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A common rationale in allocating government grants and aid is income redistribution. Consider receipts by individuals for example. Under a host of programs, economic hardship is a necessary and often sufficient condition for receiving benefits. A second major beneficiary category for federal and state aid is municipalities and localities. There again equity considerations frequently affect grant receipts, although purely demographic factors such as population can also influence the level of assistance. Considered together, one would expect disbursements across these two broad aid categories to be explained by varying economic and demographic factors consistent with the intended equity rationale. Recently, however, economists have begun to question the primacy of the proffered redistributive motive. They suggest instead that political influence vested in committee assignments, chairmanships, and legislative tenure accounts significantly, if not exclusively, for the allocation of federal grants across states. At present, the empirical support for this hypothesis is growing, but neither overwhelming nor without its critics. Perhaps the fairest assessment of the empirical literature on this issue is that it is in its incipiency.

The present paper offers an extension of the empirical research conducted up to this point. Previous studies verifying the political influence hypothesis have dealt with the flow of federal dollars across states. However, no research to date has traced the distribution of federal/state monies to the ultimate recipients, localities within the states. This extended focus is important because varying locality traits,

conceivably lost in aggregated state data, may be the more appropriate testing ground for distinguishing the effects of political influence from deliberate policy criteria in grant disbursements. Using data for the Commonwealth of Virginia, this paper examines whether political or policy variables better explain grant receipts at two separate levels: (1) state allocations to localities; and (2) federal allocations to localities.

Section I contains a brief review of the empirical literature. Section II introduces the data and describes the model and estimation procedure. The empirical results are presented in Section III. Section IV discusses the implications of our findings for policy as well as for past and future empirical studies in this area.

I. The Politics of Grant Receipts Literature

Stigler was the first to model the relationship between political power and economic assistance.[1] Using the distribution of federal grants and non-defense employment across states as measures of legislator performance, Stigler estimated the relative effectiveness of senators versus house representatives. His results indicated that two senators are roughly equal to a state's entire house delegation in terms of securing federal grants and almost two and one-half times more productive in garnering employment dollars for their state. As Stigler noted, however, these estimated weights were not robust. Furthermore, the model itself was rather simplistic.

A conceptual improvement within the Stigler prototype was introduced by Crain and Tollison.[2] They stressed that Stigler's specification was implicitly a "one man-one vote" model and thus ignores the likely relationship between congressional tenure and political influence via seniority

rules. After weighting states' house and senate delegations based on total time in office, Crain and Tollison found that "the total age of the House delegation is a powerful explainer of . . . expenditure proportions across states."[3] It is noteworthy, however, that the senate variable, adjusted for tenure, becomes insignificant. Though counter to Stigler's results, Crain and Tollison interpret this reversal as entirely consistent with the constitutional role of the House versus the Senate in framing appropriations bills. Another interesting aspect of their findings is that seniority, while significantly raising political influence, appears to reflect diminishing returns.

Despite their statistical significance, the empirical studies noted above display specification bias. This point was emphasized by Greene and Munley in a response to Crain-Tollison.[4] The thrust of their criticism was that the explanatory strength attributed to delegation tenure in the house followed from its high correlation with population, a variable excluded from the model but often a major consideration in federal aid formulas. In a reply, while defending their specification, Crain and Tollison concur with their critics that the separate effects are intractable when dealing with aggregated state data:

> Unfortunately, as Greene and Munley seem to recognize, there is no easy way to untangle the separate effects of representation and population on the distribution of spending across states. The relevant data on expenditures, representation, and population are aggregated to the state level, and, as a consequence, the size of a state's congressional delegation is clearly going to be highly related to its population. The mathematics of apportionment guarantee such a relation. This high correlation between representation and population creates a problem for both Greene and Munley and us.[5]

This comment is especially pertinent to our paper. Since we will be using locality data in examining the flow of federal grants, our specification will be able to capture the separate effects of population and house tenure.

In some respects, the strongest results supporting the political influence hypothesis were obtained by Holcombe and Zardkoohi.[6] By limiting their federal aid sample to economic assistance grants, they framed a clear case where disbursements across states should correlate significantly with variables reflecting economic need. Using a log-linear form, their model regressed economic assistance grants per capita against seven explanatory variables, three political and four policy oriented. The political variables included the mean length of tenure of a state's senators, the percentage of a state's representatives belonging to the majority party in the House, and a dummy variable indicating whether a state had congressmen on either the Senate Finance or the House Appropriations Committee. The policy variables were the state's population, percent of population below poverty, per capita income, and the percent of the population in metropolitan areas. It is notable that all of the political variables were significant. It is even more remarkable, and rather disconcerting, that none of the policy variables significantly accounted for dispersion of economic assistance grant across states.

The Holcombe and Zardkoohi finding is especially curious when compared to the results of a more recent paper by McKenzie and Yandle.[7] They test whether changes in a state's delegation size effected its share of federal funds. Interestingly, their results suggest diseconomies to delegation size. More pertinent to the this paper, however, is their finding of a negative and highly significant relationship between state income and federal aid. This result indicates that the federal aid system is oriented toward income redistribution.

II. A Model of Grant Disbursements to Localities

As the foregoing review reveals, the empirical tests of the political influence hypothesis have returned mixed results. As we have already indicated, part of the debate reduces to a data problem. However, we also believe that errors in specification account for some of the conflicting results. The present paper is addressed to both issues. Though in general we adopt the Holcombe-Zardkoohi model, several specification adjustments are incorporated. Our hybrid model is then used to examine separately the basis on which federal and state grants are distributed to localities within the Commonwealth.

All grant and aid data are from the Virginia's "Comparative Report of Local Government Revenues and Expenditures for 1981." Demographic and income data are from the "1980 Census of Population." There are several advantageous features of the data sources that should be highlighted. First, in all matters of public accounting, cities and counties in Virginia are treated uniformly and as separate localities. Therefore, one does not face the problem, say, as in the case of Illinois, of differentiating aid received by Chicago for reasons unique from those determining receipts by Cook County. The expenditure data reported for Virginia is also valuable because it clearly distinguishes the categorical and non-categorical components of both state and federal aid as it is distributed to 136 localities. A further convenient fact of the data is that the locality definitions used in the public accounts correspond to the reporting units used in 1980 Census. Thus, the demographic and income observations correspond well with the relatively small geographic regions to which grants flow. In sum, the data is highly uniform and disaggregated. This latter feature is important because, as previously indicated, more highly aggre-

gated data makes the separate affects of House representation and population in grant disbursements intractable. The only likely criticism of our data is that it is exclusively for Virginia. Though this fact may seem at first to preclude any broader regional relevance for our findings, one may argue that several characteristics of the state perhaps qualify it as representative.[8]

Following Holcombe and Zardkoohi, the dependant variable in our model includes only categorical state and federal aid. Major components of categorical aid are income-tested programs, revenue sharing, and assistance to local educational. If such funds are administered strictly according to policy criteria, disbursements should correlate positively with demographic variables and negatively with income variables. For example, education funds should depend on number of students, for which population is a reasonable proxy. Population is also a factor in revenue sharing formulas. Regarding income-tested programs, receipts should be high in localities with low per capita income and/or high instances of poverty.

The major difference between estimating a state versus federal disbursements model lies in the specification of the political variables. The state aid model includes five political variables. SENATE is the time in office of each locality's state senator. Generally, senate representation spans more than one locality.[9] Due to multiple delegate representation in several localities, assessing political power in the House of Delegates warrants two variables. DELEGATE is the average length of service by a localities delegation and DELEGATE TENURE is the time in office of the most senior representative.[10] The COMMITTEE specification follows Holcombe and Zardkoohi; a dummy equal to 1 for localities with Assembly members on either the Senate Finance or House Appropriations Committee, and equal to 0

otherwise. CHAIRMAN is a second dummy variable reflecting whether a senator or delegate is a committee chairman. Combining these political variables with policy variables yields the following model for state disbursements:

$$(1)\quad SCAT = \alpha + \beta_1\ POP + \beta_2\ INCOME + \beta_3\ POVERTY + \beta_4\ URBAN + \beta_5\ SENATE + \beta_6\ DELEGATE + \beta_7\ DELEGATE\ TENURE + \beta_8\ COMMITTEE + \beta_9\ CHAIRMAN + \varepsilon$$

where SCAT is the level of state categorical aid, POP is population, INCOME is per capita income, POVERTY is the number of persons below 125% of official poverty level, and URBAN is a dummy for urban versus rural as defined in the 1980 Census. If state categorical aid is being distributed to localities under various objective criteria of need, differences in receipt levels should be positively related with population, numbers in poverty, and urban characteristics. A truly redistributive grant system should also show a negative relation with per capita income. A positive sign on any of the political variables is evidence of political influence in the distribution of state grants.

Unhappily, extending the model to explain federal grants causes most of the political variables to drop out. The most obvious deletion is the Senate variable since every locality is represented by the same two United States Senators. However, it also turns out that the committee and chairmanship variables must be dropped. This is due to a coincidence that none of Virginia's Congressmen served in either category in 1981. Therefore, the federal aid model retains only one political variable--the varying tenure of House members from the ten Virginia Congressional districts.[11] Using the same policy variables as before, the federal categorical aid (FCAT) equation is written:

$$(2)\quad FCAT = \alpha + \beta_1\ POP + \beta_2\ INCOME + \beta_3\ POVERTY + \beta_4\ URBAN + \beta_5\ HOUSE\ TENURE + \varepsilon$$

Both models are run in three different functional forms: (1) linear, (2) non-linear, and (3) log-linear. The reasons for the three forms is to facilitate comparisons of our model with previous studies.

III. Empirical Results

The regression results for state categorical aid appear in Table 1. Generally, the results are of high statistical quality and seem to indicate quite clearly that state aid is distributed to localities in close keeping with the objective criteria. Observe that, under the linear form, all of the policy coefficients are of the predicted sign and highly significant. Regarding political influence, two of the five variables display significant positive effects. It is interesting, and perhaps reasonable from an institutional perspective, that committee appointments and chairmanships carry greater influence than the simple longevity factor implicit in the SENATE, DELEGATE, and DELEGATE TENURE specifications.

The non-linear form of the state aid equation was run in deference to Crain and Tollison's finding that political power vested in longevity exhibits diminishing returns. If this is the case, the SENATE, DELEGATE, and TENURE observations should be run as the log rather than the level of time in legislative service. The reader may verify, however, that this adjustment leaves the results largely unaltered. The only notable change is that the income coefficient falls from the five to ten percent significance level.

The log-linear form is the specification used by Holcombe and Zardkoohi. Recall that they found powerful support for the political influence hypo-

Table 1: Regression Results Explaining State Categorical Aid

Dependent Variable:	Linear	Non-Linear †	Log-Linear
Variable			
POPULATION	0.163*	0.164*	1.182*
	(29.47)	(29.83)	(12.33)
INCOME	-0.377**	-0.282	-0.589*
	(1.89)	(1.46)	(3.03)
POVERTY	0.252*	0.263*	-0.085
	(5.62)	(6.05)	(0.94)
URBAN	2313.440*	2047.00*	0.041
	(3.60)	(3.25)	(0.55)
SENATE	-78.447	-63.05	-0.007
	(1.34)	(1.11)	(1.06)
DELEGATE	-55.739	607.190	0.113
	(0.53)	(0.75)	(1.30)
DELEGATE TENURE	23.124	-549.797	-0.104
	(0.34)	(0.69)	(1.23)
COMMITTEE	573.546*	495.269**	0.025
	(2.58)	(2.26)	(0.47)
CHAIRMAN	451.869*	354.998**	-0.003
	(2.00)	(1.67)	(0.06)
Intercept	2021.40	997.431	9.332
	(1.47)	(0.85)	(5.87)
R-squared	0.973	0.973	0.947
F-Statistic	503.94	504.87	252.20
Observations	136	136	136

* The parenthesis contain t-statistics. An asterick denotes that the coefficient is significant at the 1% level.

** Coefficient is significant at the 5% level.

† The logged independent variables are Senate, Delegate, and Delegate Tenure.

thesis and virtually no evidence of any policy criteria being met. Our results suggest just the opposite occurs at the state level. POPULATION and INCOME are dominant in the equation with all other variables becoming insignificant. More thorough comparisons with Holcombe-Zardkoohi will be drawn shortly. For the moment, merely note that our findings question the appropriateness of the log-linear specification.

Table 2 contains the results explaining federal disbursement to localities. Observe that in the linear estimation POPULATION and POVERTY are the only significant coefficients. The insignificance of HOUSE TENURE warrants special elaboration. Recall the Greene-Munley comment that previous findings of House influence were actually poorly specified population effects. Also recall that our federal/locality data afford a unique test of this issue. In the simple linear case, our results suggest that population is the explanatory variable. It is indeed noteworthy, however, that when HOUSE TENURE is non-linearly specified in keeping with the Crain-Tollison diminishing political returns hypothesis, TENURE emerges, in addition to POPULATION and POVERTY, as highly significant.

Regarding the log-linear form, verify once again that this specification completely eliminates otherwise significant coefficients. Our results, as well as our intuition, prompts us to seriously question the constant elasticity assumption that this specification imposes on the relationship between grant distribution and policy/political variables. We believe the log-linear form contributes partly to the lack of policy significance reported by Holcombe-Zardkoohi. Further specification issues contributing to their findings rest in their treatment of population and poverty, both highly significant variables in our model. Regarding population, Holcombe-Zardkoohi use per capita grants as the dependant variable and then interpret

Table 2: Regression Results Explaining Federal Categorical Aid

Dependent Variable:	Linear	Non-Linear †	Log-Linear
Variable			
POPULATION	0.373*	0.385*	0.506
	(15.73)	(16.65)	(0.50)
INCOME	-0.619	0.623	-1.342
	(0.75)	(0.73)	(0.64)
POVERTY	1.836*	1.820*	1.112
	(10.35)	(10.69)	(1.16)
URBAN	-3640.06	-3688.95	-1.248**
	(1.35)	(1.43)	(1.66)
HOUSE TENURE	224.453	1191.43*	-0.117
	(0.85)	(3.32)	(1.23)
Intercept	-2881.18	-10796.20	11.456
	(0.43)	(1.87)	(0.66)
R-squared	0.936	0.941	0.213
F-Statistic	376.97	409.27	6.95
Observations ‡	134	134	134

* The parenthesis contain t-statistics. An asterick denotes that the coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
† The logged independent variables are Senate, Delegate, and Delegate Tenure.
‡ Two Virginia localities received no federal categorical aid.

an insignificant sign on the population coefficient as indicating no influence. In fact, the more reasonable interpretation of the insignificant population coefficient is that the per capita grant form of the dependent variable is adjusted for population affects. A truer test of population's influence would seem to cast, as we have done, total rather than per capita grants as the dependent variable.[12] Regarding their poverty variable, Holcombe-Zardkoohi use the percent rather than the number of persons in poverty. This is clearly inappropriate since the level of income-tested receipts to individuals in an area are based on formulas of absolute, not relative need.[13] Though our focus on federal disbursements is limited to one state, this experience with the general research question leads us to conclude that the Holcombe-Zardkoohi model which found such overwhelming support for the political influence hypothesis is conceptually flawed.

IV. Concluding Remarks

Regarding state disbursements, the results indicate that categorical distributions are closely honed to objective policy criteria. However, our findings also support the not surprising conclusion that politics do matter. Indeed, we find that the nodal points of political influence on the state level are committee appointments and chairmanships. As for federal grants, we also find that disbursements to localities conform to stated policy criteria. Although the correspondence is not as strong as that displayed by state administered aid, it is important considering the conclusions to the contrary in previous studies, particularly Holcombe-Zardkoohi's. We believe some of their results follow from specification bias.

In the Introduction, we noted that all previous tests of the political influence hypothesis have focused on the flow of federal disbursements across states. Our thesis was that since the vast share of federal money received by states is ultimately received by localities, tests of this hypothesis must focus on how aid is distributed with respect to locality, not just state profiles. Arguablely, varying locality traits for which categorical aid is legitimately awarded are likely to be diluted in aggregated state data. Generally, we find strong support for the importance of locality-level analysis. Locality-level analysis of other states should be added to the Public Choice agenda of future research.

ENDNOTES

[1] George J. Stigler, "The Sizes of Legislatures," Journal of Legal Studies (January 1976), 17-34.

[2] W. Mark Crain and Robert Tollison, "The Influence of Representation on Public Policy," Journal of Legal Studies (June 1977), 355-361.

[3] Ibid., p. 357.

[4] Kenneth V. Greene and Vincent G. Munley, "The Productivity of Legislators' Tenure: A Case of Lacking Evidence," Journal of Legal Studies (January 1981), 207-214.

[5] "Representation and Influence: A Reply," Journal of Legal Studies (January 1981), 215-216.

[6] Randall G. Holcombe and Asghar Zardkoohi, "The Determinants of Federal Grants," Southern Economic Journal (October 1981), 393-399.

[7] Richard B. McKenzie and Bruce Yandle, "The Flow of Federal Funds to the States - The Impact of Delegation Size," Presented Paper SEA Meeting, November 10-12, 1982.

[8] For example, Virginia's 1980 per capita income in the current dollars was not far from the mean for the United States, $5,250 versus $5,322 respectively. Virginia also has what might be regarded as a desirable balance in terms of population densities, urban and suburban northern Virginia as compared to the more sparsely populated southwestern regions.

[9] Forty state senators represent 136 localities. In all but a very few cases, political districts conformed to locality boundaries.

[10] These variables are similar in spirit to Crain and Tollison's. One notable difference, however, is that we use average length of a delegation's service rather than total. We feel this adjustment lessens the collinearity between population and a delegation's total service time.

[11] In other words, there are only ten different observations for this variable and they are assigned to localities according to congressional districting.

[12] This point has been verified by McKenzie and Yandle. One form of their model regresses total federal grants against population and finds the coefficient highly significant. In a later per capita grant specification, they appropriately remove population from the right-hand side.

[13] Consider the following case which was typical of our data. Alexandria Virginia had 1366 persons at 125% of poverty level which represents

12.7% of the locality population. Bedford, on the other hand, had only 174 persons so classified and yet these accounted for 17.9% of the population. It is obvious that the level of income-tested aid flowing to Alexandria should be higher, correlating with numbers not percentages in poverty.

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