Effects of Institutional and Political Factors on Fiscal Decentralization*
- The implications on corruption -
정치·제도적 요인이 재정분권에 미치는 영향
- 부패에 대한 함의 -

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국문초록

　본 연구는 1995~2017년 기간 동안 OECD 36개 국가의 자료를 활용하여 재정분권 결정요인을 분석하였다. 지금까지 재정분권 결정요인에 대한 연구는 주로 인구, 1인당 GDP, 도시화 등 사회 경제적 요인을 중심으로 이루어져왔다. 본 연구는 기존 연구에서 나아가 OECD 36개국을 분석 대상으로 하여, 1995년부터 2017년까지를 분석기간으로 하여 패널자료를 구성해 재정분권 결정 요인을 정치·제도적 요인을 중심으로 분석하고, 나아가 부패가 재정분권의 주요 결정요인임을 확인하였다.

　본 연구는 재정분권에 영향을 미치는 요인을 대통령제, 지방정부 형태, 민주주의 수준, 부패 수준 등 정치·제도적 요인으로 구분하였다. 그리고 1인당 GDP, 인구밀도, 국토면적, 도시화 등 을 통제변수로 통제하였다. 분석결과, 정책 결정권자의 정치적 성향을 제외한 대부분의 변수들 이 재정분권의 결정요인으로 작용하고 있음을 확인할 수 있었다.

　첫째, 대통령제 국가보다는 의원내각제 국가일수록 세입분권 수준이 높았으며, 대통령제 국가 보다는 군주제 국가일수록 세출분권 수준이 높은 것으로 나타났다.

　둘째, 재정분권과 부패에 대해서는 일관된 연구결과가 존재하지 않지만, 본 연구에서는 세입 분권과 세출분권은 부패 감소에 긍정적인 영향을 미치는 것으로 나타나, Fisman & Gatti (2002), Arikan(2004)의 연구결과를 지지하는 것으로 나타났다.

　본 연구는 재정분권이 경제적 요인 뿐만 아니라 대통령제, 지방정부형태, 부패 수준 등에 의 해 결정된다는 것을 확인하였다. 무엇보다 부패 감소와 민주주의 수준 향상을 통해 지방정부가 중앙정부로부터 재정에 관한 의사결정권을 확보할 수 있음을 확인하였다는 점에서 그 의의가 있다.

주제어: 재정분권, 재정연방주의, 정부형태, 부패, 민주주의 수준

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Ⅰ. Introduction

During the last three decades, fiscal decentralization has become a sustained policy tendency of governments (Dabla-Norris, 2006; Martinez-Vazquez et al., 2017; Victor et al., 2018). As a result, local governments have become major actors in mobilizing revenues and providing/distributing public goods and services to citizens all over the world.

What factors determine fiscal decentralization then? According to previous literature, fiscal decentralization is determined by various factors. Existing literature on determinants of fiscal decentralization can be divided into three main flows. The first flow of studies focused on how economic factors (such as GDP per capita, unemployment rate, economic openness, inflation rate, local government debt rate, and general government debt rate) affected fiscal decentralization. Bodman et al. (2009) and Maličká and Martinková (2018) have found that population density is associated with fiscal decentralization. Bodman et al. (2009), Canavire-Bacarreza and Martinez-Vazque (2012), Maličká and Martinková (2018), and Panizza (1999) have investigated GDP per capita. Stegarescu (2004) and Maličká and Martinková (2018) have shown that fiscal decentralization is related to unemployment rate.

However, Bodman et al. (2009), Maličká and Martinková (2018), and Stegarescu (2004) have found that economic openness is associated with fiscal decentralization. Bodman et al. (2009), Panizza (1999), and Maličká and Martinková (2018) have shown that fiscal decentralization is related to land area. Authors of a number of empirical studies have examined the relationship between inflation rate and fiscal decentralization (Maličká and Martinková, 2018; Siničáková et al., 2017; Siničáková and Gavuravá, 2017). Bodman et al. (2009), Jílek (2015), and Stegarescu (2004) have found that local government debt rate is associated with fiscal decentralization. Maličká and Martinková (2018) have reported fiscal decentralization is related to general government debt rate.

The second research flow of studies focused on political factors affecting fiscal decentralization. Afonso and Hauptmeier (2009), Arzaghi and Henderson (2005), Bodman et al. (2009), Jametti and Joanis (2016), and Panizza (1999) have shown that fiscal decentralization is related to elections. Canavire-Bacarreza and Martinez-Vazquez (2012) have presented that being allied on the political right is negatively correlated with fiscal decentralization. The third flow of studies were focused on environmental

factors such as level of democracy (Aristovnik, 2012; Panizza, 1999), ethnic fragmentation (Bodman et al., 2009; Canavire-Bacarreza and Martinez-Vazquez, 2012), and corruption index (Canavire-Bacarreza and Martinez-Vazquez, 2012) associated with fiscal decentralization.

Although there is a large and growing body of literature on determinants of fiscal decentralization, there is no theoretical consensus on factors that can explain its extent. Countries have different institutional arrangements. As stated by Buchanan and Tullock (1962), budgets are "politics by exchanges". Thus, it is necessary to take different political factors of different countries into account. Our work can be seen as an extension of the work of Afonso and Hauptmeier (2009) and Jametti and Joanis (2016), although our work differs from those authors in the following respects. First, in previous studies, the authors who studied political factors affecting fiscal decentralization limited factors they studied to elections and the left wing. In contrast, we not only included electoral variables, but also considered government system, local government system, and political inclination of decision makers as decisive factors for fiscal decentralization. Second, existing researches used ordinary least squares (OLS) and fixed- and random-effects models for empirical analysis. However, time-series cross-sectional data are characterized by deriving from repeated observations over time on individual units such as states or nations (Bailey and Katz, 2011). Thus, for this research, we used a panel-corrected standard error (PCSE) estimator for empirical analysis. PCSEs account for deviations from spherical errors and allow for better inference from linear models estimated from time-series cross-sectional data. In fact, Beck and Katz (1995) have suggested linear models for estimating such data by OLS. They proposed a sandwich-type estimator of covariance matrix of estimated parameters. They called it PCSE. It is robust to determine the possibility of non-spherical errors (Bailey and Katz, 2011). Based on Victor et al. (2018), we organized data by dividing fiscal decentralization of Organisation for Economic Co-operation and Development (OECD) countries into revenue and expenditure decentralization aspects. We then divided fiscal decentralization into three types to analyze Government Finance Statistics of the International Monetary Fund (IMF) and the OECD Fiscal Decentralization Database.

The aim of this paper was to empirically investigate determinants of fiscal decentralization with panel data for 36 OECD countries over the period of 1995-2017. This paper proceeds as follows. In Section 2, we reviewed empirical literature on fiscal

decentralization determinants more thoroughly. In Section 3, we described how we operationalized fiscal decentralization and discussed variables. In Section 4, we provided results of empirical analysis. In Section 5, we concluded this study.

Ⅱ. Theoretical Preliminaries

2.1. Fiscal decentralization

Fiscal decentralization is based on efficient allocation of resources. In this regard, Musgrave (1959) has explained that finance has three functions: income distribution, economic stability, and resource allocation. Among these, he suggested that central governments should be in charge of income distribution and economic stability and that local governments should oversee resource allocation by reflecting preferences of local residents. A representative theory related to governments' efficient resource allocation function is based on the traditional fiscal federalism of Tiebout (1956) and Oates (1972). According to the Tiebout (1956) model, when residents are free to move and local governments mainly provide public goods, residents can express their policy priorities by moving their places of residence. Therefore, local governments can reflect residents' preferences on the supply of public goods. Based on this "voting with one's feet," local governments can more efficiently supply public goods to their residents. Local governments can provide public goods more efficiently than central governments. Thus, resources are allocated more efficiently, thus improving social welfare (Tiebout, 1956).

Oates (1972) has suggested that a decentralized government can achieve efficient resource allocation and contribute to increasing social welfare, building on Tiebout's (1956) theory to develop the decentralization theorem. According to the theorem, if the central government and the local government have the same cost to supply local residents with a certain level of public goods, social welfare improves when local governments provide public goods based on local residents' preferences (Oates, 1972). In other words, Oates (1972), as did Musgrave (1959), presented a traditional inter-governmental financial relationship in which the central government would oversee fiscal income distribution and economic stability functions while the local

government would be responsible for resource allocation.

Based on Oates's (1972) decentralization theorem, Bird (1993) has explained that public goods are more efficient when they are supplied in a decentralized way as long as differences exist in preferences and supply costs of public goods between regions. Local governments also need to secure independent revenue sources for efficient supply of public goods. Fiscal decentralization thus entails transferring authority to local governments to raise independent funds, efficiently supply public services, and make resource allocation decisions that reflect residents' preferences.

2.2. Literature Review

2.2.1. Fiscal decentralization measures

Fiscal decentralization can be largely divided into revenue versus expenditure decentralization (Oates, 1985). As shown in Table 1, in previous studies, the level of revenue decentralization was measured as the proportion of local government revenue to total government revenue and the percentage of local government expenditure to total expenditure. However, to measure fiscal decentralization more substantially to reflect the autonomy of local governments (Kim, 2018), authors have included transfer funds on revenue decentralization lists or excluded grants from appropriation rights (Bird and Vaillancourt, 1999; Akai and Sakata, 2005). For the present study, we maintained the division of fiscal decentralization into revenue and expenditure decentralization and analyzed it based on OECD fiscal decentralization indicator.

Table 1. List of literature on fiscal decentralization measures

Author (year)	fiscal decentralization measures
Oates (1985) Wasylenko (1987) Davoodi and Zou (1998)	- Revenue decentralization: Ratio of local government revenue to total government revenue - Expenditure decentralization: Ratio of local government expenditure to total expenditures
Prud'homme (1995) Marlow (1988)	- National and local tax rates - Ratio of central government expenditure to local government expenditure - Ratio of grants from central government to local governments' own revenues

Dziobek et al. (2011) Fiva (2005) Bird and Vaillancourt (1999) Akai and Sakata (2002)	- Revenue decentralization: Proportion of local governments' own revenues from local-central government grants - Expenditure decentralization: Proportion of local government expenditure (local government expenditure-conditional grants) in total government expenditure in each region

2.2.2. Determinants of fiscal decentralization

The authors of most of preceding studies have used fiscal decentralization as an independent variable while rarely presenting empirical analyses with fiscal decentralization as a dependent variable or exploring its determinants. When fiscal decentralization was proposed as a dependent variable in previous studies, it was measured at the level of either fiscal decentralization or centralization as shown in Table 2. Most determinants were economic or environmental factors, political and institutional factors were rare.

Table 2. Literature review on determinants of fiscal decentralization

Author (year)	Unit	Period	Estimator	Dependent variable	Independent variable	Result	
						Expenditure	Revenue
Panizza (1999)		1975, 1980, 1985	OLS Panel regression	Centralization level of revenue and expenditure	Total land area	-	
					Ethnic fractionalization	-	
					Level of democracy	-	
					GDP per capita	-	
Arzaghi and Henderson (2005)	46 countries	1975, 1985, 1995	OLS Panel regression	Decentralization level of revenue and expenditure	GDP per capita(ln)	+	
					Population size	-	
					Urban population size	+	
					Total land area	-	
Bodman et al. (2009)	53 countries	1960-2003	OLS Panel regression	Decentralization level of revenue and expenditure	GDP per capita	+	+
					GDP per capita	+	+
					Total land area	+	+
					Population size	-	-
					Rate of population	-	-
					Population density	-	-
					Rate of urban population	-	-
					Grant rate	-	-
					Military spending % of GDP	+	-
Canavire-Bacarreza And Martinez-Vazquez (2012)	91 countries	1960-2007	OLS Panel regression	Decentralization level of revenue and expenditure	Ethnic fractionalization	+	+
					Infant mortality	-	-
					Corruption	-	-
					Political right	-	+
					Ethnic fractionalization	-	-
					Distance to Ports	-	+
					Area	+	+
					Geographic fragmentation	+	+

Jametti and Joanis (2016)	107 countries	1990-2006	Fixed-effect panel regression	Centralization level of revenue and expenditure	Government seat share	-	-
					Government HHI*	-	-
					Opposition HHI	-	-
					Left-wing	-	-
					Election year	-	-
					GDP per capita	+	+
					GDP per capita(OECD only)	-	-
Malička and Martinková (2018)	29 EU countries	1995-2015	Fixed-effect & random-effect panel regression	Decentralization level of revenue and expenditure	Openness GDP Public Debt ratio of GDP Growth of GDP per capita Local Debt ratio of GDP	Results that differ for each cluster at a statistically significant level	

* Herfindahl-Hirschman Index

Previous studies on determinants of fiscal decentralization used panels with time gaps of five or ten years. However, researchers in the last decade have conducted their analyses by building long-term panels for most countries and presented independent variables in a wide variety of ways. According to Panizza (1999), land area and level of ethnic fractionalization have negative impacts on the centralization of tax revenues and total revenues. In other words, it can be understood that gross land area and ethnic fractionalization have positive effects on fiscal decentralization. Arzaghi and Henderson (2005) have demonstrated impacts of per capita GDP, population size, urban size, and land area on level of fiscal decentralization. Through empirical analysis, they found that higher per capita GDP and larger the urban population would lead to higher level of fiscal decentralization. In contrast, population size and land area had negative impacts on fiscal decentralization. That is, the level of fiscal decentralization is lower when population size and land area are larger.

Bodman et al. (2009) have performed an empirical analysis to determine factors of expenditure, revenue, and tax decentralization in 53 countries for 43 years. The authors showed that per capita GDP, ethnic fractionalization, and population size had positive impacts on both revenue and expenditure decentralization levels. In addition, population growth rate, population density, urban population growth, and military spending against GDP showed negative effects on revenue decentralization while ethnic fractionalization had a positive influence on revenue decentralization. Canavire-Bacarreza and Martinez-Vazquez (2012) have conducted an empirical analysis of 91 countries over a 47-year period. Their analysis confirmed that per capita GDP, ethnic fractionalization, and geographic fragmentation had positive effects on both expenditure and revenue decentralization. Corruption, political authority, and distance from the port had different influences on expenditure and revenue decentralization, whereas infant mortality or

national division indices had no statistically significant influence. Jametti and Joanis (2016) have analyzed factors determining the centralization level in 107 countries over a period of 26 years (1990 to 2006), focusing on political factors, unlike previous researchers. They showed that the higher the central government's share of seats, the higher the level of fiscal decentralization. They also found a negative impact of per capita GDP on fiscal decentralization.

In a recent study, Maličká and Martinková (2018) have investigated factors such as appropriateness, revenue decentralization, expenditure decentralization, and subsidies that can determine the overall level of fiscal decentralization by dividing 29 EU countries into three clusters according to their national characteristics. The authors conducted an analysis on a 10-year period from 1995 to 2015 and presented fiscal decentralization determinants around economic variables. Their analysis resulted in different cluster-specific results at statistically significant levels.

Ⅲ. Empirical Specification and Data

In this section, we reviewed empirical methodology and data. We constructed an unbalanced panel of 36 OECD countries over the period 1995 to 2017. To test our hypothesis, we have the following equation:

$$\text{Fiscal Decentralization}_{it} = \alpha + \beta_1 PIF_{it\text{-}1} + \beta_2 EF_i + \beta_3 SEF_{it\text{-}1} + \varepsilon_{it} \qquad (1)$$

where i refers to countries, t refers to years, α is a constant, SEF is economic factor variable, PF is political factor variable, EF is environmental factor variable, and εit is the error term.

Our institutional and political variables were central and local government systems, elections, democracy Index, the political tendencies of the person in power, and the political tendencies of the ruling party. Economic variables were general government debt rate and GDP per capita. Socio-environmental variables were the corruption perceptions index, and the national competitiveness index, population density, land area, social expenditure.

3.1. Econometric procedure

Limitations of OLS estimation are well-known. For example, OLS is often biased. In addition, its results can be inconsistent. In general, when regression analysis is performed using panel data, there is a high probability of heteroscedasticity and autocorrelation. Wooldridge (2010) has suggested that when series exhibit heteroscedasticity, FGLS is a more efficient estimator than OLS. Thus, we conducted some statistical analyses such as Hausman test, F-test, and Woodbridge test. Results from these tests showed that the panel data used in this study should take the problem of fixed effects into account. Due to problems of fixed effects, variability, and auto-correlation of the panel data in this study, this study used FGLS (Feasible Generalised Least Squares) or PCSEs (Panel Corrected Standard Errors) estimates.

Another methodological issue is probability of reverse causality. In countries with higher GDP per capita, government debt, and democracy indicators, there could be pressure toward either decentralization or centralization. Conversely, fiscal decentralization can lead to higher GDP per capita, government debt, and so on. To address the probability of reverse causality, we took two approaches. First, we applied lagged values of our explanatory variables. Second, we used panel-corrected standard errors (PCSEs). Beck and Katz (1995) have suggested the use of PCSE estimator because it is robust to the possibility of non-spherical errors. For this reason, we employed PCSE estimators.

3.2. Measuring key variables

3.2.1. Dependent variables

Authors of most domestic and external studies that measure fiscal decentralization indicators have used revenue and expenditure figures which are easy to quantify as indicators of fiscal decentralization. This is because governments' revenues and expenditures reflect leaders' value judgments regarding policy and financial resource allocation (Oates, 1972). Indicators of fiscal decentralization should be measured based on quantitative figures to provide a clear picture of financial relationships between central and local governments, such as the distribution of financial authority between

the two as well as the level of autonomy in local governments' fiscal operations. Accordingly, most researchers have used indicators of revenue and expenditure decentralization as surrogates for quantitative measurement of fiscal decentralization.

In this study, we divided fiscal decentralization into revenue and expenditure decentralization and measured them as follows: 1) revenue decentralization was divided into two categories: proportion of total revenues from local governments in the country and proportion of local taxes to total revenues from local governments; 2) for expenditure decentralization, we measured the ratio of total expenditure by local governments to total expenditure by national governments.

Given that governments' finances include not only revenue, but also financial resources through debt, it is possible to point out that if only revenue is measured, revenue decentralization could be underestimated. However, it is very difficult to consider debt because transactions in debt relationships are not limited to a single year. For this reason, most researchers have measured revenue decentralization on a revenue-only basis.

In addition, local government spending includes conditional grants such as government subsidies. Conditional grants should be excluded from indicators of fiscal decentralization given that local governments do not have the authority or autonomy to make decisions related to expenditure. Thus, many researchers have excluded conditional grants from local government revenues when measuring expenditure decentralization. The problem is that financial data of international organizations such as the OECD and the IMF have a limitation in that subsidies from central governments are not systematically collected or reported. In particular, even if data related to subsidies are being collected, it is unclear whether characteristics of subsidies are unconditional or conditional. Despite the need for them, cross-countries studies that measure the level of fiscal decentralization often do not include grants in measures of expenditure decentralization. In consideration of this, we selected two types of simple indicators (revenue and expenditure decentralization) for this study from various financial decentralization indicators presented in previous studies, despite the existence of some limitations.

$$DREV\_1 = SREV \ / \ GREV, \tag{2}$$

where SREV is total subnational revenues and GREV is the general government revenue.

$$DREV\_2 = STAX / SREV, \tag{3}$$

where STAX is total subnational tax revenues.

$$DEXP = SEXP / GEXP, \tag{4}$$

where SEXP is total subnational expenditures and GEXP is total general government expenditure.

3.2.2. Independent variables: Institutional and political factors

Independent variables of this study were institutional and political factors of each state, such as government system and democracy level. Each variable was determined based on existing studies. First, we selected systems of central and local government as institutional factors by country. We chose these factors considering governments' levels and allocations of policy-making authority and, by extension, the main variable for determining government-to-government relations. We collected government systems data from OECD and IMF data.

Then we selected election status, the political tendency of policymakers and the majority of parliament, and democracy level as political factors. We collected election status and the political orientations of decision-makers and the majority of parliaments individually through the National Election Commission or Election Information websites of each country. Authors of many prior studies have measured the level of democracy system with Democracy Index first introduced in 2006. Prior to this index, no previous indicators had existed. Accordingly, we measured levels of democracy in this study by country using combined political rights and civil rights scores on freedom index issued by Freedom House. The freedom index follows a seven-point scale, ranging from 1 (very free) to 7 (very unfree).

3.2.3. Independent Variables

Previous authors have suggested that democracy and corruption are major political determinants of fiscal decentralization (Canavire-Bacarreza and Martinez-Vazquez, 2012), given that institutional variables play an important role in national and policy design (Martinez-Vazquez and Timofeev, 2009). Only a few authors have studied the

type of central or local government as the main variable in relation to institutional determinants of fiscal decentralization.

Most of previous studies have discussed political variables that affect fiscal policy in terms of political economy. However, in the process, institutional variables are almost eliminated or presented as part of political variables. Some previous authors have considered the ruling party, the majority party, coalition, the minority party, federalism, and bureaucracy (Maldonado, 2013) as dependent variables that affect fiscal policy. In addition, some investigators have analyzed effects of electoral law or type of government on fiscal policy (Blume et al., 2009). More recently, variables such as the likelihood of reelection, distribution of political parties, and government credibility have been suggested. In this regard, some authors have argued the need to present in more detail political and institutional variables such as presidential discretionary power (Ardanaz and Scartascini, 2014). In Korea, most discussions on the direction of local fiscal decentralization which can check the power of the president are based on imperial presidency. With this in mind, for this study, we distinguished institutional variables (such as national and local government system not previously presented) and political variables (such as democratic levels). We looked effects of these political system variables on fiscal division more closely.

The relationship between fiscal decentralization and economic growth is based on the traditional theory of fiscal federalism. The traditional fiscal decentralization theory suggests that decentralization will not only reduce costs and achieve efficiency in government supply of public goods, but also increase social welfare which will have a positive impact on economic growth (Bird, 1993; Oates, 1999; Martinez-Vazquez and McNab, 2003; Baldwin and Krugman, 2004). On the other hand, according to theories of second-generation fiscal federalism, fiscal decentralization is inevitably accompanied by government inefficiency, resulting in problems such as macroeconomic instability and widening income gaps between regions (Prud'homme, 1995; Tanzi, 2001). Empirical studies of the relationship between fiscal decentralization and economic factors are mostly based on these theories. These studies have analyzed levels of fiscal division, correlations between economic factors, or effects of fiscal decentralization on economic factors. Most studies have been longitudinal in the form of comparative analyses between local governments within a single country or among various countries. Their results have varied widely depending on the research model, variables for analysis, target period, researchers, research method, and measurement variables even when the

unit of analysis is the same country. The reason these study findings differ so broadly regarding the relationship between fiscal decentralization and economic growth is that there is no clear consensus on appropriate measurement methods. Therefore, researchers used different approaches and methods (Rodríguez-Pose and Ezcurra, 2010).

As a result, some researchers have argued for a positive relationship between fiscal decentralization and economic growth (Lin and Liu, 2000; Akai and Sakata, 2002; Stansel, 2005; Yilmaz, 1999; Thiessen, 2003; Iimi, 2005; Bodman et al., 2009; Jametti and Joanis, 2016), whereas others have reported no statistically significant relationship between the two or a negative relationship (Zhang and Zou, 1998; Baskaran, 2010; Neyapti, 2010; Rodriguez-Pose and Ezcurra, 2010).

Most of preceding studies have focused on impacts of economic factors on fiscal decentralization. However, political factors (such as government efficiency and corruption levels) and social/environmental factors (such as population size, area, and urbanization levels) have recently been used as major variables affecting fiscal decentralization.

The equal cost of supply between central and local proposed in Oates' (1972) decentralization theorem indicates increased efficiency in resource allocation from the demand side (Choi, 2015). However, to identify the relationship between fiscal decentralization and economic growth, there might be a variety of potential parameters such as macroeconomic instability. As a result, findings on effects of fiscal decentralization on economic growth are presented differently depending on the unit of analysis of research, how indicators are measured and analyzed, and the period analyzed. Given this, it is also necessary to analyze the relationship between fiscal decentralization and overall economic efficiency considering government's efficiency in terms of suppliers. Accordingly, the variable that is actively used to influence fiscal decentralization in recent years is government efficiency or government effectiveness. Government efficiency has been measured using various indicators including corruption level, national competitiveness, per capita income, aging level, female economic participation rate, proportion of social welfare expenditure, and fertility rate while taking economic, social, and political factors into account (Barro, 1991; Ricciuti, 2002; Kyriacou and Roca-Sagalés, 2011).

Fiscal decentralization gives greater autonomy and authority to individuals and local governments in terms of participating in policies, thereby reducing transaction costs by

interacting with greater mutual trust. As a result, a theory has been suggested that government accountability and transparency in policy decisions can also be improved through fiscal decentralization (Putnam, 1993; Ebel and Yilmaz, 2002).

Based on this theory, many prior researchers have conducted empirical analyses about impacts of fiscal decentralization on governments' fiscal responsibility and transparency using Government Corruption Index or Integrity Index. Most of previous studies have shown a negative relationship between fiscal decentralization and level of government corruption (Fan et al., 2009; Lessmann and Markwardt, 2010; Albornoz and Cabrales, 2013; Oto-Peralías et al., 2013), although a few researchers have found a positive relationship between the two (Arikan, 2004; Gurgur and Shah, 2000; Fisman and Gatti, 2002, Treisman, 2002; Jametti and Joanis, 2016).

3.2.4. Control Variable

Control variables of this study were economic, and socio-environmental factors that could affect fiscal decentralization. We determined each variable based on previous studies. First, we presented per capita GDP (the level of economic growth and macroeconomic stability) and general government debt-to-equity ratio as economic factors that could affect fiscal decentralization. We collected debt-to-GDP ratio from IMF data and GDP per capita from the OECD.

Second, we gathered corruption indices from Transparency International to measure government efficiency and social trust level according to prior research. For this index, the more the perceived corruption, the lower the rank. In addition, indicators of government efficiency and national competitiveness were ranked according to the World Economic Forum's World Competitiveness Report ranking.

Regarding other environmental variables that we used as control variables, we chose them based on previous research (Panizza, 1999; Arzagi and Henderson, 2005; Bodman et al., 2009; Jilek, 2015). We collected data on land size, excluding all rivers, streams, and seas including exclusive economic zones through the World Bank database, with population density being the total population density relative to the area of the country and urbanization level being the ratio of urban population to the total population. We limited social welfare expenditure to public expenditure ratio as a percentage of social welfare expenditure provided by the IMF's Government Finance Statistics. Definitions and sources of all variables used in this study are shown in Table 3.

Table 3. Definition and source of variables

Variables		Description	Source
Dependent Variables	DREV_1	SREV/GERV	IMF Government Finance Statistics
	DREV_2	STAX/SREV	IMF Government Finance Statistics
	DEXP	SEXP/GEXP	IMF Government Finance Statistics

Independent Variables	Gov	Government system
		  − Presidential = 1
		  − Parliamentary cabinet/presidential = 2
		  − Parliamentary cabinet/constitutional monarchy = 3
			OECD Government at a glance

	Local gov	Local government system
		  − State government only = 1
		  − Local government only = 2
		  − Local government & state government = 3
			IMF Fiscal Decentralization Database

	Dem	Utilize the combined values of the political right rating + civil libraries rating: the lower the rating, the higher the level of democracy	Freedom House

	Political power	Political tendency of the person in power (president, prime minister etc.)
		  − Conservative=1
		  − Moderate=2
		  − Progressive=3
			National Election Commission and Election Information Homepage

	Upper house Lower house	Political tendency of the party(Upper house/Lower house)
		  − Conservative=1
		  − Moderate=2
		  − Progressive=3
			National Election Commission and Election Information Homepage

	Elec	Presidential and general election year	National Election Commission and Election Information Homepage
	CPI	Corruption Perceptions Index Rank	Transparency International
Control Variables	Debt	Debt ratio of general government (% of GDP)	IMF Global Debt Database
	GDP per capita	GDP per capita (PPP, $)	OECD stats
	Comp	National competitiveness index World Competitiveness Report Ranks	World Economic Forum
	Area	The area of the land excluding rivers, streams, and seas and including exclusive economic zones	World Bank Database
	Popul	Total population density relative to land area	World Bank Database
	Urban	Level of urbanization Ratio of urban population to total population	World Bank Database
	Social	Social welfare expenditure ratio Total social expenditures (public only)	IMF Government Finance Statistics

3.3. Hypothesis

Table 4 presents our research hypotheses. Hypotheses 1~4 are assumptions about relationships between political/institutional factors and fiscal decentralization. Hypotheses 5 and 6 are assumptions about economic variables. Hypotheses 7 to 13 are related to socio-environmental variables.

Table 4. Hypotheses of this study

Hypothesis 1	Parliamentary government has a positive (+) effect on fiscal decentralization.
Hypothesis 2	Federal subnational government has a + effect on fiscal decentralization.
Hypothesis 3	Democracy degree has a + effect on fiscal decentralization.
Hypothesis 4	Progressive political power has a + effect on fiscal decentralization.
Hypothesis 5	Government debt has a negative - effect on fiscal decentralization.
Hypothesis 6	GDP per capita has a + effect on fiscal decentralization.
Hypothesis 7	Elections have a + effect on fiscal decentralization.
Hypothesis 8	Corruption has a + or - effect on fiscal decentralization.
Hypothesis 9	National competitiveness has a + effect on fiscal decentralization.
Hypothesis 10	Land area has a + effect on fiscal decentralization.
Hypothesis 11	Population density has a - effect on fiscal decentralization.
Hypothesis 12	Urbanization has a - effect on fiscal decentralization.
Hypothesis 13	Social expenditure has a + effect on fiscal decentralization.

Ⅳ. Results

4.1. Basic estimations

Results of the technical-statistical analysis of explanatory variables to identify determinants of fiscal decentralization are shown in Table 5. Dependent variables were divided into revenue or expenditure decentralization as follows: local government revenues (DREV_1), local government tax revenues (DREV_2), and total local government expenditures (DEXP). The gap between the minimum and maximum values for both revenue and expenditure decentralization was widening as shown by

differences in levels of fiscal decentralization among OECD countries. Fig. 1 presents scatter plots of revenue fiscal decentralization. Fig. 2 shows plots of expenditure fiscal decentralization.

Table 5. Summary statistics

| Variables		No. of Obs.	Mean	Standard Deviation	Minimum	Maximum
DREV_1_		762	24.71575	12.81762	2.210903	66.09949
DREV_2_		779	36.42903	17.98409	2.85868	79.21335
DEXP		764	23.84939	12.8649	5.71640	66.34852
Gov						
	2	828	0.527778	0.49953	0	1
	3	828	0.361111	0.480613	0	1
Local gov						
	2	828	0.75	0.433274	0	1
	3	828	0.222222	0.415991	0	1
Dem		828	2.626812	1.227302	2	11
Political power						
	2	828	0.146135	0.353455	0	1
	3	828	0.34058	0.474191	0	1
Upper house						
	2	828	0.109903	0.312958	0	1
	3	828	0.326087	0.469063	0	1
Lower house						
	2	828	0.123188	0.328852	0	1
	3	828	0.346618	0.476181	0	1
Elec		828	0.254831	0.43603	0	1
Debt		791	57.86295	38.68374	3.663581	237.6471
GDP per capita		828	30570.83	14840.4	5508.3	107525.2
Area		828	957659.8	2352770	2430	9161920
Popu		828	132.3811	129.7714	2.35242	527.918
Urban		828	75.88066	11.17382	50.622	97.961
Social		812	19.16404	5.913897	3.07	32.213
CPI		803	25.73474	20.7489	1	135
Comp		585	27.96068	22.0649	1	119
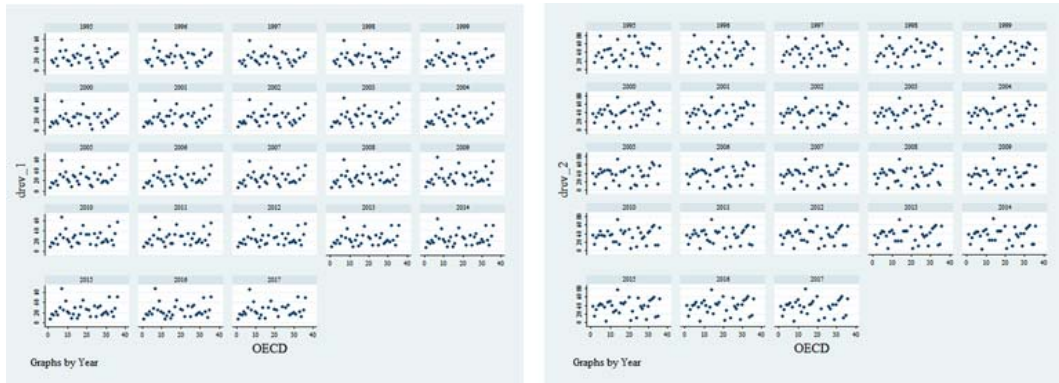
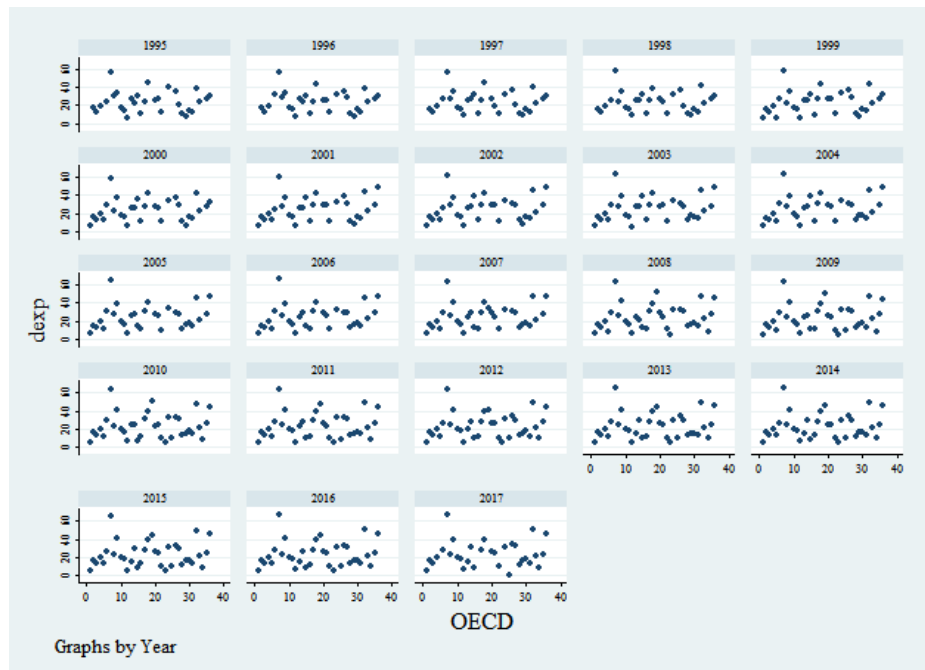Fig. 1. Revenue decentralization in OECD countries.

Fig. 2. Expenditure decentralization in OECD countries.

We divided descriptive variables into institutional, political, economic and socio-environmental.

As institutional factors, the systems of central and local governments scored averages of 2.25 and 2.19, respectively, confirming that most OECD countries adopted the parliamentary cabinet system. The political orientation of the majority in the House of Representatives and the decision-maker all have an average of 1 or 2 points,

indicating that they were at least moderately conservative. The democracy level of each OECD country had wide gaps among OECD countries. Democracy showed a minimum of 2 points, corresponding to the level at which democracy was most democratic and freedom was guaranteed, while the highest score was 11 points for both political authority and civil liberties.

We found that government debt and per capita GDP of economic factors had large standard deviations and wide gaps between the minimum and the maximum values. We also confirmed that the economic status of each country showed significant deviation.

Among socio-environmental factors, the level of government corruption and national competitiveness had wide gaps between countries, just as with economic factors. The government corruption index ranked first in terms of minimum value and 135th in maximum value, showing a wide gap between national ranks. However, the average was 25.7, which was considered good except for some countries where the corruption index was high. Finally, on the National Competitiveness Index, countries with the minimum and maximum values were ranked at No. 1 and No. 119, confirming differences in government efficiency among OECD countries, just as with other variables.

4.2. PCSE estimations

For this research, we conducted the likelihood ratio test and the Wooldridge test to examine heteroscedasticity and autocorrelation. Findings are presented in Table 6.

Table 6. PCSE estimations

Variable	Model 1			Model 2		
	Revenue		Expenditure	Revenue		Expenditure
	Drev_1	Drev_2	DEXP	Drev_1	Drev_2	DEXP
IV						
Gov						
2	7.67856***	-15.00538	-3.095481	10.39369***	24.07119***	1.530292
3	15.15393***	-10.3363	4.566639**	8.326087***	14.58346***	8.449016***
Local gov						
2	-27.19731***	-3.402963	-14.28253***	-51.7124***	-32.51024***	-35.19815***
3	-41.07787***	-4.882426	-29.71882***	-56.25998***	-35.64892***	-47.31548***
Dem	-1.214715***	-.0711687	-1.494762***	-.6047242**	-.9256537	-.4566382

Political power						
2	-.0362732	2.030732**	-.1551995	-.1244648	.4150161	-.3912605
3	-.2345939	.5434605	-.1251179	-.2282836	.2251884	-.0948458
Upper house						
2	1.065216	-.4642198	-.0780319	.3994763	-.1186876.	.0811334
3	.3959861	.3316665	.1774586	.1216964	.1491734	-.3535301
Lower house						
2	-.3991213	-.6693759	-.3151181	-.0728207	-1.308664	-.8493058
3	.0168062	.2570539	.2991646	-.5631473	.3822167	.0264865
Elec	-.1916519	.6517719	-0.0969828	.0638853	.3865487	0.3099382
CPI				-.0298496	-.0613772	-0.0549361***
CV						
GDP per capita				-.0001581***	-.0001326***	.0000969**
Debt				.0086903	.0892319***	-.0158531
Area				-1.73e-06***	-1.01e-06**	-1.61e-06***
Popul				.0064914	-.0746955***	.0015602
Urban				.2775404***	1.03169***	.2426947***
Social				.3084011***	-.2764487**	-.0038576
Comp				-.0399645***	-.0352374	-.0864732
R²				0.9002	0.9214	0.8884
No. of observations				535	538	552
No. of countries				34	34	35

*p<0.1, **p<0.05, ***p<0.01.

4.2.1. Institutional and political determinants of fiscal decentralization

Examining the effects of institutional factors on fiscal decentralization revealed that most variables acted as determinants of fiscal decentralization. First, all kinds of the level of fiscal decentralization were the highest for member states where the president existed as a representative of the state with the parliament system. The levels of revenue decentralization (Drev_1, Drev_2) were also higher in countries that combined a constitutional monarchy with a parliamentary cabinet where the parliamentary cabinet system was central, although expenditure decentralization (DEXP) was not influenced.

In terms of types of local governments, the more complicated government system and lower government level are associated with a lower level of fiscal decentralization. All fiscal decentralization levels were higher in local governments under the

dichotomized system of central and local governments than those under federalism in which state and local governments coexisted. Furthermore, the level of fiscal decentralization of countries with the only state government was higher than that of countries with local government solely.

This can be explained by the theory of fiscal decentralization: 1) The central government is in charge of income distribution and economic stability of macroeconomics, and 2) local governments are the most efficient when they are in charge of allocating resources through the provision of public services. That is, the level of fiscal decentralization appears to be higher when central and local governments are clearly divided and specialized. Furthermore, the closer the form of local government, the lower the level of fiscal decentralization compared to central or state government. This can be understood that the level of revenue of local governments is lower than that of higher government due to the size of government and the tax system. In terms of allocation of resources, expenditure decentralization was significantly influenced by government system. Thus, local government affairs are still closely linked to central policy.

This is also why a dichotomous government structure (president and Congress lead executive and legislative branches, respectively) appeared to be more favorable to fiscal decentralization. In terms of revenue decentralization, it can be considered that the fiscal autonomy of local government is guaranteed when central and local resources are clearly separated.

Unlike most institutional factors affecting fiscal decentralization, political factors do not affect fiscal decentralization except the democracy level. Neither political decision-maker nor political leanings of the Senate, the House of Representatives, nor the election has a statistically significant impact on fiscal decentralization. Whereas, the level of tax decentralization (Drev_1) decreased when the democracy level approached lower. It can be assumed that Drev_1 measured by adding subsidies and extra income to the tax revenue was taken into account the equity among local governments and redistribution among their residents compared to Drev_2, which was measured only by considering local government tax revenues.

4.2.2. Economic determinants of fiscal decentralization

We also looked at the impact of per capita GDP and government debt ratios as

economic determinants of fiscal decentralization. Per capita GDP was shown to have a negative impact on both revenue decentralization, but a positive impact on the expenditure decentralization (Baskaran, 2010; Neyapti, 2010; Rodriguez-Pose and Ezcurra, 2010; Canavire-Bacarreza and Martinez-Vazquez, 2012; Jametti and Joanis, 2016). These findings can also be found in relations between the ranking for the level of GDP per capita and the ranking for decentralization levels. As shown in Table 7, most of the top 10 countries in GDP per capita, excluding the United States and Germany, had a significant drop in their revenue and appropriation ranks. This reflects that the higher the per capita GDP, the more extensive and specific public services residents can demand, thereby appropriately reflecting their preferences of residents even if the central government provides more public goods than countries with lower per capita GDPs.

Table 7. Top 10 countries in per capita GDP: 2017 revenue and expenditure decentralization ranks

Countries	Ranking for level of GDP per capita	Ranking for Drev_1	Ranking for Drev_2	Ranking for EXP
Luxembourg	1	30	24	28
Ireland	2	31	27	30
Switzerland	3	18	2	17
Norway	4	10	19	7
United States	5	3	3	3
Iceland	6	11	1	10
Netherlands	7	8	30	9
Denmark	8	1	20	1
Austria	9	24	29	23
Germany	10	21	17	20

Meanwhile, national debt had a weak positive impact on tax decentralization (Drev_2). This outcome was completely different from our hypothesis that greater national debt tightens control over local finances which weaken fiscal decentralization. In this regard, if the national debt is the result of the government's increased supply of public goods, local governments' revenues and expenditures, including relocation funds, will also increase. These findings can also be found in relations between the ranking for the level of the national debt and the ranking for decentralization levels as shown in Table 8.

Table 8. Top 10 countries by national debt: 2017 revenue and expenditure decentralization ranks

Countries	National debt rank	Rank for Drev_1	Rank for Drev_2	Rank for DEXP
Japan	1	4	8	6
Greece	2	32	26	31
Italy	3	9	11	11
Portugal	4	27	15	27
United States	5	3	4	3
Belgium	6	26	25	26
Spain	7	23	7	25
France	8	17	6	19
Canada	9	19	16	18
United Kingdom	10	34	28	16

4.2.3. Socio-environmental determinants of fiscal decentralization

As a result of examining the impact of socio-environmental factors on fiscal decentralization, the corruption index has a negative effect on expenditure decentralization (DEXP) while the competitiveness level has a positive effect on revenue decentralization (Drev_1). This could be interpreted as the higher the levels of democracy and integrity, corresponding to our research hypothesis, the greater the national competitiveness, the more positive impact on fiscal decentralization. This is in line with results of previous studies showing that higher levels of fiscal decentralization with less government corruption can increase government efficiency (Fisman and Gatti, 2002; Arikan, 2004; Fan et al., 2009; Lessmann and Markwardt, 2010; Albornoz and Cabrales, 2013; Oto-Peralias et al., 2013).

Next, we looked at impacts of environmental factors such as country land area, population density, level of urbanization, and social welfare expenditure on fiscal decentralization. First, land area had a negative impact on fiscal decentralization, rejecting the theory of research that had been presented intuitively. This can be attributed to Tiebout's (1956) and Oates's (1972) premises. If the size of the land area is larger, residents' free movement is restricted. Therefore, the efficiency of local governments' supply of public goods is also limited. In contrast, population density had a negative impact on tax decentralization (Drev_2), similar to findings of Bodman et al. (2009) and Arzaghi and Henderson (2005). In addition, we found that urbanization as a percentage of the population living in cities relative to the total population had a

positive effect on fiscal decentralization, which contrasted with previous research theories and studies.

Finally, the ratio of public welfare spending to total government spending had a positive impact on revenue decentralization, although it had no significant impact on tax or expenditure decentralization. This reflects that, as more projects are being delegated from central to provincial areas as public welfare spending expands, government subsidies are increasing as well. Additionally, while increased subsidies contribute to higher total revenues for local governments, tax revenue inevitably deteriorates because tax autonomy does not change much.

Ⅴ. Conclusion

Fiscal decentralization is a globally expanding policy trend. For this paper, we empirically investigated relationships between political factors in OECD countries and levels of fiscal decentralization during the past decades. Recently, many authors have identified political determinants of cross-country differences in the degree of fiscal decentralization. We also aimed to identify empirical regularities that could explain fiscal decentralization.

Regarding the institutional and political factors, we found that the government system correlated positively with fiscal decentralization while most political factors had no relations with fiscal decentralization except democracy level. Furthermore, the type of local government had a negative effect on government decentralization. It means that the more complicated the local government system the more negative influence on fiscal decentralization.

The relationship between socio-environmental variables and fiscal decentralization is as follows. First, land area and population density had negative effects on fiscal decentralization. In particular, land area had negative impacts on both revenue and expenditure decentralization while population density had a negative impact on revenue decentralization. Second, level of urbanization had a positive relationship with decentralization. These results are consistent with findings of Arzaghi and Henderson (2005), but not those of Bodman et al. (2009). Bodman et al. (2009) has found a negative relationship between urbanization and fiscal decentralization. Third, social

welfare expenditure was positively related to revenue decentralization.

In contrast, national debt had a positive relationship with revenue decentralization, but a negative relationship with expenditure decentralization. Maličká and Martinková (2018) have reported that national debt in cluster 2 and cluster 3 models has a positive relationship with tax decentralization at 1% statistical significance level. However, there was a negative relationship between national debt and expenditure decentralization at 1% statistical significance level. There was also a negative relationship between national debt and revenue decentralization. Maličká and Martinková (2018) have also found the same results as ours regarding tax and revenue decentralization. Thus, our findings support those findings on consequences of national debt and fiscal decentralization. CPI and national competitiveness index showed negative relationships with both revenue and expenditure decentralization. In other words, the greater the country's integrity and competitiveness, the more positive the effect of fiscal decentralization.

This study has three implications. First, we confirmed that institutional factors were major determinants of fiscal decentralization. In particular, we showed that the government system under parliamentary systems with the president and parliamentary-oriented monarchies had a positive effect on all kinds of fiscal decentralizations. Currently, monarchies are purely symbolic. The actual authority is in parliament. These results suggest that the role of a congress is important for fiscal decentralization. The reasons can be considered as follows. Politicians elected for congress are the ones representing each region. This is why they attempt to secure funding (formerly known as grants) from central governments. These politicians will also make efforts to expand regional tax revenues. Because these efforts have positive effects on local government revenues, we conclude that the level of fiscal decentralization is higher in the parliamentary system with the president and in parliamentary-oriented monarchies.

Second, although there are no consistent studies on fiscal decentralization and corruption, this study shows that decentralization of revenue and expenditure have a positive effect on corruption reduction, supporting the findings of Fisman & Gatti (2002), Arikan (2004).

Third, we again confirmed that GDP per capita, population density, and land area had negative effects on revenue decentralization, similar to results of previous studies. These results support findings of Jametti and Joanis (2016). They showed that GDP

per capita had a negative effect on fiscal decentralization. In addition, results of our study showed that population density had a negative effect on fiscal decentralization, supporting findings of Bodman et al. (2009). Finally, we found that land area had a negative effect on fiscal decentralization, supporting findings of Azaghi and Henderson (2005).

Finally, the higher the level of integrity and national competitiveness among OECD countries, the more positive the impact on fiscal decentralization. Martinez-Vazquez and Timofeev (2009) have argued that empirical analysis of determinants of fiscal decentralization should use democracy as a control variable because institutional variables play an important role in the design of states. Results of our study support findings of Canavire-Bacareza and Martinez-Vazquez (2012). They reported that integrity and democracy had positive effects on fiscal decentralization. National competitiveness is a set of institutions, policies, and elements that determine a country's productivity level (Schwab and WEF, 2010). It is calculated by measuring economic performance, government efficiency, business efficiency, and infrastructure.

Until now, authors of empirical studies on determinants of fiscal decentralization have focused mainly on variables such as land area, population density, GDP per capita, and ethnical fractionation. The present research is meaningful in that it is the starting point for considering political and institutional factors such as government form and political leanings of policymakers as determinants of fiscal decentralization. However, because social and administrative conditions are different for each country, our findings are limited in that quantitative analysis alone can only compare countries equally. Therefore, even if the economic performance is good and political and institutional management are good, it is necessary to observe whether these factors reflect true fiscal decentralization more closely through follow-up studies. Above all, it is meaningful in that local governments can secure financial decision-making rights from the central government through reducing corruption and improving the level of democracy.

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Appendix 1. Government Finance Statistics reporting: subnational

State Government Only	Local Government Only	Local Government & State Government
United States	Chile	Australia
	Czech Republic	Austria
	Denmark	Belgium
	Estonia	Canada
	Finland	Germany
	France	Mexico
	Greece	Spain
	Hungary	Switzerland
	Iceland	
	Ireland	
	Israel	
	Italy	
	Japan	
	Korea, Republic of	
	Latvia	
	Lithuania	
	Luxembourg	
	Netherlands	
	New Zealand	
	Norway	
	Poland	
	Portugal	
	Slovak Republic	
	Slovenia	
	Sweden	
	Turkey	
	United Kingdom	

Source: Victor et al. (2018). The IMF Fiscal Decentralization Dataset: A Primer, International Monetary Fund. p.19.

<Asbtract>

Effects of Institutional and Political Factors on Fiscal Decentralization
- The implications on corruption -

Kim, Ae Jin · Kim, Jin A

The objective of this study is to investigate the effects of government system and political tendency on fiscal decentralization. For empirical analysis, a panel data set for 36 OECD countries from 1995 to 2017 is used.

This study analyzes the determinants of fiscal decentralization around political and institutional factors, and furthermore, corruption is the main determinant of fiscal decentralization.

This study classifies factors affecting fiscal decentralization into political and institutional factors such as presidential system, local government form, democratic level, and corruption level, and controlled GDP per capita, population density, land area and urbanization as control variables.

The results show that most of the variables, except for the political orientation of policy makers, are acting as determinants of fiscal decentralization.

First, the higher the level of decentralization of revenue in parliamentary cabinet rather than in presidential countries, and the higher the level of decentralization of expenditure in monarchy rather than in presidential countries.

Second, although there are no consistent studies on fiscal decentralization and corruption, this study shows that decentralization of revenue and expenditure have a positive effect on corruption reduction, supporting the findings of Fisman & Gatti (2002), Arikan (2004).

This study finds that fiscal decentralization is the determinants not only by economic factors but also by the presidential system, local government form and level of corruption.

Above all, it is meaningful in that local governments can secure financial decision-making rights from the central government through reducing corruption and improving the level of democracy