Asymmetry in the Flypaper Effect of the Conditional Grants: A Case of Korea

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Abstract. The intergovernmental grants are increasing very fast comparing to local tax income in Korea. There are two kinds of intergovernmental grants. One is the local ordinary shared tax known as the unconditional grant and another is the national subsidy called the conditional grant. Generally as the intergovernmental grants increase, the local governments tend to spend more. It is summarized as the flypaper effect. Moreover the national subsidy is increasing faster than the local ordinary shared tax in Korea. This makes more burdens on the local governments because the conditional grant is the matching grant. If the asymmetric effect exists in the national subsidy, the expenditures of local governments are going to be more inefficient. This paper is trying to test the asymmetry in the response to increase and decrease in the national subsidy.

Keywords: Asymmetry, Conditional Grants, Flypaper Effect.

1. Introduction

The problem of the local public finance is standing out because Euro zone fiscal crisis is spreading lately. When the expenditure continues exceeding the income, the fiscal crisis is bound to break out. Nowadays the expenditures of the local governments are increasing faster than incomes in Korea. Thus, the central government is worried about the fiscal deficit of local governments. There are two major reasons why the expenditures of the local governments are increasing very faster than incomes in Korea. One is that the acquisition tax income of local governments is decreasing by the global economic crisis. Another is that the expenditure on the welfare is escalating by the change of population structure. The expenditure on the welfare is too much related to the national subsidy programs. If the national subsidies increase, the burdens on the local governments augment also because the national subsidy is the matching grant.

The national subsidies are one of the intergovernmental grants. According to the decentralization theorem (Oates, 1972), the local governments are more efficient than the central governments in the supply of local public goods. The intergovernmental grants cause soft budget constraint, and the important result of the soft budget constraints is that local governments spend more money. This means that the intergovernmental grants can make the expenditure of the local governments inefficient. This inefficiency is commonly explained by the flypaper effect. The flypaper effect means the response of local governments to the intergovernmental grants is greater than that of local governments to the own revenues. Especially if there is asymmetry in the flypaper effect, the expenditures of local governments increase rapidly when the national subsidies grow. Because the asymmetry in the flypaper effect means that the expenditure is greater in response to increasing national subsidy than decreasing national subsidy. This paper is trying to test if the local governments respond to the national subsidies asymmetrically.

2. Empirical Studies

There are a lot of early studies about the asymmetry in the flypaper effect of the intergovernmental grants. Some results prove that there is the asymmetry flypaper effect on the intergovernmental grants and others show that the flypaper effect of the intergovernmental grants is not asymmetric. Park, Koo, and Kim(2009) suggest that the asymmetry in the flypaper effect can be different by the level of financial autonomy of local governments in Korea. So they divide local governments into three groups: lower, middle, and upper group in the level of autonomy. The analysis proves that the asymmetry exists only in the middle

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group. Mun and Kim (2008) are interested in the asymmetry flypaper effect on the unconditional grants. In order to test if there is asymmetry in the flypaper effect, the unconditional grants of 16 Korean metropolitan and provincial governments from 1995 to 2006 are analysed. The result shows that there is asymmetry flypaper effect in total expenditure. Gamkhar and Oates(1996) explains that the spending of local governments changes asymmetrically in response to increases and decreases in federal grants. Volden(1999) indicates that state governments response to increases and decreases in federal grants asymmetrically in the United States with Dependent Children Program across 46 states from 1965 to 1994.

The results of the tests about asymmetry of empirical studies are different according to the circumstances and conditions. This paper is interested in the conditional grants which becomes a hot potato in Korea. So it is trying to test if there is asymmetry in the flypaper effect of the conditional grants in Korea.

3. Econometric Model

This paper is interested in that there is flypaper effect of the national subsidies on the expenditure and asymmetry in the flypaper exists. To test this hypothesis, the model that Stine(1994) proposed is used following formula:

$$E(t) = b_0 + b_1 G(t) + b_2 I(t)(G(t)-G(t-1)) + b_3 X(t) + b_4 O(t) + u(t)$$

$$I(t) = 1 \text{ if } G(t)-G(t-1) < 0$$

$$= 0 \text{ otherwise } (t=2002, 2003, \cdots, 2010)$$

$$u(t) = r + v(t) + w(t)$$

Where $E(t)$ is a vector of expenditure per capita, $G(t)$ is a vector of national subsidies per capita, $X(t)$ is a vector of GRDP(Gross Regional Domestic Product) per capita, $O(t)$ is a vector of old age dependency ratio and u(t) is the disturbance term. The old age dependency ratio is the ratio of the population aged over 65 to the population aged from 20 to 64. This paper has two tests. One is to test if b_1 is greater than b_3. Another is to test if b_2 isn't zero statistically. If b_1 is greater than b_3, there is the flypaper effect of the national subsidies on the expenditure of local governments. And it means that the asymmetry in the flypaper effect exists if b_2 isn't zero statistically.

This paper uses the panel data for 16 regional local governments from 2002 to 2010. There are two assumptions about the error term(u(t)), the fixed effects assumption and the random effects assumption. The error term of panel data consists of three components: individual term(r), time variant term(v(t)), and pure error term(w(t)). The fixed effect model and the random effect model can be distinguished according to the characteristics of time variant term. The fixed effect model is a statistical model that the time variant term doesn't change over time. In the random effect model, the time term does change over time so has the distribution of the probability. Generally the statistic that Hausman(1978) suggested is used to test if the random effects model is appropriate.

There are two kinds of models in this paper. One is based on the nominal price and another is for the real price. So this paper has four models to estimate. There are the fixed effect model based on the nominal price, the random effect model based on the nominal price, the fixed effect model based on real price and the random effect model based on the real price.

4. Findings

Table 1 summarizes the result of the estimation. All the estimates are statistically significant at 1% confidence interval excluding the estimate of intercept. And the result of the Hausman test shows that the value of Chi-Square(39.7) is larger than the critical value in the model based on the nominal price. It means the fixed effect model is preferred to the random effect model. The fixed effect model is more appropriate than the random effect model in the model based on the real price. The null hypothesis(random effect) can be rejected because the value of Chi-Square(30.0) is larger than the critical value.

It is found that there are two important meanings from the result of estimation. One is that the flypaper effect in the national subsidies exists in Korea. This is proven by that the coefficient of G(t) is greater than that of Y(t). Generally the increase of intergovernmental grants makes the disposable income of residents

increase and the expenditure of the local governments increases. The problem is that the effect of national subsidies is greater than that of the income on the expenditure.

Flypaper effect: $\partial E(t)/\partial G(t) > \partial E(t)/\partial X(t)$

Another is that the flypaper effect is different between when the national subsidies increase and when they decrease. It is called asymmetry in flypaper effect of national subsides. This is proven that the estimate of I(t)(G(t)-G(t-1)) is statistically significant. Especially the sign of that estimate is negative. It means that the response of local governments when the intergovernmental grants increase is greater than when the intergovernmental grants decrease. The local governments tend to spend more money when the national subsidies increase. Even though the national subsidies decrease, the speed of decrease of the expenditure is slow.

When G(t) increases (G(t)>G(t-1)) $\partial E(t)/\partial G(t)=b_1$, When G(t) decreases (G(t)<G(t-1)) $\partial E(t)/\partial G(t)=b_1+b_2$

Asymmetry in the flypaper effect: $b_1>0$, $b_2<0$

Table 1. Estimation Results

Variables	Nominal Price		Real Price	
	Fixed Effect Model	Random Effect Model	Fixed Effect Model	Random effect Model
Intercept	-1.362[*]	-0.045	-0.506[***]	0.289[***]
G(t)	0.953[*]	1.546[*]	0.811[*]	1.235[*]
I(t)(G(t)-G(t-1))	-0.690[*]	-0.824[*]	-0.516[*]	-0.699[*]
Y(t)	0.037[*]	0.029[*]	0.050[*]	0.017[*]
O(t)	0.171[*]	0.071[*]	0.099[*]	0.071[*]

[*] - statistically significance at 1% confidence interval.

[***] - statistically significance at 10% confidence interval.

5. Conclusions

The fiscal problem of local governments is worried about in Korea because the local expenditures increase more than the local tax. The local governments try to increase tax incomes or to decrease expenditures to solve this problem. However the objective of national subsidies is to help the local governments with fiscal problem to lessen the economic burden. But the national subsidies saddle the local governments with the more burdens rather than lessen the fiscal problems. That's the reason why the national subsidies are the conditional grants so the governments have to carry more burden as the national subsidies increase. The national subsidies are increasing because deepening of the aging makes the demand in welfare expand in Korea. Thus, the national subsidies make it very difficult that the local governments spend less.

Moreover this paper investigates the flypaper effect in the national subsidies and proves that there is asymmetric flypaper effect of that. It means even though the national subsidies decrease, the local expenditures can't decrease as much as expected. The local governments need the intergovernmental grants desperately while the global economic crisis lasts. So the intergovernmental grants should not be decreased. The central government should decrease the national subsidies in Korea without decreasing total grants from the central government. There are two policies to solve this problem. One is to reshuffle the role of welfare between central government and local governments. The area of welfare occupies most of the national subsidies. Therefore the central government has to play a role in the public service such as national minimum. This can make the conditional grants decrease. Another is to increase the unconditional grants to compensate for some of decreasing national subsidies. These unconditional grants can help the local government lessen the economic burden.

This study is interested in only finding the flypaper effect and the asymmetry of that in Korea. Future research should study on the reason why there is the asymmetry in the flypaper of the national subsidies in Korea.

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