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# **How Progressive is the U.S. Federal tax system? A Historical and International Perspective**

Thomas Piketty, PSE Paris

Emmanuel Saez, UC Berkeley and NBER

Thomas Piketty, PSE, 48 Boulevard Jourdan, 75014 Paris, France, [piketty@ens.fr](mailto:piketty@ens.fr), Emmanuel Saez, University of California at Berkeley, Department of Economics, 549 Evans Hall #3880, Berkeley, CA 94720, USA, [saez@econ.berkeley.edu](mailto:saez@econ.berkeley.edu). We thank James Hines for helpful comments and discussions. Financial support from the Sloan foundation, and NSF Grant SES-0134946 is thankfully acknowledged.

## **0. Introduction**

The distribution of tax burdens across income groups is a central issue in the political debate. Liberals favor progressivity of the tax system for equity reasons: those who earn more should pay a larger fraction of their incomes in taxes. Conservatives argue that progressivity reduces incentives to work and accumulate wealth among the most talented and hence potentially creates large efficiency costs. Economists have devoted substantial attention to measuring tax progressivity.

Over the last 40 years, the U.S. federal tax system has undergone very large changes. Perhaps the three most striking changes have been the dramatic decrease in top marginal individual income tax rates, the large relative decline in corporate income taxes, and the substantial increase in payroll tax rates financing Social Security retirement benefits and health care for the elderly. In the early 1960s, the statutory top marginal individual income tax rate was 91%. This top rate had declined to 28% by 1988. The top rate was increased significantly to 39.6% in 1993 and has been reduced again down to 35% as of 2003. From the early 1960s to the early 2000s, corporate income taxes as a fraction of Gross Domestic Product have fallen by half from around 3.5 to 4% to less than 2% (see e.g., Auerbach, 2006). Corporate profits as a share of GDP, however, have not declined during this period, suggesting that capital owners get to earn relatively more net of taxes today than in the 1960s. The combined employee-employer payroll tax rate on labor income has increased from 6% in the early 1960s to over 15% in the 1990s and 2000s. Moreover, the payroll tax applies only up to a cap-equal to \$90,000 of annual earnings in 2005-and is therefore a relatively smaller tax burden for very high income earners.

The combined reduction in top individual tax rates and corporate income taxes on profits, and the increase in the payroll tax all suggest that there has been a dramatic decline in the progressivity of the federal tax system over the last 40 years. The recent dividend tax cut enacted in 2003 and the scheduled

phasing out of the federal estate tax from 2002 to 2011 are two additional factors widely perceived as potentially further undermining the progressivity of the federal tax system in the future.

This conclusion however is not obvious because the key difficulty for measuring tax progressivity is to assess the incidence of each tax on various income groups: who really bears the burden of the various taxes such as the individual income tax, the corporate income tax, the payroll taxes, or the estate tax? First, because of numerous deductions and exemptions in the federal individual income tax, statutory marginal tax rates might be a very poor measure of the effective tax burden faced by each income group. Some forms of income such as realized capital gains, have also traditionally received a much more favorable treatment and hence have reduced substantially the average income tax rate on high income taxpayers. Second, there are competing theories on the incidence effects of the corporate income tax: does it fall primarily on stockholders, does it reduce the returns on other assets such as bonds or pensions of future retirees, or is the tax in part shifted on consumers in the form of higher prices? It is clear that those incidence assumptions will have a strong impact on the burden of the corporate tax across income groups. Third, payroll taxes finance primarily social security retirement benefits. Individual retirement benefits depend on the earnings history and hence on payroll taxes paid, so that it could be misleading to assess the progressivity of the payroll tax without analyzing the progressivity of social security benefits.

There are three main goals in this paper. Our first goal is to present the main issues that arise in estimating the progressivity of the tax system and the required incidence assumptions. We will also discuss the necessary short cuts and limitations of such an exercise. Our second goal is to use the large public micro-file tax return data in order to estimate the progressivity of the US federal tax system, which essentially includes individual and corporate income taxes, estate taxes, and payroll taxes, from 1960 to today, using what we think are the most plausible and simple incidence assumptions based on previous work. As previous authors, we will rely primarily on individual income tax statistics because

those data give the most accurate picture of the top of the income distribution. We will assess tax progressivity by measuring the average tax rate for each fractile of the income distribution. It is important to analyze specifically very small groups at the top of the income distribution for three reasons. First, although those groups are small, they represent a significant fraction of aggregate income and aggregate taxes paid. Second, a very small fraction of taxpayers reach the top individual tax brackets, especially before the 1980s, when the top marginal tax rate was high and there were many tax brackets. Third, capital income is very concentrated and hence taxes falling primarily on capital income such as the corporate income tax or the estate tax have a sizeable impact only in small groups at the top of the income distribution. Our final goal in this paper is to contrast the US results with the experience from other countries. Using a similar (although somewhat simplified) methodology, we will present progressivity results for two other countries: France and the United Kingdom.

Many authors have tackled the problem of tax progressivity in the US using primarily individual income tax statistics but incorporating other taxes as well and proposing various incidence assumptions (see e.g., the classic studies by Pechman and Okun (1974), Pechman (1985) or a more recent study by Kasten et al. (1994)). Our method is more basic because we do not try to incorporate state and local taxes, and we ignore transfers. However, we provide progressivity results for over 40 years while previous studies have focused on a few years at most. We also analyze in more detail tax burdens at the very top of the income distribution, and its decomposition into various taxes.

The internal revenue service (IRS) has produced regular statistics on the individual tax burdens across income brackets (see Parisi, 2004-05 and Strudler et al. 2005 for recent analyses). Those statistics are updated annually and are clearly the best source for recent results on U.S tax progressivity. However, those regular IRS statistics focus on the federal individual income tax and in general ignore entirely other taxes such as the corporate income tax, the estate tax, or payroll taxes. This study proposes a relatively simple way to incorporate all federal income taxes, which could be updated when more years of data

become available, and usefully complement the official and individual income tax specific IRS statistics. We also hope that our international focus will also stimulate similar comparable studies for a broader set of countries.

### **1. Measuring Income Tax Progressivity**

A tax system can be defined as progressive if incomes net of taxes are more equally distributed than incomes before taxes and regressive if incomes net of taxes are less equally distributed than incomes before taxes. There are many measures of inequality and hence correspondingly many measures of tax progressivity. In this paper, we will focus on top income shares, defined as the fraction of total income going to a given group in the income distribution such as the top decile or top percentile. Other measures such as the Gini coefficient or poverty rates focus on the complete income distributions or the bottom of the income distribution. As a result, one can measure tax progressivity in different ways: how do the Gini coefficients before and after tax compare? How do top income shares compare before and after taxes? Do taxes reduce the poverty rate? Thus, inequality and tax progressivity have many facets and should be explored along different measures depending on the specific issue one wants to examine.

This paper will focus solely on the federal income tax system and will ignore entirely transfer programs, which accrue disproportionately to the bottom of the income distribution and hence reduce significantly inequality at the bottom of the distribution. As we ignore transfers in this study, we will focus primarily on the top of the income distribution. Transfers represent a small fraction of middle and high-income earners incomes and hence ignoring transfers is not an issue if one focuses on those groups only.

The after tax income share for a given group is simply equal to pre tax income share times the ratio of one minus the tax rate for the given group to one minus the average tax rate across the full distribution. Hence the analysis of tax progressivity is essentially an analysis of how tax rates vary across groups of the

income distribution. In order to estimate such tax rates across groups, we need to define income, taxes, and the groups of the income distribution. Our unit of observation is the tax unit defined as in the current US tax code as a married couple with dependents, or a single person with dependents. The total number of tax units is taken from Piketty and Saez (2003, 2006) and is estimated from census data as the sum of all adults (aged 18 and above in the US population) less all married women. This is the total number of tax units in the United States, had everybody been required to file an individual tax return. Top groups are defined relative to this total.<sup>1</sup>

### **Income Definition**

We rank tax units based on annual income to define income groups. It is important to emphasize that annual incomes are not a perfect measure of permanent income over the course of a lifetime. If families can save and borrow to smooth consumption overtime, then lifetime earnings are a better measure of well-being or economic affluence than annual incomes. In that context, several studies have shown that, because of year-to-year transitory fluctuations in income, progressive individual income taxes appear less progressive from a lifetime perspective than from an annual perspective (see e.g., Fullerton and Rogers, 1993). However, there is also substantial evidence that consumption tracks income closely either because of borrowing constraints or because individuals do not plan according to the classic inter-temporal utility model (Akerlof, 2005). Thus, the best measure of economic affluence is probably in between the extreme cases of the annual perspective and the lifetime perspective. In this paper, we focus solely on the annual perspective because of simplicity.<sup>2</sup>

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<sup>1</sup> Since 1960, about 90 to 95 percent of tax units file a tax return. Non-filers have in general very low incomes, below the filing threshold, and owe very little income tax.

<sup>2</sup> Measuring lifetime income requires longitudinal data. There are no publicly available longitudinal data covering well the top of the income distribution in the United States. Hence, previous studies on tax progressivity from a lifetime perspective have not been able to analyze tax burdens at the top of the income distribution.

Income will be defined as all sources of *market* income reported on income tax returns. This includes wages and salaries (before employer and employee Social Security and Medicare payroll taxes are deducted), bonuses and exercised stock-options, employer and private pensions, self-employment income, business income, dividends, interest, and rents, as well as realized capital gains. Our income measure does not include the value of imputed rent for homeowners and does not exclude interest payments on debts such as mortgages or consumer credit. Our income measure also excludes non-taxable benefits such as employer provided health care. As discussed above, we also exclude all government transfers such as social security retirement and disability benefits, government provided health benefits (Medicare and Medicaid), unemployment and workers compensation, and all cash and in-kind welfare programs.

Our income measure includes realized capital gains and does not include unrealized accrued capital gains. We consider only realized gains because capital gains materialize only when they are realized.<sup>3</sup> Unrealized gains are also extremely difficult to observe.<sup>4</sup> It is important to note that realized gains are nominal gains, which include both real gains and pure inflation gains. In principle and as pointed out by Feldstein (1988), one would want to count only real gains in income.<sup>5</sup> We do not attempt such a correction here.

Because realized capital gains are not an annual regular stream of income and tend to be realized by individuals in a lumpy way once every few years, we rank tax units based on income excluding realized capital gains when we define the income fractiles. We then add back realized capital gains to the

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<sup>3</sup> Similarly, our income measure excludes contributions to employer pensions (either defined benefits or defined contribution pensions) but we do include employer pensions when they are received. Thus, our pension income measure is also based on realization rather than accrual.

<sup>4</sup> Capital gains are never realized on individual tax returns if the assets are transferred at death or through inter-vivos gifts. Poterba and Weisbenner (2001) estimate that, in 1998, such capital gains on transferred assets represent about 35% of the value of gross estates reported on estate tax returns. The fraction of never realized gains passed at death for financial assets are small relative to realized capital gains reported on individual tax returns and are ignored in this study.

<sup>5</sup> Interest income should also be netted of inflation because inflation reduces the value fixed claims assets and produces a capital loss.

incomes of each of those income groups (Piketty and Saez, 2003 use the same definition for one set of their top income share series).

Our income measure does not impute retained earnings of corporations to shareholders. Retained earnings are reflected in the stock prices and will be part of our income definition when gains are realized on those stocks. Indeed, in the long-run and in the aggregate, realized capital gains on corporate stock reported on individual tax returns are of comparable magnitude to retained earnings from corporations estimated in National Accounts. Thus, once realized gains are included, it would be double counting to include retained earnings.

Realized capital gains (or equivalently retained earnings) are net of corporate income taxes. Because we include corporate income taxes in the analysis, as pointed out by Musgrave et al. (1974) and Feldstein (1988), we need to add back corporate income taxes to income. To do so, we need to make an incidence assumption about how the burden of corporate income taxes is borne across individual taxpayers, which we discuss below.

### **Allocating tax burdens across income groups**

Our paper will consider four federal taxes: the individual income tax, the corporate income tax, the estate (and gift) tax, the payroll tax financing disability, retirement, and health benefits for the elderly. Those four federal taxes represent over 90 percent of all federal taxes (the remaining federal taxes are primarily excise taxes and various other small taxes such as stamp duties). Federal taxes represent about two thirds of all US taxes, the remaining third are state and local taxes.

We ignore entirely state and local taxes in this study. State and local taxes in the United States are primarily composed of three types of taxes. First, state income taxes (individual and corporate) tend to be progressive and are about 25% of state and local tax revenues on average. Second property income taxes (falling primarily on residential real estate) are about 30% of revenue. Property taxes are progressive if incidence falls primarily on property owners but are



regressive if they are shifted on rents. Third, sales and excise taxes, which are regressive as lower income families spend a larger fraction of their income on taxed consumption goods, are about 35% of revenue. Overall, state and local taxes are believed to be somewhat regressive but this depends on the assumed incidence of the property tax. If the property tax is assumed to fall on owners of capital, then overall, Pechman (1985) shows that state and local incomes are very close to being proportional to income across income groups. In that case, ignoring state and local taxes would be of no consequence when assessing tax progressivity. Our study also ignores entirely transfers from the government (either federal, state, or local).

As discussed in introduction, the key step is to decide how to allocate each of the four federal taxes across the income groups we defined above. The spirit of this exercise is to assign only the direct tax burden to individual taxpayers and thereby ignore behavioral responses to taxation such as tax avoidance, reduction in labor supply or savings due to taxation. Those behavioral responses create an excess burden on taxpayers over and above the taxes paid (Fullerton and Rogers, 1993 build a general equilibrium model where they estimate total tax burdens, including excess burdens). Because there is still substantial disagreement among economists on the size of behavioral responses to taxation, considering the basic case with no behavioral response is a useful starting place.

We assume that individual income taxes are borne by the corresponding individual taxpayers. We use the large publicly available micro dataset of individual tax returns, available quasi annually from 1960 to 2001 to estimate individual income and construct our various income fractiles. We use the TAXSIM calculator developed at NBER (see Coutts and Feenberg, 1993) to compute federal individual income taxes. Full details on our estimation methodology are reported in the working paper version Piketty and Saez (2006).

Payroll taxes are by definition paid based on wages and salaries and shared between employers and employees. This distinction is in principle

irrelevant and we assume that both the employer and employee payroll tax is paid by the corresponding employed wage earner. Payroll taxes finance benefits such as social security retirement benefits, disability benefits, and health insurance for the elderly (Medicare).<sup>6</sup> Medicare benefits are independent of contributions and hence the medicare payroll tax is indeed a pure tax. Social security benefits are based on earnings history and hence depend on payroll taxes paid. Therefore, the payroll tax financing social security benefits is not a pure tax. Because the social security system is primarily a pay-as-you-go system, where current taxes on workers are paid out as benefits to current retirees, there is a substantial legacy tax in the system relative to a fully funded system where taxes collected would be entirely invested and paid out as benefits only to the corresponding contributing workers when they retire. In principle, one would want to subtract the value of future Social Security benefits from payroll taxes paid on an individual basis to keep only the pure tax component of the tax. For simplicity, in this study, we will consider that entire payroll tax financing Social Security is a tax.

The federal estate tax is paid based on total net worth of the decedents after various exemptions such as spousal bequests and charitable donations. Only net estates larger than \$1 million in 2005 are liable for the estate tax. As a result, only about 1-2 percent of all adult decedents are liable for the estate tax. We use IRS published tabulations reporting the number of estates and estate taxes paid by size of estate to estimate the amount of taxes paid by each fractile of decedents (relative to the total number of adult deaths). We then assume that those taxes are borne by the corresponding fractile of tax returns. This basic method is valid to the extent that ranking by income is relatively close to ranking by wealth at the top of the distribution.

We will assume that the corporate income tax falls entirely on capital income and that all financial assets (and not only corporate stock) bear the tax equally. This is the rough consensus among public finance economists since the

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<sup>6</sup> Payroll taxes also finance smaller benefits such as unemployment insurance and workers compensation (for work related injuries). We consider those programs as state programs and

pioneering work of Harberger (1962). Auerbach (2006) summarizes the literature on the incidence of the corporate income tax and points out that there is still considerable uncertainty on the question because of the inherent difficulty in measuring empirically the economy wide incidence of the corporate tax. Our assumption that the corporate income tax falls on capital income in general can be seen as a middle-ground assumption between two scenarios. In the first scenario, the corporate income tax falls solely on shareholders. Because corporate stock ownership is more concentrated than wealth ownership in general, the corporate income tax would look more progressive under this scenario. In the second scenario, the corporate tax is also shifted on labor income (either in the form of reduced wages or increased commodity prices). Because capital income is more concentrated than labor income, the corporate income tax would look less progressive under this scenario.

Figure 1 displays the average federal tax rate for the full population from 1960 to 2004 and its decomposition into the four taxes we consider. The figure shows that the total average tax rate has increased from around 22% in 1960 to around 26% in 2004. There were spikes in average tax rates in the late 1960s (additional taxes to finance the Vietnam War) and around 1980 (high inflation producing bracket creep and real tax increases). From 2000 to 2004, the average tax rate has declined significantly from almost 28% to around 26%.

The federal individual income tax is the largest tax. Individual income taxes have declined sharply from 2000 to 2004 following the tax cuts of the Bush administration. The payroll tax financing Social Security and Medicare has increased significantly from 4% to around 12%. This increase has been in part offset by the corporate tax rate, which has shrunk dramatically from 6.5% in 1960 to around 3% in recent years. The estate and gift tax rate has always been very small (around 0.5% of income) relative to the other taxes and has also decreased in size over time.

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hence ignore those payroll taxes in this study.

## Estimating tax progressivity

Table 1 displays the key statistics we are estimating for year 2004 (using inflated 2000 incomes, the most recent year for which micro data is available). Some of the tax cuts of the Bush administration had not yet been implemented in 2004.

Column 1 displays the groups we are considering from the second quintile (P20-40) to the top 0.01% (P99.99-100). Groups are ranked by market income (excluding realized capital gains, and also ignoring corporate income taxes). We exclude the bottom quintile (P0-20) from the analysis because many low income earners have zero market income and receive only government transfers such as Social Security or Disability income, and do not file income tax returns. Column 2 shows the number of tax units in each group. Column (3) shows the average market income (including realized capital gains and imputed corporate taxes) in each group. Columns (4) to (7) display the average tax rate for each of the four federal taxes we are considering. Column (8) displays the tax rate of all four federal taxes combined.

Column (9) displays the share of pre-tax income earned by each group. Column (10) displays the share of post-tax income earned by each group. Finally, column (11) displays the share of total federal tax paid by each group. Those statistics show that, even though, top groups are very small in terms of number of families, they represent a large share of income earned, and an even larger share of total taxes paid.

In order to understand the evolution of tax progressivity among top income groups, it is important to understand first the evolution of top incomes and their composition. Piketty and Saez (2003) document this evolution in detail. Figure 2 displays the top 0.1% income share and its composition into wage income, business income, capital income, realized capital gains, and imputed corporate taxes. Two important facts stand out. First, the share of income going to the top 0.1% has grown tremendously since the late 1970s: the top 0.1% income share was around 2.5% in the 1970s and reached a peak above 9% in 2000. Piketty

and Saez (2003) show that most of the gains at the top have been concentrated within the top 1% (and especially the top 0.1%) with relatively modest gains in the top decile excluding the top percentile (P90-95 and P95-99). Those gains have come at the expense of the bottom and the middle class. Second, the composition of top incomes has changed substantially. In the 1960s, top incomes were primarily composed of capital income (mostly dividends and capital gains). Figure 2 shows that the surge in top incomes has been driven in large part by a steep increase in the labor income component due in large part to the explosion of executive compensation. As a result, labor income now represents a substantial fraction of income at the top. This change in composition is important to keep in mind as corporate and estate taxes fall on capital income while payroll taxes fall on labor income.

## **2. U.S Trends in Income Tax Progressivity**

Panel A in Figure 3 displays the federal tax rate in 2004 for along various groups of the income distribution.<sup>7</sup> The figure also shows how the total federal tax rate is decomposed into individual income, payroll, corporate income, and estate tax rates. The federal income tax system is clearly progressive as the tax rate increases smoothly with income from less than 10% in the second quintile (P20-40) to around 35% at the very top. The average tax rate increases only modestly from 30% in the bottom half of the top percentile (P99-99.5) to 35% at the very top (P99.99-100), suggesting that the current federal tax system is relatively close to a flat tax rate within the top 1% (incomes above \$300,000 in 2000).

The individual income tax is the main component driving progressivity as the individual tax rate is actually negative at the bottom (because of refundable tax credits) and increases to over 25% at the very top. The progressivity of the federal income tax is due to the increasing structure of marginal tax rates coupled with exemptions and credits, which benefit lower incomes

disproportionately. The average tax rate, however, remains substantially below the top marginal tax rate of 35% even at the very top because of lower tax rates on capital gains and dividends (15% maximum) and, to a lesser extent, deductions for mortgage interest payments and charitable contributions.

The corporate income tax and the estate tax are also progressive – they increase from 2% at the bottom to about 7% at the very top – but are very small relative to the individual income tax. Those two taxes are progressive because capital income is concentrated at the top of the income distribution. The estate tax also has a very progressive structure coupled with very large exemptions (less than 1% of adult decedents are liable for the estate tax). Finally, the payroll tax is regressive, from about 6-7% below the top decile and declining to about 1% at the very top. This is due to the cap in the Social Security payroll tax (above \$87,900 in 2004) and the fact that labor income is a smaller fraction of total income at the top than in the middle of the distribution.

Panel B in Figure 3 displays the federal tax rates across groups in 1960. The contrast with 2004 tax law is striking. In 1960 federal tax system imposed lower rates on the middle class (up to the 95<sup>th</sup> percentile) and much higher rates within the top 5%, especially in very top groups. In particular, the 1960 tax system was very progressive even within the top percentile with a tax rate of around 35% in the bottom half of the top percentile to over 70% in the top 0.01%. This shows that it is extremely important to decompose the top of the income distribution into very small groups in order to fully capture the progressivity of the tax system. Although very top groups contain few taxpayers, they account for a substantial share of income earned, and an even larger share of taxes paid.

Interestingly, the larger progressivity in 1960 is not due to the individual income tax. The individual income tax rate in 1960 reached 31% at the very top, only slightly above the 25% rate at the top in 2004. Thus, lower rates on realized capital gains, as well as deductions for interest payments and charitable

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<sup>7</sup> Because the latest IRS micro data is only available until year 2001 (before most of the recent tax cuts took place), we report tax rates based on 2004 tax law (after most of the recent tax cuts

contributions, reduced dramatically the extreme progressivity of the regular tax schedule (with a top marginal tax rate of 91%).

Figure 3B shows that, in 1960 (and in contrast to 2004), the corporate income tax and the estate tax were two very significant contributors to the overall progressivity of the federal tax system. The corporate tax was about 6.5% of total income in 1960 and only around 2.5% of total income today. Therefore, because capital income is very concentrated, it generated a substantial burden on top income groups. The estate tax has also decreased from 0.6% of total income in 1960 to about 0.4% of total income today. Income concentration has increased dramatically since 1960 (see below). As a result, the burden of the estate tax relative to income has declined very sharply in top groups.

Finally, Figure 3B shows that the payroll tax (which falls primarily on the middle class from P20 to P95) was much smaller in 1960 than today, explaining why total tax rates for the middle class were lower in 1960 than today.

Figure 4 shows the pattern of federal tax rates across income groups in 1960, 1980, 1990, 2000, and the projection for 2004. The figure shows a clear flattening of the tax rate structure. There were sharp declines in top groups (especially within the top percentile), and increases for the middle class (from P40 to P99) from 1960 to 1980. In the 1980s, tax rates at the top declined, while tax rates in the middle class stayed constant, creating substantial federal budget deficits. In the 1990s, tax rates increased only within the top 5%, and the increased tax revenue erased the federal deficit by 2000. Interestingly, the 2005 projected tax rates restore lower rates of 1990 at the top and reduce tax rates on the middle class below the levels of 1980, 1990, or 2000. As federal spending has not declined, it is not surprising that the tax cuts enacted in 2001 and 2003 have generated a very large federal deficit.

Figure 5 shows how the progressivity of the federal income tax system has mitigated income concentration since 1960. Panel A displays the top 0.1% income share before and after all federal taxes. The figure shows that the federal

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took place) applied to incomes reported in 2000 (and adjusted for nominal and real growth).

tax system reduced income concentration the most in the 1960s and 1970s when income concentration was relatively low, and that the federal tax system has a relatively modest effect on the top 0.1% income share in recent years when income concentration is very high. Therefore, the rise in the top 0.1% after tax income share from 1.2% in 1970 to over 7.3% in 2000 is more dramatic than the rise in the top 0.1% pre tax income share from 2.6% to 9.3% during the same period. The recent tax reductions enacted in 2001 and 2003 further weaken the redistributive power of the federal income tax today.

Panel B repeats the same exercise but focusing exclusively on the individual federal income tax. The patterns in Panels A and B are very close in recent decades. This shows that, indeed, in recent years, the individual income tax is the major redistributive component of the tax system at the top of the income distribution. However, a comparison of Panels A and B in the 1960s and 1970s shows that, the full federal tax system generated much more redistribution than the sole individual income tax. Therefore, official reports from the Internal Revenue Service (Parisi, 2004-05, Strudler et al. 2005), which publish regular estimates of individual income tax rates and never include corporate and estate taxes might miss important features of the overall progressivity of the federal income tax system.

Finally, Panels A and B also display in dashed line (using the right axis) the fraction of taxes paid by the top 0.1% income group. The share of taxes paid is simply given by

$$\text{Top 0.1\% share of tax} = \text{Top 0.1\% tax rate} * \text{Top 0.1\% income share} / \text{Average tax rate}.$$

Our previous analysis has shown that the top 0.1% income share is the series that has experienced the largest variations and hence it is not surprising to see that indeed the share of tax series follows closely the income share series. Therefore, the share of tax paid by a top group is a completely misleading series to use to evaluate the progressivity of the tax system. Indeed, over the last 30



years in the United States, the tax rate on the top 0.1% has declined significantly and yet the share of tax paid by the top 0.1% has increased substantially.<sup>8</sup>

### **3. International Perspective**

In this section we apply the same methodology to two other OECD countries (France and the United Kingdom), and we compare the resulting patterns of effective tax rates for two years (1970 and a recent year) with those obtained for the United States.<sup>9</sup> Table 2 displays the tax rates in all three countries across income groups for 1970 and today (2005 in France, 2004 in the United States, and 2000 in the United Kingdom). The Table also shows how those tax rates are broken down into individual income taxes, payroll taxes, and estate and wealth taxes. We did not include the corporate tax in the French and British analysis because it would required a much more in depth analysis. The British results build upon the top income share series and individual tax rate series built by Atkinson (2006) and the French results build upon Piketty (2001a).<sup>10</sup>

Three key findings emerge from our international perspective. First, in all three countries, individual income tax progressivity has declined substantially over the 1970-2005 period. The decline has been particularly sharp in the United Kingdom, where the effective income tax rate for fractile P99.95-100 dropped from over 69% to less than 35% in 2005. This is due to the fact that, in contrast to the US case, the very high British top marginal rates were not tempered by tax deductions and tax loopholes.

It is also striking to note that income tax burdens incurred by top income groups are virtually identical in all three countries today (with effective tax rates

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<sup>8</sup> Although, this is a very basic point, such faulty interpretations are common, especially in the press. See Wall Street Journal for a recent example.

<sup>9</sup> The estimates presented for France and the U.K. rely on a number of simplifying assumptions which are presented in the technical appendices to the working paper version (see Piketty and Saez (2006)).

<sup>10</sup> In contrast to the United States, corporate taxes over GDP have been stable in France and the United Kingdom since 1960 suggesting that including the corporate tax would not alter the time pattern of tax progressivity in those countries.

around 30% at the very top). In particular, contrarily to popularly-held beliefs, effective income tax rates currently incurred by top income groups are smaller in France than in Anglo-Saxon countries – except for fractile P99.99-100, where the effective tax rate is (marginally) larger in France than in the US (but smaller than in the UK). At the level of fractile P99-99,5, the effective income tax rate was only 11.6% in France as of 2005, as compared to 21.4% in the U.S. and 27.4% in the U.K. That is, most high-wage individuals currently pay substantially higher income taxes in the U.S. or in the U.K. than in France. The statutory top marginal rate is currently larger in France (48%, versus 35% in the US and 40% in the UK),<sup>11</sup> but this largely undone by the large base exemptions and tax deductions that have always characterized the French income tax system.<sup>12</sup>

In 1970, individual income tax progressivity was unambiguously smaller in France than in Anglo-Saxon countries. This is largely due to the fact that the top marginal rate was only 60% in France (the highest historical level in France, except for a few years), compared to 70% in the US and 83% in the UK. During most of the post-war period, income tax progressivity has actually been substantially larger in Anglo-Saxon countries than in France and most other Continental European countries.<sup>13</sup> This illustrates a general point made by Lindert (2004): high-spending countries have always relied on a relatively low-distortion tax mix (large emphasis on tax instruments with little or no progressivity, large exemptions for capital income, etc.), while low-spending Anglo-Saxon countries have historically relied on more progressive taxes. According to Lindert, this is the key reason why the huge rise of social transfers in high spending countries such as France did not generate large efficiency losses and hence reductions in aggregate growth. Although this is true if one adopts a long-run perspective, the novelty from the recent decades is that Anglo-Saxon countries have gone through a series of significant top rate cuts since the

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<sup>11</sup> Estimates for France were computed using 2005 tax law, and did not take into account the new income tax cuts recently announced by the French government (the top marginal rate is scheduled to drop to around 42% in 2007).

<sup>12</sup> This is also due to the fact that top income levels and top income shares are significantly smaller in France than in the US and in the UK.

1970s, and have in a sense converged (and actually overshoot) towards the OECD average, in terms of individual income tax progressivity.

Second, in all three countries, payroll tax burden has increased substantially over the 1970-2005 period. Because payroll taxes are regressive, this has contributed to a general decline in tax progressivity. The rise in payroll tax burden has been particularly large in France. As of 2005, the employee payroll tax is 22.5% of gross wage in France, and the employer payroll tax is 42.5%, which means that the total labor cost corresponding to a net wage of 77.5 is as large as 142.5 (the income tax then applies to the remaining 77.5). In 1970, the employee and employer payroll tax rates were respectively 8.2% and 32.8% of gross wage. Moreover, most payroll taxes were capped in 1970, and most have been gradually uncapped between 1970 and 2005 and now apply to all wages, including very top wages.<sup>14</sup> As all internationally-mobile high-wage earners perfectly know (or should know), the reason why taxes are on average much higher in France than in Anglo-Saxon countries has little to do with the income tax, and a lot to do with the many social contributions levied through payroll taxation. However, because very top incomes are mostly made of business and capital income rather than wage income (and especially so in France), the overall impact of payroll taxation on tax progressivity is obviously regressive. In France, as of 2005, the regressivity of the payroll tax system entirely undoes the progressivity of the individual income tax system, so that the resulting tax system is basically flat (see Table 2). For instance, the combined income and payroll tax rate is 36.6% at the level of fractile P0-90 (1.8% income tax, 34.8% payroll tax), and 37.3% at the level of fractile P99,99-100 (28.8% income tax, 8.5% payroll tax). This again illustrates in a fairly dramatic way the general point made by Lindert (2004): high-spending countries rely on a low-progressivity tax mix. Needless to say, the overall picture would look substantially

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<sup>13</sup> See e.g. Dell (2006) for an analysis of the case of Germany, which appears fairly close to France.

<sup>14</sup> For a more detailed description of French payroll tax schedules, see the technical appendix of Piketty and Saez (2006).

different is we were to look at the benefits side (which are not taken into account in the present paper) and not only at the tax side.

Finally, and most importantly, the third key conclusion emerging from our international perspective is that in spite of the parallel evolutions of income and payroll tax components, overall tax progressivity has not evolved in the same way in all three countries during the 1970-2005 period. Figure 6 illustrates this by displaying the (full) tax rates across income groups in the three countries in 1970 (Panel A) and today (Panel B). While progressivity has unambiguously declined in the United States and in the United Kingdom, it has increased somewhat in France (or at least it did not decline), especially at the very top end of the distribution. This is due to a combination of two factors: the estate tax and the wealth tax. First, while estate tax progressivity has declined enormously in the United States and in the United Kingdom, it has actually increased in France. The progressivity of estate taxation has always been fairly moderate in France, just as in a number of Continental European countries (such as Germany), especially for estates transmitted to spouses and children (so-called “direct line” estates). The top marginal estate tax rate was only 20% in France until 1983, when it was raised to 40%, following the election of a socialist government in 1981. In contrast, the top estate tax rate in the U.S. and in the U.K. was above 70% during most of the post-war period, and was gradually reduced since the 1980s. As a consequence, the contribution of estate taxation to overall tax progressivity has declined substantially in the U.S. and in the U.K. between 1970 and 2005, while it has increased somewhat in France.

The other important factor is the creation of a wealth tax in France following the 1981 election. The wealth tax was repealed in 1986 and re-introduced in 1989, and it is now levied on the top 1% wealth holders, with a top marginal rate of 1.8% on wealth above 15 millions euros.<sup>15</sup> As one can see from Table 3, the contribution of the wealth tax to overall tax progressivity is non-negligible: the corresponding effective tax rate at the level of fractile P99,99-100 is 16,6% of income, and this is what pushes top effective rates above 60% in

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<sup>15</sup> See the technical appendix of Piketty and Saez (2006).

France in 2005. Note that this is still far less than the record levels observed in the U.S. (74.6%) and in the U.K. (91.7%) in 1970: the French socialist governments of the 1980s-1990s are progressive, but much less so than the Democrat and Labor Anglo-Saxon governments of the 1950s-1960s.

Although those results rely on incomplete and highly exploratory estimates, we believe they illustrate a general methodological point: in order to properly assess overall tax progressivity, it is critical to take a broad view of the tax system. Without taking estate and wealth taxation into account, one would not be able to notice that tax progressivity has increased somewhat in a country like France between 1970 and 2005, while it has declined enormously in the United Kingdom and in the United States. At a more substantial level, our preliminary findings show that the Lindert law is about to change (or has already done so): low-spending Anglo-Saxon countries used to have a more progressive tax system, but high-spending welfare states now seem to display both higher aggregate tax rates and higher tax progressivity. This is an interesting issue that would deserve further research. In particular, one would need to look at a much broader set of countries (especially from the viewpoint of intra-European tax competition) and to develop more systematic and rigorous methodologies encompassing a broader set of taxes.

#### **4. Conclusion**

This paper has discussed the progressivity of the US federal tax system, its evolution since 1960, and how it compares with other countries. Three important findings emerge.

First, the progressivity of the federal tax system has declined dramatically since the 1960s. The top 0.01% earners paid over 70% of their income in federal taxes in 1960 while they pay only about 35% of their income in 2005. Federal tax rates for the middle class have remained roughly constant overtime. This dramatic drop in progressivity is due primarily to a drop in corporate taxes and to

a lesser extent estate and gift taxes which fall on capital income *combined* with a sharp change in the composition of top incomes away from capital income and toward labor income. Because of the existence of deductions and favored treatment for capital gains throughout the history of the federal individual tax system, the reduction in the nominal progressivity of the individual income tax rate has only marginally contributed to the decline of progressivity of the federal tax system. Our analysis has shown that since the 1960s, the large reductions in tax progressivity took place during the Republican Reagan administrations in the 1980s and during the Republican Bush administrations in the early 2000s. The only significant increase in tax progressivity since 1960 took place in the early 1990s during the Democratic first Clinton Administration. Thus, there is a very clear link between changes in tax progressivity and the party in power. It is also striking to note that the most dramatic changes in the federal tax system progressivity almost always take place within the top 1% income earners (with relatively small changes below the top percentile). For example, many of the recent tax cut provisions that are currently hotly debated in Congress, such as the permanent reduction in tax rates for capital gains and dividends, as well as the repeal of the estate tax, affect primarily the top percentile of the distribution. This strongly suggests that, in contrast to the standard political economy model, the current tax system does not seem to be shaped by the tastes of the median voter.

Second, pre-tax income concentration has sharply increased since the 1970s. Thus, the decline in federal tax progressivity has led to an even more dramatic increase in post-tax income concentration: while the pre-tax share of the top 0.1% has been multiplied by 3.5 from 1970 to 2000, the corresponding post-tax share has been multiplied by 6.1. It is a disputed question whether the surge in top incomes have been *caused* by the reduction in taxation at the top through behavioral responses. There is clear evidence of short-term responses to changes in tax rates through retiming of income realization or shifts from the corporate to the individual tax base. Demonstrating a long-term causal relationship from top tax rates to more economic activity at the top, and

especially the surge in top wage compensation is almost impossible (see Saez, 2004 for a recent survey). It is conceivable that causality might have run in reverse way and that non-tax forces generated an increase in income concentration and that top income earners were able to use their greater incomes to influence the political process and obtain a reduction in tax progressivity subsequently.

Third, international comparisons confirm that is it critical to take into account other taxes than the individual income tax in order to properly assess the extent of overall tax progressivity, both for time trends and for cross-country comparisons. We hope that the preliminary international comparisons presented in this paper will contribute to stimulate more systematic comparative research in this area.

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**Table 1. Income and Tax Rate Statistics in 2004 (based on 2000 inflated incomes)**

Income Groups (1)	Number of tax units (2)	Average Income (pre-tax) (3)	Average tax rates (percent)					Shares of income and tax		
			Federal Individual (4)	Payroll (Social security+ medicare) Tax (5)	Federal Corporate (6)	Federal Estate and Gift (7)	Total Federal Taxes (8)	Pre-tax income share	Post-tax income share	Share of tax paid (11)
Full Population	143,982,000	\$52,110	11.5	9.3	2.3	0.4	23.4	100.00	100.00	100.00
P20-40	28,796,400	\$15,897	-3.2	10.6	2.0	0.0	9.4	6.10	7.21	2.46
P40-60	28,796,400	\$29,870	3.2	11.2	1.7	0.0	16.1	11.46	12.55	7.90
P60-80	28,796,400	\$52,137	7.3	11.6	1.6	0.0	20.5	20.01	20.76	17.57
P80-90	14,398,200	\$83,012	9.2	11.9	1.6	0.0	22.7	15.93	16.08	15.45
P90-95	7,199,100	\$117,709	11.6	11.5	1.8	0.0	24.9	11.29	11.07	12.03
P95-99	5,759,280	\$199,033	16.4	8.1	2.5	0.1	27.2	15.28	14.51	17.80
P99-99.5	719,910	\$428,690	21.4	4.6	3.7	1.6	31.3	4.11	3.69	5.50
P99.5-99.9	575,928	\$863,607	23.8	3.0	4.3	1.9	33.0	6.63	5.80	9.35
P99.9-99.99	129,584	\$3,158,720	25.1	1.6	4.9	2.4	34.1	5.46	4.69	7.95
P99.99-100	14,398	\$18,113,612	26.2	1.4	4.6	2.5	34.7	3.48	2.96	5.17

Notes: Computations based on income tax return statistics based on incomes from 2000 adjusted for growth and using 2004 tax law.

Groups are ranked based on market income excluding realized capital gains and imputed payroll and corporate taxes.

Average income includes realized capital gains and imputed payroll and corporate taxes. Tax rates are estimated

relative to income including realized capital gains and imputed payroll and corporate taxes.

Payroll tax includes employee+employer Social Security and Medicare taxes (excludes payroll taxes for unemployment and workers compensation)

Table 2. International and Historical Comparison of Tax Rates

Income Groups	1970 (US, France, and UK)							2004 (US), 2005 (France), 2000 (UK)						
	Average tax rates (percent)					Shares (percent)		Average tax rates (percent)					Shares (percent)	
	Individual Income Tax	Payroll Taxes	Estate, Gift, and Wealth Tax	Corporate Tax (US only)	Total Taxes	Pre-tax income share	Post-tax income share	Individual Income Tax	Payroll Taxes	Estate, Gift, and Wealth Tax	Corporate Tax (US only)	Total Taxes	Pre-tax income share	Post-tax income share
<b>A. United States</b>														
Full Population	12.5	5.8	0.7	4.3	23.3	100.00	100.00	11.5	9.3	0.4	2.3	23.4	100.00	100.00
P0-90	9.9	7.2	0.0	3.2	20.2	67.61	70.54	5.4	11.5	0.0	1.5	18.5	53.75	57.28
P90-95	13.7	4.5	0.0	3.2	21.4	10.76	11.03	11.6	11.5	0.0	1.8	24.9	11.29	11.07
P95-99	16.1	3.0	0.7	5.7	25.6	12.60	12.23	16.4	8.1	0.1	2.5	27.2	15.28	14.51
P99-99.5	20.7	1.5	3.8	10.0	36.1	2.87	2.39	21.4	4.6	1.6	3.7	31.3	4.11	3.69
P99.5-99.9	25.8	0.9	5.8	12.0	44.6	3.63	2.62	23.8	3.0	1.9	4.3	33.0	6.63	5.80
P99.9-99.99	31.5	0.4	12.5	14.7	59.1	1.76	0.94	25.1	1.6	2.4	4.9	34.1	5.46	4.69
P99.99-100	32.2	0.1	23.4	19.0	74.6	0.76	0.25	26.2	1.4	2.5	4.6	34.7	3.48	2.96
<b>B. France</b>														
Full Population	5.3	20.8	0.3		26.4	100.00	100.00	3.8	33.3	0.7		37.8	100.00	100.00
P0-90	2.3	24.0	0.0		26.3	69.30	69.39	1.8	34.8	0.1		36.7	68.93	70.19
P90-95	6.4	17.6	0.2		24.2	10.65	10.97	4.5	33.7	0.6		38.8	11.57	11.39
P95-99	10.6	14.1	0.4		25.1	12.51	12.74	7.0	31.4	1.4		39.8	12.84	12.44
P99-99.5	16.8	10.6	0.8		28.2	2.59	2.52	11.6	26.5	2.2		40.3	2.36	2.27
P99.5-99.9	21.9	7.4	1.9		31.2	3.09	2.88	16.4	21.4	5.1		43.0	2.67	2.45
P99.9-99.99	30.2	4.2	4.2		38.6	1.37	1.14	22.3	16.5	8.9		47.8	1.19	1.00
P99.99-100	40.1	1.7	6.9		48.8	0.50	0.35	28.8	8.5	24.2		61.5	0.43	0.26
<b>C. United Kingdom</b>														
Full Population	17.1	7.0	1.1		25.1	100.00	100.00	15.0	8.3	0.3	7.1	30.8	100.00	100.00
P0-90	13.0	8.1	0.0		21.2	71.64	75.41	9.7	7.6	0.0	7.7	25.0	61.22	66.30
P90-95	19.0	5.8	0.2		25.0	10.10	10.12	15.8	13.8	0.0	6.3	35.9	11.72	10.85
P95-99	25.0	4.1	2.1		31.2	11.41	10.50	21.7	11.9	1.0	5.9	40.5	14.79	12.70
P99-99.5	32.3	2.4	5.5		40.3	2.40	1.91	27.4	10.1	1.3	5.5	44.3	3.45	2.77
P99.5-99.9	41.3	1.6	10.4		53.4	2.86	1.78	30.5	8.6	1.3	5.4	45.8	4.81	3.77
P99.9-99.95	52.3	1.0	16.5		69.8	0.57	0.23	33.2	7.6	1.4	5.2	47.4	1.30	0.99
P99.95-100	69.2	0.6	21.9		91.7	1.01	0.11	34.5	6.5	1.5	5.2	47.8	3.42	2.58

Notes: Computations based on income tax return statistics. United Kingdom computations based on Atkinson (2006).

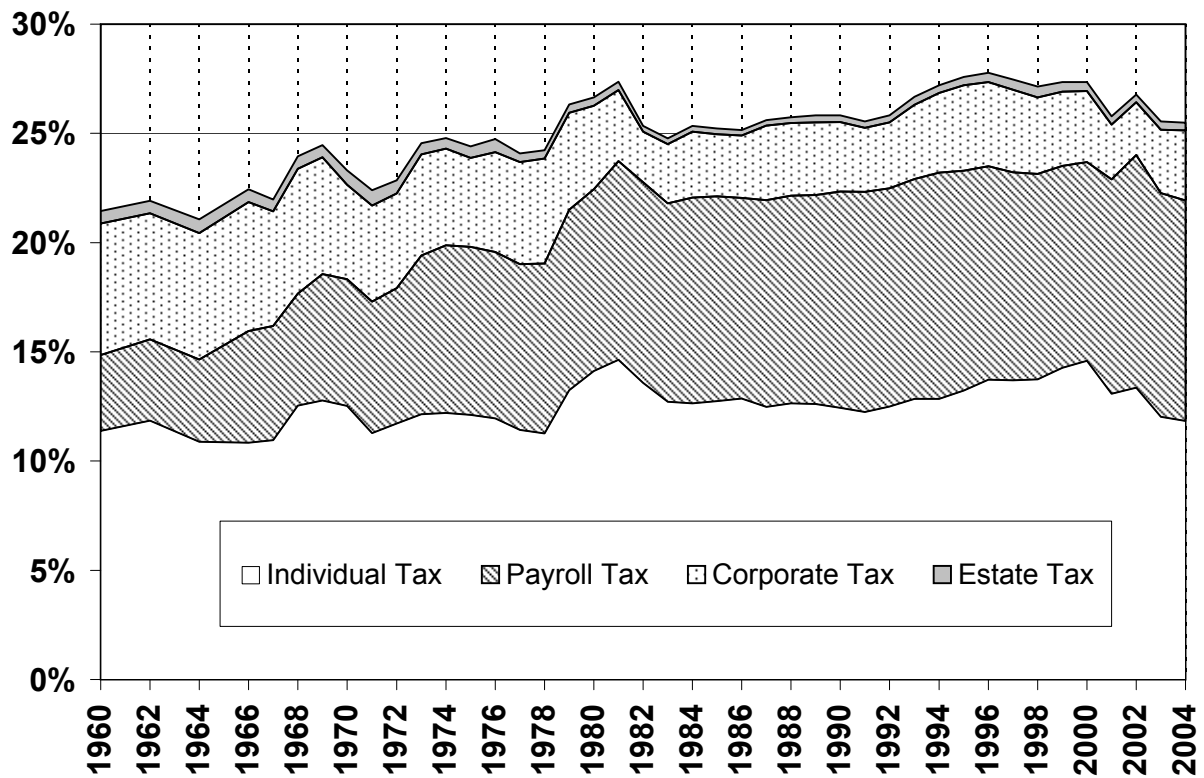
See Piketty and Saez (2006) for complete details on methodology.

Note that top group in the United Kingdom is P99.95-100 (and not P99.99-100 as in the US or France)

US numbers are based on 2004 tax law applied to 2000 incomes (adjusted to economic growth).

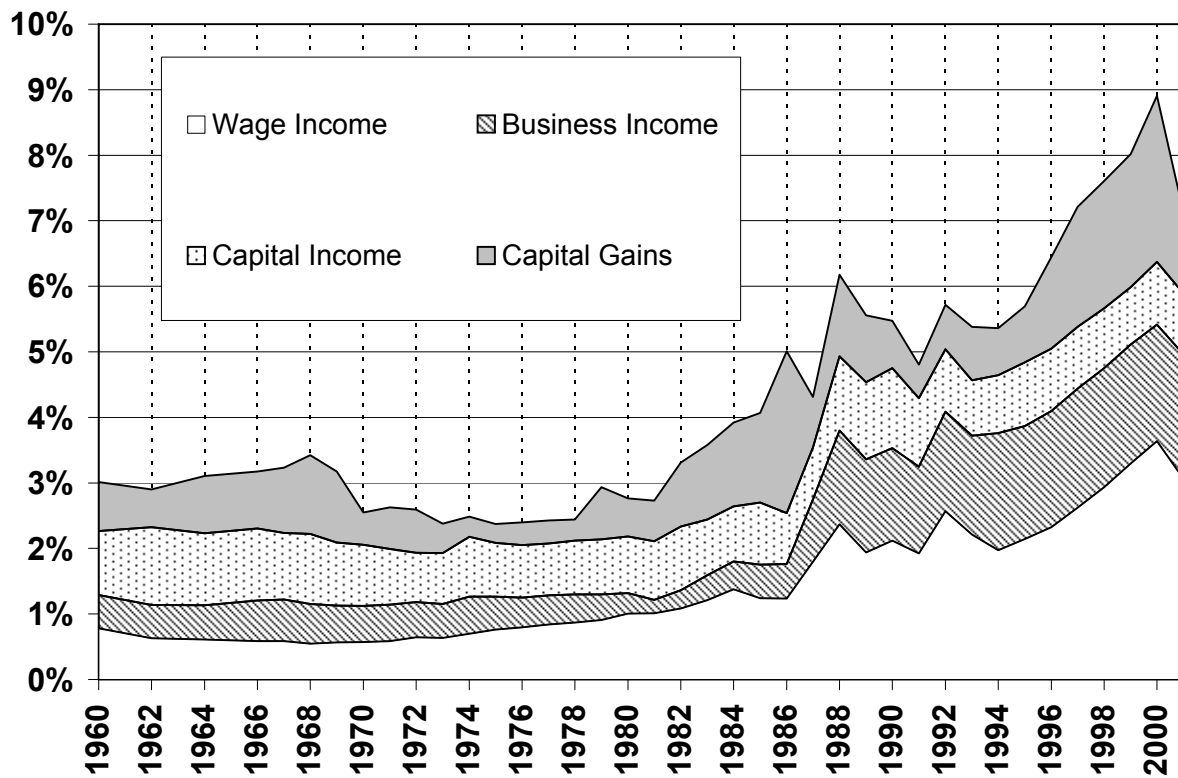
France numbers are based on 2005 tax law applied to 1998 incomes (adjusted to economic growth).

UK numbers are based on 2000 tax law applied to 2000 incomes (adjusted to economic growth).



**FIGURE 1**  
Average tax rates, 1960-2004

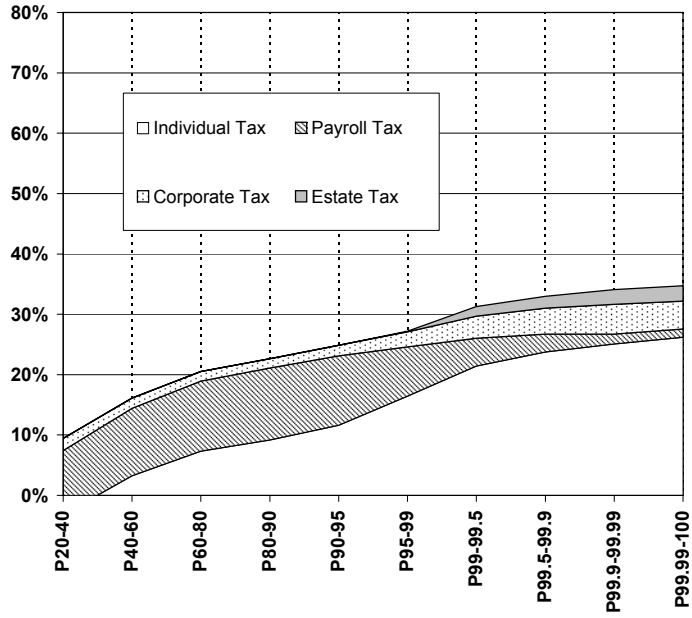
Figure displays the average tax rate for each of the 4 federal taxes for the full population.  
 Realized capital gains and corporate tax are added back to income when computing tax rates  
 Payroll taxes include employer+employee Social Security and Medicare taxes



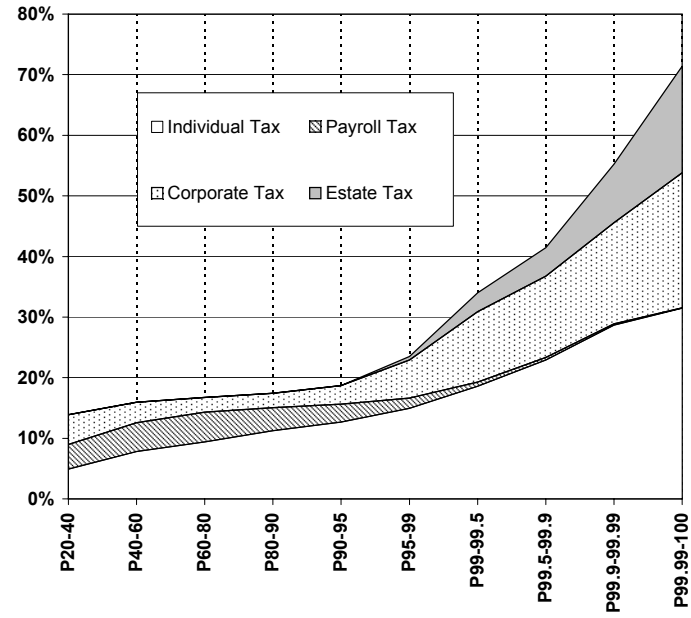
**FIGURE 2**  
The Top 0.1% Income Share and Composition, 1960-2001

The figure displays the income share of the top 0.1% tax units, and how the top 0.1% incomes are divided into four income components: wages and salaries (including exercised stock options), business income (S-corporation profits, partnership profits, sole proprietorship profits), capital income (dividend interest and rents), realized capital gains. Imputed corporate taxes are included in the corresponding category. Top 0.1% is defined based on individual market income excluding realized capital gains and corporate taxes.

**A. Tax rates in 2004**



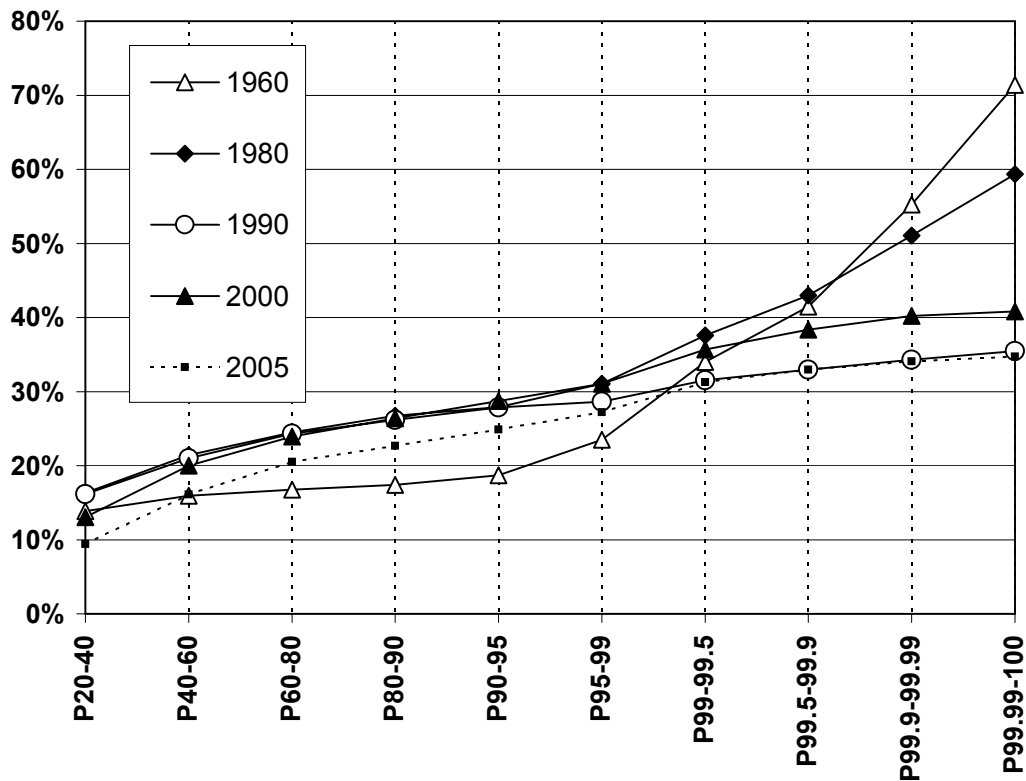
**B. Tax rates in 1960**



**FIGURE 3**

Federal Tax Rates in the United States in 2004 and 1960

Figures display the tax rate for each of the 4 federal taxes for various groups of the income distribution in 2004 (based on 2000 incomes adjusted for economic growth) and in 1960.

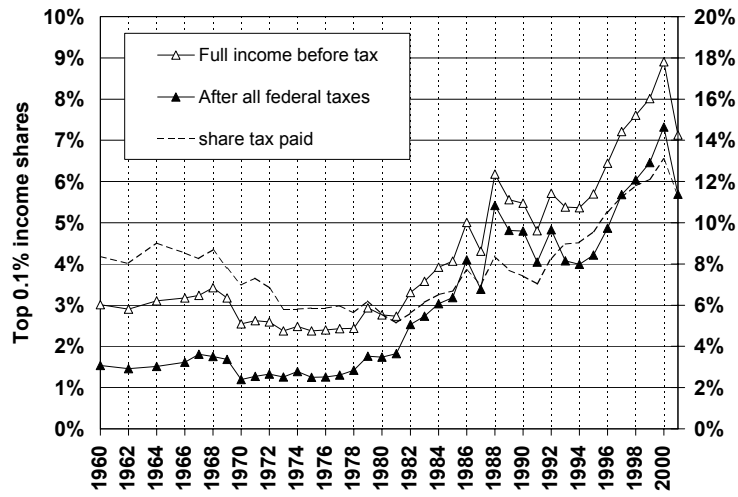


**FIGURE 4**

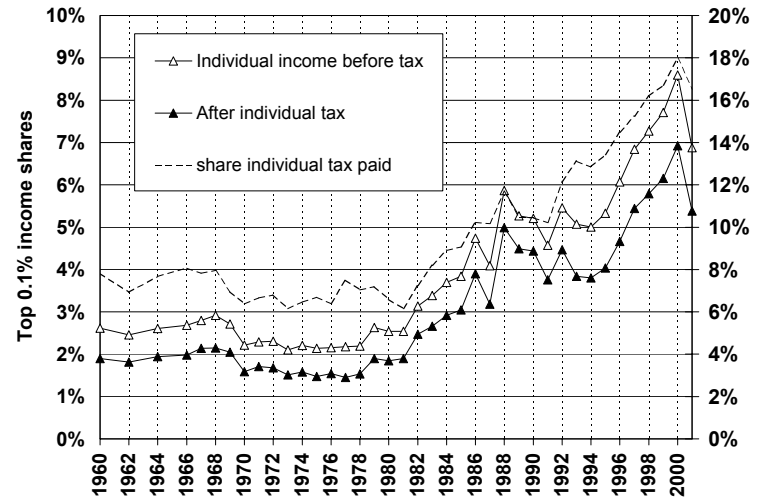
Federal Tax Rates by Income Groups from 1960 to 2004

Figures display the average federal tax rate (including individual, corporate, payroll, and estate) for various groups of the income distribution, for various years.

**A. Full income and all federal taxes**



**B. Income and individual income tax only**

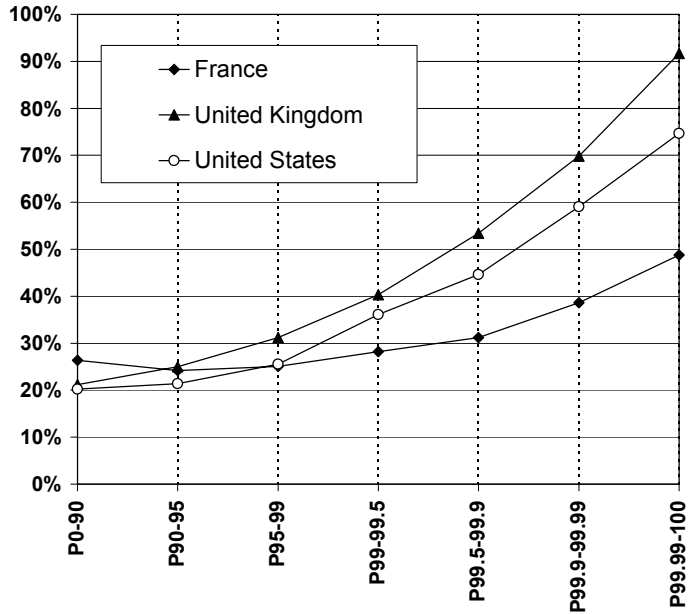


**FIGURE 5**

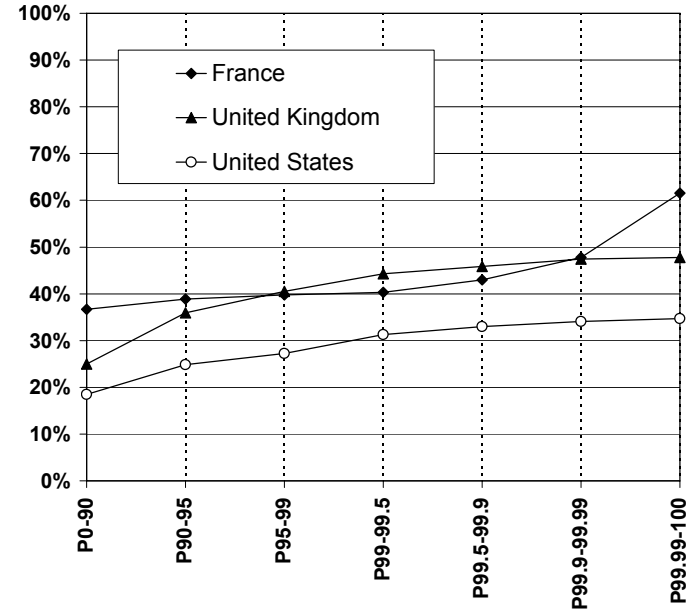
Top 0.1% income shares before and after tax, and share of taxes paid



**A. Tax rates in 1970**



**B. Tax rates today**



**FIGURE 6**

Tax Rates in France, the United Kingdom, and the United States in 1960 and today

Figure displays tax rates across income groups in the three countries.

Note that tax rates in the US include the 4 federal income taxes.

Tax rates in France and the United Kingdom include individual income taxes, payroll taxes, and estate and wealth taxes but exclude corporate income taxes.

In the United Kingdom, the two top groups are P99.9-99.95 and P99.95-100 (instead of P99.9-99.99 and P99.99-100)