THE IMPACT OF FEDERAL AND STATE GRANTS
ON LOCAL GOVERNMENT SPENDING: A TEST
OF THE FISCAL ILLUSION HYPOTHESIS

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ABSTRACT

In contradiction of the standard theory, empirical evidence indicates that unconditional grants have almost the same stimulatory impact on local government spending as matching grants. One explanation for this "flypaper" effect is the fiscal illusion hypothesis. If fiscal illusion increases with the degree of separation in taxing and spending powers, then federal unconditional grants ought to have a greater impact on local government spending than state unconditional grants. Data for the 136 counties and cities of Virginia are examined and evidence in support of this hypothesis is provided. Federal unconditional grants are observed to generate four times the level of local government expenditures as state unconditional grants, ceteris paribus.

The Impact of Federal and State Grants on Local Government Spending:

A Test of the Fiscal Illusion Hypothesis*

I. Introduction

The standard theory of the impact of intergovernmental grants on recipient government spending would suggest a much weaker stimulatory influence for unconditional grants than for matching grants [see Wilde (1971) and Oates (1972) for example]. The empirical evidence, however, indicates that unconditional grants stimulate recipient government spending to almost the same extent as matching grants [see Gramlich (1977)]. In general, the empirical findings suggest that "money sticks where it hits."

One explanation of this "flypaper" effect of grants is the fiscal illusion theory [see for example, Hewitt (1986), Oates (1979), West and Winer (1980), and Winer (1983)]. The primary hypothesis of the theory is that separation of taxing and spending powers blurs the local taxpayers' perception of the true tax cost of locally provided goods. The complex and indirect payment structure results in an underestimation of the costs of locally provided goods, resulting in increased demand for local government output. Grants from higher levels of government are perceived by the recipients to be partially paid for by residents of other localities despite the fact that the recipients, in turn, will be paying for part of similar grants to other localities; that is, the grants received are not perceived to be paid for by higher tax payments of equal value to the grantor government. Therefore the grants have both an income and price effect on the local demand for public goods. The resulting size

of the local public sector will be larger than would occur under a system of fiscally independent localities.

This paper offers further evidence in support of the fiscal illusion hypothesis. As the hypothesis is based on the assumption that separation of taxing and spending powers distorts the taxpayers' perception of the true cost of locally provided goods, it predicts that federal grants will have a greater impact on local spending than would state grants. The federal/local relationship involves greater separation in tax and spending power than that of the state/local relationship. The complexity and extent of indirectness in the structure of financing local public goods would be greater for a federal tax/grant scheme than for a state tax/grant scheme. Furthermore, a taxpayer's perceived tax cost share of a federal grant would be less than that of a state grant due to the fact that the cost is spread over a greater population. To test this hypothesis, the differential impact of federal and state grants on local government expenditures is examined.

The next section outlines a simple theory of local budget determination. Section III presents the results of empirical tests of the hypothesis and Section IV summarizes the paper.

II. The Theory

The impact of intergovernmental grants is considered within a Downsian model of utility-maximizing local politicians [see Grossman (1987) for a complete exposition of the model]. The politician is assumed to be solely interested in maximizing the likelihood of being elected or reelected. The local voter is assumed to be a rational utility maximizer, casting

his vote for the politician who he believes will maximize his net benefits. Expenditures and taxes are the two policy tools available to the politician for attracting the support of the voters, with voters assumed to respond favorably to expenditures and unfavorably to taxes.¹

The politician presents to the voters the budget she assumes will maximize the expected number of votes that will be cast in her favor. The budget is comprised of the most productive (in terms of votes generated) expenditures and the least harmful taxes (in terms of the votes lost). The size of the budget will be such that the marginal vote gain (MVG) from the last dollar of expenditures equals the marginal vote loss (MVL) from the last dollar of taxes collected. As illustrated in Figure 1, the optimal budget, in a world with no intergovernmental grants, is

$$E_0 = T_0.$$

It should be noted here that the MVG and MVL functions facing the local politician are drawn for constant levels of federal and state taxation and expenditures. If a higher level of government increases the taxes it levies, this will alter the voters' demand for local public goods, shifting the MVG function, and/or the voters' willingness to pay local taxes, shifting the MVL function. We assume that intergovernmental grants are financed exclusively by increased taxation and that the voters' response to this increased taxation is reflected totally in shifts in the MVL function.²

Consider now how intergovernmental grants will affect the optimal size of the local government budget. First assume no fiscal illusion, that is voters are fully aware of the true cost of local public goods whether financed by local taxes or by increased taxation and intergovernmental

grants from higher levels of government. In this case, increased taxation by the state government, for example, will result in a shift to the left in the local MVL function by the amount of the increase in state taxes of G dollars, from MVL_0 to MVL_1 (see Figure 2). Increased state taxes make voters less agreeable to local taxes; the marginal vote loss of each dollar of local taxes collected is now greater. If the increased state tax revenue are now returned in full to the locality in the form of unconditional grants, the MVL function will shift back to the right.

The MVL function will not return to its original position unless the state taxes are nondistortionary lump sum head taxes and the grant is employed, by the local government, in the same manner as the locally raised revenue it replaces. State taxes other than lump sum head taxes generate substitution effects in local residents' consumption choices and equal value grants are unable to return the residents to their pretax level of utility. To focus exclusively on the implications of fiscal illusion, it is assumed that state taxes are levied in such a way as to have no substitution effects, only income effects; that intergovernmental grants are unconditional; and local government expenditure patterns are unaffected. Therefore, the MVL function shifts back to its original position, MVL_0 , and the optimal sized local budget would be unchanged.

If the local voters suffer from fiscal illusion, then the increased burden of state taxation is not fully realized; that is, the local voter perceives that some portion of the intergovernmental grants is free, paid for by voters of other localities. As a result, the increase in state taxation shifts the MVL function left by some amount less than G . The MVL function shifts parallel to the left by $(1 - \alpha)G$ from MVL_0 to MVL_2 ;

where α is a measure of the extent of fiscal illusion suffered, $\alpha \geq 0$, reflecting the perceived increase in state taxation. When the taxes are returned to the locality in the form of grants, the MVL function shifts back to the right by the full amount of the grant as in the no fiscal illusion case. The effect of the grants is to shift the MVL parallel to the right by G , for a net shift right of αG , to $MVL(G)$. As α increases, a greater percentage of G is perceived by local voters to be tax free, paid by voters of other localities.

As a result of the grants, the optimal local budget increases from $E_0 = T_0$ to $E_1 = T_1 + \alpha G$. Local expenditures increase by $E_1 - E_0$ while local taxes fall by $T_0 - (T_1 + (1 - \alpha)G)$. In effect, $T_0 - T_1$ of the tax reduction is financed out of the grant with the remaining $(1 - \alpha)G$ being an offset to the perceived increase in state taxation. It is evident that the greater is α and the greater the slope of the MVL function relative to the slope of the MVG function, the greater is the impact of a dollar of intergovernmental grants on local government expenditures.

The differential effects of federal and state intergovernmental grants result from the different values of α applicable to federal and state taxes. That is, if the degree of fiscal illusion experienced by local voters is greater for federal taxes than for state taxes, then, other things equal, federal grants will have a corresponding α which is greater than the α corresponding to state grants and therefore the impact of federal grants on local expenditures will be greater.

Although it is impossible to state unequivocally that the α for federal grants exceeds that for state grants, it is hypothesized that this

is so. Though the federal government tends to rely more heavily on the direct personal income tax, one of the state governments' primary indirect taxes, the sales tax, is typically levied at point of sale, thereby lessening the voters' uncertainty regarding their tax burden. The federal government makes considerable use of the corporation tax and indirect taxes such as excise and custom duties that are not levied at point of sale. The employers' contribution for social security further clouds the federal tax burden picture, as does the federal government's ability to shift taxes into the future through deficit spending and to levy an inflation tax by printing money. In 1981, approximately 42 percent of total federal outlays were financed by indirect taxes while approximately 30 percent of total state and local own-source finances were from indirect taxes [U.S. Department of Commerce (1986, Tables 438 and 480)].³ Finally, the magnitude of α also depends on how much of the grant the residents think is actually paid for by others. This is likely to be greater for federal grants than for state grants because, at the federal level, there is a greater number of other localities contributing to total revenue. Any locality is going to be a much less significant factor at the federal level than at the state level.

III. Empirical Evidence

To test the hypothesis that federal grants will have a greater impact on local government expenditures than state grants, data for the 136 counties and cities of Virginia are examined. An advantage of the Virginia data is that there is no overlapping across jurisdictions of government functions; each locality has independent revenue-raising and

expenditure powers and responsibilities. The data are drawn primarily from Virginia Auditor of Public Accounts (1982). All data are for the period 1980-81 with the exception of Census data which are for 1979. Summary data and data sources are reported in the Appendix Table.

Two equations are estimated. The first tests for the impact of total unconditional grants (federal and state) on total expenditures, while the second tests for the differential impact of federal and state unconditional grants:

$$(1) E_m = E_1(UGT_m, CGT_m, Y_m, TX_m, U_m) \text{ and}$$

$$(2) E_m = E_2(UGF_m, UGS_m, CGT_m, Y_m, TX_m, U_m)$$

where

E_m = local government m's total expenditures;

UGT_m = total (federal plus state) unconditional grants made to local government m;

UGF_m = federal unconditional grants made to local government m;

UGS_m = state unconditional grants made to local government m;

CGT_m = total (federal plus state) categorical grants made to local government m;⁵

Y_m = median household income in community m;

TX_m = tax price share of the citizen with the median income for community m; and

U_m = percentage of population in community m living in urban areas.

A linear functional form is assumed. All dollar value variables are normalized by population.⁶

The variables CGT_m , Y_m , TX_m , and U_m are control variables. CGT_m controls for the impact of categorical grants on local government expenditures. The standard theory and empirical evidence argue that increases in categorical grants will lead to increased local government expenditures. Categorical grants would have the effect of shifting right and/or flattening the MVL function. For a given MVL function, this would represent an increase in the optimal budget size. Y_m controls for the Wagner's Law effect. Increases in income would tend to shift the MVL function and/or flatten it. For a given MVL function, this would lead to an increase in the optimal budget. TX_m , defined as the ratio of property tax paid on a house of median value to total property tax revenue, controls for variations in the tax price of locally provided goods across communities.⁷ Higher tax prices will be observed in a shift left in the MVL and/or a move out along the function into a steeper region. In either case, the impact of grants on expenditures will be lessened. Finally, U_m controls for taste differences between rural and urban voters. Traditionally, it has been assumed that urban voters have a greater demand for locally provided goods than do rural voters, indicated by a higher and/or flatter MVL function in urban areas than rural areas.

Table 1 reports the regression results. Consider first the four control variables. For all four variables and in both equations (1) and (2), the signs of the coefficients are as expected and the coefficients for CGT , Y , and U are significant at the 5 percent level. Categorical grants increase expenditures by \$0.64 for every \$1.00 of grants.⁸ The income elasticity of locally provided goods, estimated for mean values of the variables, is 0.4. A percentage point increase in a locality's degree

of urbanization adds approximately \$1.60 per capita to local government expenditures.

Turn now to the unconditional grants variables. In total, unconditional grants increase local government expenditures by approximately \$2.70 for every \$1.00 of grants.⁹ A distinct difference in the respective impact of unconditional grants is evident when they are disaggregated into their separate federal and state components. Each \$1.00 of federal unconditional grants increases total expenditures by \$4.37. State grants have only one-fourth the impact, increasing expenditures by \$1.09 for each dollar of grants. This evidence strongly suggests that the fiscal illusion effect is greater for federal grants than for state grants. To provide further support for this conclusion, the hypothesis:

$$(3) \text{ } H_0: c_1 = c_2 \text{ vs. } H_a: c_1 \neq c_2,$$

was tested. c_1 is the coefficient for UGF and c_2 is the coefficient for UGS. The null hypothesis was rejected at the 1 percent level, $F(1, 129) = 20.75$, supporting the conclusion that there is a significant difference between the impact of federal unconditional grants and state unconditional grants. The fiscal illusion hypothesis is the only hypothesis on the impact of grants on recipient government spending that is consistent with this finding.¹⁰

Finally we considered whether there might be any institutional generated variations in the impact of grants between the, in general, more urban cities and the more rural counties. The sample was divided into the two subsamples of the forty-one cities and ninety-five counties and equations (1) and (2) were estimated for each. The results are reported

in Table 2. Columns (1) and (2) report the results for the subsample of cities and columns (3) and (4) report the results for the subsample of counties. A Chow test was performed to determine if the estimated coefficients for the subsample of cities differed significantly from those estimated for the subsample of counties. For both equations, the null hypothesis of no difference was rejected at the 5 percent level with estimated F-statistics of $F(6, 124) = 2.55$ and $F(7, 122) = 2.24$ for equations (1) and (2), respectively.

Examining the coefficients for UFG and USG for the two subsamples, it is evident that there is only a marginal difference in the stimulatory effects of federal and state grants for the cities. However, for the counties, federal grants have four times the impact on local expenditures as do state grants. This is varified by a test of the hypothesis:

$$(4) \text{ } H_0: c_1 = c_2 \text{ vs. } H_a: c_1 \neq c_2.$$

Though $c_1 > c_2$ in both cases, as hypothesized, the null hypothesis was rejected at the 5 percent level or better only for the county estimates. Thus there does appear to be some unexplained institutional reason that counties are more susceptible to the fiscal illusion effect than are cities.¹¹

IV. Conclusion

This paper offers support for the fiscal illusion hypothesis of the impact of intergovernmental grants. The hypothesis suggests that the separation of taxing and spending powers results in local taxpayers underestimating the cost of intergovernmental grants. This leads to a local public sector larger in size than would result in the absence of

grants. If the degree of fiscal illusion increases with the degree of separation between the taxing government and the spending government, then federal unconditional grants should have a greater impact on local expenditures than state unconditional grants.

Evidence for the counties and cities of the State of Virginia supports this hypothesis. Federal unconditional grants have four times the impact of state unconditional grants. Every dollar of federal grants increases local spending by approximately \$4.00, while a dollar of state grants increases local spending by only \$1.00.

Finally, there appears to be some institutional difference in the response of counties and cities to intergovernmental grants. Counties appear to be more susceptible to the fiscal illusion effect.

FOOTNOTES

- * I thank Cliff Walsh and John Knapp for their helpful comments.
1. It is assumed that deficit financing is essentially equivalent to taxation--with or without fiscal illusion.
 2. The assumption that grants are financed by increased taxation alone is consistent with the standard grants models of Oates (1972) and others. If grants were partially or fully funded by reduced expenditures on the part of the grantor government then the impact of the grants would depend on the substitutability of grantor and recipient government expenditures and the relative degree of fiscal illusion for taxation and expenditures.
 3. At the federal level, the following categories were classified as indirect taxes: federal deficit, corporation income taxes, one-half social insurance taxes and contributions, excise taxes, and custom duties. For state and local governments, the following categories were classified as indirect taxes: corporate income taxes, utility and liquor stores, and insurance trust revenues.
 4. This is correct with the exception of six county-city combined school systems. Expenditure and grant information is, however, reported separately. The six county-city combinations are: Bedford County/Bedford City; Fairfax County/Fairfax City; Greenville County/Emporia City; Halifax County/South Boston City; James City County/Williamsburg City; and Roanoke County/Salem City.

FOOTNOTES (con't.)

5. Categorical grants are grants designated for a specific use by the recipient governments. These grants may or may not be subject to matching provisions.
6. The equations were initially estimated including a population variable, but it was found to be insignificant and was dropped from the equation. There was no significant change in the estimates of the remaining coefficients.
7. The definition of TX is that employed by Bergstrom and Goodman (1973) for their tax share variable.
8. The relatively low value of the coefficient for CGT reflects the dominant influence of education expenditures and grants. Expenditures on education accounted for, on average, 65 percent of the total and categorical grants for education accounted for, on average, 75 percent of total categorical grants. Reestimating the regressions for noneducation data has little effect on the control variables but the coefficient for CGT more than doubles in magnitude. This suggests that the matching provisions imposed on education grants, if there were any, were nonbinding relative to those imposed on categorical grants for other functions.
9. The unusually high stimulatory impact of unconditional grants, relative to that for categorical grants, may be due to the relatively minor role they play in local government finances. On average, unconditional grants account for approximately 6 percent of total

FOOTNOTES (con't.)

local expenditures, while categorical grants account for approximately 50 percent.

10. The standard theory suggests no difference in the impact of federal and state unconditional grants. The only other theory put forward to explain the unusually high stimulatory impact of unconditional grants is McGuire's (1973) model of utility maximizing bureaucrats. However, McGuire's theory does not suggest any reason why bureaucrats should systematically treat federal unconditional grants differently from state unconditional grants.
11. There are a number of possible differences between cities and counties that might help to explain these results [see Knapp and Grossman (1979) for a more complete discussion]:
 - (1) With the exception of Arlington and Henrico, counties have no responsibility for highways. The state government is responsible for the construction and maintenance of all secondary roads in the counties. The cities share responsibility for primary roads within their boundaries with the state and receive state grants to assist with their maintenance;
 - (2) For some programs, Health in particular, the level of expenditures and the pattern of grant allocation across localities reflects historical factors. Localities, primarily the cities, which expressed a willingness to provide matching funds when the programs were first initiated continue to receive a disproportionate share of

FOOTNOTES (con't.)

the state's grant dollar. In 1976-77, state grants accounted for an average 67 percent of total local Health program expenditures. Though there was little difference in this figure between the forty-one cities and the ninety-five counties, the cities received 50 percent of total state grants; and

(3) Finally, in addition to highways and health, there are other areas of differences in government responsibilities and the availability of state grant dollars between the cities and counties. These include law enforcement and mental health.

TABLE 1
REGRESSION RESULTS

<u>Variable</u>	<u>Estimated Coefficients</u>	
	<u>Equation (1)</u>	<u>Equation (2)</u>
UGT	2.69* (7.83)	
UGF		4.37* (8.94)
UGS		1.09* (2.29)
CGT	0.64* (5.73)	0.51* (4.67)
Y	0.02* (7.23)	0.02* (8.95)
TX	-116430.00 (1.54)	-65122.00 (0.91)
U	1.62* (8.44)	1.17* (5.76)
CONSTANT	6.01 (0.11)	-42.57 (0.82)
R ²	0.72	0.76
F-stat	65.98	66.79
S.E.E.	81.54	75.97

Notes: absolute value of t-statistic in parentheses.

* - significant at the 5 percent level, two-tailed test.

TABLE 2
REGRESSION RESULTS FOR SUBSAMPLES OF CITIES AND COUNTIES

Variable	Estimated Coefficients			
	(1)a	(2)a	(3)b	(4)b
UGT	3.21* (3.98)		2.51* (6.69)	
UGF		3.33* (3.16)		4.78* (8.82)
UGS		2.89 (1.45)		1.11* (2.64)
CGT	0.36+ (1.87)	0.35+ (1.70)	0.87* (6.38)	0.71* (5.69)
Y	0.02* (4.74)	0.02* (4.47)	0.02* (5.79)	0.02* (7.83)
TX	-234980.00+ (1.86)	-229400.00+ (1.74)	-57498.00 (0.53)	-16504.00 (0.17)
U	6.12 (1.63)	5.95 (1.51)	1.21* (2.91)	0.87* (2.35)
CONSTANT	-458.61 (1.18)	-445.67 (1.12)	-65.71 (1.01)	-114.39+ (1.98)
R ²	0.58	0.58	0.65	0.73
F-stat	9.79	7.94	32.93	40.31
S.E.E.	94.64	95.98	71.58	62.76

Notes: a - results for subsample of cities (N = 41).
b - results for subsample of counties (N = 95).
absolute value of t-statistic in parentheses.
* - significant at the 5 percent level, two-tailed test.
+ - significant at the 10 percent level, two-tailed test.

APPENDIX TABLE
SUMMARY STATISTICS AND DATA SOURCES

<u>Variable</u>	<u>Symbol</u>	<u>Mean</u>	<u>S Dev</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Source</u>
Total Expenditures+	E	579.11	150.50	372.76	1,042.00	CR
Unconditional Grants+						
Total	UGT	35.32	22.56	10.54	174.86	CR
Federal	UGF	27.63	17.18	6.66	86.48	CR
State	UGS	7.69	14.32	2.72	162.31	CR
Categorical Grants+	CGT	281.79	65.40	85.96	558.82	CR
Median Household Income	Y	15,460	3,627	9,930	30,011	CF
Tax Price*	TX	0.0001	0.0001	0.000004	0.0005	CH, TX
Urbanization#	U	41.32	43.44	0.00	100.00	CF

Notes: + - per capita.
 * - defined as the ratio of the property tax paid on median value house to total property taxes collected.
 # - defined as the percentage of total population residing in an urban area.
 CR - Virginia Auditor of Public Accounts (1982).
 CF - U.S. Department of Commerce (1983).
 CH - U.S. Department of Commerce (1982).
 TX - Virginia Department of Taxation (1983).

FIGURE 1

FIGURE 2

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