Taxes and the Economy: An Economic Analysis of the Top Tax Rates Since 1945

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Summary

Income tax rates have been at the center of recent policy debates over taxes. Some policymakers have argued that raising tax rates, especially on higher income taxpayers, to increase tax revenues is part of the solution for long-term debt reduction. For example, the Senate recently passed the Middle Class Tax Cut (S. 3412), which would allow the 2001 and 2003 Bush tax cuts to expire for taxpayers with income over $250,000 ($200,000 for single taxpayers). The Senate recently considered legislation, the Paying a Fair Share Act of 2012 (S. 2230), that would implement the "Buffett rule" by raising the tax rate on millionaires.

Other recent budget and deficit reduction proposals would reduce tax rates. The President's 2010 Fiscal Commission recommended reducing the budget deficit and tax rates by broadening the tax base—the additional revenues from broadening the tax base would be used for deficit reduction and tax rate reductions. The plan advocated by House Budget Committee Chairman Paul Ryan that is embodied in the House Budget Resolution (H.Con.Res. 112), the *Path to Prosperity*, also proposes to reduce income tax rates by broadening the tax base. Both plans would broaden the tax base by reducing or eliminating tax expenditures.

Advocates of lower tax rates argue that reduced rates would increase economic growth, increase saving and investment, and boost productivity (increase the economic pie). Proponents of higher tax rates argue that higher tax revenues are necessary for debt reduction, that tax rates on the rich are too low (i.e., they violate the Buffett rule), and that higher tax rates on the rich would moderate increasing income inequality (change how the economic pie is distributed). This report attempts to clarify whether or not there is an association between the tax rates of the highest income taxpayers and economic growth. Data is analyzed to illustrate the association between the tax rates of the highest income taxpayers and measures of economic growth. For an overview of the broader issues of these relationships see CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples.

Throughout the late-1940s and 1950s, the top marginal tax rate was typically above 90%; today it is 35%. Additionally, the top capital gains tax rate was 25% in the 1950s and 1960s, 35% in the 1970s; today it is 15%. The real GDP growth rate averaged 4.2% and real per capita GDP increased annually by 2.4% in the 1950s. In the 2000s, the average real GDP growth rate was 1.7% and real per capita GDP increased annually by less than 1%. There is not conclusive evidence, however, to substantiate a clear relationship between the 65-year steady reduction in the top tax rates and economic growth. Analysis of such data suggests the reduction in the top tax rates have had little association with saving, investment, or productivity growth. However, the top tax rate reductions appear to be associated with the increasing concentration of income at the top of the income distribution. The share of income accruing to the top 0.1% of U.S. families increased from 4.2% in 1945 to 12.3% by 2007 before falling to 9.2% due to the 2007-2009 recession. The evidence does not suggest necessarily a relationship between tax policy with regard to the top tax rates and the size of the economic pie, but there may be a relationship to how the economic pie is sliced.

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he U.S. unemployment rate has been over 8% since February 2009 and the Blue Chip consensus forecast has it remaining above 8% throughout 2012. In addition, if current fiscal policies continue, the United States could be facing a debt level approaching 200% of gross domestic product (GDP) by 2037.[1] The current policy challenge is a trade-off between the benefits of beginning to address the long-term debt situation and risking damage to a still fragile economy by engaging in contractionary fiscal policy.[2] In the long term, many argue that debt reduction will eventually become the top priority. Ultimately, debt reduction would require increased tax revenues, reduced government spending, or a combination of the two. If increased tax revenue is part of long-term deficit reduction, expanding the tax base, raising tax rates, or a combination of the two would be required.

Income tax rates have been at the center of recent policy debates over taxes. Some have argued that raising tax rates, especially on higher income taxpayers, to increase tax revenues is part of the solution for long-term debt reduction. For example, the Senate recently passed the Middle Class Tax Cut Act (S. 3412), which would allow the 2001 and 2003 Bush tax cuts to expire for taxpayers with income over $250,000 ($200,000 for single taxpayers).[3] Some have argued that higher income tax rates on high income taxpayers would make the overall tax system more progressive.[4] The Senate recently considered legislation, the Paying a Fair Share Act of 2012 (S. 2230), that would implement the "Buffett rule" by raising the tax rate on millionaires.[5]

Other recent budget and deficit reduction proposals would reduce tax rates. The President's 2010 Fiscal Commission recommended reducing the budget deficit and tax rates by broadening the tax base—the additional revenues from broadening the tax base would be used for deficit reduction and tax rate reductions.[6] The plan advocated by House Budget Committee Chairman Paul Ryan, the *Path to Prosperity*, also proposes to reduce income tax rates by broadening the tax base. Both plans would broaden the tax base by reducing or eliminating tax expenditures.[7]

Advocates of lower tax rates argue that reduced rates would increase economic growth, increase saving and investment, and boost productivity. Proponents of higher tax rates argue that higher

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[1] Congressional Budget Office (CBO), *The 2012 Long-term Budget Outlook*, June 2012.

[2] See CRS Report R41849, *Can Contractionary Fiscal Policy Be Expansionary?*, by Jane G. Gravelle and Thomas L. Hungerford.

[3] The 2001 and 2003 tax cuts (known as the Bush tax cuts) were temporarily extended in 2010 and are set to expire at the end of 2012; Congress may consider the fate of these tax cuts later this year. If the Bush tax cuts expire as scheduled, then tax rates will increase on ordinary income (e.g., wages and salaries), dividends, and capital gains. The House passed the Job Protection and Recession Prevention Act of 2012 (H.R. 8), which would extend all the 2001 and 2003 Bush tax cuts for another year. See CRS Report R42020, *The 2001 and 2003 Bush Tax Cuts and Deficit Reduction*, by Thomas L. Hungerford for an analysis of the Bush tax cuts.

[4] Peter Diamond and Emmanuel Saez, "The Case for a Progressive Tax: From Basic Research to Policy Recommendations," *Journal of Economic Perspectives*, vol. 25, no. 4 (Fall 2011), pp. 165-190.

[5] See CRS Report R42043, *An Analysis of the "Buffett Rule"*, by Thomas L. Hungerford for an analysis of the Buffett rule.

[6] The National Commission on Fiscal Responsibility and Reform, *The Moment of Truth*, December 2010 available at http://www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/TheMomentofTruth12_1_2010.pdf.

[7] For more information on tax expenditures, see CRS Report RL34622, *Tax Expenditures and the Federal Budget*, by Thomas L. Hungerford; and Thomas L. Hungerford, "Tax Expenditures: Good, Bad, or Ugly?," *Tax Notes*, vol. 113, no. 4 (October 23, 2006), pp. 325-334. Recent analysis suggests that there are impediments to base broadening by modifying tax expenditures, which would not allow for significant reductions in tax rates. See CRS Report R42435, *The Challenge of Individual Income Tax Reform: An Economic Analysis of Tax Base Broadening*, by Jane G. Gravelle and Thomas L. Hungerford.

tax revenues are necessary for debt reduction, that tax rates on the rich are too low (i.e., they violate the Buffett rule), and that higher tax rates on the rich would moderate increasing income inequality. This report examines individual income tax rates since 1945 in relation to these arguments and seeks to establish what, if any, relationship exists between the top tax rates and economic growth. The nature of these relationships, if any, is explored using statistical analysis. The analysis is limited to the post-World War II period because the U.S. income tax system was not broad-based before the war—less than 15% of families filed a tax return in 1939; 85% filed a return in 1945. For an overview of the broader issues of these relationships see CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples.

Top Tax Rates Since 1945

Tax policy analysts often use two concepts of tax rates. The first is the marginal tax rate or the tax rate on the last dollar of income. If a taxpayer's income were to increase by $1, the marginal tax rate indicates what proportion of that dollar would be paid in taxes. The highest marginal tax rate is referred to as the top marginal tax rate. How much an additional dollar is taxed depends on if it is ordinary income (e.g., wages) or capital gains. The second concept of tax rates is the average tax rate, which is the proportion of all income that is paid in taxes. An examination of the trend in the average tax rate provides information on how the tax burden has changed over time.

Although the statutory top marginal tax rate was over 90% in the 1950s, the average tax rate for the very rich was much lower. The average tax rates at five-year intervals since 1945 for the top 0.1% and top 0.01% of taxpayers is shown in **Figure 1**. The average tax rate for the top 0.01% (one taxpayer in 10,000) was about 60% in 1945 and fell to 24.2% by 1990. The average tax rate for the top 0.1% (one taxpayer in 1,000) was 55% in 1945 and also fell to 24.2% by 1990, following a similar downward path as the tax rate for the top 0.01%. Between 1990 and 1995, the average tax rate for both the top 0.1% and top 0.01% increased to about 31%. After 1995, the average tax rate for the top 0.01% was lower than that for the top 0.1%.

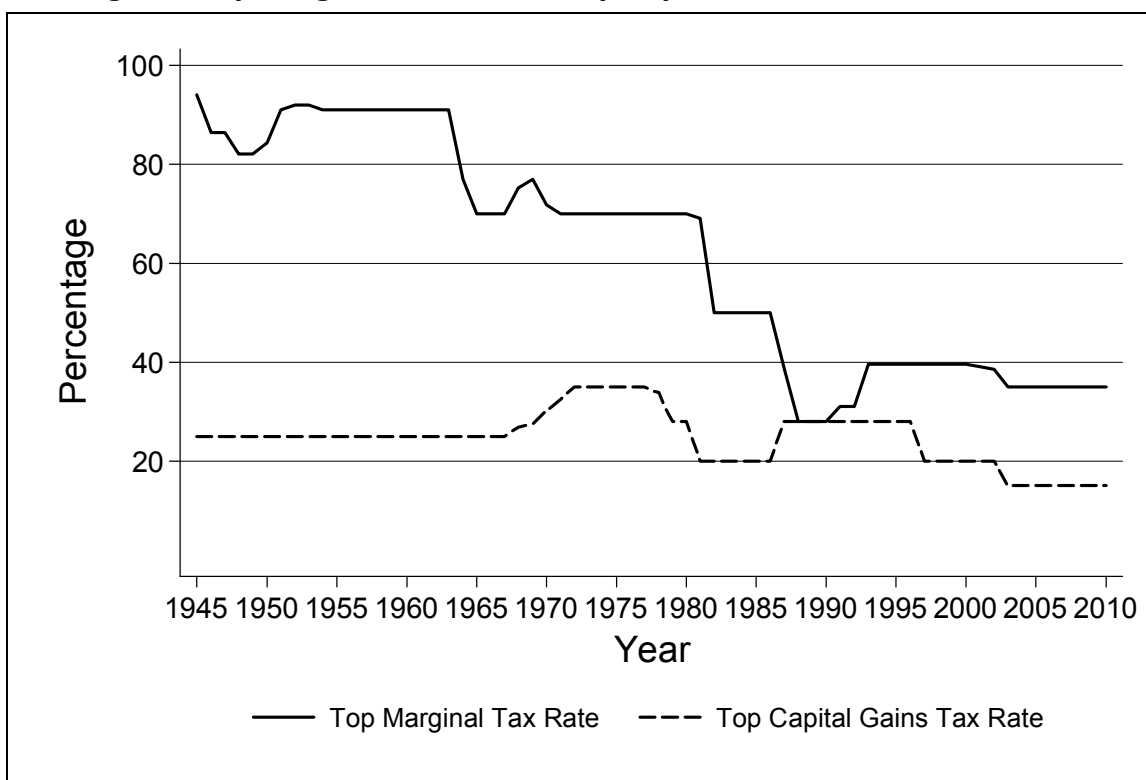**Figure 1. Average Tax Rates for the Highest-Income Taxpayers, 1945-2009**
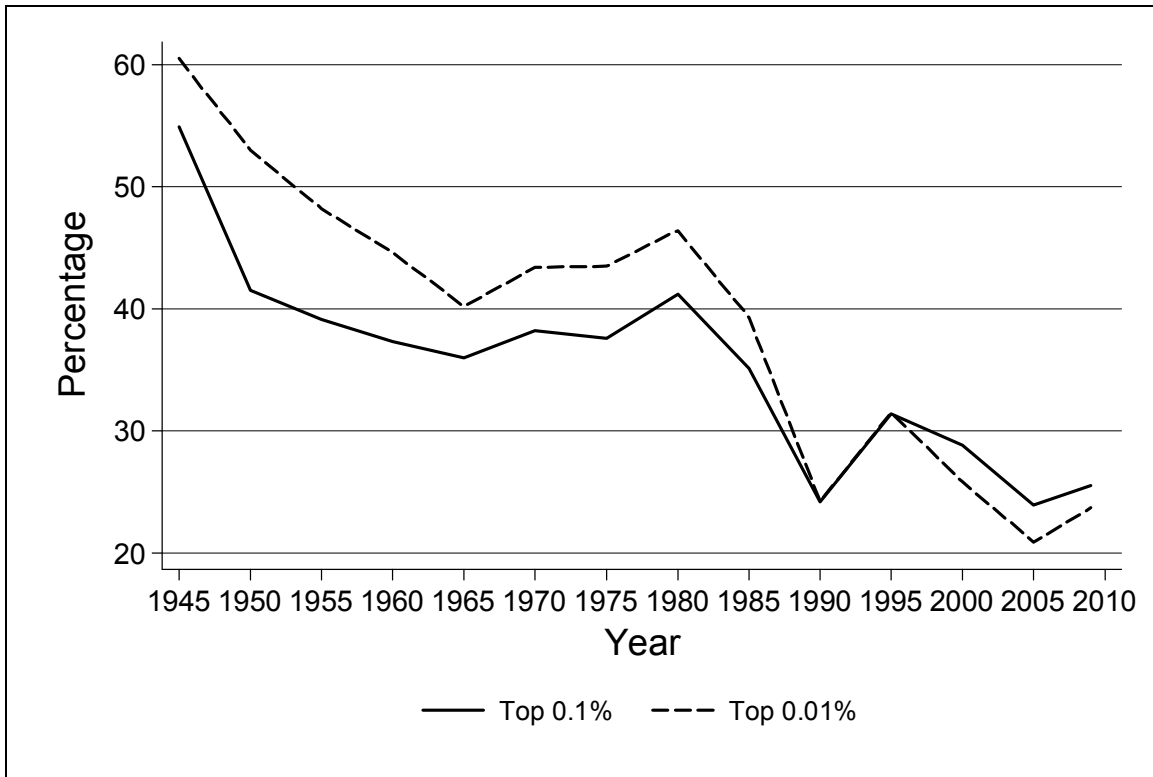
Source: CRS calculations using Internal Revenue Service (IRS) Statistics of Income (SOI) information.

Note: The vertical axis is the average tax rate.

The trends in the statutory top marginal tax rate and the top capital gains tax rate are displayed in **Figure 2**. The general trend for the top marginal tax rate has been downward since 1945 (the higher, solid line in the figure). It fell from 94% in 1945 to 91% in the 1950s and 70% in the 1960s and 1970s to a low of 28% after the enactment of the Tax Reform Act of 1986 (TRA86; P.L. 99-514).[8] The top marginal tax rate subsequently increased to 39.6% in the 1990s, before being reduced to its current level of 35% by the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA; P.L. 107-16).

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[8] In the 1970s, the top marginal tax rate on earned income was capped at 50%; only unearned income (e.g., interest and dividends) faced the 70% top marginal tax rate.

Figure 2. Top Marginal Tax Rate and Top Capital Gains Tax Rate, 1945-2010

The variation in the top capital gains tax rate since 1945 has been much lower and there appears to be no distinctive trend (the lower, dashed line). The top capital gains tax rate was 25% before 1965, was raised to 35% in the 1970s, fell to 20% in the early 1980s, and rose to 28% after the enactment of TRA86. The rate was reduced to its current level of 15% (from 20%) by the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA; P.L. 108-27). The top capital gains tax rate is scheduled to return to 20% at the end of 2012.

Top Tax Rates and the Economy

Some economists and policymakers often assert that reducing marginal tax rates would spur economic growth.[9] This could work through several mechanisms. First, lower tax rates could give people more after-tax income that could be used to purchase additional goods and services. This is a demand-side argument and is often invoked to support a temporary tax reduction as an expansionary fiscal stimulus. Second, reduced tax rates could boost saving and investment, which would increase the productive capacity of the economy and productivity.[10] Furthermore, some argue that reduced tax rates increase labor supply by increasing the after-tax wage rate. There is

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[9] See, for example, The National Commission on Fiscal Responsibility and Reform, *The Moment of Truth*, December 2010, p. 28. Support for this assertion often comes from theoretical textbook treatments, such as Robert J. Barro, *Macroeconomics*, 2nd ed. (New York: John Wiley & Sons, 1984).

[10] This is a supply side argument. See CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples for a discussion of these issues.

substantial evidence, however, to suggest that labor supply responses to wage and tax changes are small for both men and women.[11] To the extent that these mechanisms are valid, it is expected that there would be an inverse relationship between the top tax rates and saving, investment, productivity growth, and real per capita GDP growth. Each relationship is examined.

Saving and Investment

Analysts caution against a low saving rate. They argue that high capital investment leads to higher economic growth and a higher future standard of living. But if capital investment is not financed by national saving it has to be financed by borrowing abroad.[12] Persistent borrowing from abroad builds up international liabilities and implies increasing flow of funds will be sent abroad as interest and dividends.

National saving is composed of two components: private saving and public saving. Private saving is the saving by households and businesses while public saving is the budget surpluses of local, state, and federal governments. If spending is greater than income, then saving is negative (i.e., people are reducing wealth or borrowing).

From an economic perspective, the effect of taxes on private saving is ambiguous. If taxes are reduced, the after-tax return on saving is larger; consequently, individuals may be able to maintain a target level of wealth and save less (wealth will grow due to the higher after-tax returns). This is the income effect and has lower taxes leading to less saving. However, the reduced after-tax return changes the relative price of consuming now (saving less) and future consumption (saving more) in favor of future consumption. This is the substitution effect and has lower taxes leading to more saving. The actual effect of a tax reduction depends on the relative magnitudes of the income and substitution effects.[13]

The simple relationships between the private saving ratio and the top tax rates are displayed in the top two charts in **Figure 3**.[14] Each point represents the private saving ratio and top tax rate for each year since 1945. The nature of the relationship is illustrated by the straight line in the figure, which graphically represents the correlation (fitted relationship or fitted values) between the two variables.[15] The slope of the fitted values line indicates how one variable changes when the other variable changes. For both the top marginal tax rate and the top capital gains tax rate there seems

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[11] Costas Meghir and David Phillips, "Labour Supply and Taxes," in *Dimensions of Tax Design: The Mirrlees Review*, ed. Stuart Adams and others (Oxford: Oxford University Press, 2010), pp. 202-274; Robert A. Moffitt and Mark O. Wilhelm, "Taxation and the Labor Supply Decisions of the Affluent," in *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, ed. Joel B. Slemrod (Cambridge, MA: Harvard University Press, 2000), pp. 193-239; Francine D. Blau and Lawrence M. Kahn, "Changes in the Labor Supply Behavior of Married Women: 1980-2000," *Journal of Labor Economics*, vol. 25, no. 3 (2007), pp. 393-438; Bradley T. Heim, "The Incredible Shrinking Elasticities: Married Female Labor Supply, 1978-2002," *Journal of Human Resources*, vol. 42, no. 4 (Fall 2007), pp. 881-918; and Kelly Bishop, Bradley Heim, and Kata Mihaly, "Single Women's Labor Supply Elasticities: Trends and Policy Implications," *Industrial and Labor Relations Review*, vol. 63, no. 1 (October 2009), pp. 146-168.

[12] Edward Gramlich, "The Importance of Raising National Saving," the Benjamin Rush Lecture, Dickinson College, PA., March 2, 2005.

[13] See Richard A. Musgrave, *The Theory of Public Finance: A Study in Public Economy* (New York: McGraw-Hill Book Company, 1959).

[14] The saving ratio is the ratio of private saving to potential GDP (the level of GDP attainable when resources are fully employed).

[15] The fitted values are the points on the straight line that best characterize the relationship between two variables.

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to be a positive relationship—the higher the tax rate, the higher the saving ratio. The observed correlation between the tax rates and the saving ratio, however, could be coincidental or spurious. Estimation of the correlations controlling for other factors affecting saving and paying particular attention to the statistical properties of the variables indicates that the relationship observed in **Figure 3** is likely coincidental (and not statistically significant)—suggesting the top tax rates are not associated with private saving.[16] Other research suggests that taxes generally have had a negligible effect on private saving.[17] But public saving can be reduced if tax revenue is reduced due to tax rate reductions. The overall effect of tax reductions on national saving could be negative—that is, national saving falls.[18]

Taxes can affect investment not only through the income and substitution effects related to saving, but also through a risk-taking effect. The capital gains tax rate has been singled out as being important to investment. For risk-averse investors, the capital gains tax could act as insurance for risky investments by reducing the losses as well as the gains—it decreases the variability of investment returns.[19] Consequently, a rise in the capital gains top rate could increase investment because of reduced risk.

The bottom charts in **Figure 3** show the observed relation between the private fixed investment ratio (investment divided by potential GDP) and the top tax rates. The fitted values suggest there is a negative relationship between the investment ratio and top tax rates. But regression analysis does not find the correlations to be statistically significant (see **Table A-1** in the appendix) suggesting that the top tax rates do not necessarily have a demonstrably significant relationship with investment.[20]

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[16] The regression results are reported in **Table A-1**. Also see CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples.

[17] Eric Engen, Jane Gravelle, and Kent Smetters, "Dynamic Tax Models: Why They Do the Things They Do," *National Tax Journal*, vol. 50, no. 3 (September 1997), pp. 631-656; and Organisation for Economic Co-operation and Development, *Tax and the Economy: A Comparative Assessment of OECD Countries*, Tax Policy Studies No. 6, 2001.

[18] See Edward F. Denison, *Trends in American Economic Growth, 1929-1982* (Washington: The Brookings Institution, 1985); and CRS Report RL33482, *Saving Incentives: What May Work, What May Not*, by Thomas L. Hungerford.

[19] Leonard F. Burman, *Labyrinth of Capital Gains Tax Policy: A Guide for the Perplexed* (Washington: Brookings Institution Press, 1999).

[20] For further evidence see CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples; and Christina D. Romer and David H. Romer, *The Incentive Effects of Marginal Tax Rates: Evidence from the Interwar Era*, National Bureau of Economic Research, Working Paper 17860, February 2012.

# Figure 3. Private Saving, Investment, and the Top Tax Rates, 1945-2010
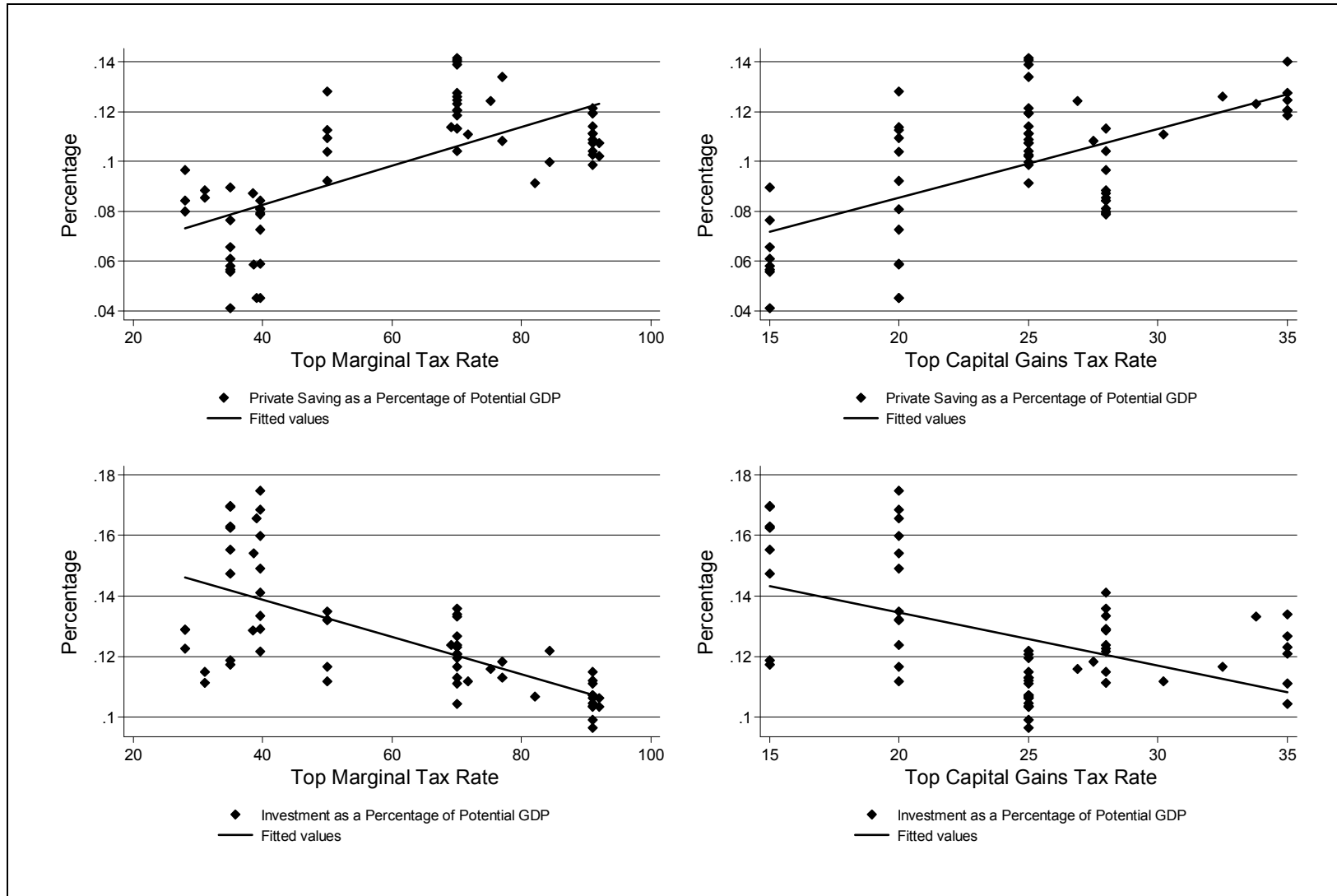
Source: CRS analysis.

Productivity Growth

Productivity can increase due to investment, innovation, improvement in labor skills, increases in entrepreneurship, and enhanced competition.[21] It is often argued that lower tax rates have a positive effect on all of these factors. Consequently, it would be expected that lower tax rates enhance productivity growth. **Figure 4** displays the relationship between labor productivity growth and the top tax rates. The fitted values suggest that the top marginal tax rate has a slight positive association with productivity growth while the top capital gains tax rate has a slight negative association with productivity growth. The regression analysis, however, does not find either relationship to be statistically significant (see **Table A-1**), suggesting the top tax rates are not necessarily associated with productivity growth.

Figure 4. Labor Productivity Growth Rates and the Top Tax Rates, 1945-2010
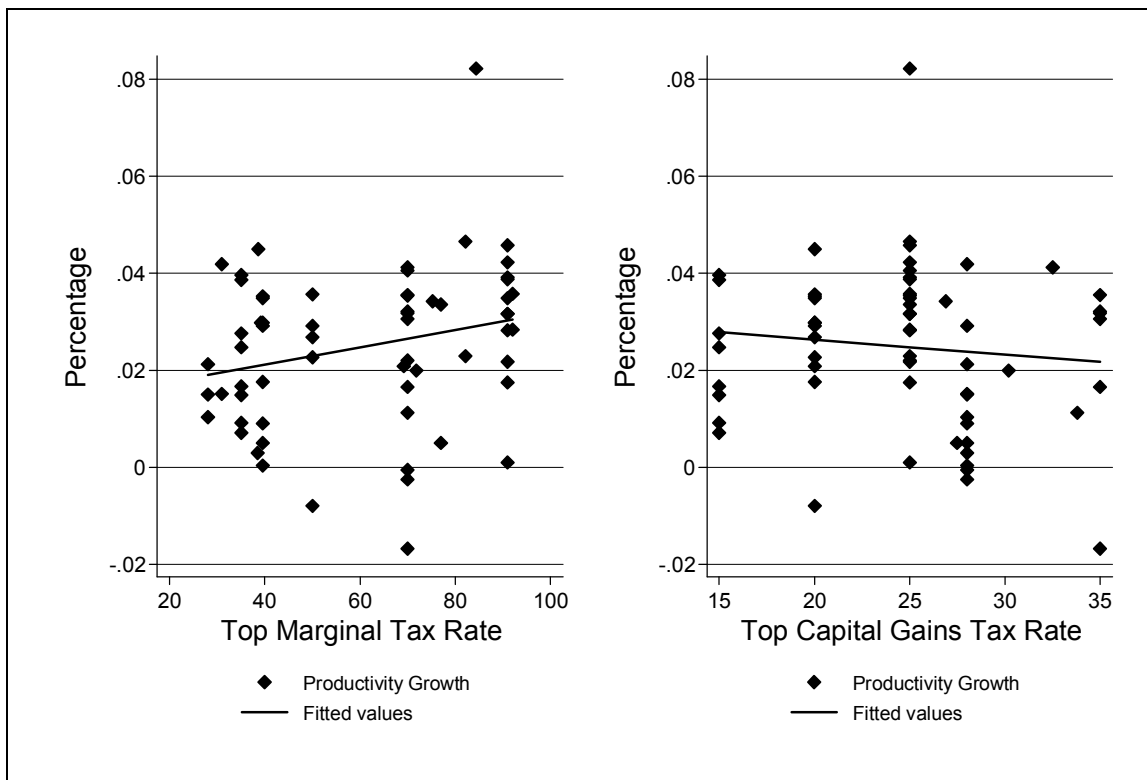
Source: CRS analysis.

Note: The vertical axis is the labor productivity growth rate.

Real Per Capita GDP Growth

The annual real per capita GDP growth rate plotted against the top marginal tax rate and top capital gains tax rate is shown in **Figure 5**. Each point represents the real per capita GDP growth

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[21] Office of National Statistics, *The ONS Productivity Handbook*, Basingstoke, Hampshire, UK, 2007, Ch. 3, http://www.ons.gov.uk.

rate and tax rate for each year since 1945. The fitted values seem to suggest that higher tax rates are associated with slightly higher real per capita GDP growth rates. The top marginal tax rate in the 1950s was over 90%, and the real GDP growth rate averaged 4.2% and real per capita GDP increased annually by 2.4% in the 1950s. In the 2000s, the top marginal tax rate was 35% while the average real GDP growth rate was 1.7% and real per capita GDP increased annually by less than 1%.

The scattered points, however, generally are not close to the fitted values line indicating that the association between GDP growth and the top tax rates is not strong.[22] Furthermore, the observed positive association between real GDP growth and the top tax rates shown in the figure could be coincidental or spurious because of changes to the U.S. economy over the past 65 years.[23] The statistical analysis using multivariate regression (reported in **Table A-1**) does not find that either top tax rate has a statistically significant association with the real GDP growth rate.[24]

These results are generally consistent with previous research on tax cuts. Some studies find that a broad based tax rate reduction has a small to modest, positive effect on economic growth.[25] Other studies have found that a broad based tax reduction, such as the Bush tax cuts, has no effect on economic growth.[26] It would be reasonable to assume that a tax rate change limited to a small group of taxpayers at the top of the income distribution would have a negligible effect on economic growth.

[22] Also see CRS Report R42111, *Tax Rates and Economic Growth*, by Jane G. Gravelle and Donald J. Marples.

[23] Immediately after World War II, the U.S. was the dominant world economy. This dominant position was gradually reduced as the European and Asian economies recovered and U.S. current account deficits grew.

[24] Statistical significance provides information on the likelihood a result occurs by chance.

[25] Eric Engen and Jonathan Skinner, "Taxation and Economic Growth," *National Tax Journal*, vol. 49, no. 4 (December 1996), pp. 617-642; and Charles W. Calomiris and Kevin A. Hassett, "Marginal Tax Rate Cuts and the Public Tax Debate," *National Tax Journal*, vol. 55, no. 1 (March 2002), pp. 119-131.

[26] Martin Feldstein and Douglas W. Elmendorf, "Budget Deficits, Tax Incentives, and Inflation: A Surprising Lesson from the 1983-1984 Recovery," in *Tax Policy and the Economy*, ed. Lawrence H. Summers, vol. 3 (Cambridge, MA: MIT Press, 1989), pp. 1-23; William G. Gale and Samara R. Potter, "An Economic Evaluation of the Economic Growth and Tax Relief Reconciliation Act of 2001," *National Tax Journal*, vol. 55, no. 1 (March 2002), pp. 133-186; and William G. Gale and Peter R. Orszag, "Economic Effects of Making the 2001 and 2003 Tax Cuts Permanent," *International Tax and Public Finance*, vol. 12 (2005), pp. 193-232.

Figure 5. Real Per Capita GDP Growth Rate and the Top Tax Rates, 1945-2010
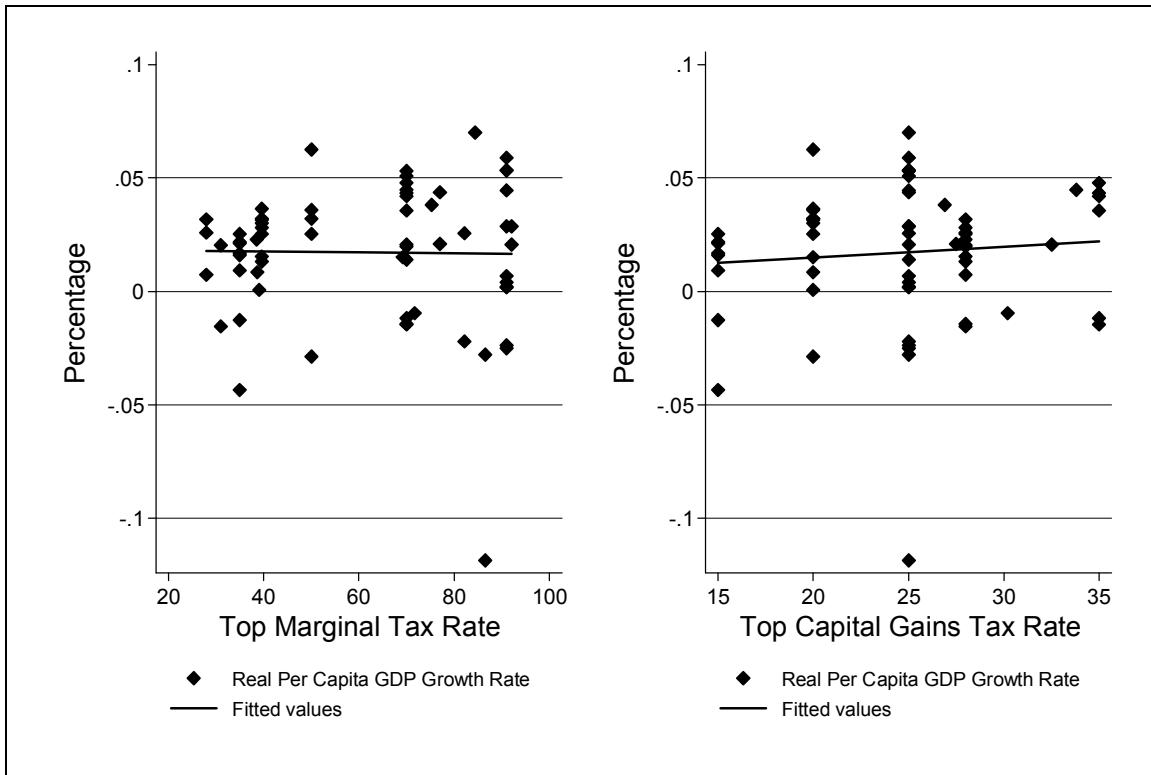
Source: CRS analysis.

Note: The vertical axis is the real per capita GDP growth rate.

Top Tax Rates and the Distribution of Income

It is recognized that measure of U.S. income disparities have increased over the past 35 years.[27] According to income tax data, average inflation-adjusted or real income increased by 116% (that is, about doubled) since 1945.[28] Average real income increased by 395% for the top 0.1% and by 692% for the top 0.01% over this period. Average real income for the balance of the top 1% in the income distribution (i.e., all but the top 0.1%) increased by about 165%. The share of income going to the top 1% increased from 12.5% in 1945 to 19.8% in 2010. Three-quarters of this increase in income share went to the top 0.1%. Since the major changes in the distribution of income were largely due to changes in the top 0.1% of the income distribution, the focus of the analysis is on the top 0.1%.

Arguments are offered for and against reducing income inequality. The classic argument against rising income inequality is the rich get richer and the poor get poorer. This can increase poverty,

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[27] CBO, *Trends in the Distribution of Income Between 1979 and 2007*, October 2011; CRS Report R42131, *Changes in the Distribution of Income Among Tax Filers Between 1996 and 2006: The Role of Labor Income, Capital Income, and Tax Policy*, by Thomas L. Hungerford; and CRS Report R42400, *The U.S. Income Distribution and Mobility: Trends and International Comparisons*, by Linda Levine.

[28] Thomas Piketty and Emmanuel Saez, "Income Inequality in the United States, 1913-1998," *Quarterly Journal of Economics*, vol. 118, no. 1 (February 2003), pp. 1-39, with updated tables available at http://elsa.berkeley.edu/~saez/.

reduce well-being, and reduce social cohesion. Consequently, many argue that reducing income inequality may reduce various social ills. Some researchers are concerned about the consequences of rising income inequality. Some research has found that large income and class disparities adversely affect health and economic well-being.[29]

In contrast, others point out that average real income has been rising, so while the rich are getting richer, the poor are not necessarily getting poorer. In addition, many argue that some income inequality is necessary to encourage innovation and entrepreneurship—the possibility of large rewards and high income are incentives to bear the risks.[30] Many argue that income or social mobility reduces income inequality and increases well-being.[31]

Figure 6 displays the trend in the income (before taxes) share of the top 0.1% (the top solid line in the figure) and the top 0.01% (the lower dashed line) since 1945.[32] Under both definitions of the top of the income distribution (i.e., the rich), the income shares were relatively stable until the late 1970s and then started to rise. In 1945, the income share of the top 0.1% was 4.2%, increased to 12.3% by 2007, fell during the 2007-2009 recession, and started to rise again in 2010.[33] The income share of the top 0.01% followed the same overall trend.

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[29] Michael Marmot, *The Status Syndrome: How Social Standing Affects Our Health and Longevity* (New York: Henry Holt and Co., 2004); Richard G. Wilkinson, *Unhealthy Societies: The Afflictions of Inequality* (New York: Routledge, 1996); Robert Frank, *Falling Behind: How Rising Inequality Hurts the Middle-Class* (Berkeley, CA: University of California Press, 2007); and Gopal K. Singh and Mohammad Siahpush, "Widening Socioeconomic Inequalities in US Life Expectancy, 1980-2000," *International Journal of Epidemiology*, vol. 35 (May 2006), pp. 969-979.

[30] Donald Deere and Finis Welch, "Inequality, Incentives, and Opportunity," *Social Philosophy and Policy*, vol. 19, no. 1 (2002), pp. 84-109.

[31] Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), p. 171.

[32] Note that the top 0.1% in the income distribution includes the top 0.01%. These are two different definitions of the rich. The top 0.1% represents one family in 1,000 and the top 0.01% represents one in 10,000.

[33] These trends are consistent with evidence that the income of high-income households has become more cyclical since 1980. See Jonathan A. Parker and Annette Vissing-Jorgensen, "The Increase in Income Cyclicality of High-Income Households and Its Relation to the Rise in Top Income Shares," *Brookings Papers on Economic Activity*, Fall 2010, pp. 1-55.

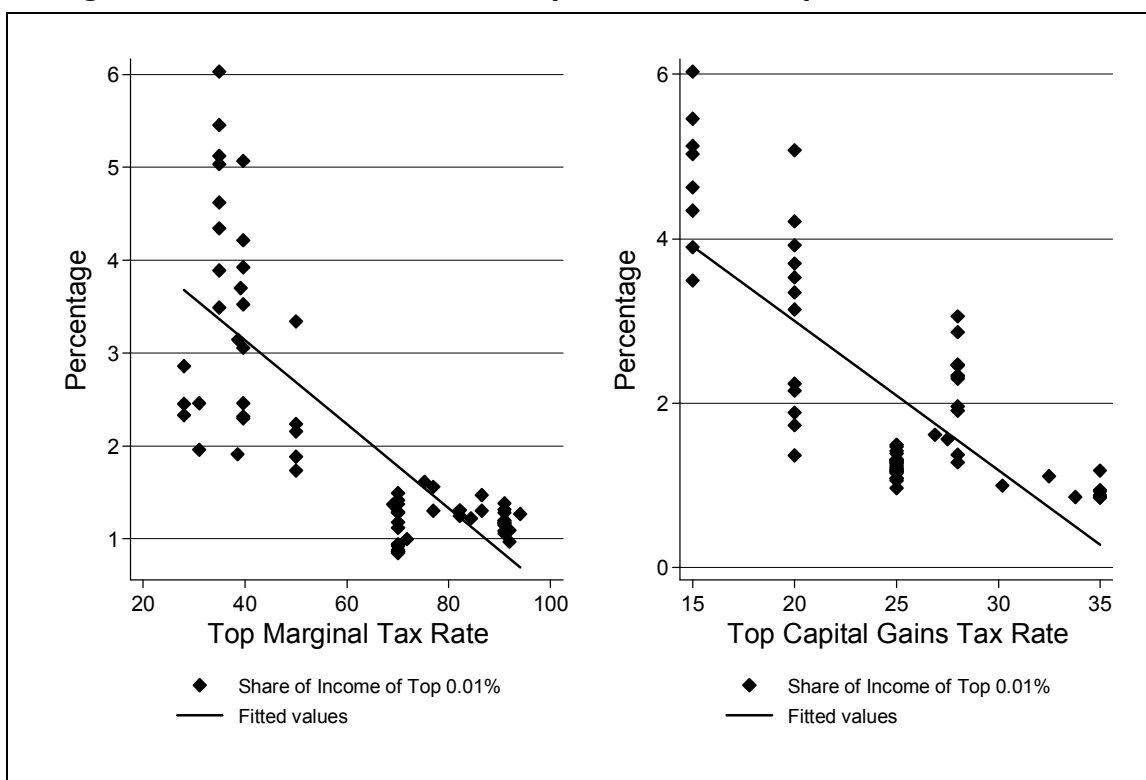**Figure 6. Shares of Total Income of the Top 0.1% and Top 0.01% Since 1945**
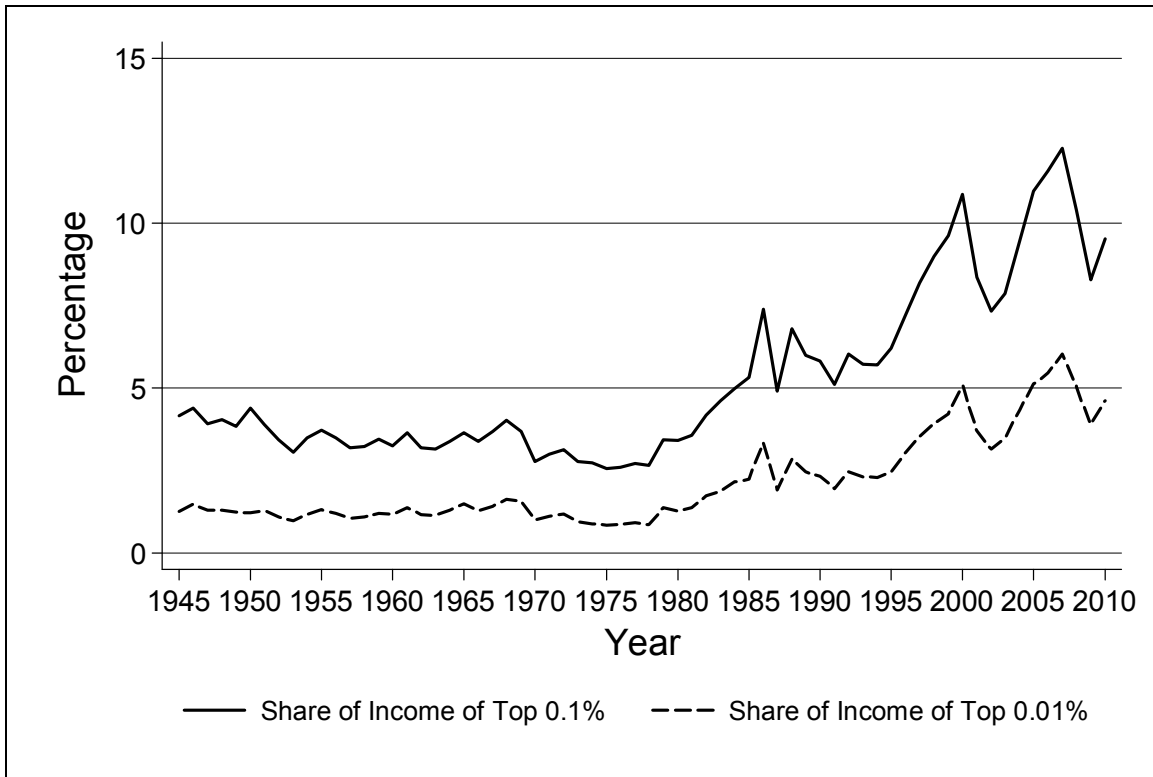
Source: Piketty and Saez.

Note: The vertical axis is the share of total income.

The observed relationship between the top tax rates and the income share of the top 0.1% and the top 0.1% are displayed in **Figure 7** (the top 0.1%) and **Figure 8** (the top 0.01%). Under both definitions of the rich, the fitted values suggest that there is a strong negative relationship between the top tax rates and the income shares accruing to families at the top of the income distribution. These results suggest that as the top tax rates are reduced, the share of income accruing to the top of the income distribution increases—that is, income disparities increase. The regression analysis results reported in **Table A-2** show that these relationships are statistically significant. Similar results by other researchers have been obtained for other countries.[34]

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[34] A. B. Atkinson and Andrew Leigh, "Top Income in New Zealand 1921-2005: Understanding the Effects of Marginal Tax Rates, Migration Threat, and the Macroeconomy," *Review of Income and Wealth*, vol. 54, no. 2 (June 2008), pp. 149-165; and Thomas Piketty, Emmanuel Saez, and Stefanie Stantcheva, *Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities*, National Bureau of Economic Research, Working Paper 17616, November 2011.

Figure 7. Share of Total Income of Top 0.1% and the Top Tax Rates, 1945-2010

Source: CRS analysis of Piketty and Saez data.

Note: The vertical axis is the share of total income.

Figure 8. Share of Total Income of Top 0.01% and the Top Tax Rates, 1945-2010

Source: CRS analysis of Piketty and Saez data.

Note: The vertical axis is the share of total income.

Research has shown that changes in capital gains and dividends were the largest contributor to the increase in income inequality since the mid-1990s.[35] Capital gains and dividends have become a larger share of total income over the past decade and a half while earnings have become a smaller share.[36] This suggests that labor's share of income could also be related to the top tax rates.[37] **Figure 9** displays this relationship. The fitted values show that the labor share of income is higher with higher top marginal tax rates and higher top capital gains tax rates. This relationship is statistically significant (see **Table A-2**).

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[35] CRS Report R42131, *Changes in the Distribution of Income Among Tax Filers Between 1996 and 2006: The Role of Labor Income, Capital Income, and Tax Policy*, by Thomas L. Hungerford.

[36] Ibid.

[37] National income is split into the share going to labor (wages) and the share going to capital (capital income).

Figure 9. Labor Share of Income and the Top Tax Rates, 1945-2010
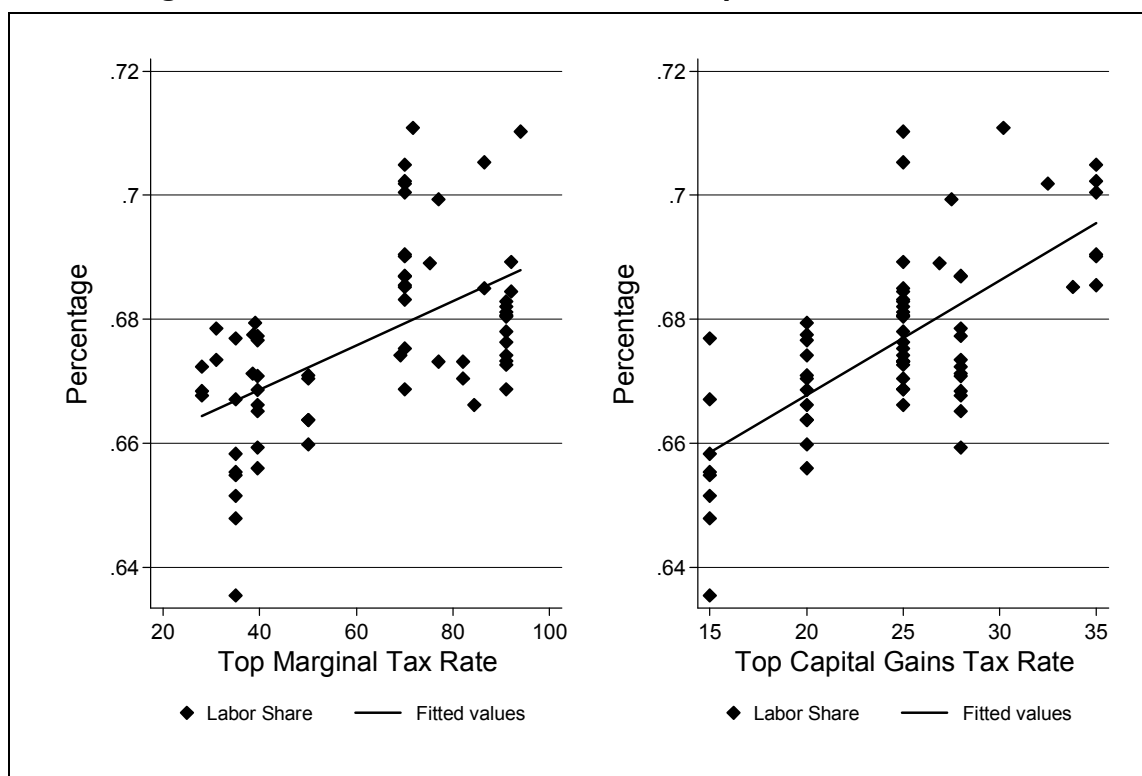
Note: The vertical axis is the share of national income accruing to labor.

Tax policy affects after-tax income. Since the U.S. individual income tax is a progressive tax system, after-tax incomes tend to be more equally distributed than before-tax income.[38] Changes in tax policy would change the distribution of after-tax income. Research has demonstrated that tax policy has a less equalizing effect now than it did in the mid-1990s and in 1979.[39]

The results suggest that pre-tax incomes tend to be more equally distributed and labor's share of income larger when the top tax rates are higher. Two related explanations have been offered that are consistent with these results. Jacob Hacker and Paul Pierson argue that some public policies benefit the few high-income families rather than middle- and low-income families.[40] In a related explanation, Thomas Piketty, Emmanuel Saez, and Stefanie Stantcheva argue that high top tax rates were part of the institutional structure that restrained top income by reducing gains from bargaining or rent extraction by CEOs and managers.[41] For example, a CEO has less incentive to

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[38] CBO, *Trends in the Distribution of Household Income Between 1979 and 2007*, October 2011.

[39] CBO, *Trends in the Distribution of Household Income Between 1979 and 2007*, October 2011; and CRS Report R42131, *Changes in the Distribution of Income Among Tax Filers Between 1996 and 2006: The Role of Labor Income, Capital Income, and Tax Policy*, by Thomas L. Hungerford.

[40] Hacker and Pierson argue that "public officials have rewritten the rules of American politics and the American economy in ways that have benefited the few at the expense of the many." Jacob Hacker and Paul Pierson, *Winner-Take-All Politics* (New York: Simon and Schuster, 2010).

[41] Thomas Piketty, Emmanuel Saez, and Stefanie Stantcheva, *Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities*, National Bureau of Economic Research, Working Paper 17616, November 2011.

bargain hard over additional compensation when he keeps 9 cents of every additional dollar (a 91% top tax rate) than when he keeps 65 cents of every additional dollar (a 35% top tax rate). A recent study by Jon Bakija, Adam Cole, and Bradley Heim provides additional support for this mechanism—60% of taxpayers in the top 0.1% are in occupations that provide some bargaining power over compensation (executives, managers, supervisors, and financial professions).[42]

Concluding Remarks

The top income tax rates have changed considerably since the end of World War II. Throughout the late-1940s and 1950s, the top marginal tax rate was typically above 90%; today it is 35%. Additionally, the top capital gains tax rate was 25% in the 1950s and 1960s, 35% in the 1970s; today it is 15%. The average tax rate faced by the top 0.01% of taxpayers was above 40% until the mid-1980s; today it is below 25%. Tax rates affecting taxpayers at the top of the income distribution are currently at their lowest levels since the end of the second World War.

The results of the analysis suggest that changes over the past 65 years in the top marginal tax rate and the top capital gains tax rate do not appear correlated with economic growth. The reduction in the top tax rates appears to be uncorrelated with saving, investment, and productivity growth. The top tax rates appear to have little or no relation to the size of the economic pie.

However, the top tax rate reductions appear to be associated with the increasing concentration of income at the top of the income distribution. As measured by IRS data, the share of income accruing to the top 0.1% of U.S. families increased from 4.2% in 1945 to 12.3% by 2007 before falling to 9.2% due to the 2007-2009 recession. At the same time, the average tax rate paid by the top 0.1% fell from over 50% in 1945 to about 25% in 2009. Tax policy could have a relation to how the economic pie is sliced—lower top tax rates may be associated with greater income disparities.

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[42] Jon Bakija, Adam Cole, and Bradley T. Heim, *Jobs and Income Growth of Top Earners and the Causes of Changing Income Inequality: Evidence from U.S. Tax Return Data*, Williams College, working paper, November 2010.

Appendix. Data and Supplemental Analysis

For the analysis, data was gathered from a variety of publicly available sources:

- Top marginal tax rates and top capital gains tax rates: IRS, Statistics of Income, various tables available at http://www.irs.gov/taxstats/indtaxstats/0,,id= 98123,00.html.

- Real per capita GDP, private saving, real private fixed investment, income tax revenue, real federal current expenditures, real federal transfers, disposable personal income, population: Dept. of Commerce, Bureau of Economic Analysis, National Income and Product Account tables, various tables available at http://www.bea.gov/iTable/index_nipa.cfm.

- Labor share of income: calculated from National Income and Product Account tables, various tables using method of José-Víctor Ríos-Rull and Raul Santaeulalia-Llopis, "Redistributive Shocks and Productivity Shocks," *Journal of Monetary Economics*, vol. 57, no. 8 (November 2010), pp. 931-948.

- Labor productivity: Dept. of Labor, Bureau of Labor Statistics, available at http://www.bls.gov/lpc/.

- Income shares of top 0.1% and top 0.01%: Thomas Piketty and Emmanuel Saez, "Income Inequality in the United States, 1913-1998," *Quarterly Journal of Economics*, vol. 118, no. 1 (February 2003), pp. 1-39, with updated tables available at http://elsa.berkeley.edu/~saez/.

- Potential GDP: CBO, available at http://www.cbo.gov/publication/42912.

- S&P annual stock returns, real home price index: Robert Shiller, Yale University, available at http://www.econ.yale.edu/~shiller/data.htm.

- AAA Bond yield: St. Louis Federal Reserve Bank, available at http://research.stlouisfed.org/fred2/categories/119.

- College graduates: Census Bureau, available at http://www.census.gov/hhes/ socdemo/education/data/cps/historical/index.html.

Multivariate time-series regression techniques were used to determine the statistical significance of the estimated relation between the top tax rates and the various indicators of economic growth. The standard errors were corrected allowing for heteroskedastic and autocorrelated error-term using the Newey-West procedure with 5 lags. All variables were tested for the presence of a unit root. Most variables were found to have a unit root; these variable were first differenced for the analysis (i.e., the one year change in the variable is used in the analysis). The other explanatory variables included in the analyses have been used by other researchers.

The right-hand side variables of interest are the statutory top tax rates for ordinary income and capital gains. The top marginal tax rate is denoted by MTR and the top capital gains tax rates is denoted by KTR. The top tax rate variables are entered into the regressions as the after-tax or net-of-tax shares, which are equal to 1 minus the top tax rates (1-MTR and 1-KTR). Consequently, a negative coefficient estimate indicates a positive relationship between the top tax rate and the indicator of economic growth. The regression results are reported in **Table A-1**.

The four regression equations are:

- *Saving ratio and investment ratio*. Private saving and private fixed investment are expressed as a percentage of potential GDP (the level of GDP attainable when resources are fully employed). In addition to the tax variables, other right-hand side variables in both regressions include the S&P stock return and the AAA corporate bond return. The percentage change in the house price index and the growth rate of disposable personal income are included in the saving ratio regression.[43] The investment ratio regression also includes the 1-year lagged change in investment ratio as a right-hand side variable, which represents "investment inertia."[44]

- *Productivity growth*. Labor productivity is an index of output per hour; it can be affected not only by taxes but also by the quantity and quality of the labor force. The indicators of the quantity and quality of the labor force include the change in the proportion of the population in their prime-age working years (25 to 64 years), the change in the proportion of the population with at least a 4-year college degree, and the change in federal transfer payments (as a percentage of potential GDP) to capture work disincentive effects of government programs.

- *Real per capita GDP growth*. In addition to the tax rate variables, right-hand side variables include the population growth rate, the change in the proportion of the population with at least a 4-year college degree, and the change in federal current expenditures as a percentage of potential GDP.[45]

The results reported in **Table A-1** suggest that neither the top marginal tax rate nor the top capital gains tax rate are strongly correlated with saving, investment, labor productivity, and GDP growth controlling for other covariates.

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[43] See Michael L. Walden, "Will Households Change Their Saving Behavior After the "Great Recession"? The Role of Human Capital," *Journal of Consumer Policy*, vol. 35 (2012), pp. 237-254.

[44] Robert J. Gordon and John M. Veitch, "Fixed Investment in the American Business Cycle, 1919-83," in *The American Business Cycle: Continuity and Change*, ed. Robert J. Gordon (Chicago: University of Chicago Press, 1986), pp. 267-357.

[45] Young Lee and Roger H. Gordon, "Tax Structure and Economic Growth," *Journal of Public Economics*, vol. 89 (June 2005), pp. 1027-1083.

Table A-1. Regression Results: Economic Growth

Standard Errors in Parentheses

	Change in Private Saving Ratio	Change in Private Fixed Investment Ratio	Change in Labor Productivity Growth Rate	Real Per Capita GDP Growth Rate
Constant	-0.0025	-0.0002	-0.0044	0.0219
Δ(1-MTR)	0.0442	-0.0079	-0.0139	-0.0992
	(0.0366)	(0.0280)	(0.0633)	(0.1026)
Δ(1-KTR)	0.0277	0.0334	0.1119	-0.0369
	(0.0341)	(0.0241)	(0.0697)	(0.0661)
Log of Disposable Personal Income	0.0325			
	(0.0759)			
ΔAAA Bond Rate	0.0357	-0.0053		
	(0.0603)	(0.0968)		
S&P Stock Return	0.0035	0.0033		
	(0.0097)	(0.0058)		
Percent Change in Real Home Price Index	-0.0485			
	(0.0295)			
1-year lag of Change in Private Fixed Investment Ratio		0.2652***		
		(0.0979)		
ΔCollege Graduates as Percent of Population			0.4952	-0.2650
			(0.8292)	(0.7916)
ΔReal Federal Transfers Ratio			1.6150***	
			(0.2767)	
ΔPopulation Growth Rate				-5.9978
				(3.6830)
ΔReal Federal Current Expenditures Ratio				-0.6445
				(0.5753)
F-statistic	1.02	2.47	9.12	1.14

Source: CRS analysis.

Note: Δ - indicates the 1-year change in the variable; *** statistically significant at 1% level.

Time-series regression techniques were also used to determine the statistical significance of the correlation between the top tax rates and the measures of income shares. The income shares of the top 0.1% and top 0.01% were converted to logarithms. In addition, following the specifications of

other researchers, the 1-year lagged real GDP growth rate was included as an explanatory variable.[46] The results are reported in **Table A-2**.

Table A-2. Regression Results: Income Inequality

Standard Errors in Parentheses

	Change in Log Top 0.1% Share	Change in Log Top 0.01% Share	Change in Labor Share
Constant	0.0068	0.0073	-0.0055
Δ(1-MTR)	0.6241*	0.4756*	-0.0168*
	(0.3601)	(0.2483)	(0.0084)
Δ(1-KTR)	3.7512***	2.5991***	-0.0510**
	(1.3076)	(0.9598)	(0.0198)
Lagged Real GDP Growth	0.0006	-0.0010	0.0016***
	(0.0046)	(0.0040)	(0.0001)
F-statistic	3.52	3.30	42.77

Source: CRS analysis.

Note: Δ - indicates the 1-year change in the variable; *** statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.

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[46] A. B. Atkinson and Andrew Leigh, "Top Income in New Zealand 1921-2005: Understanding the Effects of Marginal Tax Rates, Migration Threat, and the Macroeconomy," *Review of Income and Wealth*, vol. 54, no. 2 (June 2008), pp. 149-165; and Thomas Piketty, Emmanuel Saez, and Stefanie Stantcheva, *Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities*, National Bureau of Economic Research, Working Paper 17616, November 2011.