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Trends in Federal Tax Progressivity: 1980-1993

by

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1. Introduction

Since 1980 there have been major changes in Federal tax policy. The Congress enacted five major tax bills: the Economic Recovery Tax Act of 1981 (ERTA), the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), the Deficit Reduction Act of 1984 (DEFRA), the Tax Reform Act of 1986 (TRA), and the Omnibus Budget Reconciliation Act of 1990 (OBRA90). The Congress also had previously enacted the Social Security Amendments of 1977, which increased payroll tax rates throughout the decade, and later enacted the Social Security Amendments of 1983, which accelerated the effective date of those increases and made a portion of Social Security benefits taxable under the individual income tax. These changes in the law have resulted in a much different tax structure today than the law in effect in 1980. The income tax rate schedule is lower and flatter and many tax preferences under the individual income tax have been scaled back or eliminated. The top corporate tax rate is lower, but the investment tax credit has been eliminated and other business investment incentives, which were expanded in ERTA, were subsequently scaled back. The base for payroll taxes is wider and rates are higher. Some excise tax rates are higher today than at the beginning of the decade, offsetting in part the decline in the real value of excise tax rates with inflation.[1]

In this paper, we examine the effect of these changes on the distribution of the tax burden among income groups. We report results from simulations of a large micro database that the Congressional Budget Office (CBO) has developed by combining data files on household income, demographic characteristics, and consumption data from the Census Bureau and the Bureau of Labor Statistics and tax return data from the Internal Revenue Service. We array families by a measure of realized cash income, adjusted for family size, compute income and taxes paid for different income groups for the years 1980, 1985, and 1989, and project income and taxes paid for 1993. We simulate directly the individual income and payroll tax liabilities of families under tax laws of different years and assign corporate and excise taxes according to assumptions about the incidence of these taxes among families. We compute effective tax rates--the ratio of all taxes paid to a measure of pretax income that includes all taxes.

There are several ways of measuring changes in tax progressivity over time. One way is simply to compare ratios of taxes paid to pretax income for different income groups over time. Using this measure, we find that the sweeping changes in tax policies resulted in virtually no change in either the overall level or the distribution of tax burdens between 1980 and 1993. The total federal effective tax rate (ETR) for all families was 23.3 percent in 1980 and is projected to be 23.2 percent in 1993. The distribution of tax burdens

became slightly less progressive. The overall ETR changed little for most of the population, but declined by slightly over 10 percent for families in the top 1 percent of the income distribution. (In 1993, the cutoff level of income for the top 1 percent of families is projected to be $161,000 for a single person, $206,000 for a married couple with no children and $324,000 for a family of four.)

Changes in observed ETRs over time, however, reflect both changes in tax laws and changes in the income, consumption, and demographic composition of families in different income groups. To isolate the effects of tax policy changes alone, we must hold income and other characteristics of families fixed. We do this by simulating the effects of 1980, 1985, 1989, and 1993 tax laws on a sample of families from a single year. We perform two separate sets of such "income fixed" simulations--one comparing the impact of the four tax laws on 1985 families and another comparing the impact of the tax laws on 1989 families. The income-fixed simulations show that, compared to a small increase in the actual ETR, 1980-1993 tax law changes had no effect on the ETR for 1989 families in the lowest income quintile, while tax law changes increased the ETR by slightly more than the actual change in the ETR for 1985 low-income families. Tax law changes measured at both 1985 and 1989 incomes slightly increased the ETRs of families in the middle three quintiles, although actual ETRs declined slightly for families in those quintiles. For families in the top

quintile and especially in the top 1 percent, the income-fixed simulations show substantially different results depending on the year to which the tax changes are applied. The 1980-93 tax law changes increased the ETR only slightly for 1985 families in the top quintile and lowered it only slightly for 1985 families in the top 1 percent. In contrast, the tax law changes lowered the ETR substantially for 1989 families in the top quintile and especially for families in the top 1 percent. These differences occur because both the share of income of high income families and its composition (between capital gains and earnings) changed between 1985 and 1989.

CHANGES IN EFFECTIVE TAX RATES, 1980-1993
(in percentage points)

Measured at:	Current Incomes	1985 Incomes	1989 Incomes
Bottom Quintile	+0.3	+0.4	0.0
Second Quintile	-0.1	+1.2	+1.1
Middle Quintile	-0.3	+1.2	+0.9
Fourth Quintile	-0.6	+0.7	+0.5
Top Quintile	-1.0	+0.4	-2.1
Top 1 Percent	-3.5	-0.9	-8.2
All Families	-0.1	+0.7	-0.8

The changes that we observe in the distribution of income and its composition by source could to some extent be responses to changes in the tax law. When taxpayers alter their behavior in response to the tax law, reported income, taxes paid, and the total tax burden all can change. A complete

measure of the tax burden would include both actual taxes paid and the reduction in utility from behavioral changes to avoid paying tax. We present such a measure of the effect of tax law changes between 1980 and 1989 on ETRs of different groups, based on assumed responses of cash wages and realized capital gains to changes in marginal tax rates. The results of these simulations show a slightly smaller decline in progressivity over the 1980s than do simulations at fixed 1989 incomes, but with the largest tax reduction still occurring for the top 1 percent of families.

The plan of this paper is as follows. In section 2, we briefly describe the model CBO uses to simulate the distribution of income and the incidence of taxes. In section 3, we show how actual ETRs change between 1980 and 1993 for different income groups. Section 4 presents calculations of ETRs between 1980 and 1993, with taxpayer income and demographic characteristics held fixed. We explain why ETRs measured with income held fixed differ from actual changes in ETRs and also why the results differ depending on whether we apply the tax law changes to 1985 or 1989 families. In Section 5, we discuss how to measure ETRs when taxpayers respond to changes in the tax law and present illustrative computations of changes in ETRs between 1980 and 1989 law, using assumed behavioral responses. Section 6 briefly summarizes the findings.

2. The CBO Income Distribution and Tax Incidence Model

CBO has estimated distributions of family income for 1980, 1985, and 1989, using reported data for those years, and has projected the distribution for 1993. All these distributions are based on data from three sources. The primary source is the March Current Population Survey (CPS). The CPS is a monthly survey of approximately 60,000 families conducted by the Bureau of the Census. The reported data on income from taxable sources from the CPS files are adjusted for consistency with reported income from Statistics of Income (SOI) samples. The SOI is an extensive annual sample of actual individual income tax returns. Data on consumer expenditures are taken from the Consumer Expenditure Survey (CEX) Interview Surveys. The CEX Interview Survey is a quarterly panel survey conducted by the Bureau of Labor Statistics. The survey collects detailed data on household expenditures over a 12-month period.

In most analyses CBO does not match data sets, but uses imputations and adjustments to combine microdata from three separate sources to compute family incomes and to simulate federal taxes.[2] CBO uses a definition of income that closely corresponds to the definition of income used for federal income tax purposes. Some researchers use a definition of income that measures income when it accrues rather than when it is realized, or that includes noncash income sources, or that adjusts for differences between

income reported on tax returns and NIPA measures. These definitions of income require many adjustments to data, often with virtually no information except for the aggregate to be allocated. Because CBO uses a definition of income that is close to the definition of income in the Federal tax law, the number of required imputations and adjustments is limited.

Measuring family income

CBO measures family income on a cash receipts basis in a way that is consistent with, but not identical to, the way income is counted by the federal tax system. Major differences from the tax system definition are that family income includes all cash transfer payments, and that it is measured before all federal taxes. Family income equals the sum of wages, salaries, self-employment income, personal rents, interest, and dividends, government cash transfer payments, cash pension benefits and realized capital gains. To lessen the distortion in measured incomes that results from incentives to realize capital losses but to defer capital gains, the income measure follows the tax code by limiting capital losses in excess of capital gains to $3,000 per return. If gains were measured on an accrual basis, it would be appropriate to net total accrued gains against total accrued losses. Net income from self-employment, rents, interest, dividends, and realized capital gains are not adjusted to remove inflationary gains or losses.

Family income excludes accrued but unrealized capital gains, employer contributions to pension funds, in-kind government transfer payments, and other noncash and implicit income. Because income is measured before reductions for any federal taxes, employer contributions for federal social insurance and federal corporate income taxes are added to family income. Microdata totals for family incomes are not adjusted to national income aggregates.

Many people incur "paper losses" for tax purposes. To approximate the economic income of families better, rental losses and most partnership losses (but not losses of sole proprietorships) are not subtracted from family income.

Family income is measured over a single year. Income averaged over a number of years would better represent the true economic circumstances of families than a single year's income, but data available on a multiyear basis for individual taxpayers are inadequate for most analyses. In any particular year, income may be lower than normal because of a period of unemployment, unusually low income from self-employment, or a drop in investment returns. Capital gains realizations are another source of volatility. In any single year, gains will be unusually high if a person sells an asset that has been growing in value for a long time or has changed dramatically in value. If incomes were averaged over a number of years, there would be less dispersion in the

distribution of incomes and therefore less dispersion in the distribution of effective tax rates.

Adjusting and aging the data

CBO uses data from the SOI to adjust CPS family income data. The adjustments correct for top-coding of high incomes and underreporting of certain types of income and add missing data on deductions and capital gains realizations. The adjustments are based on imputations from the SOI. CPS families are split into tax filing units comparable to those on the SOI and missing or adjusted data are assigned to the CPS based on probability distributions from the SOI. New recipients of certain types of income are created to match SOI totals.

CBO has created an augmented version of the adjusted CPS file that has extensive information on family expenditures. To construct this augmented file, CEX expenditure records were statistically matched to records from the adjusted CPS. Each CPS unit was assumed to have the same ratio of expenditures to income as the CEX unit to which it was matched.

Extrapolated CPS and SOI data are created using detailed population projections of the Social Security Administration and income and employment

projections from the Congressional Budget Office baseline economic forecast. Once population weights are adjusted to reflect population growth, incomes from each source are inflated so that total growth in that source on the file matches CBO's projected aggregate growth rate for income from that source. Itemized deductions are increased at the same projected growth rate as income. Expenditures of different types are inflated by CBO's forecast for components of consumer spending.

Simulating combined federal taxes

Individual income taxes are simulated using constructed CPS tax filing units after reported CPS incomes have been adjusted to control totals from SOI data. The entire tax burden from individual income taxes is assumed to fall on families who directly pay the tax, with no shifting of the burden among families.

Social security payroll taxes are simulated using earnings and self-employment income from the adjusted CPS. A similar method is used to simulate the federal part of unemployment taxes. Workers are assumed to bear both the employee and employer shares of payroll taxes.[3]

Federal excise taxes are simulated using expenditure data from the adjusted CEX. Part of the tax is assigned to families based on their consumption of the

taxed items. The remainder of the tax is assumed to fall on intermediate goods. That part is allocated according to total consumption. Federal excise taxes are calculated as a percentage of family income for families in different income categories. Those percentages are then applied to CPS family incomes.

Although the corporate income tax is collected from corporations, families ultimately bear the economic burden of the tax. Economists disagree, however, whether families bear the tax in proportion to their income from corporate shares, income from all capital assets, employee compensation, or consumption. In this study we use the assumption that half of the corporate income tax falls on all income from capital and half falls on labor income. We show in the next section that the method of allocation does not materially affect the main conclusions about how the distribution of the total federal tax burden among income classes has changed over time.

To compute effective tax rates as a fraction of pre-tax income, it is necessary to adjust incomes for taxes that are paid indirectly. Reported pre-tax family incomes are adjusted to include the amount of the employer share of the Social Security payroll tax, the unemployment insurance payroll tax, and the corporate income tax. The employer share of the Social Security payroll tax and the unemployment insurance payroll tax are added to family labor incomes. Corporate income taxes are assigned to family incomes in a manner

consistent with the incidence assumption that capital and labor bear equal shares of the corporate tax. Capital income is increased by one-half of the amount of the tax, and labor income is increased by the remaining half.

Ranking families

Comparing the distribution of family incomes can present a misleading picture unless some adjustment is made for different family sizes. For example, a single person with income of $40,000 arguably has a much higher standard of living than a family of four with the same income. One alternative is to measure income on a per capita basis. This approach removes all differences among individuals based on family size, including economics of scale from living together. Another alternative is to adjust family income based on some equivalence scale, such as the family size adjustment used in determining poverty thresholds. This scale assumes, for example, that a family of four needs about twice the income of a single person to maintain the same standard of living. The incomes of families of different sizes are made comparable by dividing each family's income by its poverty threshold. Under this approach, a four person family with income of about $40,000--or three times the poverty threshold for a family of four in 1990--is on a par with a three-person family with an income of about $31,200--three times the poverty threshold for a three-person family.

To correct for differences in family size, CBO measures family income in terms of multiples of the poverty thresholds for families of different sizes. The measure is called adjusted family income (AFI).[4] CBO defines percentiles of the income distribution based on people, not families. Thus, families in the top quintile of the distribution do not constitute one-fifth of all families but rather one-fifth of the population.[5]

3. Trends In Effective Tax Rates, 1980-1993

There were five major tax bills affecting income taxes between 1981 and 1990--ERTA in 1981, TEFRA in 1982, DEFRA in 1984, TRA in 1986, and OBRA90 in 1990. In addition, the social security tax increases enacted in the Social Security Amendments of 1977 were implemented, with the last increase occurring in 1990. Despite these changes, there is little difference between overall effective tax rates (ETRs) in 1980 and 1993, when most of the OBRA90 changes will be in effect.[6]

The total federal ETR for all families is projected to be approximately the same in 1993--23.2 percent--as it was in 1980--23.3 percent. (See Table 1) The ETR reflects federal individual and corporate income taxes, social insurance taxes, and excise taxes except for the windfall profits tax. The rate will increase slightly for the quintile with the lowest incomes, fall slightly for the second and

third quintiles, and fall somewhat more for the two highest quintiles. Within the highest quintile, the top 1 percent will get the largest cut in their ETR--about 11 percent.

Changes within the period--from 1980 to 1985 and from 1985 to 1993--are larger than those between 1980 and 1993. ETRs in 1985--after the 1981 ERTA tax cuts and the first round of payroll tax increases--were less progressive than those in either 1980 or 1993. The ETR of the bottom quintile rose 28 percent between 1980 and 1985, while the ETR of the top 1 percent fell by 23 percent. Some of the change was reversed in the Tax Reform Act of 1986 and much of the rest was reversed in OBRA90.

Effective Tax Rates by Source

Although overall ETRs will change little between 1980 and 1993, there will be changes for most tax sources. (The ETRs for each source are taxes from the source divided by total income--not income taxable for that source. Thus, the ETR for a source reflects not only the ETR on income taxable by that source but also the fraction of total income represented by the income it taxes.) The combined ETR from the individual and corporate income tax will drop by 2 percentage points while the social insurance ETR will rise by nearly 2 percentage points. (See Table 2)

The ETR due to the individual income tax will fall by about 11 percent--from 12.3 percent in 1980 to 10.9 percent in 1993. Although this progressive source has become relatively smaller since 1980, the individual income tax will be more progressive in 1993 than it was in 1980. The percentage drop in the ETR is smaller as income rises--the subsidy as a percentage of income (negative ETR) for the lowest quintile will more than quintuple, the tax rate two quintiles will be cut by about 20 percent, and the tax rate of the top quintile will be cut by only 10 percent.

The added progressivity of the individual income tax did not come until after 1985. Tax rates for the lowest income groups declined, and tax rates for high-income families increased, between 1985 and 1989 and again between 1989 and 1993. In contrast, between 1980 and 1985, the largest percentage cuts had been received by the highest income groups. The net subsidy to the lowest quintile fell as inflation eroded the value of the personal exemptions, standard deductions, and the EITC.

While the effective individual income tax rate will decline between 1980 and 1993, ETRs imposed by social insurance taxes will increase. The rate for all families will grow by 24 percent, from 7.2 percent to 8.9 percent. Most of the increase in taxes was legislated before the 1980s began. The largest projected increases are at the bottom of the income distribution, where

earnings are expected to make up a larger fraction of income in 1993 than in 1980, and in the highest income categories. Because the taxable maximum was raised faster than wages in the early 1980s and because OBRA90 more than doubled the taxable maximum for Hospital Insurance (Medicare) payroll taxes, the three groups composing the top 10 percent will have increases in social insurance ETRs ranging from 38 percent to 48 percent. Despite these changes, about 10 percent of earnings will remain exempt from payroll taxes. Because of this exemption and because capital income represents a larger fraction of their income, the social insurance ETR of the top 1 percent will remain much lower than that of any other group.

Corporate income taxes were cut substantially by ERTA, and subsequent tax bills (including TEFRA and TRA, which both raised corporate taxes) have failed to restore the effective corporate income tax rate to its 1980 level. For all families, the ETR imposed by the corporate income tax was about 35 percent lower in 1985, and about 20 percent lower in 1989 and 1993, than in 1980.

Between 1980 and 1993, the ETR imposed by Federal excise taxes will rise by about 20 percent. There was virtually no change in this rate between 1980 and 1989. TEFRA raised some excise taxes in 1982, but then effective excise tax rates drifted downward because most excise taxes are specific taxes that are

not indexed for inflation. The excise ETR will jump between 1989 and 1993 because OBRA90 raised many excise tax rates. The tables show larger increases between 1980 and 1993 for low-income families than for families in higher income categories. In part this occurs because the more regressive excise taxes increased faster than others, but a more important factor is that the data show total consumption and consumption of taxed goods--the bases for allocating excise taxes--growing faster than income for low-income families.

In summary, the small changes in overall ETRs between 1980 and 1993 mask a number of offsetting trends. Both individual income taxes and payroll taxes will become somewhat more progressive over the time period. If the relative size of these two sources had stayed constant, the federal tax system would have become more progressive. Instead, the progressive income tax has declined as a fraction of income, while payroll taxes have grown, leaving total ETRs almost unchanged, except at the top. The top 1 percent, for whom payroll taxes are a relatively small share of income, will have an 11 percent lower total ETR in 1993 than in 1980.

The preceding discussion is based on allocating the corporate income tax half to labor and half to capital. Two alternative allocations of the corporate income tax--all to labor or all to capital--change the level of ETRs but do not change our conclusions about changes in them. (See Table 3) Allocating all

of the tax to capital income raises the ETR of the top 5 percent, especially the top 1 percent, and lowers the ETR of the other 95 percent. The top 5 percent is the only group that receives a larger share of their income from capital than the average for all families. The top 1 percent benefits less from the cut in corporate taxes with the all-labor allocation than with the 50/50 allocation used in Table 1, so the percentage cut in the total ETR for the top 1 percent is somewhat smaller--8 percent instead of 11 percent--but the result that the top 1 percent gets a larger cut than any other group is unchanged.

4. Effective Tax Rates at Constant Incomes

The effective tax rate (ETR) measures shown in Tables 1 and 2 reflect shifts in the level and composition of pre-tax income as well as the changes in tax policy that we seek to measure. For example, under a graduated price-indexed income tax, ETRs rise when real incomes rise. Shifts in the composition of income within income groups can change their ETRs--the rise in the share of wages in the income of the bottom quintile boosted their ETR due to social insurance taxes and reduced their benefit from the cut in corporate taxes. Changes in relative tax rates on different types of income--e.g., in relative rates on capital gains and other income--induce changes in income that affect measured ETRs. Shifts in the profitability of corporations that have nothing

to do with changes in the tax law may cause shifts in measured ETRs. Shifts in consumption patterns will change relative ETRs from excise taxes.

To isolate the effect of tax law changes, we apply the tax law from different years to a single year's data. While this analysis shows how changes in the law affect the relationship between income and taxes, it does not measure the full effect of changes in tax policy because measured pre-tax income in any given year is partly endogenous to that year's particular tax law.

We use these simulated income-constant effective tax rates to re-evaluate how ETRs have changed between 1980 and 1993. While the differences for most income groups are not dramatic, they nonetheless suggest that the overall progressivity of federal taxes decreased by more than what is suggested by changes in actual ETRs.

Simulating income-indexed tax laws

We compare indexed instead of actual tax laws for different years to remove the changes in ETRs produced by growth in nominal incomes. For example, had actual 1980 tax law remained in effect, ETRs would have been much higher in 1993 than in 1980 because both inflation and real income growth between 1980 and 1993 would have eroded the value of personal exemptions,

the standard deduction, and tax bracket boundaries relative to taxpayers' incomes.

Indexed law is constructed such that if all forms of income in all parts of the income distribution grew at the same rate, and if the demographic composition of the population remained unchanged, ETRs simulated for income-indexed law would be the same as actual ETRs.[7]

We simulate indexed individual income taxes by inflating (or deflating) all dollar tax parameters such as personal exemption amounts, standard deductions, tax bracket boundaries, break points for the earned income credit, and others by the change in per family pre-tax income between the tax law year and the income year and applying tax rates from the tax law year. (We index by the growth in income instead of the growth in the consumer price index in order to eliminate the effect on ETRs of both inflation and the average growth in real income.) We simulate indexed Social Security taxes by inflating (or deflating) the maximum taxable earnings amount by the change in per family earnings between the tax law year and the income year, and applying the payroll tax rates applicable in the tax law year. Indexed corporate income taxes are simulated by multiplying corporate profits in the income year by the ratio of corporate taxes to corporate profits in the tax law year. We simulate indexed excise taxes by multiplying per unit tax rates by the same factor used

to index individual income tax parameters, and applying those indexed tax rates to taxable expenditures in the income year.

When the tax law year differs from the income year, simulated corporate income taxes and the employer portion of the payroll tax are not equal to actual corporate taxes and employer payroll taxes in the income year. Because pre-tax family income is held constant and measured before all taxes, we must adjust family income net of corporate and employer payroll taxes to keep pre-tax family income constant. We adjust wages and income from capital in proportion to the assumed incidence of corporate income and employer payroll taxes.

Effective Tax Rates: 1980-1993

The effect of tax policy changes on ETRs in the past decade looks different when those changes are evaluated at constant incomes. While the actual total federal ETR was virtually unchanged between 1980 and 1993, 1980-1993 tax law changes increased the total federal ETR from 22.5 percent to 23.2 percent--about 3 percent--when evaluated at 1985 incomes (Tables 1 and 4). That change is reversed when the ETR is evaluated at 1989 incomes. The 1980-1993 tax law changes decreased the total federal ETR from 23.8 percent to 23.0 percent--also about 3 percent--at 1989 incomes (Table 6).

The effect of holding income constant differs across income groups. The total ETR for the lowest income quintile increased from 8.1 percent to 8.4 percent between 1980 and 1993. Over the same period, changes in the tax law increased the total ETR by about the same amount at 1985 incomes, but tax law changes had no effect on the total ETR at 1989 incomes. The actual total ETR declined by a small amount for families in the middle three income quintiles between 1980 and 1993, but 1980-1993 tax law changes evaluated at either 1985 or 1989 incomes show an increase in the total ETR for those families. The ETR for the highest income quintile fell from 27.6 percent in 1980 to 26.6 percent in 1993, but 1980-1993 tax law changes instead show a small increase at 1985 incomes. At 1989 incomes, 1980-1993 tax law changes show twice as big a decrease in the total ETR for the highest income quintiles as the actual change.

So what did happen between 1980 and 1993? The actual change in the ETR suggests that the tax burden rose in the lowest quintile and fell by varying amounts in all other income quintiles. Yet one set of income-constant results--for 1985 incomes--suggests that the tax burden rose in all income quintile, while the other set of income-constant results--for 1989 incomes--suggest that the tax burden was the same in 1993 as in 1980 in the lowest income quintile, higher in the three middle quintiles, and lower in the highest income quintile.

Explaining the differences

Between 1980 and 1993 average family incomes did not grow at the same rate in all parts of the income distribution. In addition to differential income growth, there were changes in the composition of income for different income groups. These changes are reflected in different estimates of the ETR under the same tax law when those laws are evaluated at 1985 or 1989 incomes, particularly for estimates of the ETR in 1980. For low-income families, the 1980 law ETR is higher with 1985 or 1989 incomes than the ETR with 1980 incomes. For families in the three middle income quintiles, the ETR under 1980 law is significantly lower if 1980 law is simulated with either 1985 or 1989 incomes rather than with actual 1980 incomes.

Low income families. In the lowest income quintile, the difference between ETR under 1980 law evaluated at 1980 incomes and the ETR under 1980 law evaluated at 1985 or 1989 incomes are almost entirely due to changes in the composition of income. The most notable change is the increased share of income from earnings and the decreased share from transfers (Table 8). Much of this is the result of growth in average social security benefits, which pushed retirees higher up in the income distribution. This is reflected in a declining wage share for the second and middle income quintiles and a small increase in

the share of income from transfers (mostly Social Security benefits) and other income (mostly private pensions).

For the lowest income quintile, the ETR under 1980 law simulated at 1985 and 1989 incomes is 0.4 to 0.5 percentage points higher than the actual ETR in 1980. Part of the increase is due to a higher wage share of total income which increases the portion of the ETR attributable to payroll and corporate income tax rates. However, the higher wage share also results in a lower effective individual income tax rate due to higher subsidies (negative taxes) from the earned income credit, which offset the increase in effective payroll tax rates. The remaining difference between the ETR under 1980 law at 1985 and 1989 incomes and the ETR at 1980 incomes is due to a higher effective excise tax rate, and reflects an increase in taxable consumption between 1980 and both 1985 and 1989 for low-income families. Using these higher values of consumption raises simulated excise taxes as a share of all income under 1980 law at 1985 and 1989 incomes.

Middle income families. For families in the three middle income quintiles, the actual ETR fell slightly between 1980 and 1993. The ETR evaluated at 1985 and 1989 incomes increased by about 1 percentage point for the second and middle quintiles and by about half of a percentage point for the fourth quintile.

The difference between the measured changes in actual ETRs and the changes at fixed incomes is again mostly a result of different estimates of the ETR under 1980 law. The simulated 1980 law ETR evaluated at 1985 or 1989 income levels is lower--by about one percentage point in most cases--than the 1980 law ETR at 1980 income levels. Almost the entire difference is a difference in effective individual income tax rates. The simulated 1980 law individual income ETR is lower at 1985 and 1989 incomes than at 1980 incomes for two reasons. First, there was a shift between 1980 and 1985 in the composition of pre-tax income from taxable to non-taxable income as the share of income from wages declined and the share from social security benefits grew. Second, income for the three middle quintiles grew slower than average income between 1980 and either 1985 or 1989. Because indexed law is simulated by indexing all tax parameters by the growth in average income, a graduated tax system makes income-constant effective tax rates lower than actual effective tax rates for groups whose income grows less than average. This is particularly true for the steeply graduated income tax schedule in effect in 1980.

Thus, although tax law changes evaluated at constant incomes increased ETRs for families in the three middle income quintiles, those increases were not observed in actual ETRs because of changes in the income and demographic composition of those quintiles. The increase in the income share

from tax-favored retirement benefits--as social security beneficiaries became relatively better-off--and the slower than average income growth of these quintiles both offset any increase in their ETRs after 1980.

High income families. For the highest income groups, the story is a combination of changing income composition and relatively high growth in income. This is most clearly illustrated by comparing trends in actual and income constant ETRs for families in the top 1 percent of the income distribution. For these families, the ETR under 1980 law at 1985 incomes is 10 percent lower than the ETR under 1980 law at 1980 incomes. About one-third of this difference is due to a lower measured corporate ETR, the result of applying the 1980 ratio of corporate taxes to corporate profits to the lower corporate profits of 1985. The remaining two-thirds of the difference is due to a lower ETR under the individual income tax.

The main reason for lower individual income ETRs is a change in the composition of income between capital gains and other sources. Capital gains were 27 percent of the pre-tax income of the top 1 percent in 1980 and 35 percent of other income in 1985. Because capital gains received favorable treatment under 1980 law (the maximum marginal tax rate on gains was 28 percent in 1980 compared with a maximum rate of 50 percent on earnings and 70 percent on other income), the higher capital gains share in 1985 makes the

1980 law ETR with 1985 incomes lower than the 1980 law ETR with 1980 incomes. This lower 1980 law ETR at 1985 incomes makes the decline in the ETR between 1980 law and 1993 law only 3 percent instead of 11 percent.

In contrast, the 1980 law ETR for families in the top 1 percent is 13 percent higher when evaluated at 1989 incomes instead of at 1980 incomes. Income composition changes explain part of the difference. Capital gains in 1989 were 22 percent of the pre-tax income of the top 1 percent, compared with 27 percent in 1980. With a smaller gains share, the favorable treatment afforded capital gains under 1980 law has less of an effect, and 1980 effective tax rates are higher when simulated with 1989 incomes. A more important source of the difference, however, is that the income of the top 1 percent increased at a much greater rate than average income between 1980 and 1989. This results in a much greater portion of 1989 income being taxed at the highest marginal tax rates under 1980 law (indexed to average income growth) compared to the proportion of income of the top 1 percent that was actually taxed at the highest rates in 1980. Slightly offsetting these two effects is the decline in corporate profits in 1989 relative to 1980. As with 1985 incomes, lower corporate profits in 1989 reduce the 1980 law corporate ETR evaluated at 1989 incomes relative to the actual corporate ETR in 1980. This decrease, however, offsets only about a fifth of the higher total 1980 ETR at 1989 incomes attributable to a higher effective individual income tax rate.

Was TRA a tax cut for high-income families?

Evaluating changes in ETRs with incomes held fixed also gives a different perspective on recent tax legislation. In particular, the effect of TRA on the highest income families, measured by the change in the effective ETR under the individual income tax, can appear quite different when it is evaluated in different income years.

Measured at current year income levels (Table 2), the individual income ETR for the top 1 percent rose by 6.3 percent, from 19.2 percent under 1985 law to 20.4 percent under 1989 law. Measured at constant 1985 income levels (Table 5), the individual income for the top 1 percent also rose, but by 4.7 percent, from 19.2 percent under 1985 law to 20.1 percent under 1989 law. Although the composition of income for the top 1 percent had changed from 1985 to 1989--partially in response to the tax changes themselves--in ways that offset some of the tax increase, the rapid growth in incomes at the top end of the distribution raised effective tax rates by more than they would have increased had 1985 incomes grown only at the average rate.

Measured at constant 1989 income levels, however (Table 7), the individual income ETR for the top 1 percent **fell** by 20.3 percent, from 25.6 percent under 1985 law to 20.4 percent under 1989 law. The ETR under 1985 law is much

higher when that law is evaluated at 1989 incomes (25.6 percent) instead of at 1985 incomes (19.2 percent). By 1989, not only had the incomes of the top 1 percent grown more rapidly than average incomes--resulting in a higher ETR when indexed 1985 law is applied to those incomes--but the composition of income had shifted away from sources and activities that previously had been favored under 1985 tax law.

A changing share of income from realized capital gains was part of the shift in the composition of income for the top 1 percent between 1985 and 1989. Because capital gains were taxed at a lower rate than other income under 1985 tax law, applying 1985 law to income in a year in which the top 1 percent received a smaller share of their income from capital gains (1989) yields a higher ETR than applying 1985 law to income in a year in which capital gains were a larger share of income (1985).

The difference also reflects a similar change with respect to passive losses. In 1985 passive losses for the top 1 percent were a much higher percentage of total income than they were in 1989. Because passive losses were deductible under 1985 tax law, applying 1985 law to income in a year in which passive losses were a small percentage of income (1989) yields higher effective tax rates than applying 1985 law to income in a year in which passive losses were a larger percentage of income (1985).

The ambiguity in measuring the effects of TRA on high income taxpayers is in part a standard index number problem.[8] The effect of changing relative prices--in this case reducing the tax rate on earnings and (the negative rate) on passive losses and increasing the tax rate on capital gains--is sensitive to the quantity weights (the ratios of earnings, gains, and passive losses to total income) used in computing the price effects (tax rates). In the next section we display estimates of changes in effective tax rates assuming some changes in income are themselves a response to the change in tax laws.

5. Behavioral Responses and Tax Incidence: Some Illustrative Calculations

The calculations of effective tax rates (ETRs) that we report in Tables 1-7 do not explicitly represent the effect that tax laws have on taxpayer behavior. The calculations in Tables 4 and 6, however, indicate that changes in the distribution and composition of pretax income can significantly affect static estimates of changes in ETRs. These changes in the composition of income could themselves be a response to changes in the tax law.

In this section, we use an explicit model to calculate changes in tax incidence when reported incomes change in response to changes in the tax law.

We display changes in tax incidence under 1980, 1985, and 1989 tax laws evaluated at 1989 incomes, using selected estimates of the responsiveness of cash wages and realized capital gains to changes in marginal tax rates. We compare these estimates to the measured change in tax incidence between 1980 law and 1989 law, at fixed 1989 incomes.

Behavioral Responses and Tax Incidence

Changes in the tax law produce a wide range of taxpayer responses. Changes in effective marginal tax rates on labor and capital income affect the choice between labor and leisure (or non-market production) and the choice between present and future consumption, thereby affecting work effort and saving. Changes in the relative effective marginal tax rates among activities affect the allocation of investment, the composition of consumption, and the form in which people receive compensation. Taxpayers can be especially responsive to provisions that enable them to reduce tax liability by altering methods of financing or changing the timing of activities. Based on a review of research on responses to tax law changes in the 1980s, Slemrod (1990) concludes that the income tax has a significant effect on financial and timing decisions, but only a minor effect on aggregate factor supplies.

Static measures of tax incidence typically measure the taxpayer's gain or loss from tax law changes as the change in taxes paid at the taxpayer's initial level of income. The behavioral response to this change in tax rates alters both the change in tax payments and the change in the taxpayer's well-being, although not necessarily in opposite directions. If, for example, a taxpayer responds to a reduction in the marginal tax rate on wages by increasing taxable wage income (by, for example, spending more hours in paid work or bargaining with his employer for a higher share of cash wages in total compensation), this response increases taxes paid. It is also, however, associated with an increase in the taxpayer's well-being. Because the response is voluntary, the taxpayer's net utility gain from higher cash wage income must exceed any utility loss from foregone leisure, lower tax-free fringe benefits, and higher tax payments. The static measure of the tax cut at the taxpayer's initial income overstates the reduction in taxes paid, but understates the increase in the taxpayer's well-being.

If, on the other hand, the taxpayer responds to an increase in marginal tax rates by reducing taxable wage income, then the behavioral response reduces taxes paid and increases well-being. The measured static effect at the initial income level overstates both the increase in taxes paid and the reduction in utility.

Whether the marginal tax rate decreases or increases, the net benefit to the taxpayer is greater (or the loss less than) than the static estimate of the change in tax payments at the initial level of income. This is because the change in relative prices makes the behavior that produces the initial income suboptimal; the behavioral response always increases utility. On the other hand, the tax rate change is less beneficial (or more harmful) to the taxpayer than the change in tax payments estimated at the post-adjustment level of income. The correct measure of the change in well-being is in between the two static measures of changes in taxes paid.

Effect of 1980-1989 Tax Law Changes on Incentives

Economic incentives, including incentives to work, save, invest in assets that produce taxable income, and realize capital gains, are affected by marginal tax rates on earnings, capital gains, and other income from capital (rent, interest, and dividends). The changes in tax law that became effective between 1980 and 1989 (ERTA, TRA, and the Social Security Amendments of 1977 and 1983) altered marginal tax rates substantially for some taxpayers and some forms of income. Both ERTA and TRA reduced marginal income tax rates on wages, but the Social Security Amendments increased payroll tax rates.[9] ERTA reduced marginal tax rates on capital gains, but TRA increased them

above the pre-ERTA levels. Both ERTA and TRA reduced marginal tax rates on other capital income.

The average marginal tax rate on earnings declined from 35.0 percent to 31.2 percent--a reduction of about 11 percent--when comparing 1980 tax law and 1989 law at 1989 incomes (See Table 9)[10]. There were large differences, however, in the change in marginal tax rates among income groups. The marginal tax rate on earnings increased for taxpayers in the bottom two quintiles because the rise in payroll tax rates more than offset the small decline in marginal income tax rates. The marginal tax rate declined moderately in the third and fourth quintiles and substantially (by 18 percent) in the top quintile. For taxpayers in the top 1 percent, the marginal tax rate on earnings dropped by 43 percent from over 50 percent to less than 30 percent, largely as a result of TRA.

The average marginal tax rate on capital gains increased in all income groups. The proportionate increase in the rate was greatest in the lowest income groups because, for them, there was little decline in marginal tax rates to offset the elimination of the 60 percent capital gains deduction in TRA. The rate increase, however, had relatively little total impact on those taxpayers because capital gains account for only a small fraction of their income. The average marginal tax rate on other capital income increased for taxpayers in

the bottom three quintiles of the distribution and declined for the top two quintiles. For the top 1 percent, the marginal tax rate on other capital income was more than halved, dropping from 56.7 percent to 28.2 percent.

The changes in marginal tax rates reported in Table 9 do not give a complete picture of the impact of tax law changes on incentives to work and save. The net tax wedge between the value of the marginal product of labor and after-tax wages that affects work effort depends also on excise taxes and tax preferences; the former add to the effective marginal tax rate on the return to paid work by lowering the real wage, while the latter reduce the effective marginal tax rate by allowing some consumption and saving to be financed with pretax wages. Because TRA reduced some tax preferences, it is likely that effective marginal tax rates on earnings declined by less than the decline in statutory marginal tax rates. Similarly, the slight decrease over the 1980-1989 period in the effective corporate tax rate reduced slightly the total tax on income from capital (or reduced the tax on labor income, if one assumes labor pays the corporate income tax.)

Measuring Effective Tax Rates With Behavioral Responses

To measure the effective tax rate in the presence of behavioral responses, we begin with realized cash income that taxpayers reported in 1989 under 1989 tax

law. We use equations that express realized cash income as a function of the marginal tax rate on cash income and estimate the level of reported income in 1989 if the marginal tax rate were zero. We call this level of income "potential income." The total effective tax rate is the ratio of taxes to potential income.

Taxes consist of two parts. The first part is the actual amount of taxes paid, including imputations of corporate taxes and employer payroll taxes. We call this amount the "explicit tax." The second amount is an estimate of the dollar loss to the taxpayer associated with the realized cash income he forgoes to reduce tax payments. We call this amount the "implicit tax."[11]

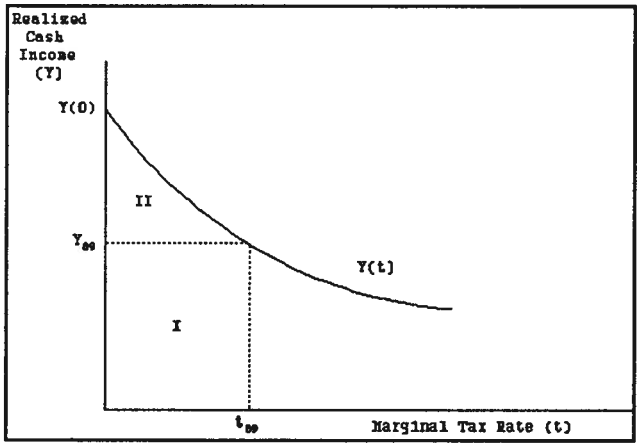

Figure 1 illustrates the method we use to measure tax burdens for each taxpayer. The curve Y(t) represents realized cash income (Y) as a function of the marginal tax rate (t), with $dY/dt < 0$. (The curve conceptually represents an income-compensated demand curve--for example, how much marginal tax rates on capital gains affect the demand for capital gains realizations with total income held fixed.) The distance Y_{89} is observed realized cash income in 1989, while $Y_{(0)}$ represents potential income

in 1989 (that is, income the equation projects at a zero marginal tax rate). The explicit tax under 1989 law is represented by area I multiplied by a_{89}, where a_{89} is the ratio of the average tax rate to the marginal tax rate on realized cash income in 1989, or:

$$1) \quad T_E = a_{89} t_{89} Y_{89}$$

The implicit tax (or excess burden) is represented by area II and measures the loss to the taxpayer from the tax-induced reduction in realized cash income.[12] We can express area II mathematically as:

$$2) \quad T_I = \int_0^{t_{89}} Y(t)dt \; - \; t_{89} Y_{89}$$

The total effective tax rate is then:

$$3) \quad ETR = (T_E + T_I)/Y_{(0)}$$

Illustrative Responses: Capital Gains Realizations and Wages

A complete specification of all the potential behavioral responses to tax law changes requires a complex general equilibrium model that is beyond the scope of this paper.[13] To illustrate how behavioral responses can affect measured changes in effective tax rates, we consider only two possible responses -- the response of capital gains realizations to changes in the marginal tax rate on

realized gains and the response of cash earnings from wages to changes in the marginal tax rate on earnings. While illustrative, these two responses do reflect two income sources whose changing composition had substantial effect on the estimates of changes in ETRs that we report in this paper, especially for high income families.

There have been many econometric studies that have estimated the response of capital gains realizations to changes in the marginal tax rate on gains, but estimates of the size of the response are diverse.[14] We simulate capital gains realizations using an equation of the form:

$$4) \quad \text{Log}(G) = a - bt_g,$$

where G is realized gains, t_g is the marginal tax rate on gains, and a and b are constants.[15] With this functional form, the elasticity of realizations with respect to t_g is directly proportional to t_g. Revenue from capital gains taxes is maximized at the tax rate $t_g^* = 1/b$.[16] We choose values of b to illustrate effects of a lower realizations response ($b = 2.0$ and $t_g^* = 50\%$) and a higher response ($b = 4.0$ and $t_g^* = 25\%$).[17]

We use a similar functional form to relate cash earnings to the marginal tax rate on wages. We represent the equation as:

$$5)\ \log (E) = c - dt_w,$$

where E is cash earnings (including the employer contribution to payroll taxes), t_w is the marginal tax rate on cash wages (including both income tax and the employer and employee contributions to payroll taxes), and c and d are constants.

To be consistent with the assumption that the incidence of individual income taxes falls on recipients of income, we assume the pretax wage rate is unaffected by changes in marginal tax rates on earnings. We consider two sources of changes in cash earnings in response to changes in t_w--changes in hours of work and changes in the proportion of compensation paid in the form of cash wages instead of tax-free fringe benefits. We choose values of L_p, L_s, and F_t, where L_p is the elasticity of labor supply of primary workers with respect to the after-tax wage, L_s is the elasticity of labor supply of secondary workers with respect to the after-tax wage, and F_t is the elasticity of the fringe benefit share of compensation with respect to the marginal tax rates.[18]

We select values of $L_p = 0$, $L_s = 0.5$, and $F_t = 0$ for the lower response case and $L_p = 0.1$, $L_s = 1.0$, and $F_t = 0.2$ for the higher response case.[19] We then compute values for the percentage change in cash earnings per percentage

point change in the marginal tax rate for primary and secondary workers (d_p, d_s), from the equations:

$$6a)\quad d_p = -[(f^*)F_t/(1-f^*)t_w^*] - [(1-f^*)L_p/((1-t_w^*)(1-f^*)+f^*)]$$

and

$$6b)\quad d_s = -[(f^*)F_t/(1-f^*)t_w^*] - [(1-f^*)L_s/((1-t_w^*)(1-f^*)+f^*)]$$

where t_w^* is the 1989 marginal tax rate on wages and f* is the 1989 ratio of tax-free fringe benefits to total compensation. Equations (6a) and (6b) give the values of d for primary and secondary workers that are implied by the selected values of the elasticity of supply of labor and the tax rate elasticity of demand for fringe benefits at 1989 levels of the marginal tax rate on wages and the ratio of fringe benefits to total compensation.

The behavioral coefficients we select are illustrative only and do not endorse any particular elasticities estimated in the literature. Two features of the responses we assume are worth mention. First, the proportional response of capital gains realizations to a percentage point change in the marginal tax rate is much greater than the corresponding response for cash earnings in both

the lower and higher response scenarios. Second, the ratio of the response to wages to the response of capital gains realizations is higher in the higher response scenario.

Illustrative Computations of Effective Tax Rates

Implicit tax rates. Implicit tax rates (the ratio of implicit taxes to potential income) declined between 1980 and 1985, reflecting overall reductions in average marginal tax rates on all forms of income (Table 10). They increased between 1985 and 1989 (and for the entire 1980-89 period) under the lower response assumptions, but decreased between 1980 and 1989 under the higher response assumptions.

These differences reflect the assumed differential responses to changes in marginal tax rates on wages and capital gains. Under the high response assumptions, the average implicit tax rate declined from 3.2 percent in 1980 to 2.9 percent in 1985 and 1989. For the top 1 percent, the implicit rate declined from 4.6 percent to 3.6 percent between 1980 and 1985 and then increased to 4.0 percent in 1989.

The changes in implicit tax rates reflect offsetting changes in marginal tax rates on earnings and capital gains. As previously discussed, average marginal

tax rates on earnings declined between 1980 and 1989, but average marginal tax rates on capital gains, while declining between 1980 and 1985, increased in TRA and were higher in 1989 than in 1980. The assumed percentage response of the tax base to changes in marginal tax rates on earnings is much smaller than the assumed response to capital gains, but the earnings response is applied to a much larger base. Under the lower response assumptions, the assumed earnings response is so low relative to the capital gains response that the increase in the marginal tax rate on capital gains affects the overall implicit tax more than the cut in the marginal tax rate on earnings. Under the higher response assumptions, the ratio of the earnings response to the capital gains response is higher and this makes the decline in the implicit tax rate from lower marginal tax rates on earnings greater than the increase from higher marginal tax rates on capital gains for the entire 1980-89 period, although the total implicit tax rate remains constant between 1985 and 1989.

Under the higher response assumptions, the implicit tax on earnings (as a share of all income) is greater than the implicit tax on capital gains in all years (Table 11). For the top 1 percent, however, the implicit tax on capital gains under these assumptions is greater than the implicit tax on earnings in 1980 and 1989. The implicit tax on both earnings and capital gains declined between 1980 and 1985 for both the population as a whole and the top 1 percent. Between 1985 and 1989, the implicit tax on earnings declined by 0.4 percent of

income for the population as a whole and by 1.0 percent of income for the top 1 percent. This was fully offset by an increase in the implicit tax on gains for the population as a whole and more than offset by an increase in the implicit tax on capital gains for the top 1 percent.

Overall Effective Tax Rates. When we include the effects of responses of cash wages and realized capital gains to changes in marginal tax rates, the overall ETR declines slightly between 1980 and 1989 (Table 12). For the bottom four quintiles, these results are almost the same as the 1980-89 changes in ETRs that we measure holding 1989 incomes fixed (Table 6). The similar findings are not surprising because we use 1989 incomes as the base for both calculations and because behavioral responses produce only minor changes in income in the bottom four quintiles. For families in these quintiles, marginal tax rates changed little except for the marginal tax rate on capital gains. But the latter rate has only a slight effect on the total ETR because capital gains account for a very small fraction of income of families in the bottom four quintiles. The total ETR increases by about 10 percent in the bottom quintile and increases slightly for taxpayers in the middle three quintiles.

There are, however, differences in the measured change in ETRs for families in the top quintile and especially for families in the top 1 percent. The measured ETR declines the most for families in the top 1 percent -- 25.3

percent under the low response assumptions and 21.5 percent under the high response assumptions. (In comparison, the ETR for the top 1 percent at fixed 1989 incomes declined by 27.2 percent between 1980 and 1989.) For these families, the assumption of large behavioral responses produces lower estimates of the ETR in all years. This occurs because the marginal implicit tax rate on the unrealized portion of the potential income we project is less than the average tax rate on both actual realized income under 1989 law and simulated realized income under 1985 and 1980 laws. This occurs even though explicit marginal tax rates are higher than explicit average tax rates. The lower estimates of the ETR reflect in part the ability of taxpayers to avoid the full impact of high marginal tax rates on wages and realized capital gains by working less, converting cash into tax-free fringe benefits, and holding on to assets with accrued capital gains.

Between 1980 and 1989, the tax law changes reduce the ETR in the top 1 percent by a smaller percentage when we assume higher behavioral responses than when we evaluate the tax cut at the post-behavior (1989) level of wages and capital gains realizations. This is because a higher response reduces the 1980 ETR by more than it reduces the ETR in the presence of the lower marginal tax rates on earnings in 1989. Even so, the estimates in Table 12 for high behavioral responses still show the tax system became less progressive

between 1980 and 1989 and still show the changes in TRA reducing the ETR for the top 1 percent.

If we had applied the same method to 1985 incomes, we would have shown a larger cut in taxes for the top 1 percent than the 8 percent cut between 1980 and 1989 shown in Table 4. However, because our adjustments for earnings and capital gains do not explain all of the differences between 1985 incomes and 1989 incomes, the results based on the 1985 data would have continued to show smaller tax cuts than those based on 1989 data.

6. Summary

Despite major changes in tax laws, total effective tax rates (ETRs) will change little between 1980 and 1993. The total ETR for all families in 1993 will be approximately the same as in 1980. The distribution of ETRs among families in different income groups will be slightly less progressive. The ETR will be slightly higher for low-income families and slightly lower for middle income families and most families in the highest quintile. The ETR will be slightly over 10 percent lower for families in the top 1 percent in 1993 than in 1980. The overall ETR and tax progressivity both declined markedly between 1980 and 1985, but both the overall ETR and measured progressivity increased between 1985 and 1989 and both are projected to increase again between 1989 and 1993.

The small overall change in the projected distribution of ETRs results mostly from a change in the composition of revenue sources. Between 1980 and 1993, payroll taxes increased as a share of total revenues and individual and corporate income taxes decreased. Although families with higher incomes will pay a larger share of both payroll taxes and individual income taxes in 1993 than they did in 1980, the tax system overall will be slightly less progressive because the distribution of payroll taxes, which increased in importance, is less

progressive than the distribution of income taxes, which decreased in importance.

The estimated changes in the distribution of ETRs between 1980 and 1993 result both from changes in tax policy and also from changes in the underlying level, distribution, and composition of pretax income and consumption. Simulations of how income-indexed tax laws in different years affect a sample of families drawn from a single year show the effect of tax policy changes alone on ETRs.

The measured effects of tax policy changes alone, however, depend on the income year for which the tax policy changes are simulated. Changes in income-indexed tax law between 1980 and 1993 increased the overall ETR when applied to 1985 incomes, but reduced the overall ETR slightly when applied to 1989 incomes. Tax changes increased ETRs for families in the bottom four quintiles at 1985 incomes and the middle three quintiles at 1989 incomes. For families in the top quintile, however, the tax changes increased the ETR by about 3 percent at 1985 incomes, but lowered it about 7 percent at 1989 incomes. For families in the top 1 percent, tax changes reduced the ETR by about 7 percent at 1985 incomes and by about 23 percent at 1989 incomes.

The differences between the two income-fixed measures for 1985 and 1989 tax laws, which reflect the changes in TRA, are particularly striking. For the top 1 percent, the tax law changes between 1985 and 1989 increased the ETR by 8 percent, at 1985 incomes, but reduced the ETR by 14 percent at 1989 incomes. The difference results mainly from the decline in the ratio of realized capital gains and passive losses to total income between 1985 and 1989. Because TRA reduced the tax rate on ordinary income, increased the tax rate on capital gains, and eliminated deductibility of passive losses, it raised taxes on 1985 incomes, but reduced taxes on 1989 incomes, which included relatively fewer capital gains and passive losses.

The changes in the distribution and composition of income could in part reflect responses to changes in the tax law. When people change reported income in response to changes in tax law, the responses alter both tax payments and taxpayer well-being. Because taxpayer responses are voluntary, static estimates of changes in tax payments underestimate the net benefit (or overstate the net cost) to them when measured at initial levels of income. In contrast, static estimates overestimate the net gain (or understate the net cost) to taxpayers when measured at post-adjustment levels of income.

A full measure of tax burdens would include estimates of both explicit taxes paid and of implicit taxes that reflect the cost to taxpayers when they reduce

reported income to avoid paying tax. Such measures require assumptions of how taxpayer behavior responds to changes in marginal tax rates. We simulate changes in total tax burdens between 1980 and 1989 using selected values of the responsiveness of earnings and realized capital gains to marginal tax rates. Because marginal tax rate changes in 1980-89 were relatively small for taxpayers in the bottom four quintiles, almost all the difference between the static and full estimates of changes in tax burdens is for high income taxpayers. The simulations with behavioral response show that ETRs for high income taxpayers declined for the highest income groups, but by less than the simulated decline between 1980 and 1989 with 1989 incomes held fixed. The decline in ETRs would have been even smaller if we had included other sources of changes in income in response to the tax law.

In conclusion, our data show little overall change in the level and distribution of Federal effective tax rates between 1980 and 1993. There is evidence, however, that tax burdens declined for the very highest income families and that previous estimates understated their gains from tax law changes. In particular, the Tax Reform Act of 1986 appears after the fact to have reduced the tax burden on the highest income families, instead of increasing it.

NOTES

1. For a description of tax changes between 1980 and 1990, see Steuerle (1992).

2. Matched data sets were used in studies by the Brookings Institution, documented in Pechman and Okner (1974), Minarik (1980) and Pechman (1985); and in a project undertaken by the Office of Tax Analysis in conjunction with its analysis of tax reform in 1984 and 1985, documented in: U.S. Department of the Treasury (1984), Nelson (1987), and Cilke, Nelson, and Wyscarver (1987). CBO analyses that focus on consumption taxes have used matched data. For example, see CBO (1990; 1992).

3. In computing the burden of Federal payroll taxes, CBO does not account for any offsetting marginal OASDI benefits employees receive in exchange for higher contributions. For estimates of marginal tax rates on wages that include the offsetting effects of retirement benefits, see Feldstein and Samwick (1992).

4. The CBO has used AFI in a number of published studies and analyses. See, for example, Congressional Budget Office (1988a).

5. CBO analyses regard individuals not living with relatives as one-person families. (In contrast, the Bureau of the Census counts as families only groups of two or more people related by blood, marriage, or adoption.)

6. The simulations for 1993 are based on CBO's economic assumptions of January 1992 and on the tax law as it existed at that time. We assumed that the distribution of income will be the same in 1993 as it was in 1989, adjusted for different rates of growth in income from various sources.

7. To illustrate how this works, consider a family of four with adjusted gross income (AGI) and total realized cash income of $25,000 in 1979. If that family had claimed no deductions other than the standard deduction and the personal exemption of $1,000 per family member, it would have been in the 28 percent marginal rate bracket and paid a total income tax of $3,497 or 14 percent of income. Between 1979 and 1989, income per family increased by about 82 percent. We simulate income-indexed 1979 level at 1989 income levels by inflating the personal exemption amount, the standard deduction, and all tax rate bracket widths by 82 percent and applying the 1979 tax rates. Under this method, a family of four with the same relative AGI of $45,500 (82 percent greater than $25,000) would be in the 28 percent marginal rate bracket under income-indexed tax law and pay an income tax of $6,365, which is also 14 percent of income.

Had we applied actual 1979 tax law instead of indexed 1979 law to 1989 incomes, we would have represented 1979 law as applying much higher tax rates to typical families in 1989 than in 1979. For example, the same 1989 family with an income of $45,500 would have been in the 43 percent marginal rate bracket under actual (unindexed) 1979 law and paid a total income tax of $10,871, or 23 percent of income.

8. Another reason TRA may have been less progressive than conventional measures would indicate is that a portion of the increases in the corporate ETR and the ETR on high-income individuals resulted from acceleration of collections from future years. For example, Gravelle (1992) points out that the estimated short-run revenue gains from the inventory capitalization rules and the passive loss restrictions are unlikely to be permanent.

9. In the calculations in this paper, we count both employer and employee contributions in computing the effect of payroll taxes on marginal tax rates. We also assume that employees respond to the tax rates alone and not to the increase in the present discounted value of higher retirement benefits that increases in qualified earnings produce. For this reason, we may overstate the adverse incentive effect of increases in payroll tax rates.

10. The average marginal tax rate on earnings reflects marginal income tax rates, including the phase-in and phase-out of the earned income credit, and both the employee and employer portion of payroll taxes.

11. The incidence assumptions in this paper imply that changes in the individual income tax do not affect pretax wage rates or prices of assets. Therefore, the implicit tax that we estimate does not reflect a change in market prices. Instead, it reflects the welfare losses that employees incur from lower cash wages attributable to fewer hours of work and that investors incur from lower realized gains due to fewer sales of assets. Workers and investors voluntarily incur these losses from reduced work effort and fewer asset sales because the cost to them of paying taxes would be even greater.

Economists have also used the term "implicit tax" to refer to the reduction in pretax monetary returns from changes in market prices in response to tax laws. An example is the case of tax-exempt bonds. Financial market equilibration makes the return on tax-exempt bonds lower than the pretax return on taxable securities of equal risk; economists have called this reduction in the tax-exempt yield an implicit tax on the owners of tax-exempt bonds. In this sense, the implicit tax reflects a price change that shifts the benefit of tax-exemption from lenders to borrowers. See Galper and Toder (1984) and Scholes and Wolfson (1992).

12. This is an approximation that assumes that any additional realized cash income under a reduced the tax rate schedule would be taxed at the new (constant) marginal rate. If, for example, current tax rates were reduced across the board by 20 percent from 15, 28, and 31 percent to 12, 20 and 26 percent, a taxpayer currently in the 15 percent bracket would now face a marginal tax rate of 12 percent. If the taxpayer increased realized income according to the equation represented in Figure 1, it is possible the increased income could put the taxpayer in the 20 percent bracket. This produces a corner solution where the taxpayer realizes just enough extra income to reach the higher bracket; an explicit utility function would be required to evaluate the reduction in excess burden. For simplicity, we assume in these calculations that induced changes in income do not cause taxpayers to move into different marginal tax brackets.

For use of a similar method to evaluate the efficiency and revenue effects of a capital gains tax in the context of a general equilibrium simulation model, see Hendershott, Toder, and Won (1991).

13. For a review of the use of general equilibrium models to analyze the 1986 Tax Reform Act, see Henderson (1991).

14. For surveys of this research, see Congressional Budget Office (1988) and Henderson (1989).

15. The semilog form of the equation for capital gains realizations has been used in several econometric studies. See, for example, Lindsey (1987), Congressional Budget Office (1988b), and Auerbach (1989).

16. A preferential rate on capital gains can reduce total income tax revenue by more than it reduces capital gains revenues if it induces people to substitute lightly-taxed capital gains for more heavily taxed ordinary income. See Cook and O'Hare (1987) and Hendershott, Toder, and Won (1991). The examples in this paper do not consider the effects of tax law changes on the incentive to substitute capital gains for ordinary income.

17. The high response assumption implies that the average, gains-weighted elasticities of realizations to marginal tax rates at 1989 law rates were: -0.16 in the bottom quintile, -0.47 in the second quintile, -0.58 in the third quintile, -0.76 in the fourth quintile, and -1.13 for families in the top quintile of the income distribution. Within the top quintile, the implied elasticities are: -1.00 in the 81st-90th percentiles -1.10 in the 91st to 95th percentiles, -1.19 in the 95th through 99th percentiles, and -1.13 in the top 1 percent. The low response elasticities are half as large in absolute value.

18. For discussions of the responsiveness of labor supply to changes in marginal tax rates that raise after-tax wage rates, see Bosworth and Burtless (1992), Hausman (1981), and Hausman and Poterba (1987). Turner (1987) and Long and Scott (1982) have estimated the response of fringe benefits to marginal tax rates.

19. In a recent book that assesses favorably the economic effects of the tax policy changes of the 1980s, Lindsey (1990) assumed values of $L_p = 0.1$, $L_s = 1.0$, and, based on Turner (1987), $F_t = 0.18$.

TABLE 1. EFFECTIVE TAX RATES BY INCOME GROUP, 1980-1993

	1980	1985	1989	1993[a]
Income Quintile[b]				
Lowest	8.1	10.4	9.3	8.4
Second	15.6	15.9	15.7	15.5
Middle	19.8	19.2	19.4	19.5
Fourth	22.9	21.7	22.0	22.3
Highest	27.6	24.1	25.5	26.6
Total	23.3	21.8	22.5	23.2
Detail on Highest Quintile				
81-90%	25.3	23.5	24.2	24.6
91-95%	26.5	24.3	25.6	26.4
96-99%	28.1	24.3	26.2	27.2
Top 1%	31.9	24.5	26.2	28.4

SOURCE: CBO Simulations
a. projected.
b. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 2. EFFECTIVE TAX RATES BY INCOME GROUP AND TAX SOURCE, 1980-1993

	1980	1985	1989	1993[a]
Effective Individual Income Tax Rates				
Income Quintile[b]				
Lowest	-0.5	-0.2	-1.8	-3.2
Second	4.5	3.8	3.2	2.8
Middle	7.9	6.7	6.5	6.2
Fourth	11.0	9.2	8.9	8.7
Highest	17.2	14.4	15.2	15.5
Total	12.3	10.7	10.9	10.9
Detail on Highest Quintile				
81-90%	13.5	11.3	11.3	11.2
91-95%	15.4	12.7	13.1	13.2
96-99%	18.5	15.1	16.2	16.1
Top 1%	23.9	19.2	20.4	21.9
Effective Social Insurance Tax Rates				
Income Quintile[b]				
Lowest	5.2	6.7	7.6	7.6
Second	7.8	9.1	9.4	9.5
Middle	8.6	9.7	10.0	10.1
Fourth	8.6	9.8	10.3	10.5
Highest	6.0	6.8	7.0	7.7
Total	7.2	8.1	8.4	8.9
Detail on Highest Quintile				
81-90%	8.3	9.6	10.0	10.4
91-95%	7.4	8.9	9.6	10.2
96-99%	5.2	6.2	6.7	7.7
Top 1%	1.5	1.7	1.6	2.1

continued

TABLE 2. Continued

	1980	1985	1989	1993[a]
Effective Corporate Income Tax Rates				
Income Quintile[b]				
Lowest	1.3	0.9	1.1	1.1
Second	1.9	1.3	1.5	1.6
Middle	2.2	1.5	1.8	1.8
Fourth	2.4	1.7	1.9	2.0
Highest	3.7	2.4	2.8	2.8
Total	2.9	1.9	2.3	2.3
Detail on Highest Quintile				
81-90%	2.6	1.8	2.1	2.1
91-95%	3.0	2.0	2.2	2.2
96-99%	3.8	2.5	2.9	2.9
Top 1%	6.2	3.4	4.0	4.1
Effective Excise Tax Rates				
Income Quintile[b]				
Lowest	2.1	3.1	2.4	2.8
Second	1.3	1.7	1.5	1.7
Middle	1.1	1.2	1.1	1.3
Fourth	0.9	1.0	0.9	1.1
Highest	0.6	0.6	0.5	0.6
Total	0.9	1.0	0.9	1.1
Detail on Highest Quintile				
81-90%	0.8	0.8	0.8	0.9
91-95%	0.7	0.7	0.7	0.8
96-99%	0.6	0.5	0.4	0.5
Top 1%	0.3	0.3	0.3	0.3

SOURCE: CBO Simulations
a. projected.
b. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 3. EFFECTIVE TAX RATES BY INCOME GROUP, WITH ALTERNATIVE ASSUMPTIONS ABOUT INCIDENCE OF CORPORATE INCOME TAX: 1980-1993

	1980	1985	1989	1993[a]
Tax Falls on Capital Income				
Income Quintile[b]				
Lowest	7.7	10.2	8.8	7.9
Second	15.0	15.5	15.3	15.1
Middle	19.1	18.8	18.9	19.1
Fourth	22.2	21.3	21.5	21.7
Highest	28.2	24.5	25.9	27.0
Total	23.3	21.8	22.5	23.2
Detail on Highest Quintile				
81-90%	24.6	23.1	23.7	24.2
91-95%	26.4	24.1	25.2	26.1
96-99%	28.8	24.7	26.7	27.6
Top 1%	34.9	26.2	28.1	30.4
Tax Falls on Labor Income				
Income Quintile[b]				
Lowest	8.3	10.6	9.7	8.8
Second	16.0	16.2	16.0	15.8
Middle	20.5	19.6	19.8	19.9
Fourth	23.6	22.1	22.5	22.7
Highest	27.0	23.9	25.1	26.2
Total	23.3	21.8	22.5	23.2
Detail on Highest Quintile				
81-90%	25.8	23.9	24.8	25.2
91-95%	26.7	24.6	25.9	26.7
96-99%	27.6	24.0	25.9	26.9
Top 1%	28.7	22.8	24.2	26.4

SOURCE: CBO Simulations

a. projected.

b. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 4. EFFECTIVE TAX RATES BY INCOME GROUP: 1980-1993 TAX LAWS APPLIED TO 1985 INCOMES

	Tax Law[a]			
	1980	1985	1989	1993[b]
Income Quintile[c]				
Lowest	8.6	10.4	9.4	9.0
Second	14.7	15.9	15.9	15.9
Middle	18.8	19.2	19.6	20.0
Fourth	22.0	21.7	22.3	22.7
Highest	26.1	24.1	25.8	26.5
Total	22.5	21.8	22.8	23.2
Detail on Highest Quintile				
81-90%	24.4	23.5	24.8	25.1
91-95%	25.5	24.3	26.0	26.4
96-99%	26.1	24.3	26.2	26.9
Top 1%	28.8	24.5	26.4	27.9

SOURCE: CBO Simulations

a. Tax law parameters are indexed to 1985 levels of income.

b. projected.

c. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 5. EFFECTIVE TAX RATES BY INCOME GROUP AND TAX SOURCE: 1980-1993 TAX LAWS APPLIED TO 1985 INCOMES

	Tax Law[a]			
	1980	1985	1989	1993[b]
Effective Individual Income Tax Rates				
Income Quintile[c]				
Lowest	-1.1	-0.2	-1.5	-2.8
Second	3.4	3.8	3.3	2.7
Middle	7.0	6.7	6.4	6.3
Fourth	10.2	9.2	9.0	8.9
Highest	16.2	14.4	15.1	15.2
Total	11.8	10.7	10.8	10.7
Detail on Highest Quintile				
81-90%	12.8	11.3	11.7	11.5
91-95%	14.5	12.7	13.5	13.3
96-99%	16.8	15.1	16.1	15.9
Top 1%	21.9	19.2	20.1	21.2
Effective Social Insurance Tax Rates				
Income Quintile[c]				
Lowest	5.7	6.7	7.0	7.2
Second	7.9	9.1	9.6	9.8
Middle	8.4	9.7	10.2	10.4
Fourth	8.4	9.8	10.3	10.6
Highest	5.6	6.8	7.2	7.6
Total	6.9	8.1	8.6	8.9
Detail on Highest Quintile				
81-90%	8.1	9.6	10.1	10.5
91-95%	7.3	8.9	9.4	9.9
96-99%	4.9	6.2	6.6	7.3
Top 1%	1.3	1.7	1.8	2.1

continued

TABLE 5. Continued

	Tax Law[a]			
	1980	1985	1989	1993[b]
Effective Corporate Income Tax Rates				
Income Quintile[c]				
Lowest	1.4	0.9	1.1	1.1
Second	2.1	1.3	1.6	1.6
Middle	2.4	1.5	1.9	1.9
Fourth	2.6	1.7	2.1	2.1
Highest	3.7	2.4	2.9	2.9
Total	3.1	1.9	2.4	2.4
Detail on Highest Quintile				
81-90%	2.8	1.8	2.2	2.2
91-95%	3.1	2.0	2.4	2.4
96-99%	3.9	2.5	3.0	3.0
Top 1%	5.4	3.4	4.2	4.2
Effective Excise Tax Rates				
Income Quintile[c]				
Lowest	2.5	3.1	2.7	3.4
Second	1.4	1.7	1.5	1.9
Middle	1.0	1.2	1.1	1.4
Fourth	0.8	1.0	0.9	1.1
Highest	0.5	0.6	0.5	0.7
Total	0.8	1.0	0.9	1.1
Detail on Highest Quintile				
81-90%	0.7	0.8	0.7	0.9
91-95%	0.6	0.7	0.6	0.8
96-99%	0.5	0.5	0.5	0.6
Top 1%	0.3	0.3	0.3	0.4

SOURCE: CBO Simulations

a. Tax law parameters are indexed to 1985 levels of income.

b. projected.

c. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 6. EFFECTIVE TAX RATES BY INCOME GROUP: 1980-1993 TAX LAWS APPLIED TO 1989 INCOMES

	Tax Law[a]			
	1980	1985	1989	1993[b]
Income Quintile [c]				
Lowest	8.5	10.6	9.3	8.5
Second	14.5	15.8	15.7	15.6
Middle	18.7	19.1	19.4	19.6
Fourth	21.8	21.6	22.0	22.3
Highest	28.4	26.1	25.5	26.3
Total	23.8	22.8	22.5	23.0
Detail on Highest Quintile				
81-90%	24.2	23.4	24.2	24.5
91-95%	25.7	24.6	25.6	26.1
96-99%	28.1	25.9	26.2	26.9
Top 1%	36.0	30.5	26.2	27.8

SOURCE: CBO Simulations

a. Tax law parameters are indexed to 1989 levels of income.

b. projected.

c. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 7. EFFECTIVE TAX RATES BY INCOME GROUP AND TAX SOURCE: 1980-1993 TAX LAWS APPLIED TO 1989 INCOMES

	Tax Law[a]			
	1980	1985	1989	1993[b]
Effective Individual Income Tax Rates				
Income Quintile[c]				
Lowest	-1.4	-0.4	-1.8	-3.3
Second	3.5	3.9	3.2	2.6
Middle	7.2	6.8	6.5	6.3
Fourth	10.2	9.3	8.9	8.8
Highest	19.1	16.8	15.2	15.3
Total	13.4	12.0	10.9	10.9
Detail on Highest Quintile				
81-90%	12.8	11.5	11.3	11.1
91-95%	14.9	13.2	13.1	13.0
96-99%	19.2	17.0	16.2	16.0
Top 1%	29.6	25.6	20.4	21.5
Effective Social Insurance Tax Rates				
Income Quintile[c]				
Lowest	6.2	7.2	7.6	7.7
Second	7.7	8.9	9.4	9.6
Middle	8.2	9.5	10.0	10.2
Fourth	8.4	9.7	10.3	10.5
Highest	5.4	6.5	7.0	7.5
Total	6.7	7.9	8.4	8.8
Detail on Highest Quintile				
81-90%	8.0	9.4	10.0	10.4
91-95%	7.5	8.9	9.6	10.1
96-99%	5.0	6.1	6.7	7.5
Top 1%	1.2	1.4	1.6	2.1

continued

TABLE 7. Continued

	Tax Law[a]			
	1980	1985	1989	1993[b]
Effective Corporate Income Tax Rates				
Income Quintile[c]				
Lowest	1.4	0.9	1.1	1.1
Second	1.9	1.2	1.5	1.5
Middle	2.2	1.4	1.8	1.8
Fourth	2.4	1.5	1.9	1.9
Highest	3.4	2.2	2.8	2.7
Total	2.8	1.8	2.3	2.3
Detail on Highest Quintile				
81-90%	2.6	1.6	2.1	2.0
91-95%	2.7	1.7	2.2	2.2
96-99%	3.6	2.3	2.9	2.8
Top 1%	4.9	3.2	4.0	3.9
Effective Excise Tax Rates				
Income Quintile[c]				
Lowest	2.2	2.9	2.4	3.0
Second	1.4	1.8	1.5	1.8
Middle	1.1	1.3	1.1	1.4
Fourth	0.9	1.1	0.9	1.1
Highest	0.5	0.6	0.5	0.7
Total	0.8	1.1	0.9	1.1
Detail on Highest Quintile				
81-90%	0.7	0.9	0.8	1.0
91-95%	0.6	0.8	0.7	0.8
96-99%	0.4	0.5	0.4	0.5
Top 1%	0.3	0.3	0.3	0.3

SOURCE: CBO Simulations

a. Tax law parameters are indexed to 1985 levels of income.

b. projected.

c. ranked by adjusted family income (AFI), equal number of people per percentile.

TABLE 8. SOURCE OF FAMILY INCOME BY INCOME GROUP, 1980-1989

	Wages	Self Employment	Rents Interest Dividends	Capital Gains	Transfer	Other	Total
				1980			
Income Quintile							
Lowest	42.1	1.7	3.2	0.9	47.0	5.1	100.0
Second	67.2	4.0	4.7	0.7	18.0	5.4	100.0
Middle	77.1	3.6	5.3	0.7	9.0	4.4	100.0
Fourth	80.9	3.0	6.4	0.9	5.2	3.6	100.0
Highest	66.5	6.4	13.9	8.2	2.3	2.6	100.0
TOTAL	70.6	4.3	9.5	4.3	7.7	3.5	100.0
Detail on Highest Quintile							
81-90%	81.3	3.6	7.2	1.8	3.2	2.9	100.0
91-95%	76.7	5.0	9.8	2.9	2.6	3.0	100.0
96-99%	62.9	8.9	16.4	6.5	2.1	3.2	100.0
Top 1%	34.9	9.7	26.4	27.0	0.8	1.2	100.0
				1985			
Income Quintile							
Lowest	46.4	0.9	3.5	0.4	43.4	5.4	100.0
Second	66.4	3.9	5.2	0.4	18.2	5.9	100.0
Middle	74.5	3.0	6.7	0.5	9.6	5.6	100.0
Fourth	78.0	2.9	7.8	0.8	5.7	4.8	100.0
Highest	62.8	5.8	14.6	11.3	2.3	3.2	100.0
TOTAL	68.0	3.7	10.7	6.1	7.3	4.3	100.0
Detail on Highest Quintile							
81-90%	79.1	3.0	8.9	1.5	3.6	3.9	100.0
91-95%	75.6	4.1	11.0	3.2	2.6	3.5	100.0
96-99%	61.7	7.4	16.1	8.2	2.2	4.3	100.0
Top 1%	30.6	9.3	23.7	35.2	0.6	0.7	100.0
				1989			
Income Quintile							
Lowest	51.3	-0.4	3.2	0.4	39.1	6.4	100.0
Second	66.1	3.6	5.3	0.5	17.7	6.8	100.0
Middle	72.9	3.4	6.8	0.6	9.9	6.4	100.0
Fourth	77.0	3.4	7.2	1.1	5.8	5.5	100.0
Highest	62.8	7.8	15.0	7.9	2.3	4.1	100.0
TOTAL	67.6	5.0	10.8	4.5	7.0	5.0	100.0
Detail on Highest Quintile							
81-90%	77.3	3.6	8.5	1.5	4.0	5.1	100.0
91-95%	75.0	4.9	10.7	2.4	2.5	4.6	100.0
96-99%	61.9	9.0	16.5	5.6	2.0	4.9	100.0
Top 1%	36.8	14.0	24.7	22.2	0.6	1.7	100.0

TABLE 9. CHANGES IN MARGINAL TAX RATES BY INCOME GROUP: 1980-1989 TAX LAWS APPLIED TO 1989 INCOMES (in percent)

	1980	1985	1989
Marginal Tax Rates on Earnings			
Income Quintile			
Lowest	14.7	21.2	19.3
Second	26.2	26.2	28.0
Third	28.7	29.3	27.3
Fourth	32.1	32.8	31.1
Highest	41.2	39.4	33.8
TOTAL	35.0	34.6	31.2
Detail on Highest Quintile			
81-90%	35.3	35.9	35.0
91-95%	39.0	37.6	34.8
96-99%	45.8	41.3	33.8
Top 1%	51.0	47.5	29.3
Marginal Tax Rates on Capital Gains			
Income Quintile			
Lowest	0.9	1.4	4.0
Second	2.9	3.0	11.7
Third	4.8	5.1	14.5
Fourth	8.4	8.1	19.1
Highest	21.1	17.5	28.2
TOTAL	19.5	16.3	26.9
Detail on Highest Quintile			
81-90%	11.2	11.0	25.0
91-95%	13.6	12.8	27.6
96-99%	17.5	15.8	29.7
Top 1%	23.6	19.0	28.2

continued

TABLE 9. continued

	1980	1985	1989
Marginal Tax Rates on Rent, Interest and Dividends			
Income Quintile			
Lowest	1.9	3.5	2.9
Second	5.2	7.6	9.0
Third	11.4	13.7	13.4
Fourth	20.0	19.2	18.6
Highest	43.0	36.8	27.9
TOTAL	33.9	29.9	23.8
Detail on Highest Quintile			
81-90%	25.8	26.3	24.8
91-95%	31.8	30.7	26.8
96-99%	42.2	37.5	30.1
Top 1%	56.7	43.8	28.2

TABLE 10. IMPLICIT TAX RATES: EARNINGS AND CAPITAL GAINS
1980-89 TAX LAWS APPLIED TO 1989 INCOMES

Lower Responses

dlog (gains)/d (marginal tax rate) = -2.000
dlog (fringe benefit share)/dlog (marginal tax rate) = 0.0
dlog (labor supply)/dlog (net compensation, primary worker) = 0.0
dlog (labor supply)/dlog (net compensation, secondary worker) = 0.5

Income Quintile	1980	1985	1989
Lowest	*	*	*
Second	*	*	0.1
Third	0.1	0.1	0.1
Fourth	0.2	0.1	0.2
Highest	0.6	0.4	0.8
TOTAL	0.4	0.3	0.5
Detail on Highest Quintile			
81-90%	0.2	0.2	0.3
91-95%	0.3	0.3	0.4
96-99%	0.5	0.4	0.7
Top 1%	1.3	0.9	1.7

Higher Responses

dlog (gains)/d (marginal tax rate) = -4.000
dlog (fringe benefit share)/dlog (marginal tax rate) = 0.2
dlog (labor supply)/dlog (net compensation, primary worker) = 0.1
dlog (labor supply)/dlog (net compensation, secondary worker) = 1.0

Income Quintile	1980	1985	1989
Lowest	0.5	0.8	0.8
Second	1.5	1.4	1.6
Third	1.9	1.9	1.8
Fourth	2.6	2.6	2.5
Highest	4.0	3.6	3.6
TOTAL	3.2	2.9	2.9
Detail on Highest Quintile			
81-90%	3.2	3.2	3.3
91-95%	4.0	3.7	3.5
96-99%	4.5	3.8	3.5
Top 1%	4.6	3.6	4.0

* Less than 0.05 percent

TABLE 11. IMPLICIT TAX RATES ON EARNINGS AND CAPITAL GAINS SEPARATELY: 1980-1989 TAX LAWS APPLIED TO 1989 INCOMES (Higher Responses)

	Earnings			Capital Gains		
	1980	1985	1989	1980	1985	1989
Lowest	0.5	0.8	0.8	*	*	*
Second	1.5	1.4	1.6	*	*	*
Third	1.9	1.9	1.7	*	*	*
Fourth	2.6	2.6	2.4	*	*	0.1
Highest	3.2	2.9	2.3	0.9	0.7	1.3
TOTAL	2.7	2.5	2.1	0.5	0.4	0.8
Detail on Highest Quintile						
81-90%	3.1	3.1	3.0	0.1	0.1	0.3
91-95%	3.9	3.6	3.2	0.1	0.1	0.4
96-99%	4.0	3.4	2.4	0.5	0.4	1.1
Top 1%	2.1	1.8	0.8	2.5	1.8	3.2

* Less than 0.05 percent

TABLE 12. EFFECTIVE TAX RATES WITH BEHAVIORAL RESPONSES
1980-89 TAX LAWS APPLIED TO 1989 INCOMES

Lower Responses

dlog (gains)/d (marginal tax rate) = -2.000
dlog (fringe benefit share)/dlog (marginal tax rate) = 0.0
dlog (labor supply)/dlog (net compensation, primary worker) = 0.0
dlog (labor supply)/dlog (net compensation, secondary worker) = 0.5

Income Quintile	1980	1985	1989
Lowest	8.5	10.6	9.3
Second	14.5	15.8	15.6
Third	18.6	19.0	19.3
Fourth	21.7	21.5	21.9
Highest	27.5	25.2	24.8
TOTAL	23.4	22.4	22.2
Detail on Highest Quintile			
81-90%	23.9	23.2	24.0
91-95%	25.4	24.3	25.4
96-99%	27.4	25.2	25.7
Top 1%	32.8	28.0	24.5

Higher Responses

dlog (gains)/d (marginal tax rate) = -4.000
dlog (fringe benefit share)/dlog (marginal tax rate) = 0.2
dlog (labor supply)/dlog (net compensation, primary worker) = 0.1
dlog (labor supply)/dlog (net compensation, secondary worker) = 1.0

Income Quintile	1980	1985	1989
Lowest	8.6	10.6	9.5
Second	14.4	15.5	15.4
Third	17.9	18.3	18.6
Fourth	20.6	20.4	20.8
Highest	24.6	22.9	22.8
TOTAL	21.6	20.9	20.9
Detail on Highest Quintile			
81-90%	22.4	21.9	22.7
91-95%	23.5	22.7	23.6
96-99%	24.6	23.0	23.6
Top 1%	27.5	23.8	21.6

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