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Fiscal Decentralization and Inclusive Growth: A Study Focusing on Income Redistribution

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Abstract. The importance of inclusive growth, which includes both sustainable economic growth and the mitigation of class polarization, is being discussed in many countries. Notably, some studies have actively shown the relationship between fiscal decentralization and redistribution based on the decentralization theorem that fiscal decentralization affects the competitiveness of the economy and the performance of government. This paper empirically analyzed the effect of fiscal decentralization on inclusive growth focused on income redistribution by using linear regression with panel-corrected standard errors. The analysis showed that fiscal decentralization had a statistically significant impact on inclusive growth, particularly on redistribution indicators such as the Gini coefficient level and labor income share. As a result, fiscal decentralization, which transfers not only financial resources but decision-making authority to local governments, can contribute to reducing inequality by increasing the level of welfare for the people.

Keywords: Fiscal decentralization, Inclusive growth, Redistribution, Laffer curve

1. Introduction

Inequality is deepening around the world. The gap between the rich and the poor within the Organization for Economic Co-operation and Development (OECD) countries has reached a record high over the last 30 years and the average income of the top 10 percentile is about ten times higher than that of the bottom 10 percent (OECD, 2018). The index was 14 times higher in the United States, Israel, and Turkey, and 27 times higher in Mexico and Chile (OECD, 2018). The gap between rich and poor is also widening in China, India, and South Africa (OECD, 2018).

The trickle-down effects have not resulted in a higher level of economic growth. What should countries do? Going forward to make sure that economic benefits are available to not just a few people, but to all? Ideally, existing policies should promote economic growth and create comprehensive policies that consider all social classes.

Recently, international organizations such as the World Bank, IMF, OECD have approached the relationship between economic growth and inequality from a new perspective and suggest 'inclusive growth' as a solution (OECD, 2018) (Kireyev & Chen, 2017). Inclusive growth is a concept that comprehensively pursues economic growth along with the mitigation of inequality, and until recently has focused on the study between individuals' income redistribution and economic growth (CEA, 2016; Berg & Ostry, 2017; Ostry et al., 2014; Joseph, 2015). However, there may be gaps in income between regions within a country, such as the financial conflict between northern and southern Italy, the claim of independence in Spain's Catalonia region, and the inequality among Seoul metropolitan areas and other regions in South Korea. Thus, some studies analyzed the relationship between fiscal decentralization and inclusive growth policies in terms of income redistribution (Neyapti, 2010; Yingyi & Barry, 1997; Andrés Rodríguez-Pose & Ezcurra, 2011; Agnese & Simone, 2014) (Sepulveda & Martinez-Vazquez, 2012; Tselios et al., 2012). Oates(1972) and Tiebout(1956) explain that fiscal decentralization between central and local governments can maximize social welfare by providing public goods to reflect local characteristics and preferences based on the decentralization theorem and voting with one's feet model. This largely positive view of fiscal decentralization explains that decentralization enhances the efficiency of the supply of local public goods and promotes regional economic growth (Ludema & Wooton, 2000; Davoodi and Hengfu, 1998), which in turn results in a trickle-down effect throughout the growth of the local economy (Tselios et al., 2012). On the other hand, some scholars point out that decentralization weakens local government control over fiscal management, thus undermining macroeconomic stability (Davoodi and Hengfu, 1998; Litvack et al., 1998) (Robert, 2001) and causing inequality by increasing the income gap between regions (Martinez-Vazquez and Roboert, 2003; Rodríguez-Pose and Nicholas , 2004; Kanbur and Xiaobo, 2005).

The problem is that there is a need for further discussion on how this fiscal decentralization affects not only the regional gap but also the social welfare level of residents. Particularly, inclusive growth ideas such as income redistribution need to be further studied. Based on the discussions of previous studies, this study aims to show the effects of a fiscal decentralization policy on achieving inclusive growth based on income redistribution.

The structure of the study is as follows. The following chapter examines the main concepts and relations between them based on prior studies. In chapter 3,

selected variables and analytical models for empirical analysis of this study are described. Chapter 4 shows the results of empirical analysis. Finally, chapter 5 summarizes the main results of this study and draws implications.

2. Theoretical Preliminaries

2.1. Inclusive Growth

Inclusive growth is based in part on the "Pro-Poor growth." It is economic growth where the Poor benefit from the system, which means that the income growth of the Poor increases faster than that of the entire population thereby alleviating inequality levels (Karry, 2002; Anand et al., 2013). Recently, it defines inclusive growth in terms of redistribution of economic performance as well as poverty reduction. The World Bank defines inclusive growth as economic growth through productive employment aimed at alleviating poverty (Ianchovichina and Lundstrom, 2009), while the IMF defines it as an economic growth that can alleviate inequality (Anand et al., 2013). The OECD defines this theory as the fair distribution of economic performance across society (OECD, 2014) and the World Economy Forum (WEF) defines inclusive growth as improving the quality of life of economic actors by reducing inequality (Richard et al., 2015).

2.2. Fiscal Decentralization

Fiscal decentralization refers to the degree of fiscal authority and responsibility transferred from the central government to local governments. Many previous studies measure fiscal decentralization by quantifying it and using its proxy as a measure of revenue and expenditure.

In general, revenue decentralization is measured by the proportion of the total revenue of the local governments in terms of the total revenue of the general government. The expenditure decentralization is measured by the proportion of the total expenditure of the local governments in terms of the total expenditure of the general government (Davoodi and Hengfu, 1998; Oates, 1985; Michal, 1987). Recently, the argument that conditional grants should be excluded from the indicators of expenditure decentralization to more accurately reflect the level of autonomy for local governments has been persuasive (Nobuo and Sakata, 2002; Richard and François Vaillancourt, 2008), and some studies also consider tax decentralization levels as indicators of fiscal decentralization (Dziobek et al., 2011). In consideration of this, cross-country comparative studies using the indicators of fiscal decentralization mostly measure the proportion of the total revenue or expenditure of local governments from the total revenue or expenditure of the general government as a measure of revenue decentralization and expenditure decentralization (Arzaghi and Henderson, 2005; Bodman et al., 2009; Canavire-Bacarreza and Martinez-Vazquez, 2012; Maličká and Martinková, 2018).

2.3. Relations between Fiscal Decentralization and Redistribution

Table.1: Empirical studies on the relationship between fiscal decentralization and income inequality

Author (year)	Unit	Period	Estimator	Dependent variable		Independent variable	Result
Tselios, Vassilis et al. (2012)	102 regions from 13 countries in Western Europe	1995-2000	Panel regression, fixed-effect model	Income inequality for the whole population /normally working people (Theil index)		Fiscal decentralization (expenditure)	(-)***
						Fiscal decentralization (revenue)	(-)***
						Political decentralization (self-rule)	-
						Political decentralization (shared-rule)	(-)***
						Political decentralization (regional authority indicator total)	-
						Trade openness	-
						Public sector size	-
Sacchi, Agnese, and Simone Salotti (2014)	23 OECD countries	1971-2000	Panel regression, fixed-effect model	GINI index calculated using gross household income (5year averages)		Fiscal decentralization (tax)	(+)***
						Fiscal decentralization (expenditure)	-
Sepulveda, Cristian, and Jorge Martinez-Vazquez (2010)	65 countries	1976-2000 (unbalanced)	Panel regression, fixed effect and random effect models	Poverty	Headcount ratio	Fiscal Decentralization (%)	-
					Poverty Gap		-
					HDI(Human Development Index)		(-)***
				Income distribution	GINI coefficient based on disposable income		(+)***
Rodríguez-Pose, Andrés, and Roberto Ezcurra (2011)	21 OECD countries	1990-2005	OLS regression	Average growth of real per capita GDP		Fiscal decentralization: total expenditure	(-)***
						Fiscal decentralization: total revenue	(-)***
						Political decentralization	-
						Administrative decentralization	(-)***

Since the original purpose of fiscal decentralization did not encapsulate poverty reduction and income redistribution, research on the relationships among inclusive growth, fiscal decentralization, and income redistribution has only been actively presented in recent years (Williams et al., 2018). It was argued that fiscal decentralization could affect income inequality by allocating some of the redistribution functions implemented by the central government to other levels of government (Ronald, 1997; Yingyi and Weingast, 1997). In particular, the relationship between fiscal decentralization and income redistribution needs to be looked at, given that decentralization occurs more actively in areas such as housing, health, education, and welfare, rather than highly centralized functions such as public safety, social protection, and order maintenance (Benedict et al., 2015).

Table. 2: Definitions and sources of variables

Classification			**Definition**	**Source of data**
Dependent variables (DV)	Individual income distribution	Gini-gap	Gini coefficient based on disposable income after tax and transfer expenditure (the higher the Gini gap, the greater the inequality)	OECD Income Distribution Database
	Functional income distribution	Labor income share	(Employee's remuneration + Overseas workers remuneration) / National Income * 100	OECD Income Distribution Database
	Redistribution policy	Social welfare expenditure	Social welfare expenditure share of total public expenditure	OECD stats
Independent variables (IV)	Revenue Decentralization	DREV	SREV(Total revenues of local governments) / GREV(Total revenues of general governments)	IMF Government Finance Statistics
		DTAX	STAX (Local tax revenues) / GTAX (Total tax revenues of general governments)	IMF Government Finance Statistics
	Expenditure decentralization	DEXP	SEXP (Total expenditure of local governments) / GEXP (Total expenditure of general governments)	IMF Government Finance Statistics
Control variables	Economic factors	Employment rate	The proportion of the Employed in Population 15-65	OECD stats

(CV)		Pre-intervened poverty	Percentage of the population whose income falls below the poverty line (before taxes)	OECD Income Distribution Database
		GDP growth rate	GDP growth per year	OECD stats
	Politico-social factors	National competitiveness ranking	Global competitiveness report Ranking	World Economic Forum
		Government type	Presidential = 1 Parliamentary system (president) = 2 Parliamentary system (monarch) = 3	OECD Government at a glance
		Local government type	State government = 1 Local government = 2 Mixture of state and local government = 3	IMF Fiscal Decentralization Database
		Political leaning of policymakers	Conservative = 1 Moderate = 2 Liberal = 3	Election Commission and political parties homepage by country
		Democracy level	Combination index of Political right and civil liberties (The lower the number, the higher the level of democracy)	Freedom House
	Other factors	Ratio of elderly population	Share of population aged 65 and over	OECD stats
		Population density	Population density	World Bank Database
		Urbanization	Proportion of urban population to the total population.	World Bank Database

Most of the early researches on fiscal decentralization and income redistribution focused on examining the relationship of decentralization and economic development or economic growth (Tselios et al., 2012; Davoodi and Hengfu, 1998; Johannes et al, 2004; Litvack et al., 1998; Tanzi, 1995; Von Braun and Grote, 2002; Tao and Hengfu, 1998). Recently, however, the concept of inclusive growth has been proposed in terms of easing inequality through income redistribution and some

studies have empirically analyzed the relationship of fiscal decentralization and income inequality directly (Neyapti, 2010; Andrés Rodríguez-Pose & Ezcurra, 2011) (Agnese & Simone, 2014; Tselios et al., 2012). These empirical studies suggest different results as shown in table 1, according to the research model and methodology, such as the target countries of analysis, data covering time period, and variables.

First, research shows that fiscal decentralization contributes to regional economic development and the provision of social infrastructure which consequently alleviates income inequality (Tselios et al., 2012). These findings explain the decentralization theorem that local governments improve the efficiency of public service. On the other hand, research has also shown that fiscal decentralization negatively affects income distribution and can deepen inequality (Agnese & Simone, 2014; Sepulveda & Martinez-Vazquez, 2012). These findings support the classical fiscal federalism theory that the central government can more effectively implement and redistribute income and macroeconomic stabilization policies than local governments (Richard, 1959).

There is also research showing that decentralization affects economic inequalities, depending on the income level of the country. Some studies have shown that decentralization contributes to the reduction of inequality in high-income countries, while it intensifies inequality levels in low and middle-income countries (Neyapti, 2010; Andrés Rodríguez-Pose & Ezcurra, 2011). Income inequality can also be alleviated until the size of a public sector reaches a certain threshold (20% of GDP), but the larger the public sector, the less effective it is to ease income inequality (Sepulveda & Martinez-Vazquez, 2012). There is also research showing that the welfare and income distribution levels of residents improved when the fiscal authority of local governments remains at an appropriate level through the Laffer curve (Erkman and Neyapti, 2017). Eventually, the relationship between fiscal decentralization and income redistribution may differ depending on the quality of the government's fiscal system and financial structure.

3. Empirical Set-up and Data

3.1. Econometric Procedures

This study conducted an empirical analysis of panel data collected from 34 OECD countries from 1995 to 2017 to examine the long-term relationship between fiscal decentralization and inclusive growth.

In general, when regression analysis is performed using panel data, there is a high probability of heteroscedasticity and autocorrelation. Thus, this study conducted some statistical analyses such as the 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. Considering the

problems of fixed effects, variability, and auto-correlation of the panel data, this study used linear regression with panel-corrected standard errors (PCSE). Moreover, the PCSE estimator is robust to the possibility of non-spherical errors.

Table 3. PCSE Estimations

DV	Model 1			Model 2		
	GINI	LIS	SER	GINI	LIS	SER
IV						
DREV	.0006026	.272051***	.227760***	.001264	.2378834***	.0352705
DTAX	.0000905	.0218753	.0228442	-.0005808***	.035297	.0770871***
DEXP	-.001999***	-.226762***	-.174530***	-.0022438***	-.2140297 ***	.0351242
CV						
Employment rate				-.000925	.3026568***	-.1560161***
Pre-tax poverty				-.0733395	5.51373	33.09568***
Ratio of elderly population				-.0000803	-.3056084 ***	.1739246***
GDP growth rate				-.0000563	-.1938236***	-.1347745***
Government type				-.0407844***	-3.708263***	3.001156***
Local government type				-.0093122	3.154538***	.6409648
Political leaning of policymaker				-.0016562	.1156118	.0175905
Democracy level				.005378	-.2534894	-.7470204***
National Competitiveness level				-.0002166	-.0117523	-.0031235
Population density				-.0000558***	.0224611***	.0002714
Urbanization level				.0021492***	.110518**	-.0465184
R^2	0.9097	0.7819	0.5209	0.9327	0.9662	0.8307
_cons	.3416734***	54.43325***	17.67169***	.394129***	25.6748***	11.5236***
N	420	723	729	336	371	380
N(group)	34	34	34	34	33	34

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

Table 4. Link between Fiscal decentralization and Inclusive growth (Laffer curve)

Bounds		DREV		DTAX		DEXP	
		Lower	Upper	Lower	Upper	Lower	Upper
GINI	Interval	2.21	66.1	2.86	79.21	-	
	Slope	-.0035425	.0018849	-.0018659	.0020494		
	t-value	-5.061996	2.382433	-3.907392	3.053381		
	P>|t|	3.10e-07	.0088193	.0000542	.0012016		
	Hypo.	H1: U shape vs. H0: Monotone or Inverse U shape				Extremum outside interval - trivial failure to reject H0	
	Result	Overall test of presence of a U shape:					
		t-value = 2.38 P>|t| = .00882		t-value = 3.05 P>|t| = .0012			
LIS	Interval	2.21	66.1	2.86	79.21	0	66.35
	Slope	.2598534	-.1786949	.1793711	-.0994312	.2224359	-.1803455
	t-value	3.546349	-2.042036	3.707423	-1.534795	3.049104	-2.038138
	P>|t|	.0002077	.0207527	.0001124	.0626282	.0011885	.0209456
	Hypo.	H1: Inverse U shape vs. H0: Monotone or U shape					
	Result	Overall test of presence of a Inverse U shape:					
		t-value = 2.04 P>|t| = .0208		t-value = 1.53 P>|t| = .0626		t-value = 2.04 P>|t| = .0209	
SER	Interval	-		2.86	79.21	0	66.35
	Slope			.3755225	-.483442	-.0747491	.2288807
	t-value			11.62179	-11.51091	-1.446624	3.6378
	P>|t|			3.71e-29	1.11e-28	.0742112	.000147
	Hypo.	Extremum outside interval - trivial failure to reject H0		H1: Inverse U shape vs. H0: Monotone or U shape		H1: U shape vs. H0: Monotone or Inverse U shape	
	Result			Overall test of presence of a Inverse U shape:		Overall test of presence of a U shape:	
				t-value = 11.51 P>|t| = 1.11e-28		t-value = 1.45 P>|t| = .0742	

**p<0.05*

Furthermore, this study hypothesized that fiscal decentralization would contribute to inclusive growth to a certain level, and will drop when certain internal threshold exceeded (Kelbesa, 2015). Thus, it is necessary to examine that the relationship is rising at lower levels and declining at higher levels within the interval. Most studies used externally established thresholds and fitting spline regressions to test the non-linearity (Lawrence and Cormier, 2001). Spline regressions have the arbitrariness problem even they're flexible (Ugo and Presbitero, 2013). The thresholds are often decided based on a specific study or a theory which can maximize the fit of the model (Kelbesa, 2015). Research that examines U-shape or inversed U-shape usually uses a quadratic term within a regression equation. If the extreme value exists and the quadratic term is significant, it can be concluded that there can be a U-shape or inversed U-shape relationship. For a proper test of a U or inversed U-shape, it is being required to check if the relationship is rise at lower values and decline at higher values within the interval (Kelbesa, 2015). The Lind-Mehlum method of testing U-shapes provides stronger tests for bell-shapes and the estimates of a regression model, thus allowing researchers to test at a certain level of significance.

Thus, this paper used the PCSE (Panel Corrected Standard Error) estimation method and the Lind-Mehlum method of testing U or inverse-U shapes (Lind and Mehlum, 2010) with STATA 14.2. The estimated regression equation is as follows.

$$Y_{it} = \alpha + \beta_1 DREV_{it-1} + \beta_2 DTAX_{it-1} + \beta_3 DEXP_{it-1} + \beta_4 ECO_{it-1} + \beta_5 POLI_{it} + \beta_6 CIRCUM_{it} + \varepsilon_{it} \quad (1)$$

Y represents inclusive growth, DREV represents revenue decentralization, DTAX represents tax revenue decentralization, and DEXP represents expenditure decentralization. ECO are economic factors that affect inclusive growth, POLI are political and social factors that affect the dependent variable, and CIRCUM are other environmental factors. α and β are constants and coefficients, and ε means random error. i and t represent the country and year, respectively.

3.2. Measuring Key Variables

This study set the Gini gap, labor income share, and the ratio of social welfare expenditure as dependent variables as performance indicators for redistribution policies that measure inclusive growth, considering the importance of easing and fair distributing income inequality. Inclusive growth is "growth in which profits are shared fairly" (UNDP), and "growth with a fair distribution of profits across society considering both monetary and non-monetary aspects" (OECD). Distribution is as important as economic growth in income growth for the Poor (Howard and Anderson, 2010). This study set the Gini coefficient, labor income

share, and the rate of social welfare expenditure as independent variables as performance indicators for redistribution policies that measure inclusive growth, considering the importance of easing and distributing income inequality. The Gini coefficient is a representative indicator of the status of distribution and imbalance between household income classes. The Gini coefficient (Gini Gap) based on disposable income after tax and transfer expenditure is selected and regarded as the result or outcome of inclusive growth, i.e. the result or outcome of the income redistribution policy. The labor income share is an indicator of the share of labor income in the national income. It measured the relative size of labor income in the national income compared to other incomes and was used as an indicator of inclusive growth in some previous studies (Richard et al., 2015). Finally, this study sets the proportion of social welfare expenditure out of total public expenditure as a dependent variable, on the premise that inclusive growth requires the expansion of welfare expenditure (Theodore and Ginsberg, 1998; Asian Development Bank, 2004).

The independent variable of this study is the level of fiscal decentralization, which can be quantitatively measured by surrogate indicators according to OECD guidelines based on previous studies. Fiscal decentralization can be divided mainly into revenue, tax, and expenditure decentralization. First, the revenue decentralization was measured by ① the ratio of the total revenues of local governments to the total revenues of general governments and ② the ratio of local tax revenues to the total tax revenues of general governments. The latter can also be defined as tax decentralization. The expenditure decentralization was measured as the ratio of the total expenditure of local governments to the total expenditure of general governments. The total revenues of local governments used for revenue decentralization are the gross revenues of local governments, excluding inter-governmental grants.

Lastly, control variables can be divided into economic, political and social, and other environmental factors. First, this study explored the relationship between economic growth indicators and inclusive growth, such as GDP growth, employment, and pre-tax poverty rates. These were used in most studies that empirically measured the relationship between fiscal decentralization and economic growth. Given this, this study assumed that as the employment rate increased and the poverty rate decreased, the indicator of inclusive growth through economic growth would be achieved. In consideration of this, this study selected the GDP growth rate, employment rate, and pre-tax poverty rate as economic control variables.

Indicators measuring the impact of fiscal decentralization on inclusive growth need to include political and social variables in addition to economic variables. Most previous studies use major political and social determinants such as corruption, democracy, the Elderly population, and national competitiveness as control

variables, while some studies use comprehensively considered government efficiency indicators (Robert, 1991; Gustavo and Martinez-Vazquez, 2012; Andreas and Roca-Sagalés, 2011; Roberto, 2004). Considering this, this study included the types of central and local governments, the political leaning of policymakers, the democracy level, and the level of national competitiveness as political and social control variables. In addition, other environmental factors such as population density and urbanization level were considered as control variables which may affect dependent variables (Gustavo and Martinez-Vazquez, 2012; Ugo, 1999; Mohammad and Henderson, 2005; Bodman, 2009; Mario and Joanis, 2016).

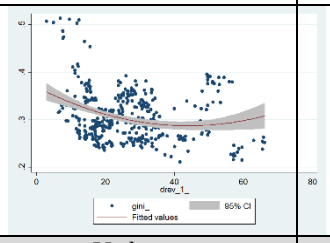
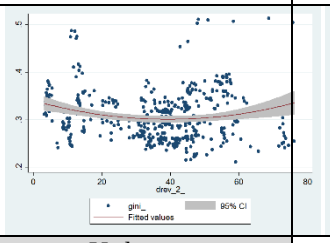
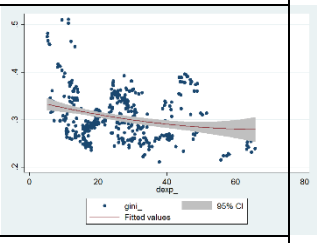
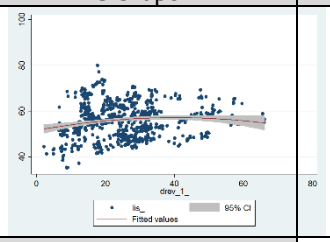
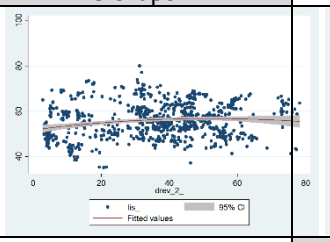
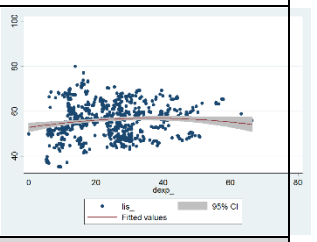
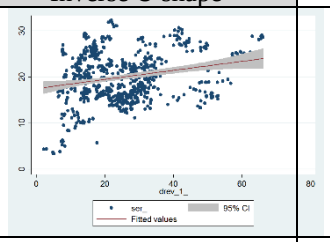
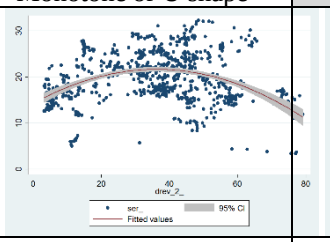
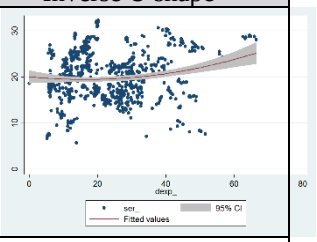
The contents and sources of data used as dependent, independent, and control variables are shown in Table 2.

4. Results

The results of PCSE analysis are shown in Table 3. First, the effects of fiscal decentralization indicators on dependent variables such as the Gini Gap, labor income share, and social welfare expenditure were examined. The tax and expenditure decentralization have negative effects on the Gini Gap. These findings show that the higher the local government's own income, the less inequality in the region. The revenue decentralization, including non-tax revenue, does not have a statistically significant effect on the Gini Gap, but it also has a positive impact on the labor income share. In other words, revenue decentralization contributed to securing jobs for local residents and regional development. The tax decentralization has a positive effect on social welfare expenditure. It can be understood as providing better service jobs and welfare services to residents as the higher the local government's financial strength. The expenditure decentralization has a negative effect on the Gini Gap. However, it is not statistically significant in social welfare expenditure and has a negative effect on labor income share. It can be understood that local governments need to overhaul the local government's fiscal spending system in a way that can alleviate inequality.

The employment rate has a positive effect on labor income share but a negative effect on social welfare expenditure. The higher the employment rate, the greater the labor force expands, which in turn increases the share of labor income. However, social welfare expenditure decreases as labor income increases. It can be understood in the context of higher pre-tax poverty rates, leading to higher social welfare expenditures. On the other hand, the GDP growth rate has no statistically significant relationship with Gini Gap, but it has a negative effect on labor income share and social welfare expenditure. Because there are many ways to make income other than labor as the economy grows, and even if the share of social welfare expenditure decreases or increases in size, the share of the government's public expenditure can decrease. In the case of the central government, the lower level of centralization, the better the Gini coefficient and the greater the share of social welfare expenditure.

Conversely, labor income share was lowered, indicating that the share of income other than labor income was higher. Population density and urbanization levels had a positive effect on labor income share, but the effect on the Gini coefficient showed different results. It can be understood that the higher the level of access to social infrastructure and the more urbanized the location, then the greater the gap in labor income.

	DREV		DTAX	DEXP
GINI				
	U shape		U shape	-
LIS				
	Inverse U shape		Monotone or U shape	Inverse U shape
SER				
	-		Monotone or U shape	Monotone or Inverse U shape

* p<0.05, ** See the appendix1 for U-test results

Fig. 1: Fiscal decentralization-inclusive growth Laffer curve with quadratic prediction plots.

As shown in the last two columns of Table 3, the coefficient of all quadratic terms is significant and positive, implying a u-shaped curve. Table 4 shows the results of the Lind-Mehlum test for an inverse U-shape. For the relationships of the Gini gap and the revenue or tax decentralization, the slope at the lower bound is negative and significant at 1 percent, while the slope at the upper bound is positive and significant at 1 percent. The labor income share has inverse-u shaped relations with revenue and expenditure decentralization. The slope at lower bound is positive and the slope at the upper bound is negative, and both are statistically significant at

5%. The rate of social welfare expenditure has no significant bell-shaped relations with fiscal decentralization.

The relationship between the redistribution and the fiscal decentralization index shows that up to a certain level, the higher the level of revenue and tax decentralization, the lower the Gini coefficient, thereby resolving inequality. The fiscal decentralization also has a reverse U-shaped relationship with the labor income share, which was shown in Figure 1. The expansion of revenue and expenditure decentralization contributes to the improvement of labor income share up to a certain threshold, but if it goes beyond a certain level it appears to be a factor that will worsen the labor income share. Unlike the Gini coefficient and the labor income share, which were found to have a U or reverse-U-type relationship with fiscal decentralization based on statistical verification, the social welfare expenditures showed different types of results. It is seen as a result of applying a complex hypothesis to identify certain types of non-linearity (Kelbesa, 2015). This is unlike the traditional method of checking general forms of non-linearity, including quadratic terms, within a typical regression equation.

5. Discussions and Implications

Based on the above findings, this study derives the following policy implications:

First, this study found that tax decentralization by increasing the proportion of local taxes to total tax revenue of the general government can reduce inequality. It could be interpreted as decision making authority matters. Second, the relationship between fiscal decentralization and inclusive growth was changed based on specific thresholds and it was verified through a Laffer curve. In other words, while fiscal decentralization contributes to inclusive growth in countries with low levels of institutionalization of fiscal decentralization, it has been confirmed that decentralization policy needs to be utilized in a balanced way in countries with expanded fiscal decentralization. In this regard, it is necessary to establish a redistribution strategy at the local government level by the changes in the economic environment through a product-supply oriented social service policy linking welfare, education, and employment (Mi Ran, 2018). And local governments and government agencies need to act as facilitators of regional development (Young-Min and Jung-Yeon, 2016; Gongcheol et al., 2019).

As a limitation, we tried to find the data-driven evidence of fiscal decentralization policy on redistribution, however, this study utilized only OECD countries from 1995 to 2017. For stronger support of our Laffer curve impact hypothesis of fiscal decentralization policy on redistribution, expansion of a data set to include underdeveloped countries is needed. In addition, we utilized three proxies to measure the level of redistribution, Gini, labor income, and social welfare

expenditure share. Cluster or factor analysis for a more balanced finding is worthwhile for future studies.

6. Conclusion

After the 2008 global financial crisis and the 2010 European financial crisis, inclusive growth has been earnestly proposed in the course of finding new economic recovery and growth strategies. The idea has spread to the World Bank and is now actively discussed at the IMF, OECD, and WEF. Governments can contribute to reducing inequality by expanding the welfare level for their citizens through fiscal transfers and via the delegation of public services to local governments. In this regard, this study examined the effects of fiscal decentralization on inclusive growth through empirical analysis using the PCSE model in OECD countries from 1995 to 2017.

The analysis showed that tax decentralization has the most positive impact on inclusive growth. Tax decentralization works in a way that improves the Gini coefficient and affects the proportion of social welfare spending in a positive direction. Considering that income and property taxes are the most commonly used taxes for local governments in most countries, the expansion of tax decentralization affects income redistribution through taxation. Moreover, if the level of tax decentralization is high, local governments can increase the share of expenditure for their residents due to the large tax revenues collected. Considering that most of the local government's policy spending comes from their residents' needs, such as welfare policies, the expansion of tax decentralization can eventually be seen as contributing to inclusive growth by improving the welfare of residents. Revenue decentralization had a positive effect on the labor income share, but it had no statistically significant effect on the Gini coefficient and social welfare expenditure. The expenditure decentralization also had a negative effect on the Gini Gap, but it does have a negative effect on the labor income share. These contradicted expectations could be explained by the impact of the non-tax revenue for boosting the social overhead capital projects those are capital intensive or spending not directly for exclusive residents. Lastly, economic factors among the control variables such as employment rate, pre-intervened poverty rate, elderly population rate, and GDP growth rate had significant effects on inclusive growth. Meanwhile, the type of central government, the population density, and the urbanization level along with political and environmental factors showed statistically significant results as well.

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