State and Local Government Choices in Fiscal Redistribution

Abstract - Economists have devoted relatively little attention to explaining why some state and local governments choose more progressive fiscal instruments than others. This paper provides an empirical model to identify the determinants of income redistribution as a budgetary choice, and estimates the strength of these determinants with state–local government panel data for a 21 year period. We find emphasis on redistributive expenditures in less urbanized and poorer states, and more emphasis on redistributive revenues in states that are less urbanized, poorer, and with larger elderly and black populations. We find that state–local governments use revenue and expenditure distribution instruments as complements.

INTRODUCTION

A well-traveled normative principle of fiscal federalism is that state and local governments should not pursue income redistribution as a budgetary objective. The conventional theory (Musgrave, 1959; Oates, 1972; Ladd and Doolittle, 1982; and Brown and Oates, 1987) holds that redistribution should be a central government responsibility for two main reasons: first, the benefits of redistribution spill–over beyond state and local boundaries; second, redistribution policies of subnational government jurisdictions will be compromised by the in–migration of poor families who are attracted by higher benefits and the out–migration of rich families who move to escape redistributive taxes. Economists seem to accept this view, though some have challenged it on efficiency grounds.1

However, state and local governments do engage in budget policies that have an explicit redistributive objective. They have responsibility for the delivery of local public services that are inherently redistributive (e.g., health, welfare, and education2) and their application of sales, income and prop-

1 Pauly (1973) and Johnson (1988) have argued that, if utilities are interdependent, it can be efficient for subnational governments to carry out redistributive tax and expenditure policies.

2 Federal policy in recent years has been to delegate more responsibility to the states for the management of the most important redistributive programs in health and welfare. This move has been interpreted not as a rejection of basic principles but a desire to use the states as “laboratories” to increase the efficiency of the programs (Oates, 1999).
erty taxes involves redistribution choices (e.g., marginal income tax rates, food exemption under the sales tax, and property tax circuit breakers). Voters do in fact appear willing to support state and local government redistribution policies (Martinez–Vazquez, 1981).

Federal government policies can exert significant influence on the composition of state and local budgets, and some of the induced changes affect the emphasis on redistributive services and taxes. The federal influence takes place through price effects (tax deductibility provisions on the revenue side and matching grant provisions on the expenditure side), through income effects (block and categorical grants, augmented perhaps by the flypaper phenomenon), through expenditure mandates, and through the interplay with the preferences of state and local residents for more redistributive programs.

Economists have devoted less attention than might have been expected to explaining why some state and local governments choose more progressive fiscal instruments than do others. This paper provides an empirical model to identify the determinants of income redistribution as a budgetary choice, and estimates the strength of these determinants with state and local government panel data for a 21-year period. In particular, we study the following questions:

1. What are the characteristics of states that undertake higher or lower levels of distribution?
2. Are expenditure–side and tax–side distribution policy instruments substitutes or complements in state and local government budgets?
3. What can past behavior tell us about how state and local governments will react to an increase in their redistribution responsibilities in the future?

**EMPIRICAL MODEL**

This paper is an empirical study of the redistribution choices of state and local governments. As a motivation for our empirical approach, which postulates the simultaneous consideration of tax and expenditure policies by government authorities, let us assume that elected officials attempt to maximize political support (votes) in their budget decisions. Whether there is distribution through expenditure and tax policies and the extent of this redistribution depends on what groups of voters will benefit the most from those policies, (that is, the net fiscal incidence of the budget), and on the voting behavior of those groups of individuals. If elected officials attempt to build supportive coalitions of lower and middle income households they will do so by combining tax and expenditure policies that clearly benefit those income groups, but in a way that may minimize electoral damage from higher income groups. The simultaneous use of tax and expenditure policies, as opposed to the isolated use of just one set of policies, should facilitate this task. The similar simultaneous consideration of tax and expenditure policies would take place if elected officials attempt to win majority coalitions based on higher income groups or on a mix of households. For example, the latter could occur by taxing high-income groups more lightly (i.e., decreasing the progressivity of taxes or increasing their regressivity) but providing higher expenditure benefits to lower income groups (i.e., increasing the pro-

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3. Chernick (1992), is a notable exception. See also Goodspeed (2000) on the use of more progressive taxation at the subnational level using cross-country data.

4. The 1996 federal shift to block grants is just such a policy. Unfortunately details on state and local expenditures are not yet available to analyze the 1996 shift.

gressivity in the distribution of expenditure benefits). The basic working hypothesis in our approach is that elected officials are quite likely to use both sides of the budget simultaneously in pursuing their goals.\footnote{The same working hypothesis of the simultaneous consideration of tax and expenditure policies would be supported by a normative model in which a benevolent government attempts to maximize a social welfare function as the result of the net fiscal incidence of tax and expenditure policies.}

In order to answer the three questions posed above, two parameters must be estimated for state and local budgets: a revenue distribution index ($\alpha$) and an expenditure distribution index ($\theta$). These are defined as:

\[
\alpha = \frac{t_r B_r}{t_0 B_0 + tr Br}
\]

\[
\theta = \frac{E_r}{E_r + E_0}
\]

where $E_r, E_o =$ redistribution and ordinary expenditures, respectively;

$t_r, t_0 =$ the tax rate on redistributive and non–distributive bases, respectively;

$B_r, B_0 =$ redistributive and non–distributive taxes bases, respectively.

The Dependent Variables: Measuring Distribution

There is no unambiguous way to measure the emphasis on distribution in state and local government budgets, i.e., to quantify $\alpha$ and $\theta$ as defined above. Virtually every government service and every tax has some element of progressivity or regressivity in it.\footnote{For further discussion see Alm and McCallin (1996) and Alm and Zubrow (1987).} The choice here is to index the degree of distributional emphasis based on budget shares allocated to redistributive services and revenue shares raised from progressive taxes.\footnote{There are at least three ways to index the distribution choice of state and local government budgets. One is to examine per capita levels of redistributive taxes which would tell us whether the level of redistributive activity is larger or smaller, but would not tell us whether the local government places more or less emphasis on redistribution activities. A second approach is to study redistributive taxes and expenditures as a percent of personal income. This also is a measure of effort but it is not independent of the level of the total public sector activity. The third approach is to examine the share of the budget allocated to redistribution. This, we think, comes closest to showing distributional emphasis. It reflects consumer voter choices in the allocation of a fixed pie between distribution and non–distribution fiscal activities. However, we acknowledge that the share approach cannot capture all aspects of redistributional policies. For example, the higher demand for redistribution at the state and local level may lead not only to higher shares of those items in the budget but also to higher overall expenditures levels. The study of redistribu-tional policies using a levels approach will be the subject of future research.}

The proportion of state and local governments’ individual and corporate income taxes in total own source revenue (RVSH) is used here as the indicator of the importance of distribution in the state and local government revenue budget ($\alpha$). There is strong \textit{a priori} reasoning to support this choice. The individual income tax is the one instrument that state and local governments may use to single out families for different tax treatment based on their income.\footnote{For many years ACIR reported a survey of citizen perceptions of the “worst taxes.” The relatively good standing of state income taxes in the ACIR annual survey is also an indication of perceived fairness.} The corporate income tax is also progressive, to the extent that its burden falls on owners of capital. There is also a perception among many politicians and voters that the corporate income tax reduces the tax burden on the state’s population because these taxes are paid by richer people who live elsewhere.\footnote{The simple correlation coefficient between individual income tax and individual plus corporate tax is 0.95 and is significant at the 0.01 level.}

Clearly, one index measure cannot capture every facet of revenue redistribution, e.g., one can note quickly that two states may rely to the same degree on income taxation but have very different tax thresholds and rate structures. On the other hand, we argue that citizens who vote a higher income...
tax share on themselves perceive that they have made a redistributive choice.\textsuperscript{11} To provide supporting evidence on the “reasonableness” of the income tax share as a proxy for revenue-side redistribution, we examined the correlation of this measure with four different indexes of tax progressivity that do take more specific structural features of taxes into account (Table 1). The relationship is positive and significant in every case.

The proxy measure for expenditure-side distribution ($\theta$) is the share of total state and local government expenditures on social services (health, welfare, and primary and secondary education) (EXPSH). Again, no single index can capture all of the elements of budget redistribution effort. But expenditure incidence analysis is likely to identify health, welfare, and education expenditures as the most progressive items in government budgets.\textsuperscript{12} In addition, voter perception is likely to be that social service expenditures are the budget choice that most improves income redistribution. To demonstrate the reasonableness of this indicator of expenditure redistribution choice, we estimated simple correlations (for 1990) between the health and welfare share of total expenditures, and the expansiveness of benefit levels under the key social programs that state and local governments control. The simple correlation coefficients have the expected positive sign, as shown in Table 2.

\begin{table}[h]
\centering
\caption{Simple Correlations Between the Income Tax Share and Selected Measures of Tax Progressivity\textsuperscript{a}}
\begin{tabular}{|l|c|}
\hline
Indexes of Tax Progressivity & Correlation Coefficient\textsuperscript{b} \\
\hline
Kiefer Index (Kiefer, 1991) & 0.44 \\
Suits Index (Kiefer, 1991) & 0.40 \\
Chernick Index (Chernick, 1992) & \\
& Gross of federal offset & 0.72 \\
& Net of federal offset & 0.59 \\
Top Marginal Statutory Rate & 0.32 \\
\hline
\end{tabular}
\textsuperscript{a}Data are for 49 states (Alaska excluded) for 1990. \\
\textsuperscript{b}All correlation coefficients are positive and significant at the 0.05 level.
\end{table}

\begin{table}[h]
\centering
\caption{Simple Correlations Between the Health and Welfare Expenditure Share and Measures of Redistribution\textsuperscript{a}}
\begin{tabular}{|l|c|}
\hline
Redistribution Measure & Correlation Coefficient\textsuperscript{b} \\
\hline
AFDC/SSI\textsuperscript{c} payments per recipient & 0.37 \\
AFDC/SSI\textsuperscript{c} recipients as a percent of population & 0.49 \\
Medicaid payments per recipient & 0.20 \\
Medicaid recipients as a percent of population & 0.65 \\
\hline
\end{tabular}
\textsuperscript{a}Data are for 49 states (Alaska excluded) for 1990. \\
\textsuperscript{b}All correlation coefficients are significant at the 0.05 level. \\
\textsuperscript{c}Aid for families with dependent children, and supplemental security insurance.
\end{table}

\textsuperscript{11} However, the structure of taxes at the state and local level may reflect not only redistribution choices, but also other factors including the difficulties associated with implementing certain taxes, such as property taxes. To some extent, the structure of state and local taxes is the product of history. See Chernick (2001) for a review of the historical difficulties in implementing major changes in state tax policy.

\textsuperscript{12} See for example Hayes and Slottje (1989). Benefit incidence analyses for developing countries also show overwhelmingly that public expenditures on health, social assistance, and primary and secondary education are progressive or pro–poor (see Martinez–Vazquez, 2001).
The inclusion of education expenditures in the expenditure–redistribution index may be questioned, but past research has consistently shown a relationship between the level of education expenditures and the reduction in fiscal disparities (Inman, 1979). The correlation (in 1990) between the education share and the health–welfare share of total expenditures is 0.44, and it is significant at the 0.10 level.

**The Determinants of the Distribution Choice**

Endogenous Variables

Politicians trying to maximize votes, or if preferred, benevolent decision makers, are likely to look at both sides of the budget in making redistributive choices. Similarly, individual voters who support expenditure redistributive polices may also care how state and local government goods and services are financed; it makes intuitive sense that individuals who advocate expanded redistributive services will not want those services financed with regressive taxes. We hypothesize that the tax and expenditure share variables (RVSH, EXPSH) are simultaneously determined and that they behave as complements in state and local budgets. In our empirical model, we allow for the endogeneity of two other variables: per capita federal aid for health and welfare (RAID) and the poverty rate (POV). Federal aid for health and welfare programs should have a significant effect on the likelihood of choosing redistributive expenditure policy because of both income and substitution effects. The level of federal health and welfare aid is treated as endogenous because the total amount received is determined partly by state and local government expenditures on those services.

Higher poverty rates are expected to encourage more redistribution through both tax and expenditure policies, but the poverty rate is likely to be endogenous to the system because more redistributive fiscal policies could encourage in–migration of the poor or out–migration of the non–poor, thereby increasing the poverty rate in a state (Gramlich and Laren, 1984; Blank, 1985; Rosenzweig and Wolpin, 1988; Peterson and Rom, 1989; Moffitt, 1990; Chernick and Goodspeed, 1997; and Brueckner, 2000). Migration could affect prices and incomes and even federal transfers, and therefore, the final demand for redistribution in the jurisdiction. We estimated the system with variables to control for neighboring states policies (such as relative levels of revenues and expenditures) and demographic changes (such as population and income). Due to a lack of significance, these neighborhood effects were excluded in the final analysis. See Brueckner (2000) for a discussion of the literature.

Expenditure Share Equation

The level of real per capita income (REALPI) is used to measure the income effect on EXPSH, but it cannot be signed *a priori*. Population size (POP) will have a negative effect on expenditure share, if a positive income elasticity is based on the existence of an altruism effect, (Hochman and Rodgers, 1969) and on a greater income demand elasticity for this type of expenditures vis–à–vis non–redistributive public expenditures. If the income elasticity of demand for non–redistributive expenditure is greater, *ceteris paribus*, per capita income will exert a negative effect on EXPSH. The income effect will be negative if voters act more directly in self interest, and opt for less redistribution in favor of greater budget allocations to services that benefit middle– and upper–income families (e.g., certain types of infrastructure investment and higher education).
“fixed cost effect” results in social services claiming a larger share of budgets in states with smaller populations. The population effect will be positive if larger states can offer a greater scope of social services. The unemployment rate (UNEMP) should be positively related to the expenditure share because (a) there is an automatic response of some entitlement programs expenditures to economic downturns, and (b) visible unemployment heightens awareness and stimulates voting support for social programs.

The demand for redistributive services will be stimulated by a lower relative price (resulting from a higher federal matching rate). We construct three price terms, each deflated by an index of private goods prices: health and welfare services (combined because these expenditures are often matched by federal funds), education services, and all other state and local government services.

The relative price of welfare and health services (PHW) is measured here as

\[
PHW_{it} = \left( \frac{MPI_t}{MPI_{68}} \right) \left( 1 - g_{i,t-1} \right) \frac{HE_{it}}{THW_{it}} + \left( 1 - g_{i,t-1} \right) \frac{WE_{it}}{THW_{it}}
\]

where:

- \( MPI_t \) = the medical price index in year \( t \)
- \( MPI_{68} \) = the medical price index in 1968
- \( g_{i,t-1} \) = the implicit matching federal rate for health and welfare grants, lagged by one period\(^{17} \)
- \( THW_{it} \) = total health and welfare expenditures in state \( i \), year \( t \), \((HE_{it} + WE_{it})\)
- \( Px_{it} \) = price of private goods (measured as the average wage in the private sector) in state \( i \), year \( t \)\(^{18} \)
- \( Px_{68} \) = the average wage in the private sector in state \( i \), year 1968 (from BEA)
- \( HE_{it} \) = health expenditures in state \( i \), year \( t \)
- \( WE_{it} \) = welfare expenditures in state \( i \), year \( t \)

The relative price of education services (EPR) is measured as the ratio of the average wage of a teacher to the average wage of a private sector worker in that state.\(^{19} \) The relative price of all other state and local government services (RPO) is proxied by the average salary of state and local government workers deflated by the average wage of all private sector workers in that state.

The signs of these price variables in the expenditure share equation are not readily predictable. We expect a negative own price elasticity of demand with respect to PHW and EPR, but depending on whether

\(^{17} \) The variable \( g_{i,t-1} \) is computed as total federal health and welfare grants to state and local governments in state \( i \) divided by \( THW_{it} \). Lagging this measure by one period helps address its potential endogeneity. Using federal matching rates for health and welfare would have been a more complex and less exact alternative. We tested alternative specifications of this price variable including using a variety of lags and found no significant differences in our final results.

\(^{18} \) We tested using the CPI as the price of private goods and again found no significant differences in the final results. The average wage in the private sector overall provides a better benchmark for public services than the CPI.

\(^{19} \) This measure was correlated with a much more specific average cost index by state, developed by Chambers (1998). As teachers’ salaries represent the largest component of overall education expenditure, we were not surprised that our education price variable has a very high, positive, and significant correlation with Chambers’ more inclusive index (currently available only for academic years 1987–88, 1989, and 1991). Unfortunately, it is not feasible to update the Chamber’s index for the entire panel data set.
demand is price elastic or price inelastic, total expenditure on redistributive services may decrease or increase. When PHW and EPR change, the demand for non–redistributive goods may also change. The cross price elasticities may be positive or negative depending on whether redistributive and non–redistributive expenditures are gross substitutes or complements. The total effect of the price change in PHW and EPR on the expenditure share for redistributive services will depend on the relative size of the own price elasticity and the cross–price elasticity.

The effect of a higher level of “other” federal grants (OAID) on EXPSH will depend on the relative income elasticities of demand for redistributive goods, all other state and local government goods, and private goods. If the income elasticity is higher for private goods and for non–redistributive goods than for distributive goods, then higher levels of federal grants will dampen the social service expenditure share. The existence of a flypaper effect for grants, ceteris paribus, will result in a larger government budget, but we cannot predict the share effect.

The expected sign for RVSH in the EXPSH equation is positive, as follows from our hypothesis about the complementarity between the two models of distribution choice. Federal aid for health and welfare (RAID) is endogenous to the model. RAID is expected to have a positive sign, because as states “buy into” programs by spending more, this should stimulate the social service expenditure share. Quigley and Smolensky (1990) find that greater state and local government expenditures for social services may be induced by a drastic decrease in federal aid. To control for this possibility we introduce dummy variable (RAIDDDUM= one for 1982 on), which allows for an exogenous increase in social service expenditure in a part of the sample period with share declines in federal aid and increased mandates.

The endogenous poverty rate (POV) could be positively related to EXPSH because a heavier concentration of poor voters may demand a more redistributive budget. However, the voting turnout of poor voters may be disproportionately low, while at the same time a larger concentration of poor families may solidify opposition against pro–poor services by the well–to–do. Therefore, we do not have an expected sign for POV.

Revenue Share Equation

We do not have an expected sign for REALPI in the revenue share equation. The direct income effect (REALPI) on revenue–side distribution would be positive if there is an altruism effect. Voters, legislatures, and governors have all often stated that they see the need to establish some sort of progressivity in the tax system, and individual and corporate income taxes are commonly thought to achieve this. The higher the income, the greater should be the pressure for a shift to income taxation. On the other hand, a self–interest effect may dominate for higher income residents and business may oppose heavier income taxes. In this case the income effect will be negative. As an additional control variable for income effects we include the unemployment rate (UNEMP), which should be negatively related to the revenue redistribution share: the income tax is more sensitive to the business cycle than are total revenues, and higher rates of chronic unemployment diminish the potential income tax base and may discourage its use relative to other taxes.

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20 Other than health and welfare grants.
21 We pieced together federal aid for health, education, and welfare programs drawing from the Annual Treasury Report of federal grants to states. A listing of those grants included in this category are in Appendix Table A.
22 See also, Quigley and Rubinfeld (1996).
To capture the relative price effect in the revenue share equation, we include as an independent variable the percent of families who itemize deductions on their federal return (ITEM). A dummy variable (DITEM = one from 1987 on) is interacted with the percent of itemizers to account for the impact of the Tax Reform Act of 1986. A positive coefficient for this interaction variable would indicate that the substitution effect resulting from elimination of sales tax deductibility and the income effect resulting from the lower average federal income tax rate after 1986, more than offset the substitution effect of the lower marginal tax rates for itemizers after 1986. The per capita level of severance taxes is used as a control for the ability to export company income taxes, and therefore is expected to be negatively related to the income tax share.

As for the endogenous variables included in the income tax share choice, we expect the social service expenditure share (EXPSH) to take a positive sign on the basis of our hypothesis about the complementarity between the two modes of distribution choice. We also include the poverty rate in the state (POV) but we do not have an expected sign. Poor people, voting in their self interest, may sway the state toward choosing more reliance on income taxation. However, the presence of more poor people may lead to the opposition from higher income residents and businesses to taxing a narrower base, at presumably a higher rate.

Poverty Equation

Poverty is the third endogenous variable in our system of equations and its determinants are complex. As exogenous explanatory variables, we use the percent of black population (BLK) and the percent of elderly population (OVER 65) to account for the higher incidence of poverty among these groups, and the rate of urbanization (URB) since poverty is generally greater in rural areas. The social service expenditure share (EXPSH) is also included as an explanatory variable. It may be negatively or positively related to the poverty rate depending on whether higher levels of social service benefits attract and hold the poor and drive away the better off, or increase the economic well being of citizens who otherwise would be poor. We also include the per capita level of federal aid for health and welfare programs (RAID) as an explanatory variable and expect a positive relationship with the poverty rate.

Federal Aid Equation

The final endogenous variable is federal aid for health and welfare (RAID). Real per capita income (REALPI) and the endogenous poverty rate (POV) are introduced as explanatory variables in the federal aid equation to account for the extent to which the system is intended to be equalizing. In addition, higher rates of unemployment (UNEMP) should stimulate grants if the system of assistance responds to the business cycle. Population density (DEN), urbanization (URB), and population size (POP) are included as control

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23 Chernick (1991, 1992) also analyzed the redistribution objective on the revenue side of the budget. He hypothesized that the more progressive (pro–poor) the revenue side of the budget, the less progressive the expenditure side may need to be. However, he found complementarily between the two sides of the budget in a single equation approach. To measure the tax price for itemizers, Chernick used the product of the percent of itemizers and the first dollar marginal rate of itemizers, drawing his data from the NBER TAXSIM model. His measure, though theoretically superior, cannot be used here because data are not available for the entire sample period. We believe, however, that the combination of the ITEM variable and the TRA dummy will adequately measure this effect. Note that ITEM maybe endogenous. We experimented with lagged values of this variable with no identifiable impact on the results.

24 “Poverty” is measured as the “Percent of Population Below Poverty” as defined in the Current Population Reports, by the U.S. Bureau of the Census. Census income measures cash receipts.
variables to account for interstate variations in population and economic structure. In addition, the per capita level of other aid (OAID) is included to control for the potential substitutability between the two types of federal assistance. Presumably, states “specialize” in federal assistance and a higher level of health and welfare aid may affect the level of other aid received. As for endogenous variables, we include the expenditure share (EXPSH) in the federal aid equation because higher amounts of federal aid will result if states buy into existing health and welfare programs.

**Estimation Approach**

Estimation of the four-equation system is done by two-stage least squares using pooled cross-section, time series data for 49 states in the U.S. for the 1969–1990 period.25 A “year” dummy variable (1969 = 0) is introduced into each structural equation to address the serial correlation problem and to allow for the possibility of fixed effects at the national level.26 Since there are several states that do not have an income tax (i.e., the revenue share variable is equal to zero), an adjustment is required. We view these states as accomplishing their fiscal redistribution solely on the expenditure side of the budget. Therefore, states for which REVSH = 0 were excluded from the first stage of estimation to avoid imputing a non-zero value of REVSH to them. However, the observations with REVSH = 0 were included in the second stage estimation with a zero value (i.e., where ) This treatment is the best solution to the issue raised by states with no income tax but our approach may bias the results due to the censoring-effect at zero. However, the direction of the bias is unknown a priori. The standard errors on all variables are adjusted using a bootstrap technique (Mooney and Duval, 1993).

**RESULTS**

**Revenue and Expenditure Equations**

The estimation results for the structural equations of the four-equation simultaneous model are presented in Table 3.27 The most important of the results is the positive and statistically significant coefficient for the endogenous revenue and expenditure distribution variables. For the period observed, states appear to view revenue- and expenditure-side distribution policies as complementary and pursue distribution objectives with both. If a state spends 1 percent more of its budget on redistributive services, it would, on average, raise about 0.35 percentage points more of its revenues from income taxes. If a state raises 1 percent more of its revenues from income taxes, it spends 0.041 percent more of its budget on social services.

We also obtain interesting results for the other two endogenous variables. A higher poverty rate, cet. par., significantly

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25 The theoretical rank and order conditions for identification of the system hold. The “empirical identification” also holds by the joint significance of the included variables in the first stage of estimation.

26 We also estimate a system that includes state and year fixed effects. The results for the critical variables are quite similar to those of the system with year dummies only. The results for the system with state and year fixed effects are presented in Appendix Table C.

27 The year dummy variable coefficients are not reported here. However, the sign pattern of the dummy variable coefficients suggests that the share of expenditures made for redistributive goods during 1970–1981 were generally greater than those in 1969. From 1982–1990, the expenditure share was not significantly different from that in 1969. On the revenue side, the dummy variable coefficients are positive and significant in most years, suggesting that the income tax share was significantly greater than that in 1969. Alternative versions of the model presented were also examined. These included log-log and log-linear specifications and inclusion/exclusion of some of the independent variables. We present the results of the model with the best overall fit.
<table>
<thead>
<tr>
<th>Item</th>
<th>Expenditure Share</th>
<th>Revenue Share</th>
<th>Poverty</th>
<th>Federal Aid</th>
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</thead>
<tbody>
<tr>
<td>BLK</td>
<td>—</td>
<td>—</td>
<td>0.2872</td>
<td>(22.18)</td>
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<tr>
<td>POV*</td>
<td>−0.2789</td>
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<td>—</td>
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<td>—</td>
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<tr>
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<td>—</td>
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<td>(5.71)</td>
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<td>—</td>
<td>—</td>
<td>0.0501</td>
</tr>
<tr>
<td>SEVPC</td>
<td>—</td>
<td>−0.0276</td>
<td>—</td>
<td>(2.12)</td>
</tr>
</tbody>
</table>

\[
R^2 = 0.4678, 0.3389, 0.5570, 0.2924
\]

*endogenous.

\(t\)-statistics in parenthesis.

Year dummy variables not reported.
dampens the share of social service expenditures and the share of income taxes. Thus, budget choices in favor of redistribution tend to decrease with heavier concentration of poverty. The endogenous federal aid variable (for health and welfare) has a stimulative effect on the redistributive expenditure share in the pre–1982 period, and, as shown by the coefficient for RAIDDUM, an even stronger effect in the post–1982 (Reagan) era, when grants were reduced and mandates were strengthened.

Price Effects

The response of the social service expenditure share to an increase in the relative price of health and welfare services is positive and statistically significant, suggesting an inelastic demand for redistributive services. Although the dependent variable (EXPSH) is too aggregate to allow the identification of individual price effects, the positive coefficient for the price of health and welfare and the negative coefficient for the price of other government goods (the cross–price effect), suggest complementarity among the two types of goods. The education price is not a significant determinant of the social service expenditure share.

Price effects also play a significant role in the revenue distribution equation. The income tax share is stimulated by the deductibility of state and local government income (and property taxes) measured here as the percent of itemizers (ITEM). There was a significantly higher stimulative effect as a result of TRA86. A higher level of per capita severance tax capacity significantly reduces the income tax share.

Income Effects

The income effect is negative and significant in both equations. A reduced income tax share in response to a higher per capita income suggests that, other things equal, higher income voters and the business community are less willing to accept an increased reliance on income taxes. Another interpretation is that voters adjust the structure of their tax system to account for the higher built–in elasticity of the income tax. The negative income coefficient on the expenditure side implies (assuming that neither of the two goods is inferior) that the income elasticity of demand of non–social services is higher than that for social services.

The exogenous federal transfer variable (OAID) is negatively related to the expenditure share for social services. The negative coefficient of OAID, like that of REALPI, can be interpreted as showing that the income demand elasticity for non–social services is higher than that for social services. Note that the larger coefficient of OAID (versus REALPI) is consistent with the flypaper effect of federal grants.

28 Interestingly, Goodspeed (2000) finds a positive relationship between income tax shares and poverty rates using a single–equation tobit model with international data. In that paper, poverty is defined as the percent of income held by the lowest 20 percent of the population.

29 This result is consistent with the findings of Moffitt (1984) and Quigley and Smolensky (1990). Also Gamkhar and Oates (1995) and Gamkhar (1995) find evidence of asymmetries in the response of state and local government expenditures to increases and decreases in federal grants.


31 This gives support to the interpretation of severance taxes as exploiting locational rents.

32 It has been argued that the transactions costs associated with discovering the true impacts of income elastic taxes are high, and consequently voters do not force a reduction in the effective tax rate (Buchanan and Dean, 1974). The results here do not support this hypothesis.
The Poverty and Aid Equations

The allocation of a greater budget share to social services has no significant effect on the poverty rate. More per capita federal aid for health and welfare, according to our estimates, is associated with a higher rate of poverty. States with more active federally supported social programs either attract or retain more poor families. Another view of this result is that the buildup in the concentration of poverty in poorer states cannot be significantly reduced by increased assistance to low income families in a period so short as the one generation covered by these data. The effects of the other control variables are as expected. States that are less densely populated, have smaller concentrations of urban population, and have larger proportions of black and elderly population, tend to have significantly more persons with incomes below the federally-defined poverty income line.

The results from the federal aid estimation also square with expectations. The share of the budget spent for social services is negatively related to the level of aid for health and welfare. The implication is that states are spending a greater share of their own resources on social expenditures and are relying less on federal assistance. The level of federal aid for health and welfare varies directly with the poverty rate, reflecting the focus of the transfer system on people rather than places. Significantly greater amounts of per capita health and welfare aid go to higher income, more populous and less urbanized states. There is also a positive relationship with the level of the unemployment rate, suggesting that federal assistance does respond to fluctuations in economic condition.

Elasticities: Direct and Indirect Effects

The combined direct and indirect effects of the exogenous variables on the expenditure and revenue shares tell a more complete story than do the marginal structural coefficients. In order to capture both the direct and indirect effects of the exogenous variables, we calculate elasticities of expenditure and revenue shares with respect to each of the exogenous variables using the results of the structural model (results in Table 3). The elasticity coefficient are estimated for 1990 and for the mean value of the sample (Table 4). The main results may be summarized by the following stylized facts:

1. The income effect is negative for the redistribution expenditure share and for the redistribution revenue share. Higher income states, ceteris paribus, are less likely to emphasize income taxation and social service spending. Using sample mean values, a 10 percent higher level of per capita income suggests a 0.6 percent lower share of social service spending and a 10 percent lower income tax share.

2. An increase in the price of health and welfare services (PHW) drives up the social service expenditure share and, indirectly, the income tax revenue share. At 1990 levels, a 10 percent higher level of per capita income suggests a 0.6 percent lower share of social service spending and a 10 percent lower income tax share.

For an abbreviated structural form of the expenditure and revenue share equations, $EXPSH = \beta_0 + \beta_1 RVSH + \beta_2 REALPI$ and $RVSH = \alpha_0 + \alpha_1 EXPSSH + \alpha_2 REALPI$, the direct effects of REALPI are $\beta_2$ and $\alpha_2$, and the indirect effects, are: $\frac{\partial EXPSH}{\partial RVSH} \frac{\partial RVSH}{\partial REALPI}$ and $\frac{\partial RVSH}{\partial EXPSSH} \frac{\partial EXPSSH}{\partial REALPI}$.

One could calculate these full elasticities (including direct and indirect or feedback effects) by solving the structural equations of Table 3 in terms of the independent variables only. Another method would utilize a simulation program that would provide an iterative solution for each dependent variable given a 1 percent change in any of the independent variables. We used the latter approach to calculate the elasticities presented in Table 4, using a subroutine of the Econometric Views software.
service expenditure share by 2 percent and the income tax share by about the same amount.

3. A reduction in the percent of federal income tax itemizers (an increase in the price of income taxes, for some taxpayers) dampens both the income tax share and the social service expenditure share, but the expenditure impact is significantly smaller.

4. The cross-price elasticity (RPO) is negative on both the social service expenditure share and the redistribution revenue share. Higher prices for other state and local government goods cause a redistribution of budget shares away from social services and less reliance on progressive sources of revenues.\(^{35}\)

5. Larger concentrations of black and elderly population in a state lead to more redistribution on the expenditure side and less redistribution on the revenue side. The elasticities, however, are very low. The redistributive budget shares are, *cet. par.*, higher in states with larger populations and in less urbanized states.

The estimated overall (direct plus indirect) effects suggest an interesting dynamic. When the redistributive expenditure share is stimulated by an exogenous effect (e.g., the relative price of redistributive goods), the stimulus is transmitted strongly to a larger income tax share. Voters in states that choose a higher social service expenditure share have a decided preference for heavier income taxes. However, an external stimulus on the revenue side is transmitted more weakly to the expenditure side, e.g., a greater population of itemizers may drive up the income tax share in a state but the higher income tax share will draw a much smaller social service expenditure response.

**POLICY SIMULATION RESULTS**

Further insight from the model can be gained by simulating the potential response of state budgets to some of the frequently discussed proposals for changes in federal policy.\(^{36}\) We run two simulations. The first is based on the block grant proposals that were part of the Republican *Contract with America*. The second re-

### TABLE 4

<table>
<thead>
<tr>
<th></th>
<th>Redistributive Expenditure Share</th>
<th>Redistributive Revenue Share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At 1990 Levels</td>
<td>At 1969–90 Means</td>
</tr>
<tr>
<td>REALPI</td>
<td>-0.067</td>
<td>-0.057</td>
</tr>
<tr>
<td>BLK</td>
<td>0.008</td>
<td>0.008</td>
</tr>
<tr>
<td>POP</td>
<td>0.035</td>
<td>0.032</td>
</tr>
<tr>
<td>URB</td>
<td>-0.438</td>
<td>-0.175</td>
</tr>
<tr>
<td>DEN</td>
<td>0.019</td>
<td>0.018</td>
</tr>
<tr>
<td>OVER 65</td>
<td>-0.176</td>
<td>0.01</td>
</tr>
<tr>
<td>RPO</td>
<td>-0.239</td>
<td>-0.229</td>
</tr>
<tr>
<td>ITEM</td>
<td>0.012</td>
<td>0.014</td>
</tr>
<tr>
<td>DITEM</td>
<td>0.004</td>
<td>0.001</td>
</tr>
<tr>
<td>OAID</td>
<td>-0.062</td>
<td>-0.068</td>
</tr>
<tr>
<td>UNEMP</td>
<td>0.002</td>
<td>0.003</td>
</tr>
<tr>
<td>PHW</td>
<td>0.216</td>
<td>0.203</td>
</tr>
<tr>
<td>EPR</td>
<td>-0.062</td>
<td>-0.057</td>
</tr>
<tr>
<td>SEVPC</td>
<td>-0.001</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**NOTE:** Significant elasticities are marked in bold print (significant at the 95 percent level or higher).

---

\(^{35}\) “Other” means exclusive of health, welfare, and education.

\(^{36}\) The simulations were run by using the system of structural equations and allowing for changes to the exogenous variables to compute the corresponding changes in the endogenous variables. We used the same Econometric View subroutine that we used to calculate the elasticities.
lates to individual income tax reforms which have been on the agenda of both political parties. The results are reported in Table 5. The main question we raise is whether often recommended, efficiency-improving measures—adopting block grants and eliminating state and local income tax deductibility—would have significant effects on state and local governments’ choices in fiscal redistribution.

**Shifting Health and Welfare Financing to Block Grants**

In 1996, federal legislation replaced the previous matching grant system to the states for health and welfare financing with a system of block grants which gave the states considerable freedom to elect the form and level of assistance to the poor.\(^3^7\) To carry out a simulation of the impacts of this program, we assume elimination of the matching provision in federal grants, but hold each state harmless in terms of the total amount of grant revenue received in 1990. In terms of our model, all grants would now be received as OAID. Quite interestingly, the model predicts that the shift to block grants does not lead to a de-emphasis of fiscal redistribution by state and local governments. The significant relative price increase for health and welfare services raises the redistributive expenditure share fundamentally because of the relatively low price elasticity of demand for social welfare services. Thus, states would be buying less services but spending more than before. Note that the income effect associated with the shift from matching to block grants assumed in the simulation, partially offsets the effect of the change in relative prices by lowering the redistributive expenditure share.\(^3^8\) The net effect is estimated to be 5 percentage point increase in the expenditure share for social services (Table 5). Quigley and Smolensky (1990) found a similar result in an analysis of federal grant cutbacks in the 1980s: state and local governments responded with higher expenditures from their own sources. Gramlich (1987) also found that state and local governments picked up expenditures dropped by the federal government in the 1980s. The model also predicts a 1.76 percentage point increase in the income tax share: voters would be willing to accept some increase in the income tax share so that their redistribution target would not be met entirely on the expenditure side of the budget.

**Eliminating Deductibility for State and Local Government Income Taxes**

A second simulation removes the deductibility of state and local government income taxes paid from federal income tax

<table>
<thead>
<tr>
<th>TABLE 5</th>
<th>SIMULATIONS OF THE EFFECT OF CHANGES IN FEDERAL POLICY ON THE REDISTRIBUTIVE REVENUE AND EXPENDITURE SHARES (in percentage points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation: 1990 levels</td>
<td>Change in Expenditure Share(^1)</td>
</tr>
<tr>
<td>Eliminate the match for health and welfare grants, and hold all states harmless in terms of total grants received.</td>
<td>5.00</td>
</tr>
<tr>
<td>Replace state and local government income tax deductibility with an equal yield credit.</td>
<td>-0.07</td>
</tr>
</tbody>
</table>

\(^1\)Predicted from this simulation, less the share predicted for the baseline 1990 case. Unweighted 49–state means.

\(^3^7\) See McGuire (1997).

\(^3^8\) Recall that both the per capita income and “other aid” response coefficients are negative in the structural expenditure share equation.
liability. The total amount of additional income tax that would be paid to the federal government under this scenario is $20 billion in 1990. In this experiment, $20 billion is allocated back to personal income in the states in proportion to each state’s aggregate federal tax liability. It is as though the deductibility of state income taxes was replaced by an equal amount of general credit against federal tax liability.

This policy change would have two impacts. First, it would reduce the number of income tax payers who itemize deductions, thereby raising the price of state income taxes and lowering the income tax share. Second, it would increase the level of (after tax) personal income thereby further reducing the income tax share. The total effect is that the redistribution revenue share would fall by about 1.31 percentage points. The decrease in the expenditure share is negligible.

The two policies enacted simultaneously would have partially offsetting effects but would still lead to an overall increase in the expenditure and revenue shares. Either of these two reforms represent a significant step toward the “Fend for Yourself” federalism that many have advocated in recent years. The efficiency gains from such a program have been generally accepted by economists, but many policy analysts have questioned whether there would be undesirable equity impacts. Our simulations indicate that the emphasis on redistribution in state and local government budgets would not decline, as measured by expenditure share on social services.

CONCLUSIONS

We set out to answer three questions in this paper:

- What are the characteristics of states that undertake higher or lower levels of distribution?
- Do states view revenue-side and expenditure-side distribution instruments as substitutes or complements?
- What can past behavior tell us about how state and local governments will react to policies that give them more responsibility in redistribution policies?

Answering these questions requires a great deal of structure and a significant list of assumptions. We are very aware that the study of state and local government distributional policies can and should be further explored following different definitions and assumptions from those made in this paper. For these reasons our findings should be considered in light of these assumptions. We find that the answer to the first question is that, at the margin, and taking both direct and indirect effects into account, we might expect more emphasis on social services in the expenditure budgets of states that are less urbanized and have lower levels of income. On the revenue side, states with lower levels of income, less urbanized populations, and a smaller concentration of black and elderly population tend to make more use of income taxes. Prices do seem to matter. Higher federal matching grant rates lead to more redistribution, as does a larger percent of federal income tax itemizers.

The answer to the second question is that revenue and expenditure distribution instruments are complements. States that use income taxes more heavily are likely to weigh social services more heavily in their expenditure budgets, and vice versa.

The policy question toward which this work is pointed is whether efficiency-improving reforms in the federal system

39 The $20 billion was estimated using IRS Statistics of Income data for 1990, assuming an average marginal tax rate for itemizers of approximately 23 percent.
are likely to have undesirable equity consequences by inducing state and local governments to spend less for social services and to tax less from progressive bases. Our empirical answer is that the shift to block grants will induce more emphasis on distribution because the demand for redistributive expenditures is price inelastic. State and local governments react to the increase in price by reducing the quantity of social services provided, cet. par., but they will dedicate a larger share of their budgets to redistributive services. The implications of our findings for federal policy is that matching grants are not more effective than block grants in leading state and local governments to spend a larger share of their budgets on health, education, and welfare. The elimination of income tax deductibility, on the other hand, would lead to less reliance on income taxation in state and local government.

Future research should further investigate the robustness of our results under alternative definitions and measurements of state and local government distributional policies. We hope this paper will create more interest in the literature on why some state and local governments choose more progressive fiscal instruments than do others.

Acknowledgments

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Oates, Wallace E.

Pauly, Mark V.

Peterson, Paul E., and Mark Rom.

Quigley, John, and Daniel L. Rubinfeld.

Quigley, John, and Eugene Smolensky.


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**APPENDIX TABLE A**

**LIST OF VARIABLES**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Values</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td>EXPSH</td>
<td>44.63</td>
<td>4.21</td>
</tr>
<tr>
<td>RVSH</td>
<td>14.58</td>
<td>8.20</td>
</tr>
<tr>
<td>BLK</td>
<td>9.25</td>
<td>9.20</td>
</tr>
<tr>
<td>OVER 65</td>
<td>11.11</td>
<td>2.00</td>
</tr>
<tr>
<td>URB</td>
<td>67.03</td>
<td>14.43</td>
</tr>
<tr>
<td>REALPI</td>
<td>3971.76</td>
<td>756.80</td>
</tr>
<tr>
<td>POV</td>
<td>13.12</td>
<td>4.45</td>
</tr>
<tr>
<td>RAID</td>
<td>58.64</td>
<td>18.16</td>
</tr>
<tr>
<td>OAILD</td>
<td>84.79</td>
<td>35.89</td>
</tr>
<tr>
<td>UNEMP</td>
<td>6.32</td>
<td>2.60</td>
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<tr>
<td>ITEM</td>
<td>32.77</td>
<td>8.12</td>
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</table>
### APPENDIX TABLE A (continued)

**LIST OF VARIABLES**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Values</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEN = population per square mile</td>
<td>157.26</td>
<td>222.87</td>
</tr>
<tr>
<td>PHW = the relative price of health and welfare services</td>
<td>0.44</td>
<td>0.13</td>
</tr>
<tr>
<td>EPR = the relative price of education services</td>
<td>1.03</td>
<td>0.12</td>
</tr>
<tr>
<td>POP = Population Size: state population (000’s)</td>
<td>4565.97</td>
<td>4751.23</td>
</tr>
<tr>
<td>RAIDDUM = a dummy variable, that takes a value of one if year = 1982 or later, interacted with RAID</td>
<td>26.07</td>
<td>32.50</td>
</tr>
<tr>
<td>DITEM = a dummy variable that takes the value of one if year = 1987 or later, interacted with ITEM</td>
<td>5.34</td>
<td>11.62</td>
</tr>
<tr>
<td>RPO = the average wage of all state and local government workers divided by the average wage of all workers in the state</td>
<td>1.136</td>
<td>0.11</td>
</tr>
<tr>
<td>SEVPC = Severance Tax: per capita severance tax revenues</td>
<td>23.17</td>
<td>75.53</td>
</tr>
</tbody>
</table>

### APPENDIX TABLE B

**DATA SOURCES**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>State–Local Total Taxes</td>
<td></td>
</tr>
<tr>
<td>State–Local Social Service Expenditure</td>
<td></td>
</tr>
<tr>
<td>Federal Aid to State and Local Governments</td>
<td></td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td></td>
</tr>
<tr>
<td>Percent of Population Black</td>
<td></td>
</tr>
<tr>
<td>Percent of Population Over 65</td>
<td></td>
</tr>
<tr>
<td>Percent of Population in Urban Areas</td>
<td></td>
</tr>
<tr>
<td>Population Density</td>
<td></td>
</tr>
<tr>
<td>Federal Aid to State and Local Governments for Health and Welfare</td>
<td>The programs included in the RAID variable are: child nutrition; food stamps; health services; planning and development; mental health research services; preventative health services; health manpower education and utilization; child welfare services; maintenance assistance; medical assistance; social services; state and local training; social and rehabilitation services; work incentives activities</td>
</tr>
</tbody>
</table>

---

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## APPENDIX TABLE C
TWO STAGE LEAST SQUARES ESTIMATES: EXPENDITURE SHARE, REVENUE SHARE, POVERTY AND FEDERAL AID EQUATIONS ON POOLED CROSS-SECTION, TIME SERIES DATA FOR 50 STATES WITH STATE AND TIME FIXED EFFECTS FOR 1969–19901, 2

<table>
<thead>
<tr>
<th></th>
<th>Expenditure Share</th>
<th>Revenue Share</th>
<th>Poverty</th>
<th>Federal Aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLK</td>
<td>—</td>
<td>—</td>
<td>1.1090</td>
<td>(19.13)</td>
</tr>
<tr>
<td>POV*</td>
<td>-0.7717 (6.67)</td>
<td>0.3400 (2.60)</td>
<td>—</td>
<td>5.6201 (8.37)</td>
</tr>
<tr>
<td>RAID*</td>
<td>0.1104 (1.96)</td>
<td>—</td>
<td>0.0561</td>
<td>(4.76)</td>
</tr>
<tr>
<td>RVSH*</td>
<td>0.0784 (12.61)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EXPSh*</td>
<td>—</td>
<td>0.4939 (9.48)</td>
<td>0.2000</td>
<td>(4.93)</td>
</tr>
<tr>
<td>REALPI</td>
<td>-0.0019 (0.52)</td>
<td>0.0006 (0.01)</td>
<td>—</td>
<td>0.0168 (1.09)</td>
</tr>
<tr>
<td>PHW</td>
<td>8.0838 (5.45)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>EPR</td>
<td>6.1310 (1.06)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>RPO</td>
<td>-0.0069 (1.98)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>RAIDDUM</td>
<td>0.0429 (18.38)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>POP</td>
<td>-0.0007 (2.86)</td>
<td>—</td>
<td>0.0006</td>
<td>(1.04)</td>
</tr>
<tr>
<td>ITEM</td>
<td>—</td>
<td>0.0313 (13.30)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>UNEMP</td>
<td>0.1872 (14.78)</td>
<td>-0.1598 (3.63)</td>
<td>—</td>
<td>-0.7987 (3.24)</td>
</tr>
<tr>
<td>DEN</td>
<td>—</td>
<td>—</td>
<td>-0.0628</td>
<td>(1.61)</td>
</tr>
<tr>
<td>OVER65</td>
<td>—</td>
<td>—</td>
<td>0.3729</td>
<td>(4.74)</td>
</tr>
<tr>
<td>URB</td>
<td>—</td>
<td>—</td>
<td>-0.0972</td>
<td>(5.79)</td>
</tr>
<tr>
<td>DITEM</td>
<td>—</td>
<td>0.0405 (1.92)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>OAId</td>
<td>0.0003 (0.16)</td>
<td>—</td>
<td>—</td>
<td>-0.0137 (1.05)</td>
</tr>
<tr>
<td>SEVPC</td>
<td>—</td>
<td>-0.0102 (0.33)</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

R²: 0.823 (0.33)

1*endogenous.
1't-statistics in parenthesis.
2Year and state dummy variables not reported.