

Tax Regressivity and the Choice of Tax Base

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INTRODUCTION

In 1995, Paul Peterson, a professor of government at Harvard University, concluded that the greatest price of the United States (U.S.) federalist system was inter-jurisdictional inequity, but that the federal government's role in redistributive policy could potentially minimize this cost. While Peterson's work focused on the expenditure side of the budget, federal governments also facilitate the redistribution of income through the tax code, but some tax bases tend to be inherently more progressive than others. Given the range of tax bases available to policy makers, the role of a tax base in income distribution is fundamental to evaluating the distributional effects of different tax structures. Using the regressivity of state and local tax systems in the U.S., this study finds that consumption taxes may impose significant equity costs when designed as sales taxes. More specifically, for each one percent increase in sales tax revenue as a share of the tax base, the system becomes 12 to 17 percent more regressive. For each one percent increase in income tax revenue as a percent of the revenue base, the system becomes 12 to 13 percent less regressive- despite the fact that United States' state governments tend to have either flat or only moderately graduated income tax rates. While this study finds that the choice of tax base can only explain about half the variation in regressivity rates, it does high light the difficulty in designing a consumption tax that achieves redistributive policy goals.

BACKGROUND

During debates in the United States over a potential switch from an income to a consumption tax base modeled after the European Value Added Taxes (VATs), opponents of the change argue that taxes on consumption are inherently regressive, while taxes on income are inherently progressive. Proponents of the switch argue that any tax can be designed so as to achieve any level of progressivity or regressivity. These debates raise the important question of whether certain tax bases are inherently more progressive or regressive than others. In the 50 U.S. states and the District of Columbia, there are 51 different combinations of tax systems, with different patterns of reliance on the three major tax bases: property, income, and consumption (levied as a sales tax). While all states primarily rely on the property tax to finance local-level expenditures, some states have either an income or sales tax and others have both. All governments need to understand the distributional effects of their tax choices, but this is especially critical in a federal system where taxpayers are subject to multiple layers of tax policy at the state, local, and national levels. It should be noted that in choosing a tax base, efficiency and equity concerns are often at odds with one another. From an efficiency standpoint, encouraging different levels of government to rely on different tax bases should minimize the

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distortions created by taxes. However, when redistribution is a goal of tax policy, reliance on various tax bases may serve to undermine the equity concerns promoted by the progressive U.S. national income tax.

According to the Institute on Taxation and Economic Policy (ITEP), non-profit, non-partisan research and education organization focused on U.S. tax and spending issues, state and local effective tax rates tend to be regressive, but the variation between systems is great. Table 1 shows the effective tax rates (before the federal offset) for the U.S. average, the most regressive state (Washington), the least regressive state (Delaware), states with little reliance on the income tax as a revenue source (less than 10 percent of revenue), and states with little reliance on the sales tax as a revenue source (less than 20 percent of revenue). Table 1 illustrates that the U.S. state and local tax system as a whole is regressive, but that there is significant variation between the states. It also illustrates the importance of revenue base in determining how regressive a system will be, since states with little reliance on the sales tax have much more progressive systems than states with little reliance on the income tax. Washington, the most regressive state, has no income tax and a high sales tax.

Table 1: Variation in Effective Yearly Tax Rates by Income Quintiles¹

	Lowest 20%	Second 20%	Middle 20%	Fourth 20%	Next 5%	Next 4%	Top 1%
U.S. Average	11.4%	10.4%	9.9%	9.4%	8.9%	8.1%	7.3%
Washington	17.6%	12.9%	11.3%	9.5%	7.9%	5.6%	3.3%
Delaware	4.7%	4.7%	5.2%	5.1%	5.1%	4.6%	4.8%
Little Reliance on Income Tax States (12)	9.5%	9.1%	8.0%	7.0%	5.5%	4.8%	3.6%
Little Reliance on Sales Tax States (8)	7.6%	7.1%	4.5%	6.6%	6.5%	7.2%	5.6%

In addition to the variance in their regressivity, state and local governments have very different tax structures. Of the 50 states and the District of Columbia, 41 states have an income tax, all but 6 of which have graduated rates (although the marginal increases are modest, when compared with those at the federal level), and 17 of which include an earned-income tax credit, similar to that provided at the federal level². While all states have some sort of property and sales taxes, in the U.S. federal system these are structured very differently. For example, some

¹ McIntyre, R. R. Denk, et al. "Who Pays? A Distributional Analysis of the Tax Systems in All 50 States," *Institute on Taxation and Economic Policy* (2003).

² *Ibid.*, 5-7.

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states choose to exempt groceries, prescription drugs, or food from sales tax; in an attempt to reduce the tax's regressivity. Likewise, homestead exemptions and low-income credits serve to make the property tax more progressive in the jurisdictions where they are employed. The variation in state and local financing systems is important, because it allows us to test the hypotheses that sales and property taxes are inherently regressive even after accounting for the exemptions, deductions, and credits states offer. Alternatively, the relatively flat rate of income taxes levied at the state level allow us to test whether the income tax is inherently progressive, using an income tax system that is not explicitly designed to redistribute wealth the way the federal income tax is. Because U.S. state and local jurisdictions are relatively homogenous in their policy preferences (at least compared to international variations), the fifty one observations provide fertile ground for testing the hypothesis that even with efforts to make sales and property taxes more progressive, the income tax remains the most inherently progressive tax base.

Popular Conceptions of Tax Incidence

An understanding of tax incidence is crucial to understanding how progressive or regressive any particular tax is. For example, a property tax levied on homeowners is much more regressive when passed on to renters in the form of higher rent than when it is born by the landlords. Likewise, a sales tax on buyers will be more regressive if it is in fact, paid by buyers and not passed on to sellers in the form of lower prices. Economists have many theories about the general incidence of different taxes and their resulting progressivity or regressivity. For a complete discussion of tax incidence, see Rosen's Public Finance chapters 12-14 and 19³ and Slemrod and Bajika's Taxing Ourselves chapter 7⁴.

The income tax is generally viewed as the most progressive of the tax bases. This is especially true at the U.S. federal level, where increasing marginal tax rates are explicitly designed to redistribute income. Table 2 illustrates the effective tax federal tax rates for 2003, as calculated by the Congressional Budget Office (CBO), showing the progressivity of the federal tax system, particularly with respect to the individual income tax. Table 2 also illustrates the relative progressivity of federal taxes compared to those levied at the state and local levels in the United States.

In December 2002, the National Tax Journal published a study discussing state and local redistribution choices in which individual and corporate income taxes as a percent of own source revenue served as a proxy for revenue-side redistribution policy⁵. This suggests that there is an academic perception that income taxes are inherently more progressive than sales and/or

³ Rosen, H, *Public Finance* (New York: McGraw-Hill Irwin, 2005).

⁴ Slemrod, J. and J. Bajika, *Taxing Ourselves* (Cambridge, Massachusetts: MIT Press, 2004).

⁵ Bahl, R. J. Martinez-Vazquez, et al. "State and Local Government Choices in Fiscal Redistribution." *National Tax Journal* v51 i4 (2002).

Table 2: Effective Annual Federal Tax Rates by Income Quintile⁶

	Lowest 20%	Second 20%	Middle 20%	Fourth 20%	Highest 20%
Individual Income Tax	-5.9%	-0.2%	3.5%	6.8%	15.5%
Corporate Income Tax	0.3%	0.3%	0.6%	0.5%	2.6%
All Federal Taxes	4.7%	10.9%	14.5%	18.7%	26.0%

property taxes. The authors found a positive and statistically significant relationship between the share of revenue from income taxes and several other selected measures of progressivity.

While, income taxes are generally viewed as progressive, sales taxes are generally perceived as regressive, since low-income individuals spend a larger percentage of their income than do higher-income individuals. This is particularly true when the sales tax is levied on necessary goods such as food, water, and medicine. However, every exemption added to the tax code to promote equity requires a higher tax rate if revenue raising potential is to be preserved. In addition, state and local governments have found defining “necessities” particularly difficult – there is agreement that fresh vegetables and candy bars fall into different categories (same with used clothing versus designer labels) but trying to make further distinctions results in large grey areas.

Historically, property taxes were also seen as regressive as low-income individuals spend more of their income on housing than do higher-income individuals. If one supposes that the tax is passed from home-owners to renters, the tax is especially regressive, since renters tend to have lower incomes than owners. However, Metcalf and Fullerton note that this “old” view presents only one side of the story and bring up the “new” view, which treats the property tax as a tax on capital income, and very progressive since capital income generally accrues to higher-income individuals⁷. The authors also present a third perspective, the “benefit” view, which does not treat property taxes as a tax. Rather, under the “benefit” view, property taxes are fees paid for services provided by the government, and as such are capitalized into housing values. Thus, the higher taxes paid will increase the value of the property, since they presumably result in a higher level of government services. Under the benefit view of the property tax, tax payments will be reimbursed to the payer upon sale of the house⁸.

Perhaps the most thorough attempt to measure the progressivity of different tax bases in the United States was done by Daniel Suits in 1977. Suits created a measure of progressivity based on a modified gini coefficient and then applied the measure to taxes in the U.S. system for 1966 and 1970. The measure ranges from +1, indicating perfect progressivity to -1, which indicates a completely regressive tax system. Suits found that sales, payroll, and property taxes

⁶ Congressional Budget Office, *Historical Effective Tax Rates: 1979 to 2003* (Washington DC: Congressional Budget Office, 2005).

⁷ Fullerton, D. and D. Rogers, “Lifetime Versus Annual Perspectives on Tax Incidence” *National Tax Journal* v44 (1991), 13.

⁸ *Ibid.*, 14-15.

were generally regressive, while income taxes were progressive. Table 3 indicates the complete findings from Suits' study.

Table 3: Suits' Progressivity Indices of Various U.S. Taxes⁹

	1966 Index	1970 Index
Individual Income Tax	.17	.19
Corporate Income Tax	.36	.32
Property Tax	.23	.18
Sales and Excise Taxes	-.16	-.15
Payroll Taxes	-.17	-.13
Personal Property Taxes	-.12	-.09
All Federal Taxes	.09	.09
All State and Local Taxes	.04	.03

Also published in 1977, a study by Nanak Kakwami attempts to make inter-jurisdictional comparisons of the progressivity of federal and state and local taxes. Kakwami finds that federal taxes are more progressive than state and local tax systems, and that in the United States, state and local taxes tend to be regressive¹⁰. These findings are consistent with the perception that state and local governments are unable to use the tax system to redistribute wealth. Peterson writes that the redistribution of wealth must necessarily take place at the federal level, because the mobility of people and capital will make it impossible for state and local governments to redistribute wealth. More specifically, if a state or local government levies higher taxes on the wealthy, they will encourage the wealthy to leave the locality while attracting poorer citizens. To avoid this fiscally-unsustainable "race to the bottom", state and local governments will be reluctant to tax the wealthy in favor of the poor. As states compete with each other to attract the wealthiest residents and deter the poorest, state policies will become increasingly regressive¹¹. For an additional discussion of the inability of state and local governments to redistribute wealth see Oates' *Fiscal Federalism* chapter 1¹². These findings suggest that if redistribution is to be achieved via the tax system, it is most likely to be successful when undertaken by the national government in a federalist nation.

The inability of state and local governments to redistribute wealth explains the regressive nature of the U.S. state and local tax systems and the very progressive nature of the federal tax system. The following study attempts to identify how progressive or regressive a system becomes as a result of relying on each of the three major tax bases (sales, property, and income) at the state and local levels. Because it is the role of the federal government to engage in the redistribution of income, national tax bases that are inherently progressive will facilitate achieving such policy goals more effectively than regressive tax bases.

⁹ Suits, D. "Measurement of Tax Progressivity" *The American Economic Review* v67 i4 (1977).

¹⁰ Kakwami, N. "Measurement of Tax Progressivity: An International Comparison" *The Economic Journal* v87 i345 (1977), 71-80.

¹¹ Peterson, P. *The Price of Federalism* (Washington, DC: The Brookings Institution, 1995).

¹² Oates, W. *Fiscal Federalism* (New York: Harcourt Brace Jovanovich, 1972).

Lifetime vs. Annual Incidence

The present study relies on annual tax and income data in determining state and local regressivity. However, income tends to be rather lumpy when compared with consumption, since it is highly dependent upon age and temporary job conditions. Many people who appear “poor” in a given year may either be young and just beginning their careers, old and living on accumulated wealth as opposed to income, or suffering from temporary misfortune¹³. In these cases, income serves as a relatively poor proxy for well-being and will include many people who are not the truly poor. Fullerton and Rogers note that most people have “hump-shaped income profiles,” where income increases during early years and then decreases during later years¹⁴. Average annual tax rates for groups at either end of the age distribution may portray a tax burden much higher than rates calculated over a lifecycle. Illustrating the potential mobility of people between income groups, Metcalf correlates annual and lifetime income quintiles and finds a correlation coefficient of only 0.45¹⁵, suggesting that there is significant mobility between income groups. Thus, many analysts argue that it is misleading to look at tax progressivity when the effective tax rate is measured on an annual basis.

Using lifetime, as opposed to annual, incidence Metcalf finds that the switch to a consumption tax in the U.S. would appear much less regressive. He presents the change in average tax rates using both a lifetime and an annual approach to illustrate how much more regressive a tax on consumption appears under an annual perspective. Table 4 presents his findings – particularly significant is the estimate that tax rates would increase 64.3 percent for the poorest citizens under an annual basis of estimation, but only 5.7 percent under a lifetime basis.

Table 4: Metcalf’s Estimate of Change in Tax Rates from Moving to a Tax on Consumption¹⁶

Income Decile	% Change in Average Tax Rates using an Annual Basis	% Change in Average Tax Rates using a Lifetime Basis
1	64.3%	5.7%
2	24.4%	4.0%
3	17.4%	1.0%
4	11.5%	1.0%
5	7.3%	1.2%
6	2.3%	0.4%
7	3.9%	0.4%
8	-0.6%	-2.0%
9	-0.9%	-1.3%
10	-7.0%	-2.0%

¹³ Metcalf, G. and Fullerton, D. *The Distribution of Tax Burdens* (Medford, Massachusetts: Tufts University, 2002).

¹⁴ Fullerton and Rogers “Lifetime Versus Annual Perspectives,” 278.

¹⁵ Metcalf, G. “The National Sales Tax: Who Bears the Burden?” *Policy Analysis* i289 (1997), 6.

¹⁶ *Ibid.*, 8-9.

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A study of Canadian tax incidence also finds that sales and other taxes appear much more regressive when annual data is used than when lifetime data is used, but that income taxes appear more progressive using annual data¹⁷.

These findings suggest that using annual data may cause sales taxes to appear more regressive than under a lifetime study, while income taxes appear excessively progressive. However, there are several reasons why annual studies are still an important contribution to the literature on tax progressivity. First, and most importantly, for lifetime incidence to be the theoretically sound measure to use, the market for savings and borrowing must be competitive and open to all. If temporarily-low-income individuals are unable to borrow against future earnings, then their yearly well-being is directly related to their yearly income. This is an especially important consideration when lifetime tax incidence is taken as a measure of ability to pay. Rogers and Fullerton note that: “a misconception is that the lifetime perspective takes lifetime income as a superior measure of current ability to pay. Not so”¹⁸. Rather, the authors suggest that annual tax burdens should increase with annual abilities to pay¹⁹. This consideration seems especially applicable to those in the early stages of life, who have yet to approach their earnings peak. For such persons, the market for borrowing may be closed or require an especially high interest rate, diminishing future utility when the bills are paid off. Inconsistencies may also exist between the ability to pay and lifetime earnings of the elderly, but due to accumulated wealth, they are likely to be less serious.

A second justification for continuing to use annual data to calculate effective tax rates is the difficulty in obtaining reliable estimates of lifetime earnings. While advances in economics and computing make these calculations increasingly feasible, the burden in doing so does create an extra cost to the analyst. Finally, according to the data collected by Metcalf, 50.1 percent of those in the lowest income quintile on an annual basis are also in the lowest quintile on a lifetime basis²⁰. If over half of the poor are permanently poor, this suggests that annual studies focusing on tax burdens for the poor will reach half of their target population. It also suggests that for about half of the poorest population, ability to pay does not increase under a life-cycle perspective.

The present study uses data on annual effective tax rates at the state and local levels to measure the regressivity or progressivity of the sales, property, and income taxes. Because the data are calculated on an annual basis, the estimates will portray the sales and property taxes as more regressive and the income tax as more progressive than they would appear under a lifetime calculation. However, the data are only calculated for persons under the age of 65. This somewhat mitigates the problems associated with people on the higher end of the age distribution that have abilities to pay greater than their income level would suggest.

¹⁷ Davies, J., F. St-Hilare, et al. “Some Calculations of Lifetime Tax Incidence” *The American Economic Review* v74 i4 (1984), 633-649.

¹⁸ Fullerton and Rogers “Lifetime Versus Annual Perspectives,” 278.

¹⁹ *Ibid.*, 286.

²⁰ Metcalf “The National Sales Tax,” 6.

DATA SOURCES AND METHODOLOGY

Data for this study were obtained from the Institute on Taxation and Economic Policy's (ITEP) reports, "Who Pays: A Distributional Analysis of All 50 States" 1st and 2nd editions²¹. The dependent variable, tax regressivity, is a modified gini coefficient, calculated by analysts at ITEP, using the average tax rates of different income quintiles that are reported in both of the "Who Pays" reports. Data on the independent variables, percent of revenue going to property, sales, and income taxes were also obtained from the two reports. The study uses OLS (Ordinal Least Square) to determine how much more regressive a tax system becomes as the percent of revenue from each of the major revenue sources increases by one percentage point.

While data from the two time periods are similar, comparisons must be interpreted with some caution as the methodology of data collection varied somewhat. The largest difference is that in 1995, data were only collected on non-elderly married persons; while in 2000, the data were collected on all non-elderly persons²². Because of this difference, instead of doing a time-series, two separate OLS regressions were employed. A second difference is that the 2000 data is actually a blend of data from 2000 and 2002, using 2002 tax laws and 2000 income data and revenue source data²³. Therefore, the results for the 2000 model must be interpreted as representing the period from 2000 to 2002 as opposed to a single year.

ITEP found that most state and local tax systems and the United States state and local tax systems as a whole tend to be very regressive. In 1995, the lowest income quintile faced an average tax rate of 12.5 percent, while the rate faced by the top 1 percent of earners was 7.9 percent²⁴. In 2000, the average tax rate for the lowest income quintile was 11.4 percent, while that for the top 1 percent was 7.3 percent²⁵. While the overall state and local systems in the U.S. are regressive, there is also considerable variation between the states in both 1995 and 2000. In both years, Washington was the most regressive state (with the ratio of tax rates paid by the lowest income quintile to the highest percent of earners equal to 17.6 percent/3.3 percent in 2000²⁶ and Delaware, the most progressive (with the same ratio equaling 4.7 percent/6.9 percent in 2000²⁷). This is largely because Washington relies heavily on the sales tax and has no income tax, while Delaware's sales taxes are fairly low. Data on the range and means of the dependent variable, an overall index of regressivity, are reported in Table 5, along with descriptive statistics of the independent variables.

Looking at the data, state and local taxes became marginally more regressive between 1995 and 2000, but the variation in regressivity also increased. The largest change was a decreased reliance on the sales tax, which was absorbed by relatively modest increases in

²¹ ITEP *Who Pays? A Distributional Analysis of the Tax Systems of All 50 States* (Washington DC: The Institute on Taxation and Economic Policy, 1996 and 2003).

²² personal communication with Matt Gardner, ITEP 4/2006

²³ ITEP *Who Pays* (2003), 14.

²⁴ ITEP *Who Pays* (1996)

²⁵ ITEP *Who Pays* (2003), 118.

²⁶ *Ibid.*, 110.

²⁷ *Ibid.*, 30.

Table 5: Descriptive Statistics

	2000 Range	2000 Mean	1995 Range	1995 Mean
Inequality Index	-12.8 – 2.0	-3.40	-11.0 – 1.0	-3.22
Percent Revenue from Property Tax	0.04 – 0.43	0.25	0.07 – 0.45	0.21
Percent Revenue from Sales Tax	0.08 – 0.43	0.19	0.03 – 0.46	0.25
Percent Revenue from Income Tax	0.0 – 0.34	0.18	0.0 – 0.30	0.17

reliance on the property and income taxes. However, these changes appear marginal as well, and also reflect great variation between the states.

FINDINGS

For both years of analysis, the results for income and sales taxes are statistically significant and in the correct direction. The results for property taxes are somewhat more ambiguous, which is also not surprising given the theoretical uncertainty regarding property tax incidence. In both years, the model can explain a fair portion of the variance of the dependent variable, but the fit is better in 2000 than in 1995. Table 6 presents the findings from the OLS analysis, and the following paragraphs discuss the results in more detail.

Table 6: Regression Results

	2000	1995
Percent Revenue from Property Tax	-9.00* (3.82)	-3.38 (3.76)
Percent Revenue from Sales Tax	-17.12** (3.55)	-11.27** (3.75)
Percent Revenue from Income Tax	12.12** (3.32)	13.04** (3.85)
Adjusted R2	0.59	0.42

*significant at the 0.05 level; **significant at the 0.01 level

The Property Tax

As discussed earlier, economic theory is ambiguous as to the effect of the property tax on regressivity. In 2000, the coefficient for property taxes is negative and statistically significant, suggesting that for each additional percentage of revenue coming from property taxes; the overall system becomes 9 percent more regressive. In 1995, the coefficient also has a negative sign, but its magnitude is much smaller and it is not statistically significant. This suggests marginal support for the hypothesis that property taxes are regressive, but does not rule out the

hypotheses that they are either progressive or capitalized into the tax system, suggesting the need for further research on property tax incidence.

The Sales Tax

The data regarding the sales tax are statistically significant and in the expected direction. In 2000, for each additional percent of tax revenue coming from the sales tax, the overall system became over 17 percent more regressive, while in 1995, the system became over 11 percent more regressive. Because there is great variation in state sales tax structures, with some excluding prescription drugs, food, and clothing, this suggests that despite such exemptions aimed at reducing the tax's regressivity, taxes on consumption do tend to be highly regressive when evaluated on an annual basis. To determine how regressive a sales tax would be in the absence of such exemptions, the presence of these exemptions could be included in an empirical model. However, the current study aims to identify how regressive the sales tax is even when such exemptions are in place, and therefore the inclusion of these controls would not be theoretically sound.

The Income Tax

The signs for the income tax are also both statistically significant and in the expected direction. In 2000, the system became over 12 percent more progressive as the percent of revenue derived from the income tax increased by 1 percent, and in 1995, the system became over 13 percent more progressive due to a 1 percent increase. Since state and local income tax rates tend to be far less progressive than those at the federal level, these findings suggest that even at flat to slightly graduated rates, the income tax is inherently more progressive than other forms of taxation.

The Fit of the Models

Considering the small sample sizes and the few explanatory variables, both models achieve a respectable adjusted R² (0.59 in 2000 and 0.42 in 1995). In 2000, the choice of revenue base, alone, can account for almost 60 percent of the variance in regressivity, while in 1995, the choice of tax base can explain a little over 40 percent. While these results highlight the importance of the choice of tax base in determining how progressive a tax system is, they also indicate that there is room for variation after the tax base has been decided upon.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study provides empirical evidence to support the hypotheses that income taxes are inherently progressive and sales taxes inherently regressive. The strength of the statistical relationships are strong enough to suggest that it will be very difficult to switch to a national consumption tax in the United States and maintain the current level of progressivity. Findings regarding the property tax are more ambiguous, although it appears to be moderately regressive, suggesting the need for additional research on the incidence of the property tax.

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An important research agenda involves the construction of state-by-state progressivity indices using both state and local data, but also adding in federal taxes paid by citizens of each state. In the U.S. citizens can deduct taxes paid to state and local governments from their federal income tax liability. Thus, the apparent regressivity of state and local taxes may be reduced when looking at the entire tax picture. However, it is very difficult to create records of individual sales taxes paid at the state and local levels and provide the documentation required by the U.S. Internal Revenue Service. The difference in federal deductibility between state sales and income taxes may augment the regressivity of the sales tax at the state and local levels. A study factoring in federal tax liabilities would also allow one to evaluate the overall progressivity of the federal tax system on a state by state basis. Peterson's *The Price of Federalism*²⁸ provides a comprehensive look at U.S. federal, state, and local spending with respect to redistributive policy and the factors that seem to promote or impede redistribution. A complementary study doing the same with respect to redistribution through the tax system would provide a more comprehensive approach to addressing the redistributive costs of federalism in the United States.

Future research should also try to integrate the expenditure and revenue sides of the budget with respect to redistributive policy. At the state and local levels, research is needed to determine the relationship between the tax systems' regressivity and spending on redistributive policies. If the relationship is strong, then it may be that state and local systems are approximating the benefits principal of taxation, where people pay in accordance with benefits received. If there is no relationship (or an inverse one) between tax regressivity and redistributive spending, then the federal system will tend to augment the inter-jurisdictional inequities of the lower classes. However, the analysis should not only encompass state and local spending and benefits, but federal spending and taxing as well. Because the federal tax system is highly progressive and many of the expenditures redistributive in nature, the apparent inequities of the state and local systems may dissipate when pooled with federal efforts.

An additional venue for future research would be to address the lifetime tax incidence of state and local taxes. While lifetime tax burdens are generally not helpful in determining annual ability to pay, they do provide an ex-post evaluation of the fairness of a tax system. Studies addressing the same questions using lifetime and annual incidence can provide the joint benefits of providing policy guidance through annual data and evaluation information using lifetime data. As Fullerton and Rogers²⁹ note, lifetime and annual studies should be seen as complimentary, as opposed to conflicting.

Finally, because this study provides evidence that achieving a progressive tax structure with a consumption tax would be very difficult in the U.S., an important research area concerns the progressivity of many European tax systems. Since reliance on the consumption tax (through a VAT) is extremely high in Europe, a study of these countries' systems may provide insights as to the design of a consumption tax that minimizes its regressive nature.

²⁸ Peterson *The Price of Federalism*

²⁹ Fullerton and Rogers "Lifetime Versus Annual Perspectives"