SOME DISTRIBUTIONAL EFFECTS OF REDUCING THE PROPERTY TAX IN RURAL AND URBAN AREAS

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A question now being asked in many states is whether the property tax is too burdensome and whether it should be displaced by another tax. Many states have lowered property taxes on specific classes of property, while other states are considering more widespread relief from property taxes. If property taxes are reduced, other taxes will have to be increased in order to offset reductions in government revenues. What is the effect of substituting one tax for another; who will pay more and who will pay less if property taxes are decreased and sales or income taxes increased? Will overall regressiveness of taxes be reduced by substitution? The basic technique of sampling and analysis presented here hopefully will be applicable in many states and will provide important answers to these questions.

OBJECTIVES

The major objectives of this study were (1) to define and describe regressiveness and progressiveness of Georgia sales, property, and income taxes for rural and urban homeowners, and (2) to demonstrate changes in regressiveness and changes in shares of tax burden when the same total tax revenue is collected by various combinations of sales, state income, and property taxes.

DATA

Cross-classification and description of property and state income taxes were made possible by a random sample of homeowners from each Georgia county. Data from paired state income and property tax returns were the basis for estimating regressiveness or progressiveness of taxes. Sales tax liability was estimated from tables supplied to taxpayers by the Internal Revenue Service [8].

PROCEDURES

A cross-classification of sample taxpayers by income group and rural-urban residence is presented for both property and income taxes, thus allowing a close examination of relationships between (1) tax liability and income and (2) tax liability and residence. The level of taxes paid is then converted to taxes paid per dollar of income to determine whether a tax is regressive or progressive.

The information on tax burdens can be used to examine alternative tax polices. Tax rate changes, which are examined in this study, allow for increases in state or local sales and income taxes to exactly offset reductions in government revenues resulting from a decrease in property taxes. The net dollar value of trade-offs resulting from increase in one tax rate versus decrease in another is estimated on a per capita basis according to level of income earned. Also, the extent to which a trade-off policy might be carried is explored by showing how regressiveness of the overall tax structure is affected in rural and urban counties by a given policy.

RESULTS

Income, Sales and Property Tax Liabilities

The cross-classification of sample taxpayers by income group and by level of property taxes due exhibited a slight positive relationship between income and taxes (Table 1). An exception to this positive relationship for all taxpayers occurs in the lowest income group for which the average property tax was relatively high compared to other low income groups.

Property tax liabilities were lower on the average in rural counties ($95.50) than in urban counties

Table 1. DISTRIBUTIONS OF PROPERTY, INCOME, AND SALES TAXES, GEORGIA, 1971

Adjusted Gross Income	Property Tax County Population Less Than 10,000	Property Tax County Population 10,000 or More	Property Tax Average	Income Tax	Sales Tax[a]
			(dollars)		
0-2,000	65.71	136.27	105.51	1.38	47.96
2,000-4,000	71.93	62.00	66.60	3.07	64.53
4,000-6,000	67.65	71.78	69.45	11.76	93.99
6,000-8,000	68.89	82.89	77.56	32.65	108.71
8,000-10,000	72.75	110.51	98.06	66.19	127.85
10,000-12,000	80.04	125.07	111.19	110.23	149.14
12,000-14,000	119.52	137.24	132.77	163.57	164.82
14,000-16,000	226.85	201.47	207.36	237.70	175.32
16,000-18,000	165.82	182.62	178.00	287.70	193.47
Over 18,000	275.22	360.44	331.62	883.51	287.12
Average	95.50	131.97	118.66	134.36	134.41

[a]Average exemption per income class ranged from 2.8 to 3.9. Thus, all sales tax estimates were based on 3 to 4 exemptions.

($131.97).[1] In fact, rural property tax liabilities were lower in almost every income class, and rural areas did not exhibit the very large property tax liability of the lowest income class found in urban areas.

Average state income tax liability for the sample was $134.36 (Table 1), ranging from $1 for taxpayers in the lowest income group to $884 for those in the highest income group. State income and sales tax liabilities for a given income class were very similar for rural and urban residents since they were subject to the same tax rates.

The average sales tax per taxpayer was $134.41, which was similar to the average property tax in urban counties, but 41 percent higher than the average property tax in rural counties. The sales tax exceeded the property tax in most of the low income classes (Table 1).

Empirical Estimates of Tax Rate

Property Tax. Sample data demonstrated that property, sales, and income tax liabilities increased with adjusted gross income. However, property taxes per dollar of income were highest for sample taxpayers having less than $2,000 adjusted gross income, and continued to decline through the $10,000-$12,000 adjusted gross income category. This fact suggests that the property tax is regressive (Table 2).[2] In general, regressiveness of property tax was exhibited throughout most of the range of observed data.

The property tax was regressive in both rural and urban areas, with the lowest property tax per dollar of income occurring in the $8,000-$12,000 income group in rural areas, but in higher income groups in urban areas. Average property tax per thousand dollars of income in urban areas is 13 percent higher than in rural areas.

Sales Tax. Since the average number of exemptions for property-owning taxpayers in the sample was 3.4, estimation of sales tax payments was based on allowable sales tax deductions for three-four exemptions. Allowable sales tax per $1,000 of adjusted gross income was very similar to the amount of property tax collected and was regressive to a similar extent. However, the level of sales tax was lower in the $0-2,000 category (Table 2).

Income Tax. Income tax collected from sample

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[1] The 62 Georgia counties with less than 10,000 population were referred to as rural counties, while the other 97 Georgia counties were referred to as urban counties.

[2] Adjusted gross income may understate total income of taxpayers in the lowest income groups, because it ignores such transfer payments as retirement and welfare payments.

Table 2. AVERAGE PROPERTY TAX, INCOME TAX, AND SALES TAX PER $1,000 OF ADJUSTED GROSS INCOME BY SIZE OF COUNTY POPULATION, TAXPAYERS IN GEORGIA, 1971

| Adjusted Gross Income | Property Tax | | | Income Tax | Sales Tax | Total Tax |
| | County Population | | | | | |
	Less Than 10,000	10,000 or More	Average			
(dollars)	----------------------------(dollars per thousand)----------------------------					
0-2,000	59.94	103.68	86.54	1.14	39.33	127.02
2,000-4,000	22.51	20.09	21.23	0.98	20.57	42.78
4,000-6,000	13.56	14.48	13.96	2.36	18.89	35.21
6,000-8,000	9.91	11.75	11.05	4.65	15.48	31.18
8,000-10,000	7.94	12.25	10.82	7.30	14.10	32.22
10,000-12,000	7.38	11.37	10.15	10.05	13.62	33.82
12,000-14,000	9.16	10.62	10.25	12.63	12.72	35.60
14,000-16,000	15.07	13.43	13.81	15.75	11.68	41.24
16,000-18,000	10.03	10.82	10.60	17.14	11.39	39.13
Over 18,000	10.71	12.05	11.64	31.02	10.08	52.74
Average	13.87	15.68	15.09	8.83	15.54	39.45

respondents also was summarized, and was progressively higher throughout most of the range of observed incomes (Table 2). Very little state income tax was paid on adjusted gross income of less than $6,000, where property taxes were found to be the most regressive. The amount of income tax paid per $1,000 of adjusted gross income increased at an almost constant rate.

Total Tax. When all three taxes were combined, the progressiveness of the income tax added some balance to the regressive effect of property and sales taxes in all but the lowest income category. A comparison of the three taxes for the average taxpayer also revealed similarity in tax payments per thousand dollars of adjusted gross income (Table 2).

TRADE-OFF ANALYSIS

Substitution of one tax for another can be identified in terms of trade-off values, which are defined as the cost or benefit to the taxpayer when this substitution takes place. Possible new tax changes considered in this paper are those in which tax liabilities for a particular tax would be changed by the same percentage for each taxpayer. The distribution of tax revenue to local uses was assumed to be unaffected by changing the tax collection policy.

Property Tax and Income Tax Trade-Off

In the first trade-off analysis, property taxes were reduced and income taxes were increased

enough to offset the reduction in tax revenue. One simple way to introduce an income tax substitute for property taxes would be to require a given percentage increase in state or local income tax liability to be added as a surcharge while decreasing property tax liability. For example, if each taxpayer in the sample paid only 50 percent of his property tax due, how much would each person increase his income tax liability so that the total of all taxes collected would not change?

If all property taxes in the sample were reduced 1 percent, an increase in all income taxes of .883 percent would just offset the reduction in tax collections (Table 1). Even though there would be no change in total taxes collected, there would be a shift in the amount of taxes that taxpayers in each income class would pay. Since the property tax is regressive and the income tax is progressive, there would be a shift in the tax burden from taxpayers with low income levels to taxpayers with high income levels.

Property Tax and Sales Tax Trade-Off

A similar trade-off analysis was made to determine how a decrease in property taxes could be offset by an increase in state or local sales taxes. Since average property tax per homeowner was 88.3 percent of his average sales tax, every 1 percent decrease in property taxes must be accompanied by an 0.883 percent increase in sales tax to maintain the current level of tax collections.

While the average percentage increases required

of sales and income tax rates to offset decreased property tax rates are coincidentally the same, the change in taxes paid by income class is very dissimilar. Because both property and sales taxes are regressive, an increase in sales taxes and a simultaneous and offsetting decrease in property taxes would not shift the tax burden from low to high income earners. Taxpayers in both low-income and high-income categories would pay less, while taxpayers in middle-income categories would pay more.

EFFECT OF PROPERTY AND INCOME TAX TRADE-OFF ON EQUITY

Simple trade-off analysis was extended to show distribution of benefits and costs by class of income earner. In general, increasing state or local income taxes and reducing property taxes by an equal amount shifts the tax burden from low-income to high-income earners. Does this policy promote equity and, if so, how far should the policy be taken, if at all? While this question must be answered in the political process, there is an additional analysis related to tax equity that may be of some interest to voters. If a progressive tax structure is thought to be more equitable than a regressive structure, then it should be possible to relate changes in tax policy to a measure of regressiveness or progressiveness.

An observed tax structure might be regressive for taxpayers at some income levels and progressive for others at a different level. An overall measure of regressiveness or progressiveness can be calculated as the weighted average of changing tax liabilities over all income levels.[3] Thus, we define tax liability change (C) as change in tax liability divided by change in income or:

$$C_i = \frac{TL_{i+1} - TL_i}{I_{i+1} - I_i}$$

where

C is tax liability change,

i specifies the income class (for example, if i=1, then the income class is $0-2,000),

TL is average tax liability per thousand dollars of income, and

I is average adjusted gross income in thousand dollars.

Tax liability changes are then weighted by the estimated percentage of taxpayers within the specified income classes. Thus, the weighted average index is given by:

$$\text{Index of Tax Equity} = \sum_{i=1}^{9} w_i C_i$$

where w_i is the weight of the ith tax liability change based on the number of taxpayers in income classes i and i+1, and

$$\sum_{i=1}^{9} w_i = 1.$$

If the value of the index for a particular tax structure is negative, then the tax structure is regressive; if positive, the tax structure is progressive.[4]

In applying the index to the sample data for the state, we find that the Index of Tax Equity is -2.99 for the property tax; -1.29 for the sales tax, and 1.12 for the income tax. Since these tax liabilities can be combined to estimate total tax liability, these indices are additive. Thus, the Index of Tax Equity for the overall structure of taxes is -3.16, indicating a regressive current tax structure.

When the Index is applied to counties having greater than 10,000 population, the total tax structure has a regressive value of -3.36. The total structure is less regressive in smaller rural counties where the Index is -2.88. The difference in Index values between rural and urban areas is, in general, a function of property tax burden. Sales and income Indices were essentially the same in all areas, but the property tax Index is -3.20 in the larger counties and only -2.73 in rural counties.

Two factors contribute to this difference. First, the most regressive part of the property tax burden falls on income earners in the $0-2,000 class who reside in urban areas. Second, the regressiveness of the property tax extends to a higher income level in urban areas and therefore covers more of the median income classes. These factors are delineated when we project trade-off polices that would change the total tax structure from regressive to progressive, or to find the point at which the Index of Tax Equity changes from negative to positive.

A state-wide Index value was calculated for

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[3] Such an average implies constant utility of money. The consequences of declining utility of money merely imply that the index is a conservative estimate of change in regressiveness.

[4] While the index correctly identifies the degree of regressiveness or progressiveness, it does not reflect the distribution of regressiveness or progressiveness within the tax structure. To reflect distribution as well, the index can be used with concentration ratios as discussed by Musgrave [3].

various trade-offs between property and income tax, with sales taxes remaining constant. Each 1 percent reduction in property taxes was accompanied by an 0.883 percent increase in income taxes. Using this trade-off procedure, property taxes would be reduced 80 percent and income taxes increased 70.6 percent in order to make the overall Index approximately equal to zero.

Although the state-wide Index would be approximately zero, urban areas would enjoy a more progressive tax structure than would rural areas. The overall Index in urban areas would be .11 and in rural areas only -.14. We can examine the distribution of these benefits by looking at the trade-off values, i.e., the estimated net benefit or cost to taxpayers in each income class. This examination shows that with an 80 percent reduction in property taxes and a 70.6 percent increase in income taxes the largest net gain was $107.96 per taxpayer in the $0-2,000 income

class in urban areas. This was almost twice the gain that would be received by taxpayers in any other group, rural or urban (Table 3). The trade-off analysis also showed that benefits extended through the $12,000 income class in urban areas and only through the $10,000 class in rural areas (Table 3). There was a small net benefit to taxpayers in the $14,000-$16,000 class in rural areas, but there were relatively few people in this class (Table 3).

IMPLICATIONS OF PROPERTY TAX DISPLACEMENT

Results presented thus far examined the effect at one point in time of substituting state income taxes for property taxes. It is important to consider how these tax bases change over time. Davis reported that the income elasticity of the property tax base for Georgia was 1.37 [1]. This figure indicates that for

Table 3. DISTRIBUTION OF THE CHANGE IN TOTAL TAX LIABILITY PER TAXPAYER RESULTING FROM 80 PERCENT REDUCTION IN PROPERTY TAXES AND 70.6 PERCENT INCREASE IN INCOME TAXES, GEORGIA,1971[a]

Adjusted Gross Income	County Population		Average
	Less Than 10,000	10,000 or More	
	------------------------(dollars)------------------------		
0-2,000	-51.68	-107.96	-83.43
2,000-4,000	-55.33	-47.46	-51.11
4,000-6,000	-45.80	-49.16	-47.27
6,000-8,000	-32.27	-43.18	-38.98
8,000-10,000	-10.94	-41.90	-31.69
10,000-12,000	12.97	-21.99	-11.22
12,000-14,000	20.77	5.55	9.39
14,000-16,000	-13.96	5.67	1.11
16,000-18,000	67.48	58.31	60.83
Over 18,000	342.90	367.02	358.86
Average	-2.42	1.27	0.00

[a]A negative sign indicates that tax liability was reduced by the policy change and would result in a net benefit to the taxpayer.

each 1 percent increase in income, there has been a 1.37 percent rise in the property tax base. The income elasticity of the property tax base was 1.68 in rural counties and 1.34 in urban counties, indicating that the property tax base was more responsive to income in rural counties. Although population actually declined in these rural counties during the 1960-1970 decade, per capita incomes increased at a faster rate in rural than in urban counties. Consequently, total income increased at essentially the same rate for the two groups; 112 percent in urban counties and 116 percent in rural counties[5] and [6]. Placing more emphasis on income in the tax base would thus have a similar effect in both urban and rural areas.

SUMMARY AND CONCLUSIONS

The sampling techniques and analysis used in this study show conclusively that the property tax is regressive. Furthermore, there is strong evidence that regressiveness of the state's total tax structure can be improved by substituting increased state or local income tax for decreased property tax. Increased local income taxes substituted for property taxes preserves the concept of local tax levies applied for local uses. If increased state income taxes were substituted for property taxes, provisions should be made to distribute the increase back to the local area.

In general, trading the state or local income tax for property tax shifts the tax burden from those earning less than $12,000 adjusted gross income to those earning greater amounts. Substituting the sales tax for property tax would make the tax burden smaller for those earning less than $4,000 of adjusted gross income, but it would lighten even more the burden of those earning greater than $14,000 adjusted gross income, thereby shifting the entire burden of increased sales taxes to those in middle income brackets.

REFERENCES

[1] Davis, L. Harlan. *Property Tax Trends Affecting Georgia Agriculture.* University of Georgia Agricultural Experiment Station Research Report No. 106, June 1971.

[2] Herber, Bernard P. Modern Public Finance, *The Study of Public Sector Economics.* Homewood, Ill: Richard D. Irwin, Inc., 1971.

[3] Musgrave, Richard A. *The Theory of Public Finance.* New York: McGraw-Hill Book Co., 1959.

[4] Samuelson, Paul A. *Economics.* New York: McGraw-Hill Book Co., 1973.

[5] Smith, Blair J., and David W. Parvin. *Employment and Income Characteristics for Georgia Counties 1940-1970.* University of Georgia Agricultural Experiment Station Research Report No. 178, Dec. 1973.

[6] Tarver, James D., and John W. Nixon. *Population Trends of Georgia Cities and Towns: A Half Century of Population Growth.* University of Georgia Agricultural Experiment Station Research Report No. 145, Oct. 1972.

[7] U.S. Dept. of Commerce, Bureau of the Census. *1969-1970 Government Finances,* Govt. Printing Office, Washington, D.C., 1970.

[8] U.S. Dept. of Treasury, Internal Revenue Service, Washington, D.C.