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INCOME INEQUALITY AND  
THE INCOMES OF VERY  
HIGH INCOME TAXPAYERS:  
EVIDENCE FROM TAX RETURNS

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ABSTRACT

This paper uses tax return data for the period 1951-1990 to investigate the rising share of adjusted gross income (AGI) that is reported on very high income tax returns. We find that most of the increase in the share of AGI reported by high-income taxpayers is due to an increase in reported income for the one quarter of one percent of taxpayers with the highest AGIs. The share of total AGI reported by these taxpayers rose slowly in the early 1980s, and increased sharply in 1987 and 1988. This pattern suggests that at least part of the increase in the income share of high-AGI taxpayers was due to the changing tax incentives that were enacted in the 1986 Tax Reform Act. By lowering marginal tax rates on top-income households from 50% to 28%, TRA86 reduced the incentive for these households to engage in tax avoidance activities. We also find substantial differences in the growth of the income share of the highest one quarter of one percent of taxpayers, and the share of other very high income taxpayers. This suggests that the increasing inequality of reported incomes at very high levels may not be driven by the same factors that have generated widening wage inequality throughout the income distribution and over a longer time period.

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The evolution of the U.S. income distribution has recently attracted enormous academic and popular attention. Systematic studies of labor earnings based on large household surveys, such as Bound and Johnson (1992), Katz and Murphy (1992), Levy and Michel (1991), and Murphy and Welch (1992), have demonstrated that labor earnings, the most important component of income for all but the highest-income households, became more unequal during the 1980s. The returns to college education rose, and the real earnings of low-skill individuals declined relative to those of better-trained workers.

The most controversial feature of the income distribution, however, is the apparent increase in the share of income accruing to a small group of very high-income households: those in the top one percent of the income distribution. A widely-publicized calculation, described in Krugman (1992), suggests that very high income households have recently received a disproportionate share of the real income growth in the U.S. economy during the last decade.

Measuring the income and wealth of high-income households is extremely difficult. The economic lives of the rich, especially the rich who are not famous, are something of a mystery. Mandel (1992) estimates that there are only a few thousand highly-visible, highly-compensated individuals in the U.S. economy — athletes, top executives at large companies, and partners at major law firms and investment banks. Various sources suggest that the compensation received by these individuals rose rapidly during the last decade. Yet whether the experiences of this group generalize to the nearly one million households in the top one percent of the income distribution remains an open question. Information from income tax returns remains the most reliable, if imperfect, source of information about the economic activities of this group.

One class of explanations for the apparent increase in the relative incomes of high- vs. low-income households focuses on changes in economic institutions or structure that might raise wages or capital incomes for the high-income group. Slemrod (1992) argues that increasing globalization of economic activity may raise the incomes of high-ability individuals by more than that of the less able. The rise of new financial institutions and practices during the last fifteen years, for example takeovers and leveraged buy-outs, may also have expanded the opportunities for a small group of individuals to earn very high incomes.

An alternative explanation for the growth of reported income inequality focuses on changes in taxpayer incentives to report taxable income, rather than deferring recognition of or otherwise sheltering income. Since high-income households derive more of their income from capital gains and self-employment income than households elsewhere in the income distribution, they are likely to have more opportunity to engage in legal tax avoidance, and more discretion in deciding how, and how much, of their income is reported to the IRS, than their lower-income counterparts. The tax reforms of 1981 and 1986 lowered marginal tax rates on high-income households, reducing their incentives to defer taxable income, to transform earnings into untaxed fringe benefits, and to engage in other forms of tax avoidance. Taxpayers at the top of the income distribution faced marginal tax rates as high as 70% in 1980, while in 1988, their marginal tax rates were capped at 28%.

The suggestion that recent tax reforms induced changes in reported taxable income, even if they did not affect taxpayer behavior, lies at the center of the recent debate on whether the tax reforms of the 1980s increased labor supply (see Bosworth and Burtless (1992) and Lindsey (1987a, 1989)). Because

the Congressional Budget Office (CBO) data on income distribution, the data underlying the Krugman (1992) calculation, rely on tax returns for data on the incomes of high-income households, changes in taxpayer reporting behavior could directly affect estimates of income inequality.

This paper presents new evidence on the changing share of adjusted gross income (AGI) reported by very high income taxpayers. We focus primarily on the comparison of annual income distributions for the years 1951-1990, and limit most of our analysis to the top one half of one percent of taxpayers. We document the changing composition of income reported by these households, and try to provide some evidence on the importance of tax-induced changes in income reporting in contributing to this group's rising share of AGI. We do not explore the variation in the relative incomes of households elsewhere in the income distribution, a subject which has also attracted substantial controversy (see Nasar (1992) and Roberts (1992)). Tax returns are not the best source of information for studying the distribution of income below the very top income tier, since they do not include information on transfer payments and not all low-income households file tax returns.

This paper is divided into six sections. The first describes our methods for using tax return data to estimate the share and composition of income accruing to high income taxpayers, who we label Top AGI Recipients (TARs). Section two describes the impact of the major tax reforms in 1981 and 1986 on the incentives for high-income taxpayers to report report taxable income. The third section presents time series information on the share of adjusted gross income (AGI), as well as various AGI components such as wages and salaries, dividends, interest, and capital gains, reported by these taxpayers. We find that most of the increase in the share of income reported by taxpayers in the

top fifth of the income distribution is accounted for by an increase in the share of reported income in the top one quarter of one percent of taxpayers.

Our results also suggest that the increase in reported income inequality is not simply an artifact of capital gains realizations in the 1980s, but reflects changes in the distribution of most other income sources as well. The share of income reported by top income taxpayers rose throughout the 1980s, but we find the sharpest increase in 1987 and 1988, the years following a significant decline in marginal tax rates. We therefore conclude, in contrast to Slemrod (1992), that changes in decisions about how much taxable income to report have contributed to the observed increase in the reported incomes of high-income households. Unfortunately, we cannot estimate the share of the reported increase in income that is due solely to changes in taxpayer reporting practices.

Section four presents data on the composition of reported income for high-income households. Wages and salaries became substantially more important, and capital income less important, between 1970 and the mid-1980s. We find that this trend began roughly in 1969, when the top marginal tax rate on earned income fell from 77% to 50%. The fifth section investigates the extent to which the changing income share of top-income taxpayers can be attributed to changes in the composition of factor rewards in the aggregate economy, rather than shifts within the distribution of each type of factor income. We find that high stock market returns during the 1980s would have raised the income share of top-income taxpayers even if the ownership of stock had remained fixed at its 1979 levels. The actual share of income received by these households rose faster than the changing distribution of aggregate factor rewards would have predicted. The changing mix of factor incomes is

particularly unsuccessful in explaining the rapid growth in the share of AGI reported by high-income households in the years following the 1986 Tax Reform Act. The final section concludes and suggests several avenues for further work.

#### 1. Estimating the Income of Very High Income Households

The Congressional Budget Office makes widely-cited estimates of the changing shape of the U.S. income distribution (see CBO (1992a, b)). This distribution is defined in terms of adjusted family income (AFI). AFI is similar to adjusted gross income as defined by the federal income tax, but it also includes cash transfer payments, such as welfare and Social Security, and an imputation of taxes paid by firms, and excludes some business losses that can be deducted when taxpayers compute adjusted gross income.

Table 1 shows the CBO's estimates of the share of AFI accruing to households in the top fifth of the income distribution during the period 1977-1988. The estimates show a rising share of income accruing to this group, and in particular show that the top one percent of households account for a very large share of the total increase for the top quintile. In 1977, the estimates suggest that the top 20% of all households received 45.6% of adjusted family income, while in 1988, the analogous group received 51.4% of the total. The share received by the top one percent of households, however, rose from 8.3% (1977) to 13.4% (1988). This increase of 5.2% is ninety percent of the 5.8% increase for the top twenty percent. The lower panel in Table 1 shows the share of wages and salaries accruing to the top 20% and the top 1% of households. The highest one percent accounts for two thirds of the

gain in the share of wages and salaries reported by all households in the top fifth of the income distribution.

An income distribution can be defined over households, as in the Congressional Budget Office estimates, or over taxpayers or individuals.<sup>1</sup> Each of these three options has advantages and drawbacks. Focusing on households can be misleading because demographic changes can shift the characteristics and number of households. Between 1960 and 1989, the average number of individuals per U.S. household declined from 3.3 to 2.6. The shares of single-person households, and households headed by a single adult with children, have increased significantly in recent decades. Since these households have lower incomes on average than other households, the share of income accruing to a given fraction of households at the top of the income distribution should increase as a result of this demographic change. While this may contaminate comparisons of the top of the household income distribution in widely separated years, it is unlikely to have a large effect on comparisons of the income distribution over short time periods.

Defining the income distribution in terms of a given share of tax returns, which would be a natural choice given our focus on tax data, can also yield spurious results. The number of tax returns filed varies with changes in the tax law. The 1986 Tax Reform Act was expected to remove almost six million low-income households from the tax rolls (see Hausman and Poterba (1987)). By shrinking the number of taxpayers, such a reform would lower the number of tax returns in the top percentile of the taxpayer distribution.

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<sup>1</sup>In 1989, there were 93 million households in the U.S., 66 million of which were "family households." By comparison, 113 million tax returns were filed in 1989.

Because the taxpayers removed from the tax rolls typically have very low incomes, this change would reduce the share of income reported by the top percentile of taxpayers. This could bias comparisons between income distribution statistics, even for adjacent years, when the tax system is in flux.

The third alternative, defining the income distribution over individuals, also raises difficult issues, such as how to treat spouses and children. Do they receive a proportional share of household income? If so, then if a single high-income taxpayer marries a lower income earner, she may drop out of the high-income category. The birth of children to high-income households could have the same effect.

Our approach to identifying the top of the income distribution begins with the set of tax returns filed in 1989. We select the top one half of one percent of tax returns; in 1989, there were 558,778 tax returns in this group.<sup>2</sup> We define this number of returns as  $N_{1989}$ , and then compute an analogous number of returns in other years by multiplying  $N_{1989}$  by the ratio of the adult population in each year to that in 1989. Our procedure in effect indexes the number of high-income tax returns to the aggregate population, rather than the aggregate number of tax returns filed or the total number of households. We define the top  $N_t$  taxpayers in each year as "Top AGI

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<sup>2</sup>Our reported income share for high-income households would not change if a top income taxpayer married someone with no income, although it would increase if a high-income taxpayer married another income recipient. It is also possible that marriages or divorces between individuals with high but not very high incomes could affect the income reported by the TAR group.

Recipients" (TARs). They represent roughly half as many households as the CBO's top one percent of the income distribution.<sup>3</sup>

### 1.1 Estimating Income Shares Using the Treasury Tax Model

In each year since 1968, the U.S. Treasury has released a data file containing an anonymous sample of individual tax returns, the Treasury Tax Model data base, which can be used to estimate the total income of high-income taxpayers. This data file over-samples high income tax returns, and therefore provides reasonably accurate information on this group's income.

Table 2 shows the number of tax returns at different income levels in the 1989 Tax Model, and indicates the sampling weights associated with returns in each group. There are nearly 12,000 returns with incomes of more than \$1,000,000 in the data base. The probability that a tax filer with taxable income in this range would be included in the data file is approximately one in five. There are a similar number of tax returns with taxable incomes between \$50,000 and \$100,000, but each return filed in this income group has less than a 1 in 1000 chance of being included on the data file. The Treasury Tax Model data bases for each year since 1979 are part of the NBER TAXSIM program, and we use these data files to tabulate the distribution of both AGI and various AGI components for these years.<sup>4</sup>

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<sup>3</sup>Although our data set on federal tax returns does not include information on the state in which the tax filer resides, we can compare the number of federal income tax returns above various threshold income levels with state revenue statistics. They show some, but not extreme, concentration of tax returns. In 1989, for example, New York residents filed 3.7% of all federal income tax returns, but 12.9% of all returns with AGI in excess of \$1 million.

<sup>4</sup>We compute the changing shares of AGI reported in each year, despite the fact that the definition of AGI changes when, for example, the capital gains exclusion is eliminated. This is partly for comparison with the widely-cited results from the CBO. Our results also focus on several components of AGI with constant definitions through time.

## 1.2 "Interpolating" Incomes for High-Income Taxpayers

For years prior to 1979, we rely on aggregate data published by the Treasury Department in Statistics of Income: Individual Income Tax Returns (SOI) to estimate the income of TARs.<sup>5</sup> The SOI tables show the number of tax returns, and reported AGI, in various taxable income intervals. The reported AGI categories for high income taxpayers have remained fixed in nominal terms for nearly three decades, with taxpayers divided into those with AGIs of 100-200K, 200-500K, 500-1000K, and more than one million dollars. Estimating the amount of AGI reported by a given share of taxpayers therefore requires interpolating the IRS data.

To estimate the total income accruing to the top 0.5% of taxpayers, we interpolate AGI within reported AGI categories below one million dollars. Instead of simple linear interpolation, we estimate a Pareto distribution for high-income tax returns, and use our estimated distribution to estimate the total income accruing to top AGI recipients (TARs). The Pareto is a two-parameter distribution which is widely used in modelling the distributions of income and wages (see Johnson and Kotz (1970)).

We present the details of our interpolation procedure in an appendix, but illustrate our method in Figure 0. This figure shows our estimated Pareto distribution for 1990, a year when our estimate of the income threshold for inclusion in the top 0.5% of the taxpayer distribution was \$258,499 (Y\*). In this case, we can determine from the reported IRS data that the AGI threshold for this group lies between \$200,000 and \$500,000. We use the reported

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<sup>5</sup>To ensure comparability over time, in any of our tables or figures that show results for the 1950-1990 period, we also interpolate during the 1979-1990 period when we could make more precise estimates using the Tax Model data base.

information on the fraction of tax returns with AGI above \$200,000, and on the fraction with AGI above \$500,000, to estimate the parameters of a Pareto distribution. We then use this distribution to estimate  $Y^*$ .

Table 3 describes the results of our interpolation procedure. The first and second columns present our estimates of the cutoff income level for the Top AGI Recipients. Figure 1 also plots this income cutoff, measured in constant dollars. This income threshold increased only ten percent in real terms between 1970 and 1985, but in the four years 1985-1989, it increased by nearly 50%, or almost \$85,000 (\$1991). The late 1980s therefore appear to be the time period when the reported income distribution changed the most amongst high-income taxpayers.

The third and fourth columns in Table 3 show the number and share of tax returns that are included in our high-income group. These columns show the net effect of our indexing the number of TARs to the adult population, rather than to the number of tax returns filed.<sup>6</sup> In the years since 1986, the share of returns in the TAR group varies very little. Between 1986 and 1987, it declined by .02%. There is very little change in the share of tax returns in the TAR group between 1975 and 1986, although there is some evidence that the number of tax returns grew more slowly than population for the period 1955-1975. Our TAR group includes a larger share of tax returns in 1960 (.58%) than in 1970 (.55), 1980 (.54%), or 1990 (.50%). This should tend to increase the share of reported income accruing to the TAR group in the early years of our data period, and yield a downward bias in our estimate of the trend in the TAR income share over time.

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<sup>6</sup>Indexing to the number of returns filed would make the last column of Table 3 equal to .005 in all years.

## 2. Tax Changes and Incentives for Reporting Taxable Income

Tax policy parameters such as marginal tax rates can affect the amount of income reported on tax returns either by inducing real changes in individual behavior, for example changes in the number of hours that individuals work, or by inducing changes in the reporting of a given income stream. Because taxpayers can use a variety of tax avoidance techniques to defer or reclassify their income, the tax base is sensitive to decisions about how much income to report. This section provides a brief overview of the changing tax avoidance incentives facing high-income taxpayers.

### 2.1 Earned Income

The two most significant changes in the tax rates on earned income of high-income taxpayers took place in 1969 and 1986. The Tax Reform Act of 1969 capped the marginal tax rate on earned income at 50%, at a time when the top marginal tax rate on unearned income was 70% (77% including the Vietnam war surtax). The top marginal tax rate on earned income remained at 50% through 1986, although rates just below those of top income taxpayers were reduced by the Economic Recovery Tax Act of 1981 (ERTA). The Tax Reform Act of 1986 (TRA86) reduced the top marginal tax rate on earned as well as unearned income from 50% to 28%, providing a second major reduction in the tax burden on this income, and consequently lowering the incentives to (legally) avoid taxes.

Declining marginal tax rates reduced the incentives to engage in a variety of tax-avoidance practices. One simple avoidance strategy involves transforming earned income into fringe benefits, ranging from company cars and conference "vacations," to health and life insurance policies. There is a large literature, cited for example in Woodbury and Hammermesh (1992),

suggesting that the demand for fringe benefits is sensitive to the marginal tax rate on earned income. A related strategy involves deferring earned income, and the associated taxes, to later years. Over long horizons, income could be deferred with retirement plans or explicit deferred compensation arrangements (see Wolfson and Scholes (1992)).<sup>7</sup>

In addition to long-run deferral strategies, some taxpayers may have used short-term income retiming strategies to move income from 1985 and 1986 to 1987 or 1988. Taxpayers with some discretion in when they bill clients for their services, and those who receive large bonuses or otherwise lumpy earned income, faced strong incentives in 1986 to find ways to avoid recognizing income until lower tax rates had become effective in later years. Deferring income by fourteen months, from December 1986 to January 1988, could raise a taxpayer's after-tax income by 44% (from 50 cents on the dollar to 72 cents). This provided powerful incentives to engage in a wide range of income-retiming activities which are unfortunately difficult to measure from tax returns or other public data sources.

A particularly significant dimension of the Tax Reform Act of 1986, from the perspective of high-income taxpayers, was the changed incentives for using Subchapter C corporations to avoid recognizing personal income. Before 1986, a dollar reported as individual income faced a tax burden of 50 cents, while a dollar earned by a subchapter C corporation faced a marginal tax rate of 46%, with somewhat lower rates on the first \$100,000 of income. Corporate income could bear subsequent individual-level taxes if the income was distributed as

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<sup>7</sup>In the first few years of a low-tax rate regime, such as 1987 and 1988, it is even possible that individuals who had previously deferred income by contributing to retirement plans would withdraw plan assets, also leading to an increase in reported income.

wages or dividends, although there were strategies, for example bequeathing stock in a closely-held business, that could reduce such taxes.

The Tax Reform Act of 1986 reduced the top personal income tax rate to a level below the corporate rate. A dollar of income reported directly on an individual income tax return faced a tax burden of 28% after 1988, compared with at least 34% if it was earned by a Subchapter C company. As Gordon and Mackie-Mason (1990) explain, these tax changes reduced the incentive to use corporations to shelter income, and could have led to an increase in reported income for high income taxpayers. Anecdotal evidence of the potential importance of this effect is provided by Wolfson and Scholes (1992), who note that there were 225,000 S-corporation elections in the last three weeks of 1986, compared with only 75,000 elections in the entirety of 1985.

## 2.2 Capital Income

The tax changes that were enacted in 1981 reduced the top tax rate on unearned income other than capital gains from 70% to 50%. TRA86 further reduced this top rate to 28%. The tax rules affecting capital gains are more complex. Between 1969 and 1978, fifty percent of long-term capital gains could be excluded from taxable income, implying a top marginal tax rate of 35% ( $70\% \times .5$ ). For some taxpayers, however, because the excluded portion of capital gains was considered a tax preference item for the minimum tax, the marginal rate on realized gains could exceed 40% (see Lindsey (1987b)). This situation changed in by the Tax Reform Act of 1978, which excluded capital gains from the set of minimum tax preference items, effective in 1979, and raised the excluded share of long-term gains to 60%. This reduced the top statutory tax rate on capital gains to 28%. This pre-announced tax change led

to significant delay in the realization of capital gains, as we shall see below. The top marginal rate cuts in the 1981 tax reform, ERTA, further reduced the top marginal tax rate on capital gains from 28% to 20%.

The Tax Reform Act of 1986 raised the top marginal rate on capital gains from 20% to 28%, since it eliminated the exclusion provisions for gains. Because the 1986 changes were legislated to take effect in 1987, there was a strong incentive for taxpayers with accrued but unrealized gains to realize these gains in 1986. This "retiming" of gains is a striking feature of the time series on gain realizations (see Auerbach (1988)).

This brief summary of the tax rates facing high-income households suggests that there have been important changes over time in the after-tax income gains associated with legal tax avoidance strategies. We now consider the detailed information on income reports by these households, to investigate whether there is evidence that such changes in taxpayer behavior took place.

### 3. The Share of Income Received by Top AGI Recipients

This section reports our basic findings on the changing concentration of reported income amongst high-income taxpayers. Figure 2 shows our estimate of the share of adjusted gross income accruing to TARs in each year between 1951 and 1990.<sup>8</sup> The figure shows that the AGI share of this group declined during the 1950s and 1960s, was roughly stable during the 1970s, and increased during the 1980s. The share of AGI reported by roughly the top one half of one

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<sup>8</sup>We have not made the various adjustments to AGI that the Congressional Budget Office uses in computing "economic income" of households. For households in our AGI class, the most important CBO modifications are exclusion of some losses on real property, arguably the result of tax shelter investments, and the inclusion of some corporate tax payments as a component of taxpayer income.

percent of taxpayers rose from six percent in 1981 to over twelve percent in 1988. The sharpest increase in AGI concentration occurred between 1985 and 1988, when the income share of this group rose from 8% to 12%. The TAR share of AGI also fell more than a full percentage point in 1989 and 1990, which could be consistent with an active role for short-term and one-time income retiming strategies in the years immediately following enactment of TRA86.

One possible explanation for the rising concentration of AGI amongst top income recipients is that capital gains realizations rose during the 1980s, and that they are a highly concentrated form of income. Figure 3 shows the share of adjusted gross income excluding capital gains reported by the top AGI recipients. The figure focuses on the period since 1979, and shows that while the non-gain AGI share of this group rose by almost one percentage point between 1979 and 1986, it rose by more than three percentage points between 1986 and 1988. This figure suggests that capital gains are not the explanation for the broad trend in the concentration of AGI. It also demonstrates, however, that there was a rapid increase in reported non-capital gain income among TARs in the years immediately following the Tax Reform Act of 1986. This is consistent with the view that these taxpayers reported more of their income in taxable form when marginal tax rates declined.

Although most of our analysis focuses on the top one half of one percent of tax returns, we also examined reported AGI for several other subsets of the high-income population. The first two columns of Table 4 report the AGI share for the top one-tenth, and top one-quarter, of one percent of the distribution of tax returns. The middle column reports data for the top one half of one percent of taxpayers, the TAR group that we focus on elsewhere. The two rightmost columns show the share of AGI reported by the top one and two

percent of taxpayers for the years 1979-1989. These estimates are based on the Treasury Tax Model data bases.

Table 4 shows that even within the top two percent of the taxpayer distribution, the gains in reported AGI during the 1980s were highly concentrated. The share of AGI reported on the top two percent of tax returns rose by 6.04% between 1979 and 1989, but more than half of this increase, 3.35%, was reported on the top one tenth of one percent of tax returns (roughly one hundred thousand tax returns). More than two thirds of the increase in AGI for the top two percent was reported by the top one quarter of one percent of taxpayers. These findings are consistent with Krugman's (1992) "fractal" hypothesis about the shape of the income distribution.

Figure 4 makes the same point with a slightly different approach. While Table 4 shows the share of AGI reported by overlapping groups: the top .1% of taxpayers, the top .25%, and so on. Figure 4 shows the share of AGI reported by five non-overlapping groups: the top .2%, the next .2%, etc. The top line in Figure 4 is the share of AGI reported by the top one fifth of one percent of taxpayers. It shows a sharp increase between 1986 and 1988, and declines slightly in 1989. Figure 4 shows that there has been a relatively small increase in the AGI shares for all groups below the top one fifth of one percent of taxpayers.<sup>9</sup> This casts doubt on the view that the factors responsible for the increase in reported incomes among high income taxpayers, especially in the 1986-1988 period, are the same factors that were responsible

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<sup>9</sup>Our tabulations focus on the distribution of income for taxpayers in each year, not the distribution of the same taxpayers over time. Thus the taxpayers in the top AGI category in one year may be different from those in this category in the next year. Slemrod (1991) provides some evidence on the persistence of income for high-income taxpayers.

for the widening of the wage distribution over a longer time period. Figure 4 also underscores the importance of the post-1986 period in contributing to the changes in reported income concentration during the 1980s.

The lower panel of Table 4 reports similar calculations for AGI excluding capital gains. These data show the same pattern as the gain-inclusive AGI statistics, with more than half of the increase in non-gain AGI for the top 2% of taxpayers accruing to the top 0.1% of taxpayers. Comparing the upper and lower panels of Table 4 provides interesting evidence, however, on the relative timing of the concentration of gain and non-gain income. While the share of total AGI, including gains, reported by the top .1% of taxpayers rose from 2.6% to 3.8% between 1979 and 1985, the share of non-gain income increased less — from 2.2% to 2.95%. In the post-1986 period, however, the non-gain income share for this group grew faster than its share of total AGI. This suggests that gain realizations were a more important factor in the concentration of AGI in the early than in the late 1980s.

We can also perform a similar analysis for components of income. Figure 5 presents data on the share of wages and salaries accruing to taxpayers in each fifth of the top one percent of the taxpayer distribution.<sup>10</sup> The figure shows some growth in the share of wages for each of the high-income groups between 1979 and 1989. The figure displays a dramatic increase, however, in the share of wages for the top 0.2% of taxpayers. Three quarters of this increase occurs between 1986 and 1988, and the sharp break in the trend growth rate in 1986 is strongly suggestive of a link between the Tax Reform Act of 1986 and this pattern of reported income.

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<sup>10</sup>We continue to sort taxpayers by total AGI in preparing this figure.

The data in Figure 5 concentrate on the last decade, but we can also use the aggregate IRS data to estimate the share of wages and salaries reported by Top AGI Recipients for a longer time period. Figure 6 presents this data. While the rapid increase in wage concentration after 1986 is unusual by historical standards, the trend toward rising concentration of wages and salaries begins in the early 1970s. The wage share of the TARs rose by nearly 1.5 percentage points between 1970 and 1980, by another 0.5 percent between 1980 and 1985, and then by more than two percentage points in the two years after the Tax Reform Act of 1986. The beginning of the trend toward rising wage and salary concentration is roughly coincident with the Tax Reform Act of 1969, which reduced the top tax rate on earned income from 77% to 50%. We suspect that the large increase in reported TAR wages and salaries in the years after 1986 reflects, at least in part, a reporting response to lower marginal tax rates of this period.

The findings in this section suggest that whatever forces were behind the rising concentration of reported income in the high-income ranks during the 1980s, they were strongly concentrated amongst a small group of taxpayers, and strongly concentrated in the years after 1986. Without much more precise information on the financial and tax-planning activities of high-income taxpayers, it is impossible to determine how much of the increase in reported income was due to changes in tax avoidance behavior, how much was due to changes in real behavior such as labor supply, and how much was due to changing returns to the factors, labor and capital that high-income taxpayers own. Evaluating these three alternatives is a central goal for future work.

#### 4. The Income Composition of High-Income Taxpayers

The previous section considered the share of total AGI, AGI excluding capital gains, and wages and salaries, accruing to high-income taxpayers. This section explores a different issue: what fraction of the income reported by top-income taxpayers is from various income sources, and how has this income mix changed over time?

Figure 7 shows wage and salary income as a share of adjusted gross income for TARs over the 1951-1990 period. The figure shows that the wage and salary share of AGI for high-income taxpayers that came from wages and salaries rose during the 1970s, from one third to one half of the AGI for this group.<sup>11</sup> During the 1980s, however, while the concentration of wage income increased, the wage share of income for the TARs actually declined. Figure 7 also shows a very sharp decline, by over ten percentage points, between 1985 and 1987.

Figure 8 reports an analogous calculation for dividend income. The stylized view that high-income taxpayers derive most of their income from dividend payments has become increasingly inappropriate during the last three decades. While the TARs drew roughly one quarter of their income from dividends in the early 1950s, this income source declined to only six percent of the total in 1989.<sup>12</sup>

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<sup>11</sup>The House Ways and Means Committee (1991) reports data from the Congressional Budget Office on the top 1% of the income distribution for households. The increase in the share of wage income, from 34.2% in 1977 to 38.4% in 1988, is less pronounced in part because of the larger set of households included in the CBO's "top 1%" group.

<sup>12</sup>One factor that may partly explain this trend, especially in the 1980s, is the rise of money market mutual fund shares which may generate dividends for lower income households.

While dividends have become a less important income source for TARs, the share of dividends received by high-income taxpayers has also fallen. Figure 9 shows that in the late 1980s, the top 0.5% of taxpayers reported roughly one quarter of the dividends on all tax returns, compared with nearly half of all dividends in the late 1950s. A similar plot for interest income, in Figure 10, shows a rather different pattern. The share of interest received by TARs declined between 1951 and the early 1960s, was stable at about 10% until 1986, and then rose by almost five percentage points between 1986 and 1988. Since clientele models of asset ownership suggest that the relative tax rates of different investors play a key role in determining portfolio composition, the post-1986 changes may reflect the changing relative marginal tax rates of TARs and investors elsewhere in the income distribution. In particular, they may be driven by the declining tax penalty associated with holding interest-bearing securities at top income brackets. The lower tax penalty was the result of both declining marginal tax rates, and a decline in the rate of inflation, which reduced the effective tax burden on interest income.

The next source of income we consider is capital gains. Figure 11 shows that the share of all capital gains reported by top-income taxpayers was stable at approximately 45% throughout the 1950s and 1960s, but fell to only 20% in the late 1970s. This was a period when, as we noted above, the marginal tax rate on capital gains received by high-income taxpayers could exceed forty percent. The sharp decline capital gains as a share of AGI in 1978 reflects the impact of an announced reduction in capital gains tax rates that was enacted in 1978 but scheduled to take effect in 1979, leading to deferral of gain realization. The share of capital gains reported by these taxpayers rose during the 1980s, to just over 50% in the second half of the

decade. The share of capital gains reported by the top AGI recipients evolves smoothly in the years surrounding the Tax Reform Act of 1986.

The final category of income we consider is income from Subchapter S corporations. Figure 12 shows that the share of profits from these companies reported by TARs increased during both the 1981-1983 and the 1986-1988 periods. We do not show the changing level of Subchapter S income on all tax returns. Gordon and Mackie-Mason (1990) report this aggregate series for all taxpayers, and find a sharp increase in Subchapter S income in the years after the Tax Reform Act of 1986.

#### 5. The Changing Mix of Factor Incomes and Income Inequality

Some types of income, such as dividends and capital gains, are distributed less equally than others, such as wages. The distribution of reported AGI may become more unequal if the inequality of some AGI components increases, or the relative importance of some particularly unequally distributed components increases.<sup>13</sup> Some types of income, such as dividends and capital gains, are distributed less equally than others. In this section we investigate whether the changing mix of income components during the 1980s can explain much of the increasing concentration of AGI that we observed in previous sections.

We investigate this question by constructing a counterfactual income distribution for each year of the 1980s. We maintained the 1979 distribution of each type of income across tax returns, but allowed the level of each

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<sup>13</sup>Karoly (1992) shows how to formally decompose one measure of aggregate income inequality, the Gini coefficient, into a weighted sum of Gini coefficients for the various income components.

income type to vary from year to year as the aggregate Statistics of Income data suggest.<sup>14</sup>

Table 5 presents the results of our calculations, which suggest that the shifting mix of factor incomes did contribute to an increase in the concentration of AGI during the 1980s.<sup>15</sup> If the distribution of each income type had remained at its 1979 level, but the mix of income types had changed as it did, the share of AGI accruing to TARs would have increased from 6.05% in 1979 to 7.69% by 1988. This is substantially less than the actual increase, to 12.02%. Our predicted income share tracks the actual income share much better for the years before 1986 than in the 1987-1988 period. We also present results for a similar exercise with AGI excluding capital gains, which yields similar results. These estimates suggest that rising share of income reported by TARs during the last decade can not simply be attributed to a shifting mix of income components, but rather reflects some shift in the underlying distribution of these components as well.

#### 6. Conclusions and Further Research

Our analysis of tax return data for the period 1951-1990 suggests that the rising share of adjusted gross income (AGI) reported income on high income tax returns is largely due to an increase in the share of AGI reported by only a few tenths of one percent of the taxpaying population. The changes through

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<sup>14</sup>In cases where an income source can be negative, for example with Schedule C or E income, we varied and distributed positive and negative income separately.

<sup>15</sup>The definition of "top AGI recipients" for this table is slightly different from that in earlier tables — it includes roughly ten percent fewer tax returns in each year than our other TAR calculations.

time in the reported incomes of taxpayers near the top of the income distribution, even those in the "lower half" of the top one percent of all taxpayers, are substantially different than the changes for the highest-income taxpayers, especially in the years following the 1986 Tax Reform Act. This suggests that the rapid growth in reported incomes at very high income levels may not be part of a general trend toward a widening distribution of income, but may reflect other factors including a tax-induced change in the share of economic income that is reported as taxable income by high-income taxpayers.

Our results are not inconsistent with the widely-documented pattern of widening wage inequality in recent years. Studies based on labor market surveys such as the Current Population Survey, however, typically have little or no information on the incomes of top-income households. In the CPS, for example, income items are "top-coded" at \$100,000. The widening inequality observed throughout the wage distribution creates a strong presumption that wages and salaries at the very top of the income distribution have increased relative to those elsewhere. Yet those studies do not suggest that the period after 1986 were marked by sharp acceleration in the dispersion of earning power. The finding that the growth in AGI for very high income taxpayers was most rapid in these years suggests that the underlying determinants of reported AGI for this group may be significantly different from the determinants of relative incomes at lower incomes.

There are many directions in which our current work can be extended. Our analysis focuses on pretax incomes, rather than the after-tax incomes that provide individuals with command over resources. Computing effective tax rates on different taxpayers requires various imputations of taxes on firms

and workers, as in Kasten, Sammartino, and Toder (1992) or CBO (1992b), and we have not attempted this complex task.

The most pressing research priority involves searching for sources of data other than tax returns that provide information on the incomes of high-income individuals. There are some sources of information on compensation for high-paid individuals, such as the data set on CEO pay compiled by Joskow, Rose, and Shepard (1992), or surveys of earnings by lawyers and doctors that are carried out by professional organizations. These data sets may permit analysis of how tax reforms have affected the mix of compensation, while also providing further evidence on the trends in earnings, if not total income, for high-income taxpayers.

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Technical Appendix: Interpolation Using the Pareto Distribution

The Pareto distribution specifies that the probability that a randomly chosen taxpayer's income,  $y$ , is greater than  $x$  is:

$$(1) \quad \Pr(y > x) = (k/x)^\alpha.$$

The two parameters are  $k$ , the minimum income that the Pareto distribution applies to ( $k > 0$ ), and  $\alpha$ , the exponent that determines the shape of the distribution.

Our objective is to estimate the total income of taxpayers in roughly the top 0.5% of the taxpayer distribution. Reported data on the number of returns and total AGI for taxpayers in different AGI categories provides us with exact income totals for subsets of the top 0.5% of the distribution. We can identify the income range where the breakpoint for the top 0.5% of the taxpayer distribution will fall. To "fill in" the top 0.5%, we estimate the parameters of the Pareto distribution using information on the reported income cutoffs that bracket the actual breakpoint in each year.<sup>16</sup> Denote these cutoff incomes as  $y_1$  and  $y_2$ , and the associated probabilities that a taxpayer's income will fall below these cutoffs as  $F_1$  and  $F_2$ , respectively. Equating these observed probabilities with those implied by the Pareto distribution yields

$$(2a) \quad 1 - F_1 = (k/y_1)^\alpha$$

and

$$(2b) \quad 1 - F_2 = (k/y_2)^\alpha.$$

Solving these two equations yields an estimate of  $\alpha$ :

$$(3) \quad \hat{\alpha} = \log [(1-F_1)/(1-F_2)] / \log [y_2/y_1].$$

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<sup>16</sup>McCubbin and Scheuren (1988) discuss an alternative approach to interpolation from the published SOI data.

Given this value for  $\hat{\alpha}$ , our estimate of  $k$  is

$$(4) \quad \hat{k} = y_1(1-F_1)^{(1/\hat{\alpha})}.$$

A discussion of some of the issues involved in estimating parameters of the Pareto distribution can be found in Johnson and Kotz (1970) and Quandt (1966).

Table A-1 shows our parameter estimates for each year between 1951 and 1990. The parameter  $k$  is measured in current dollars, and corresponds to the income level below which the Pareto distribution would not apply. The  $\alpha$  parameter, which determines the rate at which the density of households declines as one moves to higher incomes, rises between the early 1950s and 1970, and then declines for the following two decades.

We can estimate that income threshold,  $y^*$ , that only 100s% of all taxpayers have incomes above from our estimated Pareto distributions. The value  $y^*$  satisfies the equation  $s = (\hat{k}/y^*)^{1/\hat{\alpha}}$ , so  $y^* = \hat{k}s^{-1/\hat{\alpha}}$ . Our estimate of the total income accruing to taxpayers with incomes above  $y^*$  is therefore

$$(5) \quad Y_{\text{top}} = N \int_{y^*}^{\infty} x f(x) dx = N \int_{y^*}^{\infty} \hat{\alpha} k^{\hat{\alpha}} x^{-\hat{\alpha}} dx$$

where  $N$  denotes the total number of tax returns. When we need to interpolate particular types of income rather than AGI, for example wages and salaries, we assume that the amount of income in each category ( $w_i$ ) is related to AGI ( $y$ ) according to a power function,  $w_i = cy^{\delta}$ . Total wage income received by taxpayers with incomes above  $y_1$ , which we shall denote  $w_1$ , is given by the integral over taxpayers' income of the income component at each AGI level, times the density of taxpayers at that income:

$$(6) \quad w_1 = N \int_{y_1}^{\infty} cx^{\delta} \hat{\alpha} k^{\hat{\alpha}} x^{-\hat{\alpha}} dx.$$

A similar expression for  $w_2$  yields two equations in two unknowns. Solving for  $\delta$  and  $c$  yields:

$$(7) \quad \delta = \log[w_1/w_2] / \log[y_1/y_2] + \alpha$$

$$(8) \quad c = w_1(1-\alpha)/N\alpha k^\alpha x^{1-\alpha},$$

Because the actual amount of wage income above  $y_2$  is a published aggregate, only the amount of wages between  $y^*$  and  $y_2$  needs to be approximated.

We performed several validation exercises on our estimated Pareto distributions and found that they fit the actual income data reasonably well in the neighborhood of  $y^*$ . For years since 1979, we can compare our estimate of the share of income accruing to top-income taxpayers with the more accurate estimates from the public use version of the Treasury Individual Tax Model. Table A-2 presents the results of this validation exercise. The largest error in our estimate of the share of total income accruing to high income taxpayers is .44%, in 1982, and the next largest error is .36% in 1986. That year's exceptional level of capital gain realizations (see Auerbach (1988)) may be a contributory factor to our error, particularly if realized capital gains are not distributed according to a Pareto distribution. These results support our use of the interpolated values for the income distribution, especially for years in the late 1980s when the difference between the Tax Model and imputed values are small.

Table 1: CBO Income Distribution Estimates, 1977-1988

	1977	1980	1985	1988
Share of Adjusted Family Income Received by:				
Top 20%	45.6%	46.7%	50.1%	51.4%
81-90%	15.6	15.7	15.7	15.3
91-95%	10.1	10.1	10.4	10.1
95-99%	11.6	11.7	12.4	12.6
Top 1%	8.3	9.2	11.6	13.4
Share of Wages and Salaries Received By:				
Top 20%	42.1	43.5	45.8	47.7
81-90%	17.7	17.8	17.9	17.5
91-95%	10.5	10.7	11.2	11.1
95-99%	9.8	10.3	11.2	11.4
Top 1%	4.1	4.7	5.5	7.7

Source: Congressional Budget Office (1992b). The statistics in the top panel are also reported in the 1992 Green Book (page 1521).

Table 2: Tax Returns Included in the Treasury Tax Model Data Base

Income Class	Number of Returns	Average Sample Weight
< 50K	53,680	1794
50 - 100K	11,947	1087
100- 200K	4,561	455
200- 500K	6,705	91
500-1000K	7,700	15
> 1000K	11,996	5

Source: Authors' tabulations from 1989 Tax Model Data File.

Table 3: Income Thresholds for "Top AGI Recipients," 1955-1990

Year	High-Income Threshold		Returns Above Threshold	
	Current Dollars	1991 Dollars	Number (000s)	Percent of Total
1955	28,466	144,801	334	.0057
1960	31,290	144,098	355	.0058
1965	39,836	172,197	384	.0057
1970	49,594	173,978	410	.0055
1975	61,721	156,204	441	.0054
1980	104,611	172,895	502	.0054
1981	111,670	167,274	510	.0054
1982	117,797	166,258	517	.0054
1983	125,448	171,546	523	.0054
1984	137,723	180,566	529	.0053
1985	150,996	191,189	535	.0053
1986	171,195	212,727	541	.0053
1987	199,436	239,059	548	.0051
1988	238,652	274,762	554	.0051
1989	251,338	276,066	558	.0050
1990	258,499	269,376	564	.0050

Source: Authors' calculations using data from annual publications of Statistics of Income: Individual Tax Returns. Data in column three are in thousands of returns. The definition of the "high income threshold" is the income level that excludes only the  $.005 * (\text{Adult Population}_{1990}) / (\text{Adult Population}_{1990})$  highest-income tax returns.

Table 4: The Share of Income Accruing to Very High Income Taxpayers, 1979-88

Year	Fraction of the Income Distribution				
	Top 0.001%	Top 0.0025%	Top 0.005%	Top 0.01%	Top 0.02%
PANEL A: ADJUSTED GROSS INCOME					
1979	2.61%	4.18%	6.05%	8.81%	12.90%
1980	2.63	4.24	6.12	8.91	13.05
1981	2.63	4.19	6.03	8.76	12.85
1982	3.14	4.81	6.73	9.51	13.66
1983	3.38	5.10	7.04	9.84	13.99
1984	3.66	5.41	7.36	10.14	14.29
1985	3.83	5.66	7.66	10.49	14.64
1986	4.74	6.71	8.84	11.79	16.05
1987	4.90	7.10	9.44	12.64	17.12
1988	6.75	9.38	12.02	15.41	19.93
1989	5.96	8.43	11.00	14.37	18.94
PANEL B: ADJUSTED GROSS INCOME EXCLUDING CAPITAL GAINS					
1979	2.19%	3.66%	5.45%	8.14%	12.15%
1980	2.24	3.74	5.54	8.24	12.29
1981	2.20	3.66	5.40	8.04	12.05
1982	2.54	4.08	5.90	8.59	12.64
1983	2.66	4.21	6.02	8.68	12.73
1984	2.87	4.46	6.28	8.94	12.96
1985	2.95	4.58	6.42	9.09	13.10
1986	2.83	4.43	6.26	8.95	13.00
1987	3.65	5.53	7.60	10.52	14.75
1988	5.09	7.37	9.73	12.85	17.18
1989	4.62	6.80	9.12	12.27	16.66

Source: Authors' tabulations using U.S. Treasury Individual Tax Models for years 1979-1988.

Table 5:  
Actual Income Shares vs. Forecast Shares Using 1979 Factor Distributions

Year	Adjusted Gross Income		AGI Excluding Capital Gains	
	Actual	Forecast	Actual	Forecast
1979	6.05%	6.05%	5.45%	5.45%
1980	6.12	5.84	5.54	5.35
1981	6.03	5.73	5.40	5.26
1982	6.73	5.72	5.90	5.22
1983	7.04	5.88	6.02	5.23
1984	7.36	5.95	6.28	5.27
1985	7.66	6.15	6.42	5.41
1986	8.84	6.97	6.26	5.34
1987	9.44	7.15	7.60	5.57
1988	12.02	7.69	9.73	6.11
1989	11.00	7.52	9.12	6.00

Source: Authors' calculations using annual data from U.S. Treasury Statistics of Income: Individual Tax Returns publications, as well as the U.S. Treasury Individual Tax Model for years 1979-1988. Cell contents indicate the share of aggregate income on tax returns going to top AGI recipients.

Table A-1: Estimated Pareto Distribution Parameters, 1955-1988

Year	$\hat{\alpha}$	$\hat{k}$
1951	1.83	1061
1952	1.79	967
1953	1.89	1159
1954	1.90	1205
1955	2.08	1720
1956	2.03	1661
1957	2.06	1731
1958	2.08	1782
1959	1.98	1685
1960	2.17	2124
1961	2.18	2240
1962	2.20	2366
1963	2.20	2503
1964	2.15	2454
1965	2.11	2505
1966	2.13	2713
1967	2.12	2919
1968	2.22	3558
1969	2.32	4006
1970	2.46	4725
1971	2.44	4892
1972	2.38	4959
1973	2.43	5587
1974	2.38	5674
1975	2.38	5891
1976	2.37	6342
1977	2.35	6621
1978	2.36	7445
1979	2.27	7324
1980	2.26	7904
1981	2.24	8293
1982	2.13	7614
1983	2.04	7174
1984	2.04	7876
1985	1.99	8036
1986	1.96	8711
1987	1.73	6830
1988	1.54	5390
1989	1.62	6845
1990	1.59	6698

Source: Authors' estimates using the method described in the text.

Table A-2: Actual &amp; Estimated Income Share of Top AGI Recipients, 1979-1989

Year	Estimate Using Treasury Tax Model Micro-data	Estimate Using Pareto Distribution Interpolation	Absolute Difference
1979	6.04%	6.06%	0.02%
1980	6.12	6.11	0.01
1981	6.03	6.05	0.02
1982	6.27	6.71	0.44
1983	7.04	7.06	0.02
1984	7.35	7.38	0.03
1985	7.65	7.78	0.13
1986	8.83	9.23	0.36
1987	9.44	9.49	0.05
1988	12.02	12.05	0.03
1989	11.00	11.21	0.21

Source: Authors' calculations using annual data from U.S. Treasury Statistics of Income: Individual Tax Returns publications, as described in the text, as well as the U.S. Treasury Individual Tax Model for years 1979-1988.

# Sample Pareto Density Function

alpha=1.59, k=6619 (1990 parameters)

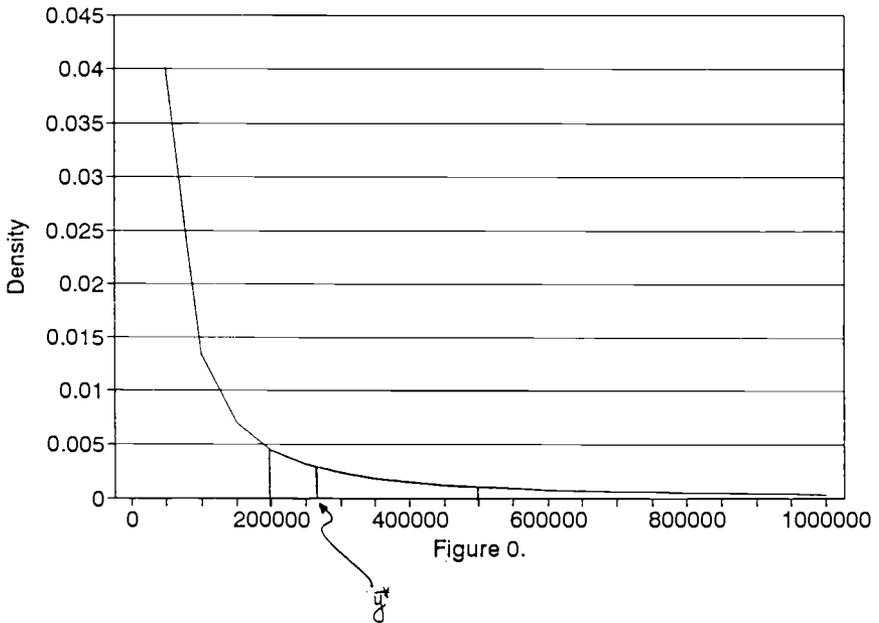


Figure 0.

# High Income Threshold for TARs. 1951 - 1990

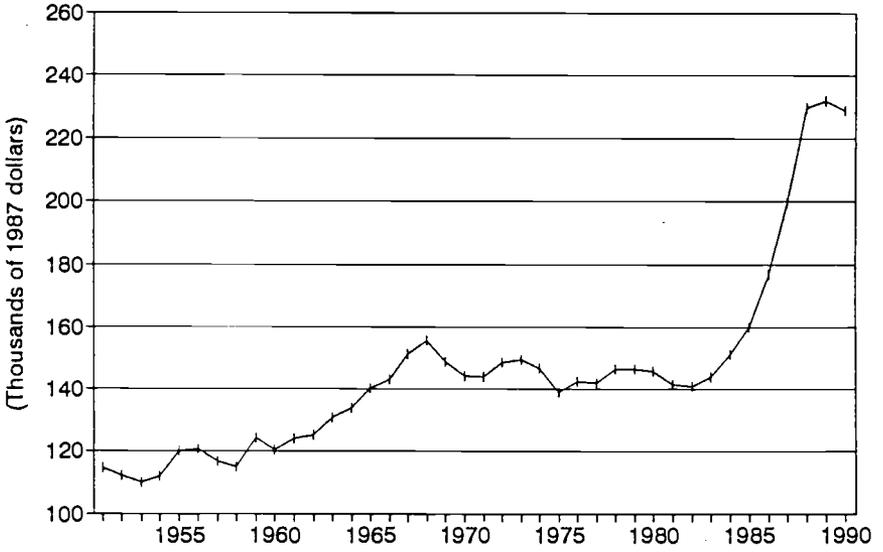


Figure 1.

# TAR Share of Total AGI.

1951 - 1990

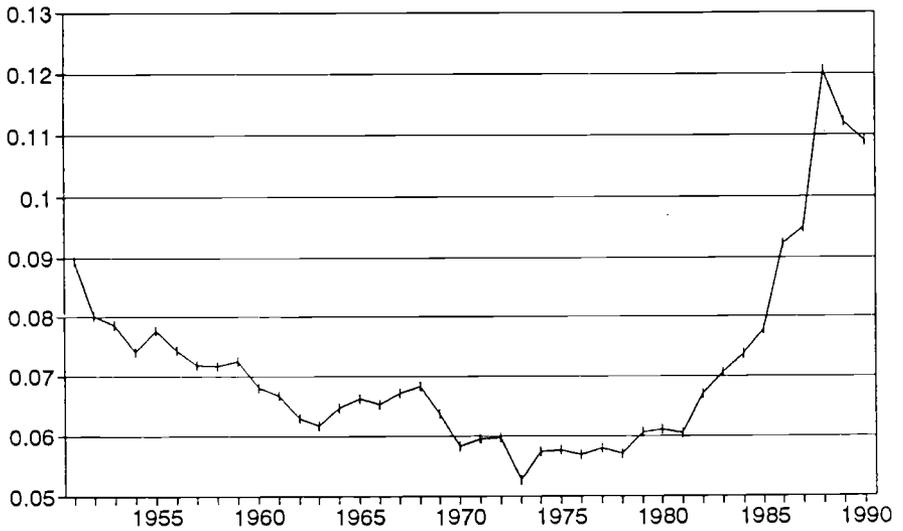


Figure 2.

# Share of Non-Gain Income to TARs 1979 - 1989 (Ranked by non-gain income)

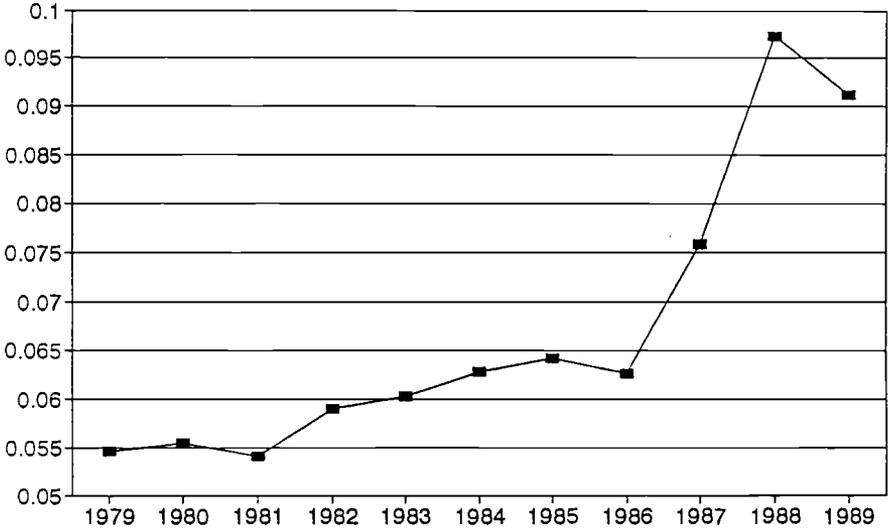


Figure 3.

# Distribution of AGI within top percent. 1979 - 1989

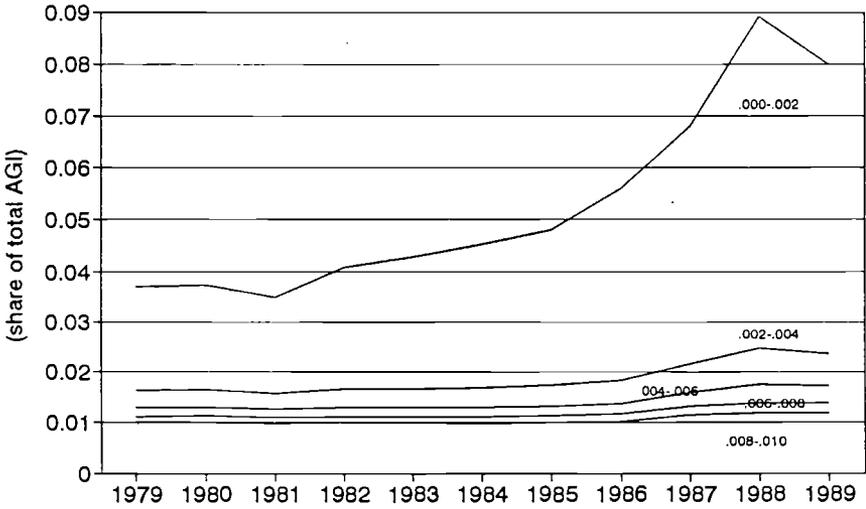


Figure 4.

# Wage Shares Within the Top Percentile. 1979 - 1989

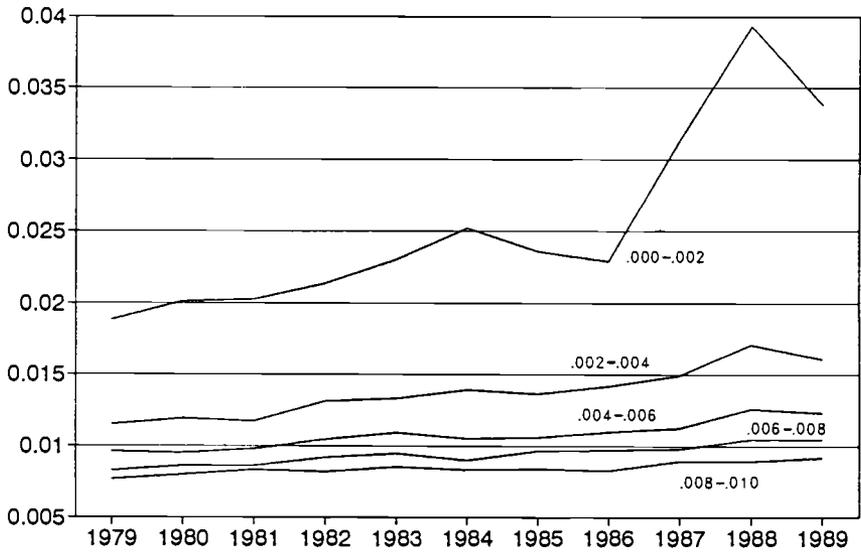


Figure 5.

# TAR Share of Total Wages. 1951 - 1990

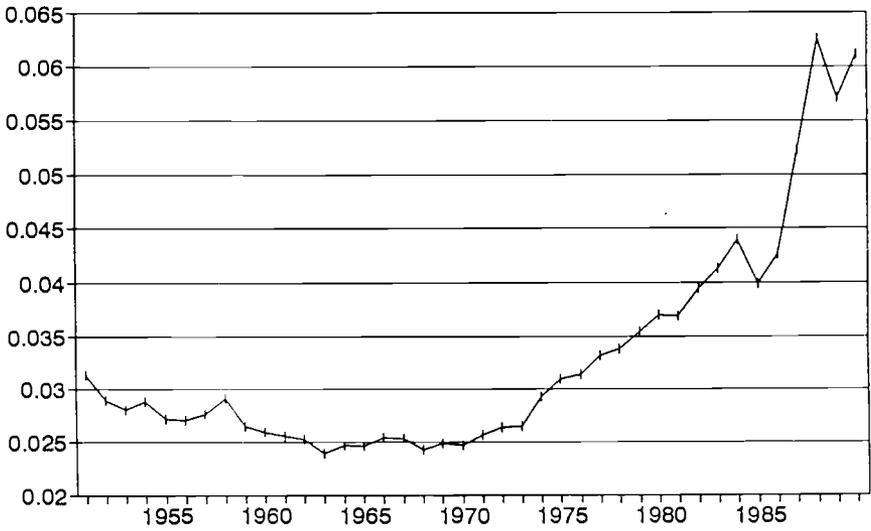


Figure 6.

# Wage Share of AGI Among the TAR.

1951 - 1990

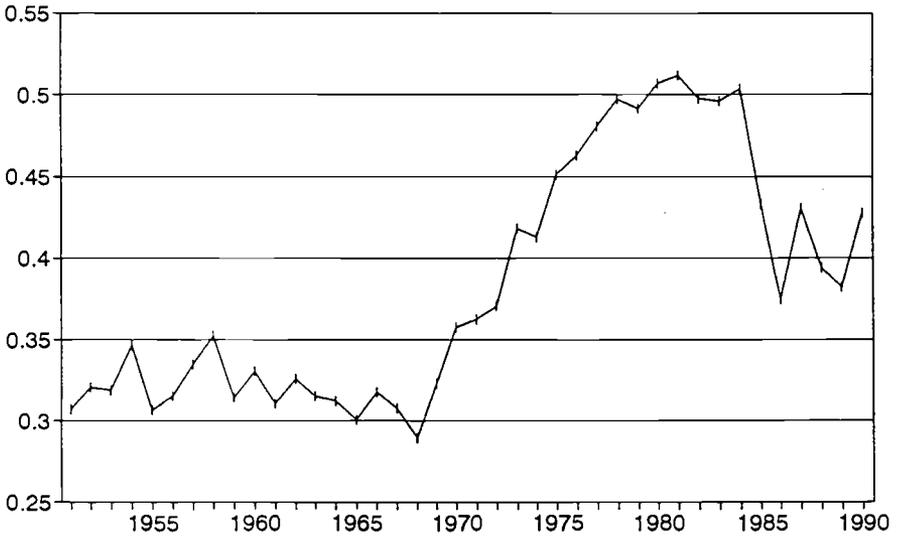


Figure 7.

# Share of Dividends in TAR Income. 1951 - 1990

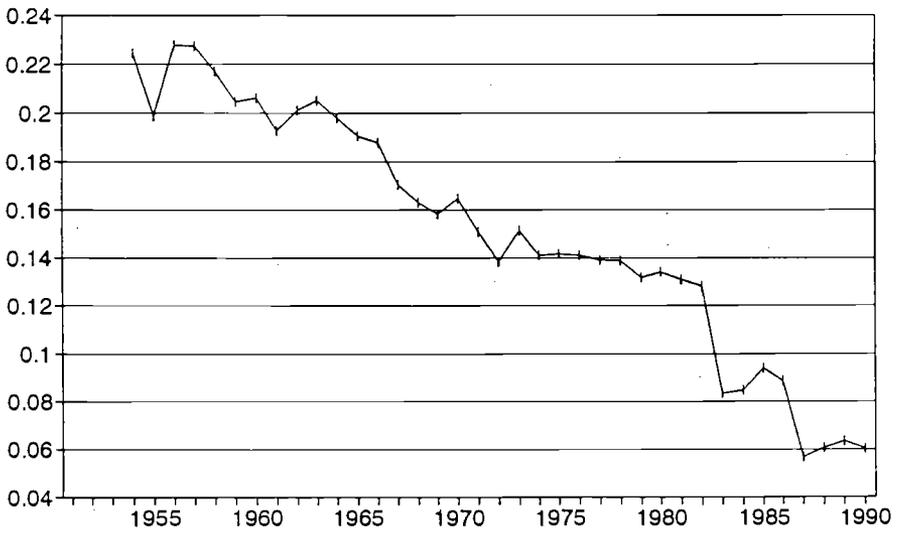


Figure 8.

# Tar Share of Total Dividend Income 1954 - 1990

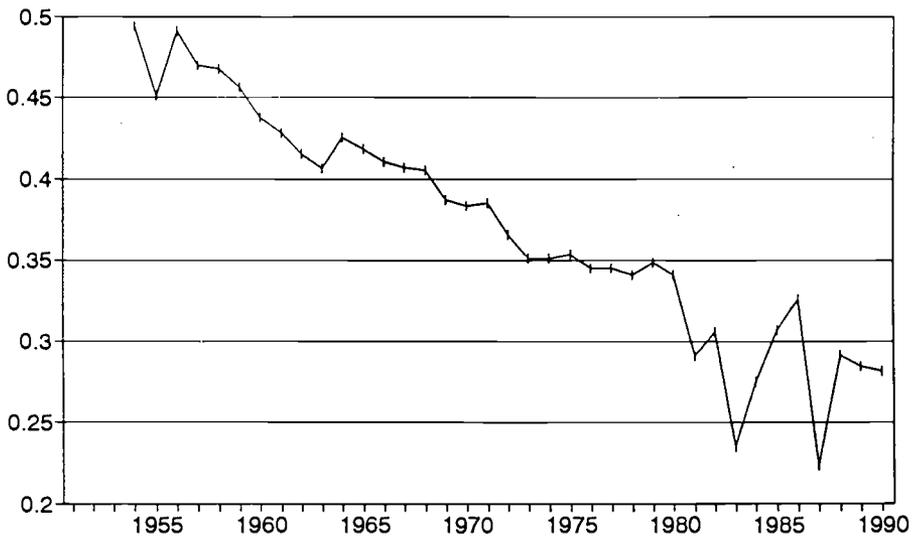


Figure 9.

# TAR Share of Total Interest Income.

1951 - 1990

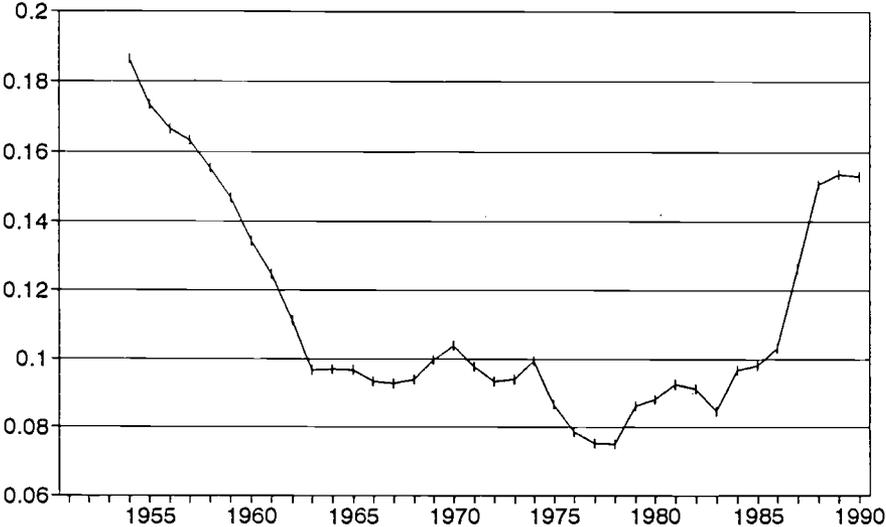


Figure 10.

# TAR Share of Net Capital Gains.

1951 - 1990

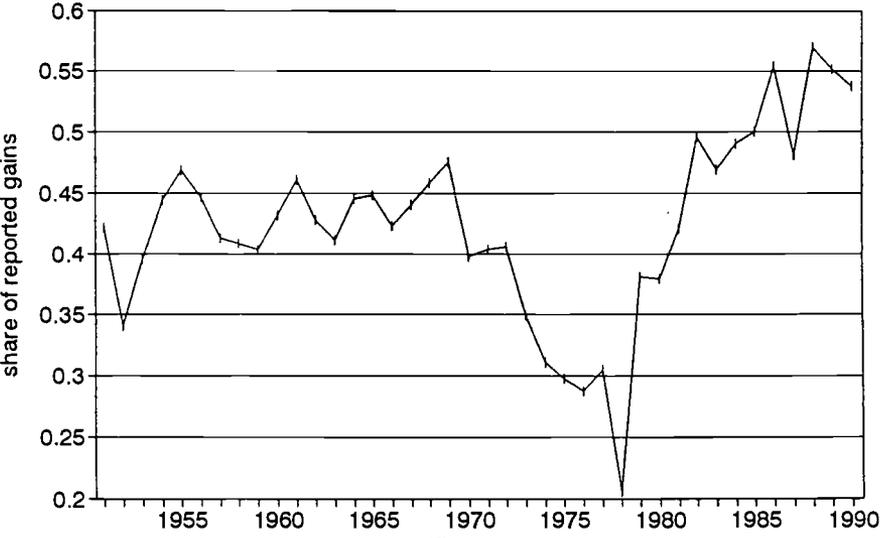


Figure 11.

# TAR Share of Subchapter S Profits. 1979 - 1989

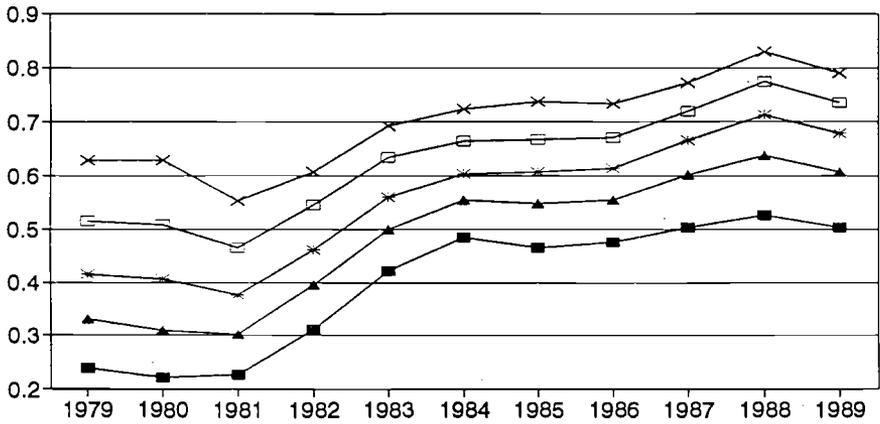


Figure 12.

