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State and Local Government Choices in Fiscal Redistribution

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Fiscal Research Program

STATE AND LOCAL GOVERNMENT CHOICES IN FISCAL REDISTRIBUTION

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Table of Contents

	Page
Executive Summary	iv
Introduction	1
Empirical Model	3
A. The Dependent Variables: Measuring Distribution	3
B. The Determinants of the Distribution Choice	6
C. Estimation Approach	12
Results	14
A. Revenue and Expenditure Equations	14
B. The Poverty and Aid Equations	17
C. Elasticities: Direct and Indirect Effects	17
Policy Simulation Results	21
A. Shifting Health and Welfare Financing to Block Grants	22
B. Eliminating Deductibility for State and Local Government Income Taxes ..	23
Conclusions	24
Appendix	26
References	28

Executive Summary

While it is widely held that that state and local governments should not pursue income redistribution as a budgetary objective, state and local governments do engage in budget policies that have an explicit redistributive objective. On the expenditure side, responsibilities range from health, welfare and education (each with a redistributive component). State and local governments also impose tax laws that involve redistribution including progressive income tax rates, food exemptions for the sales tax, and property tax circuit breakers. In short, voters do appear willing to support state and local government redistribution policies (Martinez-Vazquez, 1981).

Federal government policies may affect the tendency of state and local governments to do redistribution. The level and composition of federal grants can affect the price of state and local expenditures, federal deductibility of state and local taxes affects the cost of tax-related redistribution, and through income effects associated with certain types of grants.

Economists have devoted relatively little attention 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 in an empirical framework:

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?

There is no unambiguous way to measure the emphasis on distribution in state and local government budgets as virtually every government service and every tax has some element of progressivity or regressivity in it. The choice we use in this paper is to index

the degree of distributional emphasis based on budget shares allocated to redistributive services and revenue shares raised from progressive taxes. We classify the following as redistributive services: health, welfare, and primary and secondary education. On the revenue side, the proportion of state and local governments' individual and corporate income taxes in total own source revenue is used as the indicator of the importance of distribution in the state and local government revenue budget. The appropriateness of these variables is tested by comparing these variables to other potential measures of redistribution and we believe that our measures hold up quite well.

We are seeking an explanation of what makes state and local governments choose more or less redistribution, measured as the percent of total expenditures on health, education, and welfare and the percent of revenues coming from state and local individual and corporate income taxes. We believe that this expenditure/revenue redistribution decision is made simultaneously and governments either view the expenditure side and revenue side redistribution decision as a complementary one or that one substitutes for the other. In this context, two other variables are considered as endogenous--per capita federal aid for health and welfare and the poverty rate. Federal aid for health and welfare programs will 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 itself endogenous to this model 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 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.

A number of variables are chosen as exogenous. For each dependent variable (revenue share, expenditure share, poverty, and per capita federal aid) we rely on the literature and economic theory to determine appropriate variables. We estimate the four equation system for the period 1969-1990 for all state and local governments by state. 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.

Expected results are also obtained for the other two endogenous variables. A higher poverty rate, *ceteris paribus*, significantly dampens the share of social service expenditures and the share of income taxes. Budget choices in favor of redistribution tend to decrease with heavier concentration of poverty. The endogenous federal aid variable (for health and welfare) have a stimulative effect on the redistributive expenditure share in the pre-1982 period, and an even stronger effect in the post-1982 (Reagan) era, when grants were reduced and mandates were strengthened. Many of the other results are consistent with expectations.

From the regression results, we also find 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.

What do these results suggest for future policy? We simulated two potential changes in government policy to determine the effect on redistributive expenditure and revenue shares for state and local governments. We investigated the two following policies: the elimination of the federal matching provision in state-local grants (with a hold-harmless assumption in terms of total amount of grant received) and the elimination of the federal deductibility of state income taxes.

Interestingly, our 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.

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. The net effect is estimated to be 5-percentage-point increase in the expenditure share for social services. 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.

The elimination of the federal income tax deduction for state and local taxes (holding total income harmless) 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. Secondly this change 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. On the expenditure side of the budget there is little effect. The return of the increased federal income tax as an income supplement will lead to little change in the expenditure share on social services because other government services are more income elastic.

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 property taxes involves redistribution choices (e.g., marginal income tax rates, food exemption under the sales tax, and property tax circuit breakers). Voters do 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 distributive 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

¹Pauly (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.

²Federal 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).

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.³ 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?⁴

³Moffitt (1990) and Chernick (1992), are notable exceptions. See also Goodspeed (2000) on the use of more progressive taxation at the subnational level using cross-country data.

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

Empirical Model

This paper is an empirical study of the redistribution choices of state and local governments.⁵ In order to answer the three questions posed above, two parameters must be estimated for state and local budgets: a revenue distribution index (α) and an expenditure distribution index (θ). These are defined as:

$$\alpha = \frac{t_r B_r}{t_o B_o + t_r B_r} \quad \text{and} \quad \theta = \frac{E_R}{E_R + E_O}$$

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

t_r, t_o = the tax rate on redistributive and non-distributive bases, respectively;

B_r, B_o = redistributive and non-distributive taxes bases, respectively.

A. 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 α and θ as defined above. Virtually every government service and every tax has some element of progressivity or regressivity in it.⁶ 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.⁷

⁵A theoretical approach to treating income redistribution as a fiscal choice in a local public goods model is presented in Bahl, Martinez-Vazquez, and Wallace (1996).

⁶For further discussion see Alm and McCallin (1996) and Alm and Zubrow (1987).

⁷There 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

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 (α). There is strong *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.⁸ 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 income taxes on "business" reduce the tax burden on the state's population because these taxes are paid by richer people who live elsewhere.

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. 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.

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.

⁸For 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.

State and Local Government Choices in Fiscal Redistribution

**TABLE 1. SIMPLE CORRELATIONS BETWEEN THE INCOME TAX SHARE AND
SELECTED MEASURES OF TAX PROGRESSIVITY^a**

Indexes of Tax Progressivity	Correlation Coefficient ^b
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

^aData are for 49 states (Alaska excluded) for 1990.

^bAll correlation coefficients are positive and significant at the 0.05 level.

NOTES: The Suits index is a measure of the progressivity of tax measured as the tax liability at various levels of income. The Kiefer index measures the decrease in inequality of the income distribution due to the tax system. The Chernick index measures progressivity as the ratio of the average tax burden of the top 5 percent of the income distribution divided by the average tax burden of the lowest quintile.

The proxy measure for expenditure-side distribution (θ) 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.⁹ 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.

⁹See for example Hayes and Slottje (1989).

TABLE 2. SIMPLE CORRELATIONS BETWEEN THE HEALTH AND WELFARE EXPENDITURE SHARE AND MEASURES OF REDISTRIBUTION^a

Redistribution Measure	Correlation Coefficient ^b
AFDC/SSI ^c payments per recipient	0.37
AFDC/SSI ^c recipients as a percent of population	0.49
Medicaid payments per recipient	0.20
Medicaid recipients as a percent of population	0.65

^aData are for 49 states (Alaska excluded) for 1990.

^bAll correlation coefficients are significant at the 0.05 level.

^cAid for families with dependent children, and supplemental security insurance.

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).¹⁰ 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.

B. The Determinants of the Distribution Choice

1. Endogenous Variables

Individuals who support expenditure redistributive policies 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. The tax and expenditure share variables (RVSH, EXPSH) are simultaneously determined in this model and they are expected to behave as complements in state and local budgets. 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 will have a significant effect on the

¹⁰Cross-section, time-series data on the concentration of education expenditure efforts in distressed areas, on programs for the disadvantaged, etc. are not available.

likelihood of choosing redistributive expenditure policy because of both income and substitution effects. The level of federal health and welfare aid is itself endogenous to this model 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 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 (Moffitt, 1990; Peterson and Rom, 1989; Gramlich and Laren, 1984; Blank, 1985; and Rosenzweig and Wolpin, 1988; Chernick and Goodspeed, 1997; and Brueckner, 2000).¹¹

2. 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*.¹² Population size (POP) will have a negative effect on expenditure share, if a “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.

¹¹Migration 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.

¹²The argument for 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-a-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).

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

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

$$PHW_{it} = \frac{\left[\frac{MPI_t}{MPI(68)} (1 - g_{i,t-1}) \right] \frac{HE_{it}}{THW_{it}} + (1 - g_{i,t-1}) \frac{WE_{it}}{THW_{it}}}{\frac{Px_{it}}{Px_{168}}}$$

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 ¹³
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
Px_{168}	=	the average wage in the private sector in state i , year 1968 (from BEA)
HE_{it}	=	health expenditures in state i , year t

¹³The 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} . We tested alternative specifications of this price variable including using alternative lags and the general CPI and found no significant differences in our final results.

State and Local Government Choices in Fiscal Redistribution

$$WE_{it} = \text{welfare expenditures in state } i, \text{ year } t$$

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.¹⁴ 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 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)¹⁵ 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.

RVSH is included in the EXPSH equation to test whether the two policy instruments are substitutes or complements. Federal aid for health and welfare, (RAID) is

¹⁴This 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).

¹⁵Other than health and welfare grants.

endogenous to the model because states may "buy into" programs by spending more, and should stimulate the social service expenditure share.¹⁶ However, greater state and local government expenditures for social services may be induced by lower RAID (Quigley and Smolensky, 1990). An interaction dummy variable (RAIDDUM=1 for 1982 on) is introduced to control for the possibility that the social service expenditure response to grants was stronger in this period of declining aid and increased mandates (Quigley and Smolensky, 1990 and Quigley and Rubinfeld, 1996).

The poverty rate (POV) could be positively related to EXPSH because a heavier concentration of poor voters may demand a more redistributive budget. However, a larger concentration of poor families may solidify opposition against pro-poor services by the well-to-do, while the voting turnout of poor voters may be disproportionately low.

3. 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 business 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.

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

¹⁶We 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 B.

return (ITEM).¹⁷ A dummy variable (DITEM = 1 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 offsets 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 should be negatively related to the income tax share.

Two endogenous variables are included as determinants of the income tax share choice. The social service expenditure share (EXPSH) allows a test of the substitute-complement relationship between expenditure-side and revenue-side distribution policy. The poverty rate in the state (POV) controls for the possibility that poor people, voting in their self interest, may sway the state toward choosing more reliance on income taxation. A negative association between the poverty rate and the income tax share would indicate an opposition from higher income residents and businesses to taxing a narrower base, at presumably a higher rate.

4. Poverty Equation

The determinants of poverty 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

¹⁷Chernick (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 complementarity 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.

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.

5. Federal Aid Equation

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 variables to account for interstate variations in population and economic structure. The per capita level of other aid (OAID) is included here to control for the substitutability between the two types of assistance. Presumably, states "specialize" in federal assistance and a higher level of health and welfare aid may affect the level of other aid received.

The endogenous expenditure share (EXPSH) is also included as an explanatory variable in this equation but the direction of the effect is not clear. Traditionally, analysts have assumed that higher amounts of federal aid will result if states buy into existing health and welfare programs.

C. Estimation Approach

Estimation 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.¹⁸ 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. An adjustment is required for those states that do not use either the individual or corporate income tax, hence accomplish their fiscal redistribution solely on the expenditure side of the budget. States for which $revsh = 0$ were excluded from the first stage of estimation so that a non-zero value of $revsh$ would not be imputed to these states. These observations were included in the second stage estimation where

¹⁸We checked theoretical identification of the system via rank and order conditions which do hold. We also checked "empirical identification" by examining the significance of included variables in the first stage of estimation.

$$revsh = rev\hat{s}h = 0.$$

The standard errors on all variables are adjusted using a bootstrap technique (Mooney and Duval, 1993).

Results

A. Revenue and Expenditure Equations

The estimation results for the four-equation simultaneous model are presented in Table 3.¹⁹ 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.

Expected results are also obtained for the other two endogenous variables. A higher poverty rate, *ceteris paribus*, significantly dampens the share of social service expenditures and the share of income taxes.²⁰ Budget choices in favor of redistribution tend to decrease with heavier concentration of poverty. The endogenous federal aid variable (for health and welfare) have 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.²¹

¹⁹The 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.

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

²¹This 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.

State and Local Government Choices in Fiscal Redistribution

TABLE 3. TWO STAGE LEAST SQUARES ESTIMATES: EXPENDITURE SHARE, REVENUE SHARE, POVERTY AND FEDERAL AID EQUATIONS ON POOLED CROSS-SECTION, TIME SERIES DATA FOR 50 STATES FOR 1969 - 1990^{1,2}

	Expenditure Share	Revenue Share	Poverty	Federal Aid
BLK	...	...	0.2872 (22.18)	...
POV ⁺	-0.2789 (4.29)	-0.3589 (2.98)	...	1.8957 (6.08)
RAID ⁺	0.2272 (6.75)	...	0.0648 (5.71)	...
RVSH ⁺	0.0408 (2.41)	...	...	...
EXPSH ⁺	...	0.3548 (4.22)	0.0575 (1.45)	-1.0123 (3.19)
REALPI	-0.0036 (9.13)	-0.0034 (4.51)	...	0.0126 (7.02)
PHW	24.8751 (9.76)	...	...	...
EPR	-3.0134 (1.28)	...	...	...
RPO	-0.0109 (3.11)	...	...	...
RAIDDUM	0.0687 (4.09)	...	...	...
POP	0.0001 (2.87)	...	-0.0001 (3.12)	0.0012 (7.45)
ITEM	...	0.5786 (11.68)	...	...
UNEMP	-0.1125 (2.11)	-0.0182 (0.21)	...	0.5762 (2.13)
DEN	...	...	-0.0079 (11.66)	0.0317 (9.25)
OVER 65	...	...	0.3176 (5.40)	...
URB	...	...	-0.0336 (3.01)	-0.5749 (9.65)
DITEM	...	0.1876 (1.94)	...	...
OAID	-0.0553 (13.62)	...	...	0.0501 (2.12)
SEVPC	...	-0.0276 (6.50)	...	...
$\bar{R}^2$	0.4678	0.3389	0.5570	0.2924

⁺endogenous.

¹t-statistics in parenthesis.

²Year dummy variables not reported.

1. 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.

The price effect in the revenue distribution equation also is significant. 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).²² 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.

2. 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.²³ 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.

²²Courant and Rubinfeld (1987), Feldstein and Metcalf (1987), Holtz-Eakin and Rosen (1988), Lindsey (1988), and Gade and Adkins (1990), all found evidence of a significant effect of the tax price on state and local government tax structures. Inman (1989) reached a similar conclusion about the tax systems of city governments.

²³Some will argue 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 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.

B. 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.

C. 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,²⁴ we calculate the reduced form elasticities of expenditure and revenue shares with respect to each of the exogenous variables. The elasticity coefficients 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:

TABLE 4. CALCULATED REDUCED FORM REVENUE AND EXPENDITURE SHARE ELASTICITIES AT 1990 LEVELS AND AT 1969-1990 MEANS

	Redistributive Expenditure Share		Redistributive Revenue Share	
	At 1990 Levels	At 1969-90 Means	At 1990 Levels	At 1969-90 Means
REALPI	-0.067	-0.057	-1.158	-1.091
BLK	0.008	0.008	-0.062	-0.066
POP	0.035	0.032	0.039	0.040
URB	-0.438	-0.175	-0.181	-0.059
DEN	0.019	0.018	0.044	0.046
OVER 65	-0.176	0.01	-0.053	-0.088
RPO	-0.239	-0.229	-0.238	-0.252
ITEM	0.012	0.014	1.005	1.321
DITEM	0.004	0.001	0.326	0.070
OAID	-0.062	-0.068	-0.068	-0.082
UNEMP	0.002	0.003	-0.009	-0.012
PHW	0.216	0.203	0.217	0.224
EPR	-0.062	-0.057	-0.062	-0.063
SEVPC	-0.001	0.000	-0.057	-0.045

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

²⁴For an abbreviated structural form of the expenditure and revenue share equations, $EXPSH = \beta_0 + \beta_1 RVSH + \beta_2 REALPI$ and $RVSH = \alpha_0 + \alpha_1 EXPSH + \alpha_2 REALPI$, the direct effects of $REALPI$ are β_2 and α_2 , and the indirect effect, are: $\frac{\partial EXPSH}{\partial RVSH} \cdot \frac{\partial RVSH}{\partial REALPI}$, and $\frac{\partial RVSH}{\partial EXPSH} \cdot \frac{\partial EXPSH}{\partial REALPI}$.

State and Local Government Choices in Fiscal Redistribution

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 ten percent higher price for health and welfare services will increase the social service expenditure share by 2.0 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.²⁵
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, *ceteris paribus*, 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

²⁵"Other" means exclusive of health, welfare, and education.

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. Some of these simulations are based on proposals that were originally part of the Republican *Contract with America*, some relate to federal policies on block grants that were accepted by Congress, and others are related to individual income tax reforms which are on the agenda of both political parties. The results are reported in Table 5.²⁶ 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.

TABLE 5. SIMULATIONS OF THE EFFECT OF CHANGES IN FEDERAL POLICY ON THE REDISTRIBUTIVE REVENUE AND EXPENDITURE SHARES (IN PERCENTAGE POINTS)

Simulation: 1990 levels	Change in Expenditure Share ¹	Change in Revenue Share ¹
Eliminate the match for health and welfare grants, and hold all states harmless in terms of total grants received.	5.00	1.76
Replace state and local government income tax deductibility with an equal yield credit.	-0.07	-1.31

¹Predicted from this simulation, less the share predicted for the baseline 1990 case. Unweighted 49-state means.

²⁶The simulations were run by first solving the system of structural equations and then allowing for changes to the exogenous variables to compute the corresponding changes in the endogenous variables.

A. 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.²⁷ 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.²⁸ 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.

²⁷See McGuire (1997).

²⁸Recall that both the per capita income and "other aid" response coefficients are negative in the structural expenditure share equation.

B. 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 liability. The total amount of additional income tax that would be paid to the federal government under this scenario is \$20 billion in 1990.²⁹

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. On the expenditure side of the budget there is little effect. The return of the increased federal income tax as an income supplement will lead to little change in the expenditure share on social services because other government services are more income elastic.

The two above 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 would 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.

²⁹The \$20 billion was estimated using IRS, *Statistics of Income* data for 1990, assuming an average marginal tax rate for itemizers of approximately 23 percent.

Conclusions

We set out to answer three empirical 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 redistributive policies?

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 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, *ceteris paribus*, 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.

State and Local Government Choices in Fiscal Redistribution

Appendix

TABLE A. LIST OF VARIABLES

			Mean Values	Standard Deviation
EXPSH	=	expenditures on health, education, and welfare as a percent of total expenditures;	44.63	4.21
RVSH	=	individual and corporate income taxes as a percent of total taxes;	14.58	8.20
BLK	=	percent of black population;	9.25	9.20
OVER 65	=	percent of population older than 65 years of age;	11.11	2.00
URB	=	percent of population living in urban areas;	67.03	14.43
REALPI	=	per capita personal income;	3971.76	756.80
POV	=	percent of population with income below the poverty line;	13.12	4.45
RAID	=	per capita federal aid for health and welfare services;	58.64	18.16
OAID	=	per capita federal aid for all functions other than health and welfare;	84.79	35.89
UNEMP	=	unemployment rate;	6.32	2.60
ITEM	=	percent of federal income taxpayers who itemize;	32.77	8.12
DEN	=	population per square mile;	157.26	222.87
PHW	=	the relative price of health and welfare services;	0.44	0.13
EPR	=	the relative price of education services;	1.03	0.12
POP	=	state population (000's);	4565.97	4751.23
RAIDDUM	=	a dummy variable, that takes a value of 1 if year = 1982 or later, interacted with RAID;	26.07	32.50
DITEM	=	a dummy variable that takes the value of 1 if year = 1987 or later, interacted with ITEM;	5.34	11.62
RPO	=	the average wage of all state and local government workers divided by the average wage of all workers in the state.	1.136	0.11
SEVPC	=	relative per capita severance tax revenues	23.17	75.53

Appendix

Data Sources

Variable	Source
State-Local Income Tax Revenue	U.S. Department of Commerce, Bureau of the Census, <i>Census of Governments</i> , 1962, 1967, 1972, 1977, 1982, 1987
State-Local Total Taxes	
State-Local Social Service Expenditure	
Federal Aid to State and Local Governments	
Population	
Per Capita Personal Income	U.S. Department of Commerce, Bureau of the Census, <i>Current Population Survey</i> , P-60 Series
Percent of Population Below Poverty	
Percent of Population Black	
Percent of Population Over 65	
Percent of Population in Urban Areas	
Population Density	U.S. Department of Commerce, Bureau of the Census, <i>Statistical Abstract</i> , Selected Years
Percent of Population Itemizing Federal Income Tax Returns	
Federal Aid to State and Local Governments for Health and Welfare	Internal Revenue Service, <i>Statistics of Income</i> , Selected Years
	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

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***State and Local Government Choices in Fiscal Redistribution* (Roy Bahl, Jorge Martinez-Vasquez and Sally Wallace)**

This report explores the factors that are associated with the level and nature of states' income redistribution programs. FRP Report/Brief 49 (October 2000)

***Profile of Georgia State Revenues 1974-1999* (Mary Kathleen Thomas)**

This report provides detailed information on trends in Georgia's major revenue sources over the period 1974-1999. FRP Report/Brief 48 (October 2000)

***Economic Development: Report of Statewide Results of Georgia Poll July 2000* (Fiscal Research Program/Applied Research Center)**

This report presents results of an annual survey on economic development activities in the state. FRP Report/Brief 47 (July 2000)

***A Decade of Budget Growth: Where Has the Money Gone?* (Alan Essig)**

This report presents an analysis of state budget growth between fiscal years 1991 and 2000. In specific, policy decisions that drive the budget increases are highlighted. FRP Report/Brief 46 (September 2000)

***International Trade in Georgia: Review of State Programs, Policies, and Recent Trends.* (Robert E. Moore)**

This report provides a review of the recent trends on international trade in Georgia and reviews Georgia's policy and programs related to international trade. FRP Report/Brief 45 (July 2000)

The Effect of the Growth in Elderly Population on State Tax Revenues. (Laura Wheeler)

This report explores the implications of an aging state population on income tax and sales tax revenues. FRP Report/Brief 44 (July 2000)

Provision of An Equitable Public School Finance Structure in Georgia. (Ross Rubenstein)

This report presents options for reducing inequities in the funding of Georgia's public school districts. FRP Report 43 (February 2000)

Handbook on Taxation, 6th Edition. (Jack Morton and Richard Hawkins)

A quick overview of all state and local taxes in Georgia. FRP Annual Publication A(6) (January 2000)

An Analysis of Georgia's Economic Development Tax Credit Incentives. (Dagney Faulk, Keith R. Ihlanfeldt, David L. Sjoquist, William J. Smith, Jeanie Thomas, and Kathleen Thomas)

This report presents an analysis of Georgia's economic development tax credit incentives, i.e., Georgia's BEST program. FRP Report/Brief 42 (January 2000)

A Profile of Georgia's Economic Performance and Competitiveness. (David L. Sjoquist, William J. Smith, and Kathleen Thomas)

This report compares Georgia's recent economic performance and its economic competitiveness relative to the U.S. and surrounding states. FRP Report 41 (January 2000)

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