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## Excessive Government Spending in the U.S.: Fact and Theories

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# EXCESSIVE GOVERNMENT SPENDING IN THE U.S.:

## Facts and Theories

by Edward M. Gramlich

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## **INTRODUCTION**

The United States has neither the highest nor the most rapidly growing share of national output devoted to public spending of the major western industrial countries. But it does have by far the most discussion within its economic profession of the question of excessive government spending. United States economists have been responsible for several different models of excessive government spending. They have devised Constitutional amendments to limit spending, and they have been in the forefront of political campaigns on the issue. In America the question of the size and growth of government has been as much one of the development of economic thought in the field of applied public finance as it has of the basic facts.

In this paper I try to review both the facts and the theories coming from the American experience. The facts are obviously particular to the United States and only relevant to other countries to the extent that similar things are happening there for similar reasons. The theories are obviously not particular to the United States, but of more general interest. The paper will therefore focus more attention on them.

Five theories will be summarized, two regarding the growth of government spending over time and three regarding reasons why the level of government spending may be excessive. The five are:

### Growth theories

- 1) Borcharding's (1977) positive residual hypothesis;

- 2) Baumol's (1967) productivity disparity hypothesis;

Level theories

- 1) Borcharding-Bush-Spann's (1977) voting distortion hypothesis;
- 2) Peltzman's (1980) redistribution hypothesis;
- 3) Courant-Gramlich-Rubinfeld's (1979) public wage hypothesis.

For each I will try to provide informal tests of the hypothesis using either macro statistics or the results of voter surveys taken after some recent statewide tax limitation votes. These tests will basically be aimed at trying to determine whether there is or is not strong evidence that government spending growth rates or levels are excessive in the United States today. At the outset, however, I must warn that the tests are not able to confirm or refute every aspect of every theory, and sometimes not even the most important aspects of the theories. Moreover, the business of creating theories to explain government growth is booming so much now that even these theories do not exhaust the set, so other interesting views will be ignored. Finally, most of the facts used in the paper will focus on actual government spending, ignoring the new and interesting area of government regulation of the private sector -- an area that is now beginning to spawn its own theories.

## **GROWTH THEORIES**

### **Government Growth and Borcharding's Residual Hypothesis**

The main idea behind Borcharding's residual hypothesis is that government growth is excessive if it cannot be explained. He tries to predict government growth by applying elasticities estimated from cross-sectional data to growth rates of important independent variables and finds large positive residuals. These residuals -- growth unaccounted for by movements in the independent variables -- suggest the existence of some mysterious, or at least nonquantifiable, force pushing up government budgets and tax rates.

There are serious problems in interpreting such a test because not all nonquantifiable movements imply that government growth is excessive. If, for example, government spending was too low at the start of some period, rapid and unexplained growth would imply only that the initial disequilibrium was being corrected. Or, tastes for public expenditures might shift over some interval, resulting in apparently unexplainable growth. But even though there are such problems of interpretation, it is still useful to go through the Borcharding exercise as a way of organizing the facts of the U.S. experience.

The actual residual test can be developed by solving a three equation model. The first is a standard public goods demand function, written as

$$X_i = A Y_i^{c_1} P_i^{c_2}, \quad (1)$$

where  $X_i$  refers to the utility services conferred by a unit of public spending,  $A$  is a constant,  $Y_i$  is income, and  $P_i$  is the tax price of a unit of these services, with the  $i$  subscript referring to the "decisive" voter in the community.  $c_1 (>0)$  refers to the income elasticity of public goods demand and  $c_2 (<0)$  the relative price elasticity. In the straightforward median voter theory of Hotelling (1929), Bowen (1943), and Downs (1957), the  $i$ th citizen is the median voter, but given various kinds of imperfections and gaps in information, the model can be generalized to make  $i$  refer to the particular voter who, upon changing his or her vote, can alter the political outcome.

Utility services are then related to public goods purchases by the crowding expression of Borchering-Deacon (1972) and Bergstrom-Goodman (1973):

$$X_i = G/N^{a_1}, \quad (2)$$

where  $N$  is community population and  $G$  is the real purchases of public goods in the community. When  $a_1 = 0$ , the good or service in question is a Samuelsonian (1954) public good and increments to population do not lower the utility services received by the  $i$ th voter. When  $a_1 = 1$ , the good is crowdfundable in that added consumers do lower utility proportionately, even though the good may still be supplied through the public sector (an example is public schooling).

The tax price for a unit of public services can be expressed as the product of three components, the gross price of a unit of public output, the tax share of the decisive voter, and the inverse of the crowding function:

$$P_i = (P)(Y_i/Y)(N^{a_1}), \quad (3)$$

where  $P$  is the gross relative price of a unit of public services and  $Y$  is the community tax base. The second term shows how much of this relative price will be paid by the decisive voter, and the third term adjusts for crowding. Whenever  $a_1 > 0$ , the cost to the decisive voter of a unit of public services varies directly with community population (the more people in the community, the more public goods one has to buy to gain a unit of utility).

Inserting (2) and (3) into (1), taking logs, differentiating, and using the approximation that  $d \ln Y_i = d \ln Y - d \ln N$  yields as the general growth equation for public expenditures

$$d \ln G = c_1 d \ln Y + c_2 d \ln P + (a_1(1+c_2) - c_1 - c_2) d \ln N \quad (4)$$

Other things equal, government spending will rise with income but will increase less the more public sector relative prices rise. Borcharding's point, very simply, is that the equation has not worked: that actual growth rates on the left side have exceeded predicted growth rates on the right side.

Before actually examining these residuals, one aspect of equation (4) should be emphasized. Most studies of public goods demands in the United States find income elasticities ( $c_1$ ) that are less than one, and price elasticities ( $c_2$ ) that are negative. These findings are characteristic for every one of eleven commonly cited recent empirical studies, listed in Table 1. If such is the case, and if  $0 < a_1 < 1$  as required by the theory,



the predicted growth rate of government spending may well be less than the growth rate of GNP. Hence it may be possible to find cases where Borcharding's residuals are positive -- that is, government spending is growing more rapidly than would be predicted by an equation such as (4), but the share of government in real GNP is either stable or declining. In broad outline, this appears to be happening in the United States, at least for certain types of expenditures.<sup>1</sup>

To make the actual comparisons I focus on three types of government expenditures:

- a) exhaustive purchases for national defense
- b) other exhaustive purchases
- c) transfer payments

The comparisons aggregate national, state, and local government spending for the specified categories, and thus obviate the need to worry about rapidly growing intergovernmental grants. I will also ignore subsidies of governmental enterprises, which are small and best thought of as negative indirect taxes, and interest payments on governmental debt, which can be explained by a straightforward relationship with interest rates.

Table 2 gives the residual comparisons for the three types of expenditures for the last five decades. National defense is perhaps not a good place to begin because the growth comparisons are

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<sup>1</sup> Note, however, that this statement refers only to the share of government spending in real GNP. If  $P$  is rising and  $c_2$  is less than one in absolute value, the money share of government spending (GP) could be increasing. Oates' paper in this volume focuses on that ratio.

seriously distorted first by World War II, then by the Cold War buildup, and finally by the Vietnam War expenditures in the late sixties. Moreover, to my knowledge nobody has provided estimates of income and price elasticities for national defense. Yet because these purchases are so important in shaping overall government spending levels in America, these comparisons are given in the top panel of the Table. For these comparisons  $c_1$  and  $c_2$  are taken at the mean values shown in Table 1, and  $a_1$  is assumed to equal zero since national defense expenditures are the classic example of a pure public good. The growth equation then becomes

$$d\ln G_{ND} = .65 d\ln Y - .51 d\ln P_{ND} - .14 d\ln N \quad (5)$$

and the results are presented in column (2) of the Table. There it can be seen that defense spending did exceed its prediction by a large amount in the World War decade of the forties, and also in the Cold War decade of the fifties. Even with the Vietnam buildup in the sixties, defense spending barely kept up with its prediction and fell behind GNP (column (4)), and in the seventies it has fallen well behind both its prediction and GNP. By 1979, defense spending was down to only 4.5 percent of GNP (in real terms), the lowest share it has reached since sometime in the thirties.

Perhaps a better example of the Borchering test lies with the other purchases of federal, state, and local governments. For these the estimates of  $c_1$  and  $c_2$  given in Table 1 are appropriate, and I also use the apparently noncontroversial finding that the crowding parameter  $a_1$  is close to unity (as has been found by the only three studies to estimate this parameter). The growth equation then becomes

$$d\ln G_0 = .65 d\ln Y - .51 d\ln P + .35 d\ln N \quad (6)$$

and the results are shown in the second panel of Table 2. The residuals are generally positive, with the exception of the War decade, but smaller in the seventies than before. Also note that even though these residuals are positive in the seventies, the share of real GNP devoted to other purchases has declined slightly in the decade. Considering all types of purchases, for defense and other, the total real share of GNP devoted to exhaustive expenditures of government is now .19, slightly less than it was as far back as 1940 -- even though the Borchering residuals have been generally positive over the period.

The one type of government spending where there is no doubt about the growth is transfer payments (T), shown in the bottom panel. Growth in transfers is perhaps not quite as dangerous to those worried about protecting private enterprise because private consumers still have control over the resources, but on the other hand transfers must be paid for out of taxes. For these we can assume  $a_1 = 1$ , since obviously total transfers confer reduced utility to recipients as the number over which the pie is split increases. Also, since purchases are not made, the price effect is absent. The resulting prediction equation is thus

$$d\ln T = .65 d\ln Y + .35 d\ln N \quad (7)$$

and the results are as shown. Residuals are definitely positive in all decades, and high enough that the real share of GNP is rising steadily. The only ex post interpretation difficulty is that for transfers it could be argued that "tastes have

changed", with the introduction of Social Security in the thirties, and fairly large scale redistributive transfers in the seventies. Moreover, the early plans of the Reagan Administration on transfer payments are unmistakable -- in all likelihood the real growth in this item is a thing of the past.

To put all this together, even though one must make some very tenuous assumptions to make the Borcherding comparison, in general the residuals from this sort of a test are positive for most decades and types of expenditures. This could provide suggestive evidence of some mysterious force making for unexplainable growth in government, or it could just indicate that tastes have changed over this interval. Moreover, even with the positive residuals, the share of exhaustive purchases in real GNP has not risen over most of the period, though the share of transfers has. By 1979, as the Reagan Administration wields its widely-publicized axe to the public sector, total purchases and transfer payments stand at about .29 of GNP, about the same as in 1959 and slightly below the median for Western industrial countries.

#### **Government Growth and Baumol's Productivity Disparity Hypothesis**

Baumol's (1967) productivity-disparity model antedated many of the other theories, and in fact was not initially a theory about government growth at all. Baumol postulated that the relative price of public goods would rise over time because of the lack of productivity growth in the public sector. This productivity disparity could set up one of two possible outcomes:

a) The share of employment devoted to the public sector might remain constant, but because of more rapidly rising private sector productivity, the share of real output devoted to the public sector would fall.

b) The share of output would remain constant, but a progressively larger share of the work force would need to be devoted to the public sector to bring about this result.

Baumol was initially worried that the former outcome would materialize, but lately it has become fashionable to worry about the latter.

The relevance of Baumol's hypothesis to the government growth picture can be discussed at several different levels. Since the national income accounts use labor input prices to measure public output prices, they assume that there will be no productivity growth in the public sector, and hence assume a Baumol-like model. I first examine the macro statistics to see, in this upper-bound case, how dramatic the price differentials are. I then examine actual growth behavior for exhaustive expenditures to see which of the two possible outcomes appears to be closest to the truth. Finally I ask whether there might be a form of measurement error in the national accounts that generates the whole problem -- if true output prices were used, would productivity differentials simply vanish?

To begin with the price differentials themselves, suppose that public output is produced according to the Cobb-Douglas production function

$$G = e^{rt} E^b K^{1-b}, \quad (8)$$

where  $r$  is some rate of productivity change,  $E$  is the number of public employees, and  $K$  is the public sector's capital stock. If a community hires factors up to the point where the value of their marginal product equals their real wage, we get the first order conditions

$$\frac{\partial PG}{\partial E} = b \frac{PG}{E} = W \text{ and } \frac{\partial PG}{\partial K} = (1-b) \frac{PG}{K} = P_k, \quad (9)$$

where  $P_k$  is the gross rental price of capital, assumed to be constant,  $P$  is the relative price for public services, and the equalities are exact if the value of marginal products equal wages and correct up to some proportional factor if the value of marginal products are proportional to wages. These first order conditions can be solved for  $E$  and  $K$  and substituted back into (8) to yield

$$d \ln P = -r dt + b d \ln W \quad (10)$$

as the growth equation for the relative price of public output, one of the independent variables in (4). Baumol's argument is that if wages grow at the same rate in the public and private sector because of competitive labor markets, the fact that  $r$  is zero in the public sector implies that the relative price of public output ( $P$ ) will be rising over time.

In Table 3 I show the rates of real wage growth for public and private employees, along with the change in relative prices for public output over the last five decades. Comparing rates of growth of real wages in the first two columns, it can be seen that wages do rise at approximately the same rate. In the prewar period private wages ( $W_p$ ) rose slightly more rapidly; in the postwar period public wages have. Then, comparing columns (2) and (3), it can be seen that a zero rate of productiv-

ity change does indeed appear to be assumed for public employees. Over the last three decades  $W$  has risen at the average rate of .018, and if  $b$  is assumed to be about .7 for the public sector,  $r$  can be calculated from equation (10) to be very close to zero (in fact, slightly negative). At this level the Baumol story appears to be accurate.

The next question is what does this rise in relative public sector prices do to output shares? Both Baumol and Bush-Mackay (1977) set up rigid models where either real output shares or the proportion of the labor force in the public and private sector were constant, and where the non-fixed variable progressed steadily to one or zero. But as equation (4) suggests, if income and price elasticities are allowed to take non-unity values, there is no reason why an intermediate outcome could not occur, and why both  $G/Y$  and  $E/N$  could progress or regress at slower rates. Columns (4), (5), and (6) of Table 3 indicate that such an intermediate case has indeed been the actual outcome in the United States. The share of full time employment devoted to the public sector in column (6) has risen slightly over the period (though dropping in the most recent period due to the reduction in military employees), but slightly more than enough to compensate for the slower assumed productivity growth in the public sector. The consequence has been the slight rise in the share of real output purchased by the public sector noticed above (again until the recent decade). The rising relative price of government output has also implied a rising share of nominal output to government over the 1949-69 period. Even the share of nominal output purchased by government has fallen in the recent decade, however,

mainly because of the disproportionate cutback in real outlays for national defense. Hence until the most recent decade the overall picture was one falling closest to the second extreme posed by Baumol: the share of the workforce hired by the public sector has risen slightly and the share of real output purchased by the public sector has been stable or slightly increasing.

The final question that can be raised about the Baumol model in effect goes behind published statistics to question their assumptions. In compiling price indices for public goods, the Department of Commerce simply assumes productivity advances for government employees of zero. At the federal level, both the Civil Service Commission (1972) and the Office of Personnel Management (1980) have found rates of productivity advance of from 1% to 2% for agencies comprising a majority of civilian employees, enough to account for the entire rise in the relative price of government output if extrapolated to local government as well. At the state and local level, there is as yet no evidence in favor of positive rates of productivity change, and there is some in favor of negative rates of productivity growth (Bradford-Malt-Oates, 1969 and Spann, 1977). All of these estimates should be taken with a good deal of care because of the great difficulty in holding constant the quality of public output, but at least we should be cognizant of the possibility that the Baumol productivity disparity model is based on measurement error in trying to define rates of productivity increase in the public sector.

Whatever the case, neither of the two models intending to explain the growth of government provides very convincing explanations of the postwar



experience in the United States for the simple reason that the share of output and employment devoted to government has not grown that much. Since 1949 only .036 more of the full time work force is devoted to government, only .047 more of nominal GNP is devoted to government purchases, and only .044 more of GNP is devoted to government transfer payments. Since 1969, there has been a drop in the share of government employment, a drop in the share of nominal output and a sharp drop in the share of real output devoted to government, though still some rise in the share of transfer payments. This hardly seems to be provocation for the massive political movement that has crystallized around constitutional measures to limit taxes in America, unless tastes have changed in the direction of desiring smaller levels of government. Whether that is so awaits a more careful examination of voter tastes, something I deal with in the next section of the paper.

#### **LEVEL THEORIES**

##### **The Voting Distortion Hypothesis of Borcherting-Bush-Spann**

We turn now to the theories that suggest that however rapidly government spending has grown, there are political tendencies for its level to be too high. In an economic efficiency sense, these tendencies would imply public spending beyond the point where the marginal social benefits to society equal the marginal costs. This point is very hard to estimate, however, so for practical purposes bigness is usually defined as spending beyond the level that would be favored by the median voter in a direct democracy. A great many

theories of bigness have been constructed, and it is impossible to do justice to all of them. These theories generally assume first that government employees, whether bureaucrats or legislators, have a taste for higher levels of public spending than private voters, and, second, that as a result of their position, they are able to manipulate the system so as to gain their objectives.

One of the first models was that of logrolling by Buchanan and Tullock (1962). Under this view, individual legislators with intense preferences for certain public spending actions and modest preferences against others would logroll to pass a large number of actions that a pure median voter system would not pass. Niskanen (1971) focused more on nonelected bureaucrats, arguing that since they cannot compete for any surplus generated by their agency, they will compete to have large agencies with many employees to supervise. A complementary motive, not emphasized by Niskanen but also implying public spending greater than the median voter condition, is that those already working in the public sector have a job security motive for wishing to enlarge it. Niskanen also worked in legislative oversight committees, which should constrain the bureaucrats but do not because they also have high demands for public spending. Romer-Rosenthal (1978) focused on the fact that bureaucrats and legislators are able to control the political agenda, and hence confront voters with two options, one implying spending greater than voters would prefer and a second, conferring even less utility to voters, with greatly reduced public spending (if you do not build another school, we will not teach at all). Through this mechanism public employees could raise the size of government. Denzau-Mackay-Weaver (1981)

focused the monopolistic position of public agencies, and how this monopoly permitted the growth of public spending. Goetz (1977) discussed the fiscal illusion problem -- that voters may not be aware of all the taxes they are paying for public goods, particularly if these public goods are financed by grants from higher levels of government and therefore apparently free to lower level taxpayers.

Everybody has good anecdotal evidence that many of these imperfections exist, but in general it is extremely hard to test these big government theories very systematically. Even Romer-Rosenthal, who have found one state (Oregon) that uses "reversion" budgeting, have had great difficulty because it turns out that the impact of the reversion level is nonlinear -- if the reversion level is well below the median voter point, rises in it will imply lower levels of public spending, but if it is slightly above the median, rises in it will imply higher levels.

The recent raft of tax limitation amendments in the United States has provided one opportunity to test some of the theories. Both public and private voters can be surveyed directly to try to measure their taste for public goods, and to see if systematic taste differences exist among those who have more or less to gain from higher levels of public spending. It is also possible to see whether turnout and voting differences imply that public employees favor and can bring about higher levels of public spending.

The framework that I will use to make these tests is the voting distortion hypothesis of Borcharding-Bush-Spann (1977). Borcharding-Bush-Spann focused

on the fact that public employees are more organized than private employees, but I will here generalize their notion to allow for taste differences as well.

Say that there is some election where the voters are directly voting on the size of public budgets -- a common occurrence in America with its school millage property tax elections and recent spate of tax limitation amendments. These elections are decided by majority vote, and we have already seen (Table 3) that the public work force comprises only about 20% of the labor force in the United States. Hence in straight sector of employment voting, the private sector will always win. But there is not straight sector of employment voting -- voters in both the public and private sector have taste differences and turnout differences, and it may still be possible for a minority group such as public sector workers to have an important influence on electoral outcomes.

This can be seen in the following model, developed from that of Borcharding-Bush-Spann. The large budget option in the election will win if

$$E_g Q_g V_g + (1-E_g) Q_p V_p \geq .5(E_g V_g + (1-E_g) V_p), \quad (11)$$

where all variables lie between zero and one, the  $g$  subscript refers to the public sector and  $p$  to the private sector, and  $E_g$  refers to the share of public employees in the electorate (presumably proportional to  $E/N$ ),  $Q_g$  and  $Q_p$  to propensities to vote for higher public spending or against tax limits, and  $V_g$  and  $V_p$  to voter turnout rates. The left side of the inequality then gives the share of the electorate voting for larger public budgets, and the right side gives the majority rule

conditions: more than half of those actually voting must favor larger public budgets for the measure to pass.

The expression can be manipulated by dividing through by the right hand side and recombining to yield

$$Q_p + \frac{(Q_g - Q_p)E_g V_g}{E_g V_g + (1-E_g)V_p} \geq .5 \quad (12)$$

This expression can be interpreted as follows. If  $Q_p \geq .5$ , even the private voters favor higher public budgets (or oppose tax limits), and measures to raise spending should pass. In these cases the presence of public voters may affect the vote count, but not the actual fiscal result. But if  $Q_p < .5$ , the presence of public voters with different tastes may "bias" the outcome by virtue of the second term. For this bias to exist there must be taste differences  $(Q_g - Q_p) > 0$  and public voters must comprise a large enough weight that these taste differences matter ( $E_g V_g > 0$ ).

Before looking at numbers, I should mention two philosophical problems with the argument. The first is that the  $(Q_g - Q_p)$  term is typically used as a measure of bias, as if private sector voters have "pure" tastes and public sector voters have a conflict of interest -- they are suppliers of public goods who are allowed to vote on the demand side. But to establish the existence of this bias, one must argue that public employees have different tastes because they are public employees. If their tastes were prior and they only work in the public sector because of their innate preference for public goods, or because they have better information about the true value of public goods,

it would be biased to disenfranchise these employees and to treat  $Q_p$  as the unbiased estimate of voter preferences.

A similar argument can be made about turnout differences. If  $V_g > V_p$ , public employees' votes are differentially weighted because of their higher turnout rates. Perhaps this is due to greater union organization and distorts the vote. But also the higher public turnout rates could be due to more intense preferences, and optional turnout may then be a reasonable way to allow these more intense preferences to be expressed. For both reasons one must be extremely cautious in interpreting private levels of  $Q$  and  $V$  as appropriate, and differences in public levels as reflecting some sort of voting bias.

The actual numbers come from a telephone survey of a random sample of 2001 households in the state of Michigan, taken by Courant-Gramlich-Rubinfeld (1980) just after the widely-publicized 1978 vote on the Headlee Amendment. This Amendment would have limited own state government revenue to the pre-existing share of state personal income -- in effect, forestalling further increases in  $PG/Y$  unless financed by federal grants. It also limited the growth in local property tax assessments to the growth in inflation, unless overridden by local referenda. The measure was fairly straightforward, at least compared to some on the ballots in the U.S. lately (see the Oates paper), and was viewed as a fairly straightforward test of taste for public goods. It passed with 52% of the overall vote.

The basic data for evaluating the Borcharding-Bush-Spann "bias" are given in Table 4 and the

calculations worked out in Table 5. Beginning with row 1 in Table 4, .514 of the sample (the electorate) voted on the measure, a turnout rate that is low by international standards but average for the United States. The share voting against the amendment was .438, less than the .48 of the actual vote because the actual voting population included university students (who probably voted against the Amendment in greater numbers) and because there may have been some selective recall.

The first four rows of the Table give basic turnout and voting data. If public employees are to be defined as all households with at least one adult member working in the state and local sector, the most liberal definition, the results are summarized in row 1 of Table 5. There it can be seen that  $Q_g$  is indeed .185 higher than  $Q_p$ , that  $V_g$  is .222 higher than  $V_p$ , and that the voting "bias" is .043. Since  $Q_p$  was only .395, a bias of .043 was not enough to sway this election, and indeed a bias of this magnitude would not have swung any of the nine tax limitations amendment so far on the ballot in the state of Michigan. It is hard to get numbers on electoral margins in the other states that have had limitation elections, but in general the winning or losing margins have also been much larger than .04. The same calculation is done in row 2 of Table 5 with only those households that could be allocated to specific state or local agencies, reaching essentially identical conclusions. Finally, not all state and local employees earn more in the public sector than they would working in the private sector, so we developed a technique (based on the work of Smith, 1976, and described in Gramlich-Rubinfeld, 1982) for identifying only those state and local employees with positive labor market "rents". When the bias calcu-

lation was redone for just this conception of the public sector (row 13 of Table 4 and row 3 of Table 5), a much smaller share of the electorate, only .054, was in the public sector but the differences between  $Q_g$  and  $Q_p$  and  $V_g$  and  $V_p$  were greater so the bias declined only to .022.

Rows 4 and 5 of Table 5 then try to verify these calculations with a school millage vote in Troy, Michigan (see Rubinfeld, 1977). Estimates of both sets of V's and Q's are higher in the millage elections, but the bias calculations are quite close to those computed for the Headlee vote. Biases on this order (.04) would have swung about 10 percent of all failing school millages into the win column in the state of Michigan (see Neufeld, 1977).

In Table 4 I have focused on the actual voting and turnout data, in line with the usual economist's presumption of letting behavior reveal tastes. However in the survey we did also ask people whether they would favor a larger or smaller public sector (both state and local), and if so, how much they would like to see both taxes and expenditures altered in percentage terms. The results for state expenditures and taxes are shown in column 6 of Table 5. There it can be seen that even though  $Q_g$  is above  $Q_p$ , in explicit answers to this hypothetical question, public sector voters look much more like private sector voters.

The upshot of all this for the voting bias theories is that there is some evidence of taste and turnout differences between public and private voters, on the order of .2 for both ratios. Multiplying together leads to public employee biases of .02 - .04, not a negligible number but a number



small enough that very few tax limitation of school millages are swung. Hence the pure voting bias, supposedly raising the size of government is relatively small, even in the worst case where the entire difference in turnout and voting rates are attributed to public sector worker conflict of interest. If, as seems likely, only a portion of these differences should be attributed to conflict of interest, the voting bias would be smaller and less significant yet. Moreover, if instead of looking at voting behavior we looked at differences in answer to direct but hypothetical questions about preferred levels of public spending, any public-private differences become totally insignificant.

While these voting data only permit a direct test of the Borchering-Bush-Spann big government hypothesis, it is possible to make some indirect tests of both the Niskanen (1971) bureaucratic manipulator hypothesis and the Goetz (1977) fiscal illusion hypothesis. For the Niskanen case we measure the tastes only (not their ability to lobby for bigger agencies) of upper level bureaucrats, those likely to be in public sector management positions. Statistics for these individuals are shown in rows 11 and 12 of Table 4: there it can be seen that these high income state and local managers have turnout rates and voting propensities about like all other state and local employees not likely to be in management positions (except for the remarkably high turnout rate for high income local employees). There is then some taste difference between high income public employees and private workers, enough at least to be consistent with Niskanen's hypothesis.

Goetz has argued the fiscal illusion hypothesis, paying particular attention to the fact that local

taxpayers may view grants from the federal government as free money, forgetting the federal taxes they pay when voting on local projects. It is possible to make a weak test of this hypothesis through the following reasoning. Using estimates of individual demand functions (Gramlich-Rubinfeld, 1982), the consumer surplus from public expenditures can be derived by integrating up to the actual level of expenditures in the community and then subtracting local property taxes paid. The net surplus as so defined is then used to rank private voters into high and low surplus groups, as shown in rows 3 and 4 of Table 6. An infusion of grant money would shift low net surplus voters to the high net surplus category. If they then vote like others in that category, the table shows that the share voting against Headlee (for larger public output) goes down. One explanation for this finding is that high net surplus voters already have enough public goods and have a low marginal rate of substitution, explaining their lower rate of voting for an increase. But another possibility is that the Goetz hypothesis is not confirmed: an infusion of grants does not create any fiscal illusion leading voters to vote for larger public budgets.

#### **The Redistribution Hypothesis of Peltzman**

The Peltzman (1980) model essentially ignores public goods and focuses instead on the redistribution function of government. In this it is similar to an earlier paper by Meltzer and Richard (1978). Meltzer-Richard's politicians try to maximize their vote by extending the franchise; Peltzman's by finding a politically dominant redistribution strategy. Were politicians to tax Johnny Carson

and distribute the proceeds to poor people, these politicians would lose one vote (Carson's) and gain the votes of all transfer beneficiaries. Then they might focus on the next person in the income distribution, Bob Hope -- losing his vote but gaining another set. They would proceed in such a manner until the marginal political benefits equal the marginal costs, rising because more and more voters would be taxed, and perhaps aggravated by labor supply effects. There will always be redistribution in such a model because rich people have only one vote but lots of money to "buy" lots of votes.

There are two ways to test such a model with voting data, and as it happens the tests yield ambiguous results. One test, in which the model does not come off very well, is shown in Table 6. Rows 6 through 15 of the table show voting results for various sets of transfer recipients, the beneficiaries of Meltzer-Richard or Peltzman government growth schemes. The general conclusion is that politicians who attempt to buy votes by redistribution are in for a rude shock. Whereas the turnout rate for working private sector voters (row 2, Table 4) is .486, only social security recipients (or retired and disabled) turn out in larger numbers, and most groups turn out in much smaller numbers (the rate is only .171 for the unemployed, who presumably have enough leisure time to vote). Regarding voting percentages, both the low income working poor (row 15) and all groups of non-workers (rows 7 through 9) have the same or lower rates of voting against the Headlee Amendment. Transfer recipients do show slightly higher rates of voting against the Amendment, but

only by fairly trivial amounts (with the exception of food stamp recipients, where almost nobody turns out). Computing the transfer vote bias for transfer recipients in the manner done above for public employees leads to a bias of only .017 for all transfer recipients, .014 for social security recipients, and trivial amounts for the other groups. If politicians really are trying to buy votes by redistributing income, there is little evidence here that their actions are being reciprocated in the votes of transfer recipients for more public spending.

However there is another test yielding results more favorable to the Peltzman hypothesis. Voter surveys in three different states -- California (Citrin, 1979), Michigan (Courant-Gramlich-Rubinfeld, 1980), and Massachusetts (Ladd-Wilson, 1983) are in close agreement on one point. When voters are asked whether they want larger or smaller governments, they generally opt for no overall change (see Table 4 for evidence). When they are asked about particular functional categories of expenditures, they opt for no change or an increase with one striking exception -- most voters in the three states want to see a cutback in welfare payments. This part of the argument fits the Peltzman model very well. If politicians were really trying to buy the voters of transfer beneficiaries by passing expensive redistribution schemes, we might expect the electorate in general to be upset about it, and that is exactly what they seem to be. The only problem, as mentioned above, is that the beneficiaries themselves do not appear to be playing along.

**The Public Wage Growth Hypothesis of Courant-  
Gramlich-Rubinfeld**

The theories used to explain government growth or bigness to this point have all focused on the real quantity of government spending. This is moderately surprising because in utility terms that should not be as harmful to the private sector as when the factor cost of government services is rising -- then the quantity of both public and private goods consumed by the private sector is being reduced, whereas before there was just a shift between public and private consumption. We now turn to a model of the market power of public employees and how that might be used to raise their wages above competitive levels.

Public employees are in the unique and enviable position of being sellers of public services who vote on the demand side. When they get to be an important voting block, they can either influence elections directly or vote for mayoral candidates who promise implicitly to raise public wages if elected. Sympathetic political candidates can also hire more workers into the public sector, expand the power of the voting block even more, and lead to parallel growth of the public work force and public wages (see Tullock, 1974).

When one tries to model the process, as both Courant-Gramlich-Rubinfeld (1979) and Inman (1980) have, the conclusions turn out to be somewhat more restrictive. Taking the worst possible case, assume that the public employees of a local government have complete control over their wage level, and can set it in a monopolistic manner. The decisive voter, whether in the public or private sector, is then allowed to choose a level of gov-

ernment employment (E), and private employees are given the additional ability to leave the community if the tax price of public services is driven to excessive levels by these monopolistic public servants. In this case the solution for levels of W and E turns out to depend on a simultaneous solution of two equations, one essentially like (1) that gives the public employment level given W, and another that gives optimal (from a public employees' standpoint) wages for a given level of E.

The latter expression can be derived simply by assuming public employees have conventional utility functions

$$U_g = U_g(C_g, E), \quad (13)$$

where the g subscript again refers to the public sector, taken for simplicity to have homogeneous tastes and to be admitted to the public sector only if the voting process creates more public sector jobs. To find the maximum, or optimal, level of W for each E, the E argument in (13) can be held fixed, and the optimization exercise involves simply maximizing the private consumption of public employees with respect to W. The only trick is that since Y equals the wage bill of the public plus the private sector, it can in principle rise or fall with W -- it will rise if the higher public sector wage income is not offset by lower private sector wage income, or fall if the higher public sector wage income and tax rates inspire emigration or reductions in labor supply. Solving the optimization exercise yields

$$W = Y/E(2-\eta), \quad (14)$$

where  $\eta = \frac{dY}{dW} \frac{W}{Y} \leq 1$ , as the expression for the real wage level desired by public employees. The important aspect of (14) is that public wages and employment levels are inversely correlated, in contrast to the Tullock political prediction. As  $E$  increases, higher public wages entail higher income tax rates even for public employees, reducing their after-tax income even though before-tax income is increased. Also note that the lower is  $\eta$  and the more mobile is the private sector, the lower is  $W$ . When  $\eta = 0$ , the optimal wage is set so that government spending is just half of total output; when  $\eta = -1$ , government spending is one-third, and so forth.

Finding that employment and wage levels are inversely correlated implies that there are severe limits on government employee wage exploitation of the private sector. In the first place, when voting on  $E$ , public employees will be torn between choosing an  $E$  that maximizes their utility as consumers of public output and one that provides optimal levels of rent. For another, there is now a difficult trade-off for public employees. They can vote to expand the public sector to give themselves more political power (raising  $E_g$  in equation (10)), but this very action reduces the optimal wage level. Or they can try to keep the public sector small and optimal wages high, but this action reduces the probability they will have enough voting power to raise public wages above competitive levels in the first place.

Does the evidence support this view of the public sector wage determination process? There have been many attempts to explain government wage rates, but most have not tried to distinguish wage differentials according to whether private voters do or

do not have a credible exit threat. But it is perhaps possible to glean at least some information from empirical work on public sector wage differentials.

A first question is whether public sector workers in fact get any noncompetitive rents. The answer depends on the study you look at, but there is some weak evidence of positive rents. Results from three human-capital type studies are listed in Table 7. In each, wage levels for individuals are regressed on age, race, sex, education, location, and other variables, with a dummy or some other correction for sector of employment. They indicate that only for the federal government, whose jurisdiction is hardest to emigrate, are rent levels generally positive. It should be noted however that a later analysis of Quinn (1981) shows that other terms of the wage bargain such as pension arrangements, disability, tenure, and job interest are also seen to be more favorable for public than private employees.

Other interesting evidence about wage rents comes from the work of Inman (1980) and Ehrenberg-Goldstein (1975). Inman showed that the presence of competitive suburbs with income levels comparable to these in a central city -- implicitly, negative values of  $\eta$  -- does appear to hold down wages for policemen and firemen by a large and statistically significant amount. Ehrenberg-Goldstein have reinforced the same conclusion from a different standpoint. They show that the union organization of suburban employees raises central city public wages (by reducing the credibility of private employees' exit threat), while the organization of central city employees raises suburban public wages. Both the existence of public sector rents,



and their negative correlation with the private employee's exit threat then tend to support also the wage monopoly rationale for some degree of excess government spending.

#### **SUMMARY AND IMPLICATIONS**

This analysis of the size and level of government budgets in the United States thus contains some mixed signals. On the one hand, it does not appear that the growth of government is out of control. In earlier decades government spending grew at rates that exceeded those predicted on the basis of cross-section elasticity estimates, but at least in the seventies that has not been true for exhaustive expenditures for national defense, and not as true for civilian exhaustive expenditures and transfer payments. And even though government growth has not been fully explainable by cross-section elasticity estimates, the shares of real and nominal GNP devoted to government purchases and the labor force devoted to government employment are not particularly high by international standards, and have been declining for a decade.

The productivity disparity, on which the Baumol argument is based, has been responsible for a rise in the relative price of government output of about one percent a year for the last three decades. This rise is in the official statistics which assumes zero productivity growth among public employees, an assumption that is at least moderately questionable for federal government workers, though perhaps not for state and local employees. In any case, when demand functions are used that are more flexible than in the original Baumol model, the rise in relative prices of

public output has implied essentially constant real output shares devoted to the public sector and only slightly rising employment shares. Again, however, all public sector shares have declined in the past decade.

But simply saying that government spending is not rising at excessive rates does not imply that spending is at its efficient level where all marginal benefits of public output equal marginal costs, or its democratically chosen median voter level. One reason why the median voter rule might be violated involves a whole set of "supply-side" arguments suggesting that public employees have a taste for more government spending, and the position to bring this about. I examined carefully one aspect of this argument, the part involving differential tastes and turnout rates of government employees, and whether that biases electoral fiscal outcomes. There is in fact evidence of differential tastes and turnout rates, and this can alter outcomes on fiscal votes, though the actual number of cases where this has happened is undoubtedly very small. But simply arguing that tastes or turnout rates differ still does not establish any voting bias unless it can also be shown that differential tastes result from the fact of government employment, and so far that has not been shown.

I also examined two other hypotheses involving more than median-voter government spending levels. The Peltzman redistribution hypothesis might superficially appear to be confirmed by the quite general voter feeling that welfare payments are too high, but there is still a weak point in the argument because it seems that actual beneficiaries of transfer programs do not vote much differ-

ently than anybody else (unlike public employees), and they turn out for votes in very small numbers. Hence it is not obvious that redistribution-minded politicians have a winning strategy -- they make some voters mad and do not make others happy -- and therefore one would have difficulty in arguing the pervasiveness of this explanation of government growth.

There was slightly more evidence of some monopolistic rent in public sector wage differentials, with studies indicating that federal wages appear to be about 10 percent above corresponding private wages, though state and local wages appear to be about the same as private wages. Formal models of the wage setting process indicate why federal wages may be somewhat higher than those at the state-local level (there is less fear of fiscal emigration of private taxpayers). But they also show why ultimately public employee growth and public wage growth are substitutes, not complements, and lead to a constrained and not unbounded overall size of the public sector.

The upshot of all this is that while there is some evidence in favor of all theories of excessive government size -- public employees do vote differently, welfare payments may be too high, public wages may be excessive -- the quantitative magnitudes are not great and the arguments all have at least some theoretical or empirical weak links. The theories are interesting and at least partly confirmed by the facts, but they have yet to make a very compelling case that government spending has grown to excessive proportions in the United States.

**Table 1 Estimates of Public Expenditure Demand Parameters**

Study	TS or		Type	$c_1$	$c_2$	$a_1$
	CS <sup>1</sup>	Date				
Ashenfelter- Ehrenberg (1975)	PCS	58-69	SL Employment	.78	- .72	n.c.
Barlow (1970)	CS	60	Mich. Sch. Dist.	.64	- .34	n.c.
Bergstrom- Goodman (1973)	CS	60	Mich. Cities	.88	- .41	.98
Borcherding- Deacon (1972)	CS	62	SL Agg.	.83	- .76	.92
Feldstein (1975)	CS	70	Mass. Sch. Dist.	.48	-1.00	n.c.
Gramlich (1978)	TS	54-77	SL Agg.	.70	- .36	n.c.
Gramlich- Rubinfeld (1982)	CS	77	Mich. Counties	.40	- .06	1.01
Inman (1978)	CS	68-69	N.Y. Sch. Dist.	.72	n.c.	n.c.
Johnson- Tomola (1977)	TS	66-75	SL Emp.	.62	- .56	n.c.
Lovell (1978)	CS	70	Conn. Sch. Dist.	.32	- .83	n.c.
Ohls-Wales (1972)	CS	68	SL Agg.	.74	- .11	n.c.
Mean estimate				.65	- .51	.97
Standard deviation				.17	.29	.02

<sup>1</sup> TS means a time-series analysis, CS a cross-section analysis, and PCS a pooled cross-section analysis.

**Table 2 Explained and Unexplained Rates of Growth of Various Components of Government Spending**

All variables in real terms, rates of growth in per annum terms

Purchases for National Defense ( $G_{ND}$ )				
Decade	(1) dln $G_{ND}$	(2) Predicted by Eqn. (5)	(3) Residual	(4) Share of real GNP at end
1929-39	n.c.	n.c.	n.c.	.017
1939-49	.179	.026	.153	.065
1949-59	.089	.017	.072	.107
1959-69	.021	.022	-.001	.088
1969-79	-.035	.014	-.059	.045

  

Other Purchases by Federal, State, Local Government ( $G_0$ )				
Decade	(1) dln $G_0$	(2) Predicted by Eqn. (6)	(3) Residual	(4) Share of real GNP at end
1929-39	.034	-.007	.041	.180
1939-49	.012	.026	-.014	.132
1949-59	.036	.017	.019	.129
1959-69	.055	.022	.033	.149
1969-79	.028	.014	.014	.144

  

Transfer Payments, All Levels (T)				
Decade	(1) dln T	(2) Predicted by Eqn. (7)	(3) Residual	(4) Share of real GNP at end
1929-39	.115	.003	.112	.001
1939-49	.093	.033	.060	.045
1949-59	.051	.031	.020	.052
1959-69	.067	.032	.035	.067
1969-79	.070	.023	.047	.099

**Table 3 Rates of Growth of Public and Private Real Wages, Relative Prices for Government Services, and Real and Nominal Shares of Employment and Output Devoted to Government**

Rates of growth in per annum terms

Decade	(1) dln Wp	(2) dln W	(3) dln P	(4) G/Y at end	(5) PG/Y at end	(6) E/N at end <sup>1</sup>
1920-39	.003	-.001	.014	.197	.149	.172
1939-49	.020	.015	-	.197	.149	.155
1949-59	.023	.019	.011	.236	.200	.186
1959-69	.018	.022	.010	.237	.221	.205
1969-79	.007	.012	.010	.190	.196	.191
Average 1949-79	.016	.018	.010	.215	.192	.184

<sup>1</sup> Share of full-time equivalent employment hired by the public sector.

**Table 4 Voting Data for Various Groups**  
1978 Tax limit vote in Michigan

(1)	(2)	(3)	(4)	(5)	(6)
Group	Number in sample	Share of elec- torate	Turnout rate for Headlee vote	Share voting against Headlee	Mean, desired state tax and exp. change %
1. Total	2001	1.000	.514	.438	-1.8
2. Private workers <sup>1</sup>	1279	.639	.486	.396	-1.9
3. Not working <sup>2</sup>	381	.190	.444	.391	-1.3
4. Pure public <sup>3</sup>	186	.093	.683	.654	-0.9
5. Mixed <sup>4</sup>	155	.077	.716	.496	-1.5
6. State and local <sup>5</sup>	239	.119	.720	.616	-1.1
7. State govt.	47	.023	.489	.696	-1.9
8. State univ.	25	.012	.600	.533	-1.4
9. Local govt.	64	.032	.797	.588	-1.3
10. School dist.	103	.051	.806	.626	-0.5
11. High income, state. <sup>6</sup>	23	.011	.696	.625	n.a.
12. High income, local <sup>7</sup>	31	.015	.903	.607	n.a.
13. Rent earning, st. or loc. <sup>8</sup>	109	.054	.734	.700	-0.4

<sup>1</sup> Includes federal government workers, who for these purposes are not in the relevant public sector.

<sup>2</sup> Detailed breakdown is given in Table 6, rows 7, 8, and 9. Does not include temporarily laid off.

<sup>3</sup> Respondent is single and works in the public sector, is in a household where the only working spouse works in the public sector, or is in a household where both spouses work in the public sector.

<sup>4</sup> Both spouses are working and one works in the public sector and one in the private sector.

<sup>5</sup> Less than the sum of rows 4 and 5 because many of pure public households could not be allocated.

<sup>6</sup> All state employees with income above the median for state employees (\$16,000).

<sup>7</sup> All local employees with income above the median for local employees (\$13,000).

<sup>8</sup> Based on procedure described in Gramlich-Rubinfeld (1982).

**Table 5 Voting Biases for Different Votes**  
1978 Tax limit vote in Michigan

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Election	$E_g$	$V_p$	$V_g$	$Q_p$	$Q_g$	$\frac{(Q_g - Q_p)(E_g V_g)}{E_g V_g + (1 - E_g)V_p}$
1. Headlee, all public emp. <sup>1</sup>	.170	.476	.698	.395	.580	.043
2. Headlee, st. & loc. emp. <sup>2</sup>	.119	.486	.720	.402	.616	.037
3. Headlee, rent earning emp. <sup>3</sup>	.054	.501	.734	.416	.700	.022
4. First Troy millage <sup>4</sup>	.107	.768	.797	.552	.941	.043
5. Second Troy millage <sup>4</sup>	.107	.807	.828	.631	.962	.036

<sup>1</sup> Based on the sum of rows 4 and 5, Table 4.

<sup>2</sup> Based on row 6, Table 4.

<sup>3</sup> Based on row 13, Table 4.

<sup>4</sup> All Q and V estimates are based on sample probabilities and are only relatively accurate, not absolutely accurate. Hence the level of  $V_p$  and  $V_g$  will be off by the same amount, as will that of  $Q_p$  and  $Q_g$ .



**Table 6 Voting Data for Nonpublic Voters**  
1978 Tax limit vote in Michigan

(1) Group	(2) Number in sample	(3) Share of electorate	(4) Turnout rate for Headlee vote	(5) Share voting against Headlee
1. <u>Private, working &amp; not</u> <sup>1</sup>	1660	.830	.476	.395
2. Nonhomeowners	758	.379	.342	.429
3. High net surplus <sup>2</sup>	451	.225	.608	.365
4. Low net surplus <sup>2</sup>	451	.225	.570	.401
5. Lansing area <sup>3</sup>	70	.035	.386	.333
6. <u>Not working</u> <sup>4</sup>	381	.190	.444	.391
7. Retired & disabled	18	.109	.550	.392
8. Unemployed	35	.196	.536	.333
9. Other	128	.064	.336	.395
10. <u>Transfer recipients</u> <sup>5</sup>	657	.328	.461	.449
11. Social security	392	.196	.536	.462
12. Unemp. ins. <sup>6</sup>	188	.094	.436	.427
13. Food stamps	109	.054	.211	.521
14. AFDC & SSI (Welfare)	181	.090	.320	.431
15. Working poor <sup>7</sup>	300	.150	.340	.392

<sup>1</sup> Based on the sum of rows 2 and 3, Table 4.

<sup>2</sup> Based on procedure described in Gramlich-Rubinfeld (1982).

<sup>3</sup> All residents of counties of Lansing SMSA.

<sup>4</sup> Same as row 3, Table 4.

<sup>5</sup> Less than the sum of rows 11-14 because some households receive benefits from more than one program.

<sup>6</sup> Larger than row 8 because temporary layoffs are not included in 8, and because Total includes many on UI for a short time who were working again when the survey was taken.

<sup>7</sup> Bottom quartile of row 2, Table 4 -- annual pretax income below \$11,800.

**Table 7 Percentage Differentials between Public and Private Pay Levels, Controlling for Human Capital Variables**

	(1)		(2)		(3)	(4)
	Smith (1980)		Quinn (1979)		Mitchell (1979)	
	Males	Females	Males	Both sexes		
Federal government	11	21	20	2		
State government	- 6	3	17	-16		
Local government	10	0	-6	- 2		

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