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Portfolio Responses to Taxation: Evidence from the End of the Rainbow

by

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LEADING IN THOUGHT AND ACTION

Portfolio Responses to Taxation Evidence from the End of the Rainbow

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Abstract

The past fifteen years include three tax reforms that substantially changed the tax environment confronting wealthy households. This paper uses comprehensive wealth data from the Surveys of Consumer Finances to analyze the effects of tax changes on the portfolio holdings of households, particularly those at the top of the wealth distribution. Although marginal tax rates are shown to have explanatory power for cross-sectional differences in portfolio allocations, the role of tax changes in determining the observed changes in household portfolios relative to the market portfolio over time is more limited. Evidence on the changes in portfolio allocations by marginal tax rate also fails to support an important time-series role for marginal tax rates.

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I. Introduction

In the pursuit of revenue and equity, taxes induce inefficiencies.

Resources devoted to tax avoidance (and tax compliance) are clear examples of deadweight loss to the economy. The simple fact that the wealthiest households have the most at stake when the taxman comes and the most flexibility in managing their tax liabilities suggests that their behavior will change the most when taxes change. Since portfolio choices involve small costs in comparison to changes in labor supply and saving, it is reasonable to expect that portfolio choices would be among the most tax sensitive household decisions. The economic importance of portfolio responses is demonstrated by simulation studies of tax reform such as Galper, Lucke, and Toder (1988) that find potentially large efficiency costs of portfolio distortions.

The effect of taxes on portfolio decisions of the wealthy has received less attention than other decisions like labor supply, in large part because there are few data sets in which wealth can be accurately measured.¹ For the United States, the most comprehensive source of data is the Surveys of Consumer Finances (SCFs) conducted by the Federal Reserve Board every three years since 1983. With the release of the 1995 SCF, the sample period now includes both the Tax Reform Act of 1986 and the Omnibus Budget Reconciliation Act of 1993. The former was an attempt to lower the marginal tax rate by broadening the tax base, while the latter increased marginal tax rates substantially at the upper end of the income

distribution. The existing study that most closely resembles the present one is Scholz (1994), who used the SCFs from 1983 and 1989 to analyze the effect of taxes on portfolio composition. The additional years of data allow for a more comprehensive analysis that can distinguish the effects of marginal tax rate changes--which showed a reversal over the longer time period--from secular trends that may have affected portfolio choices.

The methodological contribution of this paper is to calculate marginal tax rates for SCF households and estimate the extent to which changes in portfolio allocations over time can be attributed to changes in marginal tax rates. The primary unit of analysis is percentile ranges of the net worth distribution, such as the top one percent. The main conclusion is that marginal tax rates provide a limited explanation for the actual portfolio changes of households at all points in the net worth distribution. For example, predicted changes in the portfolio allocations of the wealthiest households based solely on changes in their tax rates appear to explain about one tenth of the actual changes *over time*. This conclusion holds true despite the significant role that marginal tax rates on both ordinary and capital gain income have for the *cross-sectional* distribution of portfolio holdings.

This surprising result is reinforced by a less parametric test for the effect of taxes on portfolio allocations of financial assets. This test is based on the time-series changes in portfolio allocations at different points in the distribution of

marginal tax rates. Between 1983 and 1989, the distribution of tax rates across households converged, with the highest and lowest tax rates moving in toward the middle of the distribution. Between 1992 and 1995, the opposite happened, with the highest tax rates getting substantially higher. However, financial portfolios grew more distinct across households during the early period and more similar across households during the later period. Portfolio allocations diverged when tax differentials converged and converged when tax differentials diverged. This pattern again suggests that marginal tax rates are not the primary explanation for the observed time-series changes in portfolio allocations.

The remainder of the paper is organized as follows. Section II presents the basic classification scheme for the components of household portfolios as measured in the Survey of Consumer Finances and discusses the tax treatment of different assets. Section III discusses the aspects of the tax changes over the sample period that would be expected to affect portfolio allocations. The algorithm for computing tax liabilities is also presented in this section. Section IV documents the changes in portfolio allocations for net worth categories over time. Section V uses an econometric framework similar to that in Poterba and Samwick (1997a) to determine the extent to which tax changes were responsible for these portfolio changes. Section VI analyzes the response of portfolios to marginal tax rate changes at different points in the distribution of marginal tax rates, and Section VII concludes.

II. Surveys of Consumer Finances

The Surveys of Consumer Finances (SCFs) are a series of triennial surveys of the United States population designed to collect comprehensive data on household wealth holdings. The original survey in 1983 was designed to be the first of a panel, but the reinterviews survey in 1986 yielded only two thirds of the original sample and only one third in 1989. The 1989 sample was supplemented by new households and all waves since 1989 have been conducted as unrelated cross-sections using the same survey questionnaire and sample design. Although the study of tax policy has not been the main application of the SCFs, the timing of the surveys is ideal for the task. The three important tax reforms in 1986, 1990, and 1993 all lie squarely in the intervals spanned by the SCFs of 1983-1989, 1989-1992, and 1992-1995.²

Another important aspect of the SCFs is the oversampling of high-income households. Each SCF sample is comprised of an area-probability sample of the United States population and a sample of households drawn from an Internal Revenue Service file of high-income returns. Oversampling based on income helps to equalize the probability of each dollar of wealth in the economy--rather than each household in the population--appearing in the sample.³ The distinction is important when analyzing the distribution of assets and liabilities that are highly concentrated. A limitation of the SCFs that is introduced or exacerbated

by the presence of the high-income sample is that the household's state of residence is not available on the public release of the surveys (except for the area-probability sample in 1983). This precludes the calculation of the household's state income tax rates as part of a more complete measure of tax incentives.

Table 1 presents a breakdown of the sample by net worth category (to be defined below) for each of the four survey years. Each cell of the table contains the number of sample observations and their proportion of the total observations in each category. The 1989 survey is somewhat anomalous in having only 3,143 observations, about a thousand fewer than the other waves. The oversampling of high-income households can be seen clearly by comparing the proportions of the sample in the highest wealth categories to the range of percentiles in those categories. For example, the households in the top 1 percent of the wealth distribution in 1983 comprise 7.07 percent of the sample. This proportion increases substantially to 14.60 in 1989 and then exceeds 16 percent in the 1992 and 1995 surveys. The 95-99th percentiles are also disproportionately represented in each year (though by a lower factor than the top percentile), as is the remainder of the top decile in all but the 1983 survey. Although oversampling is a feature of all the surveys, there is a possibility that the change in the sampling design after the 1983 survey may contribute to changes in the measured distribution of wealth holding between 1983 and the later surveys (see Kennickell and Woodburn (1997)).

A growing literature has compared the SCFs to other sources of data on household wealth. Curtin, Juster, and Morgan (1989) compare the SCF 1983 to the wealth data from the Panel Study of Income Dynamics and the Survey of Income and Program Participation from 1984. They find that, of the three, only the SCF adequately represents the upper tail of the wealth distribution. Other papers, most notably by Wolff (1987, 1994, 1997), have compared the SCF to the household sector of the Flow of Funds accounts and suggested modifications to the asset holdings in the SCF to reconcile the disparities.⁴

Table 2 provides an indication of the magnitude of the changes involved with reweighting. The left panel tabulates the average, total, and share of net worth by percentiles of the net worth distribution for each survey year using the survey weights. All dollar figures are reported in constant 1992 dollars. Average wealth rose from \$174,000 to \$192,000 between 1983 and 1989, lost about half of that gain by 1992, and rebounded to the same level by 1995. Although not uniform across wealth categories, the pattern of changes for each range of percentiles is not far from the average. The third column depicts the concentration of wealth by category. The share of wealth held by the wealthiest one percent is often used to characterize the inequality of wealth. This fraction increased from 30.86 in 1983 to 33.50 in 1989, fell to 29.52 in 1992, and then rose substantially to 35.13 in 1995. The time pattern of changes in the remainder of the top decile moved opposite to those for the top percentile.

The right panel of the table presents the analogous calculations using a set of reweightings based on Wolff (1987, 1994, 1997).⁵ The reweightings increase the measures of wealth in all cases, and do so disproportionately at the highest percentiles of the distribution, largely because the reweightings increase the values of assets that are typically held primarily by wealthy households. The reweightings do not substantially alter the comparisons between successive surveys, but the comparison of the wealth distributions in 1983 and 1992 are quite sensitive to them. Since the analysis presented below depends primarily on comparison of successive surveys (i.e., 1983 - 1989, 1992 - 1995, and to a lesser extent, 1989 - 1992), the discrepancies between the SCFs and Flow of Funds may not be too important. All further tabulations will use the unadjusted sample weights.⁶ The remainder of this section gives a detailed description of the components of financial assets and net worth and briefly discusses their tax treatment.

The overall decomposition of net worth into portfolio components is as follows. Net Worth is equal to Total Assets less Total Debt. Total Assets have five components: Financial, Owner Occupied Housing, Other Property, Miscellaneous, and Business Equity. Total Debt has four analogous components: Financial, Owner Occupied Housing, Other Property, and Miscellaneous. Financial Assets are further disaggregated into Interest Bearing Accounts, Taxable Bonds, Taxable Equity, Retirement Accounts, Tax-Exempt Bonds, and

Other Financial Assets. Assets in Retirement Accounts are further distinguished as Bonds or Equity.

Components of Financial Assets

Interest Bearing Accounts: Checking accounts, saving accounts, certificates of deposit, and money market accounts (excluding tax-exempt accounts). Returns on these assets are taxed each year at the household's marginal tax rate on ordinary income.

Taxable Bonds: Federal government bonds, corporate bonds, and foreign bonds, whether held directly or in mutual fund accounts but not in retirement accounts. Interest payments on these assets are taxed each year at the household's marginal tax rate on ordinary income. Capital gains and losses on these assets are taxable at the household's capital gains tax rate only if the assets are sold before maturity.

Taxable Equity: All holdings of stocks outside of trusts and retirement accounts, including brokerage accounts, mutual funds, investment clubs, and shares in a company where a household member is employed. Unlike interest payments, retained earnings are first taxed at the corporation's marginal tax rate. Dividend payments to households are further taxed each year at the household's marginal

tax rate on ordinary income. Taxation of capital gains and losses on these assets is at the household's capital gains tax rate but is deferred until the assets are transferred in a taxable transaction.

Retirement Accounts: All assets held in Individual Retirement Accounts (IRAs), Keogh plans for the self-employed, and defined contribution (DC) pension plans, including 401(k) plans and employee stock ownership plans (ESOPs). Equity holdings may take any of the forms listed under Taxable Equity above. Bond holdings include all of the forms listed under Taxable Bonds above and Tax-Exempt bonds below, as well as all responses not specifically coded as equity.⁷ Interest, dividend, and capital gain taxes are deferred until withdrawn from the account during retirement (pre-retirement distributions are taxed at a supplemental penalty rate), when such withdrawals face the household's marginal tax rate on ordinary income. Accrued entitlements under defined benefit (DB) pension plans and Social Security are not included in any measure of wealth.

Tax-Exempt Bonds: All state and municipal bonds, whether held directly, in money market accounts, or in mutual funds, but not in retirement accounts. Interest from these assets is tax-exempt. Capital gains or losses resulting from sales prior to maturity face the household's marginal tax rate on capital gains.

Other Financial Assets: The sum of the cash value of whole life insurance policies and trust accounts. These assets generally receive some form of tax-preferred treatment, typically by exempting the annual gains in the value of the assets from taxation while the policy or trust is in effect.

Components of Net Worth

Financial Assets: The sum of all financial assets discussed above.

Owner Occupied Housing Assets: The gross value of the household's primary residence.

Other Property Assets: The gross value of other properties owned by the household, including amounts owed to the household from the past sale of real estate.

Miscellaneous Assets: The residual component of total assets, including the value of all other assets not classified as financial, real estate, or business related.

Business Equity: The value of the household's share in unincorporated businesses (including farms), whether the household is self-employed and actively

manages the business or holds a passive interest.

Financial Debt: The outstanding balances on credit cards and lines of credit not secured by the value of the household's residence.

Owner Occupied Housing Debt: The outstanding balances on loans secured by the household's residence, including first and second mortgages, home equity loans, and home equity lines of credit.

Other Property Debt: The outstanding balances on loans related to the purchase of real estate other than the household's primary residence.

Miscellaneous Debt: The residual component of total debt, including the outstanding balances on loans taken out for the purchase of consumer durables or investment securities.

Net Worth: The sum of all assets (financial, owner occupied real estate, other property, miscellaneous, and unincorporated businesses) less the sum of all debts (financial, owner occupied real estate, other property, and miscellaneous).

There are two main sources of tax advantages with regard to the

components of net worth other than financial assets. The first is the deductibility of interest payments on real estate at the household's ordinary income tax rate. Prior to the Tax Reform Act of 1986 (TRA), interest on non-real estate loans was also deductible. TRA phased out full deductibility so that by 1989, only 20 percent of such interest payments were deductible and by 1992, payments were not deductible. Interest payments on real estate loans retained their tax deductibility. Sales of real estate and business assets generate capital gains and losses, which are preferentially taxed at the household's capital gains tax rate. The second advantage is the popularity of limited partnerships for tax shelters, which may be classified as passively managed businesses or other property in the SCFs. The tax shelter industry largely disappeared after TRA due to narrower differentials between ordinary and capital gains tax rates as well as new passive loss limitations.⁸ The undoing of TRA's rate reductions in subsequent tax legislation may have reintroduced incentives to use these assets to reduce tax burdens.

III. Tax Changes in the 1980s and 1990s

This section discusses the tax changes that have been implemented over the sample period of 1983 to 1995 and the algorithms used to calculate marginal tax rates in the SCFs. The main focus of the analysis is on the marginal tax rate (MTR) each household faces on an additional dollar of ordinary income from

investments. The algorithms also permit the calculation of the statutory marginal tax rate on realized capital gains. Although these are not the only relevant aspects of tax policy for portfolio decisions, many of the tax incentives--and especially the differences in these incentives across households--are the direct result of cross-sectional variation in these rates.⁹ The estimates are made from the income, balance sheet, and demographic data that are reported by the household.

The algorithm for calculating marginal tax rates in each survey proceeds line-by-line down the Form 1040 and the relevant schedules. Filing status is determined by the household's marital status, with all married households assumed to file a joint return. Personal exemptions are estimated based on marital status and the number of dependents in the house under age 18. The SCFs report information on many of the components of total income. Wages and salaries, taxable interest, tax-exempt interest, dividends, alimony received, rents and royalties, business income, and farm income are all straightforward and similarly defined in the SCF and the tax return.

Other components of income required for the 1040 are not reported in the SCFs. The approach followed here is to treat some of these items as zero and others as fully taxable. Refunds of state and local income taxes, other gains, and IRA distributions are not reported in the SCFs and therefore assumed to be zero. All pension and unemployment compensation that is reported is assumed to be taxable.¹⁰ Social Security benefits are taxed according to the formula appropriate

to each year. Reported capital gains are assumed to be taxable as long-term gains, but no adjustments can be made in the calculations for any losses carried forward to or from the current year.

The remaining component of adjusted gross income (AGI) is adjustments to total income. The self-employment tax is applied to all business and farm income. Households are assumed to claim the maximum IRA deductions consistent with their reported balances and individual earnings. Alimony paid is also reported by the SCFs. All other adjustments such as moving expenses are not reported in the survey and assumed to be zero. Subtracting the total adjustments from total income gives the household's AGI.

The next step in the computations is to estimate the household's possibility of itemizing deductions on Schedule A. The SCF reliably reports information on interest payments and charitable contributions. Deductions for local taxes are based on the reported value of real estate and personal property subject to tax. Itemization is determined by comparing the sum of these deductions to the standard deduction appropriate for the household's age and filing status. The lack of reported information on other possible deductions, such as medical expenses, state and local income taxes, casualty losses, and job expenses is the biggest handicap in calculating tax rates in the SCFs. The household's exemptions and deductions are then subjected to the limits based on income in the later survey years. Subtracting them from AGI yields the household's taxable income.

Applying the appropriate tax rate schedule to taxable income gives the household's tax liability. Total taxes include this amount plus self-employment and alternative minimum taxes. Credits such as the Earned Income Credit were not computed.

The household's marginal tax rate on any type of income can be calculated by running this algorithm twice--once with a base amount and then with the base amount plus an increment. The difference in the total taxes divided by the increment gives the marginal tax rate. Following Poterba and Samwick (1997a), the base amount is chosen to be the household's taxable income assuming that it had no income from interest, dividends, tax-exempt interest, and capital gains. The increment is set equal to a constant fraction (5 percent) of the household's total financial assets, with a minimum of 100 dollars. This "first-dollar" marginal tax rate therefore does not depend on the particular portfolio allocation that the household has chosen, but it does allow for the possibility that if a household invested all of its financial assets in taxable interest bearing accounts or realized them all as taxable capital gains, it might move into a higher tax bracket. The analysis below utilizes marginal tax rates on ordinary income and on capital gain income calculated in this way.

There were three major changes to the relationship between a household's taxable investment income and its tax liability over the sample period. The most comprehensive of these was the Tax Reform Act of 1986 (TRA). Marginal rates

were reduced for most of the income distribution, with the MTR on the highest incomes falling from 50 to 28 percent. Lower down in the income distributions, there was only one other nonzero MTR of 15 percent. TRA also introduced a "bubble" MTR of 33 percent over a range of taxable income in order to recapture the benefits of the 15 percent bracket and personal exemptions from high-income taxpayers. While retaining its progressivity, the tax schedule had far fewer brackets than it previously did.

TRA also made substantial changes to the definition of taxable income and eliminated the capital gains exclusion (see Hausman and Poterba (1987) for an overview). In 1989, the statutory rate on capital gains was the same as that on ordinary income. Another change was to include up to 50 percent of Social Security benefits in taxable income for sufficiently high-income recipients. Since the definition of income for this provision includes investment income, it changes the tax treatment of returns to financial wealth. Although not the focus of this analysis, the tax calculating algorithms do take all of these changes into account.

TRA also lowered the top marginal tax rate on corporate income from 46 to 34 percent, so that for the first time the top personal rate exceeded the top corporate rate. As analyzed in Gordon and Mackie-Mason (1990), this inversion of tax rates affected the financing decisions and organizational form of corporations. More generally, Feldstein and Slemrod (1980) show that the position of the marginal tax rate on corporate income in the distribution of

personal income tax rates is an important determinant of the portfolio allocations of investors under a progressive tax system. The role of changes in the corporate income tax rate on the analysis of household portfolio allocations will be discussed in more detail below.

The other two tax reforms were the Omnibus Budget Reconciliation Acts (OBRA) of 1990 and 1993.¹¹ These reforms were more limited in scope than TRA, affecting primarily the taxpayers with the highest incomes. OBRA 90 replaced the marginal tax rate bubble with a new top bracket of 31 percent and revised the phaseout of the personal exemptions. Itemized deductions were also partially phased out for high-income taxpayers. OBRA 90 also increased the alternative minimum tax (AMT) rate from 21 to 24 percent. The maximum statutory tax rate on capital gains was capped at 28 percent. OBRA 93 added two new tax rate brackets of 36 and 39.6 percent and further increased the rate on the AMT. With an increase in the top corporate rate to only 35 percent, the top personal rate was again higher than the top corporate rate. The Act further increased the share of Social Security benefits that could be subjected to tax to 85 from 50 percent. An important feature of the analysis is that OBRA 90 and 93 worked in opposition to the base broadening and rate reductions of TRA. This feature allows differences over time in response to tax reforms to be distinguished from secular trends that may exist in asset allocations.

The effect of the tax reforms is evident in Figure 1. In this figure, the

horizontal axis represents the percentiles of the distribution of the marginal tax rate on ordinary income in each year. The vertical axis represents the actual value of the MTR in percentage points. The four curves trace out the average value of the MTR in each percentile separately for each of the four sample years. The distribution of MTRs in each year is the result of applying the tax-calculating algorithm for that year to the corresponding sample of SCF households.¹² In each year, roughly 25 percent of the households face a zero MTR. These are households whose current income is low enough that they do not have to pay tax. Beyond this point, the 1983 schedule is substantially different from the other three years, with many short, flat portions denoting tax brackets, on the way up to a top rate of 50 percent. The effect of TRA in compressing the tax brackets is shown by the long, flat portions of the 1989 schedule, first at 15 percent and then at 28 percent, rising up to a top rate of 33 percent. Over most of the distributions, the values for 1992 and 1995 are quite close to those for 1989.

Figure 2 expands the top quintile of the graph to show the differences between the later three years more clearly. After about the 90th percentile, the 1992 and 1995 graphs increase to reflect the 31 percent bracket. The 1995 schedule increases rapidly thereafter due to the 36 and 39.6 percent brackets as well as the phasing out of exemptions and deductions. The 1992 schedule drifts upward only to reflect the phasing out of exemptions and deductions. The similarity of the 1992 and 1995 schedules is the result of an indexed tax code, low

intervening real wage growth, and the targeting of OBRA 93 on taxpayers with the highest taxable incomes.

The fourth column of Table 2 shows the average value of household MTRs on ordinary income by net worth category and year. The average MTR fell from 17.40 percent in 1983 to 14.10 in 1989 as a result of TRA. The tax rate reductions ranged from a low of about 2.5 percentage points for the bottom 60 percent to 13 percent for the top 1 percent of the net worth distribution. The effect of OBRA 90 was to increase average MTRs by one to three percentage points for all categories above the 60th percentile and to 14.70 percent overall. OBRA 93 further increased the sample average to 14.78 percent, primarily due to a large five-point increase for the highest category. For net worth categories below the top decile, the magnitudes of the changes are less than one percentage point in magnitude and mixed in sign.

In an economy in which households face different tax rates, a household's optimal portfolio allocations in equilibrium will depend not only on its own tax rate but on where that tax rate falls in the distribution of tax rates. As in Miller (1977), the households with the highest tax rates will form the natural "clientele" for the most tax-advantaged assets, and those with the lowest tax rates will be the clientele for the least tax-advantaged assets.¹³ The fifth column of Table 2 shows the average percentile in the MTR distribution for households in each net worth category. In 1983, the households in the top 1 percent of the wealth distribution

were at the 82nd percentile of the MTR distribution, on average. After TRA, the average for the top percentile fell to 74.07. The effect of TRA was to reduce the variation in marginal tax rates, with the top and bottom categories moving toward the center and the four middle categories moving toward the extremes between 1983 and 1989.

This effect was largely undone by OBRA 90 and 93. Between 1989 and 1992, the average MTR percentile increased for all but the bottom wealth category. By 1992, the average MTR percentile for the top net worth percentile was higher than it was in 1983. Between 1992 and 1995, the average MTR percentile for the top wealth decile increased again, while the average MTR percentile fell for all lower categories except the bottom 60 percent of the net worth distribution. Given the compression in tax rates due to TRA, even the smaller changes to MTRs in the later legislation were enough to reintroduce substantial variation in MTRs across net worth categories.

IV. Portfolio Allocations by Wealth Categories

This section documents portfolio allocations by net worth categories and shows the magnitudes of changes in these allocations over the 1983 to 1995 period. The basic data on portfolio allocations by net worth category and year are presented in Tables 3 and 4, which correspond to the components of financial assets and net worth, respectively. The next section estimates the share of those

changes that can be attributed to the changing cross-sectional pattern of tax rates that occurred over the same period.

Table 3 shows the portfolio holdings of each net worth category from Table 2 in each of the survey years, along with average marginal tax rates on ordinary income and tax rate percentiles (weighted by financial asset holdings). The columns are arranged by tax status, with relatively more heavily taxed assets (interest bearing accounts) on the left and relatively less heavily taxed assets (tax exempt bonds) on the right. Because it is not exactly clear where the “other financial assets” belong on this spectrum, they are reported in the last column. The bottom row in each group of numbers (marked "All") gives the aggregate portfolio allocation of the whole population. This row is analogous to the "market" portfolio in the sense that if every household held the same portfolio, then it would have to be comprised of this allocation. Changes in tax policy may affect this allocation through the financing decisions of firms, banks, and governments as well as the decisions by firms to sponsor defined contribution pension plans. However, the composition of the market portfolio is exogenous to the decision making process of each individual household. The logical way to analyze household portfolio choices is therefore relative to the benchmark of the aggregate portfolio in each year.

Between 1983 and 1989, the share of equities fell and there was a pronounced shift of allocations toward retirement accounts. Interest bearing

accounts and bonds, both taxable and tax-exempt, made up a greater share of the portfolio, while other financial assets comprised less. In subsequent surveys, allocations moved away from interest bearing accounts and bonds and into equities. The share in retirement accounts surged again between 1989 and 1992 but leveled off after that.

The other rows in each group of numbers depict the portfolio allocations by net worth percentiles. Comparing the top one percent to the benchmark shows that in all years, the rich hold less of their assets in interest bearing accounts and retirement accounts. They hold correspondingly more in taxable equities and tax-exempt bonds. Over the sample period, the pattern of increases and decreases in their allocations to interest bearing accounts, taxable bonds, tax-exempt bonds, and taxable equity reflect the changes in the aggregate portfolio. The magnitudes of these changes are typically larger, however. Their allocations to retirement accounts show less steady growth and their allocations to other financial assets become steadily smaller over time.

The rightmost two columns present the weighted averages of the ordinary marginal tax rate and its percentile for each net worth category. The difference between these numbers and those in Table 2 is that the weights here are the household's amount of financial assets. In comparison, the changes in the tax rates over time for the highest wealth categories are more pronounced when the focus is on the marginal tax rate on the average dollar, rather than the average

household. The goal of the econometric estimation to follow is to determine the extent to which the greater relative changes in the portfolio allocations of the rich are commensurate with the greater relative changes in their tax rates.

Table 4 presents the analogous portfolio shares for components of net worth, expressed as percentages of total assets held in each asset or debt category. Looking first at the asset categories, the rich clearly have more in financial, other property, and business assets and less in owner occupied housing. The latter constitutes over half the total assets of the bottom 80 percent of the wealth distribution in every year, and its share in the total remains fairly stable across years. Over time, the movements in the population share of financial assets follows that of equities described in Table 3, with the rich again having larger portfolio swings than the rest of the population. The share of business equity grows over time for the rich relative to the share for the population as a whole. For other property, the allocations by the rich relative to the population grow between 1983 and 1992 and then fall sharply by 1995. One tax-related factor that may explain some of these movements is that while TRA severely curtailed tax shelter opportunities in all types of investments, the cutbacks were less severe in real estate than in other sectors.

The leverage ratios in the right panel of Table 4 show that the rich have less debt relative to their total assets in every form except for other property. The table clearly shows the dramatic increase in indebtedness between 1983 and 1989

and a smaller decrease in subsequent years. The magnitude of the increase is substantial in all types of debt for the bottom 60 percent of the wealth distribution, and after a small retreat in 1992, this group achieved a 52 percent leverage ratio in 1995. For the next 20 to 30 percent of the wealth distribution, the increases were more limited to owner occupied housing over the whole sample period. For higher wealth groups, other property debt generated most of the time-series variation, and, unlike the lower wealth groups, the overall level of indebtedness decreased substantially after 1989. In interpreting these leverage ratios, it is important to note that their changes may be due as much to changing levels of total assets as to active changes in the dollar amounts that households choose to borrow.

V. Econometric Framework

The simple tabulations discussed in the previous section document the variation in both the changes in tax rates and portfolio allocations of the rich over the sample period. The purpose of this section is to specify an econometric model that allows for marginal tax rates to affect the portfolio allocations chosen by households. The results can then be used to predict how portfolio allocations of each net worth group would have changed across each tax reform as a function only of the changes in their tax rates. The end result will be a set of comparisons of predicted to actual changes that will suggest whether tax considerations play an

important role in the changes in portfolio allocations of households in each category of the wealth distribution.

Although a full structural model of portfolio allocations lies beyond the scope of this paper, theoretical considerations can still motivate a reasonable reduced form specification.¹⁴ The first consideration is simply that a household's demand for any given asset will be a function not just of the tax rate on that asset but the tax rates on all other assets in which the investment could be made. Since relative prices are what matter, the specifications below include the marginal tax rates on both ordinary and capital income.

Another consideration is that the levels of the household's tax rates are not by themselves sufficient to determine its optimal portfolio allocations. According to the certainty version of the clientele model of Miller (1977), for example, the tax incentives for a household to hold an asset are determined by the household's tax rate on the asset *relative* to the distribution of all households' tax rate on the asset. Feldstein and Slemrod (1980) further show that the household's marginal tax rate relative to the corporate income tax rate will also be relevant in determining its portfolio allocations in general equilibrium.

Considerations of the entire schedule of personal and corporate tax rates suggest that in testing a specific model of portfolio allocation, the real unit of observation is the entire distribution of household allocations in a given year. Given only four such observations, the approach followed in the reduced form

model here is to include dummy variables for each sample year in the econometric specification. These dummy variables can account for the household's position in the marginal tax rate distribution and its position relative to the corporate tax rate. The entire marginal tax rate distribution may well have an important effect on the relative supplies of assets in the aggregate, but this analysis cannot identify that effect. What the results can determine is whether the household level variation in marginal tax rates *around their sample averages each year* is related to the household level variation in portfolio allocations around their sample averages each year. When comparing predicted and actual changes in allocations by net worth group, the actual change in the market proportion of each asset must be deducted from the observed change in the group's proportion.

There are also factors other than tax rates that affect portfolio allocations. Some of them are related to the preferences of the household, such as risk aversion. Others pertain to aspects of the household's budget constraint, such as borrowing restrictions or other risks that the household may have to bear (see Kimball (1993)). In a reduced form specification, these effects are proxied by including other variables that would at least partially reflect the differences in these factors across households. In the analysis below, these other covariates include gender, marital status, age, income, education, occupation, and industry. Each of these variables is entered as a set of dummy variables.¹⁵ Note that the inclusion of age and year effects incorporates the variation in portfolio holdings

by cohort estimated by Poterba and Samwick (1997b), even if all three effects cannot be separately identified. Additionally, the specification includes six dummy variables representing each of the net worth categories from Tables 2 through 4: 0-60th percentile, 60-80, 80-90, 90-95, 95-99, and 99-100. The inclusion of a dummy variable for each net worth group ensures that the predicted tax effects for each group will be unaffected by any factor that is idiosyncratic to that net worth group.

Because portfolio shares are censored at values of 0 and 100 in the data, the appropriate econometric model is a two-limit tobit, provided that the assumption of normally distributed errors in portfolio shares is acceptable. A refinement to this model would be to impose the constraint that the marginal effects of taxes on the portfolio shares must sum to zero at the estimation stage. For simplicity, this constraint is not imposed for the components of either financial assets or net worth. Not imposing the constraint makes the estimated coefficients less efficient but does not affect their consistency. Each asset demand equation is assumed to be a function of the same explanatory variables, and the equations for different assets are estimated independently. In each regression, all observations from all sample years are pooled (see Table 1), yielding one set of coefficients for each asset share.

It is important to note that the identification of the tax effects comes from two sources of variation. The first is the cross-sectional variation across

households in each survey year. The coefficients on marginal tax rates could be estimated with a single year of data. The second source of variation is in the different tax rate schedules (relative to the average tax rate) across sample years. Figures 1 and 2 show that there is substantially more variation within cross-sections than across cross-sections, suggesting that the first source of variation is more important in the identification of the estimates than the second.

The econometric results are summarized in Table 5. Each row corresponds to a tobit model for a different asset or liability's share of financial assets (top panel) or total assets (bottom panel). The first four columns are the coefficients and standard errors on the ordinary and capital gain marginal tax rates. The fifth column is the p-value for the test of the joint significance of the two tax rate variables.

Consider the first three assets, all of which are subject to at least partial taxation in the current period. For interest bearing accounts, the coefficients are jointly but not individually significant. The negative coefficient on the ordinary MTR is consistent with a higher tax rate on these accounts leading to lower portfolio allocations to them. However, these accounts never generate capital gains or losses, so a higher capital gains MTR should reduce allocations in other assets and increase them in these accounts, contrary to what is implied by the negative coefficient.¹⁶ For taxable bonds, the tax rate variables are neither individually nor jointly significant, and the point estimates are of the wrong signs.

For taxable equity, a higher ordinary MTR leads to significantly greater allocations in taxable equity, while a higher capital gain MTR leads to lesser allocations. This result is consistent with investors choosing equities to hold for the long term, to achieve capital gains rather than to receive immediate dividends.

The next three rows show the results for holdings of retirement accounts overall, and by bonds and equities. These results are harder to interpret because neither of the tax variables exactly measure the effective marginal tax rate on income earned within the retirement account. In all cases, a higher ordinary MTR leads to greater allocations, with statistical significance in the case of bonds and the total balances. A higher capital gain MTR leads to greater shares of financial assets in tax-deferred equity and lower shares of financial assets in tax-deferred bonds. One possible explanation is that the higher capital gain tax rate prompts households to take their equity holdings inside the retirement account, and this shift results in less scope for bond holdings in those accounts, which in most cases have contribution limits. However, this explanation does not account for the negative (though insignificant) coefficient on the capital gain MTR for retirement accounts overall.

The next two rows pertain to tax-exempt bonds and other financial assets (whole life insurance and trusts), both of which are tax-preferred relative to the other asset categories. This tax preference should lead to positive coefficients on both tax variables. For both asset shares, the coefficients on both variables are in

fact positive, though in the case of other financial assets, the estimates are neither individually nor jointly significant. For tax-exempt bonds, the ordinary MTR is significant while the capital gains MTR is not. A possible explanation for the poor empirical performance of the capital gains MTR is that it uses the statutory rate rather than the effective rate, which would take into account any household-specific factors that might influence the timing of realizations. This allows less identifying variation into the construction of the variable.

The theoretical predictions for how taxes should affect the allocation of total assets into its components are less clear. The specification includes two marginal tax rates for potential substitutes (in the form of financial assets) but none for the asset itself. A convenient way to summarize the role that taxes might play is to classify these assets as similar to the financial asset components that would exhibit the same pattern of coefficients. The results indicate that the tax effects on financial assets, miscellaneous assets, and business equity resemble those that would be predicted for equity. In contrast, both owner occupied and other real estate exhibit the tax effects that would be predicted for bonds.

The theory of tax arbitrage gives some indication of how tax rates should affect the leverage ratios in the bottom portion of the table. In a tax arbitrage, the investor borrows funds, deducting the interest payments, and uses the proceeds to purchase tax preferred assets. The tax preference on the assets typically comes in the form of taxing the gains at a capital gains tax rate that is lower than the

ordinary income tax rate. This "conversion" of income from ordinary to capital through the use of debt is at the heart of a tax shelter.¹⁷ Given this, we should see higher leverage ratios when the ordinary MTR is high (so the deductions of interest payments are more valuable) and when the capital gains MTR is low (so the eventual tax liability is lower). This pattern of a positive coefficient on the ordinary MTR and a negative coefficient on the capital gain MTR is present and statistically significant for every type of debt except for owner occupied real estate. Mortgage debt on the primary residence is intuitively less likely to be determined by tax arbitrage considerations. The coefficients are particularly large for other property debt, which is consistent with the tax arbitrage explanation.

The results in Table 5 suggest that portfolio allocations respond to marginal tax rates in a way that is consistent with basic economic prescriptions. Based on these results, it is reasonable to conjecture that the dramatic tax changes over the sample period are responsible for a portion of the observed changes in household portfolio allocations. To determine how important tax changes were, the tobit equations can be used to predict how much the portfolio allocations of each net worth category would have changed across survey years if only its tax rates were changed. For example, the tobit equation can be used to generate a predicted asset share for each household based on its explanatory variables. It can also be used to predict what each household's asset share would be if it instead faced the (dollar weighted average) marginal tax rates that its net worth category

faced in the previous survey. The difference between the two predicted values is the effect of taxes for that time period.

This prediction can then be compared to the actual change in that net worth category's asset share to determine how important tax changes were to the overall change. The appropriate measure of the actual change is net of the change in the asset share in the entire population. The difference between the actual and predicted change represents the effect of factors that are not related to the households' relative positions in the tax rate distributions. Some of this difference will be due to the other factors in the model. The rest will be due to factors that were not explicitly modeled, but note that such factors will be orthogonal to the predicted effect by net worth category due to the inclusion of the net worth dummy variables in the model.

Table 6 lists the actual and tax-related changes in portfolio allocations of financial assets relative to the population average for each of the three intervals in the sample period. For interest bearing assets, tax effects are predicted to be less than one percentage point, compared to actual changes that are typically four percentage points or more. The tax effects for taxable bonds are even smaller, with none exceeding 0.20 percentage points. Taxes appear to be a slightly larger component of the actual changes in taxable equity shares, but still less than ten percent of the observed magnitudes. There is also a better match between the signs of the effects as well. For retirement account shares, the magnitudes of the

tax effects are now comparable to the actual effects. The matchup is better for bonds than for equity in these accounts. For tax-exempt bonds, the predicted magnitudes are less than one percentage point, and for other financial assets, all predicted effects are small.

The correspondence between actual and predicted changes for the components of net worth is more robust, as shown in Table 7. For financial and other property assets, the matchup in the signs of the effects is generally close, with magnitudes of predicted changes around ten percent of the actual changes. For all four asset measures, the comparisons are closest for the 1992 to 1995 interval and for the bottom, not the top, of the wealth distributions. The predicted and actual changes for the debt measures are less clearly related. Financial debt shows the closest match, largely because both actual and predicted effects are small. For owner occupied debt, the magnitudes are comparable but the signs are unrelated. For other property, the magnitudes are comparable only for the 1983 to 1989 change, and the signs are not obviously related.

The comparisons in Tables 6 and 7 suggest some very general conclusions about the role of tax changes in explaining the actual changes in portfolio allocations. First, there is no evidence that tax changes play a greater role in the portfolio changes of the high net worth groups relative to the low net worth groups. This is especially true for the components of net worth. Second, the correspondence between predicted and actual is generally the best for the 1992 to

1995 period and worst for the 1989 to 1992 period, although this is not uniformly true across net worth categories and asset types. Among financial asset components, taxes seem to play the largest role for asset shares in retirement accounts. Among net worth components, taxes have fairly consistent effects on all components except for owner occupied and other property debt.

There are several caveats to this type of analysis that must be acknowledged. The first is that Tables 6 and 7 present a particular type of "marginal" effect calculation in which the change in tax rates is chosen to be the observed historical change. As long as the econometric model is consistent, the divergence between actual and predicted effects based on tax changes simply suggests that the primary explanation for the magnitudes of the changes lies elsewhere. The second is that the comparisons are measuring the changes in portfolio allocations for subgroups of the population *relative* to the population average. This is appropriate for a household level analysis of the effect of taxes, but it does not preclude the overall tax schedule, including the corporate income tax, from playing an important role in determining the population average itself. The link is that the financing decisions of firms, governments, and pension plans will determine the aggregate portfolio and may be very sensitive to tax changes in the overall tax schedule. In this analysis, taxes are allowed to explicitly determine only the deviations of net worth groups' holdings from the market portfolio.

VI. The Distribution of Asset Ownership by Tax Rate

The results of the previous section suggest that although marginal tax rates have significant effects on portfolio allocations in the cross-section, their role in explaining time-series changes in allocations is limited. Another way to assess the role of taxes is to consider changes in allocations at different points in the marginal tax rate distributions. The simple intuition is that in models of portfolio choice under uncertainty such as the standard capital asset pricing model, all households have the same portfolios of risky assets. They hold the market portfolio in order to diversify optimally. The introduction of differential tax rates across assets and investors prompts them to deviate from the market portfolio, with the size of the deviation determined at least in part by how different the investor's tax rates are from the average tax rates in the population.¹⁸

As suggested by Figures 1 and 2, the SCF sample period contains two intervals during which the distribution of marginal tax rates changed substantially. Between 1983 and 1989, TRA compressed the distribution so that the highest marginal tax rates were closer to the population average. With a smaller tax wedge, the portfolio allocations of the highest MTR households should more closely resemble the population proportions in 1989 than in 1983. Conversely, OBRA 93 raised marginal rates at the top of the distribution relative to the average. Portfolio allocations of the households at the top of the distribution should adhere to the market proportions to a lesser degree in 1995 than in 1992.

Tables 8 and 9 provide the data necessary to analyze these propositions informally. The rows of the tables refer to different percentile ranges in the yearly distributions of the ordinary income marginal tax rates. The groups were chosen so that the average MTR by category, weighted by financial assets (shown in the last column), changed very little over time for the bottom four groups. As in the previous tables, the other columns are the shares of financial assets allocated to each asset type. Table 8 compares allocations in 1983 and 1989, while Table 9 compares them for 1992 and 1995. The basis of comparison is shown in the bottom group of rows, labeled "Change," in each table. For each MTR category j , the change in allocations is given by:

$$\left| x_{j,t} - \bar{x}_{j,t} \right| - \left| x_{j,t-1} - \bar{x}_{j,t-1} \right|$$

where x is either a portfolio allocation or marginal tax rate and the bar denotes the population mean. A positive value of this change indicates that the portfolio share of asset x in category j 's portfolio got farther away from the market portfolio over the time interval from $t-1$ to t . A negative value indicates the opposite. The test of the proposition is whether the signs of these changes were the same for the MTR as for each asset's portfolio share.

Consider first the change in allocations from 1983 to 1989 in Table 8. The last column of the bottom panel shows that MTRs got closer to the population averages for the top 5 percent and bottom 75 percent of the distribution and slightly farther away for the 75th to 95th percentiles. The first column shows that

for all but one MTR category, the signs of the changes in interest bearing account shares were the same as those for MTRs--negative at the top and bottom and positive in the middle. The same is true for taxable equity, shown in the third column. For no other asset is there any pattern of signs on the asset share changes that aligns well with those of the MTR changes. When examined by MTR category, the bottom quartile and the 60th to 75th percentiles have the most consistent matches. For the top 5 percent, the deviations in portfolio allocations in 1989 are as often as not larger than they were in 1983.

Table 9 presents the analogous changes for the 1992 to 1995 interval. The pattern of signs on the MTR changes is directly opposite to that found in Table 8. The top 5 percent and bottom 75 percent moved away from the average MTR, while those in the intervening 20 percent moved toward the average. The other columns of the table show that with the minor exception of bonds in retirement accounts, there is no asset for which the signs on the allocation changes aligns well with those on the MTR changes. While the correspondence across assets is good for the 95th to 99th percentiles and 60th to 75th percentiles, it is very poor for the other categories, especially the top percentile. The key factor seems to be that there is remarkably little variation in financial asset portfolio allocations in 1995.

The results in Tables 8 and 9 do not constitute strong evidence that changes in portfolio allocations over time were determined by changes in marginal tax rates across groups. Furthermore, the restriction on the data that was

being tested--that changes in deviations from the sample average should be correlated with analogous changes in MTRs--was a fairly weak one to impose. There are, however, two potential problems with this methodology. The first is that, as in the case of changes by net worth category, the proper specification is a multivariate one that accounts for other possible changes in the optimal allocations of each MTR group. Based on the explanatory power of other covariates like age, education, occupation, etc. in the estimates in Table 5 and Poterba and Samwick (1997a), however, this is not likely to be an important omission. The second is that there are other factors that determine the extent to which differential tax rates will change portfolio allocations. An important one is the degree of systematic risk among all the financial assets. The lack of variation in portfolio allocations across groups in 1995, for example, may be due to a higher degree of systematic risk in that year.

VII. Conclusion

Simple cross-tabulations of portfolio allocations by net worth or marginal tax rate group in any year clearly show that marginal tax rates are correlated with the ownership of tax-preferred assets in a way that is consistent with standard economic theory. More careful multivariate analysis, such as that in Table 5 and Poterba and Samwick (1997a), upholds this result in the cross-section. The analysis in this paper shows that the ability of taxes to explain the time-series

changes of portfolio allocations of net worth groups relative to the economy as a whole is more limited. Predicted effects from tax changes constituted about 10 percent of the observed changes, although this number varies considerably across time periods and assets. Within this framework, the predicted portfolio responses of the wealthy, though larger in magnitude, do not seem to be any more tax-related than the responses of other net worth categories.

The primary methodological improvement made in this analysis relative to previous studies of portfolio responses to taxation is the calculation of marginal tax rates for a sample period that spans multiple tax reforms. An important feature of the tax environment was that the later OBRAs undid much of what was accomplished in TRA. This allows for conclusions to be based not just on trending variables, which would likely be correlated with several factors that are not modeled explicitly.

Nonetheless, there are several reasons why the analysis here could yield predicted effects that are smaller than the actual effects. The first is that the metric for comparison--the similarity of the predicted effect by group to the actual effect observed in the data--is analogous to an R^2 in a regression. Measurement error will lower any such "goodness of fit" measure. In this analysis, it is quite likely that survey responses to portfolio questions are measured with error. The tax calculating algorithm, though very detailed, will also introduce measurement error. The second is that the true relationship between tax rates and asset shares

may be nonlinear. For example, the highest marginal tax rate investors will be the natural clientele for tax exempt bonds in every sample year. Lowering the marginal tax rate on the top marginal tax rate group may not induce the same change in portfolios as increasing the marginal tax rate on a low marginal tax rate group by the same amount. The impact of such a change will be reflected in price changes rather than quantity changes. Scholz (1994) examines the 1983 to 1989 period in more detail and shows that the yield spread between tax-exempt and taxable bonds narrowed over the period. His observations on the quantities of assets held by income and wealth groups match those presented here. Welfare analysis of tax reforms must be made based on changes in both quantities and prices.

A third reason for the low predicted effects of tax rate changes is that transaction costs may prevent portfolios from fully reflecting contemporaneous tax rates. In addition to the well known problems of “lock-in” due to taxation of gains upon realization rather than accrual, all purchases and sales of assets incur transaction fees. These fees may be large relative to the welfare gains that can be obtained from immediate portfolio rebalancing. In this respect, the second test for tax effects provides useful reinforcement for the main results. Where tax differentials narrowed, differences in portfolio allocations across households widened, and where tax differentials widened, portfolio allocations narrowed. This finding is similar to that of Slemrod (1994), who compared the portfolios of

the affluent in the low-tax 1980s and the high-tax 1960s and found no noticeable shift out of tax-exempt securities and into taxable securities.

There are three principal shortcomings in this analysis where improvements could be made in future work. One is to more carefully calculate effective tax rates that explicitly incorporate the deferral and conversion of tax liabilities for equity-like investments. Alternative methods of imputing the determinants of taxable income and itemized deductions based on information in tax return data might also refine the analysis. A second improvement is to use a structural model of portfolio allocations that can generate sharper predictions to be tested. Such a model would incorporate non-tax factors for portfolio allocations, most notably risk and borrowing constraints, and allow for nonlinear effects of tax rates on portfolio allocations. A third improvement would be to test the same basic propositions as in this paper using a panel dataset on wealth holdings such as the SCF 1983-1989 panel. A panel dimension would overcome the problem that the identity of the richest households changes over time. Distributions of household well-being based on marginal tax rates or net worth could be defined based on more than one year of data and thereby be more robust to transitory components of wealth and income. A panel would also permit greater time-series variation to be used in estimating the tax elasticities.

The responsiveness of the portfolios of the rich to taxation appears to be limited. This phenomenon may be the result of another factor, such as systematic

risk, that makes it worthwhile for the rich to hold a portfolio that is not optimal based on tax-considerations alone. The absence of appreciable variation in financial portfolio allocation by marginal tax rates in 1995 in particular suggests the strong desire to diversify risk across asset types. The presence of other factors over which households must optimize in choosing their portfolio allocations reduces the scope for the rich to lessen their tax liabilities by changing their portfolios in response to tax reforms.

Notes:

¹ Prominent examples include Feldstein (1976), King and Leape (1984), Agell and Edin (1990), and Scholz (1994). See Poterba and Samwick (1997a) for a review of the literature.

² The SCF 1986 will not be used in this analysis due to its small sample size and the possibility that it represents a transition to the regime implemented by TRA, which was actively discussed during the months when the survey was conducted.

³ The sampling design and construction of the sample weights that allow the two samples to be used together is discussed in Avery, Elliehausen, and Canner (1984a, b), Heeringa, Conner and Woodburn (1994), Kennickell and Woodburn (1992), Kennickell, McManus, and Woodburn (1995), and Kennickell and Woodburn (1997).

⁴ See also Avery, Elliehausen, and Kennickell (1988), Scholz (1994), and Antoniewicz (1996).

⁵ I am indebted to Ed Wolff for summarizing the changes necessary to reweight the data. The reweighting factors are as follows: For 1983, the factors are checking accounts (1.68), savings and time deposits (1.50), financial securities (1.20), stocks and mutual funds (1.06), and non-mortgage debt (1.16). The Wolff calculations use the "Full Sample Composite Weight" rather than the "Extended Income Weight," as in the unadjusted calculations. For 1989, the factors are

checking accounts (1.361), thrift and other accounts (1.111), stocks, bonds, and trusts (1.795), and household income (1.123). The Wolff calculations use the average of the two design-based weights, where the unadjusted calculations use the design-based weights from Kennickell and Shack-Marquez (1992). For 1992, the factors are all deposits (1.32) and trusts (1.41). The Wolff calculations also reweight the sample weights by income category (increasing the representation of very high income households in the SCF) to match the proportion of the sample with income over one million dollars to published tabulations based on tax return data, as described in Wolff (1997).

⁶ Two other factors support the use of the unadjusted weights. First, Antoniewicz (1996) shows that some discrepancies between the SCFs and Flow of Funds for 1989 and 1992 are attributable to different populations and definitions of items. Her comparisons yield estimates of wealth aggregates that are within one standard error of each other when these differences are eliminated. Second, even if the wealth reported in the Flow of Funds is deemed to be the correct number, it is not clear that all adjustments should be proportional. Such adjustments assume that the discrepancies in the SCF are due entirely to (proportional) under-reporting by households who report that they own the asset in question rather than misreporting by households who report that they do not own the asset. Wolff's (1997) comparisons of the high end of the income distributions in the SCF 1992

and the corresponding Statistics of Income are more troubling and clearly merit further study.

⁷ Asset allocations for retirement accounts are not directly reported in the SCF 1983 and so are imputed (conditionally on equity ownership outside of retirement accounts) from the allocations in the SCF 1989.

⁸ See Samwick (1996) for an analysis of the effect of TRA on tax shelters.

⁹ Two other important sources of marginal tax rate differences across households are due to state taxes and the estate tax.

¹⁰ Another approach would be to impute aggregate amounts or taxable shares based on reports of analogous quantities in the IRS Statistics of Income. Refining the precise calculations of marginal tax rates is the subject of work in progress.

¹¹ See Sammartino and Weiner (1997) for a thorough discussion of OBRA 90 and 93 and an analysis of their effects on reported taxable income.

¹² The effects of the tax reforms on aspects of the tax code other than the MTR, such as the base broadening that occurred during TRA 86, are therefore reflected in the position of each household in the yearly distribution. Had the definition of taxable income remained the same between 1983 and 1989, many households in 1989 would have lower marginal tax rates. This would shift the 1989 schedule to the left, abstracting from complications introduced by the marginal tax rate "bubble" in 1989.

¹³ The formation of clienteles will be complicated by the presence of retirement accounts, which attach the tax preference to any asset held in the account. See Samwick (1997) for an elaboration of this point.

¹⁴ The econometric framework here is a slight variant of the one that Poterba and Samwick (1997a) used to analyze the effects of taxation on household portfolios more broadly.

¹⁵ The gender variable is a dummy variable for a female-headed household. The marital status variable is a dummy variable for married households. The age categories are: Under 25, 25-34, 35-44, 45-54, 55-64, and 65 and over. The income categories are (in thousands of 1992 dollars): 0-15, 15-25, 25-50, 50-75, 75-100, 100-250, and 250 and over. The education categories are: Less than high school, High school diploma, Some college, College degree, and Some graduate work. The occupation categories are: Executives and Professionals; Clerical, Technical and Sales; Services; Crafts; Laborers; Farmers; Retired; and Homemakers or other not in the labor force. The industry categories are: Agriculture, Forestry, and Fisheries; Mining, Construction, and Manufacturing; Services; and Public Administration.

¹⁶ When the model is estimated using the ratio of $(1 - \text{ordinary MTR}) / (1 - \text{capital gain MTR})$, the coefficient is positive with a p-value of 0.27, suggesting that the effect of the ordinary MTR is more important when the two tax rates are included

separately in the regression.

¹⁷ Cordes and Galper (1985) discuss the market for tax shelters in the period before TRA.

¹⁸ There is also an effect of taxes through the induced change in the variance of risky asset returns. See Auerbach and King (1983) for a derivation.

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Figure 1
Marginal Tax Rate Distributions, by Year

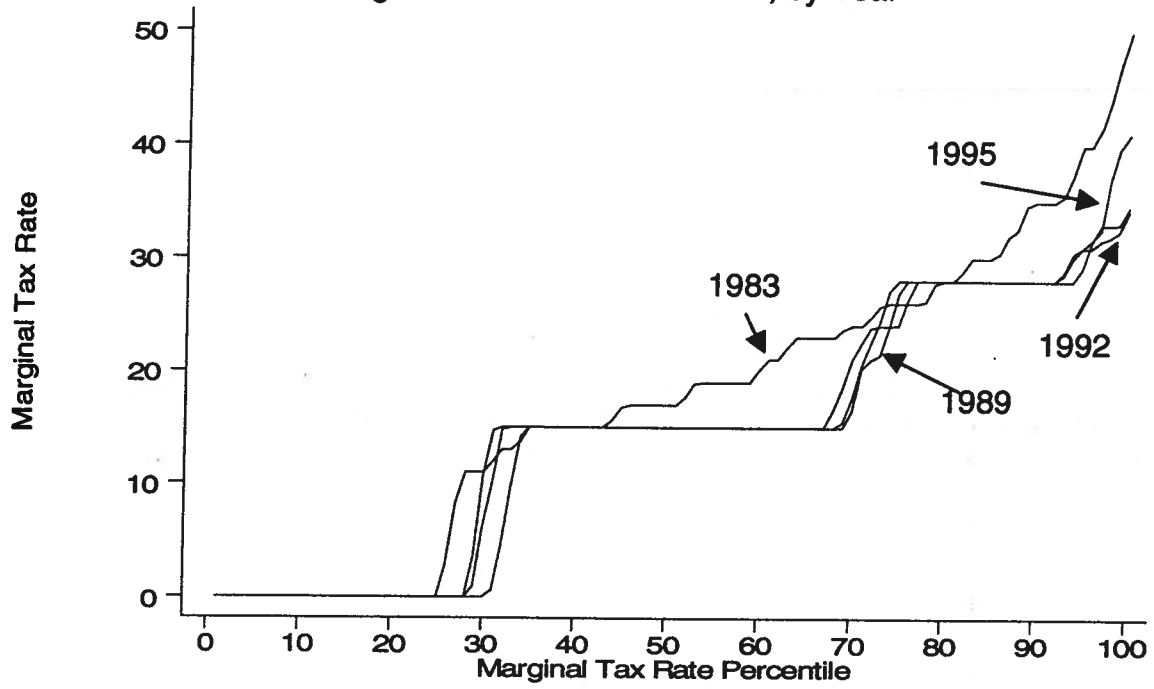


Figure 2
Top Quintile of Marginal Tax Rate Distributions, by Year

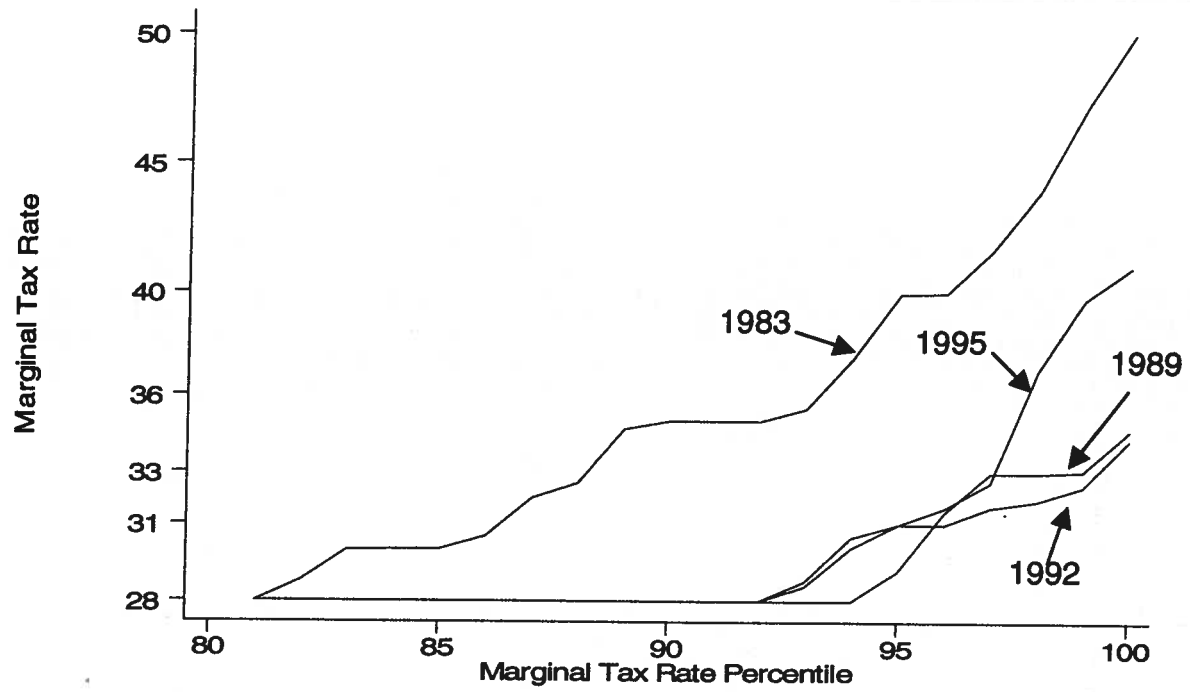


Table 1

Frequency Counts and Sample Shares by Year

Net Worth Percentiles	1983	1989	1992	1995
99-100	290 7.07	459 14.60	662 16.95	698 16.24
95-99	273 6.65	348 11.07	428 10.96	472 10.98
90-95	203 4.95	211 6.71	242 6.20	304 7.07
80-90	364 8.87	315 10.02	355 9.09	392 9.12
60-80	747 18.21	482 15.34	538 13.77	596 13.86
00-60	2226 54.25	1328 42.25	1681 43.04	1837 42.73
Total	4103 100	3143 100	3906 100	4299 100

Source: Author's tabulations from the Surveys of Consumer Finances, 1983-1995.

Notes:

- 1) Top number is the number of observations in each percentile of the Net Worth distribution
- 2) Bottom number is the proportion of the observations in each percentile of the Net Worth distribution.

Table 2

Summary Statistics on Net Worth and Tax Rates

Net Worth Percentiles	Unadjusted SCFs					Wolff Adjustments		
	Mean (Thousands)	Sum (Billions)	Share (Percent)	Marginal Tax Rate	Tax Rate Percentile	Mean (Thousands)	Sum (Billions)	Share (Percent)
1983								
99-100	5343	4495	30.86	36.51	81.73	6236	5251	32.55
95-99	992	3329	22.86	26.86	67.62	1063	3570	22.13
90-95	420	1765	12.12	24.46	64.64	456	1916	11.87
80-90	227	1905	13.08	21.89	60.18	252	2111	13.08
60-80	117	1957	13.44	19.86	56.51	126	2107	13.06
00-60	22	1113	7.64	14.29	43.23	23	1178	7.30
All	174	14563		17.40		192	16133	
1989								
99-100	6413	6002	33.50	23.37	74.07	7739	7207	35.27
95-99	1017	3787	21.13	21.86	70.52	1187	4427	21.67
90-95	449	2104	11.74	19.76	65.11	514	2392	11.71
80-90	256	2386	13.32	17.86	59.38	282	2633	12.89
60-80	132	2450	13.68	15.42	53.56	138	2567	12.56
00-60	21	1187	6.62	11.88	44.25	22	1207	5.91
All	192	17916		14.10		219	20433	
1992								
99-100	5301	5132	29.52	27.06	83.08	7199	6910	34.64
95-99	1061	4068	23.40	24.74	77.54	1190	4570	22.91
90-95	454	2186	12.57	21.46	68.00	484	2306	11.56
80-90	248	2379	13.68	19.07	61.99	257	2458	12.32
60-80	123	2360	13.58	16.39	54.87	126	2417	12.12
00-60	22	1262	7.26	11.97	42.51	22	1289	6.46
All	181	17387		14.70		209	19952	
1995								
99-100	6688	6678	35.13	32.11	85.80			
95-99	1020	4031	21.20	25.88	75.34			
90-95	453	2251	11.84	21.25	65.94			
80-90	239	2364	12.43	18.24	58.86			
60-80	120	2370	12.47	15.88	53.36			
00-60	22	1316	6.92	12.27	43.81			
All	192	19010		14.78				

Notes:

- 1) All dollar values are in constant 1992 dollars.
- 2) Wolff adjustments are detailed in Wolff (1987, 1994, 1997).
- 3) Marginal tax rates are the average of the "first-dollar" marginal tax rates on ordinary income for the households in the specified percentiles of the net worth distribution.

Table 3

Portfolio Allocation of Financial Assets, by Net Worth Percentiles and Year

Net Worth Percentiles	Interest Bearing Accounts	Taxable Bonds	Taxable Equity	Retirement Accounts			Tax Exempt Bonds	Other Financial Assets	Average Marginal Tax Rate	Marginal Tax Rate Percentile
				All	Bonds	Equity				
1983										
99-100	9.04	5.13	45.08	8.36	5.30	3.07	12.50	19.89	42.81	90.77
95-99	24.81	9.81	29.04	14.11	8.62	5.49	8.54	13.69	30.23	73.71
90-95	39.10	10.53	16.42	19.71	12.07	7.63	5.09	9.14	26.53	68.25
80-90	48.67	3.96	13.59	18.97	11.86	7.12	0.84	13.97	22.13	60.75
60-80	47.29	3.00	6.30	23.20	13.82	9.38	0.36	19.85	21.96	61.04
00-60	45.06	3.45	6.31	19.41	9.49	9.93	1.01	24.77	19.11	54.84
All	27.73	6.27	27.32	14.67	5.80	8.86	7.15	16.87	31.59	74.83
1989										
99-100	21.34	10.95	23.87	12.27	6.45	5.64	17.14	14.44	24.59	78.00
95-99	27.76	7.70	23.38	20.80	12.99	7.33	9.98	10.37	24.06	76.12
90-95	31.54	6.67	12.43	27.18	16.73	9.46	7.62	14.57	21.02	68.78
80-90	36.62	5.32	12.11	30.57	17.09	13.05	4.26	11.11	19.49	63.43
60-80	43.35	4.84	6.41	26.23	16.39	9.59	3.19	15.97	15.22	53.81
00-60	44.10	4.73	5.91	25.86	15.73	9.93	1.92	17.47	16.62	56.37
All	30.59	7.68	17.07	21.44	8.38	12.67	9.68	13.53	21.54	69.75
1992										
99-100	17.49	7.56	34.57	13.70	5.38	8.17	16.02	10.66	27.97	86.03
95-99	17.97	7.34	21.16	29.67	14.54	14.60	11.30	12.56	26.33	81.51
90-95	31.01	5.94	13.19	31.91	18.50	13.41	7.32	10.63	21.41	67.22
80-90	31.66	4.39	13.34	34.46	16.88	15.86	3.94	12.20	20.27	65.23
60-80	34.97	6.03	7.57	33.80	18.29	15.49	3.93	13.70	18.78	61.16
00-60	41.53	4.38	6.92	26.27	15.04	11.07	1.53	19.36	16.83	55.54
All	25.37	6.41	19.77	26.82	12.81	13.57	9.34	12.28	23.61	74.04
1995										
99-100	15.60	8.96	38.05	12.78	5.10	7.11	13.34	11.26	34.11	90.39
95-99	16.47	5.85	27.42	31.96	10.98	20.72	6.26	12.03	28.10	80.04
90-95	21.00	7.35	16.79	36.29	14.62	20.02	3.51	15.06	22.05	68.63
80-90	27.37	6.13	13.36	33.52	15.52	16.54	3.02	16.61	19.81	63.17
60-80	27.19	4.99	10.80	36.86	15.98	19.49	1.41	18.74	18.86	60.74
00-60	30.89	3.45	7.17	37.70	15.29	21.21	0.92	19.86	16.86	55.98
All	20.00	6.93	25.18	26.85	15.28	10.70	7.18	13.86	26.82	76.77

Notes:

- 1) Each entry in the left panel represents the share of the aggregate financial assets held in the form of the asset specified at the top of the column by the households in the percentiles of the net worth distribution specified at the left of the row.
- 2) The entries in the right panel are the dollar-weighted marginal tax rates on ordinary income and percentiles of that tax rate's distribution for the households in the specified net worth percentiles. The weights are the sample weights multiplied by the household's level of financial assets.

Table 4

Portfolio Allocation of Total Assets, by Net Worth Percentiles and Year

Net Worth Percentiles	Assets					Debt				
	Financial	Owner Occupied	Other Property	Misc.	Business	Financial	Owner Occupied	Other Property	Misc.	Total
1983										
99-100	37.23	9.16	18.39	1.34	33.87	0.39	1.09	3.11	1.17	5.76
95-99	30.93	21.22	19.18	2.71	25.95	0.38	2.46	3.01	0.81	6.66
90-95	28.09	32.32	16.09	4.92	18.57	0.56	5.52	2.28	1.44	9.80
80-90	29.44	42.51	15.15	4.80	8.10	0.45	9.15	3.45	1.79	14.84
60-80	22.28	58.28	8.77	6.58	4.09	0.73	13.28	2.27	2.65	18.92
00-60	19.04	60.88	5.28	12.91	1.88	1.71	25.33	1.84	8.49	37.37
All	29.69	31.49	15.08	4.50	19.25	0.61	7.32	2.78	2.20	12.90
1989										
99-100	27.48	9.83	23.79	5.47	33.43	0.24	1.31	6.51	0.56	8.63
95-99	28.38	24.74	20.76	6.41	19.71	0.13	3.78	5.53	1.12	10.56
90-95	35.11	36.52	12.45	6.11	9.82	0.37	6.57	2.87	1.20	11.01
80-90	28.89	48.97	10.79	6.61	4.74	0.38	10.65	2.50	1.80	15.33
60-80	22.21	58.16	6.66	8.39	4.58	0.68	17.22	2.44	3.25	23.58
00-60	16.69	60.96	5.57	15.54	1.23	2.21	28.33	7.05	11.98	49.56
All	26.71	33.59	15.71	7.41	16.58	0.53	8.91	4.84	2.55	16.84
1992										
99-100	29.68	8.84	23.20	3.54	34.75	0.22	1.50	4.34	0.68	6.74
95-99	34.91	23.98	17.63	4.72	18.75	0.10	5.49	4.64	0.64	10.87
90-95	37.64	33.07	14.70	4.18	10.41	0.28	8.43	3.39	0.43	12.53
80-90	32.84	45.98	9.04	6.02	6.11	0.44	12.28	1.83	0.91	15.47
60-80	24.69	55.76	7.28	8.17	4.10	0.64	18.67	1.48	2.10	22.89
00-60	16.98	61.86	4.55	15.20	1.41	2.67	32.54	1.83	8.00	45.04
All	30.08	32.93	14.61	6.19	16.19	0.56	10.65	3.25	1.69	16.15
1995										
99-100	39.29	7.74	12.45	3.46	37.07	0.11	1.47	2.45	0.64	4.67
95-99	42.55	21.96	16.78	5.95	12.76	0.11	5.20	2.83	0.58	8.71
90-95	40.13	32.25	14.35	5.79	7.48	0.21	7.50	3.79	0.95	12.45
80-90	32.70	45.01	9.37	8.23	4.69	0.49	10.47	2.14	1.30	14.41
60-80	26.27	55.34	5.83	9.69	2.86	1.06	19.30	1.25	2.47	24.08
00-60	17.20	61.30	3.24	16.73	1.53	3.01	37.22	1.46	10.39	52.08
All	34.74	30.92	11.10	7.26	15.97	0.65	10.78	2.35	2.18	15.97

Noes:

- 1) Each entry in the left panel represents the share of the aggregate total assets held in the form of the asset specified at the top of the column by the households in the percentiles of the net worth distribution specified at the left of the row.
- 2) The entries in the right panel are the ratio of the outstanding balances on the type of debt specified at the top of the column to the gross value of all the assets owned by households in the percentiles of the net worth distribution specified at the left of the row.

Table 5

Summary of Econometric Results for Portfolio Allocations, Coefficients on Tobits for Asset Shares

Asset	Ordinary MTR		Capital Gains MTR		Joint Significance (p-value)
	Coefficient	Std. Err.	Coefficient	Std. Err.	
Shares of Financial Assets					
Interest Bearing Accounts	-0.0742	0.0881	-0.1774	0.1073	0.0000
Taxable Bonds	0.0534	0.0673	-0.0291	0.0825	0.5747
Taxable Equity	0.1877	0.0935	-0.1093	0.1163	0.0298
Retirement Accounts					
All	0.4814	0.1093	-0.1996	0.1331	0.0000
Bonds	0.7733	0.1103	-0.6494	0.1344	0.0000
Equity	0.0983	0.1172	0.2116	0.1436	0.0000
Tax-Exempt Bonds	0.2927	0.1251	0.0841	0.1570	0.0000
Other Financial Assets	0.0040	0.1033	0.0898	0.1269	0.3524
Shares of Total Assets					
Financial Assets	0.2642	0.0622	-0.0110	0.0755	0.0000
Owner Occupied	-0.3018	0.0750	0.1364	0.0912	0.0000
Other Property	-0.7937	0.0849	0.3635	0.1055	0.0000
Miscellaneous	0.1778	0.0506	-0.1514	0.0613	0.0012
Business	0.4854	0.1061	-0.1907	0.1343	0.0000
Financial Debt	0.1885	0.0481	-0.2544	0.0574	0.0001
Owner Occupied Debt	-0.3522	0.0690	0.0689	0.0839	0.0000
Other Property Debt	0.7389	0.0721	-1.1217	0.0861	0.0000
Miscellaneous	0.2382	0.0713	-0.1917	0.0863	0.0017
Total Debt	0.1608	0.0614	-0.4258	0.0741	0.0000

Notes: See the text for discussion of the econometric specification.

Table 6

Comparison of Actual and Predicted Changes in Portfolio Allocations of Financial Assets, by Net Worth Percentile and Time Period

Net Worth Percentile	Interest Bearing Acct		Taxable Bonds		Taxable Equity		Retirement Accounts				Tax-Exempt Bonds		Other Financial Assets	
	Actual	Tax	Actual	Tax	Actual	Tax	All	Bonds	Equity		Actual	Tax	Actual	Tax
83 to 89														
99 - 100	9.44	0.67	4.41	-0.18	-10.96	-0.89	-2.88	-1.81	0.00	-0.38	2.11	-1.26	-2.13	-0.11
95 - 99	0.09	-0.69	-3.52	0.04	4.59	0.18	-0.09	0.68	-0.74	0.51	-1.09	0.62	0.01	0.18
90 - 95	-10.42	-0.47	-5.28	0.08	6.26	0.31	0.69	1.22	-0.74	0.53	-0.01	0.35	8.76	0.09
80 - 90	-14.91	-0.66	-0.05	0.13	8.77	0.50	4.82	2.14	3.36	0.80	0.89	0.36	0.48	0.10
60 - 80	-6.80	0.04	0.43	0.09	10.36	0.27	-3.74	1.53	-2.36	0.39	0.30	0.09	-0.55	-0.07
00 - 60	-3.81	-0.55	-0.12	0.10	9.85	0.23	-0.34	1.89	-2.57	0.46	-1.62	0.07	-3.97	0.03
89 to 92														
99 - 100	1.37	-0.11	-2.12	0.03	7.99	0.14	-3.95	0.31	-1.90	0.12	-0.77	0.23	-2.52	0.02
95 - 99	-4.57	0.03	0.91	0.00	-4.92	0.04	3.48	0.26	2.83	0.21	1.66	0.00	3.44	0.00
90 - 95	4.69	0.26	0.55	-0.02	-1.95	-0.07	-0.65	-0.02	-0.49	0.19	0.04	-0.17	-2.69	-0.05
80 - 90	0.26	0.17	0.34	-0.02	-1.47	-0.05	-1.49	0.08	-1.12	0.32	0.03	-0.09	2.34	-0.02
60 - 80	-3.17	-0.43	2.46	0.02	-1.54	0.05	2.19	0.60	1.46	0.69	1.08	0.07	-1.02	0.11
00 - 60	2.64	0.00	0.92	-0.01	-1.70	0.00	-4.95	0.10	-3.30	0.24	-0.05	-0.01	3.14	-0.01
92 to 95														
99 - 100	3.48	-0.09	0.88	0.08	-1.92	0.42	-0.95	0.90	-3.54	0.15	-0.52	0.49	-0.97	0.00
95 - 99	3.88	0.20	-2.02	-0.02	0.85	-0.10	2.28	-0.07	3.65	0.12	-2.88	-0.13	-2.10	-0.03
90 - 95	-4.64	0.20	0.88	-0.05	-1.80	-0.21	4.36	-0.45	4.14	0.21	-1.65	-0.12	2.85	-0.01
80 - 90	1.08	0.33	1.21	-0.05	-5.40	-0.22	-0.97	-0.54	-1.79	0.20	1.24	-0.12	2.83	-0.03
60 - 80	-2.41	0.21	-1.57	-0.04	-2.18	-0.12	3.04	-0.39	1.53	0.30	-0.35	-0.05	3.46	0.00
00 - 60	-5.27	0.08	-1.46	-0.03	-5.15	-0.07	11.39	-0.41	7.67	0.20	1.56	-0.02	-1.07	0.01

Notes:

- 1) The "Actual" column is the difference in the portfolio allocation of the specified asset over the time interval for the specified net worth category net of the difference in the portfolio allocation of all households over that time period. The raw data are presented in Table 3.
- 2) The "Tax" column is the predicted change in the portfolio allocation of the specified asset over the time period based on the difference between the households' tax rates in the later year and the weighted average tax rates for the same percentile group in the earlier year. Predictions are based on the estimated coefficients in Table 5.

Comparison of Actual and Predicted Changes in Portfolio Allocations of Total Assets, by Net Worth Percentile and Time Period

Notes:

2) The "Tax" column is the predicted change in the portfolio allocation of the specified asset over the time period based on the difference between the households' tax rates in the later year and the weighted average tax rates for the same percentile group in the earlier year. Predictions are based on the estimated coefficients in Table 5.

Table 8

Portfolio Allocation of Financial Assets, by Marginal Tax Rate Percentiles for 1983 to 1989

Tax Rate Percentiles	Interest Bearing Accounts	Taxable Bonds	Taxable Equity	Retirement Accounts			Tax Exempt Bonds	Other Financial Assets	Average Marginal Tax Rate
				All	Bonds	Equity			
1983									
99-100	11.22	5.16	41.91	11.67	7.28	4.39	9.07	20.96	50.00
95-99	17.53	5.52	33.47	20.17	13.22	6.95	9.43	13.87	45.08
90-95	22.00	3.93	24.73	18.11	9.15	8.97	12.16	19.07	37.49
75-90	29.74	6.60	18.60	20.16	11.94	8.22	3.55	21.34	30.44
60-75	34.10	11.74	15.80	19.40	11.16	8.24	2.41	16.55	23.42
25-60	42.73	7.54	21.51	9.02	5.34	3.68	6.84	12.36	13.43
00-25	55.09	3.54	19.84	5.37	4.08	1.29	2.21	13.95	0.00
All	27.73	6.27	27.32	14.67	8.86	5.80	7.15	16.87	31.59
1989									
99-100	31.53	2.05	15.19	39.73	34.02	5.18	7.34	4.16	34.50
95-99	23.57	3.85	17.68	28.23	12.78	15.13	9.85	16.82	32.06
90-95	30.77	11.04	25.22	15.01	8.98	5.62	9.29	8.67	28.63
75-90	24.30	8.48	16.36	26.55	16.41	9.83	11.23	13.08	28.00
60-75	25.58	8.69	16.17	19.49	11.68	7.52	12.07	18.00	21.58
25-60	43.71	7.38	15.45	13.81	8.58	4.53	7.71	11.94	9.44
00-25	45.01	5.80	12.07	24.83	16.14	8.23	3.81	8.49	0.00
All	30.59	7.68	17.07	21.44	12.67	8.38	9.68	13.53	21.54
Change									
99-100	-15.57	4.52	-12.71	15.29	19.77	1.79	0.42	5.28	-5.45
95-99	-3.18	3.08	-5.54	1.29	-4.25	5.60	-2.11	0.29	-2.97
90-95	-5.55	1.02	5.56	2.99	3.40	-0.41	-4.62	2.66	1.20
75-90	4.28	0.47	-8.01	-0.38	0.66	-0.97	-2.05	-4.02	5.30
60-75	-1.36	-4.46	-10.62	-2.78	-1.31	-1.58	-2.35	4.15	-8.13
25-60	-1.88	-0.97	-4.19	1.98	0.57	1.73	1.66	-2.92	-6.07
00-25	-12.94	-0.85	-2.48	-5.91	-1.31	-4.36	0.93	2.12	-10.05

Notes:

- 1) The first eight columns contain the share of the aggregate financial assets held in the form of the asset specified at the top of the column by the households in the percentiles of the distribution of marginal tax rates on ordinary income specified at the left of the row.
- 2) The last column is the dollar-weighted marginal tax rates on ordinary income for the households in the specified net worth percentiles. The weights are the sample weights multiplied by the household's level of financial assets.
- 3) The bottom panel marked "Change" is the difference in the column values for the specified percentile across the two years less the analogous difference for all of the households in the population.

Table 9

Portfolio Allocation of Financial Assets, by Marginal Tax Rate Percentiles for 1992 to 1995

Tax Rate Percentiles	Interest Bearing Accounts	Taxable Bonds	Taxable Equity	Retirement Accounts			Tax Exempt Bonds	Other Financial Assets	Average Marginal Tax Rate
				All	Bonds	Equity			
1992									
99-100	22.72	2.24	18.39	41.43	16.30	25.13	5.26	9.97	34.13
95-99	16.98	6.22	23.00	28.08	12.56	15.31	12.14	13.58	31.83
90-95	19.27	8.41	24.69	27.89	13.85	13.29	11.28	8.45	29.90
75-90	23.16	5.36	17.64	32.12	16.25	15.21	9.80	11.93	27.36
60-75	24.15	6.56	20.81	27.53	14.38	12.47	8.76	12.20	21.07
25-60	39.13	7.12	14.00	17.48	10.63	6.81	6.27	16.00	11.27
00-25	51.41	4.64	12.95	15.79	10.56	5.07	4.29	10.92	0.00
All	25.37	6.41	19.77	26.82	13.57	12.81	9.34	12.28	23.61
1995									
99-100	16.50	7.00	26.17	28.01	6.60	19.50	8.27	14.04	41.00
95-99	17.40	9.32	32.20	20.32	8.14	11.99	10.70	10.06	36.77
90-95	14.71	4.78	32.57	29.74	10.80	18.32	5.55	12.65	29.70
75-90	18.72	4.58	11.81	43.97	14.62	28.27	2.98	17.95	28.00
60-75	21.44	6.99	22.32	22.24	9.84	11.02	8.35	18.66	21.48
25-60	28.25	6.94	16.56	27.30	14.83	11.73	4.19	16.75	10.08
00-25	28.31	3.99	25.08	28.70	15.09	12.26	3.22	10.71	0.00
All	20.00	6.93	25.18	26.85	10.70	15.28	7.18	13.86	26.82
Change									
99-100	0.85	-4.10	-0.39	-13.45	1.37	-8.10	-2.99	-2.13	3.66
95-99	-5.79	2.20	3.79	5.27	1.55	0.79	0.72	2.50	1.73
90-95	-0.81	0.15	2.47	1.82	-0.18	2.56	-0.31	-2.62	-3.40
75-90	-0.93	1.30	11.24	11.82	1.24	10.59	3.74	3.74	-2.57
60-75	0.22	-0.09	1.82	3.90	0.05	3.92	0.59	4.72	2.79
25-60	-5.51	-0.70	2.85	-8.89	1.19	-2.45	-0.08	-0.83	4.40
00-25	-17.73	1.17	-6.72	-9.18	1.38	-4.72	-1.09	1.79	3.21

Notes:

1) The first eight columns contain the share of the aggregate financial assets held in the form of the asset specified at the top of the column by the households in the percentiles of the distribution of marginal tax rates on ordinary income specified at the left of the row.

2) The last column is the dollar-weighted marginal tax rates on ordinary income for the households in the specified net worth percentiles. The weights are the sample weights multiplied by the household's level of financial assets.

3) The bottom panel marked "Change" is the difference in the column values for the specified percentile across the two years less the analogous difference for all of the households in the population.