COUPE PAPERS ON PUBLIC ECONOMICS 1
George E. Peterson, General Editor

Fiscal Federalism and Grants-in-Aid

Edited by
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THE STIMULATIVE EFFECTS OF INTERGOVERNMENTAL GRANTS: OR WHY MONEY STICKS WHERE IT HITS

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The theoretical literature on the impact of intergovernmental grants on state and local fiscal behavior has reached a consensus on some basic propositions. According to this theory, the form in which grant assistance is given is very important in predicting the effect of the grant on local public spending. Nonmatching grants are assumed to alter the income available to jurisdictions without altering the relative price of public goods, and are hence assumed to have an effect on local spending similar to that of any other change in private income in the community. Matching grants, on the other hand, cause relative prices to change and thus are found to stimulate more spending per dollar of grant than nonmatching grants.[1]

Empirically, one of these predictions has passed the statistical test and one has failed. The generally confirmed result is that matching grants stimulate more spending per dollar of grant than do nonmatching, revenue-sharing types of grants. Regarding the nonconfirmed hypothesis—that nonmatching grants have spending effects similar to those of other changes in private income—the preponder-

1. A good summary of this theory can be found in Wilde (1971).

ance of evidence is that nonmatching grants stimulate much more local spending per dollar of grant than does income going to private citizens within the community. The obvious reason for this phenomenon, which we term the "flypaper effect" (money sticks where it hits), is that bureaucrats and politicians find it easier to avoid cutting taxes when the government receives revenue-sharing monies than they do to raise taxes when some exogenous event raises the income of the community.[2]

The fact that the standard theory of intergovernmental grants has been only partially supported by empirical studies suggests that some modifications to the theory may be in order. In this paper we make two. The first uses orthodox, median-voter assumptions—that the median voter is a private employee taking all wages and prices as given—and shows why even in this case the tax price and spending effects of nonmatching grants and changes in private income may not be identical. The economic rationale for the flypaper effect hinges on the inability of voters to perceive the true marginal price of public expenditures when nonmatching grants are present. Finding this economic rationale of course does not preclude an additional political rationale, but it helps to improve the relevance of the economic theory of grants. The second modification follows the logic of the first, except that we now investigate tax price and spending behavior for the case where some voters belong to the public (rather than private) sector and may possess sufficient power to determine public employee wage rates and output levels.

These two amendments to the traditional theory are developed in a model of an economy with two types of governments—an exogenous federal government and an endogenous local government—and just one type of grant, consisting of nonmatching aid of a fixed dollar amount. The model distinguishes between private and public sector employees, analyzing the optimizing behavior of both.

In the first section of the paper the formal assumptions for both the private and public employee models are presented. The second section uses the private employee model to examine the utility-maximizing behavior of private sector employees when all prices and wages are taken as given and develops our economic rationalization of the flypaper effect. The third section then deals with the public employee case, this time distinguishing between real and nominal

2. This empirical literature has been summarized by Gramlich (1977).

flypaper effects because wages may not be exogenous. The final section gives a few concluding observations.

The Formal Assumptions

Consider first a model of community behavior in which the median voter is in the private sector. This private employee is assumed to maximize a utility function whose arguments are private consumption C_p and public output, represented simply by public employment (E_g) following standard accounting conventions. Private consumption goods are bought on a national market at a fixed price (P), and are also produced by the private sector workers in the community (E_p) according to a production function that is homogenous of degree one in E_p. All income earned in the community is assumed to be wage income, earned either by public employees who are compensated at a fixed money rate (W_g) or by private employees compensated at the money wage (W_p), fixed by the homogeneity of the production function and the fact that goods prices are fixed.

The total labor force in the community (E) is the sum of private and public employees:

$$E = E_p + E_g. \tag{1}$$

Total money income earned in the community (W^*E), the gross tax base for both the federal and local government, is the sum of wage income earned by workers in both sectors

$$W^*E = W_pE_p + W_gE_g, \tag{2}$$

where W^* is a wage index.

In the first case (pp. 8–16) we consider the optimization of private employees who choose their desired levels of C_p and E_g, taking W_g, W_p, and P as given. Since W_g is fixed, public employees will be unable to negotiate higher wages and we assume that there will be no incentive for private taxpayers to migrate. This means that the total labor force in the community can be viewed as fixed.[3] However, there could still be an effect of changes in E_g on W^*E through the reallocation of

3. Assume for the sake of simplicity that high public sector wages are the only cause of private sector migration. We have dealt with this issue in more detail in an earlier paper where we use models of this sort to examine the real and nominal level of government spending. See Courant, Gramlich, and Rubinfeld (1979).

labor between lower and higher wage sectors. As long as the wage differential is small, however, this effect will be minor and it seems reasonable to expect that private voters will not take account of it in their maximizing calculus. Accordingly we assume that atomistic private voters will treat W^*E as given, despite the fact that general equilibrium shifts in W^*E will be incorporated into the final solution of the model.

In the second case (pp. 16–20) we consider the situation in which public employees have sufficient political-bargaining strength to actually set their own wages. As a result, W_p and P are taken as given but W_g is variable. Then private employees are allowed to migrate out of the community in response to monopolistic public employee behavior. As a result, E can become a negative function of W_g, with the gross tax base varying both through the direct impact on E and the indirect impact of compositional shifts. Public employees are assumed to be aware of these aggregate effects, and thus will incorporate assumptions about changes in W^*E in their maximizing calculus.

The local government must always balance its budget. This is accomplished by the levy of a proportional income tax at a rate which equates income tax revenue plus grant revenue with the level of total public expenditure (W_gE_g) in the community. However, the federal government need not balance its budget and its exhaustive expenditures are assumed to have no impact on local decision making. The federal government influences community behavior by assessing proportional income taxes at the rate t and giving close-ended nonmatching grants of amount B.[4]

Private Employee Optimization

Private sector employees are assumed to maximize utility, subject to the constraint that their expenditures on the consumption good (PC_p) plus their expenditures on public goods at the tax price P_p

4. Since we are not forcing the federal budget to be in balance and not treating federal exhaustive expenditures explicitly in the model, we also ignore the fact that the local community must make a federal tax contribution for federal grants. Simply assume that these grants are financed either by a change in exhaustive expenditures or the federal deficit, with no effect on local utility, or that grants are net of the federal tax contribution. Johnson and Tomola (1977) show how the tax contribution effect can be worked into a model of local expenditures.

sum to their income net of federal taxes. Assuming for the moment that the only source of income is wage income, net income is simply $W_p(1 - t)$. The private employee then maximizes

$$U_p = U_p'(E_g, C_p) \tag{3}$$

subject to

$$W_p(1 - t) = PC_p + P_pE_g. \tag{4}$$

The general solution is the familiar condition that the marginal rate of substitution be equal to the relative price of the public good:

$$\frac{U_1'}{U_2'} = \frac{P_p}{P}, \tag{5}$$

where the subscripts of U' denote partial derivatives.

With a proportional income tax, the tax price of public goods that a private sector employee faces will be the net cost of a unit of public goods times the employee's locally taxable share of community income net of federal taxes.[5] Recalling that the net cost of a unit of public goods is W_g, and that nonmatching grants at level B add to community income, the *average* tax price is then

$$P_p = \frac{W_p(1 - t)W_g}{W^*E(1 - t) + B}. \tag{6}$$

Substituting (6) into (4) yields the general expression for the budget constraint as it might be viewed by the private employee:

$$W_p(1 - t) = PC_p + \frac{W_p(1 - t)W_gE_g}{W^*E(1 - t) + B} \tag{7}$$

To examine the effect of grants on local spending, assume that initially $t = 0$ and $B = 0$, and that federal grants at the level B are financed through federal tax rate t which leaves net spendable resources of the community, $W^*E(1 - t) + B = W^*E$, constant.[6] In standard grant theory analysis this type of shift would leave community spending on public output unaffected and there would be no flypaper effect.[7] But in the approach taken here, there can be two

5. This was the definition used in Peterson (1973) and Rubinfeld (1977).

6. We make this assumption to simplify the exposition. Unless otherwise stated, the results derived in this section hold in general.

7. See Oates (1972), chap. 3, appendix B, for a good discussion.

separate effects on E_g:

i) since in the short run the private employee will feel that his/her disposable income had decreased (W_p is fixed but t is increased), the perceived individual budget constraint will involve a loss of income equal to tW_p, and this income effect will lower E_g (assuming that E_g is a normal good);

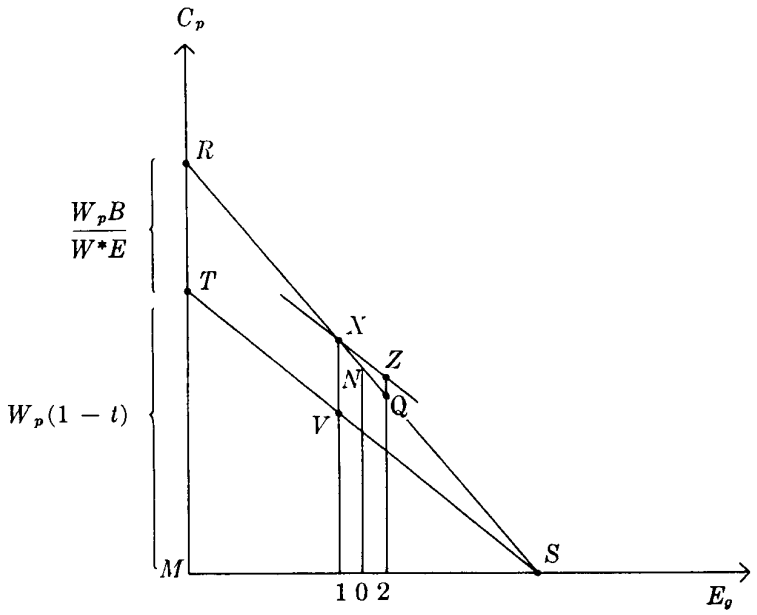
ii) since the numerator of (6) has declined and the denominator has remained constant, the average tax price of public output will fall. If voters are not able to see that the true marginal price of public output is unchanged, this price effect will raise E_g.

There are, in other words, two misperceptions here, one involving income and one involving price. If the voter is laboring under both misperceptions, the net of these two offsetting influences on E_g would appear to depend on the relative strength of the income and price effects. But this is not so. When we take explicit account of the fact that the net spendable resources of the community have remained constant, the income misperception is eliminated and the remaining price misperception will cause public employment and expenditures to increase.

A graphical presentation of our argument is shown in figure 1. Assume for convenience that the private employee is the median voter in the community and has the usual choice between public and private goods. As before, assume that the federal government has no revenue-sharing program and no federal taxes, so that line MR, the maximum value of private consumption for the consumer, equals W_p. The initial equilibrium for money public expenditure levels is at $W_gE_g^0$ (E_g^0 is denoted by 0 on the graph). Then the central government introduces a revenue-sharing grant to the community of B, simultaneously taxing all income earned in the community at rate t such that aggregate community spending power, $W^*E(1 - t) + B$, is left unchanged at W^*E. Standard grants analysis would predict that this consumer and the community will remain at point 0 because there has been no change in either income or relative prices at the margin for the community. But this may not be the case. In the first instance the consumer is likely to think that the price of public output has fallen and that his income has been reduced to $W_p(1 - t)$ by the federal income tax. He will face the budget constraint represented by line segment ST, and will optimize at point V choosing public expenditures of E_1 (this would be the case when public expenditures demands

Figure 1

(assume $P = 1$)



are inelastic and the income effect outweighs the substitution effect). But along ST the consumer is only spending his after-tax private income, not his share of the revenue-sharing grant, and if all consumers do likewise, the local government will run a surplus.

The surplus arises as follows. Given that expenditures have been set at level 1, the line segment $1X$ represents that portion of community resources available for private consumption by the private-sector employee. (Recall that RS represents the true trade-off between public and private expenditures.) However, the private employee has calculated his private consumption to be equal to line segment $1V$. The result, when the government actually spends $W_gE_g^1$, is an unexpected surplus of VX dollars per private employee. In the first instance local officials will presumably compute this surplus at the actual level of public expenditures and mail this consumer his share, a check in the amount of VX.

Since the price of public goods to the consumer has not changed

with the return of the surplus, the private employee will then view his constraint line as XZ and vote, say, for expenditure level 2. At this higher expenditure level the government will run a deficit of an amount equal to ZQ for this particular employee. As a result the original rebate check will be reduced and a new budget line drawn. This process will eventually converge towards an equilibrium. The equilibrium point will lie on line RS, the true community resource constraint line, and will be the point of tangency between an indifference curve and a price line parallel to XZ and ST. We will see that at this final equilibrium the rebate the consumer receives will be less than his federal tax payment by the complement of the proportion of income spent on the public sector. Moreover, since community resources are the same as before the policy change, the private good price remains at P, the price of public goods faced by the individual is reduced, and the final level of expenditures must necessarily increase. The trade of revenue sharing for private incomes has *raised* public spending and resulted in what would appear to empirical researchers to be a flypaper effect.[8]

This result can be obtained mathematically if we solve to find the surplus or incremental income, ΔY, to be returned to the private employee so that the final equilibrium occurs at a point which marks his expenditure choice, given income $(W_p + \Delta Y)\ (1 - t)$ and facing a relative price of public output P_p/P. The incremental income is determined from the community resource constraint which arises in the standard case in which all revenue-sharing funds are allocated to consumers who then make their public or private choice. Since BW_p/W^*E represents the employee's share of revenue sharing money, it follows that

$$W_p\left(1 - t + \frac{B}{W^*E}\right) = PC_p + \frac{W_pW_gE_g}{W^*E} \tag{8}$$

where W_gW_p/W^*E is the true marginal cost of public output. But the

8. At this point we can return to a statement made above and say that any compositional effects on W^*E from (2) will also influence the final community-wide equilibrium by adjusting the community-wide resource constraint line. For Walrasian reasons, the local government will find it possible to mail a check for the maximum amount of private consumption individual households can engage in at any level of E_g without unbalancing their own budget. If changes in E_g influence the aggregate constraint line, therefore, these shifts will be incorporated in the rebate checks.

employee's optimization involves the following budget constraint

$$(W_p + \Delta Y)(1 - t) = PC_p + \frac{W_p(1 - t)W_gE_g}{W^*E}. \tag{9}$$

Combining (8) and (9) to solve for ΔY, we find that (using the fact that $tW^*E = B$):

$$\Delta Y = \left(\frac{W_pB}{W^*E}\right)\left(1 - \frac{W_gE_g}{W^*E}\right)\left(\frac{1}{1 - t}\right) \tag{10}$$

Thus, the increment to after tax income, $\Delta Y(1 - t)$, is equal to the private employee's share of nonmatching grants, less the fraction of that share spent on public output. If all income in the community is devoted to public output, the income increment is zero. If none of it is spent on public output (and the federal government permits the community to keep the grant), disposable income increases by the employee's share of the grant. Since the increment to income will also be subject to federal taxation, the community-resources constrained income of the employee becomes

$$Y_p(1 - t) = (W_p + \Delta Y)(1 - t) = W_p(1 - t) + \frac{W_pB}{W^*E}\left(1 - \frac{W_gE_g}{W^*E}\right). \tag{11}$$

Now we are in a position to prove that an increase in t and B which leaves community resources constant will always increase the desired level of public output, E_g. To see this, note that the effect of such a change on $Y_p(1 - t)$ and P_pE_g is of equal magnitude and sign when E_g is held constant. That is, for $d(tW^*E) = dB$ and E_g fixed (from equations [11] and [6]),

$$\frac{dY_p(1 - t)}{d(tW^*E)} = \frac{-W_pW_gE_g}{(W^*E)^2} = \frac{dP_p}{d(tW^*E)}E_g. \tag{12}$$

Equation (12) implies that the change in disposable income is just equal to the change in expenditure necessary to purchase the initial C_p and E_g pair, implying that the initial bundle is attainable under the changed tax price and disposable income. But if the initial pair was an equilibrium under the initial prices—i.e., if equation (5) held—then it cannot be an equilibrium under the changed price ratio. In particular, if dt is positive, the relative price of public goods will have

fallen and private employees will demand more public goods than they did at the initial price ratio. Of course, the increase in demand for public goods will engender a decrease in $Y_p(1 - t)$ through (11), and thus the equilibrium level of E_g which is demanded will fall between the initial level and that which would be demanded if $Y_p(1 - t)$ remained at the level associated with the initial level of E_g. But in essence, balanced (federal) budget changes in t and B alter perceived relative prices while leaving real consumption opportunities unchanged.

The difference between standard analysis and that given above is that standard analysis assumes away all illusions. The aggregate omniscient political authority is assumed to know that the trade of revenue-sharing and federal taxes does not change relative prices for the community at large, and is assumed to respond accordingly. But in real life there is not one aggregate decision maker but a host of voters who, to the extent that they are guided by economic considerations, would presumably be aware only of their own average tax prices—not the relative price structure facing the community at the margin. As long as the government does not incorporate the revenue-sharing grant in locally taxable income, voters will vote for higher levels of public expenditures.[9] In terms of the graph, the government can eliminate this misinformation only by restoring the initial price line RS. The obvious way of doing this would be to give consumers the full prorated revenue-sharing grant, making $(W_p + \Delta Y)(1 - t) = W_p(1 - t + B/W^*E)$, and then assessing tax shares on this basis

$$P_p' = \frac{W_p(1 - t + B/W^*E)W_g}{W^*E(1 - t) + B} = \left(\frac{W_p}{W^*E}\right) W_g \qquad (13)$$

so as to make individual budget constraints equal to (8) in the standard analysis and then to emasculate the price effect. Incidentally, it is clearly in the community's (perhaps not the bureaucrat's)

9. It is conceivable that over time voters will learn that the level of $Y_p(1 - t)$ is systematically and negatively correlated with E_g, and thus learn that their true budget constraints are given by equation (8) and line RS in figure 1. But such learning can only be expected to take place if there are repeated changes in t and B, and if voters keep records on the effects of such changes and undertake statistical analyses of the relationship between their disposable income and the behavior of the public sector in response to such changes. To say the least, the information requirements placed upon individuals in such a scenario make it implausible.

interest to make this tax price correction, for the switch between revenue sharing and taxing has altered neither tastes nor the boundary of the opportunity set and hence expenditure level 2 is clearly not an optimum. Any deficiencies in the standard analysis are, in other words, descriptive but not normative.[10]

We can also consider the implications of the preceeding analysis if local revenues are raised by property taxation rather than income taxation. Here the extent to which capitalization occurs is the key issue. If the value of nonmatching grants is capitalized into property values, then the local tax base will rise by the amount of such grants, while the local level of disposable income will fall by the amount that federal taxes are increased to finance the nonmatching grants. The numerator of (13) is unchanged and there is no price effect of the type we have considered.[11] To the extent that nonmatching grants are not fully capitalized, the "price-illusion" analysis presented above is appropriate, as some portion of local resources will not be locally taxable. Again, in the short and medium run, incomplete capitalization, and hence the flypaper effect, would seem to be a plausible result.

Finally, we should try to assess the quantitative importance of the flypaper rationale we have identified. The disparity between the estimated marginal propensity of public spending with respect to private income and unconditional transfers is on the order of \$.40: if a community raises public spending by x when private income rises \$1.00, it raises public spending by x + \$.40 when unconditional transfers rise \$1.00 (here the value of x depends on the taste for public and private goods, which is assumed to be different across communities). In the experiment we examine here, the federal government

10. In the simple case we have used here to illustrate the problem, an alternative way of making the correction would be to assign tax shares equal to W_p/W^*E, ignoring federal taxes and transfers altogether. That will not work whenever the change in income tax revenues does not equal the change in revenue sharing grants, however. Then (13) must be used.

11. Note that even with complete capitalization, an increase in federal taxes used to finance a nonmatching grant such that community resources are left constant will not be perfectly analogous to the standard case unless each household's annual imputed rental gain from property is just equal to its loss of disposable income. Since this condition will never be met in practice, such a policy change would in general change the distribution of income in a community. If there are income effects on the demand for public goods, this would lead to a change in demand—although the sign of the change is uncertain.

conducts a balanced-budget change that leaves the community resource constraint unaffected, but which does pivot the price line around the initial point. If the reduction in the perceived price is .1 (B/W^*E goes from 0 to .1) and the price elasticity of demand for public expenditures with community resources held constant is .5, W_gE_g/W^*E will rise by .05. Say that initially W_gE_g/W^*E equals .2, as it does in many communities. The new level of W_gE_g/W^*E is .21, the change in public spending is $.01W^*E$, and the change in B is $.1W^*E$. Hence this change will appear as a difference in the marginal propensity to consume unconditional transfers over private income of as much as .1 for certain communities. We cannot, nor would we want to, explain the entire observed flypaper effect with this phenomenon, but in certain communities with a high level of B, a high level of public spending, and strong price elasticities, these orders of magnitude show that the phenomenon could be a significant force.[12]

Public Employee Optimization

To this point we have examined grant theory under the assumption that the private sector median voter implicitly determined public employment levels. Now we show how the results change when public employees have varying degrees of electoral or bargaining power. We make three sets of assumptions: (a) that public employees have sufficient electoral power to determine their own employment levels; (b) that employees have sufficient bargaining power to determine their own money wages; (c) that employees have enough power to determine both public employment and wages.

In the first case, public employees control (either through voting or through other political processes) the level of public output, but public wages are given exogenously. The median public employee voter then maximizes

$$U_g = U_g'(E_g, C_g) \tag{14}$$

12. In a companion paper whose content we were not aware of until the first draft of our own was completed, Wallace Oates explains a much larger share of flypaper effect through a phenomenon that sounds suspiciously like ours. There is a difference, however. Oates' voters misperceive the marginal price even more that ours do—they would consider it line TN in figure 1. We reduce the perceived price by just the reduction in perceived average tax prices; Oates reduces it by the share of expenditures paid for by unconditional grants ($[W_gE_g - B]/W_gE_g$ in our notation). Oates also does not have the community resource constraint built in. See Oates in this volume.

subject to

$$Y_g = PC_g + P_gE_g \tag{15}$$

with

$$P_g = \frac{W_g^2(1-t)}{W^*E(1-t)+B}. \tag{16}$$

The solution to this system is essentially the same as before, except that public wages play a dual role—being a component of both the income of public employees and the price they have to pay for public goods. If basic taste parameters are the same, public employees will have a higher demand for public output when $W_g > W_p$ and the income effect outweighs the substitution effect, and a lower demand when the substitution effect outweighs the income effect. As before, there is a flypaper effect when the public employee receives as income some portion of the revenue-sharing grant as long as that grant is not included in the computation of this tax price.

Now consider the second case in which public employees have no control over output, but do have sufficient bargaining strength to raise their wages above that of private employees.[13] To illustrate the nature of the results, we make the strong assumption that public employees can set W_g, and examine the partial equilibrium results when E_g is fixed.

The solution to this case turns out to hinge on the elasticity of the overall tax base, W^*E, with respect to W_g. As long as E_g is fixed, a rise in W_g will increase the money income earned by the public sector, W_gE_g, proportionately. But if there is intercommunity migration in response to the rise in W_g, resulting in a fall in W_pE_p, the overall tax base, $W_pE_p + W_gE_g$, will not rise in proportion to W_g and may even fall. If we define

$$\eta = \left(\frac{dW^*E}{dW_g}\right)\left(\frac{W_g}{W^*E}\right) \tag{17}$$

as the elasticity of this tax base with respect to the public wages, the above remarks imply that η is strictly less than one and may even be negative.

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13. Studies of public sector wages indicate that this may be the case for many urbanized areas with strong unions. See Smith (1977) and Ehrenberg and Goldstein (1975) for the general proposition, and Horton (1973) for a description of how it might have already happened in New York City.

The first order condition when E_g is held fixed can be found simply by maximizing C_g with respect to W_g in equations (14)–(16). Using the same assumptions as in the previous section regarding the treatment of rebate checks

$$C_g = W_g\left\{1 - t + \frac{B}{W^*E}\left(1 - \frac{W_gE_g}{W^*E(1-t) + B}\right)\right\} - \frac{W_g(1-t)W_gE_g}{W^*E(1-t) + B}$$

or (18)

$$C_g = W_g\left(1 - t + \frac{B}{W^*E}\right)\left(1 - \frac{W_gE_g}{W^*E(1-t) + B}\right).$$

If public employees know the size of their tax and revenue-sharing change, they know also that both the aggregate spendable resources and $(1 - t + [B/W^*E])$ will not be affected by the federal policy changes, though of course they must also worry about the fact that increases in W_g could reduce the community tax base W^*E if $\eta < 0$. Their optimal solution is given by

$$\frac{W_gE_g}{W^*E(1-t) + B} = \frac{1}{2 - \eta}. \tag{19}$$

If η, the elasticity of the overall tax base with respect to public wages, equals zero, these wages will be set so that the aggregate net public sector wage bill equals just one-half of total community spendable resources. As employees increase their wage beyond this level, the increase in the local tax rate necessary to finance the further wage increases is so great that employees' command over consumption goods actually declines. If $\eta < 0$, the share of resources devoted to the public sector is further reduced by employees' fear of losing tax base when they raise their wages; while $\eta > 0$ the same consideration will raise their wage bill. But as long as $\eta < 1$, which it clearly is as long as W_pE_p does not increase, (19) will be a maximum for public employees and will insure that the public wage bill is less than the level of total output.

Since the optimization condition is stated in terms of the total public wage bill, as the public employee work force expands, increases in W_g must be paid to additional workers, who cost more in terms of

necessary tax increases. Hence there is an inverse correlation between the size of the public employee work force and the wage that each can extract. Regarding grants, there is no flypaper effect in this situation. No matter how the government sets tax shares, the employees are assumed to know that aggregate resources are held equal by the federal change, and to set wage policy to take the appropriate fraction.

We note one other interesting feature of (19). If there were no federal taxes or grants, then local tax rates on all income would equal $1/(2 - \eta)$. If the federal government decides to increase its own taxes without a compensatory increase in nonmatching grants, the local public sector is left to take $1/(2 - \eta)$ of a smaller remainder, so that the combined local-federal tax rate is larger than $1/(2 - \eta)$. Generalizing, in a hierarchical federal system with strong employee unions each of which is setting wages on the basis of income left over after the higher level governments take their share, the combined tax rate for all levels of government could get quite large—asymptotically approaching unity in all cases and realistically being well in excess of one-half even when η is close to zero.

The final case where public employees set both wage and employment levels is a composite of the first two. The wage first-order condition (given E_g) is equation (19), and the employment first-order condition (given W_g) is found by maximizing (14) subject to (18). Since public employee households gain their revenue-sharing checks but are not taxed on them at the local level, the employment first-order condition leads them to overconsume public goods, as in the private sector flypaper case. But since optimal wage behavior is set by (19) and is independent of the origin of the community's tax base, there is in effect no *nominal* flypaper effect. Hence the simultaneous solution of the two first-order conditions is that *real* expenditures are larger than before the federal policy change (and larger than if tax prices were computed optimally), that nominal expenditures are exactly the same, and that public sector wages are *reduced* by the so-called flypaper effect. In the private sector optimization case, the unadjusted tax price leads voters to overconsume real and nominal government expenditures; but in the public sector case the same phenomenon leads to overconsumption of public goods and less exploitation of the private sector through high public-sector wage levels. In a welfare sense, the flypaper effect made the private sector worse off when they were determining employment levels and better

off when public employees were determining both wage and employment levels.

Implications

In this paper we try to amend the standard theory of intergovernmental grants by inquiry into the mechanism by which grant-induced changes in community prices and incomes are actually transmitted to individual voters. In the first half of the paper we find an economic rationale for a well-known empirical puzzle in the grant literature—that a dollar of nonmatching aid seems to stimulate a good deal more local public expenditures than a dollar change in private community income, despite the fact that both should have had exactly the same effect on community-wide relative prices and incomes. The rationale is that in order for the nonmatching grant neutrality to hold, local officials must take the grants into account in computing tax shares, an action that seems quite unlikely. If this is not done, there will be a relative price effect for nonmatching grants which will stimulate expenditures more than private income increases. All of this is, of course, not to deny that there could be other, more powerful, political reasons for the empirical puzzle in addition to the economic rationale we have given.

In the second section of the paper we extend this reasoning to the case where public employees are the median voters. These employees are allowed, successively, control over expenditure levels, wage levels, and both together. Incorrectly viewed relative prices will lead public employees to overconsume public goods just as with their private sector counterparts, but will not affect their wage behavior or the size of the public budget in nominal terms. Hence when public employees control employment as well as wages, the incorrect relative prices will actually aid the private sector—leading to the same sized budget in nominal terms but greater levels of real expenditures and lower levels of public wages.

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