of decentralization is positively associated with the degree of the fiscal independence of local governments.

INDEX WORDS: Fiscal decentralization, Fiscal federalism, Korean local finance, Decentralization hypothesis, Functional responsibility, Fiscal independence, Generalized Least Square (GLS), Two Stage Least Square (2SLS), Random effects model

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CHAPTER 1

INTRODUCTION

1.1. Introduction

In recent years, fiscal decentralization has been advocated worldwide. Examples are abundant around the world: functional devolution by the Reagan administration in the U.S., decentralization of fiscal decision-making and public administration in Latin American countries, and economic reforms (from centralized to decentralized economies) in Asian countries.

While fiscal decentralization has several reasons for being adopted around the world,[1] the common motive is that fiscal decentralization is considered to have the potential to improve the performance of the public sector (Oates, 1999:1120). Of three major economic functions of governmental action – *allocation, redistribution, and stabilization* (Musgrave, 1959), the key question of fiscal federalism is which level of government should undertake what function, and on whose budget? The theory holds that for certain public goods or services such as local public goods, providing them in a decentralized fashion can increase efficiency[2] and accountability in resource allocation because (1) local governments can be better tailored to the geographical areas in which public goods are distributed, (2) local governments are better positioned to recognize local preferences and needs, and (3) pressure from inter-jurisdictional competition may motivate local

[1] Bird and Vaillancourt (1998) identify four reasons especially in developing countries: (1) economic efficiency, (2) cost efficiency, (3) accountability, and (4) resource mobilization.
[2] Throughout this dissertation the term "efficiency" means economic efficiency (*Pareto optimal*) unless indicated otherwise.

governments to be innovative and accountable to their residents (Oates, 1972). The theory also holds that the *redistribution* and *stabilization* functions, as well as provision of national public goods such as national defense in the *allocation* function should be the central government's task (Musgrave, 1959; Oates, 1972).

However, this conventional argument has been challenged on several grounds. For the *redistribution* and *stabilization* functions, several recent empirical studies challenge the conventional wisdom. For the *allocation* function of local public goods, recent studies argue that the conventional wisdom may remain true in developed countries, but it is not the case in developing countries. They hold that the conventional argument that decentralized provision of public goods will increase efficiency in resource allocation may not be applicable in developing countries (Bahl and Linn, 1994; Prud'homme, 1995). The reason is that most developing countries do not meet implicit or explicit assumptions posed by fiscal federalism theory. In developing countries, for example, local voter preferences may not be as readily reflected in local budget outcomes as in developed countries. Local governments have weak administrative capacity to carry out their own fiscal decisions. Without independent decision-making capacity in determining the quantity and quality of public goods provided and sources of finance that internalize the costs, decentralized provision of local public goods may not increase efficiency. Rather, centralization is more suited in this situation because it may take advantage of scale economies in production of public goods and services. Also, fiscal centralization may be a more effective tool for economic stabilization, economic growth, income redistribution, and tax administration. These are very critical pending issues in developing economies.

A review of international determinant studies regarding decentralization has found that stage of economic development in a country, measured by income, urbanization, and Gross Domestic Product (GDP), is associated with a significantly greater subnational share of expenditure (Kee, 1977; Bahl and Nath, 1986; Wasylenko, 1987; Pinizza, 1999). Bahl and Linn (1992:393) conclude, "[t]he implication of this observation is that government policies to promote fiscal decentralization are more likely to be effective for [developed] countries."

As a result, most empirical studies on the subject of fiscal decentralization are limited to developed countries. However, fiscal decentralization takes place not only in developed countries, but also in developing countries. Although there are several studies covering a specific developing country, they are all descriptive. Typically, they describe the current fiscal structure, assess a new decentralization program, and identify possible problems and their solutions (e.g., Fukasaku and Mello, 1999; Bennnett, 1994; Bird and Vaillancourt, 1998; Ahmad, 1997).

Missing from the literature is a systematic analysis of the actual effects of decentralization on the overall public sector in developing countries. The recent development of local autonomy and fiscal decentralization in Korea provides an excellent opportunity in this matter. Also, because Korea represents the borderline between developed and developing countries, a decentralization study of such a country will contribute to testing the validity of the contention that there is no efficiency gain in developing countries. Until now, there have been few efforts to systematically analyze the actual effects of decentralization on the overall public sector in Korea.

This study asks three questions about the actual effects of decentralization on the fiscal structure in Korea. First, has fiscal decentralization affected the size of the public budget in Korea? A decentralized system is expected to respond better to local preferences and needs and to promote competition among local units in the provision of public goods and services. The better fitted provision of public goods and services and competition will result in a more efficient and less wasteful provision of public goods and services, thus affecting the size of the budget.

Second, what changes occur in functional responsibility as the degree of fiscal decentralization increases? The conventional argument for assignment of functions is that the central government should be engaged in *stabilization* and *redistribution* functions while sub-national governments should be engaged in the *allocation* of local or regional public goods (Musgrave, 1959; Oates, 1972). However, the conventional wisdom has been challenged on several grounds. The role of local governments in the *stabilization* function and the *redistribution* function has been re-evaluated. Some empirical studies provide a rationale for subnational stabilization and redistribution policies (Gramlich, 1987; Pauly, 1973). Still, the issue is unresolved. Therefore, it is interesting to investigate the issue outside the United States.

Third, what are the effects of decentralization on fiscal independence of local governments? One major argument for deferring local autonomy implementation in Korea is that local governments were heavily dependent upon intergovernmental transfers to finance local public goods and services. A degree of fiscal independence in local government is critical for efficiency gain in the provision of local public goods. Also, without adequate revenue-raising capacity, the capacity of independent fiscal decision-

making in local governments is limited. Therefore, it is important to investigate changes in the fiscal independence of local governments as decentralization proceeds.

1.2. Importance of This Study

This study is important in several respects. First, many decentralization studies have tended to be polemical rather than analytical or empirical (Wolman, 1994:249). Many benefits of fiscal decentralization policies are based on theoretical arguments. Therefore, it is important to test these theoretical arguments in an empirical setting.

Second, most empirical decentralization studies are limited to the U.S. The few existing exceptions represent similar government structure to that of the U.S. However, Oates (1977:4) holds that "in economic terms, all governmental systems are more or less federal. Even in a formally unitary system, there is typically a considerable extent of de facto fiscal discretion at decentralized levels." Therefore, to generalize fiscal federalism theory, it is an important step to extend the study area – from federal to unitary structure.

Third, most empirical studies on the subject of fiscal decentralization are limited to the developed countries. Many scholars argue this situation exists because most developing countries do not meet implicit or explicit assumptions posed by fiscal federalism theory. Another reason may be the difficulty of obtaining reliable fiscal data from developing countries. In order to assess the worldwide phenomenon accurately, we need a systematic analysis of fiscal decentralization in developing countries.

Fourth, this study may help to formulate future intergovernmental fiscal policy in Korea. Because the current development of fiscal decentralization is a relatively new phenomenon in Korea, policy-makers desperately need much more input on this matter.

As a subfield of public finance, fiscal federalism is concerned with the vertical structure of the public sector. The traditional concerns of the fiscal federalism literature are what functions and instruments should be decentralized or centralized and what welfare gains are recognized from decentralization. Recently, these traditional concerns have been expanded to several new topics: laboratory federalism, interjurisdictional competition, the political economy of fiscal federalism, market-preserving federalism, and fiscal decentralization in the developing economy (Oates, 1999). This study contributes to some of these new topics of the fiscal federalism literature.

1.3. A Rationale for Governmental Action

Human desires for goods and services are seemingly unlimited. But our resources to satisfy them are limited. Economists refer to the imbalance between them as scarcity. The discipline of economics studies how scarce resources are allocated among alternative uses (Hyman, 1993:3). A free competitive market and pricing system has been recognized as an efficient system to allocate scarce resources as long as it meets four conditions – perfect competition, information, complete market, and exclusion and rival consumption.[3]

When any or all of the four conditions mentioned above are not satisfied, economists refer to this outcome as market failure. Market failure makes the free private competitive

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[3] (1) Perfect Competition: A perfectly competitive market means producers have no power in setting the price. They accept the price as given and sell as much as they can at that price.
(2) Information: Asymmetric information is the condition that prevails in a market in which some participants are better informed about the quality of a product than are the participants with whom they trade. The problem is that the less complete the information, the more likely the buyer will make the incorrect selection. That unintentional error in judgement can lead to an inefficient pattern of resource use.
(3) Complete Market: If the cost of production is more than the amount that people are willing to pay for goods, there will be no market for that goods.
(4) Nonexclusivety and nonrivalry are the nature of public goods.

market no longer efficient in resource allocation, thus providing a rationale for governmental action.

Among those conditions in which market failure takes place, scholars of public finance have paid special attention to the nature of public goods because it is related directly to the issue of public provision of goods and services. Pure public goods have two basic distinguishing characteristics: nonexclusivety and nonrivalry in consumption.

Nonexclusivety in consumption means that consumption cannot be withheld from consumers who choose not to pay the price. When the good is nonexclusive, the transaction costs of excluding a person from obtaining it are extremely high. Nonrivalry in consumption means consumption of a given quantity of a good by any one person does not reduce the availability of the good to others. Therefore, the marginal cost of allowing an additional consumer to enjoy the benefits of the goods is zero until the presence of congestion. In practice, beyond some level of consumption the marginal social cost of consumption can become positive because the good is congested.

Besides market failure stemming from the nature of public goods, there are three reasons that justify governmental action in the marketplace (Musgrave and Musgrave, 1989:42). First, a market solution is not efficient in resource allocation if there are "externalities," which are costs or benefits of market transactions not reflected in prices. In other words, "An externality is any valued impact (cost or benefit) resulting from any action (whether related to production or consumption) that affects someone who did not fully consent to it" (Weimer and Vining, 1992:57). Examples are shown in Table 1.1.

Table 1.1. Examples of Externalities

	Positive	Negative
Producer-to-producer	Warm water from nuclear power plant used by downstream fish farmers	Toxic chemical pollution harming downstream commercial fishing
Producer-to-consumer	Private timber forests providing scenic benefits to nature lovers	Air pollution from factories harming lungs of people living nearby
Consumer-to-consumer	Immunization by persons against contagious disease helping protect others	Cigarette smoke from one person reducing enjoyment of meal by another
Consumer-to-producer	Unsolicited letters from consumers providing information on product quality	Disturbing of domestic farm animals by game hunters

Source: Weimer and Vining (1992:59)

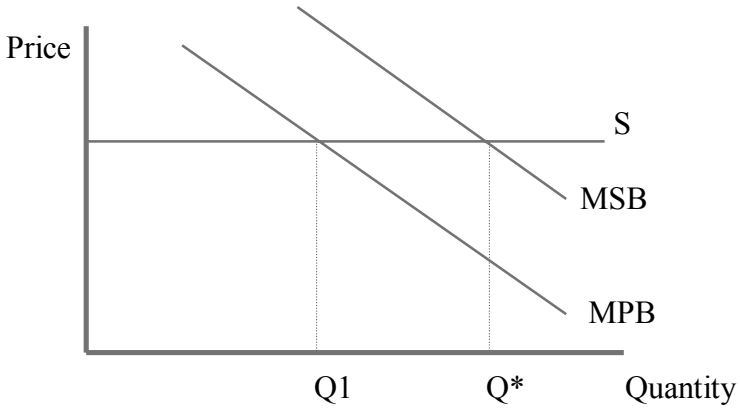

Figure 1.1. Underproduction with a Positive Externality

Figure 1.1 illustrates the resource allocation effects of a positive externality in production. In the presence of a positive externality, producers will produce too little of

the good that generates the externality. For example, the individual student is willing to pay the price for education depending on his or her own utility, not depending on the overall effect of his or her education on society. Therefore, quantity for education is chosen at Q1 at which supply schedule (S) intersects marginal private benefit schedule (MPB). But economic efficiency requires that marginal social benefits (MSB) and marginal social costs (which is supply schedule) be equal at the selected output level. Therefore, efficient output level should be at Q*.

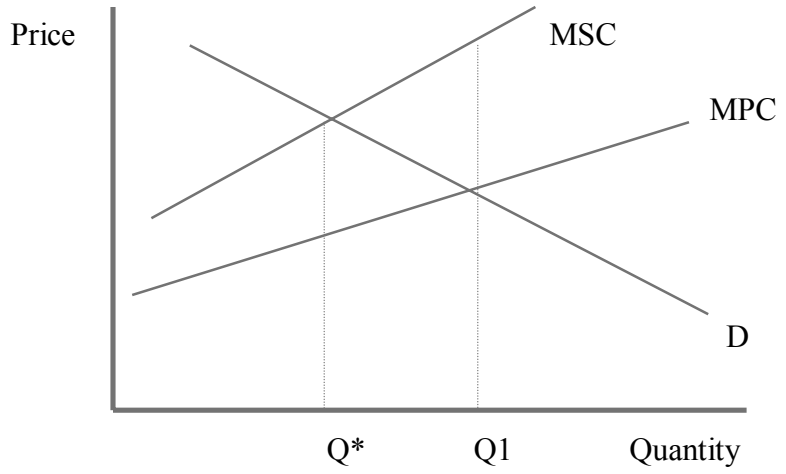

Figure 1.2. Overproduction with a Negative Externality

Figure 1.2 illustrates a negative externality. In the presence of a negative externality, producers will produce too much of the goods that generate the externality. For example, if the goods are a chemical product, marginal private cost (MPC) represents the marginal amounts the firm has to pay for the raw materials, labor, and other things needed for the final product. Therefore, quantity for the chemical product is chosen at Q1 at which MPC

intersects demand schedule (D). But the marginal private cost does not reflect the negative impacts of the pollution that is a byproduct of the manufacturing process. If we can find out how much each person is willing to pay to avoid the pollution at each output level, then we can add these amounts to the marginal costs. That will be the marginal social cost (MSC). Economic efficiency requires that marginal social benefits (which is demand schedule) and marginal social costs be equal at the selected output level. Therefore, efficient output level should be at Q*.

According to Musgrave and Musgrave (1989), another reason that justifies governmental action in the marketplace is that society does not like the results of resource allocation even though the market is working efficiently. According to an agreed-upon normative standard, society judges what is a fair and equitable distribution of income and goods and services. In this case, society charges government with altering the market outcomes to confirm with the normative standard. A third reason for governmental action is related to macroeconomic problems. A competitive free market cannot guarantee full employment, price stability, and economic growth.

Musgrave (1959) terms these three functional areas of governmental action: *allocation*, *redistribution*, and *stabilization*. The *allocation* function covers all public policies that restore an efficient allocation of resources that the market cannot perform because of the nature of public goods and externalities. The *redistribution* function includes public policies that make the actual distribution of income and wealth fair and equitable according to society's normative standard. The *stabilization* function refers to public policies that are designed to insure full employment, price stability, and economic growth.

1.4. Multiunit Provision of Public Goods

If we look at the real world, we can hardly find any nation that has only one governmental unit. For example, South Korea, which is a relatively small country, has about 250 governmental units.[4] The US has about 80,000 governmental units. In reality, therefore, multi-governmental units, not one governmental unit, perform the three governmental functions mentioned above in both nations. This multiunit governmental structure leads us to ask why we need multi-governmental structures instead of one big government. Obviously, this multiunit governmental structure reflects each nation's social and political history. Models of federalism attempt to define the relationships between the national government and subnational governments (Leach, 1970; Lauth and Douglas, 1995). A competitive theory of federalism characterizes the relationships as competing for power. It includes nation-centered federalism, state-centered federalism, and dual federalism. An interdependent theory of federalism emphasizes the interaction among levels of government, especially interactions based upon allocation of financial grants and aids. It includes cooperative federalism, creative federalism, and new federalism (which sought to reallocate functional responsibilities among national, state, and local levels of government). Although theories of federalism may explain much about the role of the national government and its fiscal relationship with subnational governments, they do not provide a complete explanation of intergovernmental relations.

In addition to history and political theory, there are also economic reasons for the multiunit governmental structure. According to Musgrave (Musgrave, 1959; Musgrave and Musgrave, 1989), the economic rationale for multiunit governmental provision of

[4] The governmental unit means a government that has taxing and expenditure power.

public goods is that each public good in question has a different geographical benefit area. The benefit area is a geographical area over which public good's quality remains unchanged (Raimondo, 1992:51). In the case of fire protection, for example, its benefit area is small or local because the distance between a fire station and an individual household affects the quality of fire protection. For the case of national defense, its benefit area is large or nationwide because individuals receive the same quality of defense service regardless of where they live. Efficient allocation of resources requires that "each jurisdiction provide services the benefits of which accrue within its boundaries, and it use only such sources of finance as will internalize the costs" (Musgrave and Musgrave, 1989:447). Therefore, the provision of a specific good should be assigned according to its benefit area.

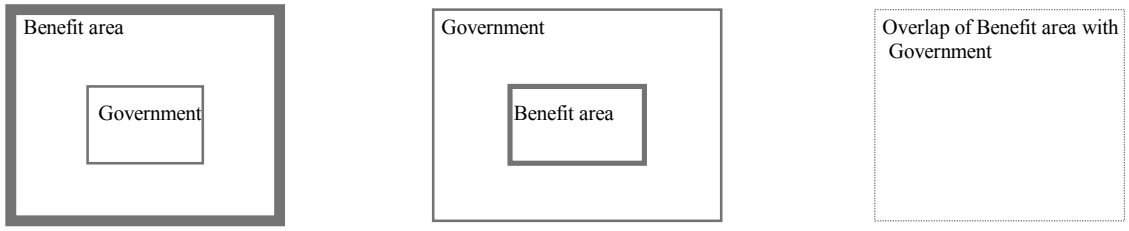

Figure 1.3. Correspondence between the Benefit Area and the Size of Government (Raimondo, 1992:55)

Figure 1.3 illustrates the degree of correspondence to which the benefit area and the size of a governmental unit match.[5] In the case I, the benefit area is greater than the size

[5] The governmental unit is assumed to fully internalize the costs within its jurisdiction.

of the government. This situation is called a benefit spillover (or spatial externality). Like the positive externality, the residents underestimate the true social benefit and demand too little of the good or service. In the case II, the benefit area is smaller than the size of the government. All residents pay for the good or service, but only some of the people receive it. This situation is called a cost spillover. Like the negative externality, the people who receive the benefit underestimate the true social cost and demand too much. The case III has a perfect match between the benefit area and the size of the governmental unit. In this case, because the quantity will be chosen at the point where the marginal social benefit equals perfectly the marginal social cost of the provision, the resulting resource allocation is efficient.

Musgrave and Musgrave (1989:447) conclude that

> The spatially limited nature of benefit incidence calls for a fiscal structure composed of multiple services units, each covering a different-sized region within which the supply of a particular service is determined and financed…. Some services call for nationwide, others for statewide, and still others for metropolitan-area-wide or local units.

Until now, we have discussed the rationale for multiunit provision of public goods only in terms of the spatial dimension of goods in question. Besides that, there are other considerations that we should take into account for the multiunit provision of public goods. If all people desire the same amount and type of a specific service, for example police protection, then there is no reason for more than one governmental unit, which will be a large one, to provide uniform police protection service across the nation (assuming that the benefit area of police protection is nationwide). But if people differ in their preferences for police protection service, many people will be dissatisfied with the uniform

level of service. The efficient solution is to provide a different level of police service depending on people's preferences. Moreover, as Tiebout (1956) argues, if consumers can choose residential location freely depending on their preferences for service/tax packages, the advantage of a multiunit governmental structure is strengthened because the residential sorting may increase heterogeneous demands and differential tax prices across jurisdictions.

A welfare loss due to centralized provision of public goods is illustrated in Figure 1.4. Two groups have different demands for a particular public good. Demand curve 1 (D1) represents the demand of group 1 while demand curve 2 (D2) represents the demand of group 2. Let us assume the unit price of the public good is fixed at P. A government provides a single level of quantity at Qc. For group 1, the government overprovides the public good. For group 2, the government underprovides the public good. Welfare loss due to unitary provision is represented by two shaded areas, which are ABC and CEF. Therefore, if the provision of the public good is decentralized at Q1 and Q2, the welfare loss, the sum of ABC and CEF in this particular example, will disappear.

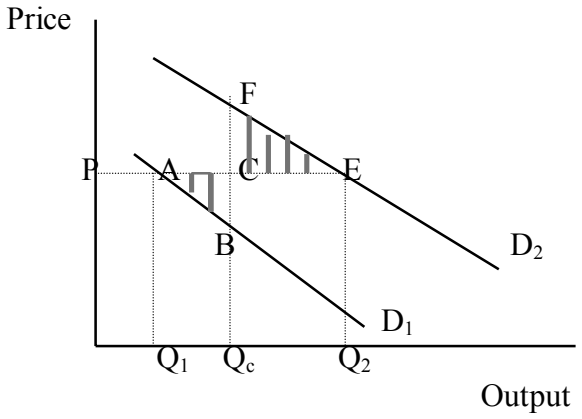

Figure 1.4. Welfare Loss due to Centralized Provision (Oates, 1977:10)

This consumers' surplus analysis implies another point. The magnitude of the welfare loss from centralized provision is dependent upon the variation in individual demands. For example, if the distance between Q1 and Q2 were much longer than the distance presented in Figure 1.4, the welfare loss, that is, the sum of ABC and CEF could be larger. Therefore, the magnitude of efficiency gain from decentralized provision is critically dependent upon the extent of heterogeneous demands and differential tax prices across jurisdictions (Oates, 1977:10).

There are also several arguments against multiunit provision of public goods. The most common argument is related to economies of scale. The term refers to a decrease in cost per person for a given amount of service as population served increases.[6] It is argued that for a service provision or production, the responsible political jurisdiction should be large enough to take advantage of falling per person cost. The reasons for potential economies are the elimination of duplication of inputs, increased coordination, and economies in purchasing. However, the empirical studies on economies of scale in service provision or production are not consistent. In a review of the literature, Bahl and Vogt (1975:13-14) conclude that

> Most positive findings of scale economies are based on statistical results that show a negative relationship between population size and per capita expenditures. There are great statistical and theoretical problems with interpreting such results as showing scale economies, and about as many studies that find a negative relationship find a positive one. (Fisher, 1996:126)

1.5. Fiscal Federalism

Fiscal federalism generally describes the division of governmental functions and revenue powers between entities in a multilevel government system. The key question of fiscal federalism is which government should undertake what activity, and on whose budget?

The term "federalism" may have multiple meanings depending on how or where it is used.[7] In this study, the focus is on economic usage. In economic terms, fiscal federalism is defined as the study of multilevel finance (Oates, 1977). In this sense theories of fiscal federalism may be applied for a country in a formally unitary system because there is typically a considerable extent of de facto fiscal discretion at decentralized levels even in that country.

According to Musgrave (1959), stable economic growth and the redistribution of income are appropriate objectives of the central government while the allocation function should be assigned to other levels of government depending on the nature of goods and services. However, theorists differ regarding the proper assignment of functions in the first two areas: stabilization and redistribution.

For the stabilization function, the conventional argument is that subnational economies are so open that the effects of local stimulative policy disperse throughout the whole economy. This argument is based on the idea of spatial externality. That is, if a benefit is not held within the area where the benefit is financed, the resulting resource allocation is

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[6] In standard microeconomic usage, economies of scale refers to a decrease in average cost as the quantity of output rises.

[7] For a legal study, federalism generally refers to a constitutional framework. In the field of political science, the term is used to cover a wide range of studies such as research on federal institutions, intergovernmental policy formulation, and implementation.

not efficient. A remedy is that the cost area is increased according to the benefit area. Therefore, the central government should undertake stabilization policy.

However, this conventional argument has been challenged on several grounds. Some studies provide a rationale for subnational economic development policy. Gramlich (1987) holds that many subnational economic development policies have greater effects within the jurisdiction. And, increasingly, macroeconomic problems are regional rather than national. Therefore, to solve the regional macroeconomic problems may require regional rather than national policy.

For the redistribution function, the conventional argument follows the same logic as in the stabilization function. The benefit of a redistribution policy in a subnational government cannot be held within the jurisdiction because of free mobility of population. For example, if a state has a generous welfare benefit package for lower income families, the residents in nearby states, which have less generous welfare programs, might migrate into the state that has a generous program. Meanwhile, higher-income taxpayers might move to a different state where less generous welfare program exists. Because of this externality, the conventional argument holds that the central government should undertake the redistribution function.

However, some studies show that few welfare recipients actually move to other states to receive higher welfare benefits (Homer, 1975). Moving is costly and other locational factors may offset redistributional incentives. If mobility of welfare recipients among jurisdictions is trivial, there may be an efficiency rationale for redistribution at the subnational level because subnational governments are better able to express regionally diverse preferences for redistribution (Pauly, 1973).

On the revenue side, each level of government requires fiscal instruments to carry out the assigned functions. Then, the issue will be "Which taxes are best suited for use at the different levels of government?" (Oates, 1999:1125)

As mentioned earlier, efficient allocation of resources requires that each jurisdiction should provide services the benefits of which accrue within its boundaries, and that it should use only such sources of finance as will internalize the costs. Therefore, efficiency requires that the beneficiaries of each benefit jurisdiction pay for the services, which that jurisdiction provides. Accordingly, if the benefit region is nationwide, then a national tax is necessary. If the benefit region is local, then a local tax is more logical.

Because of the inherent nature of taxation, however, the link between spending and taxing is not always explicit. In other words, taxation cannot always follow this benefit principle. Therefore, there is a need for compromise in which efficiency cost is minimal in a given situation. Considering this fact, Musgrave (1983) suggests the following principles for tax assignment.

1. Highly progressive taxes, especially for redistributional purposes, should be centralized. Such taxes are to be avoided at decentralized levels of government because of the perverse incentives they create for migration among jurisdictions.
2. In general, lower-level governments should eschew taxes (at least nonbenefit taxes) on highly mobile tax bases. Such taxes can distort the locational pattern of economic activity. Decentralized governments are better advised to employ taxes on relatively immobile tax bases (such as land).
3. The central government should exercise primary taxing authority over those tax bases that are distributed across jurisdictions in a highly unequal fashion. Taxes on deposits of natural resources, in particular, should be centralized to avoid geographical inequities and to prevent allocative distortions that can result from the local taxation of such resources.
4. While user taxes and fees have much to commend them at all levels of government as benefit taxes, they are an especially appealing revenue

> instrument at the most decentralized levels of government. They create, in principle, no potentially distorting incentives for movements among jurisdictions. (recited from Oates (1994:131))

This prescription may be summarized that nonbenefit taxes should be assigned to the central level and benefit taxes should be assigned to the local level in order to minimize economic distortion induced by taxes, based on the following assumptions: (1) the mobility cost of economic units such as labor, capital, etc. increases as the geographical size of jurisdiction increases and (2) people are more willing to pay taxes if they receive services they value.

However, there are few empirical studies on this issue. Some recent studies explore the efficiency costs induced by local income tax (Goodspeed, 1989) and local taxation of natural resources (Mieszkowski and Toder, 1983). They conclude that the economic distortions by such taxes are marginal so that the constraint on the local use of ability-to-pay taxation is somewhat exaggerated and the restraint on the local taxation of natural resources may be justified only according to the equity standard. The issue is not settled. As Oates (1994:133) holds, therefore, "we have some general prescriptions for the assignment of revenue instruments to different levels of government. But we badly need a better empirical sense of just what is at stake here." The research undertaken in this dissertation will contribute to improving our understanding of this issue.

1.6. Summary

This chapter stated three research questions and presented arguments regarding the importance of this study. According to Musgrave (1959), three major economic functions

of governmental action are *allocation, redistribution,* and *stabilization*. The nature of public goods and externalities provide a rationale for the *allocation* function. Income redistribution and macroeconomic issues provide a rationale for the *redistribution* and *stabilization* functions.

A key argument for decentralization is that the decentralized provision of public goods increases efficiency in resource allocation because the quantity of the public goods can be better adjusted to citizens' preferences. The key question of fiscal federalism is which level of government should undertake what function, and on whose budget?

In the case of functional assignment among the levels of government, the conventional argument prescribes that subnational governments should be engaged in the *allocation* function, while the central government should be engaged in the *redistribution* and *stabilization* functions. Musgrave (1959) and Oates (1972, 1977) provide a theoretical rationale for this prescription. However, some empirical studies provide a rationale for subnational redistribution and stabilization policies (Homer, 1975; Pauly, 1973; Gramlich, 1987). Because of this conflicting view, it is useful to re-examine this issue.

In the case of the assignment of revenue instruments, the conventional argument is that the beneficiaries of each jurisdiction should pay for the services which the jurisdiction provides. However, some empirical studies find that local use of ability-to-pay taxation may induce only marginal economic distortion. Therefore, we need a better empirical understanding of this issue.

In the next chapter, we review the recent development of local autonomy and fiscal decentralization in Korea. We also describe fiscal structure of local governments in Korea for a better empirical sense of the issues.

CHAPTER 2

FISCAL FEDERALISM IN KOREA

In the previous chapter, we reviewed theoretical arguments concerning fiscal decentralization. The first section of this chapter is devoted to (1) describing the recent development of local autonomy and fiscal decentralization in Korea and (2) defining the concept of fiscal decentralization. The latter part of this chapter is devoted to describing the fiscal structure of local government in Korea. The section, "Fiscal Structure of Local Government in Korea," has two purposes: (1) a clear understanding of the structure of Korean local finance and (2) descriptive analysis of fiscal decentralization's effects on local finance. A detailed description of local finance in Korea will be helpful for a solid understanding of the subject. Later on, we perform a more sophisticated statistical analysis concerning the effects of fiscal decentralization on local finance. This chapter contributes to providing background information for that systematic analysis.

2.1. Local Autonomy and Fiscal Decentralization in Korea

2.1.1. Brief History of Local Autonomy

Recently, Korea has embarked on a new political system which allows subnational elections and local autonomy. When the modern Korean government was established in 1948, local autonomy was included in the Korean Constitution. However, the military coup in 1961 suspended the law's implementation. The main reason for this abeyance was that a decentralized government was thought to have the potential for social disorder and inefficiency. Local preferences and priorities received low attention. Instead, the policy

emphasis was on national economic development. There were no local assemblies or elected officials in local governments. All governors and mayors were appointed by the central government. As a result, the local governments were administrative agencies of the central government rather than autonomous decision-making units.

Accordingly, the most distinctive characteristic of the fiscal structure of Korean local government had been uniformity (Jun, 1992:363). Because the functions and responsibilities of local governments were determined by national law, not by the local electorate, they were uniform throughout the country for governments at each level. Also, local taxes across the country had the same structure and rate.

However, this highly centralized system was increasingly strained by the need for financing local public services which were expanded to meet an increasing demand due to economic development. Such critical services as education and health care failed to reach large segments of Korean society. Some reformers thought that elected local authorities with resources adequate to meet local needs were increasingly necessary.

Another force toward local autonomy is based on politics. Many Koreans suffering from long military autocracy were desperately longing for political democratization. As a result, the National Assembly passed the Local Autonomy Act (L.A.A.) of 1989. Local assembly elections were held in 1991 and gubernatorial and mayoral elections were held in 1995. This enactment and its implementation symbolize progress in democratic governance in Korea. By law, local governments were no longer spending agencies of the central government. The local assembly has the power of deciding its own budget and local law even though it has some limitation. The elected governors and mayors also have considerable power over personal management and fiscal decision-making.

2.1.2. Fiscal Decentralization

According to Oates (1972), fiscal decentralization refers to the degree of independent decision-making power in the provision of public services at different levels of government. The concept is on a continuous spectrum rather than being dichotomously centralized or decentralized. Depending on the degree of fiscal decision-making at the subnational level, it may have three different names; deconcentration, delegation, and devolution (Bird and Vaillancourt, 1998:3). First, "deconcentration means the dispersion of responsibilities within a central government to regional offices or local administrative units." The central government shifts some tasks to the local administrative units without allowing local discretion. Therefore, local administrative units have little independent decision-making power. Second, "delegation refers to a situation in which local governments act as agents for the central government, executing certain functions on its behalf." In this case, local governments may have discretion to a certain degree in the provision of public services, but they ultimately follow the central government's direction and request. Third, "devolution refers to a situation in which not only implementation but also the authority to decide what is done is in the hands of local governments." In this case, local governments are independent decision-making units so that they can respond ultimately to resident preferences and needs in the provision of public services. In this study, fiscal decentralization means devolution; resident preferences are readily revealed and reflected in local budget outcomes.

The next issue is how to measure the degree of independent decision-making power in the provision of public services at different levels of government. A complete measure of this must include a number of dimensions. It may include legal, political, organizational,

demographic, cultural, geographical, historical, and fiscal variables. An index, which includes all of these dimensions, might be developed but it is not easy to develop because some of the variables may not be measurable empirically. This study focuses only on the fiscal aspects of governmental activities. As Oates (1972:197) holds, the extent of fiscal activities at different levels of government is of fundamental importance in determining their influence on the allocation of resources.

Therefore, the independent fiscal decision-making power of different levels of government can be used as a measure of the fiscal autonomy of each level of government. There are logically three ways in which the degree of local autonomy changes. First, where the central government exclusively provides a public service, no local autonomy is evident in this service area. Second, where local governments have exclusive responsibility of providing a public service, there is a clear evidence of local autonomy. Third, where the central and local governments have shared responsibility of delivering a public service, we have the best opportunity of observing the degree of local autonomy changes. The importance of local finance relative to central finance regarding the delivery of a public service serves as an indicator of the degree of independent decision-making power in local governments. Fiscal data to measure the degree of independent decision-making power in the provision of public services are readily available.

Prud'homme (1990) provides a simple definition of fiscal decentralization. He (1990:118) suggests that the degree of fiscal decentralization may be defined by three criteria: (1) the importance of local taxes relative to central taxes, (2) the importance of local expenditures relative to central expenditures, and (3) the importance of central subsidies to local resources.

However, there are some limitations to use this definition. A simple ratio of the subnational revenue or expenditure to total revenue or expenditure may not be appropriate to measure the degree of fiscal decentralization. The problem with the use of fiscal measures for decentralization has to do primarily with the effects of grants and mandates. It is well recognized that receipt of grants by local government may be accompanied by restrictions on their use, thus in effect limiting local government discretion. Therefore, local government expenditures may not provide a good measure of subunit discretion or effective decision-making. Local own-source revenues as a proportion of total revenues suffer from similar difficulties. The higher-level government may raise the bulk of revenues in a system, but, if it then turns around and sends some of these back to subunit governments in the form of general purpose grants, the local units are not as deprived of discretionary power as might appear. Therefore, some adjustments are needed to utilize these measures. In this study, as Oates (1972:201) suggests, conditional grants are counted as central government expenditures and unconditional grants are counted as local revenue.

2.1.3. Signs of Fiscal Decentralization in Korea[8]

Table 2.1 shows how local government taxes in Korea have changed during the last 30 years. The local government share of total taxes has more than doubled from 8.3 percent to 21 percent. The steep rise in the local share of tax revenue between 1985 and 1990 also implies that a great deal of change in local tax structure took place during the second

[8] Although we come up with a modified measure of fiscal decentralization in the previous section, difficulty of getting data before 1980 prevents a presentation with the modified measure in this section. In hypothesis testing, however, we use the modified measure of fiscal decentralization.

half of the 1980s. It is an indication that revenue decentralization has taken place during the 1980s and 1990s.

Table 2.1. Local Government Share of Total Taxes
(billion won; $1 is approximately 1,200 won)

	1970	1975	1980	1985	1990	1995	1998
Total	398.1	1,549.8	6,575.4	13,531.0	27,081.8	70,205.2	81,769.3
National	364.9	1,391.0	5,807.7	11,876.4	21,924.2	54,888.3	64,621.0
Local	33.2	158.8	767.7	1,654.6	5,157.6	15,316.9	17,148.3
%Local	8.3%	10.2%	11.7%	12.2%	19.0%	21.8%	21.0%

Source: Bank of Korea, *Economic statistics yearbook*, various years

Table 2.2 shows how local government expenditures in Korea changed during the last 30 years. The local government share of total government expenditures has almost doubled during the last 30 years from 24.1 percent to 39.2 percent. This indicates expenditure decentralization during the 1980s and 1990s.

Table 2.2. Local Government Share of Total Government Expenditures
(billion won)

	1970	1975	1980	1985	1990	1995	1998
Total	693.7	2,482.1	10,502.9	20,028.4	51,023.4	126,306.2	176,678.1
Central	526.5	1,923.6	7,898.7	13,433.8	29,439.2	75,247.2	107,495.9
Local	167.2	558.5	2,604.2	6,594.6	21,584.2	51,059.0	69,182.2
%Local	24.1%	22.5%	24.8%	32.9%	42.3%	40.4%	39.2%

Source: Bank of Korea, *Economic statistics yearbook*, various years

Table 2.3 shows how the self-reliance rate of local governments (ratio of own-source revenue to total local revenue) has changed during the last 30 years. The self-reliance rate has increased from 38.5 percent in 1970 to 66.5 percent in 1998. An especially steep

increase occurred in the self-reliance rate of local governments between 1985 and 1990. This indicates a change in the degree of fiscal decentralization during this period.

Table 2.3. Self-reliance Rate of Local Government
(billion won)

	1970	1975	1980	1985	1990	1995	1998
Total	143.4	517.0	2,339.7	5,655.9	15,164.7	36,667.4	48,977.6
Own-source	55.2	235.2	1,272.8	2,960.2	10,358.2	24,349.4	32,591.4
Grants	88.2	281.8	1,066.9	2,695.7	4,806.5	12,318.0	16,386.2
Self-reliance	38.5%	45.5%	54.4%	52.3%	68.3%	66.4%	66.5%

General account only
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local governments*, various years

To sum up, during the 1980s and 1990s the Korean fiscal structure shows signs of decentralization in terms of "the importance of local taxes relative to central taxes," "the importance of local expenditures relative to central expenditures," and "the importance of central subsidies to local governments." In the following section, the fiscal structure of local governments in Korea is described in detail.

2.2. Fiscal Structure of Local Government in Korea

In this section, we describe the fiscal structure of local government in four perspectives: (1) local finance by account, (2) local finance by local autonomy unit, (3) local revenues, and (4) local expenditures.

2.2.1. Local Finance by Account

Local finance in Korea may be divided into local government finance and local education finance. The former consists of a general account, public enterprise special accounts, and other special accounts, while the latter is an education special account.

According to Table 2.4, local government finance accounts for 80.9 percent of all local government expenditures while local education finance accounts for 19.1 percent of all expenditures. The general account, the public enterprise special, and other special accounts represent 73.3 percent, 12.1 percent, and 14.6 percent of total local government finance expenditures respectively.

Table 2.4. Composition of Local Finance, 1998
(billion won)

	Expenditure*	Percentage
Total	**91,515**	**100.0%**
Local Government Finance	**73,995**	**80.9%**
General Account	54,265	73.3%
Public Enterprise Special Accounts	8,920	12.1%
Other Special Accounts	10,810	14.6%
Sub-Total	73,995	100.0%
Local Education Finance		
Education Special Account	17,520	19.1%

* Budget figures
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999

The public enterprise special account supports five public enterprises: waterworks, sewage, public development, regional development funds, and the subway. The other special accounts category has eight special accounts including education & culture, health & environment, social security, housing & regional development, farming & fishing

development, regional economy development, resources conservancy development, and transportation development.

Special accounts are designed for special projects, while the general account is for the overall fiscal activities of government (Park, 1992:307). Special account budgets follow a similar budgetary process to that of the general account. They are included in the local government budget and hence under the control of the local assembly. The expenditures of the special account are not supported by local taxes, but by user charges, intergovernmental grants, and debt financing.

There are two reasons for establishing a special account. First, because local governments are required by the central government to have a balanced budget for the general account, if they want to initiate a new project that has a possibility of jeopardizing budget balance, they might establish a special account for that activity. Second, even though special accounts are under the control of the local assembly, the local assembly's focus is usually put on the general account because special accounts are not financed by local taxes. Therefore, having special accounts allows public officials to escape strict control. Some argue that the proper use of special accounts may help local governments to actively operate financial resources in terms of more service provision. However, as Ha (1997:61-62) warns, the proliferation of special accounts also may cause disorganized and fragmented public budgeting.

Table 2.5. Composition of Revenue Sources of Education Special Account, 1998

	# of Units	From Central Gov	From General AC	Others
Total	16	78.5%	6.0%	15.4%
Seoul	1	58.9%	22.2%	18.7%
Metro City	6	72.7%	8.6%	18.7%
Province	9	85.8%	0.9%	13.3%

Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government,* 1999

There are 16 education boards (Table 2.5), each with its own jurisdiction. These education boards are responsible for providing elementary and secondary education. Education special accounts receive revenue from central government transfers (78.5 percent), transfers from the general accounts of local governments (6 percent), and other sources including user fees (15.4 percent). This shows that elementary and secondary education in Korea is heavily dependent upon central government transfers. A comparison of jurisdictional types shows that education boards in provinces are more dependent upon central transfers (85.8 percent). The education board in Seoul receives the highest percentage of support from the local general account (22.2 percent).

2.2.2. Local Finance by Local Autonomy Unit

As of 1998, local autonomy units in Korea consisted of Seoul and its 25 autonomous districts, six metropolitan cities and their 44 autonomous districts, and nine provinces and their 73 cities and 92 counties. Unlike the U.S., there is no geographical overlapping jurisdiction between cities and counties in Korea.

Table 2.6. Local Autonomy Units in Korea (1998 and 1991)
(* billion won)

	1998			1991		
	Number of Units	Expenditure*	Percent	Number of Units	Expenditure*	Percent
Total	**250**	**67,469.4**	**100.0%**	**275**	**21,850.2**	**100.0%**
Seoul	**26**	**11,133.1**	**16.5%**	**23**	**4,449.0**	**20.4%**
Head Office	1	8,216.0	12.2%	1	3,313.0	15.2%
Autonomous	25	2,917.1	4.3%	22	1,136.0	5.2%
Metro City	**50**	**14,203.3**	**21.1%**	**39**	**4,153.4**	**19.0%**
Head Office	6	10,966.5	16.3%	5	3,012.3	13.8%
Autonomous	44	3,236.8	4.8%	34	1,141.1	5.2%
Province	**9**	**15,044.5**	**22.3%**	**9**	**2,307.1**	**10.6%**
City	**73**	**17,475.2**	**26.0%**	**67**	**5,418.8**	**24.8%**
County	**92**	**9,613.4**	**14.2%**	**137**	**5,521.9**	**25.3%**

All accounts combined except education
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999 and 1992

Table 2.6 shows the number of local governments and their expenditures in 1998 and 1991. The number of local government units decreases from 275 in 1991 to 250 in 1998. This decrease is largely due to city-county consolidations which were implemented during the period 1995 through 1996. The major purpose of these consolidations was to increase the size of local governments, thus making the fiscal capacity of local governments stronger (Kwon, 1998:19).

The most interesting change is that, while the expenditure share of provinces has more than doubled during this period, the expenditure shares of Seoul and county governments have decreased. The decreasing expenditure share of counties may be explained partly by the decrease in the number of county units. The increasing expenditure share of provinces may indicate that the functional responsibility of provincial government is becoming greater.

Table 2.7. Expenditure Shares of General, Enterprise Special, and other Special Account, 1998
(billion won)

	Total Expenditure	%	General Expenditure	%	Enterprise Expenditure	%	Other Special Expenditure	%
Total	**67,469.5**	**100.0**	**51,520.6**	**76.4**	**7,188.1**	**10.7**	**8,819.0**	**13.1**
Seoul	**11,133.1**	**100.0**	**8,119.5**	**72.9**	**685.8**	**6.2**	**2,386.2**	**21.4**
Head Office	8,216.0	100.0	5,400.7	65.7	685.8	8.3	2,187.9	26.6
Autonomous	2,917.1	100.0	2,718.8	93.2	0.0	0.0	198.3	6.8
Metro City	**14,203.3**	**100.0**	**9,138.9**	**64.3**	**2,036.9**	**14.3**	**3,027.4**	**21.3**
Head Office	10,966.5	100.0	6,175.3	56.3	2,036.9	18.6	2,754.3	25.1
Autonomous	3,236.8	100.0	2,963.6	91.6	0.0	0.0	273.1	8.4
Province	**15,044.5**	**100.0**	**12,443.4**	**82.7**	**1,515.6**	**10.1**	**1,085.4**	**7.2**
City	**17,475.2**	**100.0**	**13,244.6**	**75.8**	**2,794.7**	**16.0**	**1,435.9**	**8.2**
County	**9,613.4**	**100.0**	**8,574.2**	**89.2**	**155.1**	**1.6**	**884.1**	**9.2**

Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999

Table 2.7 shows the expenditure shares of general, enterprise special, and other special accounts in relation to total expenditure for each jurisdictional type. Overall, the percentages of general accounts are high. Especially, the general accounts of autonomous districts in Seoul and other metropolitan cities have higher percentages (93.2 percent and 91.6 percent). The general accounts of head offices in Seoul and other metropolitan cities have lower percentages (65.7 percent and 56.3 percent). Counties have the lowest expenditure percentage for enterprise special accounts (1.6 percent). Autonomous districts in Seoul and metropolitan cities do not have this type of account. For other special accounts, head offices in Seoul and metropolitan cities have relatively high percentages (26.6 percent and 25.1 percent).

This observation shows us that urban governments such as Seoul, other metropolitan cities, and medium cities establish more special accounts in comparison with rural

governments such as counties. This may imply that urban governments provide more diversified services to the residents than rural governments.

2.2.3. Local Revenues

Table 2.8. Composition of Local Revenues by Source
(percentage)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Own	**71.5**	**68.6**	**73.0**	**73.4**	**75.9**	**75.4**	**78.5**	**76.9**	**76.4**	**75.5**	**76.3**	**76.3**	**72.1**
Tax	27.1	27.5	30.0	38.8	30.8	30.8	29.7	31.9	32.4	32.1	29.5	28.4	26.6
Non	44.4	41.1	43.0	34.6	45.1	44.6	48.7	45.0	44.0	43.5	46.8	47.9	45.6
Grant	**28.5**	**31.4**	**27.0**	**26.6**	**23.9**	**24.6**	**21.5**	**23.2**	**23.7**	**24.4**	**23.7**	**23.8**	**27.9**
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100

All local accounts are included except education
Local borrowing excluded
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

Korea's local government revenues are composed of local taxes, non-tax revenues, and grants such as local shared tax and subsidies. The total amount of local revenue has increased from 7474.7 billion won in 1986 to 63327 billion won in 1998. This represents a nine-fold increase. There are several interesting observations in Table 2.8. First, tax revenue shares increased dramatically between 1986 and 1989 (27.1 percent to 38.8 percent), but it still has a relatively low share of the total local government revenues. Second, overall the shares of non-tax revenues are high. Third, the shares of intergovernmental grants steadily decreased from the late 1980s through the early 1990s (28.5 percent to 21.5 percent) but by 1998 they returned to the late 1980s level. The declining trend of intergovernmental grants share of total local government revenues is due to the increase in non-tax revenue share of total local revenues. Since the end of 1997, Korea has suffered from a financial crisis that hit several Asian countries. That

financial collapse was one of the reasons for the increase in intergovernmental grants share of total local revenues in order to supplement local tax revenue loss due to the economic downturn.

Table 2.9. Composition of Local Revenue by Autonomy Unit, 1998
(billion won)

	Tax	Share (%)	Non-Tax	Share (%)	Grant	Share (%)	Total	Share (%)
Seoul	4,178.8	53.8	3,045.2	39.2	543.2	7.0	7,767.2	100.0
Metro City	3,558.9	32.9	5,008.8	46.4	2,235.6	20.7	10,803.3	100.0
Province	3,413.1	22.9	3,295.5	22.2	8,163.7	54.9	14,872.3	100.0
City	3,638.0	19.9	11,363.4	62.1	3,293.5	18.0	18,294.9	100.0
County	958.1	11.1	3,999.3	46.3	3,682.0	42.6	8,639.4	100.0
Autonomous	1,401.4	34.0	2,655.1	64.4	68.5	1.7	4,125.0	100.0

all accounts combined except education
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

As shown in Table 2.9, by the type of government, local governments have a different revenue structure. Big cities and their autonomous districts have higher tax revenue shares than other local governments. Autonomous districts and medium cities have non-tax revenues as the most important revenue source. For province and county governments, intergovernmental transfers are the most important revenue source. This observation may imply that depending upon the type of local governments, the degree of self-reliance rate is different. Because big cities have a larger tax base than rural cities and counties, they have higher self-reliance rate. On the other hand, because rural cities and counties do not have such a productive tax base, they are heavily dependent on intergovernmental grants to finance their programs. In the following, tax revenue, non-tax revenue, and intergovernmental grants are described in detail.

2.2.3.1. Local Tax

In general, there are six criteria to evaluate a tax: (1) economic efficiency, (2) fairness, (3) administration, (4) revenue stability, (5) the link between spending and taxing, and (6) tax visibility (Musgrave and Musgrave, 1989). First, economic efficiency tells us a tax should minimally affect an economic decision because economic distortion induced by taxes produces economic inefficiency. In other words, "the tax should ordinarily be neutral: economic behavior should be the same with a particular tax in place as it would have been without the tax" (Mikesell, 1995:294). For example, if jurisdiction A imposes a tax on the consumption of cigarettes, consumers can purchase cigarettes in jurisdiction B which imposes a lower tax. This involves an efficiency cost because individuals change their behavior due to the tax-induced price changes. A simple solution for this situation is that both of jurisdiction A and B impose the same tax rate on the consumption of cigarettes. The uniform taxation across jurisdictions may reduce the efficiency cost related to the mobility factor. However, the uniform taxation may be an impediment to efficiency gain of fiscal decentralization because it may not allow local governments to provide the tax and service packages that residents prefer.

Second, fairness is concerned with the concepts of horizontal and vertical equity. Horizontal equity concerns equal treatment of taxpayers who have equal capability to pay taxes. For example, suppose that two taxpayers are equivalent in income and wealth, but one taxpayer pays a significantly greater tax. The tax structure would then lack horizontal equity. On the other hand, vertical equity considers different treatments of taxpayers who have different capabilities to pay taxes. Unlike the horizontal equity standard, there is considerable disagreement as to what the proper differentiation should be. In general,

there are three types of tax burdens on income distribution: progressive, proportional, and regressive. A progressive tax is one where the tax burden (as a percentage of income) rises as income rises. People with higher income have higher marginal tax rates. A proportional tax is one where the tax burden is constant as income rises. All people regardless of their income have the same tax rate. A regressive tax is one where the tax burden falls as income rises. People with higher income have lower marginal tax rates even though the actual amount of tax contributions by people with higher income may exceed that of people with lower income.

The conventional argument concerning tax assignment among levels of government recommends that local governments should not use progressive taxation because of the efficiency cost induced by the mobility factor. However, there is little empirical evidence on this issue (e.g., Goodspeed, 1989; Mieszkowski and Toder, 1983). Rather, the constraint on the local use of a specific tax, for example a progressive tax, may impede the independent fiscal decision-making power in local governments. For example, if jurisdiction A has considerable income variation among residents, and the mix of public services and tax prices is not met by the demands of many residents in that people with higher income want higher quality of services and people with lower income want a lower tax price, one possible solution with the no mobility assumption might be to adopt a progressive tax to finance higher quality services for the rich and to put a lower tax price for the poor. In this sense, the proper choice of revenue instruments by local governments may increase efficiency in resource allocation.

The third criterion is administrative simplicity. A tax should be collected at reasonable cost because the cost of tax collection provides no net service to society (Mikesell,

1995:293). The collection cost, which consists of administrative cost and compliance cost should be as low as possible. If a tax's base and rate are complex, the collection cost will be high. In practice, however, this criterion is reconciled with other objectives such as efficiency and equity and becomes a complementary criterion. For example, a head tax with a flat rate is the simplest tax base and rate to calculate but it may violate the equity principle. As a result, it has not been adopted widely. Another example is a local property tax. The property tax requires much more administrative complexity than other taxes such as income and sales. Even though it is complex, local governments have adopted the property tax due to other reasons such as efficiency. Therefore, this criterion should be evaluated in conjunction with other objectives.

The fourth criterion is revenue stability. Citizens expect government to provide basic public goods and services regardless of the condition of the private economy. Therefore, a stable flow of tax revenue is important, especially in subnational governments because subnational governments are more likely to suffer from economic downturn. One indicator for revenue stability is revenue elasticity, which is the responsiveness of the tax base with respect to income. If the revenue elasticity of a specific tax is relatively low, the revenue flow of the tax is stable.

Fifth, the link between spending and taxing should be as clear as possible in subnational governments. The link between spending and taxing cannot be always identified in a public budget. Public economists suggest that benefit taxation may solve this difficulty. If local governments adopt benefit taxation, people may be able to know how each program spends the monies paid. Then voters can better evaluate public program options. This

will result in less tax resistance and avoidance behaviors because people receive services they value.

Also, from the efficiency perspective, as mentioned earlier, there must be a correspondence between the benefit zone of local public expenditure and the burden zone of the tax. If there is tax exporting in which outsiders absorb part of the cost of local services in a particular jurisdiction, the residents of the jurisdiction may not have to bear the full cost of their own public services and, as a result, they have an incentive to push the output of public services beyond the efficient level. This will result in inefficient resource allocation.

In practice, however, extensive use of benefit taxation may face some difficulties. For a benefit-base levy to be considered, there should be a strong link between the taxed commodity and the public good being financed (e.g., the link between gasoline and highway). But the link is not always explicit. Without an explicit link between the taxed commodity and the public good financed, earmarked revenues do not contribute to improve efficiency in resource allocation. Rather, they may impede the flexibility of local budget operation.

Sixth, the degree of tax visibility depends on several factors: economic transaction, size, and time (Bartlett, 1973). If the tax is part of the transaction, it is less visible. If the payment is relatively small, the tax is less visible. If a tax is paid often, then it is less visible.

According to several Korean scholars, there are several characteristics of the Korean local tax system related to fiscal decentralization. First, the tax base and tax rate of local governments are determined by national law and thus have the same structure across the

country. The central government gives local governments discretion to determine their own tax rates within a limited range. Such taxes as inhabitant tax, automobile tax, city planning tax, and regional development tax have a discretion range, but it is too narrow to produce a different tax structure across the country (Kwon, 1998:82). The same tax structure across the nation is obviously an impediment to fiscal decentralization because local governments cannot readily respond to the demand change of local residents.

Second, local taxation relies heavily upon property-related taxes. In principle, property taxes have the least revenue elasticity, which means the revenue flow is stable regardless of economic fluctuations. In this sense, this revenue source is appropriate for local use. However, Korean local governments levy taxes more heavily on sale and transfer of properties than on possession of properties. The revenues from Acquisition and Registration taxes far exceed those from Property and Aggregate Land taxes. Those revenues from the sale and transfer of properties are likely to be sensitive to business cycles in the property market. Therefore, revenue stability in Korean local governments is not secure even though local taxation relies heavily on property-related taxes.

Third, the Korean local tax system incorporates a variety of tax expenditures[9] set up by the central government. In 1996, the tax expenditures amounted to more than 10 percent of local tax revenues. The tax expenditure may encourage certain activities and assist certain groups. The problem is that because the central government establishes tax expenditures for local governments, certain tax expenditure items may not reflect well the reality of those local governments. Rather, it undermines local revenue sources.

[9] The tax expenditure is a revenue loss attributable to provisions of tax laws that allow a special exclusion, or deduction from gross income, or that provide a special credit, preferential tax rate, or deferral of tax liability (Mikesell, 1995:574).

Fourth, some scholars argue that local tax revenues are unevenly distributed between urban and rural jurisdictions, and the regional inequality in revenue-raising capacity may be a major obstacle to fiscal decentralization (e.g., Oh, 1992b). Ironically, however, the uneven distribution of local revenue is actually what fiscal decentralization wants to accomplish in terms of provision of various service/tax packages. Probably, the issue will be that some portions of the nation cannot afford a so-called "minimum standard of public services" due to weak revenue-raising capacity. However, regional disparities are not a particular phenomenon in Korea. Regional disparities exist in most countries including developed countries. A recent study shows that regional disparities in Korea are not as severe as in US (Choi and Kwon, 1997). Therefore, the argument concerning regional disparities seems to be somewhat exaggerated.

In 1998, the Korean local tax system was composed of 15 different taxes[10] (refer to Table 2.10). In 1986, it had 13 taxes. The 15 taxes may be classified into three broad categories; taxes on income, taxes on property, and taxes on consumption. The share of taxes on income decreased in 1990 to 10.8 percent from 17.2 percent in 1986, and increased slightly afterwards, reaching 17.4 percent in 1998. The share of taxes on property decreased in 1990 to 62.2 percent from 74.1 percent in 1986 and remained relatively constant. The most dramatic change occurred in the share of taxes on consumption. These taxes increased from 7.8 percent in 1986 to 26.2 percent in 1990. This large increase in the share of taxes on consumption is due to the introduction of a tobacco consumption tax in 1989.

[10] Refer to Appendix A for a glossary of tax terms.

Table 2.10. Composition of Local Tax
(billion won)

	1986	Share (%)	1990	Share (%)	1995	Share (%)	1998	Share (%)
Tax on Income	**310.5**	**17.2**	**675.2**	**10.8**	**1,999.5**	**13.1**	**2,978.1**	**17.4**
Inhabitant	227.7	12.6	529.8	8.5	1,701.4	11.1	2,639.1	15.4
Farmland Income	14.8	0.8	5.9	0.1	2.1	0.01	2.7	0.02
Business Firm	68.0	3.8	139.5	2.2	296.0	1.9	336.3	2.0
Tax on Property	**1,340.5**	**74.1**	**3,875.8**	**62.2**	**10,508.2**	**68.6**	**11,007.2**	**64.2**
Acquisition	371.2	20.5	1,164.9	18.7	2,691.0	17.6	2,479.8	14.5
Registration	395.9	21.9	1,377.6	22.1	3,632.5	23.7	3,388.5	19.8
Property	265.8	14.7	221.7	3.6	484.8	3.2	640.7	3.7
Automobile	139.1	7.7	413.5	6.6	1,545.2	10.1	2,174.6	12.7
Aggregate Land	0.0	0.0	381.9	6.1	1,235.2	801	1,199.3	7.0
City Planning	123.9	6.8	233.6	3.7	653.7	4.3	752.3	4.4
Fire Facility	44.6	2.5	82.6	1.3	0.0	0.0	0.0	0.0
Community Facility	0.0	0.0	0.0	0.0	204.4	1.3	301.7	1.8
Regional Development	0.0	0.0	0.0	0.0	61.1	0.4	70.3	0.4
Tax on Consumption	**140.6**	**7.8**	**1,633.0**	**26.2**	**2,611.3**	**17.0**	**2,884.9**	**16.8**
License	23.3	1.3	47.3	0.8	208.5	1.4	240.7	1.4
Butchery	18.6	1.0	17.3	0.3	33.9	0.2	48.2	0.3
Horse Race	9.4	0.5	57.9	0.9	217.0	1.4	329.4	1.9
Tobacco	89.3	4.9	1,510.5	24.2	2,151.9	14.0	2,266.6	13.2
Carry-over	18.2	1.0	46.0	0.7	197.8	1.3	278.1	1.6
Total Tax	**1,809.8**	**100.0**	**6,230.0**	**100.0**	**15,316.8**	**100.0**	**17,148.3**	**100.0**

Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

Overall, local tax revenues have been heavily dependent on property-related taxes but consumption taxes are becoming an important revenue source. This means that the Korean local governments tend to use more responsive taxes to economic fluctuations as a revenue instrument. Even though responsive taxes may not be stable, they can generate meaningful revenue during the periods of economic growth.

For individual taxes in 1998, the registration tax is the most important of all with a share of 19.8 percent, followed by inhabitant tax (15.4 percent), acquisition tax (14.5 percent), tobacco tax (13.2 percent), and automobile tax (12.7 percent). The farmland tax shows the lowest share of 0.02 percent. The registration tax status was changed from a

national to local tax in the 1976 Tax Reform Act. Its share has fluctuated around 20 percent. The inhabitant tax dropped below 10 percent in 1990 but climbed above 10 percent in 1995. The share of acquisition tax has shown a decreasing trend during the last decade. The automobile tax has increased at a double-digit percentage since 1995. In 1985 the tobacco sales tax was initially incorporated in the local tax system and in 1989 its tax base was expanded and it was renamed as the tobacco consumption tax. Before 1985 national monopoly profits from tobacco sales were transferred to the general account of the central government. In 1989, this practice was repealed. Instead, the tobacco sales tax became part of local tax base (Oh, 1992a:335).

Different types of local governments use different local taxes. Table 2.11 shows the current usage of local tax instruments by the type of government (as of 1998). A main characteristic of local tax usage by type of government is that there is little overlap in the tax bases between the levels of government (i.e., between Seoul and other metropolitan cities, and their autonomous districts; between provinces, and medium cities and counties). While metropolitan cities including Seoul do not use property taxes, aggregate land taxes, and business firm taxes, their sub-level governments, that is, autonomous districts use them as revenue instruments. While medium city and county governments do not use acquisition taxes, registration taxes, regional development taxes, license taxes, and horse race taxes, their upper-level of governments, that is, provincial governments use them as revenue instruments. Because national law determines the tax base, there may be few overlapping tax assignments among the levels of government. Again, this may be good for efficient tax administration, but centralized taxation may limit the independent fiscal decision-making power in decentralized governments.

Table 2.11. Local Tax by the Type of Government (1998)

	Seoul & Metro	Province	Medium Cities	Counties	Autonomous
Inhabitant	O		O	O	
Farmland Income	O		O	O	
Business Firm			O	O	O
Acquisition	O	O			
Registration	O	O			
Property			O	O	O
Automobile	O		O	O	
Aggregate Land			O	O	O
City Planning	O		O	O	
Community Facility	O	O	O	O	
Regional Develop	O	O			
License	O	O			O
Butchery	O		O	O	
Horse Race	O	O			
Tobacco	O		O	O	

Legend: o indicates the use of the tax.
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999

2.2.3.2. Non-Tax Revenue

Non-tax revenues include user charges, fees, interest earnings, sales of property, carryover and so forth. Particular attention is paid to user charges and fees in the context of fiscal decentralization. According to Zorn (1991:137), "User charges and fees are payments for voluntarily purchased, publicly provided services that benefit specific individuals, but exhibit public-good characteristics or are closely associated with public goods." In theory, user charges should be operated in the manner that an individual's charge depends both on benefit and cost of provision. In this way, public goods and services can be produced and distributed using a private market mechanism rather than the political budget process. Then user charges can play the role of private market prices. In other words, they can provide clear demand signals. Then, a local government can determine efficient level of services. However, if the prices of user charges are not

structured to reveal the true demand of a service (usually due to underpricing), user charges are no longer an effective instrument for a clear demand signal.

Table 2.12. The Ratio of Earnings to Operating Costs in User-charge Items.

Type of User Charge Item	Earnings/Operating Costs
Recreational Complex	56.2
Educational Facility	11.6
Cultural Facility	37.2
Business Facility	104.8
Public health Facility	33.1
Average	58.5

Source: Oh and Park (1996)

In Korea, as shown in Table 2.12, revenues from many user charges do not meet operating expenses. The main reason for those deficits is due to the low rate of user charges, which central mandates direct. National law requires that when local governments set user-charge rates, they consult with the central bureau, which is more concerned with price stability and inflation throughout the nation, than with local government's budget office. Also, central mandates require that local governments provide certain services at no cost. Therefore, the current practice of central government intervention on price setting on user charges may impede efficient resource allocation in the local sector.

As shown in Table 2.8, the shares of non-tax revenue are high. This is because enterprise and other special accounts as well as general accounts are included in Table 2.8. Compared with the shares of non-tax revenue in general accounts only and all accounts combined (Table 2.13), one may notice that the share of non-tax revenue in all accounts combined (45.6 percent) is higher than the share in general accounts only (31.5 percent). In comparing Korea to the U.S. non-tax revenues are 31.5 percent and 24.4 percent

respectively.[11] Obviously, this comparison is rough but it gives us an idea of the heavy dependence of Korean local revenue on non-tax sources.

Table 2.13. Composition of Local Revenues by Account, 1998

	General account only	All accounts combined
Tax	35.0%	26.6%
Non-Tax	31.5%	45.6%
Grant	33.5%	27.9%
Total	100.0%	100.0%

Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999

However, there is a need for careful interpretation concerning the high share of non-tax revenue. Non-tax revenue may be categorized as current non-tax revenue and temporary non-tax revenue. The current non-tax revenue refers to the non-tax revenue which is regularly collected in every fiscal year. Examples are user charges, fees, and interest earnings. The temporary non-tax revenue refers to the non-tax revenue which is temporarily gained in a particular fiscal year. Examples are sales of property and carry-over.

[11] Composition of revenue in state and local governments in the U.S.1995-1996 (*State and Local Government Finances*, 1995-1996)

Revenue	Share
Tax	56.3%
Non-tax	24.4%
Grant	19.2%

Table 2.14. Composition of Non-Tax Revenue
(billion won)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Non-Tax	916	875	1,633	2,365	3,980	5,572	6,658	5,993	7,738	5,410	13,889	16,692	15,443
Share (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Current	245	271	280	358	503	660	751	766	1,086	1,609	1,975	2,383	2,170
Share (%)	26.7	31.0	17.1	15.1	12.6	11.8	11.3	12.8	14.0	29.7	14.2	14.3	14.1
Temporary	671	604	1353	2,007	3,477	4,912	5,907	5,227	6,652	3,801	11,914	14,309	13,273
Share (%)	73.3	69.0	82.9	84.9	87.4	88.2	88.7	87.2	86.0	70.3	85.8	85.7	85.9
Carry-over	323	394	942	1,315	2,801	3,994	4,912	4,229	5,333	2,977	9,804	12,243	11,293
Share (%)	35.3	45.0	57.7	55.6	70.4	71.7	73.8	70.6	68.9	55.0	70.6	73.3	73.1

General account only
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

As shown in Table 2.14, the temporary non-tax revenue occupies a much bigger portion of non-tax revenue than the current non-tax revenue, and the carry-over occupies most of the temporary non-tax revenue. There may be several reasons why the carry-over is so high in Korean local governments. First, because the central government transfers a large amount of revenues near the end of fiscal year, local governments cannot make an outlay of transfer revenues within the fiscal year. Unspent central transfers account for a big portion of the carry-over. Second, in the case of a large-scale construction, the delay of compensation agreements between local governments and property-owners may result in carry-over. Third, the reason might be political. Before 1995 all executives of local governments were appointed by the central government. The central government used to evaluate the appointed executives by the figures in budget sheet. They were criticized for running a deficit budget and they were praised for running a budget surplus. Therefore, local executives tend to have a conservative budgeting strategy in order to avoid deficits in the budget sheet. This budgetary practice also may contribute to a high level of carry-over. As a result, the real share of own-source revenue might be much lower than the figures presented in Table 2.8 because non-tax revenue actually includes transfer revenues from the past year.

2.2.3.3. Intergovernmental Grants

There are several purposes for intergovernmental grants. First, they may reduce vertical fiscal imbalance between the central and local governments. Second, they may alleviate horizontal imbalance among local governments. Third, they may internalize externalities so as to improve efficiency in resource allocation. There are three types of

intergovernmental grant systems from the central to local governments in Korea: local share tax, subsidies, and local tax transfer. The local share tax is similar to general revenue sharing in the United States. The size of the grant is determined by a formula and the central government does not attach provisions on the local governments' use of the funds. Subsidies are provided under the condition that they should be used for a specific purpose. The local tax transfer is different from the local share tax in that the central government attaches provisions, while no such provisions are attached to the local share tax. It is also different from national subsidies in that not only are the financial sources of the grant limited to some fixed percent of three specific taxes, but also provisions attached are looser than those on the national subsidies. Later on, these three types of intergovernmental grant systems are described in detail.

Table 2.15. Share of Intergovernmental Revenues to Total Local Revenues (percentage)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Intergovern	**28.5**	**31.4**	**27.0**	**26.6**	**23.9**	**24.6**	**21.5**	**23.2**	**23.7**	**24.4**	**23.7**	**23.8**	**27.9**
Share Tax	19.4	19.5	16.5	14.6	13.4	13.2	12.3	12.8	11.9	11.9	10.8	10.5	10.9
Subsidies	9.2	11.9	10.5	11.7	10.3	9.2	5.4	6.2	7.7	8.6	8.3	8.5	12.0
Transfer	0.0	0.0	0.0	0.0	0.0	2.2	3.8	4.2	4.1	4.0	4.4	4.5	4.5
Others	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4
Own-Source	**71.5**	**68.6**	**73.0**	**73.4**	**75.9**	**75.4**	**78.5**	**76.9**	**76.4**	**75.5**	**76.3**	**76.3**	**72.1**
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

All accounts combined except education special account
Local borrowing is excluded from own-source revenue
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

Table 2.15 shows how local dependence upon intergovernmental revenues has changed between 1986 and 1998. The percentage of local share tax that has occupied the largest portion of intergovernmental revenues has somewhat decreased. The share of subsidies is

fluctuating. Local tax transfer, which has been implemented since 1991, is becoming an important revenue source of local governments.

Table 2.16. Composition of Intergovernmental Grants by Autonomy Units, 1998 (billion won)

	Share Tax	Share (%)	Subsidies	Share (%)	Tax Transfer	Share (%)	Others	Share (%)	Total	Share (%)
Seoul	3.1	0.6	540.1	99.4	0.0	0.0	0.0	0.0	543.2	100.0
Metro City	181.9	8.1	1,714.1	76.7	320.5	14.3	19.1	0.9	2,235.6	100.0
Province	1,488.2	18.2	5,415.1	66.3	993.7	12.2	266.7	3.3	8,163.7	100.0
City	2,446.0	74.3	40.1	1.2	801.7	24.3	5.7	0.2	3,293.5	100.0
County	2,888.0	78.4	21.9	0.6	768.6	20.9	3.5	0.1	3,682.0	100.0
Autonom	32.4	47.3	35.1	51.2	1.0	1.5	0.0	0.0	68.5	100.0

all accounts combined except education
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1999

Table 2.16 shows the composition of intergovernmental grants by local governments. Different types of local governments have varying compositions of intergovernmental grants as a revenue source. Counties and medium cities have higher percentages of local share tax revenue than other sources of intergovernmental revenue. Seoul, other metropolitan cities, and province governments have higher shares of national subsidies than other intergovernmental grants. Most interestingly, while national subsidies are not a very important intergovernmental revenue source in medium cities and counties, local tax transfer funds occupy a significant portion of intergovernmental revenues in medium cities and counties. In the following, each type of intergovernmental revenue is described in detail.

Local Share Tax[12]

The local share tax is similar to general revenue sharing in the United States. The size of the grant is determined by a formula and the central government does not attach provisions on the local governments' use of the funds.

The local share tax mainly has two purposes. First, it may reduce the vertical fiscal imbalance between the central government and local governments. Second, it may alleviate horizontal fiscal imbalance, or fiscal inequality, among local governments. Since the wealth of different regions and their potential tax bases differ markedly, the central government engages in regional distribution of local share tax, providing more to poorer regions.

Under the current local share tax system defined by the Local Share Tax Law, 13.27 percent of the revenues from domestic taxes of the central government are sources for the local share tax with 10/11 of the total fund going to ordinary local share tax and the remaining 1/11 to special local share tax. The percentage (13.27 percent) itself is not based on certain theoretical ground, but it was an outcome of political compromise.[13] The Ministry of Government Administration and Home Affairs is responsible for allocating funds to the various local governments. The amount of ordinary local share tax is based on a budget deficit concept, i.e., the difference between basic financial demand (need) and basic financial revenue (ability). The amount of special local share tax is based on special

[12] It is also called local share grant from the perspective of the central government. However, from the perspective of local governments, it is local tax that the central government collects for local governments.
[13] Before 1972, 17.6% of domestic taxes were to be set aside to fund this program. During the periods of 1972 and 1982, the legally mandated set-aside system was eliminated. The program was funded on ad hoc basis. After 1982, 13.27% of domestic taxes have been set aside to fund this program.

contingency of local governments such as natural disaster or special need for construction or maintenance of city hall or social welfare facility.

The ordinary local share tax reimburses local governments in the amount of the difference between the cost of an estimated standard of public services and the revenue yield from a standard of tax effort. If a local government has more standardized revenue than standardized expenditure, no local share tax fund is allocated to that jurisdiction. The measurement procedure of the cost of an estimated standard of public services and the revenue yield from a standard of tax effort is prescribed in the Local Share Tax Law.

For the measurement of the cost of an estimated standard of public services, the law specifies 28 expenditure items to be measured and their unit of measurement.[14] The unit cost to apply for the measurement is differentiated depending on the type of local government such as Seoul, metropolitan city, province, medium city, and county. But the same type of local government is assumed to have uniform unit costs for a certain service. For example, all metropolitan cities have the same unit cost for a certain service, all provinces do the same, all medium cities do the same, and all counties do the same. Assigning uniform unit costs across the same type of local government may not be reasonable because each local jurisdiction may not actually pay the same unit cost for the same service. Therefore, a coefficient of correction is employed to correct the measurement error induced by the assignment of uniform unit cost. Then, the standardized cost for jurisdiction is calculated as, first, multiplying the unit of measurement by the unit cost and the coefficient of correction, and then summing all 28 standardized costs.

[14] Appendix B includes a hypothetical example of calculation of the standardized cost in A city.

For the measurement of the revenue yield from a standard of tax effort, the standard for financial ability of a jurisdiction is 80 percent of local ordinary taxes collected at normal rates. The reason for using only 80 percent of local ordinary taxes as the standard for financial ability is that it may provide revenue reserve capacity of local governments so as to operate the local budget independently and flexibly. For example, if the standardized financial ability of a jurisdiction is fixed at 100 percent of local ordinary taxes, there is little revenue left for other expenditure purposes except 28 expenditure items listed in the standardized cost. After calculating the standard for financial ability, there is an additional step to estimate the standard for financial ability. At this stage, some portions of earmarked revenue and non-tax revenue are included in the estimation in order to reflect a more accurate picture of each jurisdiction's financial ability.

Because the total amount for local share tax fund is fixed at 13.27 percent of domestic taxes, the sum of the amount that each jurisdiction needs may exceed or be short of the fixed amount. In order to make the sum of the amount that each jurisdiction needs be equal to the fixed amount of domestic taxes, the amount of local share tax that a jurisdiction actually receives is determined by multiplying the amount of difference between the standardized cost and revenue in the jurisdiction by the adjustment rate that is the fixed amount of domestic taxes divided by the sum of the amount that each jurisdiction needs.

The distribution method can be summarized by the following four equations.

(1) $G_i = Q_i \dfrac{G}{\sum Q_i}$

(2) $Q_i = D_i - R_i$

(3) $D_i = \sum r_{ij} X_{ij} C_{ij}$

(4) $R_i = 0.8T_i + E_i$

Where G_i : The amount of local share tax that the local government, i, receives

G : Total local share tax (total domestic tax revenue * 13.27 percent)

Q_i : Local share tax that the local government, i, needs

D_i : Basic financial requirement (need) of the local government, i

R_i : Basic financial revenue (ability) of the local government, i

r_{ij} : A unit of j^{th} public service of i local government

X_{ij} : A unit cost of j^{th} public service of i local government

C_{ij} : A coefficient of correction of j^{th} public service of i local government

T_i : Ordinary tax revenue of the local government, i

E_i : Some portions of earmarked and non-tax revenues of the local government, i

There are several issues related to fiscal decentralization in the subject of local share tax. First, the distribution method of the local share tax might discourage local revenue efforts. For example, if a local government increases tax effort and, as a result, it has more tax revenue, it may reduce the amount of local share tax that the local government actually receives. Therefore, there is a need to develop a distribution scheme to be able to encourage local revenue effort. Second, although reducing horizontal fiscal imbalance is an important task of the local share tax, some scholars argue that the local share tax system makes horizontal imbalance worse (Lee, Park and Oh, 1990; Lee, 1997). If this is true, the local share tax system may fail to achieve its own major grant objective (Musgrave and Musgrave, 1989:467).

Subsidies

Subsidies are usually provided under the condition that they should be used for a specific purpose. There are two types of subsidies depending on whether the objective is national or local. First, there are projects to maintain and provide for a national minimum level of service. Very often, some local governments have difficulty in providing a national minimum level of public service due to their limited resources. This causes many problems, such as resident migration to urban areas, which further deteriorate the local government's financial capability. For projects of this type, the central government provides the subsidies, but delegates its implementation power to local governments since they can potentially carry out those projects more efficiently and conveniently. Subsidies for social security and the development of agriculture and fisheries are examples. The other kinds of subsidies are related to local level projects whose benefits may exceed the local jurisdiction. These are used to encourage spending on certain public services for each local government. Without the subsidies, local governments may tend to underproduce the public services. Therefore, the central government requires that the local governments spend subsidies only on specific services which might be underproduced otherwise. Examples include subsidies for city hospitals and construction of a local subway. In both cases, according to the government, the localities should spend the subsidy monies only on the purpose specified in the program.

The various ministries administer the subsidy programs. The Ministries of Agriculture and Fisheries, Transportation, Health and Social Affairs, Construction, and Industries and Commerce are major players in the allocation of national subsidies. Local governments which want to receive the subsidies to finance certain programs must apply for the monies

to the program-related ministry. The central ministry which receives the subsidy application has all power to approve, disapprove, or revise the application. If the application is approved, the ministry must secure funds from the Ministry of Finance and Economy and consult with the Ministry of Government Administration and Home Affairs.

In the distribution of national subsidies, the ad hoc decision-making of the central government plays a major role. For example, usually subsidies have a matching requirement and the matching rates are determined at the central government's discretion. Therefore, depending on the central government's decision, some programs have lower matching rates while others have higher matching rates. In other words, there is no specific guideline for the distribution of national subsidies. Instead, the central government's policy judgements are the determinants.

There is an irony between fiscal decentralization and subsidies. As fiscal decentralization proceeds, local governments may take more functional responsibilities which were once the central government's tasks. As a result, local governments are likely to encounter more situations in which they must deal with externalities. An efficient solution may be to finance those programs by a categorical matching grant such as the national subsidies. However, heavy dependence on national subsidies may impede fiscal discretion of local governments.

Local Tax Transfer

In 1991, local tax transfers were introduced to strengthen the revenue-raising capacity of local governments and to ensure a more balanced regional development.

The local tax transfer is different from the local share tax in that the central government attaches provisions, while no such provisions are attached to the local share tax. It is also different from national subsidies in that not only are the financial sources of the grant limited to some fixed percent of three specific taxes, but also provisions attached are looser than those on the national subsidies.

Also, the local tax transfer is similar to the national subsidies in that the main purpose of the local tax transfer is to deal with externalities. It is also similar to the local share tax in that it may allow local governments to have fiscal discretion. Therefore, this intergovernmental grant system makes an effort to solve the incongruity between fiscal decentralization and categorical matching grant mentioned before.

The choice of targeted programs financed by the local tax transfer is in the hands of the central government. In 1991, this fund was allocated only to the projects related to local road maintenance but since then the central government has added three other projects to the targeted programs: regional development of the agrarian and fishing villages, water pollution prevention, and youth upbringing. Within the purposes of those projects, local governments may have considerable discretion concerning how to spend the monies. The local tax transfer funds are distributed according to a standard developed by the central government. In order to apply the standard, local governments should submit necessary information related to the targeted programs to the Ministry of Administration and Home Affairs and the related ministries. Then, depending on the information submitted, each local government receives the local tax transfer fund.

One of the problems in the implementation of the local tax transfer is related to the selection of the targeted programs. If the targeted programs are specified in too detailed a

manner, it will be the same as the subsidies. Therefore, broader definition of the programs is needed to increase local discretion.

Other Types of Grant

Besides the three major types of intergovernmental grants, there are additional three grant systems implemented in Korea; increased amount share grant, control grant, and city and provincial subsidies. The increased amount share grant has characteristics that supplement the local share tax. It is granted when local governments face urgent and special contingencies such as a flood. The control grant and city and provincial subsidies are local-to-local grants. Seoul and other metropolitan cities provide control grants for their autonomous districts. The main purpose of this grant is to relieve fiscal discrepancies among autonomous districts. The city and provincial subsidies have the same purpose as the national subsidies. Seoul, metropolitan cities, and provincial governments grant them to autonomous districts, cities, and counties.

2.2.3.4. Summary

We reviewed the revenue structure of local government in Korea. Korea's local government revenues are composed of local taxes, non-tax revenues, and intergovernmental grants. There are several characteristics of the local revenue system related to fiscal decentralization. First, the tax base and tax rate have almost the same structure across the country. This may be an impediment to fiscal decentralization because local governments cannot readily respond to the demand change of local residents. Second, tax revenue has a relatively low share of total local government

revenues. This implies that local governments in Korea may have a low revenue-raising capability. Third, local tax revenues have been heavily dependent on property-related taxes but consumption taxes are becoming an important revenue source. Even though responsive taxes such as consumption taxes may not be stable, they can generate meaningful revenue during the periods of economic growth. Fourth, unconditional grants such as the local share tax, which has been a major source of financing local public goods and services, has been steadily declining since the late 1980s.

2.2.4. Local Expenditures

The functional classification of local expenditure shows what functions local governments actually perform. According to *Financial Yearbook of Local Government*, there are seven functional classifications of local expenditures; (1) General Administration, (2) Social Welfare, (3) Industry and Economy, (4) Regional Development, (5) Culture and Physical Education, (6) Civil Defense, and (7) Support and Others.[15]

General Administration expenditures are the expenses related to general administration, legislation and elections in local governments. Social Welfare expenditures include welfare, public health, and sanitation. Industry and Economy expenditures are the spending related to agriculture and fishery development (e.g., farmland rearrangement), development of natural resources, tourism, and transportation. Regional Development

[15] Until 1985, the functional classifications included (1) general administration, (2) social welfare, (3) industry and economy, (4) public works, (5) civil defense, and (6) support and other. After 1985 civilization and physical education expenditure item was added in the classification and public works item was renamed as regional development. In 1989, National assembly expenditure item was added and thus, there were 8 functional classifications. From 1996, again, there was re-classification of functions. Social welfare, industry and economy, regional development, and culture and physical education were consolidated into two functional classifications, that is, social development and economic development. These frequent changes in functional classifications may make data collection difficult.

expenditures include local infrastructure investment such as roads and bridges, and housing and community development. Culture and Physical Education expenditures include cultural property management and physical education. Civil Defense expenditures include civil defense facilities and fire fighting. Support and Other expenditures include local borrowing repayment, transfers, contingency, and miscellaneous expenses.

Compared with functional assignment of state and local expenditures in the U.S., Korea's functional classification does not have elementary and secondary education and police expenditures. As mentioned earlier, because the education special account is heavily dependent upon central transfers and operated independently from general government operations, the expenditures of education are excluded in this functional classification. Also, unlike the U.S., public safety such as police protection is a function of the central government.

Table 2.17. Functional Classification of Local Expenditure by Account, 1995
(billion won)

	Total		General Account		Special Account*	
	Expenditure	(%)	Expenditure	(%)	Expenditure	(%)
General Administration	7,641.6	15.4	7,630.4	21.3	11.2	0.1
Social Welfare	6,369.2	12.8	5,268.6	14.7	1,100.6	7.9
Industry & Economy	7,067.1	14.2	6,378.0	17.8	689.2	4.9
Regional Development	22,187.7	44.6	10,231.5	28.6	11,956.3	85.5
Culture & Physical Edu	2,090.2	4.2	2,031.5	5.7	59.1	0.4
Civil Defense	643.0	1.3	643.0	1.8	0.0	0.0
Support & Others	3,783.6	7.6	3,609.2	10.1	174.4	1.2
Total	49,782.4	100.0	35,791.9	100.0	13,990.8	100.0

* Education special account excluded
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1996

Table 2.17 shows the structure of local expenditures in Korea. Out of all local government expenditures, Regional Development is the highest, followed by General

Administration, Industry and Economy, and Social Welfare. However, considering the general accounts only, one can find the share of Regional Development decreases dramatically. The reason is that local special accounts are composed of many public works related accounts such as water and sewage which are related directly to the regional development function.

The fact that Regional Development occupies a high portion of local government expenditures indicates local governments are actively involved in constructing local infrastructure. Several Korean scholars argue that General Administration occupies too large a portion of government expenditure in comparison with Japan (11.1 percent) and U.S. (4.0 percent) (Kim, 1997:52-53).

Table 2.18. Functional Classification of Local Expenditure by Government Unit, 1995 (billion won)

	Seoul*		Metro*		Province		City		County	
	Exp.	(%)	Exp.	(%)	Exp.	(%)	Exp.	(%)	Exp.	(%)
General	1,200.9	22.3	1,336.0	19.8	710.0	8.0	2,491.2	29.5	1,892.2	29.6
Social W	908.0	16.8	1,224.9	18.2	1,005.6	11.4	1,349.1	16.0	780.9	12.2
Indu&Ec	73.3	1.4	263.2	3.9	2,994.0	33.9	1,127.4	13.4	1,920.1	30.1
Regional	1,652.9	30.7	2,078.1	30.8	2,155.3	24.4	2,849.2	33.8	1,495.9	23.4
Culture	548.0	10.2	491.8	7.3	332.1	3.8	455.4	5.4	203.8	3.2
Civil D	137.2	2.5	136.0	2.0	325.8	3.7	21.1	0.3	22.9	0.4
Support&	871.2	16.2	1,210.5	18.0	1,316.2	14.9	139.7	1.7	71.6	1.1
Total	5,391.5	100.0	6,740.5	100.0	8,839.0	100.0	8,433.1	100.0	6,387.4	100.0

General account only
* including autonomous districts
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, 1996

Table 2.18 shows functional shares of local expenditure by governmental unit in 1995. Provincial governments have an unusually low share of General Administration (8.0 percent) in comparison with other governmental units. Small governments such as

medium cities and counties have relatively high shares of General Administration (respectively 29.5 percent and 29.6 percent) in comparison with big cities. Provincial and county governments have the least share of Social Welfare spending (respectively 11.4 percent and 12.2 percent). Metropolitan cities such as Seoul have low shares of Industry and Economy expenditures. This is because Industry and Economy expenditures in Korea are mainly related to economic growth in rural areas. For Regional Development expenditures, medium cities have the highest share (33.8 percent), followed by metropolitan cities (30.8 percent) and Seoul (30.7 percent). Provincial and county governments have relatively low shares 24.4 percent and 23.4 percent respectively. Another interesting observation is that big cities have high shares of Support and Other expenditures compared with medium cities and counties.

Table 2.19 shows the local expenditure share changes from 1986 to 1995. General Administration shows a relatively high portion of local expenditures notably decreasing from 22.1 percent in 1986 to 18.0 percent in 1991 and increasing to 21.3 percent in 1995. Social Welfare shows a relatively stable pattern fluctuating around 15 percent. Industry and Economy steadily decreases from 14.7 percent in 1986 to 12.1 percent in 1991 and fluctuating thereafter. Regional Development increases dramatically from 28.1 percent in 1986 to 37.8 percent in 1991, and then decreases to 28.6 percent in 1995.

Table 2.19. Changes of Local Expenditure Share by Functions 1986-1995
(billion won)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
General Administration	1,134.9	1,360.6	1,721.4	2,262.6	2,769.1	3,491.4	4,255.5	4,521.6	6,612.6	7,630.4
	22.1%	20.2%	20.0%	19.4%	18.1%	18.0%	19.3%	18.7%	21.8%	21.3%
Social Welfare	780.5	1,109.3	1,388.0	1,867.0	2,583.3	2,791.9	3,387.7	3,818.3	4,385.2	5,268.6
	15.2%	16.5%	16.1%	16.0%	16.9%	14.4%	15.4%	15.8%	14.5%	14.7%
Industry & Economy	757.4	1,045.8	1,129.7	1,474.0	1,895.5	2,335.1	2,781.9	3,842.8	4,624.0	6,378.0
	14.7%	15.5%	13.1%	12.6%	12.4%	12.1%	12.6%	15.9%	15.2%	17.8%
Regional Development	1,442.5	2,214.4	2,912.3	3,548.1	5,373.4	7,320.5	7,627.8	7,585.7	9,464.0	10,231.5
	28.1%	32.9%	33.8%	30.3%	35.1%	37.8%	34.6%	31.3%	31.2%	28.6%
Culture & Physical Edu.	215.4	249.8	365.2	675.3	886.0	985.9	1,133.5	1,279.3	1,651.9	2,031.2
	4.2%	3.7%	4.2%	5.8%	5.8%	5.8%	5.1%	5.3%	5.4%	5.7%
Civil Defense	123.5	165.2	186.4	252.0	324.4	399.4	484.8	504.4	479.5	643.0
	2.4%	2.5%	2.2%	2.2%	2.1%	2.1%	2.2%	2.1%	1.6%	1.8%
Support & Others	688.0	583.8	901.2	1,612.5	1,488.7	2,024.1	2,369.6	2,668.4	3,123.4	3,609.2
	13.4%	8.7%	10.5%	13.8%	9.7%	10.5%	10.8%	11.0%	10.3%	10.1%
Total	5,142.2	6,728.9	8,604.2	11,691.5	15,320.4	19,348.3	22,040.8	24,220.5	30,340.6	35,791.9
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

General account only
Source: Ministry of Government Administration and Home Affairs, *Financial yearbook of local government*, various years

To summarize, two large portions of general account expenditures are Regional Development and General Administration. This is because local governments are involved actively in constructing local infrastructure. Comparing the functional classification of local expenditure by the type of governmental unit, we find that there are some variations between urban and rural governments, and between big and small governments. During the periods of 1986 and 1995 each functional expenditure share is fluctuating. These observations show that in recent years local public finance in Korea has changed a great deal.

2.3. Summary

The first part of this chapter described the recent development of local autonomy and fiscal decentralization, and defined the concept of fiscal decentralization. The latter part of this chapter describes the fiscal structure of local government in Korea. As of 1998, local autonomy units in Korea consisted of Seoul and its 25 autonomous districts, six metropolitan cities and their 44 autonomous districts, and nine provinces and their 73 cities and 92 counties. Korea's local government revenues are composed of local taxes, non-tax revenues, and intergovernmental grants. Tax revenue has a relatively low share of total local government revenues, while the shares of non-tax revenues are high. Local tax revenues are unevenly distributed between urban and rural jurisdictions. As a result, rural jurisdictions are heavily dependent on intergovernmental grants to finance their programs.

There is a need for careful interpretation concerning the high share of non-tax revenue in that non-tax revenue actually includes transfer revenues from the past year. There are

three types of intergovernmental grant systems from the central to local governments in Korea: local share tax, subsidies, and local tax transfer.

Out of all local government expenditures, Regional Development is the most important expenditure, followed by General Administration, Industry and Economy, and Social Welfare. This means local governments in Korea are actively involved in local infrastructure. Comparing functional classifications of local expenditure by the type of governmental unit, we find that there are some variations between urban and rural governments, and between big and small governments.

During the periods of the late 1980s and 1990s, fiscal decentralization policies have been implemented in Korea. During that time, local finance in Korea has changed a great deal. However, we may not be able to identify the effects of fiscal decentralization on local finance through descriptive analysis alone. In the next chapter, research hypotheses are formulated to systematically analyze the effects of decentralization on local public finance in Korea.

CHAPTER 3

HYPOTHESES AND LITERATURE REVIEW

In the previous chapter, we conducted a descriptive analysis of fiscal decentralization's effects on local finance. In this chapter, research hypotheses are formulated to systematically analyze the effects of decentralization on local public finance in Korea. In the first section, we develop a modified version of Brennan and Buchanan's decentralization hypothesis to test the effects of fiscal decentralization on the size of the public budget. In the second section, we present two hypotheses concerning functional realignment. In the third section, we formulate a hypothesis regarding decentralization's effect on fiscal independence of local governments.

3.1. The Effect of Decentralization on the Size of Public Budget

3.1.1. Fiscal Decentralization and Efficiency

A decentralized system is expected to respond better to local preferences and needs, and to promote competition among local units in the provision of public goods and services. Efficiency is improved as adjusting supply to demand. Earlier, we presented the theoretical argument that showed how decentralized provision of public services could minimize the welfare loss from the centralized provision of public services (Oates, 1977). Oates and Schwab (1991) also show that interjurisdictional competition fosters efficiency. These scholars (1991:140-141) argue that under the assumption that taxes play the same role as prices, "the outcome under interjurisdictional competition is identical to the outcome that would emerge if one were to replace local governments with perfectly

competitive firms that supplied local public goods to firms and households at marginal cost."

This view on government decentralization and competition is the opposite of the traditional one. The classical administrative view on government fragmentation is that it causes uncoordinated service delivery (Bollens, 1957), loss of economies of scale (ACIR, 1964), deterioration of accessibility and accountability (Glendening, 1984), and private interests making key public decisions (Perrenod, 1984).

Also, the literature on intergovernmental relations used to pay attention to cooperation among levels of governments (e.g., Grodzins, 1966) while it paid little attention to competition among the same levels of government. Traditionally, public economists also argued that interjurisdictional competition to retain and attract residents and businesses was at best a zero-sum game (Kenyon and Kincaid, 1991:2).

From both sides, however, the promised benefits or costs of decentralized provision of goods and services are usually based on theoretical arguments. A major obstacle to measuring efficiency gain directly is that we may encounter tremendous difficulties in measuring units of public output and in obtaining reliable estimates of individual demand functions, both of which are the necessities for direct measurement. Despite this difficulty, some empirical studies have tried to measure directly whether or not efficiency gains from decentralized provision is realized in the real world (e.g., Bradford and Oates, 1974). However, their study area is limited to one specific service (education) and a small geographical area (northeastern New Jersey). Therefore, their direct measure of efficiency gains from the decentralization provision of public finance does not fit our purpose

because we want to evaluate the overall performance of the public sector in Korea, not a specific service in a limited geographical area.

There may be an alternative approach to the measurement of the expected benefits of decentralized provision in an empirical setting. In this sense, we borrow Brennan and Buchanan's decentralization hypothesis to test the effects of fiscal decentralization on the Korean public sector. Brennan and Buchanan (1980) assume government as "Leviathan" which "systematically seeks to exploit its citizenry through the maximization of the tax revenues that it extracts from the economy" (Oates, 1985:748). Their view on government is drawn from the economics literature of industrial organizations (Joulfaian and Marlow, 1990). If a firm is the sole source of supply for a certain commodity, it could set its price at higher levels than would be the case if many competing sellers served the market. The common solution to monopoly power is to allow competition among firms, which will eliminate monopoly power and result in essentially competitive prices and outcomes. Brennan and Buchanan analogize government as a firm with monopoly power and suggest that a monolithic government can be constrained by decentralizing taxes and expenditures that will promote competition among subnational governments. That competition makes each decentralized government impose taxes on residents and businesses strictly in terms of their relative public goods evaluations in order to retain and attract residents and businesses. Therefore, this outcome will be efficient and the lower tax burden will collectively decrease the size of the public budget. Following this logic, we might argue that fiscal decentralization decreases the size of public budget.

This argument is basically the same as the conventional fiscal decentralization theory in that the better fitted service/tax package can improve efficiency in resource allocation.

However, it is quite different in that it does not assume government fiscal decisions automatically follow the demand function of citizens. In other words, it discards the presumption of a benevolent and public welfare-maximizing government. In particular, this hypothesis invalidates the conventional median voter model. However, the fact that it discards the median voter model makes this hypothesis most attractive in studying fiscal decentralization in developing countries. In developing countries, there may be no voters to reveal their preferences in the local sector. Even in cases where voter's preferences are revealed, local officials may not act immediately according to the voter's preferences because of a long tradition of centralization or institutional barriers such as limited taxing and spending power. Another advantage of using this hypothesis is that it provides empirically testable hypotheses.

However, there are some qualifications when we are testing the decentralization hypothesis in Korea. First, we cannot relate directly the lower tax burden to the size of budget as Oates (1985) did. Because demand for public services will increase as price decreases, we are not sure whether or not the total government receipt of tax monies decreases after the tax burden changes. However, we can assume that the total government receipt of tax monies will decrease after a lower tax burden in that local public goods are relatively price inelastic; that is, quantity is insensitive to price change. Second, in order for decentralized governments to behave like private firms, there should be a sufficient number of decentralized governments which compete with one another to retain and attract residents and businesses, and mobility among jurisdictions should cost a reasonable price. We may observe this pattern of governmental arrangement in metropolitan areas in which people move with relatively low cost. Third and most

importantly, at the initial stage "total government intrusion into the economy" should be larger than what citizens really want. In other words, government should overproduce public goods and services. Figure 3.1 may illustrate this point.

Consider first an ideal economy in which the consumption and production of one private good and one governmental good are efficient. The efficient point is A at which the community indifference curve I is tangent to the production possibility curve P. But now assume that instead of the efficient point A, decision-makers select point C. In that case, too many public goods are produced. The inefficiency of this resource allocation is induced by the fact that the new consumption and production point C lies on a lower indifference curve (II). The misallocation of resources enters on the consumption side through the mistaken choice of consumption along P.

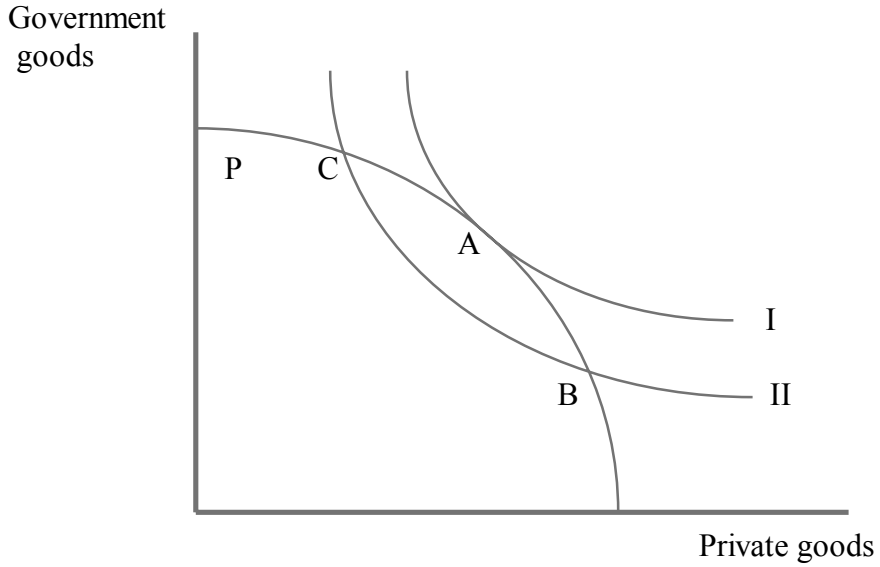

Figure 3.1. The Optimal Provision of Government and Private Goods (Bahl and Linn, 1992:50)

Point C may indicate the situation that "total government intrusion into the economy" is larger than what citizens really want. In order to get to the optimal consumption point A, a decrease in publicly produced goods and an increase in privately produced goods may have to take place. The decentralization hypothesis suggests that fiscal decentralization can play this role. According to Bahl and Linn (1992), this situation is a typical one in developed countries where public authorities are too heavily involved in the lives of their citizens (overproduction).

However, they argue that the situation in developing countries might be different. Usually governments in developing countries are challenged for not providing enough support (underprovision). In this case, decision-makers may select consumption point B at which too few publicly produced goods are provided. In order to get to the optimal consumption point A, an increase in publicly produced goods and a reduction in privately produced goods may have to take place. The decentralization hypothesis does not explicitly hypothesize this situation, but the logic of the decentralization hypothesis may explain this situation. Under the underprovision of public goods, fiscal decentralization and its competitive force may increase "total government intrusion into economy" because the competitive force has to improve the fit between provision of public goods and demands. Under this situation, therefore, fiscal decentralization may increase the size of public budget.

Although it is quite difficult to measure the Korea situation directly concerning whether the situation lies in the former (overprovision) or the latter (underprovision), there may be some indirect evidence to show whether the Korean government

overprovides or underprovides public goods. An international tax burden comparison may reveal this situation.

Table 3.1. The Ratio of Total Tax Revenue-to-GNP in Selected Countries, 1987

Country	Ratio
Korea	17.5
Japan	30.5
United Kingdom	37.4
US	29.3
Germany	37.4
Canada	36.2
Australia	34.5

Source: Oh (1992a:29)

Table 3.2. The Ratio of the Central Tax Revenue-to-GNP in Selected Countries, 1987

Country	Ratio*
Korea**	14.4
US	11.8
Germany	11.6
United Kingdom	25.8
Japan	12.9

* excluding social security revenue; ** 1990
Source: Oh (1992a:29)

Table 3.1 shows the ratio of total tax revenue-to-GNP is well below other developed countries. However, as shown in Table 3.2, the ratio of central tax revenue-to-GNP is not below other countries. This fact may indicate that the central government's intrusion into economy is larger than what citizens want while local government intrusion into economy is smaller than what citizens want. Therefore, we hypothesize that

H_1: As fiscal decentralization proceeds, the size of the central budget decreases while the size of the local budget increases.

3.1.2. Literature Review on Fiscal Decentralization and the Size of Budget

Oates (1985) tests the decentralization hypothesis, that is, other things being equal, the size of the public sector should be inversely related to the extent of fiscal decentralization. He utilizes two data sets: (1) state and local governments in the U.S. and (2) an international sample of 43 countries.

The first part of his analysis consists of cross-sectional data of 48 states in the U.S. The dependent variable is the size of public sector measured by aggregate state-local tax receipts in each state as a fraction of personal income. The independent variable is centralization measured by (1) the state share of state-local general revenues, (2) the state share of state-local total expenditure, and (3) the absolute number of local government units in a state.

The relationships between the size of public sector and state revenue share and state expenditure share measures are expected to be positive and the relationship between the dependent variable and number of local governments is expected to be negative if it is consistent with the decentralization hypothesis.

First, he conducts simple correlation analysis between the dependent variable and three measures of the independent variable. The signs of correlation coefficients of three pairs of variables are all negative. These findings mean that a more centralized state-local sector in terms of revenue and expenditure tends to be associated with a smaller state-local sector which is not consistent with decentralization hypothesis. For the measure of the number of local governments, a more centralized state-local sector tends to be associated with a larger state-local sector. In all cases, however, there is no statistically significant relationship.

Second, he conducts regression analysis of the dependent variable and each measure of the independent variable with and without control variables. The control variables employed in his regression equation are (1) per capita income, (2) population size, (3) urbanization, and (4) the percentage of state-local general revenues that comes from intergovernmental grants. He conducts logistic transformation of the dependent variable because the dependent variable has a range limited to the zero-to-one interval which is not met with the basic assumptions of regression model. The logistic transformation (G' = log (G / (1 - G))) creates a new dependent variable whose value can range over the whole set of real numbers.[16]

He finds no statistically significant relationship between the dependent and independent variables with and without control variables.[17] Oates (1985:752-753) concludes that "the results of the multiple-regression analysis do not appear to provide real support for either the view that decentralization constrains the size of the public sector or that it results in a more expansive government sector."

The second part of his analysis consists of cross-sectional data from 43 countries. The dependent variable is public sector size measured by total public revenue divided by GDP. The independent variable is centralization measured by (1) the fraction of total general revenues going to the central government and (2) the fraction of total public expenditures attributable to the central government. For the expenditure measure, intergovernmental grants are excluded from the central government expenditure.

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[16] Oates (1985:752) reports that the regression results do not differ substantially from those if the transformation is not used.

[17] Actually, he finds a statistically significant negative relationship between the dependent variable and expenditure measure of the independent variable in the equation without control variables. However, R-square is low (.10).

He groups 43 countries into three categories according to IMF standard: world sample, industrial countries, and developing countries. He conducts the same analysis performed with the US data. In regression equations without control variables in the world sample, he finds that the relationship between the dependent and independent variables is statistically significant and negative. This means a more centralized country tends to have smaller public sector. Adding control variables to the equation, however, he finds no statistically significant relationship between the dependent and independent variables in any group of the countries. Finally, he concludes that decentralization is not a factor that affects the public sector size.

This Oates study has been subject to criticism for several conceptual and methodological problems. First of all, his unit of analysis is too large to incorporate the free mobility assumption into his model (Heil, 1991:335). The decentralization hypothesis assumes free mobility of residents and businesses among jurisdictions. In reality, however, the mobility cost must increase as the geographical size of the jurisdiction increases. In other words, mobility is much more costly at the state level than at the local level and realistically international migration is very costly. In my literature review of decentralization and government size, all four studies which have the nation as the unit of analysis find that there is no significant relationship between decentralization and public sector size (Oates 1972, 1985; Heil, 1991; Kim, 1995).

Second, Oates measures competition among jurisdictions as the number of local government units in a state. He assumes that the more local governments a state has, the more competitive the environment. This approach assumes that each local government in a state has a similar influence on public sector size (Nelson, 1987:199). However, this

assumption may not be realistic because the scope of functions performed by local government varies substantially depending on type of government – general-purpose local government such as county, municipality, and township and single-purpose local government such as school district, fire protection district, and so forth. Because a single-purpose government usually performs a single function,[18] its size of budget is quite small in comparison with a general-purpose government, thus having a relatively small influence on public sector size.

Nelson (1987) divides local governments into general-purpose government and single-purpose government. He normalizes the number of local governments by population and thus, for example, his "general-purpose government" variable refers to average population per general-purpose government. He finds that the relationship between public sector size and "general-purpose government" is positively and statistically significant, while coefficients of single-purpose government are not statistically significant with negative signs. This means that greater decentralization results in increased competition among general-purpose governments and decreased overall public sector size.

Eberts and Gronberg (1988) refine the measure of competition among local governments. They use three different measures of the number of local governments: (1) the total number of each type of local government – general purpose and single purpose – in a county or SMSA, (2) the number of units by the size of population, and (3) the number of jurisdictions by the total land area in a county or SMSA. They find that an increase in decentralization of general-purpose governments, measured by any of three measures, is significantly related to a decrease in the size of local public sector. Also, they

[18] Ninety three percent of all special districts in the U.S. are single-purpose.

find that an increase in the number of single-purpose governments increases public sector size. They conclude that while competition among general-purpose governments constrains local government spending, the "overlapping labyrinth of single-purpose governments" stimulates local government spending.

Third, Oates measures the size of the public sector as aggregate state-local tax receipts in each state as a fraction of personal income. Marlow (1988) argues that Oates's study has two critical faults. First, he ignores the federal government and thus excludes more than half of total public sector activities. In order to capture the federal government activities, he employs a time-series model. Later, some studies use state-by-state disaggregated federal government expenditure data which allow researchers to employ a cross-sectional model without dropping the federal expenditure data (e.g., Joulfaian and Marlow, 1990; Shadbegian, 1999). Second, using tax revenue measures as an indicator of the size of public sector tends to underestimate public sector size because some activities are financed by debt and the government budget may run into deficit. Marlow suggests that government expenditure measures are more a precise measure of public sector size. In his time-series and expenditure measurement model, he finds that the relationship between public sector size, measured as the ratio of federal and nonfederal expenditure-to-GNP, and decentralization, measured as share of state-local expenditure in total government expenditure, is statistically significant and negative which means that a more decentralized public sector is associated with a smaller public sector.

Broadly speaking, there are two ways of measuring public sector size in the literature – a revenue measure and an expenditure measure. It seems that a choice of which measure is used in research depends upon whether or not the study includes the central government

activities. If a study includes the central government activities, researchers tend to employ the expenditure measure (e.g., Marlow, 1988; Grossman, 1989; Joulfaian and Marlow, 1990; Heil, 1991; Grossman, 1992; Kneebone, 1992; Grossman and West, 1994; Shadbegian, 1999). If a study is only concerned with local government activities, researchers tend to employ the revenue measure (e.g., Zax, 1989; Forbes and Zampelli, 1989; Rothstein, 1993). In this study, we use the expenditure measure because our study includes central government activities.

Fourth, Oates does not test the possibility of a nonrecursive relationship between the dependent variable and a couple of independent variables, that is, decentralization and intergovernmental grants. There may be a nonrecursive relationship between those variables because an increase in the central expenditure will increase total government expenditure, leading to a decrease in the decentralization ratio. If the dependent variable and independent variable have a nonrecursive relationship, OLS estimation cannot be consistent and thus an alternative method should be used to test hypotheses.

Kneebone (1992) investigates the relationship between the degree of centralization and the public sector size in Canada during the periods of 1926 and 1990. He is suspicious of nonrecursive relationships between public sector size, defined as total government expenditure as a fraction of GDP, and decentralization and intergovernmental variables in his regression equation. Therefore, he conducts two stage least squares regression. He finds that the total government expenditure and the decentralization of provincial governments have a significant positive relationship which means that a more decentralized province is associated with a larger public sector. He also finds that the total government expenditure and the decentralization of local governments have a

significant negative relationship which means that a more decentralized local government is associated with a smaller public sector. Kneebone (1992:1300) concludes that the statistically significant coefficients on both decentralization variables suggest that "the allocation of government across different levels has played an important role in determining the growth of the public sector."

Shadbegian (1999) is also suspicious of nonrecursive relationships between public sector size and decentralization and intergovernmental grant variables that are composed of US data. To detect simultaneity, he conducts a Hausman specification test and finds simultaneity of the decentralization variable in a couple of regression equations. However, he cannot find simultaneity of the intergovernmental grant variable in his regression equations and thus he treats it as exogenous. He finds statistically significant relationships between the public sector size and decentralization.

3.1.3. Summary

In this section, we developed a modified version of Brennan and Buchanan's decentralization hypothesis to test the effects of fiscal decentralization on the size of the public budget. We also identify several important conceptual and methodological issues in the literature review. First, without disaggregated central government expenditure data, only a time-series model can capture central government activities. Second, expenditure measures may be more a precise measure of public sector size than revenue measures because some government activities are financed by debt and the government budget also may run a deficit. Third, although there may be a norecursive relationship between the dependent variable and independent variables, some earlier studies do not test the

possibility of that relationship. In chapter 4, we incorporate those factors into our model and empirical testing.

3.2. The Change in Local Government Expenditure Structure

3.2.1. The Conventional Assignment of Governmental Function and Externalities

As fiscal decentralization proceeds in Korea, two particular policy areas have received much attention – redistribution and economic development. Most Korean scholars argue that there has been too little emphasis in redistribution area in Korea while much attention has been paid to economic development policies. As fiscal decentralization proceeds, functional realignment between the levels of government might be expected. An important question is what is the nature of that realignment?

According to Musgrave (1959), *stabilization* and *redistribution* functions are appropriate objectives of the central government. The *stabilization* role is concerned with the prevention of unemployment and inflation and provision for increases in the standard of living for the citizenry (Musgrave, 1959:22-27). The *redistribution* role is the correction of perceived injustices in the distribution of wealth in society, presumably to improve the conditions faced by the less well-to-do (Musgrave, 1959:17-22).

This conventional argument is based on the ideas of spatial externality and economic unit mobility. For the *stabilization* function, because subnational economies are so open that the effects of local stabilization policies dispersed throughout the whole nation, the benefits from local stabilization policies may not be contained within the area where the policies are financed. Therefore, the resulting resource allocation is not efficient. For the *redistribution* function, the benefit of a redistribution policy in a local government cannot

be contained within the jurisdiction because of economic unit mobility. Therefore, the resulting resource allocation is also not efficient. In both cases, therefore, the conventional wisdom suggests that the central government should perform those functions. In the following, each function is discussed in detail.

3.2.2. Redistribution Function

The efficiency argument for the central financing and provision of the redistribution function is well articulated by Oates (1972). Oates suggests two reasons to assign the redistribution role as a function of the central government. First, the mobility of residents among jurisdictions may limit the scope of redistribution programs by the lower level of government. For example, if a state has a generous welfare benefit package for lower income families, the residents in a nearby state, which has a less generous welfare program, might migrate into the state which has the more generous program. On the other hand, the tax-price paid by the rich for the welfare benefit package will be higher in that state, thus causing the rich to continue to move away from that state. This frustrates the ability of subnational governments to provide any redistribution program. Second, if redistribution is a public good, the benefit of a redistribution policy in a local government cannot be contained within the jurisdiction because of the residents' mobility. Therefore, the quantity produced will be lower than the socially optimal level.

However, this conventional argument has been challenged both on theoretical and empirical grounds. Goodspeed (1989) examines the use of local income tax, which has a direct analogy to the provision of redistribution. He compares the efficiency consequences of a proportional income tax and a head tax. He finds that the efficiency loss associated

with using proportional income tax at the local level is small. This finding suggests that "the use of ability to pay taxes by local governments would result in some redistribution, relative to head taxes, without serious efficiency consequences resulting from migration" (Goodspeed, 1989:340). Pauly (1973) argues that it may be efficient for local governments to provide different amounts of redistribution in accordance with residents' preferences. His efficiency argument rests on two assumptions. First, nonpoor individuals are assumed to care only about the poor in their own jurisdictions. Second, poor individuals are assumed not to move in response to differences in welfare benefits among jurisdictions.

There are two major issues related to assignment of the redistribution function in theoretical literature: (1) whether differences in welfare benefits across jurisdictions induce significant migration and (2) whether preferences for redistribution differ significantly across jurisdictions. The empirical evidence on the mobility factor is mixed. Blank (1988) and Gramlich and Laren (1984) find evidence that welfare recipients move in response to differences in welfare benefits across states. Blank (1988) uses a micro data set from the *Current Population Survey* to estimate the effect of wages and AFDC benefit levels on the location decisions of female-headed households. She finds that welfare payments, as well as other economic variables, have a significant effect on the migration decisions of female welfare recipients. Gramlich and Laren (1984) use two data sets consisting of state-level data and micro data to estimate the effect of differences in AFDC benefits on migration of the poor. They find that differences in AFDC benefit levels marginally affect migration of the beneficiaries from low-benefit to high-benefit states. They conclude that even though the effect appears to be small in the short run, the effect may be substantial in the long run.

Contrary to those findings mentioned above, several recent studies find that there is little evidence that migration decisions are influenced by differences in welfare benefits. Walker (1994) uses a micro data set to compare the migration behavior of poor young women to nonpoor young women and to poor young men. He finds that differences in welfare benefit levels are not a decisive factor in determining migration behavior of each group. Levine and Zimmerman (1995) employ a similar quasi-experimental design to estimate probabilities of moving from one state to other states for welfare eligibles relative to different control groups. They find that individuals who are eligible for AFDC are no more likely to move from a low benefit state to a high benefit state than are individuals who are not eligible for AFDC.

To summarize, these conflicting studies do not allow us to follow the free mobility assumption made by the conventional wisdom automatically. It might be true that recipients of welfare benefits are not sensitive to differences in welfare benefit levels in making location decisions. If this is true, the efficiency argument of the conventional wisdom based on the residents' mobility may be no longer valid. Rather, the decentralized provision of redistribution may improve efficiency if there are considerable differences in preferences to redistribution across jurisdictions. At least we can find some evidence on this issue in the US. As an indicator of differences in tastes for welfare spending, Fisher (1996) demonstrates that there are considerable variations in average monthly AFDC payments per family across states. One important observation is that AFDC and Medicaid benefits are substantially lower in low-income states even though states receive matching federal grants, with a larger federal share for lower-income states. Fisher (1996) argues that this variation pattern probably reflects different tastes for redistribution across states.

If taste differences are substantial across states, increases in federal grants will do little to equalize welfare services among states because the willingness to provide those services is so different. On efficiency grounds, therefore, the evidence on limited mobility and varying tastes points to a subnational role in providing redistribution contrary to the conventional recommendation.

Until now, our discussion has been based upon the US context and experience. When we apply this basic concept to the Korean setting, two fundamental questions arise: mobility and taste differences. There is no particular reason to believe that Korean citizens are more sensitive to welfare differentials than US citizens. Rather, mobility of the Korean population in response to welfare differentials is more likely to be trivial because there is much less variation in welfare benefit levels across jurisdictions. However, less variation among jurisdictions does not imply homogeneous tastes to redistribution policy. Because Korea's public sector has been highly centralized and decentralized government is a recent development, local budget outcomes across jurisdictions may not be as diversified as in the US. As fiscal decentralization proceeds, however, we expect that local voter preferences for redistribution policy may be revealed in local budget outcomes.

Like the US, there may also be a relationship between the level of income and public tastes for public assistance programs in Korea. As the level of income increases, residents are likely to pay more attention to redistribution policy. Fisher (1996) holds two reasons for this relationship. First, higher-income residents can afford more. Second, higher-income residents might have more to lose if widespread poverty leads to civil disruption or collapse of the political structure.

During the periods of 1960s and 1970s in which the level of income was relatively low, the Korean government paid little attention to welfare programs in order to sustain a high rate of economic growth and export promotion. Even though the most important public assistance program, the Livelihood Protection Act, was enacted in 1961, social welfare programs were virtually non-existent in Korea until the late 1970s (Lee and Shim, 1992). Many Korean scholars agree that since the 1980s a rapid rise in income level has caused fiscal demands in diversified areas such as public welfare (Kwack, 1992). Therefore, the Korean government is expected to play a more aggressive role in redistribution policy. Then, the question is which level of government plays a leading role in redistribution policy in Korea. The current functional alignment among the levels of government requires that local governments expand the scope of welfare programs (Local Autonomy Act of 1989, Clause 11). Therefore, we expect that as fiscal decentralization proceeds, local governments are more involved in the redistribution function to respond to local resident preferences.

3.2.3. Stabilization Function

Oates (1972) argues that there are two reasons to assign monetary and fiscal policy as a function of the central government. First, local and regional economies are so small and open that local or regional economic cycles and fiscal policies dissipate throughout the larger economy. Therefore, high labor and capital mobility can offset the benefits of subnational stabilization policies. Second, debt issued by subnational governments is external and debt held by the central government is internal. Therefore, repayment of principal and interest by subnational governments entails a transfer of real income from

residents to non-residents, and repayment by the central government just entails transfers between residents. From the national perspective, therefore, allowing subnational governments to have a stabilization role may lead to inefficiency in resource allocation.

From this conventional view, the same logic is applied to subnational economic development policies. From the national perspective, a job gained by one region is lost to another (Bartik, 1991). Consequently, economic development policies by subnational governments will add little net economic value for the overall society. Rather, they may incur efficiency costs by altering businesses' locational decisions. Furthermore, intergovernmental competition to attract industry may impose an external cost on other taxpayers. For example, if a local jurisdiction grants tax reduction to some businesses and those businesses consume governmental goods (impure public goods), other taxpayers should bear the marginal costs of services that exclusively benefit the business' owner. Also, if fiscal incentives are available in most locations, there will be little differences in relative cost of business in different locations. That will result in a lowering of overall business costs but will not create any incentive for the pattern of investment among jurisdictions to change.

There are some debates regarding the effects of fiscal concessions offered by subnational government to attract businesses. Some studies find that differences in wages, energy costs, and labor skills influence firms' decisions to locate or expand in a state but that the level of state and local taxes does not have much influence (Due, 1961; Carlton, 1983; Schmenner, 1982). On the other hand, other studies find that subnational government taxes influence business decisions among states or regions (Bartik, 1991). The evidence concerning the effects of fiscal concessions is mixed.

Contrary to the conventional argument, some studies hold that decentralized economic development activities potentially provide benefits to the national economy. Netzer (1991) argues that a nation's economy is becoming less closed today. Increasingly, competing location is beyond national boundaries. In other words, a job gain by one region is not necessarily lost to another locality within the nation. It might be at the expense of other foreign cities. In this sense, competing location is not necessarily a zero-sum game from the national perspective.

There is also another positive view concerning interjurisdictional economic development competition. Some public economists argue that from the broadest possible perspective, besides fiscal concession, any policy that affects the size of the economy may be categorized as an economic development policy. Examples include education, broad tax reform to avoid excessive taxation, streamlining regulatory structure, and provision of adequate infrastructure. Then, if subnational governments provide a generally favorable business climate by the examples mentioned above, these subnational economic development policies will support business growth within each region, which in turn will have benefits for the nation as a whole.

Recently, Rivlin (1992) and Peterson (1995) suggest an aggressive role of the subnational governments in economic development. Rivlin argues that state governments should take charge of productivity programs to revitalize the economy and raise incomes while the federal government should take charge of reforming the nation's health financing systems. Peterson argues that state and local governments should focus on developmental programs such as economic development while the federal government should focus on redistributive programs such as programs aimed at the needy, the sick, the disabled, and

the disadvantaged. Both authors propose state and local governments as the key actors to revitalize the regional economy and collectively the national economy.

Recently, Korea has stepped into this new fiscal system which enables local government to have its own power to provide services and raise revenue. With the influx of local autonomy, the scope of power and responsibility of local governments to provide public services is expected to change. The question is, in what directions might it be heading? From both theoretical and empirical perspectives, the effects of subnational economic development policies on the overall economy are not clear. However, what is clear is that subnational policy-makers are more likely to be concerned with economic development within their jurisdictions even though its overall effects are not conclusive. Therefore, we expect that as fiscal decentralization proceeds, the share of developmental expenditure will increase.

H_2: As fiscal decentralization proceeds, the levels of redistribution and developmental expenditures increase.

3.2.4. Literature Review on the Determinants of Local Expenditure

Numerous studies have tried to identify the determinants of subnational government expenditures to improve general understanding of the expenditure decision process. As an early effort, Fabricant (1952) identifies three important variables to determine local government expenditure (income, population density, and urbanization). Sacks and Harris (1964) identify an important role of intergovernmental grants over the level of local

expenditure. A series of follow-up studies (e.g., Fisher, 1961; Bahl and Saunders, 1965) confirm the earlier findings. That is:

> (1) Personal income is positively associated with general, education, police, fire, and highways expenditures. The only exception is sanitation.
> (2) Density is negatively associated with general, sanitation, and highways; and positively associated with education, police, and fire.
> (3) Urbanization is positively associated with general, education, police, fire, and sanitation. The only exception is highways.
> (4) Federal and state aid is positively associated with general, education, police, fire, sanitation, and highways. (Raimondo, 1992:82)

However, these earlier efforts of determinant studies have been under criticism that because the studies are based largely on the statistical significance of regression coefficients without guidance of general theory. Causal links between dependent and independent variables is vague (Bahl and Saunders, 1966; Bahl and et al., 1980). As a way of dealing with this deficiency, more recent research has tried to reveal the precise demand and supply functions of local goods and services. Several economists have incorporated median voter theory into the demand function and incorporated the Cobb-Douglas function[19] into the supply function (e.g., Borcherding and Deacon, 1972).

Another approach to determine public budget outcomes is incrementalism. Wildavsky (1986:10-11) argues that

> Budgets are almost never actively reviewed as a whole, in the sense of considering at one time the value of all existing programs compared to all possible alternatives. Instead, this year's budget is based on last year's budget, with special attention given to a narrow range of increases and decreases. The greatest part of any budget is a product of previous decisions.

[19] Output = f (labor input, capital input)

This has two implications: (1) the budget process is incremental and (2) budget outcome is incremental. From a normative standpoint, Wildavsky argues that the budget process should be incremental because there are (1) conflicting preferences for expenditures, (2) difficulties associated with calculating all possible alternatives, and (3) insufficient information for comparing each alternative. From an empirical standpoint, Davis, Dempster and Wildavsky (1966) show that the U.S. budget outcome had changed incrementally year after year. At the subnational level, Lauth (1978) holds that the budgeting process and outcome were still incremental even after the state of Georgia formally adopted a rational budgeting system such as ZBB (Zero-Base Budgeting).

Some critics argue that incrementalism neglects environmental factors such as socio-economic factors (Kemp, 1982). Schick (1983) argues that incrementalism offers a limited explanation of the budget process and outcome during an economic downturn although it quite well explains the budget process and outcome during the period of the economic growth.

Although no underlying conceptual model for local expenditure decision-making is fully developed, several important determinants are identified: (1) incrementalism, (2) fiscal capacity, (3) demand for services, (4) cost of supplying services, and (5) intergovernmental grants.

3.2.5. Summary

This section presented two hypotheses regarding functional realignment. The conventional wisdom suggests that the central government should perform the redistribution function and the stabilization function. However, this conventional

argument has been challenged on theoretical and empirical grounds. The role of local governments in the redistribution function and the stabilization function has been re-evaluated. As fiscal decentralization proceeds, the role of local governments is expected to be more active in those functions.

Also, based on existing theories and conventional wisdom, we identify several determinants of local government expenditure: (1) incrementalism, (2) fiscal capacity, (3) demand for services, (4) cost of supplying services, and (5) intergovernmental grants. In chapter 4, we incorporate those determinants into our empirical model.

3.3. Decentralization's Effect on Fiscal Independence of Local Governments

3.3.1. Decentralization and Fiscal Independence

Theorists of decentralization argue that decentralization will enhance local autonomy that contributes to a variety of governance values such as responsiveness and accountability (Wolman and McCormick, 1994:253). Strengthening local autonomy powers through decentralization makes people closer to government. It is generally believed that citizens can have easier access to the local decision-making process than to the national one. Elected officials in decentralized units are more accountable to local residents because of their physical proximity and community social contracts. Therefore, fiscal decisions in decentralized units may be more responsive to the demands of local residents even though those decisions might not be efficient from the perspective of the central government (Bird, 1993).

Also, the degree of fiscal independence in local government is critical for efficiency gains in the provision of local public goods. As mentioned earlier, fiscal federalism theory

holds that the financial burden of local spending ought be kept with the local electorate in order to improve efficiency. In practice, however, spending responsibility and revenue-raising capability of local governments are often mismatched. In other words, local governments are usually in the unfavorable fiscal position of not being able to finance their programs fully without central government grants. The conventional argument holds that vertical fiscal imbalance occurs for four reasons: tax competition, redistribution, economies of scale in administration, and inferior local administrative capacity (Kim, 1995).

First, the conventional argument holds that due to possible tax competition among local jurisdictions, a centrally uniform taxation has a relative advantage from the efficiency perspective. As mentioned earlier, however, even though tax competition itself may result in inefficiency, competitive environment, which tax competition causes, may not have unfavorable effects on the national economy. Rather, it may contribute to the economic development of the whole nation. Second, the central government sees a need to redistribute funds from relatively wealthy to poor jurisdictions. As mentioned before, however, if taste differences are substantial across jurisdictions, increases in central grants will do little to equalize welfare services among jurisdictions. Therefore, the magnitude of the central redistribution policy might not be as great as expected. Third, there may be economies of scale in tax collection and administration. Empirical studies concerning economies of scale in public production or provision of goods and services are not conclusive. Some studies find that gains from scale economies in the public sector may be achieved in capital-intensive production, but may not be achieved in the provision of labor-intensive goods and services. Considering that tax administration is a relatively labor-

intensive public service, it is difficult to argue that gains from scale economies can be achieved. Fourth, especially in developing countries, there is often a lack of needed administrative structure and expertise to operate a system of decentralized taxation. For example, a local property tax requires well-trained local officials, but if this is not available, the local tax administration may not be operated well. For the case of Korea, the extent of educated human capital accumulation is relatively large because of the traditional enthusiasm for better education.[20] Especially, many Koreans prefer government jobs because they are a reliable form of employment.[21] Therefore, local governments may not have difficulty in recruiting competent and qualified public servants. Putting the above discussion together, there is less rationale for central government dominance over fiscal resources and tax administration.

Furthermore, from the efficiency perspective, the heavy dependence on intergovernmental grants may cause allocative inefficiency. For conditional grants, bureaucratic regulations such as cost caps and minimum consumption requirements always follow the grant monies. These regulations may lead local governments not to choose the optimal consumption bundle. For unconditional lump-sum grants, as Gramlich (1977) indicates, the marginal increase in local spending is approximately three to four times greater when it is funded by such grant money than when it is funded by local taxpayers' income. This finding, the so-called "flypaper effect," suggests that the heavy use of unconditional lump-sum grants will lead to an inefficient allocation in local governments.

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[20] Some argue that several countries in the Far East such as Korea, Japan, and China are enthusiastic for education because of the Confucian tradition (Korean Overseas Information, 1979).

[21] Almost every university in Korea has the department of public administration. This may indicate the popularity of government jobs in Korea.

Therefore, it is so important for local governments to maintain a certain degree of own-source revenue.

Accordingly, there is a strong incentive to reform local finance structure in this way. In Korea, for example, the tobacco consumption tax was introduced as a local tax in order to enlarge local revenue. Also, unconditional grants such as the local share tax, which has been a major source of financing local public goods and services, has been steadily declining since the late 1980s (refer to Table 2.15). Therefore, we hypothesize that

H_3: As fiscal decentralization proceeds, the fiscal independence of local governments increases.

3.3.2. Other Factors Affecting Fiscal Independence of Local Government

There may be two factors affecting the size of local own-source revenue. First, the level of personal income in a jurisdiction may affect the size of the local own-source revenue. Higher personal income may imply that the jurisdiction has sufficient jobs and extensive trade flows in goods and services. This will provide a substantial amount of tax base. The availability of an enlarged tax base offers a favorable environment for the local government to achieve a more independent financing structure.

Second, as mentioned earlier, benefit spillover is a basic reason for central intervention. Simply put, local voters who are only concerned with maximizing their utility will not take into account the extra benefits that accrue to other jurisdictions. As a result, without any corrective measures, services with positive externalities will be underprovided. A common practice is that upper level of government provides intergovernmental grants to

correct those externalities. Therefore, if a jurisdiction provides more public goods with externalities, the jurisdiction will receive more intergovernmental grants. This will affect the size of own-source revenue.

3.4. Summary

In this chapter, we developed research hypotheses concerning the effects of fiscal decentralization on local finance in Korea:

H_1: As fiscal decentralization proceeds, the size of the central budget decreases while the size of the local budget increases.

H_2: As fiscal decentralization proceeds, the levels of redistribution and developmental expenditures increase.

H_3: As fiscal decentralization proceeds, the fiscal independence of local governments increases.

In the next chapter, we test these hypotheses empirically.

CHAPTER 4

DATA ANALYSIS AND RESULTS

The previous chapter was devoted to developing research hypotheses about the effects of fiscal decentralization on local finance in Korea. In this chapter, we test the hypotheses using regression analysis. Hypothesis 1 is tested using a GLS (Generalized Least Squares) estimation of time-series data. Also, as mentioned earlier, we test a nonrecursive relationship between variables. Hypotheses 2 and 3 are tested using a GLS estimation of an error-components model. To ascertain the effects of fiscal decentralization policies as perceived by local officials, we collect supplementary data using survey research.

4.1. The Econometric Approach

In regression analysis the primary objective is to explain the behavior of one variable (the dependent variable) in relationship to the behavior of one or more other variables (the explanatory variables), allowing for the fact that the relationship between them is not exact. A statistical relationship can never establish causal connection. Relationships between dependent variables and explanatory variables should be guided by the relevant theory, and even then, such relationships are probabilistic rather than certain.

The classical linear regression model (CLRM) makes the following assumptions (Gujarati, 1995):

(1) The explanatory variable(s) X is uncorrelated with the disturbance term μ. However, if the X variable(s) is nonstochastic (i.e., its value is a fixed number), this assumption is automatically fulfilled.

(2) The expected, or mean, value of the disturbance term μ is zero. That is, $E(\mu_i) = 0$

(3) The variance of each μ_i is constant, or homoscedastic. That is, $var(\mu_i) = \sigma^2$

(4) There is no correlation between two error terms. This is the assumption of no autocorrelation. Algebraically, this assumption can be written as: $cov(\mu_i, \mu_j) = 0 \quad i \neq j$

(5) No exact collinearity exists between X_2 and X_3; that is, there is no exact linear relationship between the two explanatory variables.

(6) For hypothesis testing, the error term μ follows a normal distribution with mean zero and homoscedastic variance σ^2. That is, $\mu_i \sim N(0,\sigma^2)$

With these assumptions, the OLS (Ordinary Least Squares) estimators are the best linear unbiased estimators (BLUE). In reality, however, there may be many cases in which these assumptions may not be satisfied. For example, there may be a case that (1) explanatory variables are correlated to each other (multicollinearity problem), (2) the error variance is nonconstant (heteroscedasticity problem), (3) the error terms are correlated with each other (autocorrelation problem), or (4) the explanatory variable is correlated to the error term (simultaneity problem).

4.2. Data and Sources

This study uses two data sets: (1) a financial and census data set and (2) a data set from survey research. Data for local government finances are collected from the *Financial Yearbook of Local Government* (Ministry of Government Administration and

Home Affairs). This publication is issued annually and is rich in statistical analysis of local government finances in Korea. Data for central government finances and national economic data such as disposal income and GDP are collected from the *Economic Statistics Yearbook* (The Bank of Korea). This publication also has been annually updated and contains major statistics for national economic activities. The census data for city governments are collected from the *Municipal Yearbook of Korea* (Ministry of Government Administration and Home Affairs). This publication has been issued annually and contains statistics of census data for municipal governments including cities and small townships.

These three statistical yearbooks contain most of the data needed. In addition, some supplementary data, such as number of public employees, are collected from the website of the Korean Statistical Office (http://www.nso.go.kr/).

A survey research method is utilized to collect supplementary data. During the period of October 2001 to January 2002, a questionnaire was administered to the chief financial officers in 68 local governments, including Seoul, 6 metropolitan cities, 9 provinces, and 52 cities. Thirty-five local officials returned usable questionnaires (51.5% return rate). The questionnaire includes 14 questions of which two are open-ended and 12 are closed-ended.[22] These questions are designed to ascertain the effects of fiscal decentralization policies as perceived by local officials. The distribution of the respondents is shown in Table 4.1. The responses by local government types are representative of the population as a whole; no government type is underrepresented.

Table 4.1. Frequency of Survey Response by the Type of Government

	Number of sample	number of response	Return rate
Seoul	1	1	100.0%
Metro City	6	4	66.7%
Province	9	4	44.4%
City	52	26	50.0%
Total	68	35	51.5%

During the 1980s and 1990s, many city governments have been consolidated into new cities. The 52 city governments included in this study are those that existed period 1987 to 1998, for which consistent data could be collected.

4.3. Empirical Test of Hypothesis 1

H_1: As fiscal decentralization proceeds, the size of the central budget decreases while the size of the local budget increases.

To test this hypothesis, we borrow Marlow's model. Although there are many empirical studies testing the relationship between decentralization and the size of budget, Marlow's model is best fitted to the Korean setting. A time-series data set is better suited for a study of a unitary country than a cross-sectional or pooled data set because in a unitary country the middle level of government does not play such a major role as states or provinces in a federal country.

A time series on the central and local levels of Korean government is constructed for the years 1981-1998. The choice of this time period is to balance the before-and-after periods of local assembly elections in 1991. Dependent variables are (1) the ratio of the

[22] Refer to Appendix C for the questionnaire.

central government expenditure-to-GDP (CE), (2) the ratio of local government expenditure-to-GDP (LE), and (3) the ratio of total government expenditure-to-GDP (TE). A key independent variable is fiscal decentralization measured by the ratio of local expenditure-to-total government expenditure (DEC).[23] Control variables include real per capita disposable income (INCOME)[24] and population (POP). The income variable controls the influence of Wagner's Law that suggests a positive relationship between government size and real income. The control for population acts as a scale variable.

Table 4.2. Operationalization of Variables (Hypothesis 1)

Variables	**Operationalized Definition**
CE	Central government expenditure ÷ GDP
LE	Local government expenditure ÷ GDP
TE	Total government expenditure[25] ÷ GDP
DEC	(local government expenditure – conditional grants) ÷ (total government expenditure – unconditional grants)
INCOME	Per capita disposable income in 1995 constant won
POP	Population

I conduct OLS regression analysis of three dependent variables (CE, LE, and TE) and independent variable (DEC) (Table 4.3). The logistic transformation[26] of dependent

[23] Conditional grants such as national subsidies are excluded from the local expenditure and unconditional grants such as local shared tax are included as the local expenditure. Appendix D reports the regression estimation results without controlling those effects.
[24] We use constant won (1995) instead of current won. Constant won = (current won/CPI)*100
[25] central expenditure + local expenditure

variables is conducted because dependent variables have a range limited to the zero-to-one interval, which is not satisfied with the basic assumption of the regression model.

Table 4.3. OLS Estimation of CE, LE, and TE (N=18)

	CE	LE	TE
Intercept	-0.681 (-5.945)***	-1.811 (-18.222)***	-0.723 (-5.761)***
DEC	7.48E-03 (0.019)	2.374 (6.790)***	0.804 (0.821)
R^2	0.062	0.726	0.120

t-statistics in parentheses
** significant at the 5% level, two-tailed test; *** 1%

The signs of DEC in all three equations are positive. This means a more decentralized government tends to be associated with a larger amount of government spending.

We conduct OLS regression analysis with control variables (INCOME and POP) (Table 4.4). In the CE equation and the TE equation, the sign of DEC is negative. This means a more decentralized public sector is associated with less central spending and less government total spending. In the LE equation, the sign of DEC is positive. This means a more decentralized public sector is associated with more local spending, but there is no statistically significant relationship between LE and DEC.

[26] $CE' = \log \frac{CE}{1 - CE}$

Table 4.4. OLS Estimation of CE, LE, AND TE with Control Variables (N=18)

	CE	LE	TE
Intercept	-0.421	-1.847	-0.461
	(-0.390)	(-2.025)*	(-0.392)
DEC	-2.172	0.421	-1.597
	(-3.667)***	(0.841)	(-2.479)**
INCOME	1.033E-06	7.449E-07	1.122E-06
	(1.446)	(1.235)	(1.443)
POP	3.029E-09	9.947E-09	3.991E-09
	(0.103)	(0.400)	(0.125)
D-W	0.628	0.643	0.625
Adjusted R^2	0.479	0.873	0.574

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

The Durbin-Watson d Test is used to detect an autocorrelation problem. The computed d value must lie between 0 and 4. If a computed d value is closer to zero, there is evidence of positive autocorrelation, and if it is closer to 4, there is evidence of negative autocorrelation. The closer the d value is to 2, the more the evidence is in favor of no autocorrelation.

We find all three equations suffer from autocorrelation. The GLS regression method[27] is conducted as a remedial procedure. The usual procedure of GLS using generalized difference equation is as follows.[28]

$$CE_t = \alpha_0 + \alpha_1 DEC_t + \alpha_2 INCOME_t + \alpha_3 POP_t + \mu_t \qquad \text{(equation 4.1)}$$

and assume that the error terms follow the AR(1) scheme:

$\mu_t = \rho\mu_{t-1} + \nu_t \qquad 1 \geq \rho \geq -1$ (equation 4.2)

where the νs satisfy the usual OLS assumption and ρ is known.

Now, if we can transform the model (equation 4.1) so that in the transformed model the error term is serially independent, then applying OLS to the transformed model will give us the usual BLUE estimators, assuming that other assumptions of CLRM are fulfilled.

We can write the regression (equation 4.1) with a one-period lag as

$CE_{t-1} = \alpha_0 + \alpha_1 DEC_{t-1} + \alpha_2 INCOME_{t-1} + \alpha_3 POP_{t-1} + \mu_{t-1}$ (equation 4.3)

Multiply the regression (equation 4.3) by ρ on both sides to obtain

$\rho CE_{t-1} = \rho\alpha_0 + \rho\alpha_1 DEC_{t-1} + \rho\alpha_2 INCOME_{t-1} + \rho\alpha_3 POP_{t-1} + \rho\mu_{t-1}$ (equation 4.4)

Subtract equation 4.4 from equation 4.1, to yield

$(CE_t - \rho CE_{t-1}) = \alpha_0 (1 - \rho) + \alpha_1 (DEC_t - \rho DEC_{t-1}) + \alpha_2 (INCOME_t - \rho INCOME_{t-1}) +$

$\alpha_3 (POP_t - \rho POP_{t-1}) + \mu_t - \rho\mu_{t-1}$ (equation 4.5)

From equation 4.2, $\mu_t - \rho\mu_{t-1} = \nu_t$

Therefore,

$(CE_t - \rho CE_{t-1}) = \alpha_0 (1 - \rho) + \alpha_1 (DEC_t - \rho DEC_{t-1}) + \alpha_2 (INCOME_t - \rho INCOME_{t-1}) +$

$\alpha_3 (POP_t - \rho POP_{t-1}) + \nu_t$ (equation 4.6)

---

[27] In simplest definition, GLS is OLS on the transformed variables that satisfy the standard least-squares assumptions (Gujarati 1995:363).

Since the error term ν_t in equation 4.6 satisfies the standard OLS assumption, equation 4.6 gives us a model free from serial correlation. If we write equation 4.6 as

$$CE^*_t = \alpha^*_0 + \alpha_1 DEC^*_t + \alpha_2 INCOME^*_t + \alpha_3 POP^*_t + \nu_t \qquad \text{(equation 4.7)}$$

where

$$CE^*_t = (CE_t - \rho CE_{t-1})$$

$$DEC^*_t = (DEC_t - \rho DEC_{t-1})$$

$$INCOME^*_t = (INCOME_t - \rho INCOME_{t-1})$$

$$POP^*_t = (POP_t - \rho POP_{t-1})$$

$$\alpha^*_0 = \alpha_0 (1 - \rho)$$

In order to conduct GLS regression, we need to know the ρ of each equation. There are several methods to estimate the unknown ρ.[29] We use the Cochrane-Orcutt method that uses the estimated residuals to obtain information about the unknown ρ.

Table 4.5 shows the GLS estimation of CE, LE, and TE on DEC, INCOME, and POP. To ensure no presence of autocorrelation in these transformed equations, an additional autocorrelation test is conducted. Gujarati (1995:436) notes that the Durbin-Watson tables may not be appropriate to test for serial correlation in the data that have already been adjusted for autocorrelation, and so he recommends nonparametric tests for this

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[28] For illustrative purpose, CE model is treated in the following.

[29] The simplest method is to estimate ρ based on Durbin-Watson d statistics ($\hat{\rho} \approx 1 - \frac{d}{2}$). Theil and Nagar suggest that in small samples instead of estimating ρ as (1-d/2), it be estimated as

$$\hat{\rho} = \frac{n^2(1 - d/2) + k^2}{n^2 - k^2}$$

where n = total number of observation, d = Durbin-Watson d, and k = number of coefficients (including the intercept) to be estimated.

situation. Therefore, we conduct Runs Test[30] on the estimated residuals of these transformed equations. Based on the tests, we cannot reject the hypothesis that there is no serial correlation in the residuals from each of the above three regressions.

Table 4.5. GLS Estimation of CE, LE, and TE (N=17)

	CE	LE	TE
Intercept	-1.596 (-2.875)**	-2.141 (-4.128)***	-1.745 (-2.916)**
DEC	-1.565 (-3.391)***	0.817 (1.925)*	-0.912 (-1.831)*
INCOME	-2.925E-07 (-0.487)	-2.189E-07 (-0.396)	-3.337E-07 (-0.514)
POP	5.701E-08 (2.428)**	4.984E-08 (2.308)**	6.302E-08 (2.486)**
Rho	0.392	0.382	0.393
Adjusted R^2	0.670	0.858	0.712

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Like in OLS regression, the sign of DEC in the CE and TE equations is negative while the sign of DEC in the LE equation is positive. The coefficient of DEC in the CE equation is statistically significant which means a more decentralized public sector is associated with a less central spending. Also, the coefficient of DEC in the LE equation is statistically significant at the 10 percent level, which means a more decentralized public sector is associated with more local spending. The coefficient of DEC in the TE equation is also statistically significant at the 10 percent level which means a more decentralized public sector is associated with less total spending. The coefficients of POP in all three

[30] This is also known as the Geary test.

equations are statistically significant which means an increase in population is associated with more public spending. Finally, the coefficients of INCOME in all three equations are not statistically significant. This finding indicates that level of income does not affect the level of public spending in Korea. As Bahl (1999) points out, this result may come from the fact that voter preferences have not been revealed into either national or local budget outcomes.

There may be a simultaneous relationship between two dependent variables (CE and LE) and DEC because an increase in the central expenditure will increase total government expenditure, leading to a decrease in the decentralization ratio. Or, an increase in the local expenditure may lead to an increase in the decentralization ratio.

A basic assumption in a single equation regression model is that the Xs are the exogenous variables. In other words, the causality, if any, runs from Xs to Y, not from Y to Xs. However, there are situations in which such a unidirectional relationship between Y and Xs cannot be maintained. It is quite possible that the Xs not only affect Y but Y can also affect one or more Xs. If this is the case, the single equation modeling strategy will not suffice.

A version of the Hausman specification error test is used for testing the simultaneity problem in CE and LE equations.[31]

$$CE_t = \alpha_0 + \alpha_1 DEC_t + \alpha_2 INCOME_t + \alpha_3 POP_t + \mu_{1t} \qquad \text{(equation 4.8)}$$

$$DEC_t = \beta_0 + \beta_1 CE_t + \beta_2 X_t + \mu_{2t} \qquad \text{(equation 4.9)}$$

X = a set of explanatory variables

[31] For illustrative purpose, only CE equation is treated in the following.

We assume that INCOME, POP, and X are exogenous. CE and DEC are simultaneous. In equation 4.8, if there is no simultaneity problem (i.e., CE and DEC are mutually independent), DEC_t and μ_{1t} should be uncorrelated. On the other hand, if there is simultaneity, DEC_t and μ_{1t} will be correlated. To find out which is the case, the Hausman test proceeds as follows:

First, from equation 4.8 and 4.9 we obtain the following reduced-form equation:

$DEC_t = \Pi_0 + \Pi_1 INCOME_t + \Pi_2 POP_t + \Pi_3 X_t + \nu_t$ (equation 4.10)

where

$$\Pi_0 = \frac{\beta_0 + \alpha_0\beta_1}{1-\alpha_1\beta_1} \qquad \Pi_1 = \frac{\alpha_2\beta_1}{1-\alpha_1\beta_1} \qquad \Pi_2 = \frac{\alpha_3\beta_1}{1-\alpha_1\beta_1} \qquad \Pi_3 = \frac{\beta_2}{1-\alpha_1\beta_1}$$

$$\nu_t = \frac{\beta_1}{1-\alpha_1\beta_1}\mu_{1t} + \frac{1}{1-\alpha_1\beta_1}\mu_{2t}$$

ν_t is the reduced form error term. Estimating equation 4.10 by OLS we obtain

$\hat{DEC}_t = \hat{\Pi}_0 + \hat{\Pi}_1 INCOME_t + \hat{\Pi}_2 POP_t + \hat{\Pi}_3 X_t$ (equation 4.11)

Therefore,

$DEC_t = \hat{DEC}_t + \hat{\nu}_t$ (equation 4.12)

where $\hat{DEC}_t$ are estimated DEC_t and $\hat{\nu}_t$ are the estimated residuals.

Because $\hat{DEC}_t$ is a linear combination of the nonstochastic predetermined variables (INCOME, POP and X), it is also nonstochastic. $\hat{\nu}_t$ is a random component of DEC_t. Therefore, $\hat{DEC}_t$ and $\hat{\nu}_t$ are uncorrelated according to the OLS theory (CLRM's assumption 1).

Substituting equation 4.12 into equation 4.8, we get

$CE_t = \alpha_0 + \alpha_1 \hat{DEC}_t + \alpha_2 INCOME_t + \alpha_3 POP_t + \alpha_1 \hat{\nu}_t + \mu_{1t}$ (equation 4.13)

In order to know whether DEC_t and μ_{1t} are correlated, we test the relationship between $\hat{\nu}_t$ and μ_{1t} in equation 4.13 because $\hat{DEC}_t$ is nonstochastic and $\hat{\nu}_t$ is the random component of DEC_t.

Now under the null hypothesis that there is no simultaneity, the correlation between $\hat{\nu}_t$ and μ_{1t} should be zero, asymptotically, that is, as the sample size increases indefinitely. Thus, if we run the regression and find that the coefficient of $\hat{\nu}_t$ in equation 4.13 is statistically zero, we can conclude that there is no simultaneity problem. This conclusion will be reversed if we find this coefficient to be statistically significant.

We find a simultaneity problem only in the CE equation. So, there is a need for a remedial procedure for the CE equation. The two-stage least squares (2SLS) method is used as a remedial method. The usual procedure of 2SLS method is as follows:

$CE_t = \alpha_0 + \alpha_1 DEC_t + \alpha_2 INCOME_t + \alpha_3 POP_t + \mu_{1t}$ (equation 4.8)

$DEC_t = \beta_0 + \beta_1 CE_t + \beta_2 X_t + \mu_{2t}$ (equation 4.9)

■ Stage 1.

To get rid of the likely correlation between DEC and μ_1, regress first DEC on all the predetermined variables. Therefore,

$DEC_t = \hat{\Pi}_0 + \hat{\Pi}_1 INCOME_t + \hat{\Pi}_2 POP_t + \hat{\Pi}_3 X_t + \hat{\mu}_t$ (equation 4.14)

where $\hat{\mu}_t$ are the usual OLS residuals. From equation 4.14 we obtain

$$\hat{DEC}_t = \hat{\Pi}_0 + \hat{\Pi}_1 \text{INCOME}_t + \hat{\Pi}_2 \text{POP}_t + \hat{\Pi}_3 X_t \qquad \text{(equation 4.15)}$$

Equation 4.14 can be expressed as

$$\text{DEC}_t = \hat{DEC}_t + \hat{\mu}_t \qquad \text{(equation 4.16)}$$

which shows that the stochastic DEC consists of two parts: $\hat{DEC}_t$, which is a linear combination of the nonstochastic predetermined variables (INCOME, POP and X), and a random component $\hat{\mu}_t$. Following the OLS theory (CLRM's assumption 1), $\hat{DEC}_t$ and $\hat{\mu}_t$ are uncorrelated.

■ Stage 2.

Equation 4.8 can be written as

$$\text{CE}_t = \alpha_0 + \alpha_1(\hat{DEC}_t + \hat{\mu}_t) + \alpha_2 \text{INCOME}_t + \alpha_3 \text{POP}_t + \mu_{1t}$$

$$= \alpha_0 + \alpha_1 \hat{DEC}_t + \alpha_2 \text{INCOME}_t + \alpha_3 \text{POP}_t + (\mu_{1t} + \alpha_1 \hat{\mu}_t)$$

$$= \alpha_0 + \alpha_1 \hat{DEC}_t + \alpha_2 \text{INCOME}_t + \alpha_3 \text{POP}_t + \mu^*_t \qquad \text{(equation 4.17)}$$

where $\mu^*_t = \mu_{1t} + \alpha_1 \hat{\mu}_t$

Although DEC in equation 4.8 is correlated or likely to be correlated with the disturbance term μ_1 (hence rendering OLS inappropriate), $\hat{DEC}_t$ in equation 4.17 is uncorrelated with μ^*_t asymptotically because the error term, μ^*_t, contains $\hat{\mu}_t$, which is an uncorelated error term with $\hat{DEC}_t$. As a result, OLS can be applied to equation 4.17.

Also, there is another important procedure to conduct 2SLS. In order to conduct OLS estimation of equation 4.17, we should have $\hat{DEC}_t$, not DEC_t. In order to get $\hat{DEC}_t$, we use instrumental variables, which are highly correlated with DEC_t but are uncorrelated with μ^*_t.

Table 4.6. 2SLS Estimation of CE (N = 18)

	CE
Intercept	-0.367 (-0.337)
DEC	-1.946 (-2.466)**
INCOME	1.009E-06 (1.403)
POP	4.144E-10 (0.014)
Adjusted R^2	0.32

t-statistics in parentheses
** significant at 5% level, two-tailed test

Table 4.6 shows the result of 2SLS regression.[32] DEC still has a negative coefficient of statistical significance, which means a more decentralized government tends to be associated with a less central spending.

During the last 20 years, defense spending in relation to GDP has declined (Figure 4.1). Because defense expenditures have occupied a big portion of central government expenditures, its decrease affects the level of central spending. Therefore, the conclusion

[32] Instruments employed are the exogenous variables in the model and the ratio of import and export to GDP. The import/export ratio is correlated to DEC (-0.623) but it is not correlated to CE (0.113).

that as decentralization proceeds central expenditure tends to be less, may not be valid without controlling for defense spending.

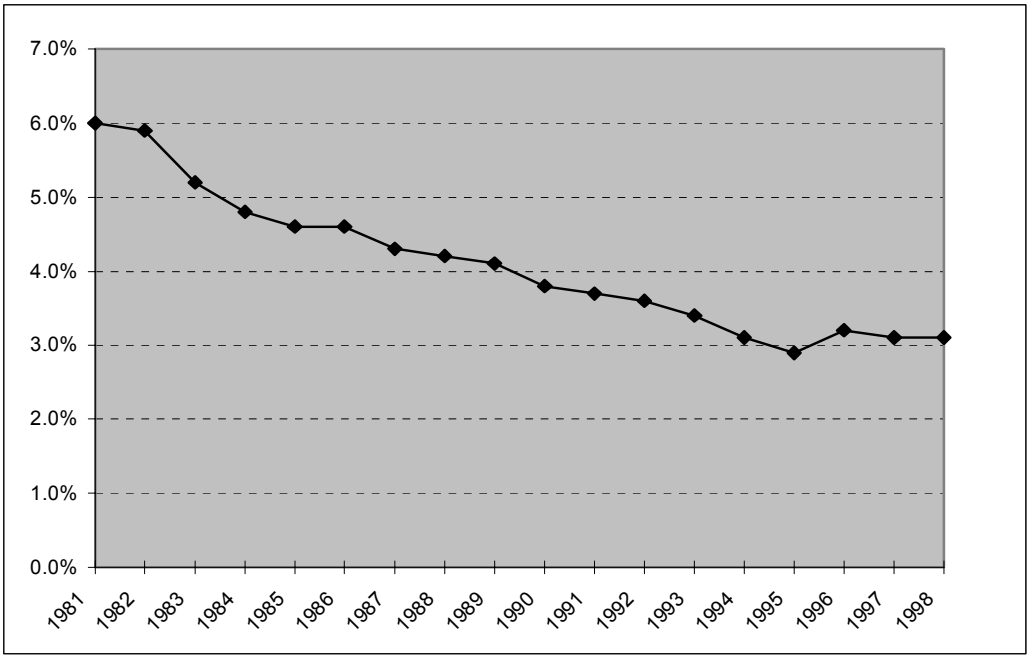

Figure 4.1. Defense Expenditure to GDP (1981-1998)
(Bank of Korea, *Economic Statistics Yearbook*, various years)

The original data are modified to remove defense expenditures from central government expenditures. We conduct a series of regression analyses with the modified data. The result is shown in Table 4.7. These results are not very much different from those with the original data. Therefore, we can conclude there is a negative relationship between the level of the central government expenditure and the degree of fiscal decentralization. The relationship between the level of local government expenditure and the degree of fiscal decentralization is positive even though it is statistically insignificant.

The relationship between the level of total government expenditure and the degree of fiscal decentralization is negative and statistically significant at the 5 percent level.

Table 4.7. OLS, GLS, and 2SLS Estimation of CE, LE, and TE without Defense Expenditure

	OLS			GLS			2SLS
	CE(D)	LE(D)	TE(D)	CE(D)	LE(D)	TE(D)	CE(D)
Intercept	-0.835	-1.944	-0.899	-1.587	-2.006	-1.744	-0.696
	(-0.819)	(-2.085)*	(-0.813)	(-2.901)**	(-3.814)***	(-2.981)**	(-0.641)
DEC(D)	-2.258	0.012	-1.649	-1.649	0.484	-0.954	-1.666
	(-4.926)***	(0.030)	(-3.319)***	(-4.221)***	(1.296)	(-2.279)**	(-2.364)**
INCOME	8.992E-07	7.890E-07	9.775E-07	-1.734E-07	-7.724E-08	-2.132E-07	9.539E-07
	(1.331)	(1.278)	(1.335)	(-0.291)	(-0.136)	(-0.334)	(1.332)
POP	1.373E-08	1.466E-08	1.507E-08	6.043E-08	5.248E-08	6.682E-08	5.493E-09
	(0.493)	(0.576)	(0.499)	(2.474)**	(2.247)**	(2.553)**	(0.181)
D-W	0.662	0.648	0.667				
Rho				0.437	0.434	0.438	
Adj R^2	0.761	0.866	0.783	0.821	0.822	0.811	0.652

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%
(D) denotes controlling for defense spending

These findings imply two points. First, as Brennan and Buchanan hypothesize, the central government in Korea had a major responsibility in government taxing and spending. As decentralization proceeds, its taxing and spending responsibility have devolved to local governments. Second, we expect local governments to respond more readily to local demands, which may induce an increase in the level of local expenditure as fiscal decentralization proceeds. However, the empirical result is not clear. One of the reasons is that the Korean government still does not respond to the citizens' demands even though fiscal decentralization has proceeded. The fact that the coefficients of income

variables in all equations do not have statistical significance may also provide a partial indication that the Korean government does not readily respond to the citizens' demands.

4.4. Empirical Test of Hypothesis 2

H_2: As fiscal decentralization proceeds, the levels of redistribution and developmental expenditure increase.

A time series on 59 city governments is constructed for the years 1987-1998. This part of the study uses a panel data set. Hsiao (1986) argues the advantages of panel data sets over conventional cross-sectional or time-series data sets are as follows. First, because panel data sets usually have a large number of data points, they increase the degrees of freedom and reduce the collinearity among explanatory variables. Second, panel data sets contrast cross-sections of a unit on one dimension as well as points of time for each unit on another. By pooling these two dimensions, they combine the virtues and few of the limitations of cross-sectional or time-series analysis. Although panel data sets have several virtues mentioned above, they are not immune from econometric problems such as heteroscedasticity and autocorrelation.

The dependent variables are the levels of redistribution and economic development expenditures. To reclassify local expenditure into those two functional areas is subject to imprecision and subjectivity. For the purpose of this study, however, reclassification is necessary. The functional classification of local expenditures reported in the *Financial Yearbook of Local Government* is rearranged. Social Welfare expenditure is classified as

redistribution expenditure. Industry and Economy, and Regional Development are classified as developmental expenditure.

Table 4.8. Operationalization of Variables (Hypothesis 2)

Variables	**Operationalized Definition**
RED	Per capita redistribution expenditure in 1995 constant won
DEV	Per capita developmental expenditure in 1995 constant won
DEC	Own-source revenue ÷ total revenue
LAG(RED)	One-time-period lagged value of RED
LAG(DEV)	One-time-period lagged value of DEV
INCOME	Per capita gross regional product (GRP)
DENSITY	Number of residents per km^2
GRANT	Per capita grants in 1995 constant won
CITY	Dummy variable. D=1 if Seoul or metropolitan cities. D=0 otherwise
POP	Population

The independent variable is the self-reliance rate of local government.[33] Because this part of the study is concerned with local expenditures only, the expenditure decentralization figure, which was the share of local expenditures to total expenditures in the previous model, cannot be obtained. Therefore, the alternative measure of decentralization employed is the self-reliance rate of local governments.

[33] The self-reliance rate of a jurisdiction is calculated as own-source revenue divided by total revenue.

Dependent variables[34] are measured as (1) per capita redistribution expenditure (RED) and (2) per capita developmental expenditure (DEV). A key independent variable is fiscal decentralization measured by the self-reliance rate of each local jurisdiction (DEC).

As mentioned earlier, we identify several important determinants of local expenditure: (1) incrementalism, (2) fiscal capacity, (3) demand for service, (4) cost of supplying services, and (5) intergovernmental grants. To capture those determinants into our model, we use some additional variables. First, we use a one-time-period lagged (t-1) ratio of each functional expenditure (LAG(RED) and LAG(DEV)) to capture incrementalism. Second, fiscal capacity of a local government is measured by Gross Regional Product (GRP) per capita (INCOME).[35] Ladd and Yinger (1989) ague that fiscal capacity of local governments can be measure by the resident's income. If a local jurisdiction has a broad tax base and strong economic activities, its resident's income is different from other jurisdictions, which have weak economic activities. Third, demand for services and cost of supplying services are measured by number of residents per km^2 (DENSITY). Because population density is usually correlated with wage rates and the price of many materials, it may be accepted as a proxy for variations in the demand for and the cost of government services (Peterson 1981:52). Fourth, intergovernmental grants are measured by per-capita grant (GRANT).[36] Intergovernmental grants tend to stimulate spending by the government that receives the grants (Oates, 1985; Grossman, 1989). Therefore, it is one

[34] We use 1995 constant won.
[35] Because Korean government has not published any income data by city, this study uses Lee and Kim's (1990:107) method to estimate GRP. This method also appears in Ahn's dissertation (American University 1995). GRP is calculated as the total amount of tax burden (national + local tax amount) divided by tax burden rate. This method assumes that income change is in proportion to tax burden change. Another common practice to incorporate income data into a model in the Korean literature is to use the number of cars.
[36] We use constant won for per-capita grant.

factor determining the size of the local budget. Finally, we use city dummy (CITY)[37] and population (POP) as scale variables.

We conduct OLS regression estimation of two equations. The models estimated are

$$RED_{it} = \alpha_0 + \alpha_1 DEC_{it} + \alpha_2 LAG(RED)_{it} + \alpha_3 INCOME_{it} + \alpha_4 DENSITY_{it} + \alpha_5 GRANT_{it} + \alpha_6 CITY_{it} + \alpha_7 POP_{it} + \mu_{it} \quad \text{(equation 4.18)}$$

$$DEV_{it} = \beta_0 + \beta_1 DEC_{it} + \beta_2 LAG(DEV)_{it} + \beta_3 INCOME_{it} + \beta_4 DENSITY_{it} + \beta_5 GRANT_{it} + \beta_6 CITY_{it} + \beta_7 POP_{it} + \nu_{it} \quad \text{(equation 4.19)}$$

The estimation result is shown in Table 4.9. At this point, a single most important finding is that the levels of redistributive and developmental expenditures are positively associated with the degree of fiscal decentralization.

However, given that the data set consists of cross-sections of cities, it will presumably have a typical heteroscedasticity problem. In Figure 4.2 and 4.3, squared residuals from OLS estimations of RED and DEV equations are plotted against the predicted values of dependent variables. We cannot conclude whether the pattern of the relationship is random or not.

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[37] D = 1, if city is Seoul or metropolitan city; D = 0, otherwise

Table. 4.9. OLS Estimation of RED and DEV (N = 708)

	RED	DEV
Intercept	-12196.57 (-2.704)***	-36672.01 (-3.664)***
DEC	17435.789 (2.383)**	102777.41 (6.261)***
LAG(RED)	0.923 (37.638)***	
LAG(DEV)		0.387 (13.203)***
INCOME	1.20E-03 (4.227)***	5.437E-03 (8.696)***
DENSITY	0.367 (0.853)	-2.958 (-3.158)***
GRANT	6.381E-02 (9.804)***	0.377 (20.341)***
CITY	-2611.113 (-0.713)	-3026.369 (-0.385)
POP	-1.170E-03 (-1.176)	1.640E-03 (0.765)
Adjusted R^2	0.882	0.887

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

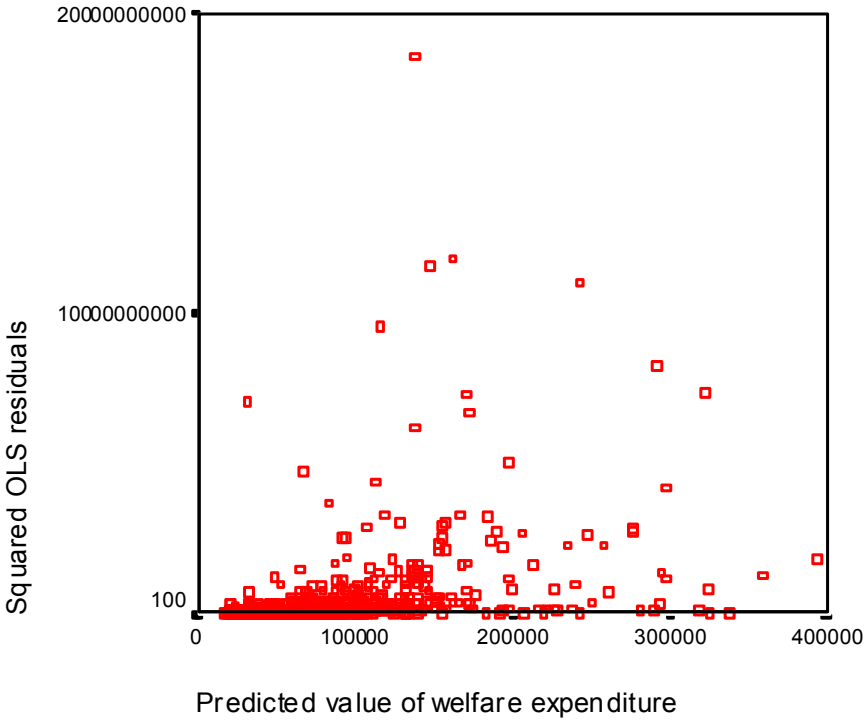

Figure 4.2. Structure of the Heteroscedasticity (RED)

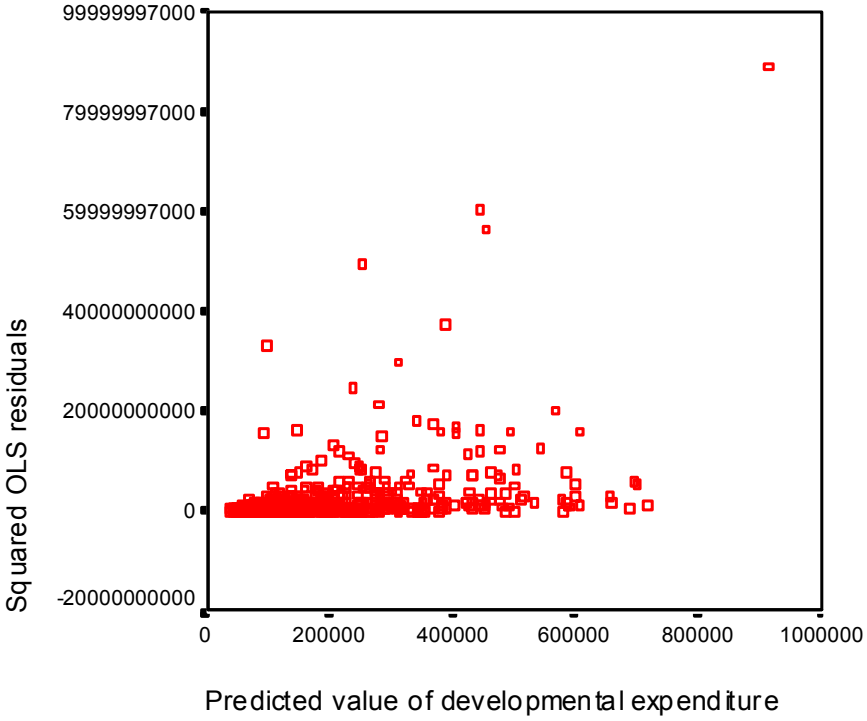

Figure 4.3. Structure of the Heteroscedasticity (DEV)

Therefore, we conduct an additional test that is a Lagrange multiplier test (Breusch and Pagan, 1980; Kmenta, 1997:629). The test statistics for the two-component model is

$$\text{LM} = \frac{NT}{2(T-1)}\left[\frac{\sum_i (\sum_t \hat{\mu}_{it})^2}{\sum_i \sum_t \hat{\mu}_{it}^2} - 1\right]^2 \sim \chi_1^2 \qquad \text{(equation 4.20)}$$

We find both equations suffer from a heteroscedasticity problem. Therefore, we need a remedial procedure. Intuitively,[38] we consider a general model that the intercepts and response parameters are permitted to differ for each cross-section in each time period.

$$Y_{it} = \alpha_{0it} + \alpha_{1it} X_{1it} + \alpha_{2it} X_{2it} + \ldots + \alpha_{nit} X_{nit} + \mu_{it} \qquad \text{(equation 4.21)}$$

However, this model cannot be estimated in its current form because there are more unknown parameters than data points. There are many types of simplifying assumptions that can be made to make the model operational. We consider the two most popular variable-intercept models (varying intercept and constant slope) in utilizing panel (cross-sectional and time-series) data: a fixed effects model and a random effects model.

From equation 4.21, the variable-intercept model assumes that

$\alpha_{0it} = \alpha_{0i}$ $\alpha_{1it} = \alpha_1$ $\alpha_{2it} = \alpha_2$ … $\alpha_{nit} = \alpha_n$

The resulting statistical model is

$$Y_{it} = \alpha_{0i} + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \ldots + \alpha_n X_{nit} + \mu_{it} \qquad \text{(equation 4.22)}$$

In equation 4.22, the intercepts vary but the slopes are constant for cross-sections in time periods. The feature that distinguishes the fixed effects model from the random effects model is the way in which the varying intercept, $\alpha_{0i,}$ is treated. As the name implies, the fixed effects model treats it as a fixed, unknown parameter while the random effects model treats it as random drawings from the population distribution of cross-section intercepts. The following section shows how each approach estimates equation 4.22.

The fixed effects model introduces a set of dummy variables to estimate equation 4.22. This method is known as LSDV (least squares dummy variable). The dummy variables are defined as follows.

$D_{1i} = 1, \quad i = 1$ $\quad D_{2i} = 1, i = 2$ $\quad D_{3i} = 1, i = 3$ $\quad \ldots \quad D_{Ni} = 1, i = N$
$\quad 0, \quad$ otherwise $\quad 0,$ otherwise $\quad 0,$ otherwise $\quad 0,$ otherwise

Under these definitions equation 4.22 becomes

$$Y_{it} = \alpha_{01}D_{1i} + \alpha_{02}D_{2i} + \alpha_{03}D_{3i} + \ldots + \alpha_{0N}D_{Ni} + \alpha_1X_{1it} + \alpha_2X_{2it} + \ldots + \alpha_nX_{nit} + \mu_{it} \qquad \text{(equation 4.23)}$$

In equation 4.23 there are N dummy variables, one for each cross-section. Therefore, each cross-sectional unit has its own intercept value, but it stays constant over time within each cross-sectional unit. The differences between cross-sectional units are reflected in the coefficients, α_{0N}.

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[38] This intuition comes from the fact that the previous OLS model presumes the intercept and response parameter remain the same for all the cross-sections and time periods.

This is a reasonable approach when the differences between cross-sectional units can be viewed as parametric shifts of the regression function. However, its estimation result is strictly conditioned on the sample in the study, and we cannot apply the result to outside-the-sample cross-sections. Also, because it introduces additional N dummy variables into the model, it loses N number of degrees of freedom. This is an important issue when the sample size is relatively small.

Another disadvantage of using LSDV is that its estimation result is biased when the model has a particular type of explanatory variable. LSDV is unable to provide the coefficient of a variable that remains unchanged over time within each cross-sectional unit (e.g., dummy variable). When a model has a lagged dependent variable as an explanatory variable, the estimation result of LSDV tends to be underestimated (Hsiao, 1986:95).

In the random effects model, we assume the intercepts (α_{0i} in equation 4.22) are random variables. Therefore, the intercepts (α_{0i}) are modeled as[39]

$$\alpha_{0i} = \overline{\alpha}_0 + \varepsilon_i \qquad i = 1, \ldots, N \qquad \text{(equation 4.24)}$$

$\overline{\alpha}_0$ is an unknown parameter that represents the population mean intercept, and ε_i is an unobservable random error that accounts for individual differences in cross-sectional behavior. We assume that the ε_i are independent of each other and μ_{it} in equation 4.22. Substituting equation 4.24 into 4.22 yields

[39] In this case we consider two components model. Although most econometrics textbooks deal with three components model ($\nu_{it} = \varepsilon_i + \lambda_t + \mu_{it}$) in theoretical basis, most applied studies omit the time component and use two components model (Kmenta 1997:627). Stimson (1985:926) argues that this practice comes

$$Y_{it} = (\bar{\alpha}_0 + \varepsilon_i) + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \ldots + \alpha_n X_{nit} + \mu_{it}$$

$$= \bar{\alpha}_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \ldots + \alpha_n X_{nit} + (\varepsilon_i + \mu_{it})$$

$$= \bar{\alpha}_0 + \alpha_1 X_{1it} + \alpha_2 X_{2it} + \ldots + \alpha_n X_{nit} + \nu_{it} \qquad \text{(equation 4.25)}$$

where $\nu_{it} = \varepsilon_i + \mu_{it}$

This model is also called an error components model. The term "error components" comes from the fact that the error term $\nu_{it} = \varepsilon_i + \mu_{it}$ consists of two components: the individual specific error and the overall error. One important caution in estimating equation 4.25 is that due to the presence of ε_i in error terms (ν_{it}), the errors from the same unit in different time periods may be correlated. This violates the basic assumption of least squares. Therefore, the generalized least squares estimator may be a better estimator (Hsiao, 1986:34).

The error components model is a reasonable approach if the individual cross-sectional units appearing in the sample are taken to be representative of a larger population of cross-sectional units. Therefore, its estimation result is applied beyond the sample. This model yields consistent estimates in so far as the cross-sectional specific error term is not correlated with the explanatory variables (Kmenta, 1997:634).

This study uses the error components model because (1) the regression model tests the effect of a dummy variable such as CITY, which cannot be tested by LSDV, and (2) the

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from two reasons: (1)autocorrelation is frequently a small problem relative to unit effects in a usual pooled data set and (2) it is frequently impossible to deal with it.

model includes a lagged dependent variable as an explanatory variable that may cause a biased estimation by LSDV.[40]

In order to conduct GLS estimation of the error components model, we need to know ρ ($\rho = \sigma_u^2/\sigma^2$). There are several methods to estimate the unknown ρ. Stimson (1985:924-925) argues that "estimator efficiency[41] is relatively insensitive to the quality of variance component estimates." We use a two-step GLS estimation (Stimson, 1985:937). The usual procedure is as follows.

$$\sigma^2 = \sigma_u^2 + \sigma_e^2 \qquad \text{(equation 4.26)}$$

where σ^2 is the total residual variance, σ_u^2 is the between-group residual variance, and σ_e^2 is the within-group residual variance.

The total variance σ^2 may be estimated from the residual variance of the OLS estimation. The within-group variance σ_e^2 may be estimated from the residual variance of the LSDV estimation. Then, the estimate of ρ is the ratio σ_u^2/σ^2.

Table 4.10 shows GLS estimation of the error-components model (GLSE). The key independent variable, the degree of decentralization, is positively associated with the levels of redistributive expenditure and developmental expenditure. This finding suggests that as fiscal decentralization proceeds, local governments increase the levels of redistributive and developmental expenditures.

The coefficients on LAGs are positive and statistically significant in both cases. This indicates that the amount of budget in year t is strongly associated with the amount of budget in year t-1. The coefficients on INCOMEs are positive and statistically significant

[40] For dynamic model, GLS estimator in the error components model may be also biased. But its bias is smaller than that of OLS or LSDV (Hsiao, 1986:88). An alternative method will be maximum-likelihood

Table 4.10. GLSE Estimation of RED and DEV (N = 708)

	RED	DEV
Intercept	-12340.96 (-2.712)***	-42081.25 (-3.972)***
DEC	17671.25 (2.386)**	114223.25 (6.471)***
LAG(RED)	0.919 (37.393)***	
LAG(DEV)		0.350 (11.910)***
INCOME	1.2E-03 (4.245)***	5.9E-03 (8.776)***
DENSITY	0.369 (0.836)	-3.293 (-2.936)***
GRANT	0.0646 (9.884)***	0.393 (21.187)***
CITY	-2676.468 (-0.708)	-4828.593 (-0.500)
POP	-1.2E-03 (-1.146)	1.9E-03 (0.712)
Rho	0.0067	0.057
Adjusted R^2	0.88	0.877

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

in both cases. This means that higher level of income is associated with higher levels of redistributive expenditure and developmental expenditure. The coefficient on DENSITY is negative and significant in DEV equation while it is not significant in RED equation.

(ML) estimator. In this study, however, we use GLS estimator instead of complex ML estimator.

This finding indicates that a city with less population density is likely to spend more developmental expenditure. The coefficients on GRANTs are positive and statistically significant in both cases. This means that intergovernmental revenues support a certain portion of redistributive and developmental expenditures.

In the survey, 24 out of 35 local governments respond that they put the most emphasis on economic development. Eight out of 35 local governments respond that they put the most emphasis on welfare function. From these survey results, we may notice that the two most important policy areas in local governments are economic development and welfare functions.

4.5. Empirical Test of Hypothesis 3

H_3: As fiscal decentralization proceeds, fiscal independence of local governments increases.

A data series on 59 city governments is constructed for the years 1987-1998. The dependent variable is the self-reliance rate of each city government (SER). The self-reliance rate is not a perfect measure of the fiscal independence of local governments in that it neglects the expenditure side of local finance. It is, however, commonly used to measure fiscal independence of local governments in Korean literature (Lim, 1997). Key independent variables are qualitative measures of decentralization using a dummy variable

[41] unbiased estimator with the least variance

(D_{DEC1} and D_{DEC2}).[42] The degree of decentralization is divided into two phases: local assembly elections since 1991 and mayor elections since 1995.

Bahl and others (1994, 1986) argue that government structure is a critical element in decentralization implementation especially in developing countries. Elected local government is a necessary condition for decentralization. During the periods of 1991 and 1995, city government structure was one with locally elected assemblies and centrally appointed mayors. Some question the quality of the local assembly in terms of its expertise and experience. Because there had been no local assembly for several decades and the Korean people were accustomed to an "executive-dominated" government system as a result of military autocracy, the "new-born" local assembly was not expected to perform its task well but just symbolized progress in democratic governance. Many Koreans think real progress in local autonomy has started since the 1995 mayor elections.

There may be several other factors affecting the degree of the self-reliance rate of a local government. First, fiscal capacity of a local government can affect the degree of the self-reliance rate. If a local jurisdiction has a broad tax base and strong economic activities, its self-reliance rate will increase. This is measured by an income proxy (INCOME).[43] Second, if a local government has more public programs in which the benefits and costs are not retained within that jurisdiction, its self-reliance rate will decrease because the central grants adjust those externalities. This is measured by the local expenditure per capita devoted to roads, flood control, and other construction

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[42] $D_{dec1} = 1$ $1995 \geq t \geq 1992$, $D_{dec1} = 0$ otherwise; $D_{dec2} = 1$ $1998 \geq t \geq 1996$, $D_{dec2} = 0$ otherwise. We introduce two dummy variables to depict the three periods (1987-1991, 1992-1995, and 1996-1998). Using only two dummy variables for three categories is a strategy to avoid dummy variable trap.

[43] Gross Regional product (GRP) per capita

(SPILL) (Kim, 1995). We use the city dummy variable as a scale variable (D_{CITY}) and use a lagged dependent variable as an explanatory variable (LAG(SER)) to capture incremental budget practice.

Table 4.11. Operationalization of Variables (Hypothesis 3)

Variables	**Operationalized Definition**
SER	Own-source revenue ÷ total revenue
D_{DEC1}	Dummy variable. $D_{dec1} = 1$ $1995 \geq t \geq 1992$, $D_{dec1} = 0$ otherwise
D_{DEC2}	Dummy variable. $D_{dec2} = 1$ $1998 \geq t \geq 1996$, $D_{dec2} = 0$ otherwise
INCOME	Per capita gross regional product (GRP)
SPILL	Per capita local expenditure devoted to roads, flood control, and other construction in 1995 constant won
D_{CITY}	Dummy variable. D=1 if Seoul or metropolitan cities. D=0 otherwise
LAG(SER)	One-time-period lagged value of SER

We conduct OLS regression analysis of the dependent variable (SER) and independent variables. The logistic transformation of the dependent variable is conducted.

The OLS result (Table 4.12) shows that the relationships between SER and DECs are negative. That means a government structure with elected local assembly tends to be associated with a lower self-reliance rate. The relationship between the dependent variable and other explanatory variables except SPILL confirms what we expect.

Table 4.12. OLS Estimation of SER (N = 708)

	SER
Intercept	-0.934 (-28.764)***
D_{DEC1}	-9.072E-02 (-4.154)***
D_{DEC2}	-6.139E-02 (-2.239)**
INCOME	2.023E-08 (7.262)***
SPILL	-0.216 (-1.916)*
D_{CITY}	8.979E-02 (3.357)***
LAG(SER)	1.990 (38.455)***
Adjusted R^2	0.835

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

However, given that the data set consists of cross-sections of cities, it will presumably have a typical heteroscedasticity problem. Therefore, we use the error components model for the same reasons mentioned in section 4.4. The model estimated is

$$SER_{it} = \alpha_{0i} + \alpha_1 D_{DEC1it} + \alpha_2 D_{DEC2it} + \alpha_3 INCOME_{1it} + \alpha_4 SPILL_{it} + \alpha_5 D_{CITYit} + \alpha_6 LAG(SER)_{it} + \mu_{it} \quad \text{(equation 4.27)}$$

$D_{DEC1} = 1$ if $1995 \geq t \geq 1992$,

$= 0$ otherwise

D_{DEC2} = 1 if 1998 ≥ t ≥ 1996,

= 0 otherwise

i = 1,2……59

t = 1987, 1988 …..1998

Table 4.13. GLSE Estimation of SER (1987 – 1998) (N = 708)

	SER
Intercept	-0.731 (-17.196)***
D_{DEC1}	-0.042 (-2.058)**
D_{DEC2}	-0.0319 (-1.230)
INCOME	0.000[a] (5.170)***
SPILL	-0.233 (-2.143)**
D_{CITY}	0.095 (2.101)**
LAG(SER)	1.649 (24.158)***
Rho	0.292
Adjusted R^2	0.582

t-statistics in parentheses
[a] denotes extremely small value
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Table 4.13 reports GLS estimation of the error components model. D_{DEC1} is negatively associated with the level of self-reliance rate. This means that the presence of local

assembly may lead to a decrease in the self-reliance rate. D_{DEC2} is negatively associated and it is not statistically significant. However, this interpretation is very tentative because we do not control several central initiatives whose purpose was to increase the self-reliance rate of local government during the late 1980s. In order to control those impacts, we divide the original data set into two time periods, which are 1987-1994 and 1992-1998. Each data set has only one DEC variable, that is, local assembly for the periods of 1987-1994 and mayor for the periods of 1992-1998. We conduct two additional regression analyses and the estimation results are reported in Table 4.14 and 4.15.

Table 4.14. GLS Estimation of SER (1987-1994) (N = 472)

	SER
Intercept	-0.665 (-13.668)***
D_{DEC1}	-0.018 (-0.762)
INCOME	0.000[a] (5.765)***
SPILL	-0.364 (-1.965)**
D_{CITY}	0.213 (3.915)***
LAG(SER)	1.480 (18.098)***
Rho	0.335
Adjusted R^2	0.608

t-statistics in parentheses
[a] denotes extremely small value
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Table 4.15. GLS Estimation of SER (1992-1998) (N = 413)

	SER
Intercept	-0.891 (-12.277)***
D_{DEC2}	0.032 (1.699)*
INCOME	0.000[a] (2.215)**
SPILL	-0.240 (-1.916)*
D_{CITY}	0.096 (1.660)*
LAG(SER)	1.874 (19.233)***
Rho	0.349
Adjusted R^2	0.635

t-statistics in parentheses
[a] denotes extremely small value
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Comparing Table 4.13, 4.14, and 4.15, we can see the signs of the variables remain the same except D_{DEC2}. D_{DEC2} in Table 4.13 has negative sign and D_{DEC2} in Table 4.15 has positive sign. The positive sign may mean that the introduction of an elected mayor may lead to an increase in the self-reliance rate of local governments. In other words, the elected mayors may contribute an increase in fiscal independence of local governments. For the case of D_{DEC1}, its coefficient is statistically significant in Table 4.13, but it is not statistically significant in Table 4.14. This means the introduction of elected local assembly may not be associated with the level of self-reliance rate.

This point is consistent with the survey results. Out of 35 responses, 33 local officials say the office of mayor has more influence in determining the final budget outcome than local assembly. Even though substantial percentages of local officials (23 out of 35) respond that the local assembly plays an important role in determining the final budget outcome, the role of the local assembly is somewhat limited because of its short history and lack of expertise. Out of 35, only 3 local officials respond that local assemblymen are well equipped with professional knowledge about budget substance. In the Korean context, therefore, the introduction of an elected executive has more impact on fiscal independence of local jurisdiction than the introduction of an elected assembly.

CHAPTER 5

SUMMARY AND CONCLUSION

The purpose of this study is to investigate the actual effects of decentralization on three important aspects of public finance in Korea: public spending, functional responsibility, and the fiscal independence of local government. Fiscal decentralization is considered to have the potential to improve the performance of the public sector. Fiscal federalism theory holds that the decentralized provision of public goods can increase efficiency in resource allocation because local governments can be better tailored to the geographical benefit areas of public goods, local governments are better positioned to recognize local preferences and needs, and pressure from interjurisdictional competition may motivate local governments to be innovative and accountable to their residents. The theory also holds that redistribution and stabilization functions should be the central government's task because of the mobility of economic units.

However, some recent studies have challenged these conventional arguments on theoretical and empirical grounds. Bahl and others (1994, 1986) hold that political, fiscal, and administrative structures in developing countries are organized in such a way that local voter preferences may not be readily revealed and incorporated into local budget outcomes. As a result, the decentralized provision of public goods may not improve efficiency in developing economies. However, the contention has never been empirically investigated.

Also, empirical studies on economic unit mobility are not conclusive. Mixed empirical findings imply that there may be a rationale for subnational redistribution and stabilization functions. The recent development of local autonomy and fiscal decentralization in Korea provides an excellent opportunity for empirical investigation of these questions.

In recent years, Korea has embarked on a new political system, which allows subnational elections and local autonomy. The National Assembly passed the Local Autonomy Act (L.A.A.) of 1989. Local assembly elections have been held since 1991 and gubernatorial and mayoral elections have been held since 1995. The L.A.A. and its implementation symbolize progress in democratic governance in Korea. By law, local governments are no longer spending agencies of the central government. The local assembly has the power of deciding its own budget and local law even though it has some limitations. The elected governors and mayors also have considerable power over personal management and fiscal decision-making.

There have been few efforts to systematically analyze the effects of the Korean decentralization initiative on the public sector. In order to evaluate the effects of decentralization on local public finance, we formulate three hypotheses and test them empirically.

In the first section of this dissertation, we used an indirect method to measure efficiency gain in the Korean public sector. Methodological difficulty precluded measuring direct efficiency gain. A slightly modified version of the decentralization hypothesis posed by Brennan and Buchanan is tested in the Korean setting. To test this hypothesis, we borrowed Marlow's model. Although there are many empirical models for testing the relationship between decentralization and the size of the public budget, Marlow's model is

best fitted into the Korean setting. We find as fiscal decentralization proceeds, the size of the central budget is decreasing while the size of the local budget is increasing. Given the assumption that the central government overproduces public goods and local governments underproduce public goods, these findings may imply that fiscal decentralization makes "the better fit" possible. In other words, this finding means that fiscal decentralization increases efficiency in the Korean public sector.

In the second section, we investigated the degree of the subnational role in the redistribution and stabilization functions as fiscal decentralization proceeded. As fiscal decentralization proceeds in Korea, two particular policy areas have received much attention – redistribution and economic development. As fiscal decentralization proceeds, functional realignment between the levels of government might be expected. The question is the direction in which the change occurs.

According to Musgrave (1959), stabilization and redistribution functions are appropriate objectives of the central government. This conventional argument is based on the ideas of spatial externality and economic unit mobility. However, empirical studies regarding economic unit mobility and taste differences are so mixed that we cannot automatically follow the assumptions made by the conventional argument. Rather, as income level in Korea increases, we expect that the redistribution function, which was once neglected, will receive more attention. Also, as fiscal decentralization proceeds, we expect that competition for economic development among localities increases. We expect that local governments pay attention to both economic development and welfare functions. In the regression estimation, we find that the degree of decentralization is positively associated with the levels of redistributive expenditure and developmental expenditure.

In the third section, we expected that as decentralization proceeded, the degree of fiscal independence of local governments would increase. Decentralization enhances local autonomy, which contributes to a variety of governance values such as responsiveness and accountability. Active citizen participation in the local policy-making process and elected government may be a mechanism to connect decision-making to local demand. Without adequate revenue-raising capacity, however, the capacity of independent fiscal decision-making in local governments is limited. The fiscal federalism theory holds that the degree of fiscal independence of local governments is critical for efficiency gain in decentralized provision of public goods. Therefore, we hypothesize that as decentralization proceeds, fiscal independence of local governments increases. We find that the introduction of the elected executive has more impact on the fiscal independence of local jurisdictions than the introduction of an elected assembly.

This study has several limitations. First of all, because we cannot obtain any income data by local government, the regression estimations may be somewhat limited. Second, because of the relatively short period of fiscal decentralization implementation (since 1989), we have a limited number of time points in the estimation. Third, some data are missing and frequent changes in data-recording methods make consistent data collection difficult. This is a typical phenomenon in developing countries. Fortunately, in recent years the Korean government has begun to recognize the necessity of accurate and consistent data. In the future there will be a more complete set of data available to researchers.

Overall, these findings lead to the conclusion that the fiscal decentralization policy, which has been implemented since the late 1980s, improves the performance of the Korean

public sector. However, much more should be done in the near future in order to achieve the full blossom of local autonomy. First, local governments should have more discretion regarding their revenue sources. The tax base and tax rate of local governments are largely determined by the central government. Fiscal federalism theory holds that the financial burden of local spending ought be kept with the local electorate in order to improve efficiency. Unless local governments face a "hard" budget constraint, local officials and their constituents are not likely to match costs of their actions with the marginal benefit to the jurisdiction. In order to maximize efficiency gains, therefore, we recommend that the central government give local governments more discretion regarding their revenue sources.

Another issue related to the revenue side is low revenue-raising capability of local governments. In general, spending responsibility and revenue-raising capability of local governments are often mismatched. Local governments are usually in an unfavorable fiscal position so that they cannot fully finance their programs without the central grant monies. Usually the central government has had the most productive revenue source such as income tax. The vertical fiscal imbalance is not unique to Korea. The issue is how to share the financial resources between the central and local governments. The inferior financial position of local governments impedes the development of local autonomy and fiscal decentralization. Therefore, we recommend that several central taxes be changed to local taxes. Possible candidates include special excise tax and telephone tax[44].

[44] Special excise tax and telephone tax are national taxes. The special excise tax is one of major Korean indirect taxes and it is imposed on about 40 items such as luxuries, durable goods, and sumptuary goods. For the telephone tax, a person using the telephone system is liable to pay the telephone tax. With the recent wide spread of telephone service network, the share of telephone tax in the national tax has been continuously increasing.

Finally, the local assembly should be equipped with more professional knowledge and budget expertise. Local governments officials must be held accountable for their decisions. An elected government may be a mechanism to connect decision-making to local demand. Officials who do not provide the "right" mix of goods and services or do not manage tax revenues well are simply voted out of office. In the case of Korea, however, there had been no local elections for several decades and the Korean people were accustomed to an "executive-dominated" government system as a result of military autocracy. As a result, local government officials tend to be more attentive to the central government rather than local constituents. The key issue here is how to convey information regarding local preferences to decision-makers. One way of doing this is to empower the local assembly. In order for the local assembly to play a role in conveying local demand to local budget outcomes, it must have professional knowledge and budget expertise concerning public services.

This dissertation has explained the implementation of the L.A.A. of 1989 and the effects of decentralization on three important aspects of public finance in Korea: public spending, functional responsibility, and fiscal independence of local government. Based upon research findings, it has concluded that the fiscal decentralization policy improves the performance of the Korean public sector. Our research conclusion has led to several recommendations for further improvement of local government in Korea.

APPENDICES

Appendix A. A Glossary of Tax Terms[45]

- **Inhabitant Tax**: It is composed of a per capita Inhabitant Tax and income-based Inhabitant Tax. The per capita Inhabitant Tax targets all the households in each jurisdiction, while the income-based Inhabitant Tax targets individuals and corporations who must pay income tax, corporation tax or farmland tax.
- **Farmland Income Tax**: Farmers who earn an income from cultivating or hiring others to cultivate crops must pay the Farmland Income Tax.
- **Business Firm Tax**: It targets business activities. The Business Firm Tax is composed of two categories. One is the per property Business Firm Tax, for which the tax base is property value. The other is per employee Business Firm Tax, for which the tax base is the monthly employee payment.
- **Acquisition Tax**: All those acquiring real estate, motor vehicles, heavy equipment, boats and aircrafts, golf memberships, and condominium memberships are required to pay the Acquisition Tax.
- **Registration Tax**: It is aimed at tax registration activities concerning acquisition, creation, transfer, alteration or lapse of property rights or other titles in official registers.
- **Property Tax**: It is a tax on the possession of properties. Since the introduction of the Aggregate Land Tax, the Property Tax base has been reduced because land has excluded from the Property Tax base. Its taxable objects are buildings, vessels, aircraft, and heavy equipment.
- **Automobile Tax**: Persons with automobiles pay it.
- **Aggregate Land Tax**: Before the introduction of the Aggregate Land Tax, the land tax existed in a form of Property Tax, which simply taxed each single unit of land without aggregating all the lands owned by each taxpayer. The Aggregate Land Tax expands the scope of the tax base by aggregating all the lands owned by each taxpayer on a national jurisdiction basis.
- **City Planning Tax**: It is designed to cover local expenditure for city planning. The taxable objects are land and houses.
- **Community Facility Tax**: It is designed to cover local expenditure for local facilities, particularly for fire-protection services.
- **Regional Development Tax**: It is designed to raise special revenue for improving local infrastructures. This tax revenue is concentrated on several areas such as harbor cities and provinces with natural resources. Its taxable objects are natural resources and containers in harbors.
- **License Tax**: This tax may be regarded as a form of public fee for public benefits which the license-holder enjoys through his license.
- **Butchery Tax**: It is a form of special excise tax concerned with the slaughter of cattle or pigs.
- **Horse Race Tax**: It is a form of special excise tax.
- **Tobacco Consumption Tax**: The tax base is tobacco sales within a city or county.

[45] This glossary is based on Oh (1992a, 1992b)

Appendix B. An Example of Calculation of Standardized Cost in A city

Expenditure Item	Unit of Measurement	Unit	Unit Cost (won)	Rate	Standard Cost (million won)
1. Local Assembly					
(1) Assembly Operation	# of local assemblyman	10	14097000	1.000	140.97
(2) Election	# of precinct				
2. Personal					
(1) Salary	# of public official	544	10391000	0.970	5483.12
(2) Expense	# of public official	544	923000	0.970	487.05
(3) Allowance	# of public official	544	1762000	0.970	929.77
(4) Finge Benefit	regular # of public official	545	2899000	0.969	1530.98
3. General Management	# of public official	391	4419000	1.000	1727.83
4. Education	# of public official	348	258600	1.000	89.99
5. Town,Township,Village					
(1) Administration for Town	# of public official in town	154	4509000	1.000	694.39
(2) Administration for sub-town	# of sub-town	109	1462000	1.000	159.36
6. Public Relation	population	95146	1800	1.284	219.90
7. Tax Collection	# of household	29522	5500	1.315	213.52
8. Building					
(1) Current	square measure of building	8449	24600	1.685	350.22
(2) Investment	regular # of public official	545	1199700	1.316	860.45
9. Social Welfare					
(1) Current	population	95146	4620	1.400	615.40
(2) Investment	population	95146	5930	1.061	598.63
10. Low Income	# of low income	1572	90200	1.000	141.79
11. Public Health					
(1) Current	population	95146	2340	1.284	285.87
(2) Investment	population	95146	1050	1.367	136.57
12. Garbage Collection					
(1) Current	population	95146	10490	1.284	1281.54
(2) Investment	population	95146	3800	1.000	361.55
13. Sanitation					
(1) Current	population	95146	1670	1.206	191.63
(2) Investment	population	95146	2770	5.892	1552.86
14. Agriculture					
(1) Current	# of agricultural household	1931	87180	1.077	181.31
(2) Investment	area of cultivated land	1674	117700	1.060	208.85
15. Fishery					
(1) Current	# of fishery	0	30030	1.000	0.00
(2) Investment	# of fishery	0	100500	1.000	0.00
16. Forestry	area of forest	4388	40430	0.906	160.73
17. Planting in Public Park	area of public park	147	45100	1.231	8.16
18. Regional Economy					
(1) Commerce and Industry	# of worker in commerce	7159	9440	2.043	138.07
(2) Transportation	# of automobile	10877	15290	1.779	295.86
19. Tourism	population	95146	900	1.067	91.37
20. City Planning	population	95146	7960	1.284	972.45
21. Waterworks	population in water supply	83000	2040	2.721	460.72
22. Sewage	population	95146	9970	1.066	1011.21
23. Road					
(1) Construction	area of unconstructed road	851	859000	0.811	592.85
(2) Pavement	length of unpaved road	0	7318000	1.000	0.00
(3) Maintenance	length of road	1392	545000	1.000	758.64
24. River					
(1) Current	length of river	24000	7580	1.157	210.48
(2) Investment	length of unimproved river	11740	7600	0.842	75.13
25. Regional Development					
(1) Current	population	95146	4170	1.268	503.09
(2) Investment	area of jurisdiction	87770	9030	1.000	792.56
26. Culture & Physical Education					
(1) Current	population	95146	3360	1.284	410.48
(2) Investment	population	95146	4710	1.193	534.63

27. Civil Defense	# of civil defense member	12340	8310	1.380	141.51
28. Fire Fighting					
(1) Current	population	95146	7200	1.284	879.61
(2) Investment	population	95146	4500	1.000	428.16
TOTAL					26909.27

Source: Yoo (1998:198-199)

Appendix C. Fiscal Decentralization Survey Questionnaire

Fiscal Decentralization Project
School of Public and International Affairs
The University of Georgia

- Please check the most appropriate response for each

1. In comparison with 1980s, your city government is operating the city budget more independently from the central government.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

2. Your local assembly plays a substantial role in determining the final budget outcome.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

3. The period of time for budget consideration by your local assembly is adequate for the task.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

4. The local assemblymen in your city are well equipped with professional knowledge about budget substance.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

5. There is a cooperative relationship between the local assembly and the budget office.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

6. After the implementation of local autonomy, your city is improving its accountability and responsiveness to your residents.

Strongly agree ( ) Agree ( ) Neutral ( ) Disagree ( ) Strongly disagree ( )

7. In which of the following areas does your city government receive the most discretion from the central government? (select only one)

- Revenue collection ( )
- Expenditures ( )
- almost the same ( )

8. Which branch of government has more influence in determining the final budget outcome? (select only one)

- Local assembly ( )
- Mayor ( )
- almost the same ( )

- Please rank order the items in the next four questions.

9. Please rank order (1 through 4) according to the amount of influence of the central government on your local government.
(1) the central government is the most influential to
(4) the central government is the least influential

- Budget preparation ( )
- Legislative consideration ( )
- Execution ( )

10. Please rank order (1 through 3) according to the amount of discretion to determine the spending level.
(1) the most discretion to determine the spending level to
(2) the least discretion to determine the spending level

- General administration expenditure ( )
- Welfare ( )
- Economic development ( )
- Other ( ) specify

11. Please rank order (1 through 3) according to the amount of emphasis in your local government.
(1) the most emphasis to
(2) the least emphasis

- General administration function ( )
- Welfare ( )
- Economic development ( )
- Other ( ) specify

12. Please rank order (1 through 8) according to the amount of discretion to determine the rate.
    (1) the most discretion to determine the rate to
    (2) the least discretion to determine the rate

- Property rent ( )
- User charge ( )
- Fee ( )
- Inhabitant tax ( )
- Property tax ( )
- Automobile tax ( )
- Tobacco tax ( )
- Aggregate land tax ( )
- Other ( ) specify

• Please write down your opinion.

13. What is the reason that "carry-over" occupies high share of local revenue?

14. Please provide any additional information concerning local autonomy and fiscal decentralization.

∗ Please return the completed questionnaire to the sender.

Thank you very much for your help.

Appendix D. Regression Estimations without Controlling Grant Effects

Table D.4.3. OLS Estimation of CE, LE, and TE (N=18)

	CE	LE	TE
Intercept	-0.705 (-6.559)***	-1.821 (-19.668)***	-0.762 (-6.335)***
DEC	0.237 (0.650)	2.539 (8.077)***	1.1 (2.694)**
R^2	0.026	0.803	0.312

t-statistics in parentheses
** significant at the 5% level, two-tailed test; *** 1%

Table D.4.4. OLS Estimation of CE, LE, AND TE with Control Variables (N=18)

	CE	LE	TE
Intercept	-0.636 (-0.577)	-1.983 (-2.129)**	-0.744 (-0.610)
DEC	-2.316 (-3.079)***	0.274 (0.430)	-1.791 (-2.150)**
INCOME	1.004E-06 (1.383)	7.408E-07 (1.207)	1.095E-06 (1.363)
POP	1.071E-08 (0.352)	1.550E-08 (0.603)	1.377E-08 (0.409)
D-W	0.688	0.686	0.691
Adjusted R^2	0.411	0.885	0.592

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Table D.4.5. GLS Estimation of CE, LE, and TE (N=17)

	CE	LE	TE
Intercept	-1.750 (-3.536)***	-2.253 (-4.965)***	-1.963 (-3.656)***
DEC	-1.563 (-3.341)***	0.806 (1.892)*	-0.904 (-1.772)*
INCOME	-4.369E-07 (-0.786)	-3.618E-07 (-0.716)	-5.230E-07 (-0.862)
POP	6.719E-08 (3.070)***	5.956E-08 (2.992)***	7.663E-08 (3.207)***
Rho	0.411	0.406	0.415
Adjusted R^2	0.678	0.888	0.751

t-statistics in parentheses
* significant at the 10% level, two-tailed test; ** 5%; *** 1%

Table D.4.6. 2SLS Estimation of CE (N = 18)

	CE
Intercept	-0.736 (-0.645)
DEC	-2.698 (-2.166)**
INCOME	1.050E-06 (1.415)
POP	1.543E-08 (0.415)
Adjusted R^2	0.29

t-statistics in parentheses
** significant at 5% level, two-tailed test

Table D.4.7. OLS, GLS, and 2SLS Estimation of CE, LE, and TE without Defense Expenditure

	OLS			GLS			2SLS
	CE(D)	LE(D)	TE(D)	CE(D)	LE(D)	TE(D)	CE(D)
Intercept	-1.009 (-0.991)	-2.101 (-2.272)**	-1.134 (-1.014)	-1.395 (-3.932)***	-1.644 (-5.021)***	-1.598 (-4.101)***	-0.964 (-0.928)
DEC(D)	-2.491 (-4.268)***	-0.207 (-0.391)	-1.931 (-3.009)***	-1.584 (-4.387)***	0.550 (1.614)	-0.871 (-2.229)**	-2.290 (-2.161)**
INCOME	8.787E-07 (1.309)	7.679E-07 (1.259)	9.541E-07 (1.294)	-3.442E-07 (-0.660)	-2.571E-07 (-0.522)	-4.272E-07 (-0.759)	8.845E-07 (1.312)
POP	2.132E-08 (0.759)	2.166E-08 (0.848)	2.466E-08 (0.799)	7.576E-08 (3.476)***	6.794E-08 (3.282)***	8.539E-08 (3.639)***	1.863E-08 (0.610)
D-W	0.817	0.793	0.835				
Rho				0.591	0.603	0.582	
Adj R^2	0.733	0.885	0.789	0.804	0.799	0.795	0.659

t-statistics in parentheses

* significant at the 10% level, two-tailed test; ** 5%; *** 1%

(D) denotes the control of defense spending

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