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Master's Thesis of Public Administration

A Study on the Effect of Fiscal
Decentralization on Local
Financial Soundness

– Focusing on Local Consumption Tax –

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Abstract

A Study on the Effect of Fiscal Decentralization on Local Financial Soundness – Focusing on Local Consumption Tax –

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In Korea, the scale of local finance has increased significantly since 1995 when the local autonomy system was implemented, while the financial soundness of local governments has deteriorated. The Korean government is pushing for fiscal decentralization to enhance the soundness and accountability of local finance. However, even if revenue decentralization and expenditure decentralization are of the same size, the effect on the financial soundness of local governments can be different. This study examined how fiscal decentralization would affect the financial soundness of local governments to find effective ways to enhance local financial soundness. In this study, the indicator of local financial soundness is the ratio of debt to the budget. This study measured revenue decentralization by local consumption

tax and the ratio of local taxes to total tax and measured expenditure decentralization by general subsidies and the proportion of social welfare expenditure. The study analyzed panel data from 16 metropolitan cities and provinces in Korea from 2010 to 2018. According to regression results, local consumption tax and the ratio of local taxes to total tax positively affected local financial soundness by reducing the ratio of debt to the budget. General subsidies negatively affected the ratio of debt to the budget, but the result was not statistically significant. The study concludes by drawing a policy implication that revenue decentralization is more effective than expenditure decentralization in enhancing local financial soundness.

Keywords: Local financial soundness, Fiscal decentralization, Local consumption tax, Local subsidies, Social welfare expenditure

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Chapter 1. Introduction

1.1. Study Background

In Korea, the scale of local finance has increased significantly since 1995 when the local autonomy system was implemented. The total budget of local governments increased from KRW 47 trillion in 1995 to KRW 210 trillion in 2018. However, the dependency of local governments on the central government for fiscal revenues has also increased, thereby deteriorating the financial soundness of local governments. The financial independence rate, an indicator of a local government's ability to make a living on its own, worsened from 63.5 percent in 1995 to 53.4 percent in 2018 (KOSIS, 2020). This may be due to the tax system in which national taxes account for about 80 percent of total taxes, while local spending is increasing due to the demand increase in the social welfare sector and state-funded projects that require matching local expenses.

Based on the recognition of this situation, the Korean government is pushing for fiscal decentralization to enhance the soundness and accountability of local finance. Fiscal decentralization, which is divided into revenue decentralization and expenditure decentralization, affects the financial soundness of local governments. The government is seeking to improve the ratio of local taxes to national tax by expanding the proportion of local consumption tax and adjust local finance by increasing the local subsidy rate.

Fiscal decentralization can boost efficiency, accountability, and transparency in public service (de Mello, 2000). However, even if the size of fiscal decentralization is the same, the impact on the financial soundness of local governments may vary depending on which method is chosen: revenue decentralization or expenditure decentralization (Shin, 2017). Therefore, it is necessary to empirically analyze how revenue decentralization such as the increase of local consumption tax rate and expenditure decentralization such as the increase of local subsidies rate affect local financial soundness, respectively.

However, few papers dealt with which policy is more effective in strengthening local financial soundness: revenue decentralization or expenditure decentralization. There are also few papers dealing with local consumption tax as a factor that affects local financial soundness. For this reason, it is timely and meaningful to examine how fiscal decentralization affects the financial soundness of local governments to find effective ways to enhance local financial soundness and draw up policy implications for the government.

1.2. Study Scope

The purpose of this study is to analyze the impact of fiscal decentralization on local financial soundness. The scope of this study is limited as follows. First, the time scope is limited from 2010 when the local consumption tax was introduced, to 2018. Second, the space scope is limited to 16 metropolitan cities and provinces in Korea.

Sejong City founded in July 2012 is excluded. Third, the content scope is limited to examine how fiscal decentralization affects the financial soundness of local governments to find effective ways to enhance local financial soundness and draw up policy implications for the Korean government. Research questions are as follows:

- Does fiscal decentralization affect the financial soundness of local governments? How?
- Are the impacts on local financial soundness of the revenue and expenditure decentralization different? Why?

The contents of this study are as follows. First, presentation of the background, purpose, and the scope of study are given. Next, a literature review examines the background of local finance soundness and fiscal decentralization policies and previous studies. The methods section establishes research hypotheses and methods and explains how variables are constructed and analyzed. The results identify the correlation between variables and analyzes the impact of fiscal decentralization on local financial soundness. Finally, a conclusion will summarize the findings and derive policy implications for the government from the results.

Chapter 2. Theoretical Background

2.1. Local Finance

2.1.1. The Structure of Local Finance

Article 2 of the Local Finance Act defines local finance as local governments' import and expenditure activities and all activities to manage and dispose of assets and liabilities of local governments. Local finance means a series of processes in which local governments procure, disburse, and manage resources necessary to perform their functions. Local finance is based on the basic principle of sound and efficient financial management, and local governments should be able to secure autonomy and accountability for financial management based on these principles (Lee et al., 2016). Local governments use income (local tax, non-tax revenue) and transfer funds (local subsidies, state subsidies) for funding affairs of their jurisdiction (NABO, 2020).

Since the implementation of autonomy for local governments in 1995, the size of local finance has been steadily expanding. <Table 2-1> shows the national and local budgets from 2010 to 2018. In 2018, the total budget is KRW 541.5 trillion. The budget of the national government accounts for 61.1 percent of the total budget with KRW 330.8 trillion, while the budget of local governments accounts for 38.9 percent of the total budget with KRW 210.7 trillion. The ratio of national to local budget remains about 6:4.

<Table 2-1> National and Local Budgets

(Unit: KRW trillion, %)

Year		2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Budget		365.8	376.6	399.7	420.5	438.3	459.6	480.3	496.2	541.5
National government	Budget	225.9	235.6	248.6	263.6	274.7	286.3	295.7	303.1	330.8
	Ratio	61.8	62.6	62.2	62.7	62.7	62.3	61.6	61.1	61.1
Local Government	Budget	139.9	141.0	151.1	156.9	163.6	173.3	184.6	193.1	210.7
	Ratio	38.2	37.4	37.8	37.3	37.3	37.7	38.4	38.9	38.9

Note: Based on the original budget

Source: Ministry of the Interior and Safety, Overview of Integrated Finances of Local Government

Despite the quantitative growth of local finance, most local governments' financial revenues are financed mainly by the central government's financial transfer (local subsidies, state subsidies, etc.) rather than local taxes. Local financial revenues consist of self-income and dependent income. The self-income consists of local taxes and non-tax revenues. Dependent income comprises of local subsidies, adjustment grants, and state subsidies. <Table 2-2> presents the local budget by revenue resource. Local revenue for FY 2018 was KRW 210.7 trillion. Of the total, self-income accounted for 47.8 percent at KRW 100.6 trillion, while dependent income accounted for 40.8 percent at KRW 85.9 trillion. Local government revenue over the past five years shows that dependent income exceeds local tax revenue, which means that local governments in Korea rely heavily on the central government for revenue, such as local subsidies and state subsidies.

<Table 2-2> Local Budget by Revenue Resources

(Unit: KRW trillion)

Year		2014	2015	2016	2017	2018
Total		163.6	173.3	184.6	193.1	210.7
Self- Income	Sub-total	75.1	79.7	86.6	93.5	100.6
	Local tax	54.5	59.5	64.8	71.2	77.9
	Non-tax revenue	20.6	20.2	21.8	22.3	22.7
Dependent Income	Sub-total	69.3	73.4	75.0	77.8	85.9
	Local subsidies	31.6	31.6	32.0	33.7	37.9
	State subsidies	37.7	41.8	43.0	44.1	48.0
Local bond		4.9	4.8	3.8	2.3	2.0
Internal transaction		14.3	15.4	19.2	19.5	22.2

Source: Ministry of the Interior and Safety, Overview of Integrated Finances of Local Government for FY 2018

The reason why the income structure of local finance revolves around financial transfer is that tax system is structured around national taxes. With the addition of the restriction of local tax taxation rights by tax legalism and the traditional government's policy of preferring subsidies, the 'fiscal transfer-driven system' has virtually become a styled fact of local finance. (Lim, 2019). <Table 2-3> illustrates the national and local tax revenue. The amount of tax revenue in 2018 is KRW 377.9 trillion. National tax accounts for 77.7 percent with KRW 293.6 trillion, while local taxes account for 22.3 percent with KRW 84.3 trillion.

<Table 2-3> National and Local Tax Revenue

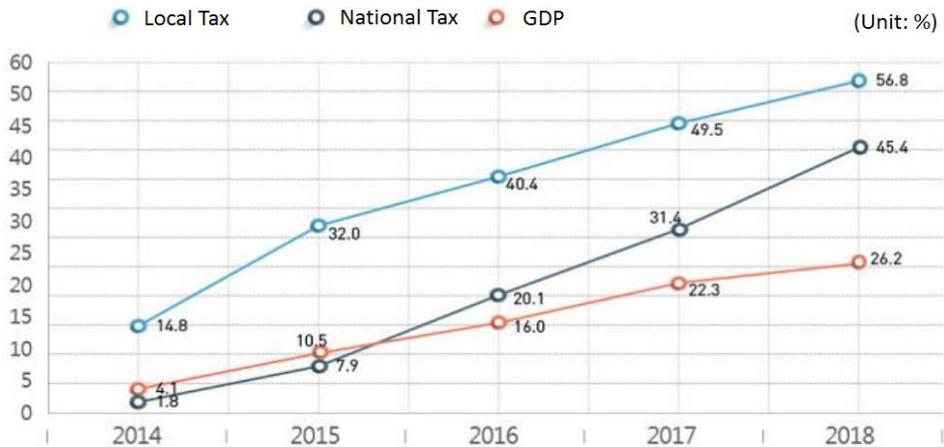
(Unit: KRW trillion, %)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Tax	226.9	244.7	256.9	255.7	267.2	288.9	318.1	345.8	377.9
National Tax	177.7	192.4	203.0	201.9	205.5	217.9	242.6	265.4	293.6
(Ratio)	78.3	78.6	79.0	79.0	76.9	75.4	76.3	76.7	77.7
Local Tax	49.2	52.3	53.9	53.8	61.7	71.0	75.5	80.4	84.3
(Ratio)	21.7	21.4	21.0	21.0	23.1	24.6	23.7	23.3	22.3

Source: National Tax Service, Collection Report; Ministry of the Interior and Safety, Yearbook of Local Tax Statistics

The higher proportion of local taxes in 2014 was due to a significant increase in the local consumption tax rate from 5 percent to 11 percent. The ratio of national to local taxes remains little changed at 77:23 since then. <Figure 2-1> shows that the growth rates of the national and local taxes are not much different except in 2014.

<Figure 2-1> Growth Rate of National and Local Tax



Note: Growth Rate compared to 2013

Source: Ministry of the Interior and Safety, Statistical Yearbook of Local Tax for 2019

In foreign countries, federal states have a relatively high proportion of local taxes, while non-federal states have a relatively low proportion of local taxes. As of 2018, the United States and Germany have a national tax-to-local tax ratio of about 5:5, while in the United Kingdom, the national tax accounts for more than 90 percent of total taxes.

<Table 2-4> Local Tax and National Tax of Foreign Countries

(Unit: %)

Year	Classification	Federal States		Non-Federal States		
		United States	Germany	United Kingdom	France	Japan
2017	National Tax	58.0	47.9	93.9	72.0	60.8
	Local Tax	42.0	52.1	6.1	28.0	39.2
2018	National Tax	52.8	47.8	93.8	71.5	61.1
	Local Tax	47.2	52.2	6.2	28.5	38.9

Source: Ministry of the Interior and Safety, Statistical Yearbook of Local Tax

Local governments need funds transferred from the national government because they cannot manage local administration only with their self-income, such as local taxes. The transfer funds include local subsidies and state (government) subsidies. The term ‘subsidies’ means subsidies (limited to subsidies granted to local governments or granted for the establishment of facilities or operation of corporations, organizations, or individuals) to promote or provide financial assistance in work or programs implemented by any non-State entity.^①

^① Article 2 of the Subsidy Management Act

The state subsidy is a system to subsidize all or part of the expenses for national delegation affairs, policy projects, etc. or to provide financial support. State subsidies shall be subject to the Subsidy Management Act, the Local Finance Act, and each statute and ordinance on the management of subsidies. Since state subsidies are designated for each project, local governments should only use state subsidies for a specific purpose, and local governments should also bear local expenses in response to the financial resources provided by the central government. In 2019, the government-subsidized project amounted to KRW 80.1 trillion: KRW 53.6 trillion paid by the national government, KRW 26.5 trillion paid by local governments. <Table 2-5> presents state subsidies and local expenses over the last five years.

< Table 2-5> State Subsidies and Local Expenses

(Unit: KRW billion, %)

Classification		2015	2016	2017	2018	2019
Government-subsidized project	Amount	644,322	671,375	652,044	706,631	800,992
	Ratio	100	100	100	100	100
State subsidy	Amount	414,078	428,646	434,869	472,042	535,994
	Ratio	64.3	63.8	66.7	66.8	66.9
Local expense	Amount	230,244	242,729	217,175	234,589	264,998
	Ratio	35.7	36.2	33.3	33.3	33.1

Note: Based on the original budget

Source: Ministry of the Interior and Safety, Overview of Integrated Finances of Local Government for FY 2019

A local government shall compile a budget in preference to other projects in response to state subsidies. As the national

government increases subsidies, the state-run matching budget method, which also requires a local government to increase local expenses, causes a financial burden for the local government (Lee, 2011). Kang (2011) mentioned that the larger the state subsidies, the larger the social welfare expenditure per resident. Issues related to state subsidies include the excessive local expense burden due to the continued expansion of state subsidies, the limitations of local governments' financial management, and the over-expansion of similar and redundant projects (Shin & Ryu, 2018).

If central ministries arbitrarily organize and operate programs that require cost-sharing with a local government, the local government will be burdened with local expenses. Therefore, Article 7 of the Subsidy Management Act stipulates that where the head of a central government agency intends to request the allocation of a subsidy budget for any program that requires cost-sharing with a local government, he/she shall consult on such program plan with the Minister of the Interior and Safety.

The important thing about the expenditure structure of local finance is that social welfare expenditure continues to increase. This change in the local autonomy system is the root cause of the deterioration of local finance (Jang, 2015). Although social welfare expenditure is easy to increase, it is not easy to return the expenditure scale to past levels due to downward rigidity. Many countries point to the increase in social welfare expenditure as a major cause of the ongoing fiscal deficit and financial crisis (Wee, 2015).

As part of the fiscal decentralization policy, the government transferred welfare tasks to local governments in 2005 but did not transfer enough funds to handle it, resulting in a crisis in local finance. Besides, most of the social welfare expenses are based on statutes, so local governments should obligatorily spend regardless of their financial capacity. <Table 2-6> shows that the proportion of social welfare expenditure is increasing every year.

< Table 2-6> Proportion of Social Welfare Expenditure

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	20.3	22.3	24.2	29.7	31.8	34.1	35.9	34.6	36.2
Busan	25.2	25.7	25.9	26.9	30.5	32.0	32.7	32.4	33.5
Daegu	26.7	28.2	27.7	28.4	32.8	34.6	35.1	34.8	36.9
Incheon	22.3	26.5	26.7	27.3	29.2	32.2	30.1	30.3	33.3
Gwangju	28.2	28.1	28.1	28.6	32.5	36.3	38.5	37.0	36.8
Daejeon	25.8	28.2	28.7	31.7	35.5	37.4	36.9	36.1	36.8
Ulsan	17.7	20.3	19.1	20.8	23.7	25.7	24.6	23.3	26.4
Gyeonggi	20.8	21.6	22.4	25.0	29.5	28.6	28.6	28.5	31.8
Gangwon	16.4	17.4	17.5	17.8	19.8	20.1	20.3	20.4	22.9
Chungbuk	19.2	19.7	20.0	21.0	23.8	24.3	24.6	24.8	26.1
Chungnam	16.7	17.7	17.7	18.1	20.9	22.9	22.7	22.5	23.6
Jeonbuk	20.9	20.3	19.9	20.8	23.3	24.7	25.1	24.7	25.4
Jeonnam	16.1	16.3	16.3	17.0	19.5	21.5	21.6	21.4	21.8
Gyeongbuk	18.1	17.8	17.6	18.3	20.4	21.9	21.6	21.4	22.7
Gyeongnam	18.2	18.8	19.2	20.6	23.7	24.8	24.9	24.2	25.9
Jeju	13.9	12.4	11.5	13.5	14.9	20.7	21.0	20.5	22.1

Source: Korean Statistical Information Service (<https://kosis.kr/eng/>)

Overall, local finance in Korea shows the unbalanced structure of tax revenue and fiscal spending, which means that the central government must transfer funds to local governments. This structure causes local governments to become dependent on the central government, thereby worsening local financial soundness. Kim (2014) mentioned the national government's supervision of local finance, the wide regional gap, and the dependency on national finance as characteristics of Korean local finance.

2.1.2. Local Consumption Tax

Local consumption tax was introduced in 2010 as a metropolitan government tax by converting 5 percent of the value-added tax, which is the national tax, into a local tax. At that time, local taxes and local subsidies decreased due to a cut in income and corporate tax rates. The central government also encouraged local governments to execute their budget early and issue local bonds in the process of expanding fiscal spending due to the global financial crisis. One of the measures to preserve local finance was the transfer of 5 percent of the value-added tax to the local consumption tax (Kim, 2018).

According to a press release by the Ministry of the Interior and Security in September 2009, the purpose of the introduction of local consumption tax was to improve the overall financial independence of local governments by expanding self-income, improving the ratio of national to local taxes, and reducing the

concentration of local taxes to metropolitan areas. There were also expectations that the local consumption tax would serve as the cornerstone of fiscal decentralization.

Local consumption tax is not a new tax, but a portion of the value-added tax that is converted into local taxes, so there is no change in the tax burden. (Joo, 2012). The biggest issue concerning the introduction of local consumption tax was the expansion of the local financial gap. Since consumption-related taxes were concentrated in a capital area, the introduction of local consumption tax would widen the gap between a capital area and non-capital areas. Moreover, since 5^② percent of the value-added tax is excluded from the total amount of internal taxes, local subsidies funded by 19.24 percent of internal taxes decrease, thereby weakening fiscal equity (Joo, 2012).

Different weights^③ are applied to each region in the process of allocation of local consumption tax to alleviate the problem of the deterioration of equity that the introduction of the local consumption tax would cause: 100% for the local governments in a capital area (Seoul, Incheon, Gyeonggi), 200% for Metropolitan cities in a non-capital area (Busan, Daegu, Gwangju, Daejeon, Ulsan, Sejong), and 300% for provinces in a non-capital area. Local consumption tax shall be proportionally distributed to the portion set aside taking into

^② The local consumption tax rate increased from 5% of the value-added tax in 2010 to 11% in 2014 and 15% in 2019.

^③ Article 75 of the Enforcement Decree of the Local Tax Act

consideration consumer spending for each region and the portion for compensating acquisition tax, local education tax, local subsidies, local education subsidies, etc. by allocating at the ratio of 5/11 and 6/11, respectively.

Proportional Distribution Standards of Local Consumption Tax for 2018:

$$\text{Local Consumption Tax} = 5\% \text{ of VAT} \times \frac{\text{CI* of the local government} \times \text{weighting}}{\text{Total sum of weighted CI of local governments}} + 6\% \text{ of VAT (Allocate according to the amount of acquisition tax reduction, etc.)}$$

* Consumption Index (CI) : Private final consumption expenditure

The expansion of local consumption tax not only directly increases the financial resources of metropolitan cities and provinces but also indirectly affects the finance of local governments through various channels. Therefore, the financial impact of the expansion of local consumption tax should take into account not only the direct effect but also the indirect effect. The increase in local consumption tax increases tax revenues for metropolitan cities and provinces. Besides, it affects the size of local subsidies allocated to local governments through changes in the financial resources of local subsidies and changes in the calculation of the local government's financial shortage (Jeong & Lee, 2019).

Before the introduction of local consumption tax, most of the research was aimed at providing the theoretical basis for the introduction of local consumption tax in 2010. After the introduction of local consumption tax, research revolves around alternatives for the desired operation of the local consumption tax (Kim, 2018). Local

consumption tax has been discussed as a means of revenue decentralization when pursuing fiscal decentralization policies. However, previous research rarely addressed the impact of local consumption tax on financial soundness, which is the purpose of fiscal decentralization. This study will select local consumption tax as an indicator of revenue decentralization and analyze the effect on local financial soundness.

2.1.3. Local subsidies

The most desirable financing plan for local governments to provide administrative services is a local tax that can be collected and freely used by local governments. However, local governments cannot cover the necessary resources with local taxes due to the central concentration of tax resources and the imbalance of tax resources between regions. Therefore, a financial support system is needed to financially support local governments that cannot secure the financial resources that are necessary to provide standard administrative services only with local taxes collected from residents.

There are various ways in which the national government pushes for fiscal decentralization. The local financial adjustment system is a method that covers the financial shortfalls of local governments. The system meets not only the role of covering the shortage but also the role of enhancing horizontal fiscal equity among regions. General subsidies account for a high proportion of the local financial adjustment system. Accordingly, the current government is

considering reforming the local subsidies system while pursuing fiscal decentralization.

The local subsidy is a system that aims to promote the sound development of local administration by providing financial resources necessary for the administrative operation and coordinating its finances to address fiscal imbalances between regions and to ensure that all local governments have a certain level of administration (MOIS, 2019). The Local Subsidy Act stipulates that the purpose of local subsidies is to develop the public administration of local governments soundly with the adjustment of their finances by subsidizing financial resources necessary for the public administration of local governments.

According to Article 4 of the Local Subsidy Act, local subsidies consist of general subsidies, special subsidies, real estate subsidies, and firefighting safety subsidies. The general subsidies are 97% of an amount equivalent to 19.24% of the total amount of internal taxes deducting firefighting safety subsidies. As shown in <Table 2-7>, local subsidies for 2019 are KRW 52.4 trillion. Local subsidies consist of KRW 49.1 trillion that is 19.24 percent of internal taxes of KRW 255.6 trillion, real estate subsidies of KRW 2.8 trillion, and firefighting safety subsidies of KRW 0.5 trillion. The fixed-rate subsidies of KRW 49.1 trillion are divided into general subsidies of KRW 47.6 trillion that is equivalent to 97 percent and special subsidies of KRW 1.5 trillion that is equivalent to 3 percent.

<Table 2-7> Local Subsidies Scale (2018-2019)

(Unit: KRW billion)

Classification	Rate	2018	2019
Total		459,805	524,618
Fixed-rate	19.24% of internal taxes	437,831	490,749
General subsidies	97%	424,696	476,026
Special subsidies	3%	13,135	14,722
Real estate subsidies	Comprehensive real estate holding tax	17,801	28,494
Firefighting safety subsidies	20% of individual consumption tax on tobacco (27.5% in 2019)	4,173	5,375

Note: Original budget base

Source: Ministry of the Interior and Safety, Explanation of the Calculation of Local Subsidies for 2019

General subsidies are financial resources that compensate for a shortfall that cannot be covered by self-income like local taxes so that all local governments can maintain a certain level of administration. General subsidies shall be granted to a local government based on the amount of a shortage when, for such a government, the standard amount of financial revenue is less than the standard amount of financial demand each year.

$$\text{The standard amount of financial demand} - \text{The standard amount of financial revenue} = \text{The amount of a shortage}$$

$$\text{General subsidies} = \text{The amount of a shortage} \times \text{Adjustment rate}$$

General subsidies are not allocated to a local government whose standard amount of financial revenue exceeds the standard amount of financial demand. Non-subsidized organizations that are

not eligible for general subsidies are not fixed and may vary depending on the financial condition of local governments every year. <Table 2-8> shows statistics of subsidized organizations and non-subsidized organizations in 2019.

<Table 2-8> Statistics of Subsidized Organizations (2019)

Classification	Total	Seoul	Metropolitan city	Sejong	Province	City	County
Total	174	1	6	1	9	75	82
Subsidized organization	168	-	6	1	8	71	82
Non-subsidized organization	6	1	-	-	1	4	-

Note 1) The 69 autonomous districts are included in the main office.

2) Non-subsidized organization: Seoul, Gyeonggi, Suwon, Seongnam, Yongin, Hwaseong

Source: Ministry of the Interior and Safety, Explanation of the Calculation of Local Subsidies for 2019

2.1.4. Local Financial Soundness

As local governments' roles and responsibilities for the welfare of residents have been expanded and emphasized, interest in the financial status of local governments has increased (Wang et al., 2007; Lee & Cho, 2019). In general, local financial soundness is an expression of the financial status of local governments, which is the ability of the governments to pay off debts from both short and long-term perspectives, while providing public services (Hur, 2011; Berne & Schramm, 1986). The financial soundness of local governments is a financial capability for the supply of goods and services to residents. It is used as a concept to assess the ability of local governments to

repay their debts (Park & Lee, 2014).

Local financial soundness can be divided into two dimensions: soundness in the structure and state of local finance, soundness in the management of local finance. The former has much to do with revenue structure and the latter has much to do with expenditure structure. Current local finance is structurally unhealthy, and financial operations are also not healthy in efforts to secure revenues or expenditures (Seo, 2017).

Local financial soundness is generally measured by consolidated fiscal balance, financial independence ratio, and debt levels (Kim et al., 2016). Since 1998, the Ministry of the Interior and Safety has been making a comprehensive analysis and evaluation of the financial status and performance of local governments to enhance the soundness and efficiency of local finance. <Table 2-9> shows the indicators that the Ministry of the Interior and Safety select to measure local financial soundness.

<Table 2-9> Local Financial Analysis Indicator System (2019)

Classification	Indicator	
Financial Soundness	Balance Management	Consolidated fiscal balance ratio, Current account balance ratio
	Debt Management	Managed debt ratio, Consolidated current liabilities ratio
	Public Enterprise Management	Debt ratio of public enterprise, Ratio of operating profit to total capital

Source: Ministry of the Interior and Safety, Handbook on Financial Analysis of Local Government for 2019

The consolidated fiscal balance, which presents the size of the government's surplus or deficit for the year, is an indicator of fiscal stability along with debt. The consolidated fiscal balance is a figure that covers all the general accounts, special accounts, and funds for the year, minus pure fiscal spending from pure fiscal revenue excluding transactions such as debt repayment. A state in which there is no difference between income and expenditure is called balanced finance.

The ratio of debt to the budget is an indicator that shows whether a local government can manage its debt, and is related to the long-term financial soundness of local governments. The Enforcement Decree of the Local Finance Act^④ determines the level of debt that local governments can afford through the ratio of debt to the budget (Lee & Cho, 2019). Also, the ratio of debt to the budget, which is calculated by dividing the debt balance by the final budget, is an indicator that determines whether local governments are in a financial crisis. The Ministry of the Interior and Safety designates the local government as a financial crisis organization if the ratio of debt to the budget of a local government exceeds 40 percent.^⑤ The increase in the ratio of debt to the budget means the deterioration of local financial soundness.

^④ According to Article 10 of the Enforcement Decree of the Local Finance Act, the limit amount for the issuance of local government bonds shall be determined within 10/100 of the budget amount of the relevant local government in the year before the preceding year.

^⑤ Article 3 of the Regulations on the Operation of the Local Financial Crisis Pre-Alert System

There are many issues in estimating the soundness of local finance. Key issues include the period of measurement, method of measurement, a reflection of external factors, and the adequacy of indicators. The adequacy of indicators is whether to consider only the financial aspect or to reflect the state of service delivery and community's expectations in addition to a financial aspect. The former can lead to an imbalance between regions in terms of service (Ahn, 2013).

Overall, local financial soundness is a concept related to whether the level of debt is manageable by local governments. The ratio of debt to the budget, one of the indicators used to measure local financial soundness, is used as an indicator to determine the level of debt that local governments can afford in the Enforcement Decree of the Local Finance Act. Also, the ratio of debt to the budget is the criterion used by the Ministry of the Interior and Safety in designating a financial crisis organization. Therefore, this study will use the ratio of debt to the budget as an indicator of local financial soundness.

2.2. Fiscal Decentralization

Fiscal decentralization refers to the transfer of authority and responsibility in financial relations between the central and local governments from the central government to local governments (Yoon, 2007). According to de Mello (2000), “fiscal decentralization has been an integral part of overall public sector reform in a number

of countries, both developed and developing, and consists primarily of re-assigning expenditure functions and revenue sources to lower tiers of government” (p. 375).

One of the fiscal issues in the intergovernmental relationship is to appropriately allocate the functions and resources between the central government and local governments. Fiscal decentralization is the process by which local governments have secured revenue authority and expenditure authority that is necessary to perform their duties (Kim, 2003). Fiscal decentralization can be divided into revenue and expenditure decentralization. The key means of revenue decentralization is to transfer a part of national taxes or the authority of setting tax rates to local governments. The key means of expenditure decentralization is to expand transfer funds by increasing the local subsidy rate (Chung, 2011).

The Korean government has paid more attention to expenditure decentralization than to revenue decentralization. Expenditure decentralization has been preferred in the context of promoting the balanced development of local finance, even though it may be passive in strengthening local governments' financial power and ensuring accountability for financial management. Despite the expansion of expenditure decentralization, local financial soundness has not improved. Rather, the gap among local governments has widened. These results indicate that although fiscal decentralization has a strong effect on local finance, it has failed to improve local finance (Chung, 2011).

As a means of revenue decentralization, the Korean government introduced a local consumption tax in 2010. The government raised the tax rate from 5% to 11% of the value-added tax in 2014 and 15% in 2019. The current government aims to improve the ratio of national to local taxes by 6:4 in the long run. As a means of expenditure decentralization, the government transfers part of the state's income to local governments through local subsidies. The increase in the local subsidy rate is one of the methods discussed when pursuing fiscal decentralization.

2.3. Literature Review

2.3.1. Studies on Fiscal Decentralization

The difference in research results on effects as well as the diversity of the concept of fiscal decentralization has caused a lot of confusion in the implementation of fiscal decentralization policy (Sohn, 2008). De Mello (2000) analyzed the impact of fiscal decentralization on budget balances using data from 30 countries (17 OECD and 13 non-OECD countries) consisting of five-year averages during 1970–1995. The writer estimated fiscal decentralization in terms of tax autonomy and fiscal dependency. The researcher measured tax autonomy as the share of tax revenue in total revenue and measured fiscal dependency as the ratio of intergovernmental transfers to the total revenue of subnational governments.

Chung (2011) analyzed the effects of fiscal decentralization on financial soundness for 78 cities from 1995 to 2009. The writer divided fiscal decentralization into revenue and expenditure decentralization. The research selected local taxes per capita and local subsidies per capita as indicators of fiscal decentralization. According to results, local governments with a higher proportion of local taxes per capita had a significant impact on the growth of self-income but local taxes per capita did not significantly impact the proportion of current expenses or debt burdens. Local governments with higher local subsidies per capita had a higher debt burden. However, local subsidies per capita did not have a significant impact on fiscal growth or a decrease in the proportion of current expenses.

Escolano et al. (2012) analyzed the impact of fiscal decentralization on fiscal performance in the European Union (EU). The researchers measured spending decentralization using subnational spending (excluding transfers paid) in percent of general government spending and measured revenue decentralization using subnational revenue (excluding transfers received) in percent of general government revenue. Results showed that spending decentralization improved fiscal performance but the positive impact of spending decentralization was diminished by transfer dependency. Revenue decentralization deteriorated the fiscal position.

Shin (2017) analyzed panel data from 16 metropolitan cities and provinces from 2007 to 2014. The researcher measured revenue decentralization as the ratio of local governments' own revenue to the

total revenue and measured expenditure decentralization as the ratio of the total expenditure excluding grants to the total expenditure. According to the results, the ratio of local governments' own revenue to the total revenue and the ratio of the total expenditure excluding grants to the total expenditure decreased the debt–asset ratio. <Table 2–10> shows indicators used to measure fiscal decentralization in previous studies.

<Table 2-10> Fiscal Decentralization Indicators

Researcher	Indicators
De Mello (2000)	Ratio of tax revenue to total revenue, Ratio of transfers to total revenue
Akai & Sakata (2002)	Ratio of local government revenue to total government revenue, Ratio of local government expenditure to total government expenditure
Escolano et al. (2012)	Ratio of subnational self-income to general government revenue, Ratio of subnational spending (excluding transfers) to general government expenditure
Woo (2008)	Ratio of local government revenue to the central government revenue, Ratio of local government expenditure to the central government expenditure
Chung (2011)	Local taxes per capita, Local subsidies per capita
Cha (2011)	Ratio of local taxes to the total revenue, Ratio of local subsidies to the total revenue, Ratio of own business expenses to the total expenditure
Shin (2017)	Ratio of local governments' own revenue to the total revenue, Ratio of the total expenditure excluding grants to the total expenditure

2.3.2. Studies on Financial Soundness

Previous studies on financial soundness are largely divided into three categories: studies analyzing financial soundness (Park & Lee, 2014), studies to develop and improve indicators that measure local financial soundness (Kim & Lee, 2015; Lee, 2016; Jun, 2018), and studies on factors affecting financial soundness (Chung, 2011; Lee et al., 2016; Kim et al., 2016). This study reviews literature focusing on the factors affecting local financial soundness and the design of fiscal decentralization. <Table 2-11> shows the indicators used to measure financial soundness in the literature.

<Table 2-11> Financial Soundness Indicators

Researcher	Independent Variable	Financial Soundness Indicators
Hyun & Yoon (2006)	Local allocation tax rate	Financial independence rate, Fiscal capacity index, Investment cost ratio
Pai (2012)	Local government types, Fiscal capacity, Demographic factors	Consolidated fiscal balance deficit rate, Ratio of debt to the budget, Debt repayment expenses rate
Kim et al. (2016)	Special subsidy taxes, Non-tax revenue	Consolidated fiscal balance, Financial independence rate
Lee et al. (2016)	Financial autonomy rate, Fiscal capacity index, Subsidy ratio of private organizations, Welfare expenditure ratio, etc.	Ratio of debt to the budget
Wee (2015)	Self-income ratio, Local tax revenue per capita, Per capita investment expenditure, Welfare expenditure per capita	Consolidated fiscal balance per capita, Debt burden increase per capita
Lee & Cho (2019)	Local tax exemption and reduction	Fiscal balances, Ratio of debt to the budget

Based on the FY 2010 data from 243 basic local governments, Pai (2012) studied how local government types, fiscal capacity, and demographic factors affect the financial soundness of local governments. Financial soundness was measured using the consolidated fiscal balance deficit rate, the ratio of debt to the budget, debt repayment expenses rate, etc. According to the results, fiscal capacity and demographic factors affected certain fiscal health indexes. However, fiscal capacity and demographic factors were not highly correlated with fiscal health indexes.

Lee et al. (2016) analyzed the factors influencing local financial soundness for 153 cities and counties from 2009 to 2013. The researchers divided independent variables into revenue and expenditure sectors. They selected financial autonomy rate and fiscal capacity index as indicators of the revenue sector and selected the subsidy ratio of private organizations, the welfare expenditure ratio, and the labor cost ratio as indicators of the expenditure sector. The ratio of debt to the budget was selected as an indicator of financial soundness. Analysis results showed that the financial autonomy of local governments positively contributed to financial soundness, while the increase in the ratio of welfare expenditure to budget negatively affects financial soundness.

Kim et al. (2016) analyzed the factors influencing local financial soundness for 244 cities and counties from 2010 to 2014. The independent variables were special grant tax and non-tax revenue. The researchers used consolidated financial balance and

financial independence rate as indicators of financial soundness. According to the analysis results, the special grant tax has a positive effect on the consolidated fiscal balance ratio, but the non-tax revenue has a negative impact.

Lee & Cho (2019) analyzed the impact of local tax exemption and reduction on financial soundness for 221 basic local governments from 2012 to 2016. The researchers divided the financial soundness of local governments into short-term and long-term financial soundness. They measured short-term and long-term financial soundness by fiscal balances and the ratio of debt to the budget, respectively.

Overall, the literature demonstrates three themes pertinent to this study. First, previous research divided fiscal decentralization into revenue decentralization and expenditure decentralization. Researchers mainly used self-income as an indicator of revenue decentralization and used the proportion of local governments' total expenditure or local subsidies as an indicator of expenditure decentralization. Second, scholars used fiscal independence rate, consolidated financial balance, or the ratio of debt to the budget as an indicator to measure local financial soundness. Third, researchers did not draw consistent results on the effect of fiscal decentralization on local financial soundness. This study will analyze the impact of fiscal decentralization on financial soundness by using indicators, such as local consumption tax and local subsidies, detailed policy measures of fiscal decentralization.

Chapter 3. Research Method

3.1. Research Hypotheses

The goal of this study is to analyze the effect of fiscal decentralization on local financial soundness, to draw policy implications on effective ways to enhance the financial soundness of local governments. Fiscal decentralization can be defined as the transfer of the revenue and expenditure authority necessary for local governments to perform their duties from the central government to local governments. Revenue decentralization and expenditure decentralization show different autonomy in terms of procurement and allocation of financial resources between the central government and local governments. Even if revenue decentralization and expenditure decentralization are of the same size, the effect on the financial soundness of local governments can be different.

In this regard, research questions are as follows:

- Does fiscal decentralization affect the financial soundness of local governments? How?
- Are the impacts on local financial soundness of the revenue and expenditure decentralization different? Why?

The purpose of revenue decentralization is to secure self-determination and accountability for revenues that local governments can independently procure and operate through the expansion of self-resources. Local governments with a high local consumption tax

per capita are less dependent on transfer funds and can manage the finances independently. Therefore, the ratio of debt to the budget may decrease, which means that financial soundness will improve. Likewise, local governments with a high ratio of local taxes to total tax will have high financial soundness because of their low financial dependence on the central government.

The purpose of expenditure decentralization is to increase funds that local governments can spend through the expansion of transfer funds as the allocation of financial resources between the central and local governments. Transfer funds increase the total amount of funds available to local governments, but there is little autonomy in the procurement of funds, so transfer funds do not strengthen revenue decentralization. However, because autonomy in expenditure exists, transfer funds can strengthen expenditure decentralization.

Social welfare expenditure through state subsidies is less related to expenditure decentralization because the autonomy of expenditure is not guaranteed. While local subsidies and state subsidies are the same transfer funds, the two funds have different autonomy in spending. They need to be dealt with together to analyze how the two resources affect local financial soundness differently.

Local subsidies, especially general subsidies, do not have specific use. The expansion of local subsidies will have a positive impact on the financial soundness of local governments as they guarantee the financial resources needed for administrative

operations and enable local governments to maintain fiscal balance. On the contrary, much of social welfare expenditure is transferred from the central government to local governments through state-subsidized projects, which are projects that have a fixed purpose of spending and require a part of the expenses from local governments. Thus, an increase in the proportion of social welfare expenditure will hurt financial soundness as it will increase the financial burden of local governments to lead to an increase in debt.

To empirically explore research questions, hypotheses are as follows.

<Hypothesis 1> Strengthening revenue decentralization (expansion of self-income) will have a positive impact on financial soundness.

Hypothesis 1-1. Local governments with a higher local consumption tax per capita will have a lower ratio of debt to the budget.

Hypothesis 1-2. Local governments with a higher ratio of local taxes to total tax will have a lower ratio of debt to the budget.

<Hypothesis 2> Strengthening expenditure decentralization (expansion of transfer funds) will have different impacts on financial soundness depending on the autonomy of expenditure.

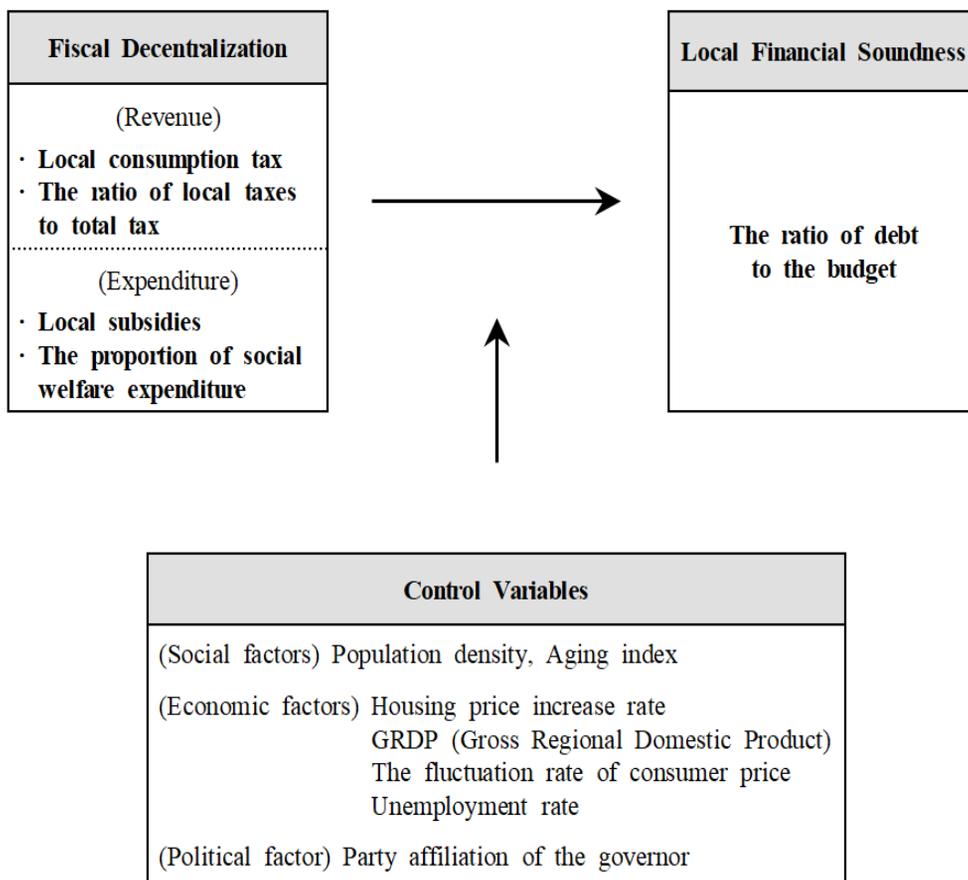
Hypothesis 2-1. Local governments with higher general subsidies per capita will have a lower ratio of debt to the budget.

Hypothesis 2-2. Local governments with a higher proportion of social welfare expenditure will have a higher ratio of debt to the budget.

3.2. Variables

This study set up an analysis model to examine the effect of fiscal decentralization, such as the increase in local consumption tax and local subsidies, on local financial soundness, as shown in <Figure 3-1>.

<Figure 3-1> Analysis Model



3.2.1. Dependent Variable

In this study, the indicator of local financial soundness, a dependent variable, is the ratio of debt to the budget, which is one of the local financial analysis indicators by the Ministry of the Interior

and Safety. Local financial soundness means that expenditure does not exceed revenue and there is no public bond issue or borrowing (Lee et al., 2016).

In terms of balance management, the consolidated fiscal balance also measures financial soundness. However, it is unstable as an indicator of financial soundness in that if local governments carry the budget over to the next fiscal year, the balance will deteriorate. A high ratio of debt to the budget means low financial soundness.

$$\text{The ratio of debt to the budget} = \frac{\text{Debt balance}}{\text{Final budget}} \times 100(\%)$$

3.2.2. Independent Variables

Revenue decentralization is to transfer a part of national taxes to local governments or to transfer the authority of setting tax rates to local governments. The study measured revenue decentralization by local consumption tax and the ratio of local taxes to total tax. Local consumption tax was converted into a per capita amount to eliminate discrimination factors that could result from population differences among cities and provinces.

$$\text{The ratio of local taxes to total tax} = \frac{\text{Local taxes}}{\text{Total tax}} \times 100(\%)$$

Expenditure decentralization is to allocate resources that local governments can spend with autonomy. This study measured expenditure decentralization by local subsidies and the proportion of

social welfare expenditure. Local subsidies were measured by general subsidies, which account for 97% of local subsidies. General subsidies were converted into a per capita amount. The proportion of social welfare expenditure was calculated as the proportion of the social welfare budget out of the total expenditure budget.

$$\text{The proportion of social welfare expenditure} = \frac{\text{Social welfare budget}}{\text{Total expenditure budget}} \times 100(\%)$$

3.2.3. Control Variables

This study considered the social, economic, and political factors in tandem with fiscal decentralization as factors affecting the financial soundness of local governments. The social factors selected in the study are the aging index and population density. The aging index is the ratio of the elderly population aged 65 or over to the youth population aged 14 or below. Population density can affect local finance because much of the local tax is imposed on a person's basis. Thus, the decrease in the population may reduce the revenues of local governments. Meanwhile, local governments are expanding their spending on basic old-age pensions, thereby increasing the proportion of their current expenses and deteriorating financial status (Chung & Kim, 2011).

$$\text{Aging index} = \frac{\text{The population aged 65 or over}}{\text{The population aged 14 or below}} \times 100(\%)$$

$$\text{Population Density} = \frac{\text{The population}}{\text{Area (km}^2\text{)}} \times 100(\%)$$

The economic factors are housing price increase rate, per capita GRDP (Gross Regional Domestic Product), the fluctuation rate of consumer price, and the unemployment rate. The housing price increase rate represents the increase rate in the transaction price of multi-unit housing (apartments, row houses, and multiplex houses) and detached houses in a particular region. It is an indicator presenting the degree of the revitalization of the local economy. The rise in housing prices could lead to an increase in local tax revenues, affecting the financial soundness of local governments. GRDP is an indicator that shows how much value has been generated for each economic activity within each metropolitan city or province.

$$\text{Housing price increase rate} = \frac{\text{Housing transaction price index for this December}}{\text{Housing transaction price index for previous December}} \times 100 - 100$$

The fluctuation rate of consumer price refers to the year-on-year change rate of the consumer price index, which is a macroeconomic indicator that shows the average cost of living or changes in the purchasing power of money of urban households. The unemployment rate is the proportion of unemployed people among the economically active population. The increase in the unemployment rate means a decrease in the number of employed people participating in economic activities, which can lead to a decrease in local taxes and negatively affect the financial soundness of local governments.

$$\text{The fluctuation rate of consumer price} = \frac{\text{Consumer price index for the same month this year}}{\text{Consumer price index for the same month last year}} \times 100 - 100$$

The political factor is whether the head of a local government belongs to the ruling party. If a mayor or a governor belongs to the ruling party, it would be easier to secure financial resources, including additional funds for the central government's relocation under political considerations. It would increase local government income and curb debt growth, thereby positively affecting the financial soundness of local governments.

3.3. Data

The ratio of debt to the budget, a dependent variable, was collected from Local Finance 365 (<http://lofin.mois.go.kr/>). This study collected local consumption tax and the proportion of social welfare expenditure from the Korean Statistical Information Service (hereinafter referred to as "KOSIS") (<http://kosis.kr/>). General subsidies per capita were calculated using Explanation of Calculation of Local Subsidies and the resident population of KOSIS. The proportion of local taxes to total tax was calculated by dividing local taxes collected from KOSIS, into the total tax.

The study calculated the population density by dividing the population collected from KOSIS into the area of each city and province collected from the Ministry of Land, Infrastructure and Transport. The aging index, GRDP per capita, the fluctuation rate of

consumer price, and the unemployment rate were collected from KOSIS. The housing price increase rate was calculated by the selling price index of the Korea Appraisal Board (<https://www.r-one.co.kr>). Party affiliation of the governor collected in the National Election Commission's election statistics system (<http://info.nec.go.kr>) is a dummy variable. If a mayor or a governor belongs to the ruling party, it is one. If not, zero.

3.4. Research Model

This study analyzed panel data of 16 cities and provinces from 2010 to 2018. Therefore, the unit of analysis is province-year. As the study could not consider all independent variables that explain the dependent variable, there is a possibility that the correlation between the error term and independent variables exists. In other words, between each observed unit, there is a unique characteristic that is difficult to measure because it cannot be observed, which can affect the variation of the dependent variable (Jang, 2011). The fixed-effect model has the advantage of analyzing how changes within each local government impact financial soundness while controlling invisible differences between local governments (Kim & Roh, 2014). For this reason, this study conducted a regression analysis using the fixed-effect model. Difference in differences is not an appropriate model for this study because policies on local consumption tax and local subsidies have been implemented across the country, which means there is no control group.

The equation to be estimated is as follows:

$$\begin{aligned} \text{Log}(\text{debt_budget_ratio})_{pt} = & \beta_0 + \beta_1(\text{local_consumption_tax})_{pt} + \\ & \beta_2(\text{local_tax2total_tax})_{pt} + \beta_3(\text{general_subsidies})_{pt} + \\ & \beta_4(\text{social_welfare_expenditure})_{pt} + X'\gamma + a_p + d_t + \varepsilon_{pt} \end{aligned}$$

where $\text{log}(\text{debt_budget_ratio})_{pt}$ is the natural log of the ratio of debt to the budget in p province and t year; $(\text{local_consumption_tax})_{pt}$ denotes local consumption tax per capita in p province and t year; $(\text{local_tax2total_tax})_{pt}$ means the ratio of local taxes to total tax in p province and t year; $(\text{general_subsidies})_{pt}$ denotes general subsidies per capita in p province and t year; $(\text{social_welfare_expenditure})_{pt}$ means the proportion of social welfare expenditure in p province and t year; X' is a set of time-varying control variables; a_p is unobserved, time-constant factors that affect the ratio of debt to the budget and d_t is unobserved, time-varying factors that affect the ratio of debt to the budget. This is a log-level model.

Chapter 4. Empirical Analysis

4.1. Descriptive Statistics

This study conducted descriptive statistics to identify the status of variables that are likely to impact the financial soundness of local governments in Korea, focusing on fiscal decentralization. The analysis period is nine years from 2010 to 2018, and the analysis units are 16 metropolitan cities and provinces except for Sejong City. <Table 4-1> presents descriptive statistics results.

<Table 4-1> Descriptive Statistics Results

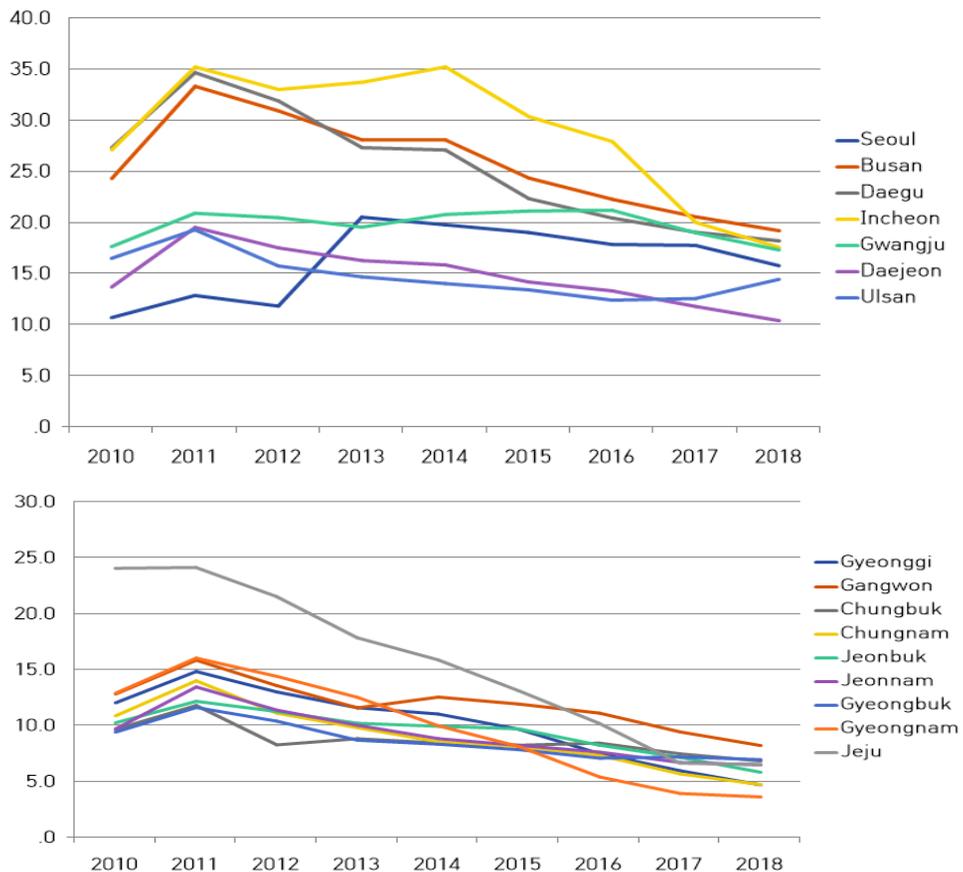
(Unit: KRW thousand, %)

Variable	N = 144			
	Mean	Std. Dev.	Min	Max
Ratio of debt to the budget	14.81986	7.497566	3.6	35.25
Local consumption tax per capita	108.0014	41.42896	28.3	205.5
Ratio of local taxes to total tax	1.396319	1.62056	0.23	6.192
General subsidies per capita	986.4486	845.4736	0	3093
Proportion of social welfare expenditure	24.81042	6.22703	11.5	38.5
Population density (people/km ²)	2329.183	4040.943	92.3	17471.4
Aging index	94.72083	31.07517	37.2	176.7
GRDP per capita	31665.38	11119.55	16379	65370
Housing price increase rate	2.332569	4.230413	-6.87	20.35
Fluctuation rate of consumer price	1.835417	1.132141	-0.2	4.5
Unemployment rate	3.138889	0.855677	1.5	5
Party affiliation of the governor	.4722222	.5009703	0	1

This study measured local financial soundness using the ratio of debt to the budget, one of the indicators of financial soundness used by the Ministry of the Interior and Safety. <Figure 4-1> shows the ratio of debt to the budget of 16 cities and provinces from 2010 to 2018. The mean of ratio of debt to the budget is 14.82 percent. It ranges from 3.6 percent (Gyeongnam in 2018) to 35.25 percent (Incheon in 2011 and 2014). Except for Seoul, the ratio of debt to the budget fell in 2018 compared to 2010. As of 2018, Busan has the highest rate of 19.16 percent, while Gyeongnam has the lowest rate of 3.6 percent.

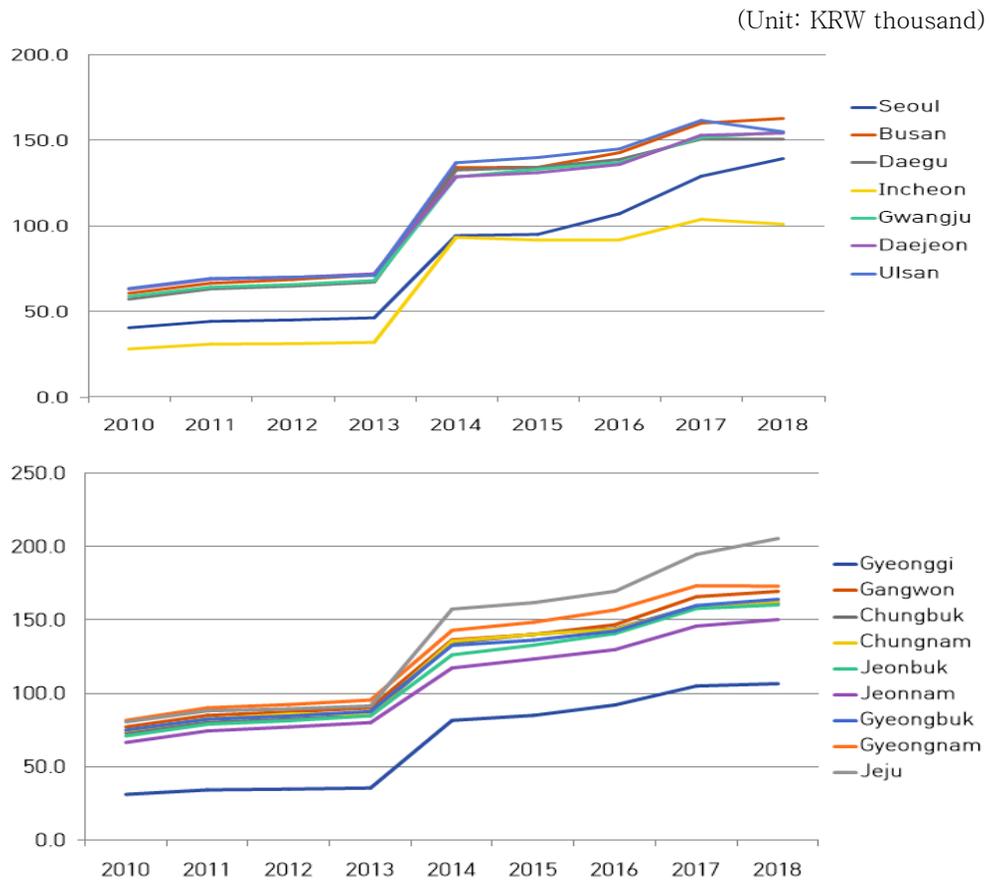
<Figure 4-1> Ratio of Debt to the Budget

(Unit: %)



This study measured revenue decentralization by local consumption tax and the ratio of local taxes to total tax. Local consumption tax per capita ranged from KRW 28,000 to KRW 205,000, with an average of KRW 108,000. The local consumption tax per capita soared when the local consumption tax rate rose from 5 percent to 11 percent in 2014. As of 2018, Jeju was the highest at KRW 205,000, while Incheon was the lowest at KRW 101,000. <Figure 4-2> presents the trend of local consumption tax per capita in 16 cities and provinces.

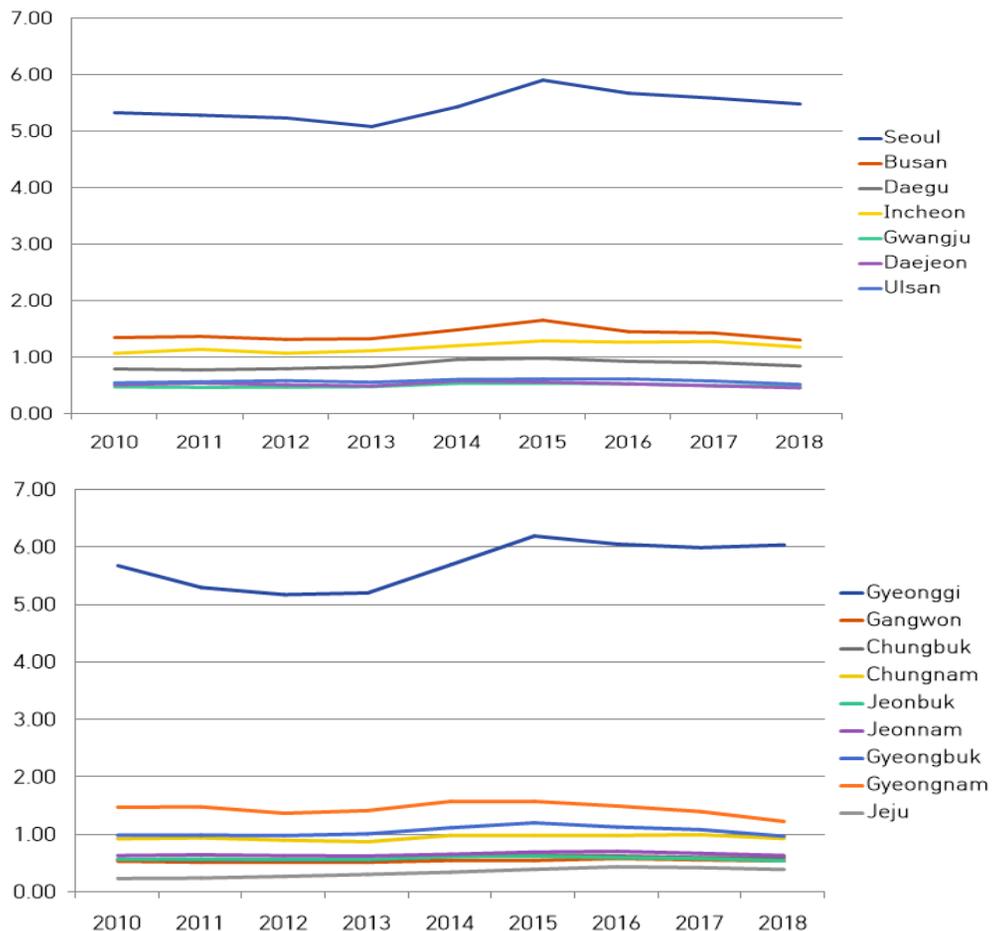
<Figure 4-2> Local Consumption Tax per capita



The mean of ratio of local taxes to total tax from 2010 to 2018 was 1.4 percent. It ranged from 0.23 percent (Jeju in 2010) to 6.19 percent (Gyeonggi in 2015). In 2018, the total amount of local taxes was 22.14 percent, which was slightly higher than 21.67 percent in 2010. As of 2018, Gyeonggi had the highest ratio of 6.04 percent, followed by Seoul. Jeju had the lowest ratio of 0.39 percent. This is because Gyeonggi and Seoul have a larger population than other cities and provinces. <Figure 4-3> presents the ratio of local taxes to total tax from 2010 to 2018.

<Figure 4-3> Ratio of Local Taxes to Total Tax

(Unit: %)

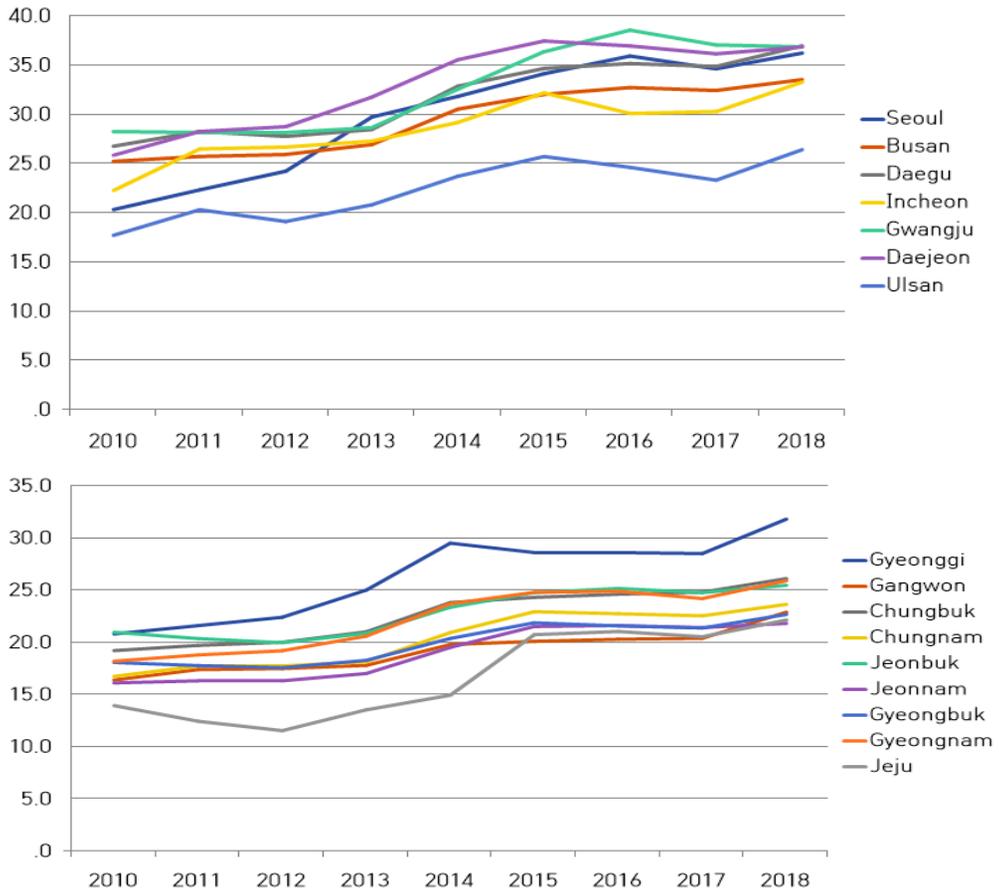


Expenditure decentralization means the allocation of financial resources between the central and local governments. This study did not use the proportion of transfer funds to total expenditure, but general subsidies per capita and the proportion of social welfare expenditure as the indicator of expenditure decentralization. This is because the purpose of this study is to analyze how expenditure decentralization policies such as the increase of the local subsidy rate or the increase in the proportion of social welfare expenditure through state subsidies affect local financial soundness.

The proportion of social welfare expenditure in local governments' budget has been on the rise since 2010. Its average was 20.4 percent in 2010 but was 28.9 percent in 2018. The proportion of social welfare expenditure during the research period ranged from 11.5 percent (Jeju in 2012) to 38.5 percent (Gwangju in 2016), with an average of 24.8 percent. As of 2018, Daegu was the highest at 36.9 percent, while Jeonnam was the lowest at 21.8 percent. The mean of 7 metropolitan cities was 34.3 percent, about 10 percent higher than the mean of 9 provinces, 24.7 percent, showing that there is a wide gap in the proportion of social welfare expenditure between metropolitan cities and provinces. <Figure 4-4> shows the proportion of social welfare expenditure out of the total expenditure of local governments.

<Figure 4-4> Proportion of Social Welfare Expenditure

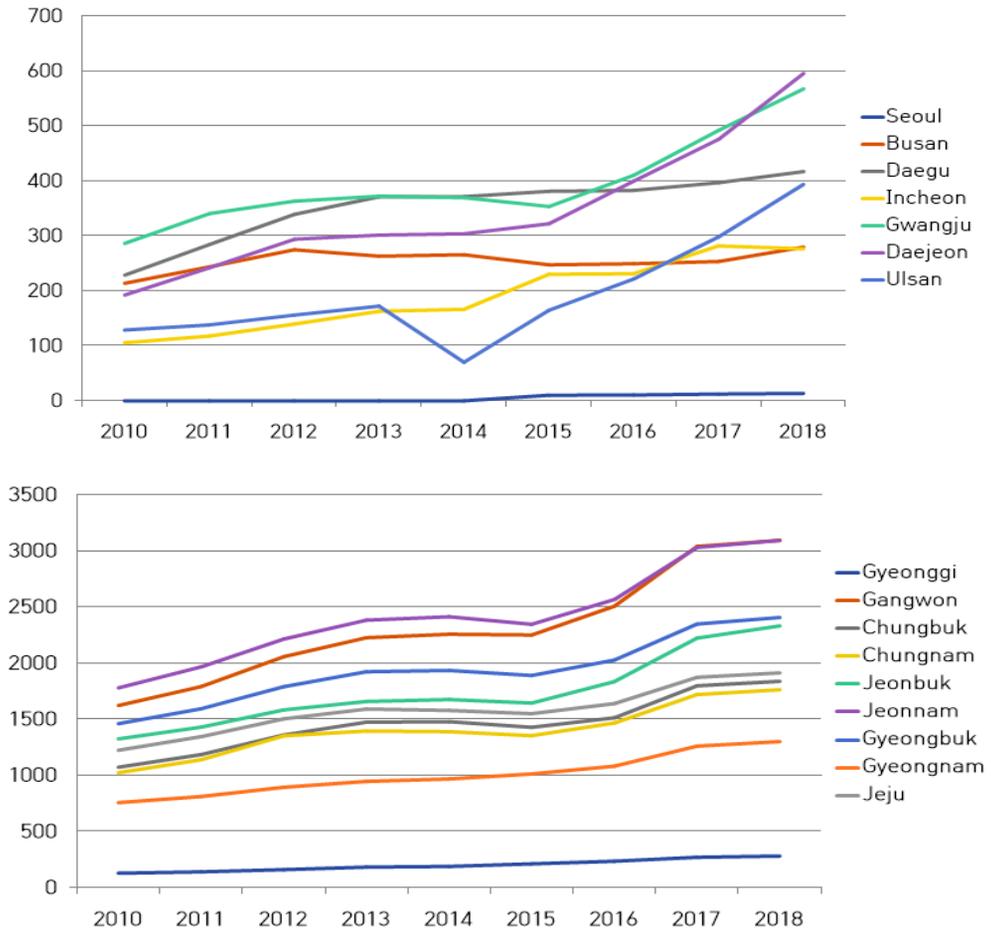
(Unit: %)



General subsidies per capita were between KRW 0 and KRW 3,093,000, with an average of KRW 986,000. Seoul was not granted general subsidies from 2010 to 2014 when financial income exceeded financial demand. The mean of general subsidies per capita increased from KRW 721,000 in 2010 to KRW 1,284,000 in 2018. As of 2018, Gangwon had the largest amount of general subsidies per capita at KRW 3,093,000, and Seoul had the lowest amount at KRW 14,000. This is because Gangwon had the highest financial shortage, while Seoul had the lowest. <Figure 4-5> shows the trends of general subsidies per capita.

<Figure 4-5> General Subsidies per capita

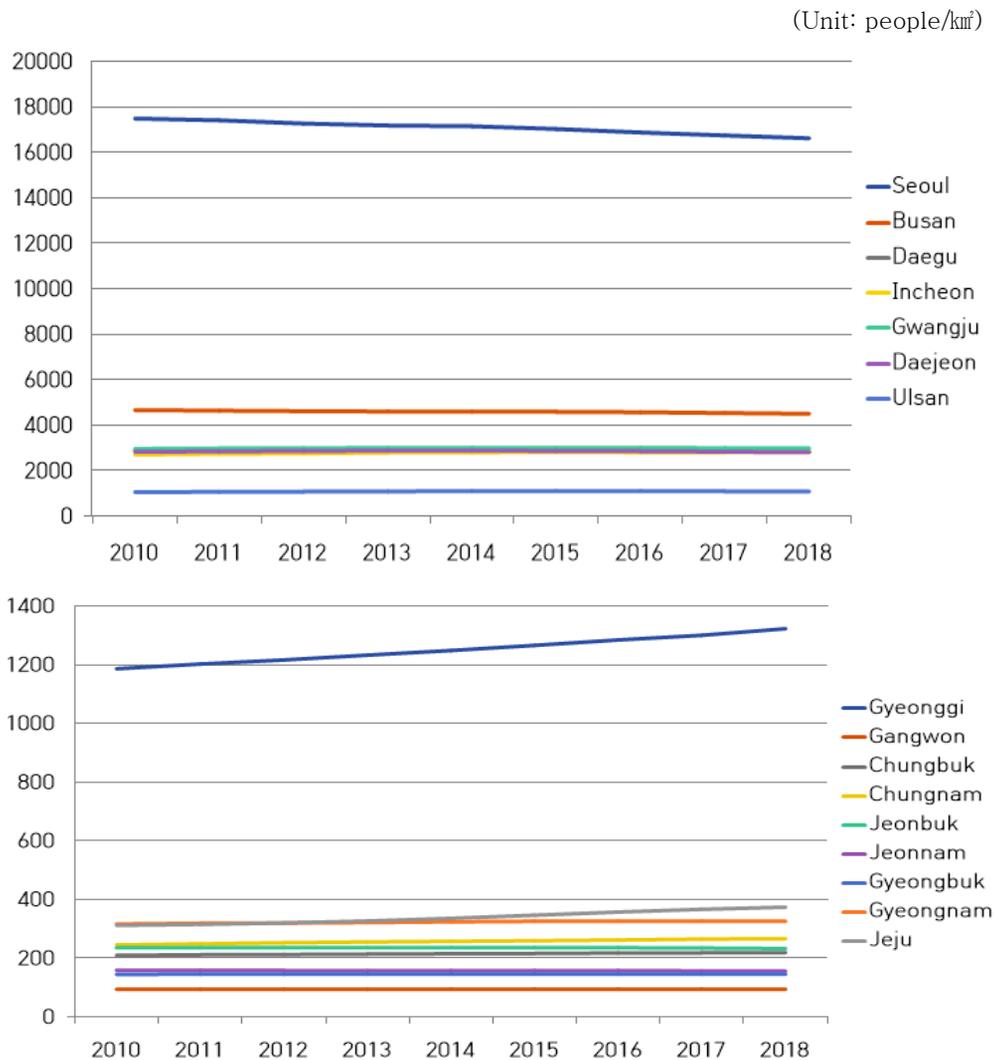
(Unit: KRW thousand)



This study considered control variables from the social, economic, and political aspects. Population density as a social factor ranges from 92 people/km² to 17,471 people/km², with an average of 2,329 people/km² and a standard deviation of 4,041 people/km². The standard deviation shows that there is a great disparity in population density between regions. In 2010, the average population density was 2,342 people/km², but in 2018, it decreased slightly to 2,300 people/km². As of 2018, Seoul was the highest at 16,605 people/km², and Gangwon was the lowest at 93 people/km², making the difference

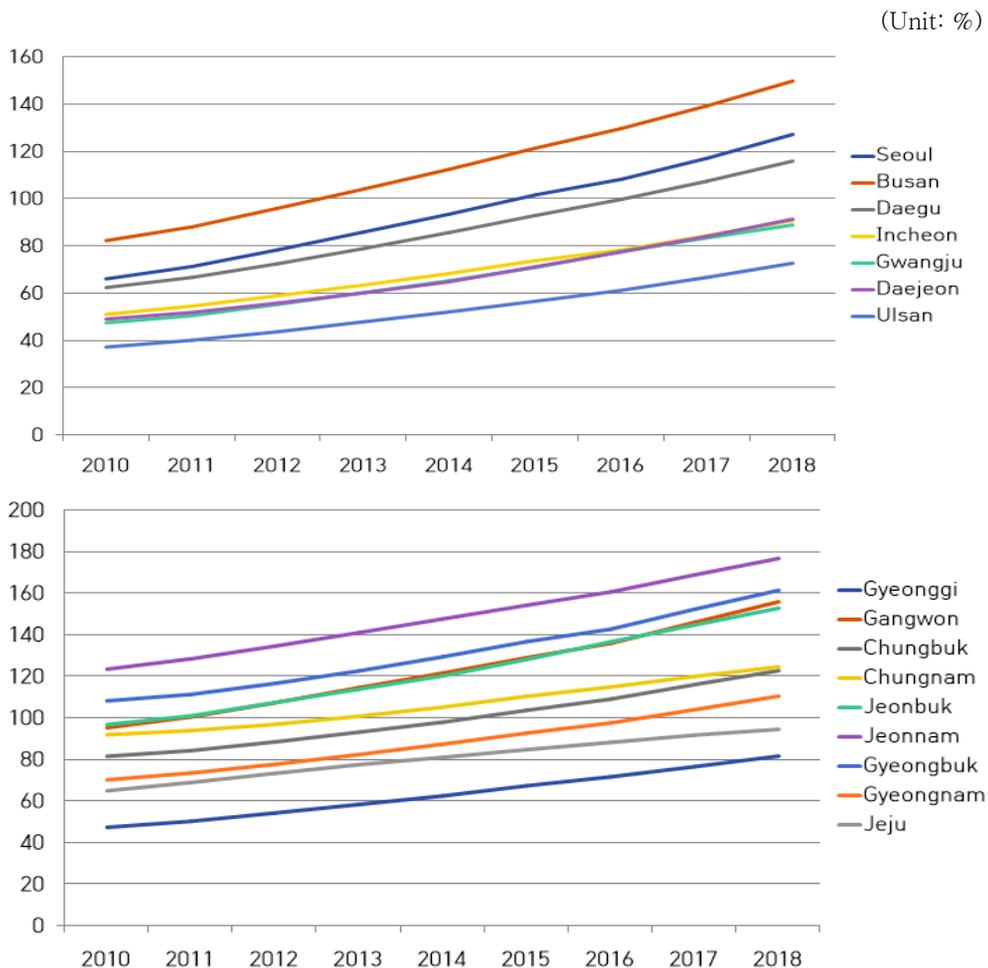
between the highest population density and the lowest population density almost 180 times. Also, the comparison of the average of 7 metropolitan cities, 2,841 people/km², and the average of 8 provinces excluding Gyeonggi, 227 people/km², shows the population concentration to metropolitan cities is very severe. <Figure 4-6> presents the trends of population density of 16 cities and provinces from 2010 to 2018.

<Figure 4-6> Population Density



The aging index ranged from 37.2 to 176.7, with an average of 94.7. The aging index over 100 means that the number of senior citizens aged 65 or over exceeds that of young people aged 14 or below. As shown in <Figure 4-7>, all cities and provinces show a sharp increase in the aging index. The average aging index was 73.5 in 2010, but it rose sharply to 119.9 in 2018 due to the falling birth rate and higher life expectancy. In particular, Korea's birth rate decreased from 1.23 per fertile woman in 2010 to 0.98 in 2018, becoming the lowest among OECD countries.

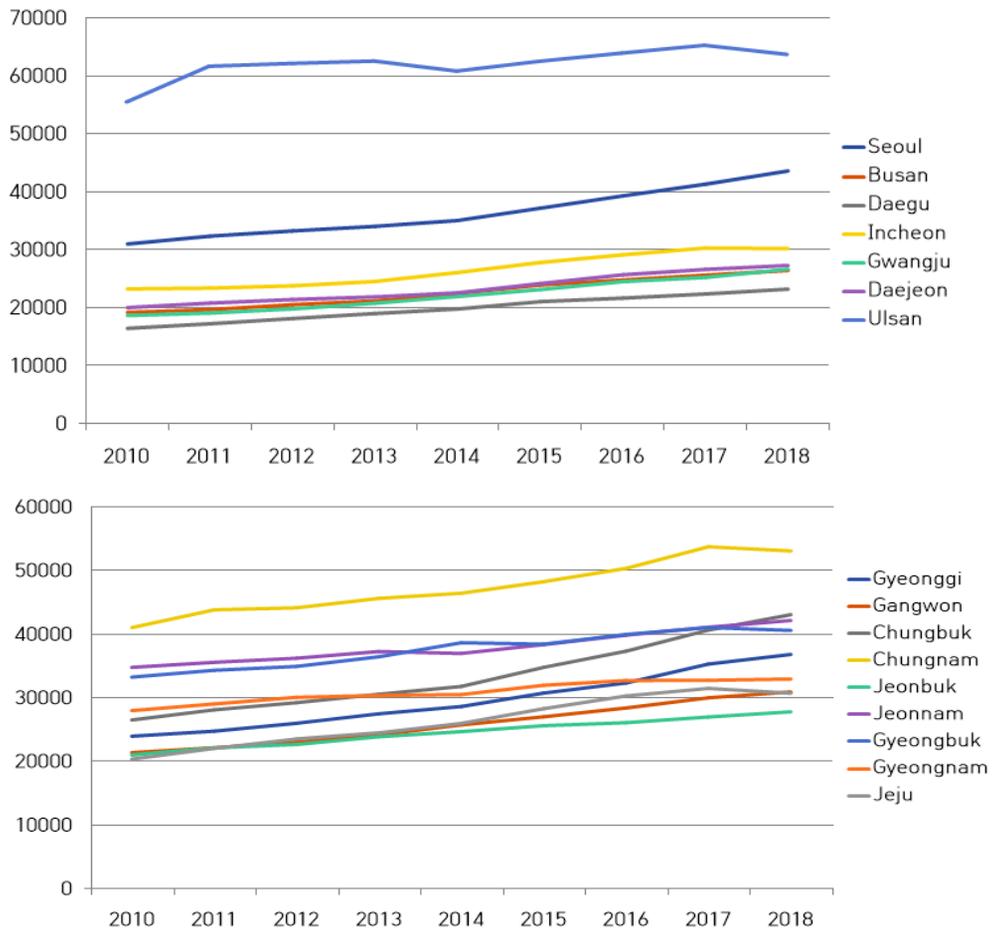
<Figure 4-7> Trend of Aging Index



The GRDP per capita ranged from KRW 16,379 thousand to KRW 65,370 thousand, with an average of KRW 31,665 thousand. In 2018, Ulsan had the highest GRDP per capita at KRW 63,793 thousand followed by Chungnam. Daegu was the lowest at KRW 23,151 thousand. <Figure 4-8> shows the trend of GRDP[®] per capita.

<Figure 4-8> GRDP per capita

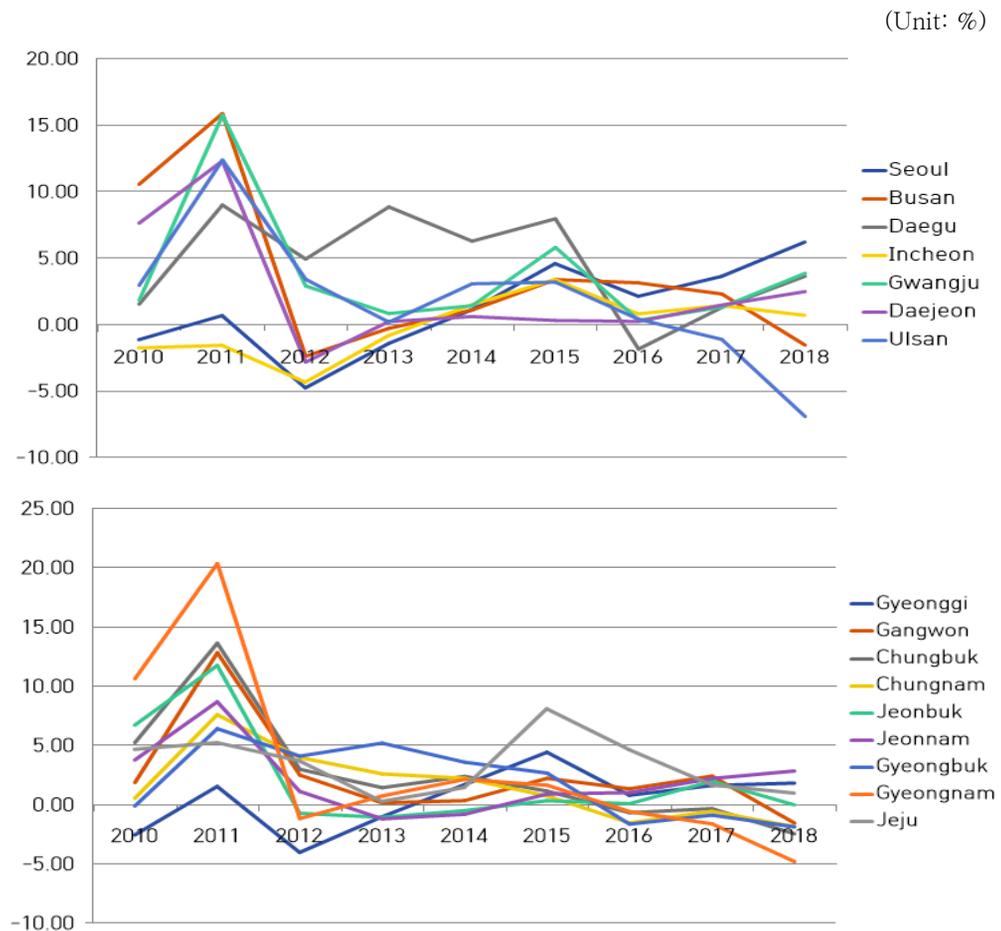
(Unit: KRW thousand)



[®] GRDP and GDP are estimated under the UN's recommended SNA (a system of national account). However, GDP and the total amount of GRDP are not necessarily the same because there may be differences in data used in estimating and the method of using data (National Statistical Office).

The housing price increase rate refers to the change rate in the housing transaction price index compared to the previous year. Between 2010 and 2018, the housing price increase rate ranged from -6.87 percent to 20.35 percent, with an average of 2.3 percent and a standard deviation of 4.2 percent. The average and the standard deviation show that housing transaction price has increased by an average of 2.3 percent year-on-year and that there is a significant regional deviation. <Figure 4-9> illustrates the trend of the housing price increase rate.

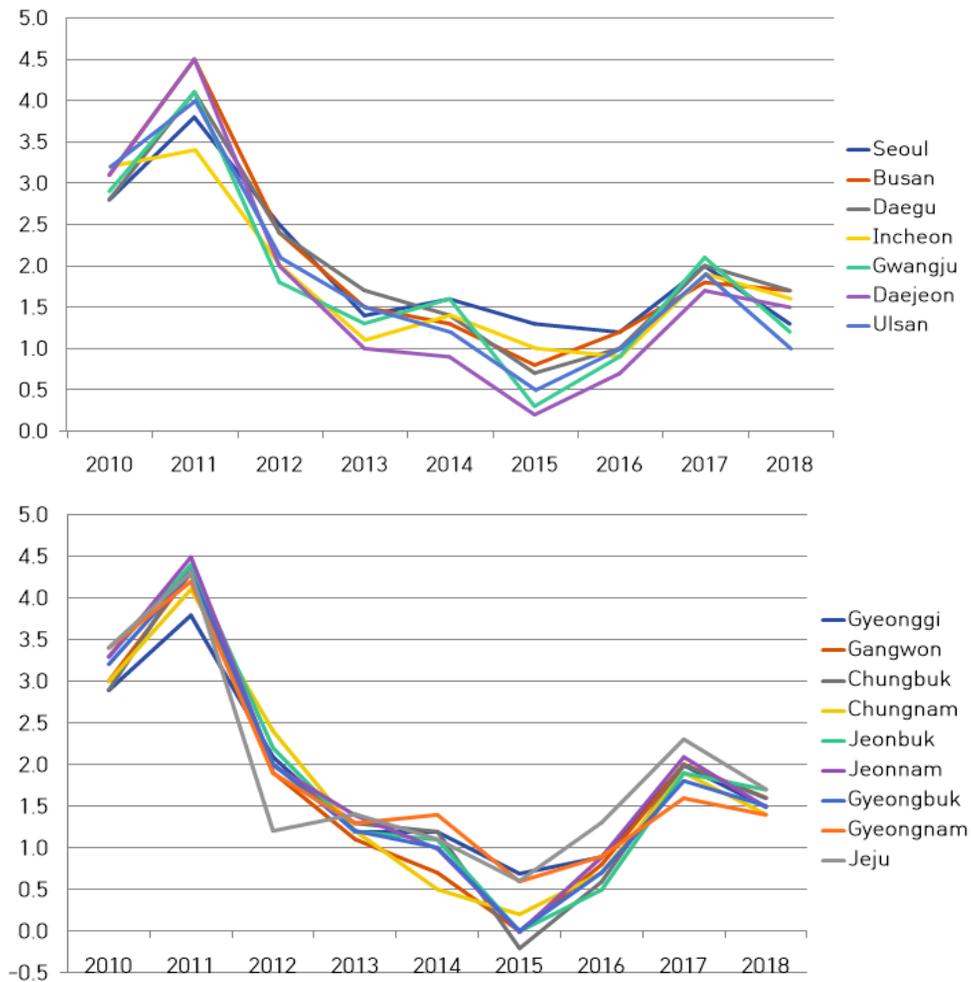
<Figure 4-9> Housing Price Increase Rate



The fluctuation rate of consumer price ranged from -0.2 percent to 4.5 percent, with an average of 3.1 percent. Except for Chungbuk recording - 0.2 percent in 2015, the fluctuation rate of consumer price in 16 cities and provinces was positive from 2010 to 2018, which means that consumer prices have continued to grow compared to the previous year. <Figure 4-10> shows the trend of the fluctuation rate of consumer price.

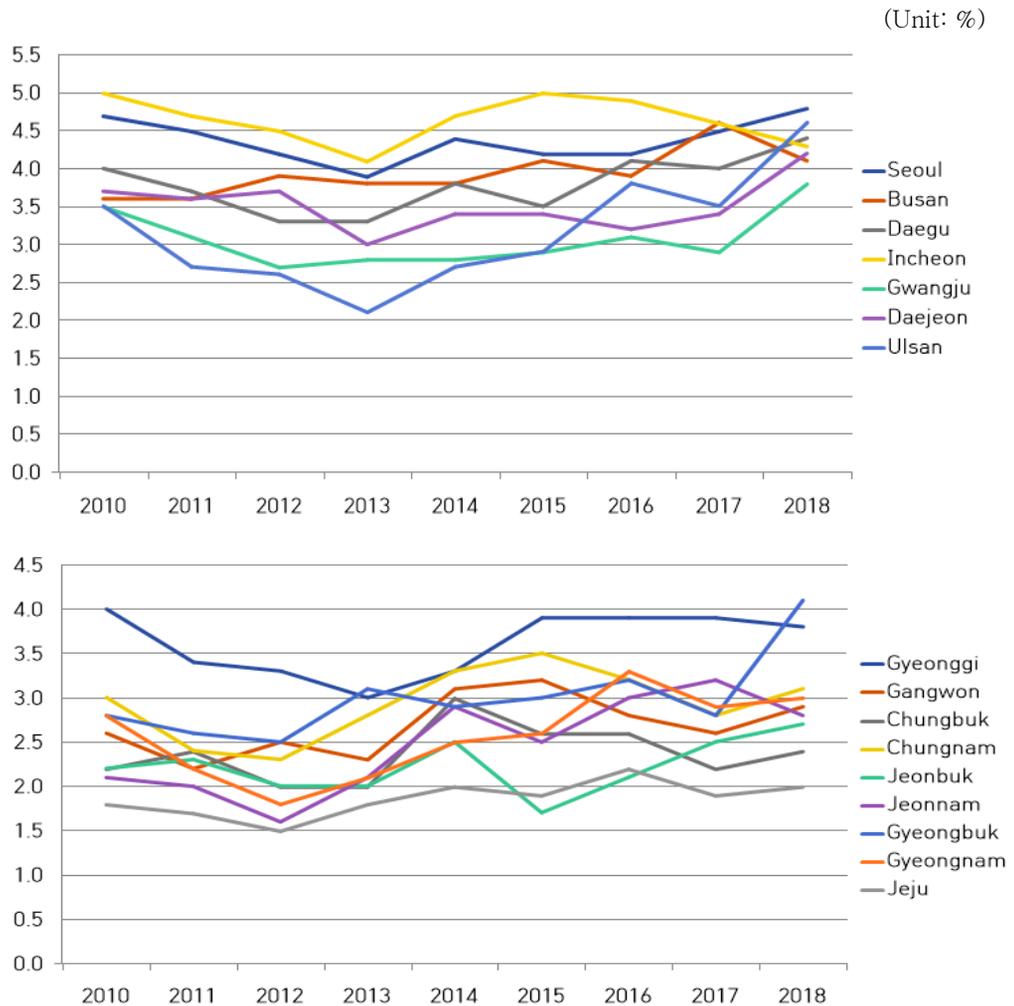
<Figure 4-10> Fluctuation Rate of Consumer Price

(Unit: %)



The unemployment rate represents the proportion of the unemployed among the productive population. Between 2010 and 2018, the unemployment rate ranged from 1.5 percent to 5 percent, with an average of 3.1 percent. As of 2018, Seoul had the highest unemployment rate of 4.8 percent, while Jeju was the lowest at 2.0 percent. As shown in <Figure 4-11>, the unemployment rate was higher in metropolitan cities (average 4.3 percent) than provinces (average 3.0 percent).

<Figure 4-11> Trend of Unemployment Rate



4.2. Correlation Analysis

The following <Table 4–2> presents the correlation between the ratio of debt to the budget as an indicator of local financial soundness and the explanatory variables used in this study. Correlation analysis is a statistical analysis technique that not only provides statistical information on the interrelationships between two variables with continuous properties but also verifies the statistical significance of the interrelationships between two variables. Correlation analysis provides information about the relationship, such as strength and direction between two variables, but does not provide information about the causal relationship between two variables.

Correlation coefficients between the ratio of debt to the budget and other variables are between 0.002 and 0.619. Correlation coefficients between the explanatory variables is distributed between 0.002 and 0.749. In general, the criterion of the correlation coefficient associated with the occurrence of multicollinearity is considered to be 0.8 or higher, so multicollinearity is not likely to occur.

The ratio of debt to the budget has a negative correlation with local consumption tax per capita, general subsidies per capita, aging index, and GRDP per capita. The correlations are statistically significant at the 0.01 level. The ratio of debt to the budget has a positive correlation with the proportion of social welfare expenditure, population density, housing price increase rate, the fluctuation rate of consumer price, and unemployment rate. The correlations are

statistically significant at the 0.01 level. However, even if there is a significant correlation between the two variables, this does not imply there is a causal relationship between the two variables. Therefore, this study conducted a regression analysis to determine the causal relationship between the dependent variable and the explanatory variables.

<Table 4-2> Correlation Analysis

Pearson Correlation Coefficients, N=144												
V.	1	2	3	4	5	6	7	8	9	10	11	12
1	1.0000											
2	-0.4692 ***	1.0000										
3	-0.0388	-0.2895 ***	1.0000									
4	-0.6191 ***	0.4251 ***	-0.4329 ***	1.0000								
5	0.3229 ***	0.2219 ***	0.2383 ***	-0.5811 ***	1.0000							
6	0.3346 ***	-0.2146 ***	0.6239 ***	-0.5227 ***	0.4363 ***	1.0000						
7	-0.4819 ***	0.5430 ***	-0.1580	0.7494 ***	-0.1217	-0.1201	1.0000					
8	-0.4031 ***	0.2591 ***	0.0411	0.1043	-0.2303 ***	-0.0395	0.0956	1.0000				
9	0.2626 ***	-0.1814 **	-0.1210	-0.0742	-0.0867	-0.0401	-0.1608 *	-0.1742 **	1.0000			
10	0.2450 ***	-0.5211 ***	0.0027	-0.1374	-0.3134 ***	0.0485	-0.2904 ***	-0.1717 **	0.5235 ***	1.0000		
11	0.3964 ***	-0.1270	0.4525 ***	-0.6153 ***	0.6358 ***	0.5633 ***	-0.1710 **	-0.0424	-0.1826 **	-0.0616	1.0000	
12	0.0019	-0.0021	0.1803 **	-0.2326 ***	0.0437	-0.0084	-0.1311	0.1107	0.0362	0.0554	0.2456 ***	1.0000

Note: 1) *** p<0.01 (Significant at the 1% level), ** p<0.05, * p<0.1

- 2) 1: ln(Ratio of debt to the budget), 2: Local consumption tax per capita, 3: Ratio of local taxes to total tax, 4: General subsidies per capita, 5: Proportion of social welfare expenditure, 6: Population density, 7: Aging index, 8: GRDP per capita, 9: Housing price increase rate, 10: Fluctuation rate of consumer price, 11: Unemployment rate, 12: Party affiliation of the governor

4.3. Regression Results

This study performed a regression analysis to analyze the effect of fiscal decentralization on the financial soundness of local governments by using local consumption tax, the ratio of local taxes to total tax, general subsidies, and the proportion of social welfare expenditure as indicators.

<Table 4-3> Regression Results

Number of obs.	=	144
F (34,109)	=	94.37
Prob > F	=	0.0000
R-squared	=	0.9325
Root MSE	=	.14884

Log(Ratio of debt to the budget)	Coef.	Robust Std. Err	T-value	P > t
Local consumption tax per capita	-.005791	.0025681	-2.26	0.026
Ratio of local taxes to total tax	-.271782	.122751	-2.21	0.029
General Subsidies per capita	-.0001516	.0000926	-1.64	0.104
Proportion of social welfare expenditure	.0170818	.013832	1.23	0.220
Population density	-.0006274	.0002743	-2.29	0.024
Aging index	.0156845	.0057896	2.71	0.008
GRDP per capita	.0000151	.0000182	0.83	0.409
Housing price increase rate	.0042813	.005563	0.77	0.443
Fluctuation rate of consumer price	.0454642	.0591103	0.77	0.443
Unemployment rate	.0044345	.0555419	0.08	0.937
Party affiliation of the governor	-.0658235	.0475304	-1.38	0.169

Results show that local consumption tax and the ratio of local taxes to total tax had a positive impact on local financial soundness by reducing the ratio of debt to the budget, all of which were statistically significant at the 0.05 level. In other words, the increase in local consumption tax and the proportion of local taxes to total tax through the transfer of national tax to local taxes will enable local governments to secure a stable and sustainable income without debt, thereby reducing the ratio of debt to the budget and strengthening local financial soundness.

The estimated coefficient of local consumption tax per capita is -0.0058 . This means that each KRW thousand increase in local consumption tax per capita decreases the ratio of debt to the budget by 0.58 percent. The coefficient of the ratio of local taxes to total tax is -0.2718 , which means that a one-point^⑦ increase in the ratio of local taxes to total tax decreases the ratio of debt to the budget by 27.18 percent.

According to the results, general subsidies had a negative impact on the ratio of debt to the budget, while the proportion of social welfare expenditure had a positive impact. In other words, the increase in general subsidies per capita decreased the ratio of debt to the budget, and the increase in the proportion of social welfare expenditure increased the ratio of debt to the budget. General subsidies are one of the transfer funds whose purpose is not fixed,

^⑦ The year-on-year increase in the ratio of local taxes to total tax in 16 cities and provinces during the study period ranged from -0.38 points to 0.5 points, with an average of zero.

so local governments have autonomy in spending. On the contrary, social welfare expenditure through state subsidies puts a financial burden on local governments through matching local expenses. However, the two results are not statistically significant because the t-values of the two variables are less than 1.96.

The coefficient of the aging index is 0.0157, which indicates that a one-point increase in the aging index increases the ratio of the debt to the budget by 1.57 percent. The result was statistically significant at the 0.05 level. The increase in the aging index means that the proportion of the elderly population aged 65 or over is increasing compared to the number of young people. The decrease in the number of economically active people results in reducing the revenue of local governments and increasing the debt, thereby eventually aggravating their financial soundness. The estimated coefficient of population density is negative, which means that the increase of population density decreases the ratio of debt to the budget. As the t-value is -2.29 , the result is statistically significant at the 0.05 level.

The GRDP per capita and housing price increase rate did not have a statistically significant impact on the ratio of debt to the budget. This result was not in line with expectations that a rise in housing prices would lead to an increase in local tax revenue, which would have a positive impact on the financial soundness of local governments. The fluctuation rate of consumer price was expected to negatively affect local financial soundness through the reduction

of local tax revenue as the rise in consumer prices decreases disposable income. As expected, The fluctuation rate of consumer price and the ratio of debt to the budget showed a positive relationship, but the result was not statistically significant. The increase in the unemployment rate was expected to negatively affect local financial soundness by reducing the number of people participating in economic activities. As expected, the unemployment rate and the ratio of debt to the budget showed a positive relationship, but the result was not statistically significant.

The coefficient of the party affiliation of the governor is negative. It means that if the head of a local government belongs to the ruling party, it has a positive impact on the soundness of local finance. However, the t-value was -1.38, indicating that the result was not statistically significant. Shin (2017) concluded that if the head of a local government would belong to the ruling party, it would have a positive impact on the soundness of local finance at a statistical significance level of 0.01. The reasons why the result of this study differs from that of Shin (2017)'s study in statistical significance are that the indicators measuring local financial soundness are different and the dummy value may differ depending on the timing of measurement since the term of office of a mayor or a governor begins on July 1.

Chapter 5. Conclusion

5.1. Summary

This study provides new findings on the effect of fiscal decentralization on local financial soundness. The study measured local financial soundness by the ratio of debt to the budget and measured revenue decentralization by local consumption tax per capita and the ratio of local taxes to total tax, and measured expenditure decentralization by general subsidies per capita and the proportion of social welfare expenditure. Social, economic, and political factors as control variables that could affect financial soundness were also considered. This study conducted a regression analysis using a fixed-effect model.

The key findings of the analysis are as follows:

First, the impact on local financial soundness of revenue and expenditure decentralization is different. The increase in local consumption tax and the ratio of local taxes to total tax, which are the indicators of revenue decentralization, decreased the ratio of debt to the budget at a statistically significant level unlike the indicators of expenditure decentralization. Therefore, local consumption tax and the ratio of local taxes to total tax have a positive effect on local financial soundness.

Second, the increase in general subsidies as an indicator of expenditure decentralization, decreased the ratio of debt to the budget, while the increase in the proportion of social welfare

expenditure increased the ratio of debt to the budget. Unlike social welfare expenditure, local governments have autonomy in the expenditure of general subsidies. This result shows that the impact of expenditure decentralization on local financial soundness is different depending on whether the local government has autonomy in the expenditure of funds. However, the impact of the two variables on the ratio of debt to the budget was not statistically significant.

Third, the increase in the aging index increased the ratio of debt to the budget. The increase of aging index means a decrease in the number of economically active people, thereby raising the ratio of debt to the budget and worsening financial soundness. Contrary to the aging index, the increase in population density reduced the ratio of debt to the budget. The impacts of these two variables on the ratio of debt to the budget were statistically significant at the 0.05 level.

This study is distinguished from previous studies in the following aspects: First, this study analyzed empirically the impact on local financial soundness of local consumption tax and the ratio of local taxes to total tax, which has rarely been addressed in previous research. Second, this study considered the social, economic, and political factors in tandem with fiscal decentralization as factors affecting the financial soundness of local governments. In particular, the study found that the birth rate may be related to financial soundness. Third, this study found out which method is more effective in enhancing local finance soundness: revenue decentralization or expenditure decentralization.

5.2. Policy Implications

Policy implications derived from analysis of the results are as follows:

First, revenue decentralization is more effective than expenditure decentralization in improving local financial soundness. If the size of the budget spent on the revenue and expenditure decentralization is the same, the increase in local consumption tax rate as a means of revenue decentralization is more effective than the increase in the local subsidy rate as a means of expenditure decentralization. The budget should be spent effectively because the government has a limited budget to support local governments. Therefore, when implementing fiscal decentralization to improve local financial soundness, the government should prioritize policies that increase the proportion of local taxes by increasing the local consumption tax rate than the local subsidy rate.

Second, the impact of expenditure decentralization on local financial soundness differs depending on whether local governments have autonomy in spending. General subsidies and state subsidies are funds transferred to local governments by the central government and a means of expenditure decentralization. However, general subsidies where local governments have the autonomy of spending strengthen local financial soundness, while state subsidies used for specific purposes worsen local financial soundness. Therefore, it is more effective to transfer funds to general subsidies than state subsidies in strengthening the soundness of local finance.

Third, a policy study on the impact of the birth rate on local financial soundness is needed. This study analyzed the impact of the aging index on local financial soundness and found that the aging index has a negative impact. It is possible to estimate that increasing average life expectancy and declining birth rate increase the aging index. However, this study did not analyze the causal relationship between the birth rate and financial soundness. The reason why the government has implemented fiscal decentralization policies but the financial soundness of local governments has not improved may be the falling birth rate. Therefore, it is necessary to identify the causal relationship between the birth rate and local financial soundness.

5.3. Limitations

This study has the following limitations: First, although this study conducted for nine years from 2010 when local consumption tax was introduced, to 2018, and included every metropolitan city and province except for Sejong City, it may be difficult to generalize the results of the study due to relatively small observations. Second, this study could not use various variables affecting the soundness of local finance due to practical constraints such as the discontinuation of time series data. In the future, it is necessary to enhance the precision and representativeness of the model by developing and utilizing various indicators that can better measure financial soundness and fiscal decentralization.

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국문초록

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본격적인 민선 지방자치체 실시한 이후 지방정부 예산은 1995년 47조원에서 2018년 210조 원으로 증가하였다. 지방재정 규모의 확대에도 국세와 지방세의 비율은 8:2의 구조를 벗어나지 못하고, 지방정부의 중앙정부에 대한 재정 의존도는 높아졌다. 또한 국고보조사업의 확대와 사회복지분야 지출 증대는 지방비 부담을 증가시켜 지방정부의 재정건전성이 악화되고 있다. 재정건전성을 가늠하는 지표인 재정자립도는 1995년 63.5%에서 2018년 53.4%로 악화되었다.

이러한 문제점을 인식하여 현 정부는 지방재정의 책임성과 건전성을 확보하기 위해 강력한 재정분권을 국정과제로 선정하였다. 실권과제로 지방소비세율 확대 등을 통해 국세와 지방세 비율을 6:4 수준까지 개선하고, 지방교부세율 인상과 국고보조사업 정비 등 이전재원 조정을 추진하고 있다. 그러나 같은 규모의 예산을 투입하더라도 세입분권과 세출분권이 지방재정 건전성에 미치는 영향은 다를 수 있다. 이에 본 연구는 2010년부터 2018년까지 9년을 분석기간으로 하여 16개 시·도를 대상으로 세입분권과 세출분권이 재정건전성을 추정할 수 있는 지표인 예산대비채무비율에 어떠한 영향을 미치는지 고정효과모형을 사용하여 회귀분석을 실시하였는데, 주요 분석 결과는 다음과 같다.

첫째, 세입분권을 추정한 1인당 지방소비세와 총 조세 대비 지방세 비중의 증가는 통계적으로 유의미한 수준에서 예산대비채무비율을

감소시키는 것으로 나타났다. 예산대비채무비율의 감소는 재정건전성의 개선을 의미한다. 이러한 분석결과는 지방소비세율의 인상, 국세의 지방세 이양을 통한 지방세 비중 증가 등 자체재원의 비중이 확대되면 지방정부가 안정적으로 재원을 확보할 수 있어 채무비율이 감소하므로 지방재정 건전성에 긍정적인 영향을 미치는 것으로 볼 수 있다.

둘째, 세출분권을 추정한 1인당 보통교부세의 증가는 예산대비채무비율을 감소시키는 반면, 사회복지비 비중의 증가는 예산대비채무비율을 증가시키는 것으로 나타났다. 이는 같은 이전재원이라도 보통교부세와 국고보조금을 통한 사회복지비는 지출의 자율성에 있어서 차이가 있기 때문에 지방재정 건전성에 미치는 효과가 다르다는 것을 알 수 있다. 하지만 위 두 변수들이 예산대비채무비율에 미치는 영향은 통계적으로 유의미한 수준은 아니었다.

셋째, 통제변수인 인구밀도의 증가는 예산대비채무비율을 감소시키지만 노령화지수의 증가는 예산대비채무비율을 증가시키는 것으로 분석되었다. 이는 인구밀도가 높아지면 경제활동인구가 증가하여 지방자치단체의 재정력을 높이고 채무비율을 낮추는 반면 노령화지수의 증가는 경제활동인구수의 감소를 의미하므로 인구밀도와 반대의 효과를 가져와 채무비율을 높이고 재정건전성을 악화시키는 것으로 볼 수 있다.

이번 연구는 다음과 같은 점에서 선행연구와 차별화 된다. 첫째, 그동안 재정건전성 영향요인으로 선행연구에서 거의 다루지지 않았던 지방소비세가 재정건전성에 미치는 영향을 분석하였다. 둘째, 재정분권이 지방재정 건전성에 미치는 영향을 분석하면서 사회적·경제적·정치적 요인까지 총체적으로 고려하였다. 셋째, 재정분권을 추진할 때 세입분권과 세출분권 중 어느 정책수단이 재정건전성 강화에 더 효과적인지를 실증적으로 밝혔다.

결과 분석을 통해 도출한 정책적 시사점은 다음과 같다. 첫째, 세입분권이 세출분권보다 재정건전성 향상에 효과적이다. 세입분권과 세출분권에 같은 규모의 예산이 투입될 경우 세입분권 수단인 지방소비세율 인상이 세출분권 수단인 지방교부세율 인상보다 효과적이다. 정부가 지방자치단체에 지원할 수 있는 예산은 한정되어 있으므로, 정부가 재정건전성 향상을 위해 재정분권을 추진할 때에는 지방교부세율 인상보다는 지방소비세율을 인상하여 지방세 비중을 높이는 정책을 우선시할 필요가 있다.

둘째, 세출분권이 지방재정 건전성에 미치는 영향은 지방자치단체가 지출의 자율성을 갖는지 여부에 따라 다르다. 지방교부세와 국고보조금은 세출분권의 수단이지만, 지방자치단체가 지출의 자율성을 갖는 지방교부세는 지방재정 건전성을 강화하는 반면 지출의 용도가 지정되어 있는 국고보조금은 지방재정 건전성을 악화시킨다. 따라서 정부가 지방자치단체에 재원을 이전할 때에는 국고보조금보다는 지방교부세로 재원을 이전하는 것이 지방재정 건전성 향상에 효과적이다.

셋째, 출산율이 지방재정 건전성에 미치는 영향에 대한 정책적 연구가 필요하다. 본 연구에서는 노령화지수가 높아지면 지방재정 건전성이 악화된다는 것을 실증적으로 밝혔다. 노령화지수의 상승 원인으로 평균수명 증가와 출산율 감소를 추정해 볼 수 있지만, 출산율과 지방재정 건전성과의 인과관계를 실증적으로 분석하지는 않았다. 정부가 재정건전성을 높이기 위해 재정분권 정책을 추진하고 있지만 재정건전성이 개선되지 않는 원인이 출산율 감소일 가능성이 있다. 따라서 출산율과 지방재정 건전성 사이의 인과관계를 파악하는 연구가 필요하다고 할 것이다.

주제어: 지방재정 건전성, 재정분권, 지방소비세, 지방교부세, 사회복지비,

학번: 2018-29026

Appendix

1. The Ratio of Debt to the Budget

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	10.69	12.86	11.82	20.52	19.77	19.02	17.85	17.76	15.77
Busan	24.27	33.29	30.88	28.04	28.04	24.31	22.23	20.52	19.16
Daegu	27.28	34.62	31.84	27.28	27.05	22.29	20.39	19.0	18.16
Incheon	27.13	35.25	33.04	33.75	35.25	30.38	27.95	20.03	17.58
Gwangju	17.66	20.92	20.49	19.56	20.80	21.14	21.21	19.01	17.33
Daejeon	13.63	19.46	17.46	16.22	15.79	14.12	13.25	11.73	10.34
Ulsan	16.52	19.32	15.77	14.71	14.05	13.44	12.43	12.59	14.47
Gyeonggi	12.04	14.84	13.01	11.60	11.04	9.68	7.50	5.97	4.70
Gangwon	12.77	15.79	13.51	11.53	12.49	11.87	11.06	9.38	8.16
Chungbuk	9.62	11.75	8.23	8.78	8.40	8.20	8.39	7.43	6.79
Chungnam	10.89	14.02	11.12	9.83	8.57	8.14	7.36	5.70	4.74
Jeonbuk	10.26	12.18	11.27	10.22	9.95	9.72	8.26	7.18	5.84
Jeonnam	9.66	13.41	11.34	9.98	8.79	8.19	7.59	6.66	6.45
Gyeongbuk	9.38	11.58	10.36	8.66	8.30	7.81	7.05	7.16	6.92
Gyeongnam	12.88	16.01	14.38	12.50	9.96	8.11	5.39	3.91	3.60
Jeju	24.04	24.11	21.51	17.83	15.86	13.10	10.18	6.62	6.51

2. Local Consumption Tax per capita

(Unit: KWR thousand)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	40.4	44.2	45.0	46.2	94.3	95.0	107.0	128.9	139.2
Busan	60.6	66.4	68.5	71.3	134.0	134.1	142.6	159.9	162.6
Daegu	57.0	63.0	64.7	67.0	132.4	134.0	138.6	150.6	150.4
Incheon	28.3	31.1	31.4	32.1	93.5	91.9	92.0	104.0	101.2
Gwangju	59.0	64.4	65.8	68.2	128.7	133.2	137.2	151.7	154.8
Daejeon	63.0	68.8	70.0	72.1	128.8	131.1	135.9	153.0	154.2
Ulsan	63.3	69.2	69.9	71.0	136.7	139.8	144.8	161.4	154.8
Gyeonggi	30.9	33.9	34.5	35.2	81.3	84.7	91.8	104.7	106.3
Gangwon	77.2	85.1	87.4	90.3	136.5	140.2	146.8	165.9	169.5
Chungbuk	73.3	80.6	82.7	85.5	134.7	140.7	144.4	159.9	161.4
Chungnam	75.0	82.7	86.2	86.2	135.9	140.4	143.8	159.3	162.8
Jeonbuk	71.3	79.2	81.7	85.0	126.5	133.1	141.0	158.1	160.5
Jeonnam	66.8	74.6	77.3	80.3	117.5	123.6	130.0	146.1	150.5
Gyeongbuk	75.1	82.5	84.5	87.7	132.7	136.2	142.5	159.8	164.1
Gyeongnam	81.6	90.1	92.3	95.4	142.8	148.3	156.7	173.2	172.9
Jeju	80.6	88.2	89.4	91.5	157.5	161.8	169.6	194.7	205.5

3. Ratio of Local Taxes to Total Tax

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	5.32	5.28	5.23	5.08	5.43	5.90	5.67	5.58	5.48
Busan	1.35	1.37	1.32	1.33	1.49	1.66	1.45	1.43	1.31
Daegu	0.80	0.79	0.81	0.84	0.97	0.99	0.94	0.91	0.85
Incheon	1.07	1.14	1.07	1.12	1.21	1.29	1.27	1.28	1.18
Gwangju	0.47	0.46	0.47	0.48	0.53	0.54	0.53	0.49	0.49
Daejeon	0.51	0.54	0.51	0.49	0.58	0.56	0.53	0.50	0.46
Ulsan	0.54	0.56	0.58	0.55	0.60	0.61	0.61	0.57	0.52
Gyeonggi	5.68	5.30	5.17	5.20	5.69	6.19	6.05	5.99	6.04
Gangwon	0.54	0.52	0.52	0.52	0.55	0.55	0.58	0.56	0.54
Chungbuk	0.58	0.56	0.56	0.56	0.63	0.65	0.64	0.61	0.60
Chungnam	0.92	0.94	0.90	0.87	0.98	0.98	0.98	0.99	0.93
Jeonbuk	0.57	0.58	0.57	0.57	0.61	0.62	0.60	0.58	0.54
Jeonnam	0.63	0.65	0.63	0.63	0.66	0.69	0.71	0.67	0.63
Gyeongbuk	0.98	0.98	0.97	1.00	1.11	1.19	1.12	1.08	0.96
Gyeongnam	1.47	1.48	1.36	1.41	1.57	1.57	1.49	1.39	1.22
Jeju	0.23	0.24	0.27	0.30	0.34	0.39	0.43	0.42	0.39

4. General Subsidies per capita

(Unit: KRW thousand)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	0.0	0.0	0.0	0.0	0.0	10.1	10.6	12.3	13.5
Busan	213.7	243.7	274.7	263.0	265.6	247.3	249.2	253.3	279.6
Daegu	229.0	284.9	339.6	371.5	371.8	381.6	383.1	397.2	417.5
Incheon	104.6	116.8	138.6	161.8	165.5	229.1	230.2	280.8	275.7
Gwangju	286.7	341.0	363.5	372.6	369.8	353.8	410.8	492.4	567.8
Daejeon	192.8	242.5	294.3	301.9	304.3	322.6	400.2	476.2	595.9
Ulsan	128.7	138.1	155.9	172.2	70.0	164.5	221.6	298.1	393.6
Gyeonggi	127.8	139.6	159.1	182.0	188.1	210.6	234.2	269.2	280.2
Gangwon	1622.0	1790.3	2056.6	2226.0	2256.7	2250.1	2506.7	3038.9	3093.0
Chungbuk	1075.6	1188.0	1362.8	1476.6	1481.0	1430.8	1515.7	1800.4	1840.4
Chungnam	1018.3	1133.9	1346.7	1389.6	1383.9	1348.4	1461.3	1714.4	1757.1
Jeonbuk	1327.6	1432.0	1585.8	1660.8	1678.3	1646.6	1838.0	2225.0	2334.0
Jeonnam	1775.7	1962.7	2210.6	2378.9	2408.9	2342.0	2562.9	3026.5	3089.6
Gyeongbuk	1457.8	1590.4	1787.3	1920.2	1931.4	1886.7	2024.1	2345.0	2403.6
Gyeongnam	756.1	810.5	893.1	945.8	966.8	1012.0	1081.2	1259.4	1300.2
Jeju	1220.5	1341.7	1500.2	1587.6	1575.2	1546.5	1636.1	1870.1	1909.5

5. Population Density

(Unit: people/km²)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	17471.4	17397.4	17254.5	17164.7	17134.2	17011.6	16860.6	16729.3	16605.4
Busan	4692.3	4666.9	4642.8	4629.2	4621.6	4616.5	4598.5	4563.0	4529.4
Daegu	2864.0	2862.2	2860.5	2857.8	2850.6	2845.1	2841.8	2831.2	2818.1
Incheon	2728.1	2762.0	2777.9	2815.0	2823.5	2844.1	2825.3	2832.4	2842.6
Gwangju	2929.0	2948.1	2960.3	2969.8	2978.7	2974.2	2971.1	2963.0	2957.2
Daejeon	2812.6	2834.5	2849.8	2864.9	2869.4	2846.6	2839.6	2816.8	2795.4
Ulsan	1078.7	1088.6	1100.3	1111.7	1124.0	1130.7	1127.2	1117.3	1107.5
Gyeonggi	1187.3	1203.4	1217.2	1233.6	1249.4	1267.0	1285.5	1301.3	1323.7
Gangwon	92.5	92.3	92.4	92.4	92.6	93.0	93.1	93.1	92.8
Chungbuk	211.8	213.7	214.7	216.0	217.3	218.2	219.7	220.2	221.2
Chungnam	245.4	249.1	252.9	255.7	257.7	259.8	262.2	265.1	266.7
Jeonbuk	234.2	235.0	235.0	235.1	235.1	235.0	234.5	233.4	231.5
Jeonnam	158.4	158.1	157.6	157.0	157.1	157.5	157.1	156.3	155.2
Gyeongbuk	143.3	143.9	143.9	144.1	144.4	144.6	144.6	144.2	143.6
Gyeongnam	317.9	320.4	321.2	322.9	325.3	327.1	327.8	327.9	327.2
Jeju	312.2	315.4	320.4	327.0	336.2	346.8	357.6	366.9	374.0

6. Aging Index

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	66.2	71.4	78.5	86	93.6	101.7	108.3	117.2	127.3
Busan	82.3	88.1	96	104.1	112.5	121.4	129.7	139.3	149.8
Daegu	62.4	66.7	72.5	78.9	85.7	92.9	99.7	107.4	115.9
Incheon	51.2	54.7	59.1	63.6	68.5	73.9	78.4	84.5	91
Gwangju	47.6	50.6	55.4	60.3	65.4	71	77.8	83.5	89
Daejeon	49.1	51.9	55.9	60.2	64.9	71.2	77.5	84.1	91.4
Ulsan	37.2	40.1	43.7	47.9	52.1	56.6	61.2	66.7	72.7
Gyeonggi	47.6	50.5	54.5	58.6	62.7	67.6	71.9	76.8	81.9
Gangwon	95.2	100.4	107.2	114.5	121.5	128.9	135.8	145.9	155.8
Chungbuk	81.7	84.4	88.6	93.3	98.1	103.8	109.2	116.2	122.9
Chungnam	91.9	93.9	96.9	100.8	105.2	110.4	114.9	120	124.6
Jeonbuk	97	101.2	107.6	114	120.4	128.3	136.8	144.9	153
Jeonnam	123.4	128.4	134.5	141	147.6	154.2	160.6	168.8	176.7
Gyeongbuk	108.2	111.3	116.6	122.6	129.4	136.7	142.7	152.3	161.4
Gyeongnam	70.3	73.6	77.8	82.5	87.5	92.8	97.7	104.1	110.6
Jeju	64.8	68.8	73.2	77.4	80.9	84.6	88.1	91.6	94.4

7. GRDP (Gross Regional Domestic Product) per capita

(Unit: KRW thousand)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	31053	32407	33312	34105	35113	37236	39356	41374	43664
Busan	19223	19700	20554	21217	22467	23956	24815	25650	26464
Daegu	16379	17170	18078	18946	19725	20991	21602	22310	23151
Incheon	23234	23384	23770	24526	26068	27798	29120	30284	30194
Gwangju	18667	19093	19799	20789	21944	23139	24511	25240	26654
Daejeon	19950	20728	21347	21793	22497	24094	25606	26533	27214
Ulsan	55585	61755	62242	62653	60925	62605	64021	65370	63793
Gyeonggi	23972	24763	26007	27492	28638	30748	32336	35307	36821
Gangwon	21312	22088	22973	24094	25676	26946	28328	29925	30856
Chungbuk	26455	28050	29177	30507	31729	34728	37273	40590	43016
Chungnam	40962	43752	44071	45550	46360	48173	50264	53663	53006
Jeonbuk	21016	22136	22670	23876	24681	25621	26089	26988	27797
Jeonnam	34768	35553	36201	37264	36953	38339	39824	41076	42131
Gyeongbuk	33341	34408	35014	36533	38742	38510	40040	41130	40677
Gyeongnam	28026	29072	30124	30416	30555	32007	32758	32789	32993
Jeju	20366	22041	23525	24491	25968	28280	30284	31470	30721

8. Housing price increase rate

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	-1.12	0.69	-4.75	-1.41	1.13	4.60	2.14	3.64	6.22
Busan	10.59	15.91	-2.34	-0.24	1.14	3.43	3.18	2.35	-1.49
Daegu	1.54	9.00	4.93	8.85	6.28	7.96	-1.84	1.29	3.64
Incheon	-1.78	-1.57	-4.35	-0.85	1.46	3.37	0.79	1.42	0.68
Gwangju	1.86	15.77	2.93	0.85	1.45	5.83	0.35	1.34	3.88
Daejeon	7.67	12.34	-2.78	0.27	0.64	0.35	0.28	1.51	2.52
Ulsan	3.00	12.41	3.44	0.22	3.11	3.23	0.44	-1.08	-6.87
Gyeonggi	-2.51	1.58	-3.99	-0.97	1.74	4.47	0.84	1.67	1.86
Gangwon	1.86	12.81	2.49	0.14	0.34	2.21	1.33	2.40	-1.57
Chungbuk	5.21	13.60	2.96	1.41	2.37	1.13	-0.70	-0.36	-2.48
Chungnam	0.57	7.62	4.01	2.63	2.25	0.77	-1.51	-0.53	-1.83
Jeonbuk	6.72	11.76	-0.72	-1.06	-0.49	0.35	0.09	1.98	-0.01
Jeonnam	3.79	8.71	1.15	-1.17	-0.78	0.92	1.05	2.23	2.87
Gyeongbuk	-0.13	6.39	4.08	5.17	3.57	2.65	-1.66	-0.90	-1.89
Gyeongnam	10.63	20.35	-1.17	0.74	2.14	1.64	-0.58	-1.62	-4.80
Jeju	4.66	5.22	3.69	0.27	1.44	8.08	4.63	1.66	0.97

9. The fluctuation rate of consumer price

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	2.8	3.8	2.5	1.4	1.6	1.3	1.2	2.0	1.3
Busan	3.1	4.5	2.4	1.5	1.3	0.8	1.2	1.8	1.7
Daegu	2.8	4.1	2.4	1.7	1.4	0.7	1.0	2.0	1.7
Incheon	3.2	3.4	2.0	1.1	1.4	1.0	0.9	1.9	1.6
Gwangju	2.9	4.1	1.8	1.3	1.6	0.3	0.9	2.1	1.2
Daejeon	3.1	4.5	2.0	1.0	0.9	0.2	0.7	1.7	1.5
Ulsan	3.2	4.0	2.1	1.5	1.2	0.5	1.0	1.9	1.0
Gyeonggi	2.9	3.8	2.1	1.2	1.2	0.7	0.9	2.0	1.5
Gangwon	3.0	4.3	1.9	1.1	0.7	0.0	0.8	2.0	1.6
Chungbuk	2.9	4.4	2.0	1.3	1.2	-0.2	0.6	2.0	1.6
Chungnam	3.0	4.1	2.4	1.2	0.5	0.2	0.7	1.9	1.4
Jeonbuk	3.3	4.4	2.2	1.2	1.1	0.0	0.5	1.9	1.7
Jeonnam	3.3	4.5	2.0	1.4	1.0	0.0	0.9	2.1	1.5
Gyeongbuk	3.2	4.3	2.0	1.2	1.0	0.0	0.7	1.8	1.5
Gyeongnam	3.4	4.2	1.9	1.3	1.4	0.6	0.9	1.6	1.4
Jeju	3.4	4.3	1.2	1.4	1.1	0.6	1.3	2.3	1.7

10. Unemployment rate

(Unit: %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Seoul	4.7	4.5	4.2	3.9	4.4	4.2	4.2	4.5	4.8
Busan	3.6	3.6	3.9	3.8	3.8	4.1	3.9	4.6	4.1
Daegu	4.0	3.7	3.3	3.3	3.8	3.5	4.1	4.0	4.4
Incheon	5.0	4.7	4.5	4.1	4.7	5.0	4.9	4.6	4.3
Gwangju	3.5	3.1	2.7	2.8	2.8	2.9	3.1	2.9	3.8
Daejeon	3.7	3.6	3.7	3.0	3.4	3.4	3.2	3.4	4.2
Ulsan	3.5	2.7	2.6	2.1	2.7	2.9	3.8	3.5	4.6
Gyeonggi	4.0	3.4	3.3	3.0	3.3	3.9	3.9	3.9	3.8
Gangwon	2.6	2.2	2.5	2.3	3.1	3.2	2.8	2.6	2.9
Chungbuk	2.2	2.4	2.0	2.0	3.0	2.6	2.6	2.2	2.4
Chungnam	3.0	2.4	2.3	2.8	3.3	3.5	3.2	2.8	3.1
Jeonbuk	2.2	2.3	2.0	2.0	2.5	1.7	2.1	2.5	2.7
Jeonnam	2.1	2.0	1.6	2.1	2.9	2.5	3.0	3.2	2.8
Gyeongbuk	2.8	2.6	2.5	3.1	2.9	3.0	3.2	2.8	4.1
Gyeongnam	2.8	2.2	1.8	2.1	2.5	2.6	3.3	2.9	3.0
Jeju	1.8	1.7	1.5	1.8	2.0	1.9	2.2	1.9	2.0