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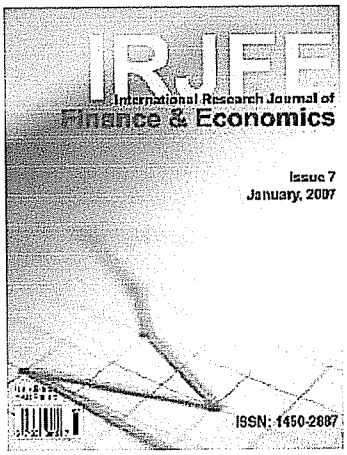

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The Surge Impact of the Flypaper, Substitution and Stimulation Effect on Local Tax Effort in Turkey

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Abstract

The previous literature concentrates more the causes of the flypaper, substitution, stimulation effects rather than its consequences. This study, therefore, examines the surge impact of the flypaper, substitution, stimulation effects on local tax effort. Empirical evidence does not support the theoretical prediction of the bureaucratic model explanation of the flypaper effect, which suggests that local governments decrease tax effort if the flypaper effect occurs in richer provinces. It is also found that the stronger the flypaper effect the higher the tax effort. Based on these findings, this study argues that local tax effort is also influenced by the substitution and stimulative effects of grants on local expenditure in addition to the variance in the flypaper effect.

Keywords: Flypaper effect, local tax effort, Turkey
Jel Classification Codes: H77, H81

I. Introduction

Intergovernmental transfers are distributed for a number of objectives, i.e. central governments enforce their preferences by using intergovernmental transfers. Central governments can affect the level of local expenditure and local tax level by using intergovernmental transfers. For example, central governments may use intergovernmental transfers to constrain the total current expenditure of local authorities in accordance with its macroeconomic policy (Bailey, 1988). Intergovernmental transfers may have a substitution or stimulation effect on local expenditure. If transfers have a more stimulative effect on the level of public expenditure than local private income, it is known as the flypaper effect. Intergovernmental transfers could also be used to stimulate local tax effort.

There is a relationship among the substitution/stimulation effect, the flypaper effect and local tax effort. If the substitution effect is found, it is expected that local authorities spend less than they receive in transfers and thereby reduce taxes. If the stimulation effect is found, it is expected that local authorities increase local tax effort. If the flypaper effect is existent, it is expected that local authorities decrease local tax effort. This study aims to test whether empirical analysis supports these theoretical predictions by using data gathered from Turkey. The rest of this paper is organised as follows. The

following section presents theoretical background. In section 3, a model is developed and estimated for investigating the research subject. Finally, concluding remarks are presented in section 4.

II. Theoretical Background

Even though local authorities may have the same tax capacities, they collect a different amount of tax, since some make more effort to raise tax than others. This is determined by the tax effort, which shows the extent to which a local authority makes use of its available tax base (Gold, 1986). If transfers stimulate tax effort, this grant programme might produce efficiency benefits. As a result, this policy could mobilise local taxes, which may make local governments less dependent on the central government for fiscal aid. Intergovernmental transfers could be used to stimulate local tax effort by rewarding those local authorities whose revenue collection, relative to their revenue bases, exceeds the national average and penalising those local authorities whose revenue collections fall below the national average.

In the empirical studies, mostly the relationship between local tax effort and grants is examined. It is assumed in these studies that central government grants to local authorities are a significant determinant of local tax effort. Local factors such as political will, administrative capacity and institutional framework are also determinants of local tax effort.[1]

In addition, local tax effort could be influenced by the impact of grants on local expenditures. The ways in which grants affect local expenditures are as follows. Intergovernmental transfers can affect the level of local expenditures. If a unit intergovernmental transfer induces more than a unit increase in local spending, it is termed as the stimulation effect. Intergovernmental transfers will have a substitution effect if local spending increases less than a unit of intergovernmental transfers. From the point of local tax effort, where the substitution effect is existent, lower local tax effort is expected as local authorities may spend less than they receive in transfers and thereby reduce taxes. If the stimulation effect is found, it is expected that local authorities may increase local tax effort. This is because local authorities may spend more than they receive in transfers.

In the empirical literature, the impact of local income and grants on local expenditures is compared. If lump sum grants have more stimulative effect on the level of public expenditures than local private income, this is termed as the flypaper effect.[2] The flypaper effect is the prediction that increases in transfers tend to stimulate more spending than do comparable increases in voter-taxpayer incomes (Turnbull, 1998).

The first argument that explains what causes the flypaper effect is fiscal illusion. In the fiscal illusion theory, the flypaper effect is a result of voter-taxpayer ignorance of fiscal illusion. Fiscal illusion has no implication in relation to local tax effort. This subject is therefore out of the remit of this study.

The second argument that explains what causes the flypaper effect is that bureaucrats cause the effect, which is called the bureaucratic model. In the bureaucratic model, the flypaper effect is a result of budget maximising behaviour by bureaucrats (or local politicians), who more easily spend a grant than ask for a tax increase. It is assumed that 'the bureaucrat acts strategically, releases distorted information, responds to budget cuts by cutting the most popular programs first, and inflates all budget requests' (Schwallie, 1989). The implication of the bureaucratic model explanation of the flypaper effect is that local authorities make lesser local tax effort since local managers rely on grants for financing their expenditures.

This section presented the basis of three predictions: (i) the substitution effect may lead to lesser local tax effort. (ii) The stimulation effect may lead to higher local tax effort. (iii) The flypaper

---

1 For instance, Sagbas (2001) found that institutional framework explains the variations in local tax effort rather than grants in the case study of Turkish grant system.

2 The studies on the flypaper effect are voluminous. Bradford and Oates (1971), Romer and Rosenthal (1979), Courant *et al.* (1979), Fisher (1982), Oates (1988), Becker (1996), Hines and Thaler (1995), and Levaggi and Zanola (2002) could exemplify these studies.

effect, according to the bureaucratic model, may lead to lesser local tax effort. In the following section, empirical evidence will be sought to find whether these predictions are acceptable.

III. Model

In the empirical literature the following equation is developed and estimated for investigating the substitution/stimulation effects (Inman, 1979) and the flypaper effect (Courant *et al,* 1979). The impact of transfers on local expenditures is investigated using the grant elasticity. In the conventional approach, the grant elasticity is estimated as follows. Local expenditures (EX) are hypothesised to be simple linear functions of per capita income (I) per capita intergovernmental transfers (G) various socio-economic characteristics (SES) and a normally distributed error term (u) (Inman, 1979). The grant elasticity (β2) indicates whether transfers have stimulation or substitution [3] impact on local expenditure.

$$EX_i = \beta_0 + \beta_1 I_i + \beta_2 G_i + \beta_3 SE_i + u_i$$

where

EX per capita local expenditures of jurisdiction i
I per capita local income of jurisdiction i
G per capita intergovernmental transfers of jurisdiction i
SE socio-economic variables
u_i random disturbance terms

The flypaper effect is investigated by comparing the effects of income (β_1) and transfers (β_2) on local expenditure. If $\beta_2 > \beta_1$, the parameter of lump-sum transfer exceeds the parameter of income, which indicates the flypaper effect. If $\beta_2 < \beta_1$, the parameter of lump-sum transfers is smaller than the parameter of income, which indicates no flypaper effect. The substitution/stimulation effect is investigated by comparing β_2 with 1. If $\beta_2 > 1$, the stimulation effect is existent. If $\beta_2 < 1$, it indicates the substitution effect.

Table 1: These propositions can be summarised in the following table:

condition	result	Implication	relation to local tax effort
If $\beta_2 > \beta_1$	The flypaper effect	The parameter of lump-sum transfer exceeds the parameter of income.	lesser local tax effort
If $\beta_2 > 1$	Stimulation effect	A unit intergovernmental transfer induces more than a unit increase in local spending.	higher local tax effort
If $\beta_2 < 1$	Substitution effect	Intergovernmental transfers have substitution effect with varying degrees according to the value of β_2. Transfers substitute local revenues.	lesser local tax effort
If $\beta_2 < 1$ and If $\beta_2 > \beta_1$	The flypaper effect and Substitution effect exist together	---	lesser local tax effort
If $\beta_2 > 1$ and If $\beta_2 > \beta_1$	The flypaper effect and Stimulation effect exist together	---	uncertain
If $\beta_2 = 0$	Substitution effect	The substitution is complete.	lesser local tax effort
If $\beta_2 = 1$	Neutral effect	Neither substitution nor stimulation effect is determined.	lesser local tax effort subject to existence of the flypaper effect

This study develops and estimates the following equation.

$$EXP_i = \beta_0 + \beta_1 GDP_i + \beta_2 RES_i + \beta_3 POP_i + \beta_4 PIR_i + \beta_5 URB_i + \beta_6 IND_i + \beta_7 IMR + u_i \quad (1)$$

where:

[3] Gramlich (1977, p.224) used the *grant displacement effect* instead of the substitution effect in order to avoid confusion with the price substitution effect.

EXP_i per capita local expenditure of province i
GDP_i per capita local GDP of province i
RES_i per capita revenue sharing (transfers/grants) of province i
POP_i population of province i
PIR_i population increase rate of province i
IND_i industry to local GDP of province i
URB_i urbanisation rate of province i
IMR_i immigration rate of province i
$EXRT_{it}$ local expenditure of province i/total local expenditures of Turkey
$GDPRT_{it}$ local GDP of province i/GDP of Turkey
$RESRT_{it}$ revenue sharing of province i/total revenue of province of i
u_i random disturbance terms

Equation (1) is estimated by using a cross-section data set. Per capita local GDP is used as a surrogate for per capita local income, since per capita income data are not available for municipalities. In addition to local GDP and transfers, some demographic-economic variables are included in the equation to control statistically the influence of these variables on local expenditures. Cross-sectional data of 66 provinces are used. The base year is 1997. In cross section analysis, provinces are divided into two groups according to their per capita local GDP. Data are gathered from the Statistics Institute of Turkey.

Devas (1988) points out that applying the regression method may not be appropriate for most developing countries, since it does not fully capture the considerable differences between well-developed and backward regions [4]. Due to this fact, separating provinces into poorer and richer in cross section examination implicitly tries to capture differences between well-developed and backward areas.

The tax effort ratio is defined as the ratio of locally collected revenues to a measure of local wealth. The formula of local tax effort is: [Local tax effort of jurisdiction$_i$ = collected revenue of jurisdiction$_i$/estimated revenue capacity of jurisdiction$_i$]. The formula can be modified according to measurement of local revenue capacity. Three methods are used in estimating 'the revenue capacity': macroeconomic approach (Clark, 1997; Barro, 1986), microeconomic approach (Bird and Slack, 1990) and the regression analysis (Bird and Wallich, 1992).[5] This study adopts the macroeconomic approach in estimating the revenue capacity due to data availability and its advantages. The general advantages of macroeconomic approach are that: first, it is independent of the actual tax systems of local governments and second, it is economically neutral (Clark, 1997). In the macroeconomic approach, the tax base is computed according to a macroeconomic indicator and the tax effort ratio is the collected municipal taxes to the total relevant income of the area where the municipality is located. For example, if local GDP is accepted as representing the total relevant income of the jurisdiction, the formula will be: [tax effort of jurisdiction$_i$ = collected tax of jurisdiction$_i$/local GDP of jurisdiction$_i$] in cross section analysis. By using this formula, local tax effort ratios are computed and then a local tax effort index is calculated.

IV. The Findings and Results

The estimation results of regression analysis are presented in table 1 and descriptive statistics of local tax effort ratio indices is presented in tables 2. Since the examinations of the flypaper, substitution and stimulation effects are based on the of values β_1 and β_2, the following null hypothesis are also tested:

H_0: $\beta_1 = \beta_2$
H_0: $\beta_1 = 1$
H_0: $\beta_2 = 1$

---

[4] Devas (1988) points out this issue for local expenditure research. It can be suggested that this issue should also be taken into account for a tax capacity analysis where regression is applied.

[5] Since macroeconomic and microeconomic approaches are not applied in this study, their details are beyond the aim of this study.

The results indicate that $\beta_1 \neq \beta_2$, $\beta_1 \neq 1$, $\beta_2 \neq 1$.

Table 1: The impact of grants on local expenditures

	Poorer provinces	Richer provinces
C	-25.9	-92.52
	(0.65)	(-0.59)
GDP	0.02	0.01
	(6.37)*	(2.19)*
TRA	0.93	1.70
	(10.74)*	(2.07)*
POP	-0.007	0.04
	(-0.26)	(2.95)*
PIR	-0.25	0.58
	(-0.33)	(0.33)
URB	-0.13	-0.39
	(-0.82)	(-1.10)
IND	0.19	-1.39
	(0.22)	(-1.73)**
IMR	0.11	0.01
(0.44)	(0.02)	
R^2	0.894	0.848
F Statistics	30.2	19.96
White Heteroskedasticity Test: Obs*R-squared	17.02***	19.85 ***
Observation number	33	33

Figures in brackets are t-statistics. * significant at the 5 percent level. ** significant at the 10 percent level. *** denotes that the hypothesis of homoskedasticity is accepted at the 5 percent level.

Table 2: Local tax effort ratio index descriptive statistics

	Poorer provinces	Richer provinces
Mean	202	273
Maximum	332	445
Minimum	91	125
Std. Deviation	60	73
Observation number	33	33

Table 3: Summary of findings

	Poorer provinces	Richer provinces
If $\beta_2 > \beta_1$, The flypaper effect	yes	yes
If $\beta_2 > 1$, Stimulation effect	no	yes
If $\beta_2 < 1$, Substitution effect	yes	no
Expected Tax effort	Lesser tax effort	Uncertain
Actual Tax effort	Lesser tax effort	Higher tax effort
Implication	Finding confirms expectation	Finding provides a new evidence

The findings in table 1 show that $\beta_2 > \beta_1$ in both poorer and richer provinces. The flypaper effect is existent in both cases. This implies that expenditures are increased by transfers more than equivalent increases in private income regardless of the wealth of provinces. However, the flypaper effect is stronger in richer provinces than poorer provinces since the comparison between the residual between β_2 and β_1 shows that this residual is higher in the former. It is found that the stronger the flypaper effect the higher the tax effort.

Duncombe (1996) suggests that, if the flypaper effect is existent, central government should have a policy of forecasting funds required and allocating transfers accordingly. For example, if many local governments experience a budgetary gap, there are two alternative options in the revenue side of the budget: a cutback in grant or an increase in local taxes. According to the flypaper effect theory, a

cutback in grant would be more effective in reducing a budgetary gap than an increase in local taxes, since expenditures are increased by transfers more than equivalent increases in private income. In contrast to this policy suggestion, it could be suggested that a cutback in grants may not reduce local expenditures significantly based on the finding of this study that is: 'the stronger the flypaper effect the higher tax effort'.

Table 1 shows that $\beta_2 < 1$ in poorer provinces. This indicates the substitution effect. Slack and Bird (1983) found the substitution effect (in which grants substitute for local revenue) in a case study of the Colombian transfer system. They suggest that, if the substitution effect is found, it may indicate that local authorities spend less than they receive in transfers and thereby reduce taxes (or tax effort). In line with Slack and Bird's suggestion, it could be suggested that local governments spend less than they receive and thereby reduce tax effort since the substitution effect is found in poorer provinces. The descriptive statistics in table 2 also confirms that poorer provinces make less revenue effort relative to richer provinces.

Table 1 shows that $\beta_2 > 1$ in richer provinces. The finding indicates the stimulation effect, which implies that municipalities that have higher per capita GDP make more revenue effort for financing local expenditures. The descriptive statistics in table 2 reveals the same finding.

IV. Concluding Remarks

The impact of intergovernmental transfers on local expenditures may create not only the flypaper effect but also the substitution/stimulation effects. These effects may have impact on local tax effort. The aim of this study is, therefore, to explain to what extent the stimulation/substitution and flypaper effects influence local tax effort.

This study presents empirical evidence that confirms the theoretical predictions that the substitution effect inhibits tax effort and the stimulation effect enhances tax effort. However, in contrast to theoretical prediction, local governments increase local tax effort in the existence of the flypaper effect.

Based on its findings, this study argues that local tax effort is also influenced by the impact of grants on local expenditures in addition to grants and local factors such as political will and administrative capacity. As a policy suggestion, a grant policy that aims to influence local tax effort should also take the impact of grants on local expenditures into consideration.

This study provides empirical evidence from a country where a grant system based on revenue sharing with population criteria has been practised more than 25 years. Per capita revenue sharing is equal for all municipalities and local tax rates are uniform. Municipalities have significant discretion both on local tax collecting[6](not rates) and non-tax revenues that counts more than %80 of local own revenues. The empirical evidence of this study may be consequence of these specific features of the Turkish grant system. The findings should, therefore, be taken into consideration cautiously. In future studies, the findings could be compared with other countries where similar grant systems are practised.

The previous literature concentrates more the causes of the flypaper effect rather than its consequences. This study looks at local tax effort consequence of the flypaper effect. Firstly, this study examines the impact of the flypaper effect on local tax effort. Secondly, unlike previous empirical research, it investigates the surge impact of the flypaper, substitution and stimulation effects on local tax effort. This is the main contribution of this study to general knowledge. It is found that if the flypaper and substitution effects exist together, local tax effort decreases as it is expected. If the flypaper and stimulation effects exist together, a higher local tax effort is observed.

One of the findings of this study is 'the stronger the flypaper effect the higher tax effort' that contradicts with the conventional wisdom. This finding implicitly suggests that the magnitude of the flypaper effect may alter its tax effort consequence.

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[6] No penalty is given to municipalities those not collecting local taxes properly.

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