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**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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43 variables. Test results show that the political institutional variables
44 could be one of the explanation variables for the flypaper effect.
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48 **THE FLYPAPER EFFECT REVISITED:**
49 **INTERGOVERNMENTAL GRANTS AND**
50 **LOCAL GOVERNANCE**
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52 Like many fields of political science, urban politics has rediscovered
53 institutions. The study of local government and administration is
54 advantaged by a rich history of institutional work. Building upon this
55 tradition we argue that local governance structures shape the incentives
56 of local actors, which in turn influence fiscal choices. Recent work has
57 examined the implications of government form for city borrowing and
58 economic development. By extending this work to intergovernmental
59 grants emphasizing the role of local governance institutions in local fiscal
60 choices, we seek to bridge median voter and Leviathan models prevalent
61 in the literature.

62 If constitutional-level rules affect outcomes, we should expect
63 different responses to intergovernmental aid depending on the govern-
64 ance structures created in local government charters. Ostrom^[1,2] orders
65 institutional rules in a hierarchy from constitutional level to collective
66 choice level to operational level. Constitutional-level rules establish the
67 overall rules of the game and lay out the basic system of governance.
68 Form of government provisions, electoral schemes, and provisions for
69 direct democracy are all examples of constitutional level rules.

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

77 Different forms of constitutional-level government structure provide
78 different kinds of incentives such as high-powered-incentives and low-
79 powered incentives. Some "high-powered" incentives produce benefits
80 that can be directly realized by the actors. In markets, high-powered
81 incentives lead to innovation and enhanced productivity, as entrepre-
82 neurs respond to the profit motive. In politics, high-powered incentives
83 lead to political opportunism and rent-seeking, as actors seek personal
84 advantage through public means.^[5,6] We hypothesize that different



85 government forms give bureaucrats different incentives that influence
86 what kinds of resources are preferred to increase government expendi-
87 tures for their interests. By exploring the relationship between local
88 government structure and the sensitivity of city expenditures to
89 intergovernmental grants, we try to show that the intergovernmental
90 grants' stimulative effect on expenditures, the flypaper effect, is
91 influenced by local governance structure.

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94 **MAYOR-COUNCIL GOVERNMENT VS.**
95 **COUNCIL-MANAGER GOVERNMENT**
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97 Many Progressive-era municipal reforms were intended to eliminate
98 the corruption of machine party politics, often by reducing politicians'
99 ability to deliver particular benefits through local spending. Reform
100 proposals such as replacing patronage employment with merit system
101 employment, separating the articulation of policy from the execution of
102 policy, and substituting at-large elections for district elections were
103 measures that limited elected officials' abilities to reward supporters and
104 punish opponents.^[7,3] From a transaction costs perspective, these
105 measures were institutional changes that replaced high-powered incen-
106 tives with low-powered incentives.^[5]

107 A common set of municipal reforms was proposed in an effort to
108 create a "nonpolitical, essentially technical organization and manage-
109 ment."^[8] One reform proposal was the council-manager form of
110 government, in which an elected council and their employee, the
111 manager, have distinct responsibilities that separate articulating from
112 executing policy. The council establishes general policy and is account-
113 able to the voters, much like a board of directors answers to the
114 stockholders of a corporation. Policies are carried out by a city manager,
115 who plays a role like the corporation's CEO.

116 Council-manager government was seen as a substitute for a strong
117 mayor system, where the elected mayor and her employees are
118 responsible for policy making as well as for administration. Following
119 the work of Banfield and Wilson,^[9] Lineberry and Fowler^[10] found
120 empirical support for the proposition that council-manager government
121 insulates governing from "private regarding" demands. The form of
122 government embodied in the city charter works as a constitutional
123 contract which reduces the transaction costs for citizens to influence
124 public choices by defining the civil rights to have one's preference
125 included in the making of public decisions.^[11-13] The institutional rules of
126 the game in reform governments provide incentives for an emphasis on



127 citywide issues and constituencies and place constraints on politicization
128 of fiscal issues. Conversely, in the unreformed context, the rules provide
129 incentives for the emergence of narrow issues and constituencies and
130 place constraints on the role of professional expertise in informing public
131 decisions.^[14,6]

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

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

153 LOCAL FISCAL BEHAVIOR AND FLYPAPER EFFECT

154
155 The median voter model is often employed to investigate the demand
156 of local public goods.^[15,16] The median voter model describes the
157 aggregated preferences of community residents by majority rule; the level
158 of public goods provided by elected officials is determined by the
159 preferences of the median voter. Empirical support for this formulation is
160 provided by estimations of local tax and spending decision research based
161 on the characteristics of the median voter's economic characteristics. One
162 of anomalies of the median voter model is the flypaper effect. According
163 to economic theory, lump-sum grants should have the same effect on
164 local government expenditures as the local government residents' increase
165 in income. But, empirical work reports that the response of local
166 government expenditures to lump-sum grants has often been greater than
167 the effect of equal increases in the income of residents. This is called the
168 "flypaper effect."



169 Explanations have been advanced for the flypaper effect based in a
170 Leviathan model of budget maximizing behavior. Some work suggests
171 the flypaper effect occurs because local officials use their monopoly
172 power over budget information to increase their budgets.^[17-20] But, other
173 researchers argue that the flypaper effect is only the result of incorrect
174 use of statistical methods.^[21,22]

175 In studies of the flypaper effect, extant research has not differen-
176 tiated between council-manager government and mayor-council govern-
177 ment. Nevertheless, recent work has linked the impacts of state tax
178 and expenditure limitations (TEs) to local form of government.^[23]
179 According to McCabe and Feiock, mayor-council cities have relied more
180 on property taxes than the council-manager cities and are more
181 constrained by TEs. They suggest that the Leviathan model be applied
182 to mayor-council cities rather than council-manager cities. Following this
183 logic, we might expect the flypaper effect will exist to a greater extent
184 in mayor-council government than in council-manager government.

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188 **INTERGOVERNMENTAL GRANTS AND**
189 **FLYPAPER EFFECT**
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191 Varying kinds of grants are given from higher level governments to
192 lower level governments. One of these grant types is lump-sum grants
193 which are usually used for highways, health, education, manpower, and
194 environmental programs.^[24] According to economic theory, if lump-sum
195 grants are given to lower level governments, the median voter's share of
196 the lump-sum grants is equivalent to his income increase. This means that
197 lump-grants would have only an income effect.

198 To illustrate a lump-sum grant's income effect, assume that bureau-
199 crats and politicians implement policy according to the median voter's
200 preference. In Fig. 1, the median voter's initial optimal choice is e_1 and
201 the median voter's budget constraint is like the following:

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$$m = P_1 X_1 + P_2 X_2 \text{ or } X_2 = m/P_2 - (P_1/P_2)X_1$$

203

204 where, m = median voter's income, P_1 = median voter's tax-price to
205 supply that amount of local public goods, P_2 = the price of private goods,
206 X_1 = the amount of local government's public goods, X_2 = the amount
207 of private goods, $-(P_1/P_2)$ = the slope of the median voter's budget
208 constraint.

209 If lump-sum grants are given to local governments and distributed to
210 residents in proportion to their property tax rate, the median voter's

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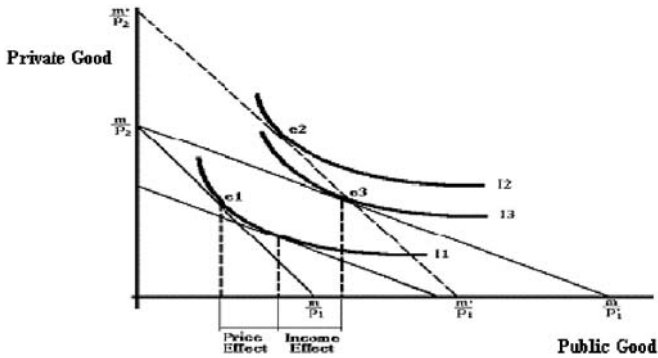


Figure 1. The effect of intergovernmental grants.

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]



253 There are two schools of thought on explaining the flypaper
254 effect. First, supporters of the median voter theory argue that the
255 flypaper effect is the result of mistakes in research methods. “This view
256 arises from the belief that the public-choice process (voting) works to
257 reflect perfectly the desires of various voters, or at least the decisive
258 voter.”^[29] Chernick^[21] argues that the lump-sum grants should be treated
259 as an endogenous variable. When the grantor government chooses local
260 government projects, the grantor government favors those projects where
261 recipient governments are willing to spend a large amount of local
262 government funds. The amount of the grant is determined by the amount
263 of local government expenditures simultaneously. Chernick’s research
264 implies that the intergovernmental grant should be treated as an
265 endogenous variable, and appropriate statistical technique is Two-Stage
266 Least Squares method or Three-Stage Least Squares method to
267 investigate the intergovernmental grant effect on the government
268 expenditures.

269 Moffit^[30] and Megdal^[22] argue that investigator’s inappropriate use
270 of budget constraints in the model cause the appearance of the flypaper
271 effect. In his research on the Aid to Families with Dependent Children
272 (AFDC) program, Moffit develops an econometric method to measure
273 the effect of piece-wise budget constraints and provides evidence that
274 incorrect definition of the budget constraint causes the flypaper effect.
275 Megdal’s argument is that with the piece-wise linear budget constraint the
276 maximum likelihood method is preferred to the ordinary least squares
277 method.

278 However, Wycoff^[31] tests Megdal’s and Moffitt’s suggestions by
279 using Michigan state aid data from 1978–1979 and finds that their
280 correction does not explain the flypaper effect.^[31] Turnbull^[20] also uses
281 Three-Stage Nonlinear Least Squares method to test the flypaper effect
282 with the 1980 general spending of all medium-size cities in five
283 Midwestern states and still finds evidence of a flypaper effect.

284 Other scholars such as Oates^[17] argue that the flypaper effect is
285 caused by budget maximizing bureaucrats’ hiding tax-price information.
286 In Fig. 1, if the grantor government gives the lump-sum grant to the
287 local government, and if the recipient government lets the median
288 voter know how much benefits he receives from the lump-sum grant,
289 the median voter’s choice changes from e_1 to e_2 . This is the income effect
290 of lump-sum grant. The lump-sum grant does not influence the
291 median voter’s marginal tax-price (P_1). But, the median voter’s
292 perceived tax-price is not the marginal tax-price but “the fraction of
293 total costs covered by local tax collections; the voter thus uses an
294 average tax-price.”^[32] The median voter’s perceived average tax-price



295 can be expressed like following:

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$$P'_1 = (G - Z)/G$$

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

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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.

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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.

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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.

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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



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337 is elected at large and he has the responsibility for policy making and the
338 administration of government. The mayor-council government gives the
339 mayor more power over the city budget than the City Council.^[33] Recent
340 work by McCabe and Feiock^[23] shows that two kinds of governance types
341 have different fiscal policy and behaviors.

342 McCabe and Feiock^[23] investigated the effects of state tax and
343 expenditure limits (TELs) on the local government's property tax reliance
344 taking into account the different institutional forms of local government.
345 Their research result implies that a Leviathan model is more likely to be
346 operative in mayor-council governments than council-manager govern-
347 ments. On the basis of McCabe and Feiock's research, we anticipate that
348 the flypaper effect would be more evident in mayor-council government.
349 Since increasing public goods is a more visible achievement than reducing
350 taxes, we expect that mayors in mayor-council cities would like to use the
351 intergovernmental grants to expand the government expenditures rather
352 than reduce taxes.

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EMPIRICAL ANALYSIS

Data

359 For this study, we examined medium-size cities (e.g., cities with
360 population between 75,000 and 800,000) located in US. Most of the data
361 are collected from 1994 County and City Data Book.^a The property tax
362 bases are collected from Census of Governments: Taxable Property Values
363 for 1992. Dollar values of different years are converted to 1990 dollar
364 values using Consumer Price Index (CPI). Data regarding the form of
365 government are obtained from Municipal Year Book for 1991. There are
366 334 cities for which data are available from all three data sources. The number
367 of mayor-council cities is 113 and that of council-manager cities is 218.

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



379 aggregated and not reported according to different kinds of grant
 380 types. Because lump sum grants are a substantial component of grant
 381 funds in this area, aggregated grants are to investigate the flypaper effect.
 382 The hardest data to collect is the median voter's tax-price which is the
 383 median voter's property tax. The median voter's tax-price is calculated by
 384 taking the ratio of the median house value and total taxable property
 385 values in the jurisdiction.^[16] Definitions of the variables are reported in
 386 Table 1.

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Table 1. Variable definitions.

Variable	Definition
EXP	Local government general expenditures.
TS	Median house value divided by total property tax base in the jurisdiction.
INC	Median household income in the jurisdiction.
AID	Intergovernmental aid receipts.
POP	Jurisdiction population.
DENSITY	Jurisdiction population per square mile.
POVLE	Percent of persons below poverty level in the jurisdiction.
RENT	Percent of renters.
BLACK	Percent of black people in the jurisdiction.
AGE	Percent of persons above age 65 in the jurisdiction.
AIDMC	Interaction term between intergovernmental grants and governance type.
TAXBASE	Total property tax base in the jurisdiction.
MC	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.
STATE DUMMY	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.



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MODEL SPECIFICATION

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:

$$\ln EXP = b_0 + b_1 \ln TS + b_2 \ln INC + b_3 \ln AID + b_4 \ln POP + b_5 \ln DEN + u_1 \tag{1}$$

where, \ln = log transformation, EXP = general expenditures, TS = the median value house divided by the total property tax base. INC = the median household income in the jurisdiction, AID = the intergovernmental grant, POP = the jurisdiction population, 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’s model: the percent of renters ($RENT$), the percent of persons above age 65 ($AGE65$), the percent of population below poverty level ($POVLE$), the percent of the population black ($BLACK$), 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



463 expected to increase government expenditures. The poverty level might
464 influence the government expenditures because one of government's roles
465 is to reduce equity problem. But, the sign of coefficient is uncertain
466 because governments sometimes hesitate to increase expenditures for low
467 income residents.^[35] Since the percent black or nonwhite have been
468 frequently used as control variables in estimations of median voter
469 models, we include the percent of the population black in the model.
470 Previous research shows that high percent of black or percent of
471 nonwhite influence the general expenditures positively.^[15,36,37]

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

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

489 $\ln EXP$
490
491 $= b_0 + b_1 \ln TS + b_2 \ln INC + b_3 \ln AID + b_4 \ln POP + b_5 \ln DEN$
492 $+ b_6 POVLE + b_7 RENT + b_8 BLACK + b_9 AGE65$
493 $+ b_{10} \ln AIDMC + b_{11} MC + \Sigma STATE_{ij} + u_2$ (2)
494

495 where, \ln = log transformation, EXP = general expenditures, TS = the
496 median house value divided by the total property tax base, INC = the
497 median household income in the jurisdiction, AID = the intergovern-
498 mental grant, POP = the jurisdiction population, DEN = the population
499 density, $POVLE$ = the percent of persons below poverty level in the
500 jurisdiction, $RENT$ = the percent of renters, $BLACK$ = the percent of
501 black people, $AGE65$ = the percent of persons above 65 in the
502 jurisdiction, $AIDMC$ = interaction term between the intergovernmental
503 grant and the governance type, MC = if the government type is the
504 mayor-council type, we code MC as one, otherwise zero. $STATE_{ij}$ = if



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505 the jurisdiction i is located in state j , we code $STATE_{ij} = 1$ and otherwise
506 0. $u_2 =$ stochastic error term.

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

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

518
$$\ln EXP = b_0 + b_1 \ln TS + b_2 \ln INC + b_3 \ln AID + b_4 \ln POP$$

519
$$+ b_5 \ln DEN + b_6 \ln POVLE + b_7 \ln RENT + b_8 \ln BLACK$$

520
$$+ b_9 \ln AGE65 + \Sigma STATE_{ij} + u_3$$
 (3)
521

522 We expect that the elasticity of grants for the mayor-council cities
523 would be greater than that for the council-manager cities.^b If the flypaper
524 effect is found, the elasticity of intergovernmental grants (b_3) would be
525 greater than that of median family income (b_2), and the elasticity of
526 grants for mayor-council cities would be higher than that for council-
527 manager cities. Even if the flypaper effect is not found in two tests
528 (mayor-council cities and council-manager cities), the intergovernmental
529 grants would show more stimulating effects in mayor-council cities than
530 in council-manager cities.
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534 **RESULTS**

535 Table 2 presents the results of estimating Eq. (2) and Eq. (3) for local
536 government's general expenditures. The second column reports the
537 estimation of Eq. (2) with full sample, and the third column report the
538 estimation of restricted Eq. (2) with full sample. The next two columns
539 report the estimation of Eq. (3) with two kinds of data (mayor-council
540 city data and council-manager city data).
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542 The results reported in the second column of Table 2 do not show
543 evidence of a flypaper effect. Since the elasticity of median household
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545
546 ^bThe coefficient is the elasticity since each variable is taken by log.



547 **Table 2.** Ordinary least squares estimates (dollar figures in constant [1990=100]
 548 values).

549	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)
550	Variable	Full sample	Full sample	MC sample	CM sample
551	Constant	-9.3107 ^b	-10.0141 ^b	-18.7190 ^b	-6.3191 ^b
552		(-5.0642)	(-5.4516)	(-5.2475)	Table 1: Variable definitions
553					(-2.9020)
554	lnTS	-0.1829 ^b	-0.1747 ^b	-0.1308 ^b	-0.2724 ^b
555		(-4.6530)	(-4.4202)	(-2.7424)	(-4.2040)
556	lnINC	1.3106 ^b	1.3014 ^b	2.0799 ^b	1.0287 ^b
557		(7.9380)	(7.8164)	(6.4220)	(5.3713)
558	lnAID	0.5550 ^b	0.6384 ^b	0.8322 ^b	0.3155 ^b
559		(11.1440)	(16.3820)	(16.6858)	(4.5773)
560	lnPOP	0.2321 ^b	0.1857 ^b	0.0007	0.4427 ^b
561		(3.2666)	(2.6759)	(0.0079)	(4.2604)
562	lnDEN	-0.0846 ^b	-0.0748 ^b	-0.1376 ^b	-0.0723 ^a
563		(-2.4253)	(-2.1374)	(-2.0704)	(-1.7170)
564	POVLE	0.0169 ^b	0.0167 ^b	0.0299 ^b	0.0107
565		(2.6606)	(2.6040)	(2.8413)	(1.3742)
566	RENT	0.0118 ^b	0.0114 ^b	0.0124 ^b	0.0148 ^b
567		(5.7245)	(5.5037)	(3.0228)	(6.3374)
568	BLACK	0.0045 ^b	0.0045 ^b	0.0058 ^b	0.0048 ^b
569		(2.8047)	(2.7675)	(2.5361)	(2.1604)
570	AGE65	0.0173 ^b	0.0149 ^b	0.0297 ^b	0.0189 ^b
571		(3.1048)	(2.6794)	(2.3290)	(3.0627)
572	lnAIDMC	0.1033 ^b			
573		(2.6991)			
574	MC	-1.7581 ^b			
575		(-2.7319)			
576	Sample	334	334	113	218
577	Log likelihood	-37.33	-42.39		
578	R ²	0.9056	0.9032	0.9451	0.8954
579					

580 Notes:

- 581 1. Figures in parentheses are *t*-statistics.
 582 2. "ln" denotes the log transformation.
 583 3. ^aSignificantly different from 0 at 10% level.
 584 4. ^bSignificantly different from 0 at 5% level.
 585 5. CM sample: Council-manager city sample.
 586 6. MC sample: Mayor-council city sample.
 587 7. The standard errors are robust standard errors.
 588 8. State dummy variables are not reported.



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589 family's income is greater than the elasticity of intergovernmental grants,
590 there is no flypaper effect. Even though the flypaper effect is not found,
591 the interaction term between the local government type and grants is
592 significantly positive. It implies that mayor-council cities rely more on
593 intergovernmental grants for the purpose of increasing government
594 expenditures than council-manager cities do. If the flypaper effect is
595 found in local government expenditures, it will be more strongly found in
596 mayor-council cities than council-manager cities. While intergovernmen-
597 tal grants influence mayor-council government expenditures more than
598 council-manager cities, the negative sign of the government type suggests
599 that council-manager city expenditures be greater than mayor-council
600 city expenditures after controlling other variables.

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

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

618 By comparing the fourth column with the fifth column, we find that
619 the elasticity of expenditures with respect to intergovernmental grants for
620 mayor-council city is greater than that of council-manager city. The
621 coefficient for aid is 0.8322 for mayor-council cities, but that coefficient is
622 0.3155 for council-manager cities. Intergovernmental grants stimulate
623 mayor-council city expenditures more than council-manager city
624 expenditures. This result strongly supports our hypotheses that the
625 form of local government influences the flypaper effect.

626 In all tests the estimates of tax-price elasticity are significantly
627 negative. These results are consistent with other studies.^[15,20] The percent
628 of renters shows a relationship with government expenditures, which
629 confirms the renter illusion.^[23,38] Population density has a significantly
630 negative effect on government expenditures in all cases. This may indicate



631 that rapidly growing municipal governments do not supply enough
632 public goods to their residents.^[15] The population, percent black, and the
633 percent elderly have positive influences on local government expendi-
634 tures. Population growth resulted in increased government expenditures
635 to keep the pace with population growth. High percent black increased
636 local government expenditures and high percent of persons over 65 years
637 also increased government expenditures. But, in the case of mayor-
638 council cities, the coefficient of population is not significant.

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

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DISCUSSION

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

659 Without a richer understanding of the flypaper effect, using the
660 median voter theory to model government expenditures is problematic.
661 We have suggested that political incentives resulting from government
662 institutions are key to understanding the fly paper effect. This approach
663 builds on suggestions in the literature that political institutions should be
664 integrated into the median voter theory.^[26,39,40] If the median voter model
665 does not consider political institutions, we are left to accept the
666 assumption that bureaucrats and politicians implement policy according
667 to the median voter's choices. This assumption seems to be too simple
668 to reflect political environment in which local governmental budget
669 decisions are made.^[4]

670 In this study, by including institutional variables in the median voter
671 model, we try to show that the median voter model could explain
672 Leviathan model of bureaucrats' budget maximizing behavior and the



673 flypaper effect.^c This study implies that in order to explain the flypaper
674 effect, two kinds of institutional variables could be considered in the
675 median voter model: local government type and the interaction term
676 between the government type and intergovernmental grants.
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709 ^cThere has been research to explain bureaucratic monopoly model (or Leviathan
710 model) using the median voter model. Holcombe^[41] introduces articles which use
711 the median voter model to explain bureaucrats' budget maximizing behaviors.
712 Wyckoff^[36] also uses the median voter model to investigate budget maximizing
713 behaviors. His study shows that bureaucratic monopoly model is matched with
714 complicated capital budgets, but the median voter model is matched with the
current budgets which are less complicated budget than capital budget.



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