The Flypaper Effect Revisited:
Intergovernmental Grants and
Local Governance

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ABSTRACT

Local governance arrangements shape the incentives of local actors, which may in turn influence fiscal choices. By emphasizing the role of local government institutions in local fiscal choices, we seek to bridge between median voter and Leviathan models prevalent in the literature. We then offer some preliminary evidence to support this explanation by empirically testing several propositions regarding the flypaper effect in intergovernmental grants. One limitation of the median voter model is that the model does not consider political institutions and their influences on government expenditures. In this study, we attempt to capture the influence of political dynamics in determining public expenditures by considering institutional

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variables. Test results show that the political institutional variables could be one of the explanation variables for the flypaper effect.

THE FLYPAPER EFFECT REVISITED: INTERGOVERNMENTAL GRANTS AND LOCAL GOVERNANCE

Like many fields of political science, urban politics has rediscovered institutions. The study of local government and administration is advantaged by a rich history of institutional work. Building upon this tradition we argue that local governance structures shape the incentives of local actors, which in turn influence fiscal choices. Recent work has examined the implications of government form for city borrowing and economic development. By extending this work to intergovernmental grants emphasizing the role of local governance institutions in local fiscal choices, we seek to bridge median voter and Leviathan models prevalent in the literature.

If constitutional-level rules affect outcomes, we should expect different responses to intergovernmental aid depending on the governance structures created in local government charters. Ostrom\(^1,2\) orders institutional rules in a hierarchy from constitutional level to collective choice level to operational level. Constitutional-level rules establish the overall rules of the game and lay out the basic system of governance. Form of government provisions, electoral schemes, and provisions for direct democracy are all examples of constitutional level rules.

Knott and Miller\(^3\) describe how the initial adoptions of these structures were shaped by expectations that changing the rules would change the outcomes in ways preferred by the initiators. Like any institution, cities’ constitutional-level rules create incentives for specific behaviors, provide stability to collective choices, minimize transaction costs, limit choices, affect policymakers’ behaviors and preferences, and provide incentives for political exchange.\(^4\)

Different forms of constitutional-level government structure provide different kinds of incentives such as high-powered-incentives and low-powered incentives. Some “high-powered” incentives produce benefits that can be directly realized by the actors. In markets, high-powered incentives lead to innovation and enhanced productivity, as entrepreneurs respond to the profit motive. In politics, high-powered incentives lead to political opportunism and rent-seeking, as actors seek personal advantage through public means.\(^5,6\) We hypothesize that different
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government forms give bureaucrats different incentives that influence what kinds of resources are preferred to increase government expenditures for their interests. By exploring the relationship between local government structure and the sensitivity of city expenditures to intergovernmental grants, we try to show that the intergovernmental grants’ stimulative effect on expenditures, the flypaper effect, is influenced by local governance structure.

MAYOR-COUNCIL GOVERNMENT VS. COUNCIL-MANAGER GOVERNMENT

Many Progressive-era municipal reforms were intended to eliminate the corruption of machine party politics, often by reducing politicians’ ability to deliver particular benefits through local spending. Reform proposals such as replacing patronage employment with merit system employment, separating the articulation of policy from the execution of policy, and substituting at-large elections for district elections were measures that limited elected officials’ abilities to reward supporters and punish opponents.[7,3] From a transaction costs perspective, these measures were institutional changes that replaced high-powered incentives with low-powered incentives.[5]

A common set of municipal reforms was proposed in an effort to create a “nonpolitical, essentially technical organization and management.”[8] One reform proposal was the council-manager form of government, in which an elected council and their employee, the manager, have distinct responsibilities that separate articulating from executing policy. The council establishes general policy and is accountable to the voters, much like a board of directors answers to the stockholders of a corporation. Policies are carried out by a city manager, who plays a role like the corporation’s CEO.

Council-manager government was seen as a substitute for a strong mayor system, where the elected mayor and her employees are responsible for policy making as well as for administration. Following the work of Banfield and Wilson,[9] Lineberry and Fowler[10] found empirical support for the proposition that council-manager government insulates governing from “private regarding” demands. The form of government embodied in the city charter works as a constitutional contract which reduces the transaction costs for citizens to influence public choices by defining the civil rights to have one’s preference included in the making of public decisions.[11–13] The institutional rules of the game in reform governments provide incentives for an emphasis on
citywide issues and constituencies and place constraints on politicization of fiscal issues. Conversely, in the unreformed context, the rules provide incentives for the emergence of narrow issues and constituencies and place constraints on the role of professional expertise in informing public decisions.\^[14,6\]

We suggest that when cities’ constitutional-level institutions create high-powered incentives, local fiscal behavior may more closely correspond to a Leviathan model of fiscal behavior. The Leviathan model of budget maximizing behavior argues that politicians and bureaucrats strategically pursue personal and political gain through increasing government expenditures. Under the mayor-council government, self-interested political actors have more reasons and means to pursue individual goals at the public expense.

On the other hand, when cities’ constitutional-level institutions create low-powered incentives, fiscal behavior is more likely to correspond to a median voter model, because political actors have fewer inducements and means of attaining individual goals at the public expense. These differences in city institutions lead to differences in our expectations of the effects of the influence of intergovernmental grants on spending. Specifically, we anticipate that the simulative effect of intergovernmental grants on spending associated with the “flypaper effect” will be confined primarily to communities operating under a mayor-council form of government.

**LOCAL FISCAL BEHAVIOR AND FLYPAPER EFFECT**

The median voter model is often employed to investigate the demand of local public goods.\^[15,16\] The median voter model describes the aggregated preferences of community residents by majority rule; the level of public goods provided by elected officials is determined by the preferences of the median voter. Empirical support for this formulation is provided by estimations of local tax and spending decision research based on the characteristics of the median voter’s economic characteristics. One of anomalies of the median voter model is the flypaper effect. According to economic theory, lump-sum grants should have the same effect on local government expenditures as the local government residents’ increase in income. But, empirical work reports that the response of local government expenditures to lump-sum grants has often been greater than the effect of equal increases in the income of residents. This is called the “flypaper effect.”
Explanations have been advanced for the flypaper effect based in a Leviathan model of budget maximizing behavior. Some work suggests the flypaper effect occurs because local officials use their monopoly power over budget information to increase their budgets.[17–20] But, other researchers argue that the flypaper effect is only the result of incorrect use of statistical methods.[21,22]

In studies of the flypaper effect, extant research has not differentiated between council-manager government and mayor-council government. Nevertheless, recent work has linked the impacts of state tax and expenditure limitations (TELs) to local form of government.[23] According to McCabe and Feiock, mayor-council cities have relied more on property taxes than the council-manager cities and are more constrained by TELs. They suggest that the Leviathan model be applied to mayor-council cities rather than council-manager cities. Following this logic, we might expect the flypaper effect will exist to a greater extent in mayor-council government than in council-manager government.

Varying kinds of grants are given from higher level governments to lower level governments. One of these grant types is lump-sum grants which are usually used for highways, health, education, manpower, and environmental programs.[24] According to economic theory, if lump-sum grants are given to lower level governments, the median voter’s share of the lump-sum grants is equivalent to his income increase. This means that lump-grants would have only an income effect.

To illustrate a lump-sum grant’s income effect, assume that bureaucrats and politicians implement policy according to the median voter’s preference. In Fig. 1, the median voter’s initial optimal choice is e1 and the median voter’s budget constraint is like the following:

\[ m = P_1 X_1 + P_2 X_2 \]
\[ X_2 = m/P_2 - (P_1/P_2)X_1 \]

where, \( m \) = median voter’s income, \( P_1 \) = median voter’s tax-price to supply that amount of local public goods, \( P_2 \) = the price of private goods, \( X_1 \) = the amount of local government’s public goods, \( X_2 \) = the amount of private goods, \(-P_1/P_2\) = the slope of the median voter’s budget constraint.

If lump-sum grants are given to local governments and distributed to residents in proportion to their property tax rate, the median voter’s
income would increase from $m$ to $m'$. The median voter’s share of the lump-sum grants is equal to an increase in his income of the same amount. This is called as “the lump-sum grant’s income effect.” The median voter’s marginal tax-price ($P_1$) is not influenced by lump-sum grants because lump-sum grants only shift the budget constraint upward. The median voter’s new budget constraint changes from $m/p_2 - m/p_1$ to $m'/p_2 - m'/p_1$, and he chooses local government expenditures at the level of $e_2$. If bureaucrats and politicians spend governmental budgets according to the median voter’s preference, new local government expenditures is determined at the level of $e_2$. For example, assume that five cents of an extra dollar of the median voter’s income is usually used for a program of school services. If one dollar of lump-sum grants is given to the local government, we would expect that the local government spends five cents for schools. Five cents of grant money is equal to the median voter’s extra one dollar of income influence on the program of school services.

Several studies have shown that lump-sum grants have a more stimulating effect on recipient government expenditures than resident income increases\[20,25,26\] i.e., the “flypaper effect.” Goodspeed\[27\] provides an example of the flypaper effect when one dollar of a lump-sum grants is given to the local government. “For instance, if a local government spends about five cents of an extra dollar of income on schools, one would expect that about five cents of an additional dollar of grant money received by that government would be used for schools, and the other $0.95 would be returned to taxpayers in the form of lower property taxes. A typical result of the empirical studies is that about $0.40 of the grant is used for local services, $0.60 being returned to taxpayers in the form of lower taxes.”\[28\]
There are two schools of thought on explaining the flypaper effect. First, supporters of the median voter theory argue that the flypaper effect is the result of mistakes in research methods. "This view arises from the belief that the public-choice process (voting) works to reflect perfectly the desires of various voters, or at least the decisive voter." Chernick argues that the lump-sum grants should be treated as an endogenous variable. When the grantor government chooses local government projects, the grantor government favors those projects where recipient governments are willing to spend a large amount of local government funds. The amount of the grant is determined by the amount of local government expenditures simultaneously. Chernick’s research implies that the intergovernmental grant should be treated as an endogenous variable, and appropriate statistical technique is Two-Stage Least Squares method or Three-Stage Least Squares method to investigate the intergovernmental grant effect on the government expenditures.

Moffit and Megdal argue that investigator’s inappropriate use of budget constraints in the model cause the appearance of the flypaper effect. In his research on the Aid to Families with Dependent Children (AFDC) program, Moffit develops an econometric method to measure the effect of piece-wise budget constraints and provides evidence that incorrect definition of the budget constraint causes the flypaper effect. Megdal’s argument is that with the piece-wise linear budget constraint the maximum likelihood method is preferred to the ordinary least squares method.

However, Wycoff tests Megdal’s and Moffitt’s suggestions by using Michigan state aid data from 1978–1979 and finds that their correction does not explain the flypaper effect. Turnbull also uses Three-Stage Nonlinear Least Squares method to test the flypaper effect with the 1980 general spending of all medium-size cities in five Midwestern states and still finds evidence of a flypaper effect.

Other scholars such as Oates argue that the flypaper effect is caused by budget maximizing bureaucrats’ hiding tax-price information. In Fig. 1, if the grantor government gives the lump-sum grant to the local government, and if the recipient government lets the median voter know how much benefits he receives from the lump-sum grant, the median voter’s choice changes from $e_1$ to $e_2$. This is the income effect of lump-sum grant. The lump-sum grant does not influence the median voter’s marginal tax-price ($P_1$). But, the median voter’s perceived tax-price is not the marginal tax-price but “the fraction of total costs covered by local tax collections; the voter thus uses an average tax-price.” The median voter’s perceived average tax-price...
can be expressed like following:

\[ P'_1 = \frac{(G - Z)}{G} \]

where, \( P'_1 \) = the median voter’s perceived average tax-price, \( G \) = the local public expenditure, and \( Z \) = the intergovernmental grant.

In Fig. 1, given the intergovernmental grants and the voter’s tax-price as an average tax-price, the median voter’s perceived tax-price is decreased from \( P_1 \) to \( P'_1 \), which is called the tax-price illusion. If there is tax-price illusion, the illusion makes the median voter think that his budget constraint has changed from \( m/P_2 - m/P_1 \) to \( m/P_2 - m/P'_1 \). The median voter’s optimal choice changes from \( e1 \) to \( e3 \). At \( e3 \), the median voter consumes more public goods than at \( e2 \). The decreased average tax-price induces the price effect as well as income effect. In other words, the median voter accepts higher local government expenditures than before the intergovernmental grants were given. Oates[17] argues that “the local government uses the grant funds to deceive voters (who possess less-than-complete information about the true cost of output) into agreeing to an excessively high level of output.”[32] Similar to Oates’ explanation on the flypaper effect, Filimon et al.[18] also argue that the flypaper effect is caused by budget maximizing behavior.

Filimon et al.[18] suggest the “grant-illusion” model to explain the flypaper effect. Their suggestion is that self-interested local bureaucrats hide intergovernmental grants from the voters. After voters decide the level of public goods and tax-price without recognizing the grants, the bureaucrats use the grants to augment local taxes. The flypaper effect occurred because budget maximizing bureaucrats use grant funding that voters were not aware of to increase overall spending.

Strumpf[19] also investigated the flypaper effect using the concept of the budget maximizing bureaucrat. High overhead indicates weak control over the local government’s fiscal decision by voters. Strumpf[19] finds that high overhead correlates with the flypaper effect. If the voters’ control over the government is weak, bureaucrats increase agency expenditures by using the intergovernmental grants.

Among the many approaches to explain the flypaper effect, one insufficiently investigated territory is the relationship between the flypaper effect and local governance institutions such as the council-manager government and mayor-council government. In council-manager government the council appoints the city manager who has the responsibility of managing the local government. The council has greater influence in budgeting than the mayor-council government’s council and also has legal right to fire the city manager. In the mayor-council government, the mayor
is elected at large and he has the responsibility for policy making and the
administration of government. The mayor-council government gives the
mayor more power over the city budget than the City Council. Recent
work by McCabe and Feiock\(^{23}\) shows that two kinds of governance types
have different fiscal policy and behaviors.

McCabe and Feiock\(^{23}\) investigated the effects of state tax and
expenditure limits (TELS\(_s\)) on the local government’s property tax reliance
taking into account the different institutional forms of local government.
Their research result implies that a Leviathan model is more likely to be
operative in mayor-council governments than council-manager govern-
ments. On the basis of McCabe and Feiock’s research, we anticipate that
the flypaper effect would be more evident in mayor-council government.
Since increasing public goods is a more visible achievement than reducing
taxes, we expect that mayors in mayor-council cities would like to use the
intergovernmental grants to expand the government expenditures rather
than reduce taxes.

EMPIRICAL ANALYSIS

Data

For this study, we examined medium-size cities (e.g., cities with
population between 75,000 and 800,000) located in US. Most of the data
are collected from 1994 County and City Data Book.\(^a\) The property tax
bases are collected from Census of Governments: Taxable Property Values
for 1992. Dollar values of different years are converted to 1990 dollar
values using Consumer Price Index (CPI). Data regarding the form of
government are obtained from Municipal Year Book for 1991. There 334
cities for which data are available from all three data sources. The number
of mayor-council cities is 113 and that of council-manager cities is 218.

The flypaper effect is specifically concerned with the lump-sum grants
but it is difficult to obtain lump-sum grant data because reported grants are

\(^a\) Even though 1994 County and City Data Book was published in 1994, most of
data were collected between 1990 and 1991. It is also worth to note why we do not
use recent data. 2000 County and City Data Book was published recently, but
some data for the median voter model were not reported. The property tax base
data were collected in 1991 while Census of Governments: Taxable Property
Values was published in 1992. In the case of 1991 Municipal Year Book, data for
the local governance were collected in 1990.
aggregated and not reported according to different kinds of grant
types. Because lump sum grants are a substantial component of grant
funds in this area, aggregated grants are to investigate the flypaper effect.
The hardest data to collect is the median voter’s tax-price, which is the
median voter’s property tax. The median voter’s tax-price is calculated by
taking the ratio of the median house value and total taxable property
values in the jurisdiction.\[16\] Definitions of the variables are reported in
Table 1.

\textbf{Table 1.} Variable definitions.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP</td>
<td>Local government general expenditures.</td>
</tr>
<tr>
<td>TS</td>
<td>Median house value divided by total property tax base in the jurisdiction.</td>
</tr>
<tr>
<td>INC</td>
<td>Median household income in the jurisdiction.</td>
</tr>
<tr>
<td>AID</td>
<td>Intergovernmental aid receipts.</td>
</tr>
<tr>
<td>POP</td>
<td>Jurisdiction population.</td>
</tr>
<tr>
<td>DENSITY</td>
<td>Jurisdiction population per square mile.</td>
</tr>
<tr>
<td>POVLE</td>
<td>Percent of persons below poverty level in the jurisdiction.</td>
</tr>
<tr>
<td>RENT</td>
<td>Percent of renters.</td>
</tr>
<tr>
<td>BLACK</td>
<td>Percent of black people in the jurisdiction.</td>
</tr>
<tr>
<td>AGE</td>
<td>Percent of persons above age 65 in the jurisdiction.</td>
</tr>
<tr>
<td>AIDMC</td>
<td>Interaction term between intergovernmental grants and governance type.</td>
</tr>
<tr>
<td>TAXBASE</td>
<td>Total property tax base in the jurisdiction.</td>
</tr>
<tr>
<td>MC</td>
<td>If the jurisdiction’s governance type is the council-manager type, we code MC as zero or if its type is the mayor-council type, we code MC as one.</td>
</tr>
<tr>
<td>STATE DUMMY</td>
<td>In the case of full sample, we include sixteen state dummy variables: AZ, CA, CO, CT, IL, IN, MA, MI, MN, NJ, NY, NC, OH, PA, VA, and WI. the state dummy variable for IA is dropped to save the degree of freedom. in the case of mayor-council data analysis, we include eleven state dummy variables except IA state dummy variable: CT, IL, IN, MA, MI, MN, NJ, NY, OH, PA, and WI. data for CA are excluded because these data only waste the degree of freedom. for council-manager city data analysis, we include thirteen state dummy variables except NJ state dummy variable: AZ, CA, CO, IL, IA, MA, MI, MN, NY, NC, OH, VA, and WI. Data for CT are excluded from the analysis because these data only decrease the degree of freedom.</td>
</tr>
</tbody>
</table>
To test the influence of institutions on the flypaper effect, we use the median voter model that assumes that the median voter owns the house with median value in the community, his house is his entire holding of real property, and he has the median income and pays the median tax-price in the community.\[16\]

Turnbull and Mitias\[16\] investigated whether the median voter model is applicable to state and county expenditures. They found that the median voter model is a useful model in describing local expenditures but not a useful model in explaining state and federal expenditures. They also compared four kinds of median voter models and chose the following median voter model specification which defeated other models in their tests. We use the following median voter model:

\[
\ln\text{EXP} = b_0 + b_1 \ln\text{TS} + b_2 \ln\text{INC} + b_3 \ln\text{AID} + b_4 \ln\text{POP} + b_5 \ln\text{DEN} + u_1
\]

where, \(\ln\) = log transformation, \(\text{EXP}\) = general expenditures, \(\text{TS}\) = the median value house divided by the total property tax base, \(\text{INC}\) = the median household income in the jurisdiction, \(\text{AID}\) = the intergovernmental grant, \(\text{POP}\) = the jurisdiction population, \(\text{DEN}\) = the population density, and \(u_1\) = stochastic error term.

Turnbull and Mitias\[16\] choose the best median voter model by using the Cox specification test, but the limitations of Cox specification test made them hesitant to add other control variables. If many independent variables are included in the test model, independent variables would exhaust residuals so that Cox specification test could not be conducted. Because of the limit of Cox specification test, they considered only a limited set of “crucial” independent variables. Because the Turnbull and Mitias’ model is so parsimonious model we include additional variables.

We add five independent variables to Turnbull and Mitias’ model: the percent of renters (\(\text{RENT}\)), the percent of persons above age 65 (\(\text{AGE65}\)), the percent of population below poverty level (\(\text{POVLE}\)), the percent of the population black (\(\text{BLACK}\)), and state dummy variables. The renter illusion hypothesis implies that renters, who bear property taxes indirectly, underestimate the tax price of public goods and demand higher public goods.\[34\] To treat the renter illusion hypothesis, we include the percent of renters. Bergstrom and Goodman\[15\] also argue that “the life cycle hypothesis would predict that persons over 65 years of age tend to spend a larger portion of their current income on current consumption than younger people.” A high percent of persons over 65 years would be
expected to increase government expenditures. The poverty level might influence the government expenditures because one of government’s roles is to reduce equity problem. But, the sign of coefficient is uncertain because governments sometimes hesitate to increase expenditures for low income residents.[35] Since the percent black or nonwhite have been frequently used as control variables in estimations of median voter models, we include the percent of the population black in the model. Previous research shows that high percent of black or percent of nonwhite influence the general expenditures positively.[15,36,37]

We also include state dummy variables in the median voter model. Since our data are cross sectional data, there would be individual effects. To correct individual effects, we include state dummy variables ($\Sigma STATEi$) representing the state in which community is located.

We include two institutional variables to test the form of government’s influence on the government expenditures and on the usage pattern of intergovernmental grants. One is a dummy variable that denotes the government type (MC): mayor-council cities vs. council-manager cities. The coefficient sign of government type (MC) would show which form of government spends more than another form of government after controlling for other variables. The other institutional variable is an interaction variable between the governance type and the intergovernmental grants (AIDMC). If the intergovernmental grants have more stimulating effect on the expenditures in mayor-council cities than in council-manager cities, the coefficient of interaction variable between the government type and the intergovernmental grant (AIDMC) would be significantly positive. The median voter model is as follows:

$$\ln EXP = b0 + b1 \ln TS + b2 \ln INC + b3 \ln AID + b4 \ln POP + b5 \ln DEN + b6 \ln POVLE + b7 \ln RENT + b8 \ln BLACK + b9 \ln AGE65 + b10 \ln AIDMC + b11 MC + \Sigma STATEij + u2$$ (2)

where, $\ln = \log$ transformation, $EXP = \text{general expenditures}$, $TS = \text{the median house value divided by the total property tax base}$, $INC = \text{the median household income in the jurisdiction}$, $AID = \text{the intergovernmental grant}$, $POP = \text{the jurisdiction population}$, $DEN = \text{the population density}$, $POVLE = \text{the percent of persons below poverty level in the jurisdiction}$, $RENT = \text{the percent of renters}$, $BLACK = \text{the percent of black people}$, $AGE65 = \text{the percent of persons above 65 in the jurisdiction}$, $AIDMC = \text{interaction term between the intergovernmental grant and the governance type}$, $MC = \text{if the government type is the mayor-council type}$, we code $MC$ as one, otherwise zero. $STATEij = \text{if}$
the jurisdiction \( i \) is located in state \( j \), we code \( \text{STATE}_{ij} = 1 \) and otherwise 0. \( u_2 \) = stochastic error term.

A likelihood ratio test is conducted to check whether or not institutional variables are crucial in explaining government expenditures. First, we ran the regression with Eq. (2) to obtain the log-likelihood value of unrestricted model. Then, after excluding two institutional variables, we ran the regression again to get log-likelihood value for the restricted model. The likelihood ratio test is conducted using the log-likelihood value for Eq. (2) and the log-likelihood value for the restricted model.

To compare the degree of the flypaper effect in two government types, we divide all data into two categories, the mayor-council city data and the council-manager city data. The test model for two data sets is as follows:

\[
\ln EXP = b_0 + b_1 \ln TS + b_2 \ln INC + b_3 \ln AID + b_4 \ln POP \\
+ b_5 \ln DEN + b_6 \text{POVLE} + b_7 \text{RENT} + b_8 \text{BLACK} \\
+ b_9 \text{AGE65} + \Sigma \text{STATE}_{ij} + u_3
\] (3)

We expect that the elasticity of grants for the mayor-council cities would be greater than that for the council-manager cities.\(^b\) If the flypaper effect is found, the elasticity of intergovernmental grants (\( b_3 \)) would be greater than that of median family income (\( b_2 \)), and the elasticity of grants for mayor-council cities would be higher than that for council-manager cities. Even if the flypaper effect is not found in two tests (mayor-council cities and council-manager cities), the intergovernmental grants would show more stimulating effects in mayor-council cities than in council-manager cities.

RESULTS

Table 2 presents the results of estimating Eq. (2) and Eq. (3) for local government’s general expenditures. The second column reports the estimation of Eq. (2) with full sample, and the third column report the estimation of restricted Eq. (2) with full sample. The next two columns report the estimation of Eq. (3) with two kinds of data (mayor-council city data and council-manager city data).

The results reported in the second column of Table 2 do not show evidence of a flypaper effect. Since the elasticity of median household

\(^b\)The coefficient is the elasticity since each variable is taken by log.
Table 2. Ordinary least squares estimates (dollar figures in constant [1990 = 100] values).

<table>
<thead>
<tr>
<th>Column (1)</th>
<th>Column (2)</th>
<th>Column (3)</th>
<th>Column (4)</th>
<th>Column (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Full sample</td>
<td>Full sample</td>
<td>MC sample</td>
<td>CM sample</td>
</tr>
<tr>
<td>Constant</td>
<td>−9.3107(^b)</td>
<td>−10.0141(^b)</td>
<td>−18.7190(^b)</td>
<td>−6.3191(^b)</td>
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<tr>
<td>(−5.0642)</td>
<td>(−5.4516)</td>
<td>(−5.2475)</td>
<td>(−2.9020)</td>
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<tr>
<td>lnTS</td>
<td>−0.1829(^b)</td>
<td>−0.1747(^b)</td>
<td>−0.1308(^b)</td>
<td>−0.2724(^b)</td>
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<tr>
<td>(−4.6530)</td>
<td>(−4.4202)</td>
<td>(−2.7424)</td>
<td>(−4.2040)</td>
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</tr>
<tr>
<td>lnINC</td>
<td>1.3106(^b)</td>
<td>1.3014(^b)</td>
<td>2.0799(^b)</td>
<td>1.0287(^a)</td>
</tr>
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<td>(7.9380)</td>
<td>(7.8164)</td>
<td>(5.3713)</td>
<td>(6.4220)</td>
<td></td>
</tr>
<tr>
<td>lnAID</td>
<td>0.5550(^b)</td>
<td>0.6384(^b)</td>
<td>0.8322(^b)</td>
<td>0.3155(^b)</td>
</tr>
<tr>
<td>(11.1440)</td>
<td>(16.3820)</td>
<td>(4.5773)</td>
<td>(6.4220)</td>
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<tr>
<td>lnPOP</td>
<td>0.2321(^b)</td>
<td>0.1857(^b)</td>
<td>0.0007(^b)</td>
<td>0.4427(^b)</td>
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<td>(3.2666)</td>
<td>(2.6759)</td>
<td>(4.2040)</td>
<td>(2.7424)</td>
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<tr>
<td>lnDEN</td>
<td>−0.0846(^b)</td>
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<td>−0.1376(^b)</td>
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<td>(−2.1374)</td>
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<td>(−1.7170)</td>
<td></td>
</tr>
<tr>
<td>POVLE</td>
<td>0.0169(^b)</td>
<td>0.0167(^b)</td>
<td>0.0299(^b)</td>
<td>0.0107(^b)</td>
</tr>
<tr>
<td>(2.6060)</td>
<td>(2.6040)</td>
<td>(1.3742)</td>
<td>(1.3742)</td>
<td></td>
</tr>
<tr>
<td>RENT</td>
<td>0.0118(^b)</td>
<td>0.0114(^b)</td>
<td>0.0124(^b)</td>
<td>0.0148(^b)</td>
</tr>
<tr>
<td>(5.7245)</td>
<td>(5.5037)</td>
<td>(6.3374)</td>
<td>(6.3374)</td>
<td></td>
</tr>
<tr>
<td>BLACK</td>
<td>0.0045(^b)</td>
<td>0.0045(^b)</td>
<td>0.0058(^b)</td>
<td>0.0048(^b)</td>
</tr>
<tr>
<td>(2.8047)</td>
<td>(2.7675)</td>
<td>(2.1604)</td>
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<tr>
<td>AGE65</td>
<td>0.0173(^b)</td>
<td>0.0149(^b)</td>
<td>0.0297(^b)</td>
<td>0.0189(^b)</td>
</tr>
<tr>
<td>(3.1048)</td>
<td>(2.6794)</td>
<td>(3.0627)</td>
<td>(3.0627)</td>
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</tr>
<tr>
<td>lnAIDMC</td>
<td>0.1033(^b)</td>
<td>0.0299(^b)</td>
<td>0.0299(^b)</td>
<td>0.0189(^b)</td>
</tr>
<tr>
<td>(2.6991)</td>
<td>(2.6991)</td>
<td>(2.6991)</td>
<td>(2.6991)</td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>−1.7581(^b)</td>
<td>−0.7484(^b)</td>
<td>−0.1376(^b)</td>
<td>−0.0723(^a)</td>
</tr>
<tr>
<td>(−2.7319)</td>
<td>(−2.7319)</td>
<td>(−2.7319)</td>
<td>(−2.7319)</td>
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<tr>
<td>Sample</td>
<td>334</td>
<td>334</td>
<td>113</td>
<td>218</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>−37.33</td>
<td>−42.39</td>
<td>0.9056</td>
<td>0.9032</td>
</tr>
<tr>
<td>R²</td>
<td>0.9056</td>
<td>0.9032</td>
<td>0.9451</td>
<td>0.8954</td>
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</tbody>
</table>

Notes:
1. Figures in parentheses are t-statistics.
2. “ln” denotes the log transformation.
3. "Significantly different from 0 at 10% level.
4. "Significantly different from 0 at 5% level.
5. CM sample: Council-manager city sample.
6. MC sample: Mayor-council city sample.
7. The standard errors are robust standard errors.
8. State dummy variables are not reported.
family’s income is greater than the elasticity of intergovernmental grants, there is no flypaper effect. Even though the flypaper effect is not found, the interaction term between the local government type and grants is significantly positive. It implies that mayor-council cities rely more on intergovernmental grants for the purpose of increasing government expenditures than council-manager cities do. If the flypaper effect is found in local government expenditures, it will be more strongly found in mayor-council cities than council-manager cities. While intergovernmental grants influence mayor-council government expenditures more than council-manager cities, the negative sign of the government type suggests that council-manager city expenditures be greater than mayor-council city expenditures after controlling other variables.

To test whether or not the institutional variables are crucial variables, likelihood ratio test is conducted. While the value of the likelihood with the full model (column 2) is $-37.32$, the likelihood value from the restricted model (column 3) is $-41.39$. The chi-square from these values is $8.14$ with two degree of freedom which is statistically significant at the 0.05 level. The likelihood ratio demonstrated that institutional variables are in fact crucial variables to explain local government expenditures.

In Table 2, if we compare test results of the mayor-council city data (column 4) with results from the council-manager city data (column 5), we find that mayor-council cities rely on residents’ incomes to increase government expenditures more than council-manager cities do. In mayor-council cities, the income elasticity of government expenditure is $2.0799$ but, in council-manager cities, the income elasticity of government expenditure is reduced to $1.0287$. Again the increase of resident’s income contributes to mayor-council city expenditures more than council-manager city expenditures.

By comparing the fourth column with the fifth column, we find that the elasticity of expenditures with respect to intergovernmental grants for mayor-council city is greater than that of council-manager city. The coefficient for aid is $0.8322$ for mayor-council cities, but that coefficient is $0.3155$ for council-manager cities. Intergovernmental grants stimulate mayor-council city expenditures more than council-manager city expenditures. This result strongly supports our hypotheses that the form of local government influences the flypaper effect.

In all tests the estimates of tax-price elasticity are significantly negative. These results are consistent with other studies. The percent of renters shows a relationship with government expenditures, which confirms the renter illusion. Population density has a significantly negative effect on government expenditures in all cases. This may indicate
that rapidly growing municipal governments do not supply enough public goods to their residents.\textsuperscript{[15]} The population, percent black, and the percent elderly have positive influences on local government expenditures. Population growth resulted in increased government expenditures to keep the pace with population growth. High percent black increased local government expenditures and high percent of persons over 65 years also increased government expenditures. But, in the case of mayor-council cities, the coefficient of population is not significant.

Another interesting finding is that the percent of population below the poverty level has significantly positive effect on mayor-council city expenditures, but does not have a significant effect on council-manager city expenditures. In mayor-council cities, the poverty populations appear to exert an influence on expenditure choices that is absent in council-manager cities.

**DISCUSSION**

Over the past decade, the flypaper effect has been an interesting research topic because it is an anomaly of the median voter model. If bureaucrats and politicians implement fiscal policy according to voters’ choices, intergovernmental grants have the same effect on the recipient government’s expenditures as an increase in the incomes of the recipient government’s residents. But, empirical research shows that the recipient government spends more to increase public goods with intergovernmental grants than with an equivalent increase in its residents’ incomes—the flypaper effect.

Without a richer understanding of the flypaper effect, using the median voter theory to model government expenditures is problematic. We have suggested that political incentives resulting from government institutions are key to understanding the flypaper effect. This approach builds on suggestions in the literature that political institutions should be integrated into the median voter theory.\textsuperscript{[26,39,40]} If the median voter model does not consider political institutions, we are left to accept the assumption that bureaucrats and politicians implement policy according to the median voter’s choices. This assumption seems to be too simple to reflect political environment in which local governmental budget decisions are made.\textsuperscript{[4]}

In this study, by including institutional variables in the median voter model, we try to show that the median voter model could explain Leviathan model of bureaucrats’ budget maximizing behavior and the
flypaper effect. This study implies that in order to explain the flypaper effect, two kinds of institutional variables could be considered in the median voter model: local government type and the interaction term between the government type and intergovernmental grants.

REFERENCES


—There has been research to explain bureaucratic monopoly model (or Leviathan model) using the median voter model. Holcombe[41] introduces articles which use the median voter model to explain bureaucrats’ budget maximizing behaviors. Wyckoff[36] also uses the median voter model to investigate budget maximizing behaviors. His study shows that bureaucratic monopoly model is matched with complicated capital budgets, but the median voter model is matched with the current budgets which are less complicated budget than capital budget.


Intergovernmental Grants and Local Governance


