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**HOW FAIR?  
CHANGES IN FEDERAL INCOME TAXATION  
AND THE DISTRIBUTION OF INCOME, 1978 TO 1998**

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## **I. Introduction**

The federal individual income tax in the United States has long been viewed as an instrument to redistribute income. While the progressivity of the individual income tax has been supported in some circles by the ability-to-pay principle of taxation, the extent to which the tax should be progressive has been hotly debated for decades, and the actual amount of progressivity of the tax has also been the subject of much analysis and discussion.<sup>1</sup>

Tinkering with the federal tax code over the last two decades has resulted in numerous changes to the individual income tax code, both in the definition of the income tax base and in the tax rates applied to this base, and these changes have had significant effects on the progressivity of the income tax. There have been several useful studies of the distributional effects of some of these tax law changes. For example, Wallace, Wasylenko, and Wiener (1991) find that the Tax Reform Act of 1986 increased the progressivity of the individual income tax slightly, although its effects are typically small. Scott and Triest (1993) find a drop in the progressivity of the federal income tax between 1979 and 1984, and then a slight increase in progressivity between 1984 and 1989 (at least when high-income returns are excluded). In contrast, Gouveia and Strauss (1994) show that equalization of income through the federal individual income tax decreased over time through 1989. Kasten, Sammartino, and Toder (1994) analyze the effect of major changes in the federal income tax laws on the progressivity of the income tax for the period 1980 to 1993, and find that the progressivity of the income tax increased slightly. Burman, Gale, and Weiner (1998) focus more specifically on effective

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<sup>1</sup> The literature on taxation and progressivity is enormous, and, like many things in economics, goes back all the way to Smith (1776). Also, see Blum and Kalven (1953) and Musgrave (1959) for classic discussions of the theoretical conditions under which the ability-to-pay principle justifies - or does not justify - progressive taxation,

marginal tax rates in the federal income tax over the period 1980 to 1995, and they find that marginal tax rates fell significantly for most taxpayers, especially after the 1981 and 1986 tax law changes. More recently, Mitrusi and Poterba (2000) examine the combined tax burdens of the individual income and the payroll taxes from 1979 to 1999, and show that decreases in income tax liabilities have on average been largely offset by increases in payroll tax obligations.

However, despite the numerous insights from these prior studies, there are still important and unresolved empirical issues about the effects of these tax law changes, even aside from the somewhat conflicting conclusions of these studies on the overall effects on tax progressivity. In particular, the impact of tax law changes on tax progressivity is often confounded by significant changes in the pre-tax distribution of income, changes that are likely to be at least partly caused by the tax law changes themselves; that is, *how have tax law and income distribution changes separately contributed to the changes in tax progressivity over time?* In the same vein, the ability of tax law changes to affect the income distribution may well depend upon the specific distribution of income that exists at the time that taxes are changed. A given change in the tax base or in the rate structure may have differential effects on progressivity that vary with the underlying pre-tax distribution of income; that is, *how does a specific pre-tax distribution of income affect the equalizing ability of a given tax change on the post-tax distribution of income?* Finally, the impact on progressivity of tax law changes is likely to be different for different states and different regions of the country. Put differently, *are there differential regional impacts of tax law changes on tax progressivity?*

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and see Bradford (1995) for more recent treatment of these issues.

This paper revisits the distributional effects of recent tax law changes in an attempt to answer these questions. We use information from the *Current Population Survey* (CPS) for various years that follow either immediately after significant tax law changes or after the full enactment of these changes (e.g., 1979, 1985, 1988, 1990, 1993, 1996, and 1999) to measure the effect of income taxes on the distribution of income for selected years over the period 1978 to 1998. We explicitly consider the effects of five major tax initiatives of the federal government over the period: the Economic Tax Recovery Act of 1981 (ERTA81), the Tax Reform Act of 1986 (TRA86), the Omnibus Budget Reconciliation Act of 1990 (OBRA90), the Omnibus Budget Reconciliation Act of 1993 (OBRA93), and the Taxpayer Relief Act of 1997 (TRA97). An important and novel aspect of our analysis is the use of a series of counterfactuals that attempt to isolate the direct distributional impact of changes in federal tax policy from the induced changes in the pre-tax distribution of income. To do this we hold constant in some calculations the pre-tax distribution of income at, say, the 1978 level, and we then simulate the distributional effects of each of the five major tax changes. By varying the year at which the income distribution is held constant (e.g., 1978, 1984, 1987, 1989, 1992, 1995, and 1998), and examining each of the five tax law changes for each of these years, we are able to isolate the separate effects of tax changes for a given income distribution. This procedure also allows us to examine how the equalizing ability of a given tax change varies with a specific pre-tax distribution of income. Finally, we analyze the impact on regional tax progressivity of federal taxes to determine whether the federal changes have a differential impact on tax progressivity across regions and across time.

We find that, even when account is taken of the induced effect of changes in federal income tax laws on pre-tax income, the individual income tax structure has been less successful in equalizing after-tax income since the 1980s and into the early 1990s. We also find that a given tax law's equalizing effect on the distribution of income is significantly affected by the pre-tax distribution of income and thus by the year in which the law is implemented. For example, the OBRA90 law is more equalizing if it had been applied to the pre-tax distribution of income in 1987; however, OBRA90 had the least equalizing impact of all the tax reforms considered because it was in fact fully implemented in 1992 with the pre-tax income distribution that existed at that time. Finally, we find significant regional differences in the impact of the changes in federal tax law on tax progressivity.

Section II discusses the changes in federal individual income tax policies over the last two decades. Section III presents our methodology, and section IV our results. Our conclusions are in section V.

## **II. Federal Individual Income Tax Law Changes, 1978 to 1998**

Since 1978 there have been several major changes to the federal individual income tax. We classify the changes into two categories: base changes (including deductions, exemptions, and credits), and rate/bracket changes. The major changes are listed in Tables 1 and 2.<sup>2</sup>

*Base changes* have been many and varied over the last two decades. Some have followed a theme of reducing preferential treatment of certain types of income. For example, in 1979

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<sup>2</sup> A detailed list of the provisions of each tax act can be found in selected years of *The Budget of the United States*. See also Steuerle (1992) and Graetz (1999) for comprehensive discussions of the individual income tax.

unemployment compensation benefits were made taxable for persons earning other income over \$20,000 (\$25,000 for married couples), and in 1987 unemployment compensation benefits were made taxable for all persons regardless of the amount they earned in other income. The federal taxation of social security benefits has also increased over the years. In 1984 half of the social security benefits were made taxable for persons with other income over \$25,000 (\$32,000 for married couples). This was expanded in 1993 to tax up to 85 percent of benefits for individuals with other income over \$25,000.

Other base changes over the years have narrowed the tax base through various tax expenditures. One of the more expensive provisions of ERTA81 was to allow deductible contributions to individual retirement accounts (IRAs) for most all individuals. ERTA81 also expanded the contribution limits for Keogh accounts, and provided for inflation adjustments of rate brackets, personal exemptions, and standard deductions beginning in 1985.

In the last two decades, TRA86 contained the largest individual income tax base-broadening provisions of any federal tax law. The details are widely known, and they include a severe reduction in deductible IRA contributions, the elimination of the deductibility of sales taxes and consumer interest (other than home-mortgage interest), limitations in the deductibility of medical, business meals and entertainment, and miscellaneous expenses, and repeals of the capital gains exclusion and the two-earner deduction. These changes of TRA86 served to expand the tax base, and were accompanied by a significant reduction in marginal tax rates, as discussed later.

OBRA90 also made a number of adjustments to the tax base. The earned income tax credit (EITC) was increased, and the phase-out percentage was increased. A new phase-out was

also added for itemized deductions. For taxpayers with adjusted gross income (AGI) in excess of \$100,000, total itemized deductions (except for medical, casualty and theft, and investment interest) were reduced by 3 percent of the amount of AGI in excess of \$100,000, and the total reduction was limited to 80 percent.

Although the main feature of OBRA93 was the introduction of two additional rates on high-income taxpayers, there were also changes to the tax base. The amount of social security benefits subjected to tax was increased from a maximum of 50 percent to a maximum of 85 percent, and the phase-out of itemized deductions and personal exemptions for high-income taxpayers introduced in OBRA90 was made permanent in OBRA93. Other base changes in the 1993 tax legislation included a major expansion of the EITC and the allowance of deductibility of the appreciated value (rather than the acquisition value) of tangible gifts to charities.

The Taxpayer Relief Act of 1997 introduced the most significant base changes to the income tax code since the base broadening efforts of TRA86. Under TRA97, higher income taxpayers became eligible for traditional IRAs. TRA97 also introduced the Roth IRA. In contrast to a traditional IRA, contributions to a Roth IRA are not deductible; however, the returns to a Roth IRA are untaxed, just as with a traditional IRA, and a Roth IRA allows tax-free withdrawals for home purchases and education. TRA97 also introduced a nonrefundable \$500 tax credit for each dependent child under 17, as well as two nonrefundable education credits. The HOPE Scholarship Credit pays up to \$1,500 for the first two years of post-secondary, and the Lifetime Learning Credit pays 20 percent of tuition up to \$5,000 after the first two years. TRA97 also provided a limited deduction for interest on student loans. All the credits are phased out as income increases.

*Tax rates and brackets* have undergone numerous changes over the past two decades. ERTA81 significantly reduced statutory marginal tax rates. The top marginal tax rate was reduced from 70 percent to 69.125 percent in 1981, and in 1982 it was further reduced to 50 percent. TRA86 also reduced statutory marginal tax rates by phasing down the rates. The top rate in 1987 was reduced from 50 percent to 38.5 percent, and was reduced even further in 1988 to 28 percent, with a phase-out of the benefits of the first bracket rate and the personal exemptions for high-income taxpayers increasing the effective top marginal rate to 33 percent. (Recall that TRA86 also provided an increase in personal exemptions and standard deductions.) OBRA90 combined the top two post-TRA rates of 33 and 28 percent into one top marginal tax rate of 31 percent.<sup>3</sup> It also increased the alternative minimum tax rate from 21 to 24 percent.

OBRA93 created two new tax brackets (36 percent and 39.6 percent) for high-income taxpayers, thereby moving the top statutory marginal tax rate closer to pre-TRA86 levels.

TRA97 reduced the top rate on capital gains from 28 percent to 20 percent, and reduced the 15 percent rate on capital gains to 10 percent.

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<sup>3</sup> The top statutory marginal rate was changed to 31 percent, but this rate does not reflect the impact of the phase-outs of itemized deductions and personal exemptions. Overall, the combination of changes increased estimated revenue yield due to the amount of income in the previously defined 28 percent bracket (Steuerle, 1992).

**Table 1. Major Federal Individual Income Tax Base Changes, 1978 to 1998**

Year/Tax Act	Provision
1979-1981	<ul style="list-style-type: none"> <li>•Increased personal exemptions and standard deductions</li> </ul>
Economic Recovery Tax Act of 1981 (ERTA81)	<ul style="list-style-type: none"> <li>•Indexed brackets, standard deductions, and personal exemptions (effective 1985)</li> <li>•Introduced taxation of unemployment compensation</li> <li>•Expanded deductibility of IRAs</li> <li>•Expanded the Keogh contribution limit</li> </ul>
Social Security Amendment of 1983	<ul style="list-style-type: none"> <li>•Introduced taxation of social security benefits</li> </ul>
Railroad Retirement Revenue Act of 1983	<ul style="list-style-type: none"> <li>•Introduced taxation of railroad retirement benefits</li> </ul>
Tax Reform Act of 1986 (TRA86)	<ul style="list-style-type: none"> <li>•Increased standard deductions and personal exemptions</li> <li>•Increased the earned income tax credit</li> <li>•Repealed the two-earner deduction, the dividend exclusion, the capital gains exclusion, income averaging, state and local sales tax deduction</li> <li>•Limited unemployment compensation exclusion, IRA deductions, medical, business meals and entertainment, and miscellaneous expense deductions</li> <li>•Eliminated the charitable contribution deduction for non-itemizers</li> </ul>
Omnibus Reconciliation Act of 1987	<ul style="list-style-type: none"> <li>•Limited home-mortgage interest deduction</li> </ul>
Omnibus Budget Reconciliation Act of 1990 (OBRA90)	<ul style="list-style-type: none"> <li>•Limited itemized deductions for high-income taxpayers</li> <li>•Adjusted the phase-out of personal exemptions</li> <li>•Expanded the earned income tax credit</li> </ul>
Omnibus Budget Reconciliation Act of 1993 (OBRA93)	<ul style="list-style-type: none"> <li>•Expanded taxation of social security benefits</li> <li>•Made permanent limitations on itemized deductions for high-income taxpayers</li> <li>•Made permanent the phase-out of personal exemptions for high-income taxpayers</li> <li>•Expanded the earned income tax credit</li> <li>•Allowed deductibility of the appreciated value of tangible property gifts to charities</li> </ul>
Taxpayer Relief Act of 1997 (TRA97)	<ul style="list-style-type: none"> <li>•Extended traditional IRAs to higher income taxpayers</li> <li>•Introduced Roth IRAs (e.g., contributions are non-deductible, withdrawals are tax-free, withdrawals for home purchases and education are penalty-free)</li> <li>•Introduced Education IRAs (e.g., contributions are non-deductible, and withdrawals for educational expenses are penalty-free)</li> <li>•Introduced a child tax credit</li> <li>•Introduced tax credits for post-secondary education expenses (e.g., the HOPE Scholarship Credit and the Lifetime Learning Credit)</li> <li>•Allowed limited deductibility of interest on student loans</li> </ul>

Sources: Steuerle (1992), Office of Management and Budget (various years), *Significant Features of Fiscal Federalism* (various years), and Commerce Clearing House(various years).

**Table 2. Federal Individual Income Tax, Tax Rates and Brackets, 1978 to 1998**

<b>Years</b>	<b>Tax Rates: Range in Percent</b>	<b>Lowest Tax Rate: Amount Under</b>	<b>Highest Tax Rate: Amount Over</b>
1979-1981	0.0-70.0	3,400	215,400
1982	0.0-50.0	3,400	85,600
1983	0.0-50.0	3,400	109,400
1984	0.0-50.0	3,400	162,400
1985	0.0-50.0	3,540	169,020
1986	0.0-50.0	3,670	175,250
1987	11.0-38.5	3,000	90,000
1988	15.0-33.0	29,750	71,900
1989	15.0-33.0	30,950	74,850
1990	15.0-33.0	32,450	78,400
1991	15.0-31.0	34,000	82,150
1992	15.0-31.0	35,800	86,500
1993	15.0-39.6	36,900	250,000
1994	15.0-39.6	38,000	250,000
1995	15.0-39.6	39,000	256,500
1996	15.0-39.6	40,100	263,750
1997	15.0-39.6	41,200	271,050
1998	15.0-39.6	42,350	278,450

Sources: Steuerle (1992), *Significant Features of Fiscal Federalism* (1995), Tax Foundation, *Facts and Figures on Government Finance* (2000), Office of Management and Budget (various years), and Commerce Clearing House (various years).

In total, these many tax law changes are likely to have significant, and complicated, effects on the distribution of tax of tax burdens. The next section discusses our data and methodology for measuring these effects.

### **III. Data Sources and Methodology**

We use data from the *Current Population Survey* (CPS) to measure the effect of federal income taxes on the distribution of income for selected years. The CPS data set is compiled from an annual sampling of households by the Bureau of the Census. It contains data for each selected household in the sample as well as data for each person in the household. The survey records characteristics such as income, age, race, household structure, education, family relationships, occupation, and employment history. We use the *Annual March Current Population Survey* for CPS years 1979, 1985, 1988, 1990, 1993, 1996, and 1999 to capture the progressivity trends of federal individual income taxes before and after a number of significant tax law changes. Note that the income variables in the CPS are income reported for the previous year (e.g., the 1993 CPS contains income data for 1992). Our choice of these CPS years corresponds to our intent to calculate tax burdens following the major tax law changes over the last two decades. For example, we use the 1988 CPS year data with its income data for 1987 to measure the effects of the partially phased-in Tax Reform Act of 1986, and the 1990 CPS year data with income information for 1989 to calculate the impacts of the fully phased-in act.

We are interested both in total pre-tax income and in after-tax income of the population. An important advantage of the CPS is that it is a rich source of micro-level data on sources of income, especially for government transfers to low income households. It also has the advantage

of including information on non-filers, information that is not available from data files compiled by the tax authorities (e.g., Statistics of Income data). These advantages come at some cost. The CPS data set does not capture certain sources of capital income, such as interest on state and municipal bonds and tax shelters (such as IRAs). Furthermore, unlike data collected for tax administration, important items of information for calculating tax liabilities are missing in the CPS (e.g., itemized deductions), so that it is necessary to impute these missing items.

There are several steps in our analysis.

**First**, we use an aggregate of the following components of income as a comprehensive measure of pre-tax income: wages and salary, income from self-employment, farm income, workers' compensation, social security, retirement income, interest, dividend, rent, child support payments, alimony, welfare receipts, unemployment income, and a broad category of "other income". This measure of aggregate pre-tax income is quite complete, and enables us to measure consistently the relative rankings of income groups before and after taxes.

**Second**, we impute itemized deductions using Internal Revenue Service Statistics of Income (SOI) data. There are two aspects to this imputation: identifying itemizers and determining the amount of the itemized deductions. None of this information is directly available in our CPS data set.

To identify itemizers, we use the following procedures. We create sixteen income classes in the SOI data, and then determine the share of the taxpayers in each income class that itemizes using the appropriate year's published SOI data on itemizers by income group (AGI). Because of the extremely small share of itemizers in income classes below \$20,000, we assume that no persons with income below \$20,000 are itemizers; we also exclude as itemizers

pensioners who are not homeowners. For those persons with income above \$20,000, we group individuals in our CPS data set into sixteen income classes that correspond to those income classes in the SOI data set. Then for each of these sixteen income classes in the CPS we randomly designate as itemizers the share of the individuals in that income class that equals the share of itemizers in the corresponding SOI income class.

To impute the amount of itemized deductions for itemizers, we calculate itemized deductions as a share of income (based on the published SOI data) for each income class in the SOI data set for each year we analyze. The shares so obtained are then used to impute the amount of itemized deductions to designated itemizers in the respective income class in our CPS data set.

**Third**, we calculate tax payments using a microsimulation model that applies federal individual income tax rules to calculate federal tax liabilities for each taxpayer in our data set, on the assumption that individuals bear the full burden of these taxes. The simulator is calibrated with federal tax rules for 1978, 1984, 1987, 1989, 1992, 1995, and 1998, corresponding to CPS income data for the years used in the study. The output of the microsimulation model is a series of tables of effective federal tax rates for income quartiles for the entire sample and by region. A subprogram within the microsimulation model calculates Gini coefficient measures of income distribution before taxes and after federal taxes for the selected years.<sup>4</sup>

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<sup>4</sup> With over 50,000 observations for each year, the calculation of the Gini coefficients would have required an inordinate amount of computer resources and hours of computer time. We therefore group the observations into fifty income classes that are 2 percent apart, and calculate the Gini coefficient on the grouped data. This procedure considerably lowered the required computer resources and shortened the execution time of the Gini subprogram. Berliant and Strauss (1993) find that relative rankings of income classes are largely unaffected by the number of income classes, although the number of income classes does affect cardinal values of calculated indexes of income inequality. We consistently model tax bases, tax brackets, rates, itemized and standard deductions, personal exemptions, earned income tax, and child credits. We are not able to model certain credits including the foreign tax

There is an extensive literature on the appropriate measure of the redistributive effects of taxation. For example, Musgrave and Thin (1948) define a tax progressivity index as  $m = (1 - G_a)/(1 - G_b)$ , where  $G_a$  and  $G_b$  are the Gini coefficients of after-tax and before-tax income, respectively. Kiefer (1991) summarizes alternative indices, and concludes that there are differences in magnitudes of these measures but that the relative progressivity rating of states is similar under a variety of progressivity measures. Berliant and Strauss (1993) also apply a variety of measures to calculate the progressivity of federal and state income taxes pre- and post-1986, and they find generally similar results across these indicators. Accordingly, we rely on the Gini coefficient measure as a well-tested index of progressivity. For comparative purposes, we also calculate a Suits (1977) index for each year.

There are several novel aspects of our calculations. Most previous studies of the changes in the distribution of the federal income tax have not attempted to hold constant the potentially endogenous changes in the distribution of income that occur as a result of tax law changes. However, there is an enormous literature on the behavioral responses of taxation that indicates that taxes have some impact on labor supply, capital income, and savings.<sup>5</sup> To the extent that this is so, measurements of pre- and post-tax distributions of income in a given year are confounded by these behavioral impacts; that is, the pre-tax distribution of income may itself be altered by tax policy so that retrospective analyses of the progressivity of the income tax cannot separate the effects of tax law and behavior. Of course, it is not possible to capture fully any induced changes in the distribution of income. However, these different impacts may be isolated

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credit and adoption credit.

<sup>5</sup> For example, see Aaron and Pechman (1981) and Slemrod (1992) for a number of studies that attempt to

in part by constructing several counterfactuals that hold constant the pre-tax distribution of income and that then measure the effects of appropriately deflated tax codes on this constant distribution of income.

For example, we can hold the distribution of income constant at, say, 1978 levels, and then calculate the distributional impact of the 1978, 1984, 1987, 1989, 1992, 1995, and 1998 tax codes on this constant distribution of income. By varying the distribution of income that is held constant across the different years of CPS data (e.g., CPS income years 1978, 1984, 1987, 1989, 1992, 1995, and 1998), and applying each of the different year's tax code to each of these income distributions, we can separate the effects of the tax code on the after-tax distribution of income from the potentially complicated tax policy effects on the pre-tax distribution of income. Note that this procedure also simulates a given tax law against a changing distribution of income, thereby giving some insight into what may have happened to progressivity if the federal tax code were left alone at different points in time.

The construction of these counterfactuals therefore allows us to answer the following question: *how have tax law and income distribution changes separately contributed to the changes in tax progressivity over time?* It also allows us to address the question: *how does a specific pre-tax distribution of income affect the equalizing ability of a given tax change on the post-tax distribution of income?*

Another novel aspect of our analysis is the examination of regional differences in the impact of tax law changes. The progressivity impacts of the changes in the federal tax laws are likely to be significantly different for different states and regions of the country because the pre-

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measure these behavioral responses.

tax income distribution varies from state to state. Berliant and Strauss (1993) examine state differences pre- and post-TRA86. Their calculations indicate that the effective federal tax rates fell post-TRA in nearly all states, but the percentage changes varied from state to state. Here, we compare the progressivity impacts of the federal income tax law changes across regions and across years to determine whether the federal tax law changes have affected some parts of the country more than others over the last two decades. We are therefore able to answer the question: *are there differential regional impacts of tax law changes on tax progressivity?*

#### **IV. Results**

We focus upon several main sets of results. Our first set presents the basic Gini coefficient and Suits Index calculations for the different years and tax codes. We then examine the regional impacts of these tax law changes. We conclude with our various counterfactuals, which allow us both to isolate the direct distributional impact of changes in federal tax policy from the induced changes in the pre-tax distribution of income and to examine the impact of a given pre-tax distribution of income on the ability of a tax change to affect the post-tax income distribution.

##### *Basic Calculations*

Table 3 presents the Gini coefficients and Suits indices for pre- and post-tax income distributions for each of the years. Recall that the Gini coefficient equals 0 if income is equally distributed, and equals 1 if a single household receives all income. Also, the Suits index can vary from  $-1$  (a regressive tax) to 0 (a proportional tax) to  $+1$  (a progressive tax). As indicated

in Table 3, there have been significant changes to the pre- and post-tax distributions of income.

**Table 3. Gini Coefficients and Suits Indices, 1978 to 1998**

<b>Year of Income</b>	<b>Gini Coefficient</b>	<b>Suits Index</b>
1978	Pre-tax: 0.40362 Post-tax: 0.36942 Percent Change: -8.47	0.27301
1984	Pre-tax: 0.43030 Post-tax: 0.39289 Percent Change: -8.69	0.28311
1987	Pre-tax: 0.42714 Post-tax: 0.39312 Percent Change: -7.96	0.26715
1989	Pre-tax: 0.43191 Post-tax: 0.40390 Percent Change: -6.49	0.22562
1992	Pre-tax: 0.41364 Post-tax: 0.38971 Percent Change: -5.78	0.20904
1995	Pre-tax: 0.48913 Post-tax: 0.45543 Percent Change: -6.89	0.22189
1998	Pre-tax: 0.49122 Post-tax: 0.45493 Percent Change: -7.38	0.22917

Both the Gini coefficients and the Suits index calculations suggest that the federal individual income tax structure has become gradually less able to equalize post-tax income since the early 1980s, at least until the OBRA93 was introduced and effective; that is, the percent decline in the pre-tax and post-tax Gini coefficients tends to become smaller over the 1984 to 1994 period, before increasing in 1995. Until 1995, it does not appear that the distribution of pre-tax income has made the job of redistribution more difficult. In fact, our data show that from 1984 through 1994 the pre-tax Gini coefficients are similar. There is a significant increase in the pre-tax Gini coefficient in 1995, which reflects the well-documented increase in income inequality during the 1990s.<sup>6</sup>

Our results are generally consistent with the findings of other studies of progressivity of the individual income tax. However, direct comparisons with other studies are complicated by the use of different data and time periods. For example, Scott and Triest (1993) examine the distributional impact of taxes through 1989, and our Gini coefficient estimates are similar to the estimates of Scott and Triest (1993) that rely upon a Reynolds-Smolensky measure of progressivity, in part because these two measures are quite similar. However, our Suits index is more sensitive to the CPS top coding problem because the Suits index measures the distribution of the tax paid. Similarly, Gouveia and Strauss (1994) use effective tax rates as a measure of

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<sup>6</sup> Since the CPS is top coded each year, we also calculated the Gini coefficients eliminating high-income observations and using a consistent, indexed value of the top coded income. The results of these calculations are quite similar to those in Table 3:

<b>Year</b>	<b>1978</b>	<b>1984</b>	<b>1987</b>	<b>1989</b>	<b>1992</b>	<b>1995</b>	<b>1998</b>
Percent Change in Gini Coefficient	-8.30%	-8.91%	-7.77%	-6.73%	-5.76%	-6.11%	-6.58%

income tax progressivity, and, like us, they conclude that the progressivity of the federal income tax tended to decrease during the period 1978 to 1989. Berliant and Strauss (1993) also conclude that the after-tax distribution of income became less equal between 1985 and 1987. CBO (2001) reports a decrease in the effective individual income tax rate for the highest income quintile through the early to mid 1980s, then a reduction in the effective tax rate until 1993, when the effective tax rate rose again for the highest income group.

### *Regional Differences*

It is of some interest to examine the regional effects of tax law changes, and Table 4 presents the Gini coefficients for nine Census-defined regions.<sup>7</sup> There are significant regional differences in our measures of progressivity. Two patterns in particular emerge from these calculations. A first pattern is that there is more variation among the regions in 1984, 1987, and 1989 than in other years. This finding suggests that the flattening of the tax rates in the 1980s both hid significant changes in the tax base and also had very different effects across the regions of the country. For example, the increased taxation of social security benefits would tend to hit

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<sup>7</sup> The regions are defined as follows:

R1 New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)

R2 Middle Atlantic (New Jersey, New York, Pennsylvania)

R3 East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)

R4 West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)

R5 South Atlantic Division (Delaware, Washington, D.C., Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)

R6 East South Central (Alabama, Kentucky, Mississippi, Tennessee)

R7 West South Central (Arkansas, Louisiana, Oklahoma, Texas)

R8 Mountain (Arizona, Colorado, Idaho, Montana, Nevada, Utah, Wyoming)

R9 Pacific (Alaska, California, Hawaii, Oregon, Washington).

the Middle Atlantic and New England regions the hardest.<sup>8</sup> Still, it is difficult to determine the impact of the treatment of social security taxation on progressivity without detailed knowledge of the different distributions of the elderly among regions.

A second pattern is that the regions in which the federal income tax is more redistributive change after TRA86. The federal individual income tax structure is relatively more redistributive in the traditionally liberal, higher-income regions of New England and the Pacific through 1987. However, in 1989 and 1992 the income tax is most redistributive in the South Atlantic and Pacific or Mountain regions, and by 1998 there is more change in the Central regions. This pattern of change is due to the combined impact of changes in the underlying distribution of income and wealth in the various regions of the country (e.g., a loss in the Northeast and an increase in the Southern states).

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<sup>8</sup> Other examples include increased exemptions for children and expanded taxation of capital income.

**Table 4. Gini Coefficients by Region, 1978 to 1998**

<b>Year</b>	<b>Region</b>	<b>Pre-tax Gini Coefficient</b>	<b>Post-tax Gini Coefficient</b>	<b>Percent Change in Gini Coefficient</b>
1978	R1	0.39499	0.35959	-8.96
	R2	0.39547	0.35995	-8.98
	R3	0.38637	0.35202	-8.89
	R4	0.39427	0.36177	-8.24
	R5	0.41287	0.37694	-8.70
	R6	0.41952	0.38370	-8.54
	R7	0.42016	0.38438	-8.52
	R8	0.41044	0.37410	-8.85
	R9	0.40959	0.37403	-8.68
1984	R1	0.41163	0.37372	-9.21
	R2	0.43642	0.39883	-8.61
	R3	0.41781	0.38208	-8.55
	R4	0.41472	0.38022	-8.32
	R5	0.43836	0.39982	-8.79
	R6	0.44638	0.41035	-8.07
	R7	0.44879	0.40909	-8.85
	R8	0.41792	0.38116	-8.80
	R9	0.41992	0.38226	-8.97
1987	R1	0.41227	0.37833	-8.23
	R2	0.43166	0.39643	-8.16
	R3	0.41979	0.38724	-7.75
	R4	0.40608	0.37546	-7.54
	R5	0.42650	0.39237	-8.00
	R6	0.44209	0.41079	-7.08
	R7	0.44316	0.40994	-7.50
	R8	0.42532	0.39140	-7.98
	R9	0.42005	0.38452	-8.46
1989	R1	0.41894	0.39093	-6.69
	R2	0.43443	0.40457	-6.87
	R3	0.41698	0.38858	-6.81
	R4	0.42093	0.39247	-6.76
	R5	0.43133	0.40161	-6.89
	R6	0.44970	0.41962	-6.69
	R7	0.44953	0.41975	-6.62
	R8	0.41979	0.39190	-6.64
	R9	0.42475	0.39528	-6.94
1992	R1	0.40216	0.37965	-5.60
	R2	0.41451	0.39067	-5.75
	R3	0.39783	0.37394	-6.01
	R4	0.40641	0.38283	-5.80
	R5	0.41517	0.38896	-6.31
	R6	0.41922	0.39471	-5.85

	R7	0.41865	0.39231	-6.29
	R8	0.41002	0.38363	-6.44
	R9	0.41360	0.39081	-5.54
1995	R1	0.47833	0.44562	-6.83
	R2	0.49914	0.46697	-6.45
	R3	0.46625	0.43451	-6.81
	R4	0.47002	0.43685	-7.06
	R5	0.48947	0.45512	-7.02
	R6	0.50556	0.46838	-7.35
	R7	0.49011	0.45469	-7.23
	R8	0.48564	0.45073	-7.19
	R9	0.50458	0.47069	-6.72
1998	R1	0.49346	0.45803	-7.18
	R2	0.50941	0.47329	-7.09
	R3	0.47612	0.44016	-7.55
	R4	0.46142	0.42721	-7.41
	R5	0.48856	0.45293	-7.30
	R6	0.48780	0.45051	-7.64
	R7	0.49716	0.45919	-7.64
	R8	0.47959	0.44336	-7.55
	R9	0.50331	0.46616	-7.38

### *Counterfactuals*

It is tempting, but risky, to conclude at this point that the statutory changes in federal tax policy have actually affected the net distribution of income. Because individuals are likely to respond to tax law changes, the pre-tax distributions of income used in the earlier calculations may have changed as a result of the changes in tax policy. One way to draw more specific conclusions about the effect of any tax law on the distribution of income is to hold the pre-tax distribution of income constant at some level and simulate the statutory (or static) effects of changes in federal tax policy on this constant distribution of income. This is one purpose of our counterfactuals. A related issue of interest is the effect of changes in the underlying distribution of income on the effectiveness of the statutory changes in redistributing income; that is, do the static impacts of the policies contained in, say, ERTA81 have the same impact on progressivity with the 1978 distribution of income as they do with, say, the 1998 distribution of income? These impacts can be analyzed by using another set of counterfactual experiments in which a given tax law is applied to each of the pre-tax distributions of income from 1978 to 1998.

The results of these counterfactual experiments are presented in Tables 5 and 6. Table 5 indicates that, holding the pre-tax distribution of income constant at 1978 levels, the impacts of the various tax policy changes are quite similar to those presented earlier, largely because the 1978 pre-tax Gini coefficient is generally of similar magnitude to the pre-tax Gini coefficients for the other years. Consequently, even holding the pre-tax distribution of income constant at its 1978 level, there is a decrease in the net progressivity of the individual income tax through OBRA90, and then an increase in the effect in the 1995 and 1998 laws. However, the percent changes in the Gini coefficients are generally somewhat different than the earlier estimates in

Table 3, sometimes larger and sometimes smaller. For example, using the actual 1992 distribution of income, the enactment of OBRA90 reduces the Gini coefficient by 5.78 percent (see Table 3); holding constant the income distribution at its 1978 level, the enactment of OBRA90 now reduces the Gini coefficient by 5.94 percent (see Table 5).

**Table 5. Distributional Impact of Federal Tax Policy:  
Pre-tax Distribution of Income Held Constant at 1978 Levels**

<b>Tax Law</b>	<b>Pre-tax Gini Coefficient</b>	<b>Post-tax Gini Coefficient</b>	<b>Percent Change in Gini Coefficient</b>
ERTA81 (1984 Law)	0.40362	0.36698	-9.08
TRA86 (1989 Law)	0.40362	0.37426	-7.27
OBRA90 (1992 Law)	0.40362	0.37963	-5.94
OBRA93 (1995 Law)	0.40362	0.37649	-6.72
TRA97 (1998 Law)	0.40362	0.37369	-7.41

Table 6 shows some different counterfactuals, in which a given tax law is applied to a variety of pre-tax distributions of income. If the objective of the individual income tax is to increase the progressivity of the post-tax distribution of income, then different tax laws are more effective if imposed at different points in time. For example, ERTA81 would have equalized the post-tax distribution of income in 1987 more than it actually did in 1984. Similarly, TRA86 would have had a more equalizing impact in 1984 than in the years after 1986. OBRA90 would have had the greatest equalizing impact in 1987, and in fact it had the least equalizing impact in 1992, 1994, and 1998. TRA97 would have had the greatest impact under the 1978, 1984, and 1987 distributions of income. Overall, the 1978 tax law appears to be the most successful in terms of its static impact on the overall distribution of post-tax income.

## **V. Conclusions**

Our calculations clearly indicate that federal income taxation has consistently worked to

equalize the distribution of income, as shown in a post-tax Gini coefficient that is lower than the pre-tax Gini coefficient, and that the amount of redistribution from the income tax has tended to decrease over time, through the early to mid-1990s. Our calculations also show that the distributional effects of tax law changes vary greatly by region; that is, a given tax change has differential impacts on tax progressivity in different areas of the country, due largely to different distributions of income in these areas. However, our results suggest that, for policy goals to be met, tax policy needs to be developed for the specific time in which it is enacted. A given tax reform will not accomplish the same distributional objectives at all points in time because the underlying pre-tax distribution of income influences the amount of redistribution that the reform can achieve. This result may in part be the reason why we see a reduction in the equalization of the personal income tax over time.

**Table 6. Distributional Impact of Federal Tax Policy:  
Constant Law with Changing Pre-Tax Distribution of Income**

Tax Law	Year of Pre-tax Distribution of Income						
	1978	1984	1987	1989	1992	1995	1998
1978 Law	Pre-tax: 0.40362 Post-tax: 0.36942 Percent Change:-8.47	Pre-tax: 0.43030 Post-tax: 0.38792 Percent Change: -9.85	Pre-tax: 0.42714 Post-tax: 0.38295 Percent Change:-10.35	Pre-tax: 0.43191 Post-tax: 0.39270 Percent Change: -9.08	Pre-tax: 0.41364 Post-tax: 0.38212 Percent Change: -7.62	Pre-tax: 0.48913 Post-tax: 0.43911 Percent Change:-10.23	Pre-tax: 0.49122 Post-tax: 0.43958 Percent Change:-10.51
ERTA81 (1984 Law)	Pre-tax: 0.40362 Post-tax: 0.36698 Percent Change:-9.08	Pre-tax: 0.43030 Post-tax: 0.39289 Percent Change: -8.6	Pre-tax: 0.42714 Post-tax: 0.38744 Percent Change: -9.29	Pre-tax: 0.43191 Post-tax: 0.39502 Percent Change: -8.54	Pre-tax: 0.41364 Post-tax: 0.38249 Percent Change: -7.53	Pre-tax: 0.48913 Post-tax: 0.44641 Percent Change: -8.73	Pre-tax: 0.49122 Post-tax: 0.45753 Percent Change: -6.86
TRA86 (1989 Law)	Pre-tax: 0.40362 Post-tax: 0.37426 Percent Change:-7.27	Pre-tax: 0.43030 Post-tax: 0.39457 Percent Change: -8.30	Pre-tax: 0.42714 Post-tax: 0.39513 Percent Change: -7.49	Pre-tax: 0.43191 Post-tax: 0.40390 Percent Change: -6.49	Pre-tax: 0.41364 Post-tax: 0.38996 Percent Change: -5.72	Pre-tax: 0.48913 Post-tax: 0.45555 Percent Change:-6.87	Pre-tax: 0.49122 Post-tax: 0.45732 Percent Change: -6.90
OBRA90 (1992 Law)	Pre-tax: 0.40362 Post-tax: 0.37963 Percent Change:-5.94	Pre-tax: 0.43030 Post-tax: 0.40276 Percent Change: -6.40	Pre-tax: 0.42714 Post-tax: 0.39639 Percent Change: -7.20	Pre-tax: 0.43191 Post-tax: 0.40313 Percent Change: -6.66	Pre-tax: 0.41364 Post-tax: 0.38971 Percent Change: -5.78	Pre-tax: 0.48913 Post-tax: 0.45682 Percent Change: -6.61	Pre-tax: 0.49122 Post-tax: 0.45882 Percent Change: -6.59
OBRA93 (1995 Law)	Pre-tax: 0.40362 Post-tax: 0.37649 Percent Change:-6.72	Pre-tax: 0.43030 Post-tax: 0.40009 Percent Change: -7.02	Pre-tax: 0.42714 Post-tax: 0.39834 Percent Change: -6.74	Pre-tax: 0.43191 Post-tax: 0.39882 Percent Change: -7.66	Pre-tax: 0.41364 Post-tax: 0.38998 Percent Change: -5.72	Pre-tax: 0.48913 Post-tax: 0.45543 Percent Change: -6.89	Pre-tax: 0.49122 Post-tax: 0.46146 Percent Change: -6.06
TRA97 (1998 Law)	Pre-tax: 0.40362 Post-tax: 0.37369 Percent Change:-7.41	Pre-tax: 0.43030 Post-tax: 0.39657 Percent Change: -7.84	Pre-tax: 0.42714 Post-tax: 0.38952 Percent Change: -8.80	Pre-tax: 0.43191 Post-tax: 0.39894 Percent Change: -7.63	Pre-tax: 0.41364 Post-tax: 0.38889 Percent Change: -5.98	Pre-tax: 0.48913 Post-tax: 0.45846 Percent Change: -6.27	Pre-tax: 0.49122 Post-tax: 0.45493 Percent Change: -7.38

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