

NBER WORKING PAPER SERIES

DEMOGRAPHIC CHARACTERISTICS
AND THE PUBLIC BUNDLE

David M. Cutler

Douglas W. Elmendorf

Richard J. Zeckhauser

Working Paper No. 4283

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 1993

This paper is forthcoming in *Proceedings of the 48th Congress of the International Institute of Public Finance, 1992*. We are grateful to Robert Haveman, Jim Hines, Marjorie Honig, Ted Lascher, Richard Musgrave, Jay Patel, Jim Poterba, Julie Wilson and Barbara Wolfe for helpful comments, and to Anne Case, Jim Hines and Harvey Rosen for providing data. We are also grateful to Andrew Wang for excellent research assistance, and to the Hewlett Foundation, the National Bureau of Economic Research, the National Institutes on Aging, and the National Science Foundation for financial support. This paper is part of NBER's research programs in Public Economics and Aging. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper #4283
February 1993

DEMOGRAPHIC CHARACTERISTICS
AND THE PUBLIC BUNDLE

ABSTRACT

This paper explores the relationship between the demographic characteristics of a community and the quantities of goods and services provided by its government. We consider three models of public spending: a traditional "selfish" public choice model in which individuals care only about themselves, a "community preference" model in which an individual's preferred spending depends on the characteristics of his or her community, and a sorting process through which individuals choose communities according to their tastes for public spending.

To evaluate these models of spending, we examine how county and state spending in the United States is affected by the age and racial composition, and the total size of a jurisdiction. The estimated effects of demographic characteristics in the state equations are strikingly different from the estimated effects in the county equations, apparently because a jurisdiction's spending is affected differently by its own demographic characteristics and by the characteristics of the surrounding area.

David M. Cutler
Department of Economics
Harvard University
Cambridge, MA 02138
and NBER

Douglas W. Elmendorf
Department of Economics
Harvard University
Cambridge, MA 02138

Richard J. Zeckhauser
John F. Kennedy School
of Government
Harvard University
79 John F. Kennedy Street
Cambridge, MA 02138
and NBER

Japan's population is rapidly aging. In Europe, foreign nationals flow across borders. The Soviet Union, Czechoslovakia and Yugoslavia have splintered along ethnic lines. And in the United States, the non-white share of the population continues its rapid increase.¹ As the demographic compositions of political jurisdictions change, their citizens' preferences for public expenditures may change as well. This paper explores the relationship between the demographic characteristics of a community and the quantities of goods and services provided by its government, what we label the "public bundle."

We consider three models of public spending. The first is a traditional "selfish" public choice model in which individuals care only about themselves and not about others. The second is a "community preference" model in which an individual's desired spending depends on the characteristics of his or her community, either in a discriminatory fashion, where an individual's concern for other people depends on their similarity to that individual, or in an even-handed way, where an individual's concern for others depends on those people's needs but not their identities. The

¹ The United States Census asks citizens to indicate their race in the following categories: white, black, American Indian, Asian and Pacific Islander, and "other" (most of whom are individuals of Spanish origin). The non-white share of the population rose from 12.4 percent in 1970 to 19.8 percent in 1990.

third model presents a sorting process through which individuals choose communities according to their tastes for public spending.

To evaluate these models of spending, we examine how county and state spending in the United States is affected by the age and racial composition, and the total size of a jurisdiction. Our analysis proceeds in three steps. First, we discuss the theory relating demographics and public spending. Second, we review the existing literature on the relationship between demographic composition and state and local public spending. Third, we present our results for county and state spending in the United States. The data yield intriguing patterns and enable us to distinguish, at least in part, among our three models of public spending. The sorting model does not provide an adequate explanation of the effects of demographic composition on spending, because controlling for jurisdictional fixed effects fails to eliminate the explanatory power of demographic variables. The usual exposition of the selfish public choice model seems less than sufficient to explain our results as well, because demographic characteristics of the area surrounding a jurisdiction appear to affect individual preferences for spending within that jurisdiction. We tentatively support a community preference model of demand for public spending, although the determinants of the community preference function are complex.

I. Demographics and Public Spending: Theory

Our concern is with citizen preferences for the "public bundle," the goods and services provided by government. There are at least three reasons why demographic characteristics may be correlated with the level of public spending.² First is the well-known sorting or Tiebout model, in which individuals choose among communities according to their tastes for public spending. If some individuals value education more than others, for example, they will choose to live in communities that spend more on education. Families with children will also want to live in these communities. Hence, a larger share of children in a community is associated with higher spending on education, but this is due solely to the sorting of people, not because the presence of children has any direct impact on education spending decisions.

A second explanation for a correlation between demographic characteristics and public spending is what we refer

² One additional reason, which we do not emphasize, is that demographic characteristics may affect the cost of providing public services. The relationship between demographics, cost, and public spending is explored by Schwab and Oates (1991), Schwab and Zampelli (1987), and Schwartz (1992), among others. As we explain below, the effect of demographics on cost does not adequately explain all of the influences of demographics on public spending that we find.

to as the selfish public choice model. In this view -- the most traditional in economic analyses of public choice -- people act entirely in their own self-interest, paying no heed to the interests of others. Given majority-rule voting, the only effect of variations in the demographic composition of the population is to change the identity of the person with the median level of desired spending. Thus, if families with children wish to spend more on education, the median voter in child-rich communities will prefer more education spending than median voters elsewhere.³

A third explanation derives from what we call the community preference model, in which individuals implicitly consider a welfare function for their community in deciding on spending. In this view, people care about the welfare of others within their community, although presumably less than they care about their own welfare. Changes in the demographic composition of a community could therefore affect each individual's desired spending -- for example, individuals may care about the welfare of children and thus spend more on education when there are more children in the community. This offers a sharp contrast to the selfish public choice model, in

³ Logrolling and other phenomena in the political process mean that the median voter's desires may not be reflected in actual spending. If logrolling accounts perfectly for intensities of preference, then the average of voters' desires would dictate the outcome.

which variations in demographic composition affect only the identity of the median voter and do not change any individual voter's preferences. With even-handed community preferences, the welfare function of a citizen does not depend on the group to which he or she belongs. With discriminatory community preferences, it may.⁴

The classic statement of the proposition that voting behavior is determined by self-interest is Downs (1957). Empirical support for this view is presented in Deacon and Shapiro (1975), Riker and Ordeshook (1968), Rubinfeld (1977), and Sears and Citrin (1982), among others. The alternative proposition that voting behavior is influenced strongly by

⁴ The Wall Street Journal recently provided anecdotal evidence that discriminatory attitudes play a role in local funding decisions. The Journal reports that in Holyoke, Massachusetts, "the town's mostly white, working-class voters, mainly aged and childless, are alienated from its mainly Puerto Rican public-school children. ... Services for older people get funded. Those for children, such as parks and recreation programs, the library and the schools, don't" (November 25, 1991, page A1).

Note that discriminatory preferences affect the demand for education spending because the spending generally cannot be separated into spending for non-minority children and spending for minority children. When education spending must be distributed equally among all schoolchildren, a dollar of such spending will have greater value to an individual with discriminatory preferences in a town with more non-minority schoolchildren relative to minority schoolchildren. We return to this example later in this section.

individuals' perceptions of community welfare is summarized by Mansbridge (1990), Kelman (1987), and Orren (1988). Huckfeldt and Kohfeld (1989), Jackson and King (1989), and Wolfinger (1974) emphasize the role of ethnic and racial allegiance in voting behavior.⁵

To explore the difference between the selfish public choice hypothesis and the community preference hypothesis, we present a simple model of individuals' preferences for public spending. Our starting point is the observation that a large and growing share of public spending is "directed," in that it predominantly benefits restricted groups within the population, such as poor people, school children, or the elderly. This directed spending includes both transfers and a large share of non-transfer spending, such as primary education. It is important to recognize this directed character of public spending because it explains why the existence and form of community preferences may have a large effect on that spending.⁶

Suppose that individuals fall into different groups based on income, occupation, age, race, or some combination of those

⁵ For example, in the context of Congressional voting on the 1978 Tax Reform Act, Jackson and King describe constituent preferences for income redistribution as a function of their own and their county's demographic characteristics.

⁶ For a more complete description and analysis of directed public spending, see Cutler, Elmendorf and Zeckhauser (1993).

characteristics. These characteristics determine the per capita quantity of each directed good, such as education, that an individual receives. For good k , a member of group i receives g_{ik} . The vector of g_{ik} 's directed at members of group i is denoted G_i ; the matrix of all g_{ik} 's is denoted simply G .

Assume that there are n_i individuals in group i , all with identical preferences. Each of these individuals has the utility function

$$u_i = U_i (y_i - t_i , G_i , c_i) ,$$

where y_i is income, t_i is the tax burden, and c_i is the value of the community welfare function as evaluated by a member of group i . For that individual, the community welfare function is $c_i = C_i(N,G)$, where N is the vector of n_i 's. With even-handed community preferences, the C_i function would not differ across groups. With discriminatory community preferences, the C_i function would differ across groups; hence, the weight given to each g_{ik} would depend on both the n_i 's and the individual forming the preferences. The tax burden for an individual in group i is defined as

$$t_i = \left(\frac{s_i}{\sum_j n_j s_j} \right) * G_T ,$$

where s_i is the tax weight of individual i and G_T is total government spending.

We distinguish between the alternative hypotheses of demand for public spending on the basis of the structure of the utility function. The selfish public choice hypothesis omits c_i from the utility function. In this case, individual i 's desired level of spending on good k is determined by the condition:

$$U_y * \left(\frac{s_i}{\sum_j n_j s_j} \right) = U_{gk} .$$

This condition says simply that the marginal value of the private income foregone by an additional dollar of public spending should equal the marginal value of that dollar of public spending. This individual prefers no spending on goods that he or she does not consume, and the demographic composition of the community does not enter the equation.

In the community preference hypothesis, by contrast, the demographic mix of the population serves as an important component of preferences. The condition for the optimal level

of spending on good k is now:

$$U_y * \left(\frac{s_i}{\sum_j n_j s_j} \right) = U_{g_k} + \sum_j U_c C_{g_k}$$

In this case, the benefits to other groups do count in each voter's valuation of public spending.

We can pursue the implications of the community preference model in several directions. For concreteness, let us assume that the community preference function c_i has the form

$$C_i(N, G) = \sum_j w_{ij} f(n_j) v_j(G_j)$$

Here $v_j(G_j)$ is the benefit to each member of group j who receives spending of G_j , $f(n_j)$ aggregates the welfare of individual members of group j into the total welfare of the group, and w_{ij} is the weight that each member of group i places on the welfare of group j . With even-handed preferences, w_{ij} is the same for all i ; with discriminatory preferences, it is not. Three aspects of the community preference model deserve comment: 1) the implication of different $v_j(\cdot)$ functions for spending in communities with different demographic compositions; 2) the

implication of discriminatory preferences for spending in communities with different demographic compositions; and 3) the effects of community size on spending. We consider these issues in turn.

First, as indicated by its subscript, the $v_i(.)$ function may vary across groups. For example, older people may obtain more health benefits from a \$1,000 per capita health care expenditure than younger people would. If members of group i place the same weights on the welfare of each elderly person and each young person, then they would want to spend more on health care in an older community.

Second, consider a situation of discriminatory preferences, where people weight the welfare of different groups differently in their community preference functions. Assume that individuals in different groups must receive the same amount of spending (as discussed in footnote 4 above) and, contrary to the discussion in the previous paragraph, value that spending the same. In this case, each individual would have her personal

weighted average of the welfare of the recipients, and her overall valuation of spending would differ from community to community depending on the demographic composition of those communities.

To illustrate this point, Figure 1 shows the benefits and cost of education spending for a hypothetical white individual with a discriminatory community preference function.⁷ We analyze spending per capita and assume that the individual does not receive any of this spending. The upward-bending curve shows the utility cost of additional spending, based on the increasing tax burden. The concave curves indicate the utility benefit of additional spending. These benefit curves are drawn to reflect the notion that the number of people belonging to a certain group in the county influences the individual's valuation of the welfare of each person in the group; for example, as the number of white children in the county increases, the per capita value of spending on them falls.

⁷ We let the weight on white children equal 1, the weight on non-white children equal 1/2, $f(n_j) = (n_j)^{1/2}$, and $v_j(G_j) = \ln(G_j)$.

The equilibrium condition for spending is of course that the marginal value of spending equal its marginal cost. The hypothetical white individual would like to spend g_n^* per non-white child and g_w^* per white child, expenditure levels where the relevant benefit and cost curves are parallel to each other. This is not a feasible outcome, however, as spending on whites and non-whites must be the same. Therefore, the individual would compute a weighted average of the two relevant value curves. If there were many non-white children in the county, the individual would have the optimal level of spending called \bar{g}_1 . With fewer non-white children in the county, the optimal level of spending would increase to \bar{g}_2 .⁸

Finally, the community preference model has implications for the effect of community size on public spending. Suppose that the number of people belonging to a certain group in the

⁸ On the other hand, as the number of non-white children in the county increased, the number of non-white voters would generally increase as well, and the median voter would shift toward individuals who viewed non-white children more favorably.

community had no effect on individuals' valuation of the welfare of each person in that group. In this case, individuals would care only about the total benefit being received, and $f(n_j)$ would simply equal n_j . Now consider doubling the size of the community, holding its demographic composition fixed. In the larger community, the same level of spending by each member of group i would raise the welfare of twice as many members of group j by the same amount. This would greatly increase the value of this spending to each individual in group i , implying that individuals in larger communities should support more public spending per capita than individuals in smaller communities.

On the other hand, there may be greater anonymity in large political units than in small ones. Individuals in a small town may feel a stronger allegiance to other people in their community than do individuals in a large city. This suggests that $f(n_j)$ may be diminishing in total population, again holding demographic composition fixed. If this anonymity effect is sufficiently strong, individuals in larger communities may

actually want to spend less per capita than individuals in smaller ones.

To conclude this section, we want to demonstrate the potential importance of understanding the relationship between demographic characteristics and public spending. As we noted at the outset, demographic heterogeneity in the United States is increasing rapidly. Our concern in this paper is with spending within smaller political units, however, so we care primarily about the *local* intermixing of different groups. The metric that we employ to assess the degree of local heterogeneity works in the spirit of the Lorenz curve. First, we rank counties in order of the share of their population that belongs to a particular age or ethnic group. Moving through the counties, we then plot the cumulative share of the nation's population of that group against the cumulative share of the nation's total population. If racial groups were perfectly mixed, the curve would lie along the 45-degree line; if racial groups were strictly segregated, the curve would run along the bottom of the box.

Figure 2 shows these "Lorenz curves" for the non-white population in 1970, 1980, and 1990. Although there is substantial disparity across counties in the non-white share of the population, there is also increasing intermixture over time. The Gini coefficient in 1970 is .530; in 1980, it is .468; and in 1990, it is .437. The segregation of non-whites by county, although still significant, has fallen by 18 percent in the past twenty years. We also formed Lorenz curves for the elderly and for people below age 18, who tend to be beneficiaries of local expenditures. Geographic segregation of the elderly is significant but well below that of non-whites, and it has declined slightly over time.⁹ On the other hand, the distribution of children across counties is remarkably equal and has remained so over time.¹⁰

In the following section we review previous research on demographics and public spending; in the third section we

⁹ The elderly Gini coefficient in 1970 is .165; in 1980, it is .159; and in 1990, it is .156.

¹⁰ The children Gini coefficient in 1970 is .058; in 1980, it is .088; and in 1990, it is .068.

present new results on the topic.

II. Demographics and Public Spending: Previous Research

Most previous research on the demand for public spending focuses on estimating the income and price elasticities of demand. Many studies include some demographic variables as controls in these demand functions, but few focus on the estimated coefficients on the demographic variables or on their interpretation. We briefly review a number of past studies in this section. Unfortunately, they paint an inconsistent picture of the relationship between demographic characteristics and public spending. Although there are some common elements in previous results, there are also many inconsistencies and contradictions.

Table 1 provides an overview of previously reported effects of demographic variables on public spending. The table

reviews two types of studies: the first, far more prevalent in the literature, examines equilibrium spending levels; the second investigates explicit votes for public spending based on referenda outcomes or voter surveys. We report two studies that compare spending levels across states and nine studies that compare spending levels across counties, towns, or school districts. The type of spending considered varies across studies as well, although education is by far the most common. We report four studies of voting -- one that compares votes across school districts, and three based on surveys of individual voters. Most of these results pertain to education spending as well.

The surveys include measures of both individual characteristics and community characteristics, so Table 1 includes coefficients both for the percent of a community belonging to a certain demographic group and for a dummy variable indicating that the survey respondent belongs to a certain group. A "+" sign in the table indicates that a variable has a statistically significant positive effect, a "-" sign indicates a statistically

significant negative effect, a "0" indicates no significant effect, and a blank means that the variable was not included in the study.¹¹

The most notable feature of Table 1 is the great variation across studies in the estimated effect of the demographic characteristics. Almost every characteristic seems to raise spending, lower spending, and have no effect on spending in some specification. This may be due partly to differences in the types of spending considered, but even among the studies focusing on education, substantial differences are found.

Despite this general confusion, however, some patterns appear in these results. The share of young people in a community seems to have no effect on spending, although the surveys indicate that parents with children at home seem to prefer

¹¹ We do not report the coefficient estimates themselves for two reasons. First, the estimates are not directly comparable due to important differences in the specification of the equations (for example, some equations are estimated in logarithms, and some are not). Second, our main point is that previous results reveal a variety of inconsistencies, a conclusion that is adequately supported by the signs of the variables alone.

more spending. A larger share of older people in a local community appears to raise spending, although older individuals report in surveys that they are content with current spending. In contrast to the local results, a greater share of older people in a state seems to lower spending. A greater share of non-white people in a local community appears to raise spending, and non-white individuals themselves report that they would prefer more spending. As with the elderly, however, a different effect appears at the state level, where a greater non-white share in the population seems to lower spending. In the following sections we find confirming evidence for this contrast between the effects of demographic variables at the state and local levels.

III. Demographics and Public Spending: New Evidence

This section presents new results relating state and county spending to demographic variables. We find that the estimated

effects of demographic characteristics in the state equations are strikingly different from the estimated effects in the county equations; we then explore some possible explanations for those differences.

We assume that community i 's demand for public spending is of the form:

$$\begin{aligned} \log(\textit{Spending per cap.})_i &= \beta_0 + \beta_1 \cdot \log(\textit{Income per cap.})_i \\ &+ \beta_2 \cdot \log(\textit{Grants per cap.})_i \\ &+ Z_i \cdot \Gamma + \epsilon \end{aligned}$$

where income and grants per capita capture the budget constraint for the community, and the vector Z_i represents relevant demographic variables. Unfortunately, we do not have a measure of the price of government-purchased goods for the communities that we study, so we omit price from the analysis. Under the selfish public choice model, this equation can be interpreted as the median voter's demand for public spending. Under the community preference and sorting models, there is a more complex link between the financial and demographic

variables and the preferences of the median voter.

We estimate this equation for two samples of data. The first is a panel of the 48 contiguous states from 1970 to 1985.¹² The data for each state include both spending by the state government and spending by all local governments (counties, municipalities, and school districts) within the state. The second set of data is for 3092 counties for which we match spending data from the 1972 and 1982 Censuses of Government to demographic and financial data from the 1970 and 1980 Population Censuses. The data include spending by all local governments within each county.¹³

Table 2 reports our basic estimates. The first three columns present results for the state sample. The dependent variable is the total of state and local spending in the state. The

¹² The state data were kindly supplied to us by Anne Case, Jim Hines and Harvey Rosen, who use these data to examine the effect of interstate competition on public spending (1989).

¹³ Counties are the smallest political units for which one can obtain a consistent measure of all local spending. When school districts include more than one municipality, for example, school district spending is not allocated to the municipalities involved.

last three columns present results for the county sample. The dependent variable is local spending in the county. For each sample we show cross-section results for 1970 and 1980, as well as panel results using the full data sets.¹⁴ The panel results control for fixed features of the jurisdictions, such as political variables, social factors, regulatory differences, and so on. The state panel includes annual observations from 1970 to 1985; the county panel uses the 1970 and 1980 data.¹⁵ Because the cross-sections give different results from the panels, we will focus on

¹⁴ To control for differences across states in the share of state and local spending that takes place at the local level, we include state dummy variables in our cross-section county equations. Including region dummy variables in the state cross-sections has no substantive effect on the results.

¹⁵ Note that the R^2 's for all of the county panel estimates that we report look very small because we estimate the equations in differences. The R^2 's for the state panel estimates are much larger because they include the portion of the variation in spending attributable to the fixed effects.

The third column of Table 2 is close to the first column in Table 2 in Case, Hines, and Rosen (1989). The only difference is that we measure the financial variables in logarithms, while they use levels. The conclusions about the effects of the financial and demographic variables are quite similar.

the panel results that include the jurisdictional fixed effects.¹⁶

Table 2 indicates that the income elasticity of public spending is similar for states and counties (.39 and .41), as is the grant elasticity (.17 and .27). These coefficients are positive, economically important, and statistically significantly different from zero. At both the state and county level, there is evidence for the "flypaper effect," the tendency of a dollar of grant income to "stick," and thereby to result in more spending than a dollar of private sector income. In the county data, for example, on a per capita basis, mean income in 1979 is \$6,046, mean spending is \$980, and mean grants are \$431. Evaluated at these means, a \$100 increase in income would increase spending per capita by \$7, while a \$100 increase in grants would increase spending by \$62.

The demographic variables have important effects on public spending at both the state and county level, but the

¹⁶ The cross-sections for different years also look somewhat different from each other, an intriguing issue which we do not pursue.

directions of the effects are different in the two samples. In the state data, both the share of the population that is aged and the share that is non-white are associated with lower spending per capita. The effects are statistically significant and substantively large. The share of children is unrelated to total state spending, as is the state population.

In the county data, however, the results are completely different. In this setting, increases in all of the demographic shares increase total spending. Such effects for the elderly and non-white shares of the population -- positive locally but negative statewide -- are consistent with the pattern that we noted in our summary of previous research. Table 2 also shows that the number of people in a county is negatively related to local spending per capita in that county. As we explained earlier, however, the community preference model suggests that population size should be positively related to spending. Evidently, the greater anonymity of larger communities more than offsets the value of providing the same per capita benefits

to a larger number of people for the same level of personal expenditure.¹⁷

Why do the state and county results differ so much? We explore two possible explanations.¹⁸ The first potential explanation is that public spending may involve a different bundle of goods at the state level than at the county level. In fiscal year

¹⁷ Because these estimates are based on changes in the variables, an alternative interpretation is that areas experiencing fast growth in population fail to keep pace in their expansion of public services, thus reducing spending per capita.

¹⁸ A third possible explanation is that individuals' preferences for spending in small political units (like many U.S. counties) may be substantially different from their preferences for spending in large ones (like many U.S. states). Specifically, population may matter not only for the level of spending directly, as our specification allows, but also for the effect of various demographic characteristics on spending. To test this hypothesis, we estimated the equation separately for counties with populations above and below 50,000 (on average for 1970 and 1980). If the hypothesis were valid, one would expect the results for larger counties to be substantially closer to the results for states. That was not the case. The estimated demographic coefficients for small counties were very close to the coefficients reported in Table 2 for all counties together. The estimated coefficients for large counties were somewhat different from those for small counties, but still sharply different from the coefficients for the state sample. In particular, the share of children in the population was even more strongly related to spending, although the minority share was less so.

1989-90, for example, 31 percent of direct state government spending was for social services and income maintenance, compared to only 11 percent of local government spending. And only 19 percent of state spending was for education, compared to 38 percent of local spending. Even the educational goods are different at the two levels -- 81 percent of state education spending was for higher education, compared to only 6 percent of local education spending.

To investigate this potential explanation for our results, Table 3 reports regressions analogous to the panel estimates in Table 2, but divides spending in each state into spending by the state government (the first column) and spending by all local governments within the state (the second column). The third column repeats the panel results for local spending from Table 2.

The only demographic variable with a significant effect on the spending of state governments is the non-white share, which

has a positive and substantively large effect.¹⁹ The elderly share also exerts a positive influence, although not statistically significantly different from zero. Local spending is affected by all of the demographic variables, however, with the elderly and non-white shares having statistically significant and substantively large negative effects, similar to the results in Table 2 for state and local spending together. This implies that the effects of demographic composition on spending that were reported for the state panel in Table 2 apply predominantly to local spending rather than state spending. Thus, this finding accentuates the contrast between our initial state and county results, as it appears that the determinants of local government spending aggregated to the state level are very different from the determinants of local spending aggregated only to the county level.²⁰

¹⁹ Although the significant presence of non-white individuals surely shifts the location of the median voter within the white community, no states in our sample have a majority of non-white voters.

²⁰ There is also the question of why a state's demographic composition has very different effects on spending by the state government and spending by local governments within the state.

The second potential explanation for the divergence between the state and county results is that a jurisdiction's spending is affected differently by its own demographic characteristics and by the characteristics of the surrounding area, what we might think of as a surroundings hypothesis. The next section proposes several hypotheses for why surroundings might affect spending. Table 4 examines the surroundings hypothesis empirically. The table reports more panel results for the county sample, adding as independent variables the population and demographic composition of the state to which each county belongs.²¹ The results show that state demographic variables have important effects on local spending, but those effects are strikingly different from the effects of the county demographic

One potential explanation is that federal mandates for state welfare spending (particularly Medicaid, which helps the poor and elderly) have increased the positive link between certain demographic characteristics and state government spending. Future research could usefully address this question.

²¹ More precisely, the state demographic characteristics that we include for each county refer to the other counties in the state.

variables. In the first column, for example, increases in the shares of young people, older people, and non-whites in a local area all raise total local spending per capita. On the other hand, increases in the shares of older people or non-whites in the state lowers local spending per capita. Further, these effects of the state demographic characteristics are larger than the corresponding effects of the county demographic characteristics, so a *statewide* increase in the share of non-whites or older people lowers local spending in the state. These are precisely the effects on local spending aggregated to the state level that we reported in Table 3.

The second column of Table 4 examines whether these effects are attributable solely to changes in spending at the state level. To test this hypothesis, we add the additional explanatory variable of state government spending. We find that state spending has a moderately positive impact on local spending, but our demographic results are unchanged. A substantial discrepancy persists between the effects of demographic variables

at the county level and at the state level.²²

IV. Implications for Theories of Demographics and Public Spending

Now we discuss the implications of our empirical results for theories of demographics and public spending. We turn first to the effects of *state* demographic characteristics on local spending, and then to the effects of *county* characteristics on local spending.

The initial question concerning the state demographic characteristics is why they matter at all for local spending. The first model that we considered, the Tiebout or sorting model, provides no explanation for the role of these variables. Neither does the usual exposition of the selfish median voter model --

²² We also experimented with including interactions of the demographic variables, but we found no significant or consistent effects.

after controlling for the demographic composition of a county, the composition of the surrounding state should have no effect on the identity of the median voter in that county.²³ We propose two possible explanations for the finding that the demographic composition of surrounding counties matters.

First, people may form their opinions about government and public spending based not solely on their local communities but on their surroundings more broadly. Suppose, for example, that most voters have discriminatory community preferences and are less receptive to public spending when they feel that more of the benefits are directed to people of a different race. If people's impressions of the recipients of public spending are formed by the state in which they live, then white people in a state with many non-whites may be less supportive of redistribution, and this attitude may carry over to local spending. A second reason why surroundings may matter is that citizens may worry about

²³ The possible effects of demographic composition on the cost of providing public services (see footnote 2) also cannot explain the role of out-of-county demographics.

migration into their communities. Generous spending on redistribution might encourage "less desirable" people to move into a local area. Some individuals may not want to lure more children into their county, for example, because that would require greater expenditures on schools. Further, if the children are from a different ethnic or religious group, attracting them with higher spending may substantially change the nature of the community, which might be considered a disadvantage quite apart from any effects on the public fisc. In a state that has many children or non-whites, such "deterrence" concerns may be more important.²⁴

The other set of effects to be discussed is the influence of the county demographic characteristics on local spending. These effects are similar to those reported by previous authors, and we briefly suggest a few interpretations here. Once again, the sorting model does not seem to adequately describe the

²⁴ This explanation does not seem particularly convincing for the effect of the state elderly share, however, because the elderly are not primarily beneficiaries of local spending.

relationship between demographic composition and public spending. The standard Tiebout logic is that communities with higher permanent levels of spending may attract different types of people than communities with lower permanent levels of spending. We find this reasoning quite plausible, but we control for these fixed features of jurisdictions by using panel data. In order to explain our panel results with a sorting model, one would need to argue that different *changes* in spending attract different types of people, and we find this story far less compelling. This leaves us with the selfish median voter model and the community preference model, both of which can account for the effects of county demographics that we find.²⁵

There are two interpretations of the county demographic

²⁵ There are at least three other reasons why the demographic composition of a county may be correlated with public spending in that county. The first, noted in footnote 2, is that demographics may affect the cost of providing public services. The second is that the federal or state governments may mandate certain spending that is correlated with demographic composition. The third is that certain groups may gain control of specific elements of the resource allocation process when they represent a larger share of the local population or of the beneficiaries of particular programs. We do not pursue these explanations here.

results that are consistent with the selfish median voter model. The first and most straightforward interpretation is that the identity of the median voter is affected by the share of the population belonging to certain demographic groups. If non-white individuals prefer more public spending (perhaps because their tax share is below their share of the population), then the presence of many non-whites may shift the median voter toward those individuals, possibly white themselves, who favor greater spending.

Another, more cynical, interpretation of the results that is consistent with the selfish public choice model stresses the potential personal gain to local spending. Individuals may prefer higher public spending in a community with more non-whites because the spending is perceived to reduce crime and public disorder. They may also prefer higher spending in a community with more children because of the beneficial externalities of a well-educated populace.

Three different interpretations of the county demographic

results are consistent with the community preference model. The first such interpretation is simply that the share of the population belonging to certain demographic groups may affect the perceived need for public spending. The second such interpretation is that different demographic groups may have different degrees of concern for the welfare of the community. For example, older people may be more likely to be long-time residents of a community and may feel stronger ties to its other residents. And the third interpretation is that people may value directed spending more highly at the local level than they do at the state level. Tip O'Neill, former Speaker of the House of Representatives, once famously remarked that "all politics is local." A natural corollary of this comment is that the perceived value of transfers may be greater at the local level than at the state level.

V. Concluding Remarks

Significant demographic shifts are a salient feature in most developed nations. In a pure public welfare theory of government, where marginal benefits and marginal costs are equated in expenditure decisions, such shifts would have important effects on the public bundle. For example, a community with more older people would spend noticeably more on health care.

Governments are elected by majorities, however, and intense preferences by minorities may be overridden. If voters were strictly selfish, we would conjecture that there would be relatively little spending on schools in communities where families with children were in the minority, or on chronic-care facilities in locales where the elderly were few. Looking at the United States, however, we find quite high levels of public expenditure on directed goods, predominantly private goods that are consumed by certain members of the community but not by others. Citizen preferences appear to contain a significant concern for the well-being of the larger community. Although

our data are drawn from the United States, we expect that the lessons from our work will prove important for any nation facing significant demographic heterogeneity or change.

The formation of community preference is much more complicated than any simple theory would suggest, however. The striking result of our empirical work is that state demographic characteristics and county demographic characteristics have opposite effects on local spending. For example, county expenditures decrease with the number of elderly in the state but increase with the number of elderly in the county. These findings are consistent with a surroundings hypothesis, namely that local governments respond not only to local conditions but also to political attitudes that are strongly influenced by the larger areas around those local jurisdictions. Demographic composition plays a central role in determining the size and makeup of the public bundle, albeit in some unexpected ways. Developing an understanding of this relationship will help us to understand one of the most fundamental questions in public

economics: how do individuals value the welfare of others?

REFERENCES

- Atkinson, Anthony B. and Joseph E. Stiglitz, *Lectures on Public Economics*, New York: McGraw-Hill, 1980.
- Bergstrom, Theodore C. and Robert P. Goodman, "Private Demands for Public Goods," *American Economic Review*, June 1973, 280-296.
- Bergstrom, Theodore C., Daniel L. Rubinfeld and Perry Shapiro, "Micro-Based Estimates of Demand Functions for Local School Expenditures," *Econometrica*, September 1982, 1183-1205.
- Bogart, William T., "Observable Heterogeneity and the Demand for Local Public Spending," *National Tax Journal*, June 1991, 213-223.
- Case, Anne C., James R. Hines, Jr., and Harvey S. Rosen, "Copycatting: Fiscal Policies of States and Their Neighbors," National Bureau of Economic Research Working Paper #3032, July 1989.
- Craig, Stephen G. and Robert P. Inman, "Education, Welfare, and the "New" Federalism: State Budgeting in a Federalist Public Economy," in Harvey S. Rosen, ed., *Studies in State and Local Public Finance*, Chicago: University of Chicago Press, 1986, 187-222.
- Cutler, David M., Douglas W. Elmendorf, and Richard J. Zeckhauser, "Directed Goods: Theory and Evidence," Mimeo, 1993.

- Deacon, Robert and Perry Shapiro, "Private Preference for Collective Goods Revealed Through Voting on Referenda," *American Economic Review*, December 1975, 943-955.
- Denzau, Arthur T., "An Empirical Survey of Studies on Public School Spending," *National Tax Journal*, June 1975, 241-249.
- Denzau, Arthur and Kevin Grier, "Determinants of Local Spending: Some Consistent Estimates," *Public Choice*, 2:1984, 375-383.
- Downs, Anthony, *An Economic Theory of Democracy*, New York: Harper and Row, 1957.
- Gramlich, Edward M. and Daniel L. Rubinfeld, "Micro Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses," *Journal of Political Economy*, June 1982, 536-560.
- "Hard Lessons," *Wall Street Journal*, November 25, 1991.
- Huckfeldt, Robert and Carol Weitzel Kohfeld, *Race and the Decline of Class in American Politics*, Urbana: University of Illinois Press, 1989.
- Inman, Robert P., "Testing Political Economy's 'As If' Proposition: Is the Median Income Voter Really Decisive?," *Public Choice*, 4:1978, 45-65.
- Jackson, John E. and David C. King, "Public Goods, Private Interests, and Representation," *American Political Science Review*, December 1989, 1143-1164.

- Kelman, Steven, *Making Public Policy: A Hopeful View of American Government*, New York: Basic Books, 1987, 255-259.
- Ladd, Helen F., "Local Educational Expenditures, Fiscal Capacity and the Composition of the Property Tax Base," *National Tax Journal*, June 1975, 145-158.
- Lovell, Michael C., "Spending for Education: The Exercise of Public Choice," *Review of Economics and Statistics*, November 1978, 487-495.
- Mansbridge, Jane, "Self-Interest in Political Life," *Political Theory*, February 1990, 132-153.
- Megdal, Sharon Bernstein, "A Model of Local Demand for Education," *Journal of Urban Economics*, July 1984, 13-30.
- Neufeld, John, "Taxrate Referenda and the Property Taxpayers' Revolt," *National Tax Journal*, December 1977, 441-456.
- Oakland, William H., "Theory of Public Goods," in Alan J. Auerbach and Martin Feldstein, ed., *Handbook of Public Economics, Volume II*, Amsterdam: North-Holland, 1987, 485-535.
- Orren, Gary R., "Beyond Self-Interest," in Robert B. Reich, ed., *The Power of Public Ideas*, Cambridge: Ballinger Publishing, 1988.
- Riker, William H. and Peter C. Ordeshook, "A Theory of the Calculus of Voting," *American Political Science Review*, 1968, 25-42.

- Romer, Thomas, Howard Rosenthal and Vincent Munley, "Economic Incentives and Political Institutions: Spending and Voting in School Budget Referenda," National Bureau of Economic Research Working Paper #2406, October 1987.
- Rubinfeld, Daniel L., "Voting in a Local School Election: A Micro Analysis," *Review of Economics and Statistics*, February 1977, 30-42.
- Schwab, Robert M. and Wallace E. Oates, "Community Composition and the Provision of Local Public Goods," *Journal of Public Economics*, March 1991, 217-237.
- Schwab, Robert M. and Ernest M. Zampelli, "Disentangling the Demand Function from the Production Function for Public Goods: The Case of Public Goods," *Journal of Public Economics*, July 1987, 245-260.
- Schwartz, Amy Ellen, "Individual Production, Community Characteristics and the Provision of Local Public Services," *Journal of Public Economics*, 1992, forthcoming.
- Sears, David O. and Jack Citrin, *Tax Revolt: Something for Nothing in California*, Cambridge: Harvard University Press, 1982.
- Wolfinger, Raymond E., *The Politics of Progress*, Englewood Cliffs, N.J.: Prentice-Hall, 1974.

Table 1: Previous Results on Demographic Characteristics and Public Spending

Jurisdiction Author(s)	state		local (county, town or school district)						
	Case, Hines & Rosen	Craig & Inman	Bogart	Bergstrom & Goodman	Denzau	Denzau & Grier	Romer, Rosenthal & Munley	Megdal	
log (Population)	0	0	0	+	+				
Below 18 ¹ your kids percent in area	0	-	0	0	0	0		0	
Above 65 ² yourself percent in area	-	-	0	+	+	0	0	0	
Non-White ³ yourself percent in area	-	-	+	+	+	0	+	+	
Owner-Occupier yourself percent in area			0	-	-	0	-	-	
Poverty ⁴ yourself percent in area			0	0	0	0	+	+	
Population Change ⁵									
Tax Price included?	no	no	yes	yes	yes	some	yes	yes	
Type of Spending	total per cap.	educ. per pupil	fire ⁷	police	educ. per pupil	educ. per pupil	educ. per pupil	educ. per pupil	
Sample	panel 1970-85 ⁶	panel 1966-80	cross- sect. 1980	cross- sect. 1960 ⁹	cross- sect. 1970-1	cross- sect. 1975-6	cross- sect. 1970-7		

Notes appear at the end of the table.

Table 1 (cont.): Previous Results on Demographic Characteristics and Public Spending

Jurisdiction Author(s)	local (county, town or school district)						
	Ladd	Inman	Lovell	Neufeld	Rubinfield	Gramlich & Rubinfeld	Bergstrom, Rubinfeld & Shapiro
log (Population)							
Below 18 your kids percent in area	0			0	0	+	your kids: age 1-11 + age 12-16 0
Above 65 yourself percent in area		-		0	0	0	0
Non-White yourself percent in area				+	+	0	+
Owner-Occupier yourself percent in area		0	-	0	-		0
Poverty yourself percent in area	0	+	+				
Population Change							
Tax Price included?	yes	yes	yes	no	no	yes	yes
Type of Spending	educ. per pupil 1970	educ. per pupil 1969	educ. per pupil 1970	educ. ref. 10 cross-sect. 1959-61 69-71	educ. ref. 10 survey 1973 11	educ. total survey 1978 11	educ. per pupil survey 1978 11
Sample							

Notes appear at the end of the table.

Notes to Table 1:

- 1 CHR, D and M use percent between 5 and 17 instead. Ladd uses percent in private school and percent in public school instead; both coefficients are small and insignificant. R uses separate dummies for number of kids; all are significant. GR use separate dummies for kids in public school and kids in private school; neither is significant.
 - 2 CI and M use percent of households with head over 65 instead. N uses percent of population above 61 instead.
 - 3 CHR, B, RRM, N, and BRS use percent black instead. GR use separate dummies for black and other non-white; neither is significant.
 - 4 BRS use recipient of AFDC or food stamps instead.
 - 5 BG use the percent population change from 1950 to 1960; D is not specific.
 - 6 The dependent variable includes both state and local spending. We report their results without the so-called "neighbor effects."
 - 7 The dependent variable includes spending by special districts.
 - 8 The dependent variable is total spending less spending on education and welfare.
 - 9 We report their results for all cities pooled.
 - 10 The dependent variable for referenda equations is the logarithm of the ratio of yes votes to no votes.
 - 11 The survey included homeowners only.
-

Table 2: Demographic Characteristics and Public Spending
 Dependent Variable: log(Total spending per capita)

Independent Variable	State Sample			County Sample		
	1970	1980	1970-85 Panel	1970	1980	1970-80 Panel
<u>County Demographics</u>						
log(Population)	---	---	---	-.032** (.004)	-.056** (.005)	-.047* (.026)
Percent Below 18	---	---	---	.978** (.137)	-.034 (.184)	.680** (.191)
Percent Above 65	---	---	---	.329** (.150)	-.221 (.160)	.961** (.295)
Percent Non-White	---	---	---	.091** (.035)	.275** (.042)	.229** (.074)
<u>State Demographics</u>						
log(Population)	-.015 (.016)	.000 (.015)	.003 (.035)	---	---	---
Percent Below 18	3.785** (1.312)	1.007 (1.823)	.255 (.366)	---	---	---
Percent Above 65	1.538 (1.057)	-.452 (.922)	-1.992** (.484)	---	---	---
Percent Non-White	.009 (.196)	-.041 (.154)	-1.402** (.310)	---	---	---
<u>Financial Variables</u>						
log(Income per capita)	1.106** (.125)	.757** (.135)	.387** (.045)	.610** (.027)	.787** (.035)	.410** (.034)
log(Grants per capita)	.304** (.057)	.472** (.065)	.171** (.021)	.359** (.014)	.482** (.017)	.271** (.012)
State Effects	No	No	Yes	Yes	Yes	No
County Effects	No	No	No	No	No	Yes
Year Effects	No	No	Yes	No	No	Yes
N	48	48	768	3096	3102	3092
R ²	.782	.792	.948	.717	.634	.188

Note: The table shows regressions of the logarithm of spending per capita on the area's mean financial variables and demographic characteristics. Spending in the state regressions is state and local spending; spending in the county regressions is local spending. The state panel is annual from 1970 to 1985. The county panel is the two years of 1970 and 1980. In the state data, the percent below age 18 is actually the percent between ages 5 and 17.

* Statistically significantly different from zero at the 10 percent level.

** Statistically significantly different from zero at the 5 percent level.

Table 3: Demographic Characteristics and Spending by Different Levels of Government
 Dependent Variable: log(Total spending per capita)

Independent Variable	State Sample 1970-85 Panel		County Sample 1970-80 Panel
	State Spending	Local Spending	Local Spending
<u>County Demographics</u>			
log(Population)	---	---	-.047* (.026)
Percent Below 18	---	---	.680** (.191)
Percent Above 65	---	---	.961** (.295)
Percent Non-White	---	---	.229** (.074)
<u>State Demographics</u>			
log(Population)	-.311** (.057)	.169** (.044)	---
Percent Below 18	-.345 (.593)	1.405** (.459)	---
Percent Above 65	1.083 (.783)	-5.525** (.606)	---
Percent Non-White	2.791** (.502)	-4.343** (.389)	---
<u>Financial Variables</u>			
log(Income per capita)	.527** (.073)	.281** (.056)	.410** (.034)
log(Grants per capita)	.242** (.034)	.092** (.026)	.271** (.012)
State Effects	Yes	Yes	No
County Effects	No	No	Yes
Year Effects	Yes	Yes	Yes
N	768	768	3092
R ²	.915	.963	.188

Note: The table shows regressions of the logarithm of spending per capita on the area's mean financial variables and demographic characteristics. The state panel is annual from 1970 to 1985. The county panel is the two years of 1970 and 1980. In the state data, the percent below age 18 is actually the percent between ages 5 and 17.

* Statistically significantly different from zero at the 10 percent level.

** Statistically significantly different from zero at the 5 percent level.

Table 4: Tests of the Surroundings Hypothesis --
 County Spending with State Demographic Composition
 Dependent Variable: log(Total spending per capita)

Independent Variable	County Sample 1970-80 Panel	
<u>County Demographics</u>		
log(Population)	-.116** (.030)	-.113** (.030)
Percent Below 18	.363* (.211)	.350* (.211)
Percent Above 65	.530* (.319)	.467 (.320)
Percent Non-White	.305** (.083)	.303** (.083)
<u>State Demographics</u>		
log(Population)	.306** (.046)	.342** (.049)
Percent Below 18	.202 (.532)	.523 (.555)
Percent Above 65	-2.033** (.807)	-2.199** (.811)
Percent Non-White	-.743** (.143)	-.790** (.145)
<u>Financial Variables</u>		
log(Income per capita)	.349** (.034)	.334** (.035)
log(Grants per capita)	.250** (.012)	.250** (.012)
log(State spending per capita)	---	.080** (.040)
County Effects	Yes	Yes
Year Effects	Yes	Yes
N	3092	3092
R ²	.208	.209

Note: The table shows regressions of the logarithm of spending per capita on the county's mean financial variables and demographic characteristics and the state's demographic characteristics. The state demographic characteristics are for the other counties in the state.

* Statistically significantly different from zero at the 10 percent level.

** Statistically significantly different from zero at the 5 percent level.

Figure 1
Benefits and Cost of Education Spending
For a White Individual

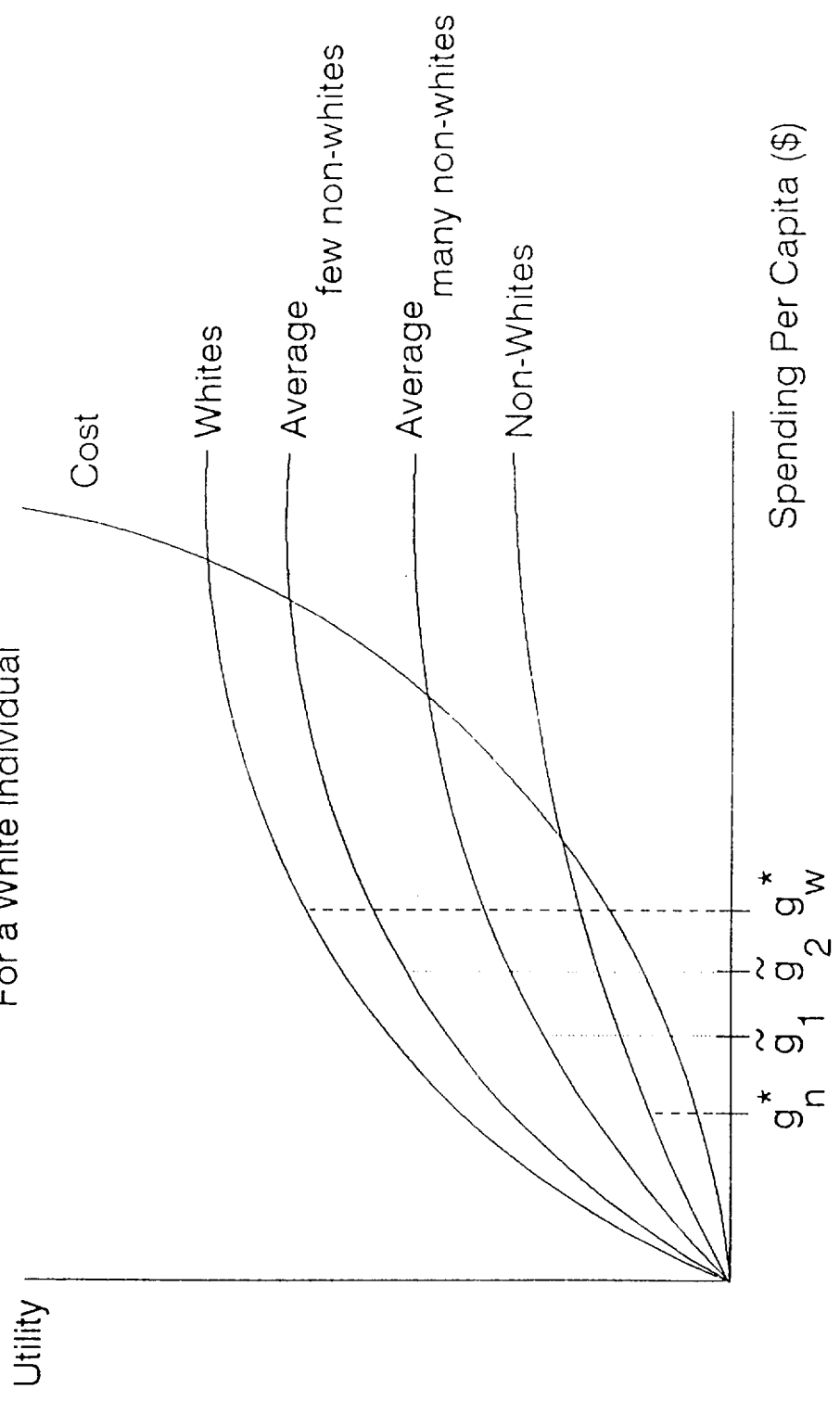


Figure 2

Lorenz Curves for Minority Population

