



Tax Rates and Economic Growth

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Summary

This report summarizes the evidence on the relationship between tax rates and economic growth, referring in a number of cases to other CRS reports providing more substance and detail. Potentially negative effects of tax rates on economic growth have been an issue in the debates about whether to increase taxes to reduce the deficit and whether to reform taxes by broadening the base to lowering tax rates.

Initially, it is important to make a distinction between the effects of policies aimed at short-term stimulation of an underemployed economy and long-run growth. In the short run, both spending increases and tax cuts are projected to increase employment and output in an underemployed economy. These effects operate through the demand side of the economy. In general, the largest effects are from direct government spending and transfers to lower-income individuals, whereas the smallest effects are from cutting taxes of high-income individuals or businesses.

Long-run growth is a supply-side phenomenon. In the long run, the availability of jobs is not an issue as an economy naturally creates jobs. Output can grow through increases in labor participation and hours, increases in capital, and changes such as education and technological advances that enhance the productivity of these inputs.

Historical data on labor participation rates and average hours worked compared to tax rates indicate little relationship with either top marginal rates or average marginal rates on labor income. Relationships between tax rates and savings appear positively correlated (that is, lower savings are consistent with lower, not higher, tax rates), although this relationship may not be causal. Similarly, during historical periods, slower growth periods have generally been associated with lower, not higher, tax rates.

A review of statistical evidence suggests that both labor supply and savings and investment are relatively insensitive to tax rates. Small effects arise in part because of offsetting income and substitution effects (which make the direction of effects uncertain) and in part because each of these individual responses appears small. Institutional constraints may also have an effect. Offsetting income and substitution effects also affect savings. Capital gains taxes are often singled out as determinants of growth, but their effects on the cost of capital are quite small. International capital flows also appear to have a small effect. Most expenditures that affect the productivity of labor and capital inputs (research and development, education, or infrastructure) are already tax favored or provided by the government. Small business taxes are also sometimes emphasized as important to growth, but the evidence suggests a modest and uncertain effect on entrepreneurship.

Claims that the cost of tax reductions are significantly reduced by feedback effects do not appear to be justified by the evidence, where feedback effects are in the range of 3% to 10% and can, in some cases, be negative. Because of the estimated realizations response, capital gains tax cuts have in the past been estimated to have a large revenue offset (about 60%), but more recent empirical estimates suggest one of about 20%. In general, for stand-alone rate reductions the additions to the deficit would cause tax cuts to have a larger cost both because of debt service and because of crowding out of investment, which would swamp most behavioral effects.

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This report summarizes the evidence on the relationship between tax rates and economic growth, referring in a number of cases to more-detailed CRS reports. Potentially negative effects of tax rates on economic growth have been an issue in the debate about whether to increase taxes to address the budget deficit and whether to broaden the base and lower the rates with tax reform. After first distinguishing between short-run counter-cyclical considerations and long-run growth effects, the following section provides some historical data on tax rates and measures of factor supply and growth. This report then reviews the empirical evidence on the major contributors to growth. The final section concludes with a review of dynamic scoring issues.

Short-Run Counter-Cyclical Effects Versus Long-Run Growth

Initially, it is important to make a distinction between the effects of policies aimed at short-term stimulation of an underemployed economy and long-run growth. In the short run, both spending increases and tax cuts are projected to increase employment and output in an underemployed economy, such as the United States today.¹ These effects operate through the demand side of the economy. In general, the largest effects are from direct spending and transfers to lower-income individuals, whereas the smallest effects are from cutting taxes of high-income individuals or businesses.²

Long-run growth is a supply-side phenomenon. In the long run, the availability of jobs is not an issue, as an economy naturally creates jobs. Output can grow through increases in labor participation and hours, increases in capital, and changes such as education and technological advances that enhance the productivity of these inputs. The remainder of the report addresses this longer-term growth issue.

Historical Comparisons of Tax Rates, Labor Supply, Savings, and Growth Rates

This section summarizes the historical insights about the effect of tax rates on economic growth and selected factors—labor force participation, savings, and growth in investment—commonly associated with economic growth. Although this type of historical analysis is unable to identify causal relationships, it can offer suggestive evidence on the magnitude of the tax effect on these factors. To summarize, the evidence presented in this section suggests that past changes in tax rates have had no large clear effect on economic growth and selected factors commonly associated with economic growth.

Because much discussion is focused on the consequences of individuals in the top marginal tax rate brackets who provide much of the saving and entrepreneurial input in the economy, the

¹ See CRS Report R41332, *Economic Recovery: Sustaining U.S. Economic Growth in a Post-Crisis Economy*, by Craig K. Elwell for further information on the current state of the U.S. economy.

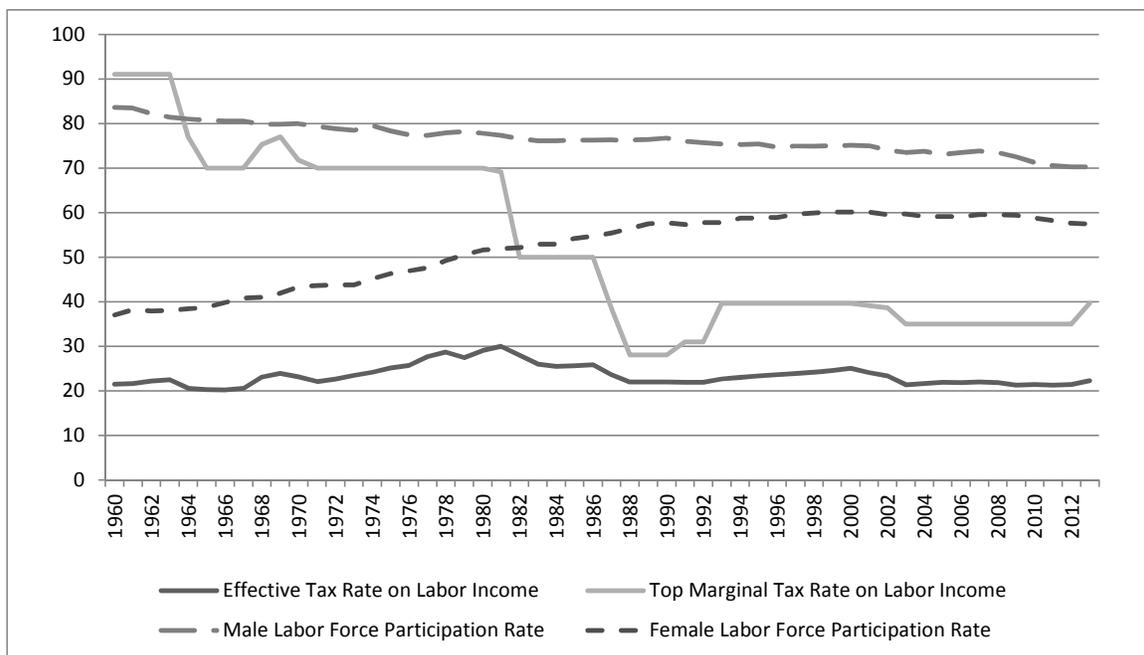
² See multipliers in Table 1 and Table 2 of CRS Report R41849, *Can Contractionary Fiscal Policy Be Expansionary?*, by Jane G. Gravelle and Thomas L. Hungerford.

following charts include examinations of the relationship between labor supply, savings, and growth rates for the top marginal rates. Similarly, there is often a particular focus on capital gains tax rates and savings, so these data presented below include relationships between these variables.

Labor Force Participation

Labor force participation rates for men and women have trended in opposite directions over the past 50 years. In particular, for men the labor force participation rate has fallen by roughly 13 percentage points (from 83.6% to 70.3%), whereas the female labor force participation rate has risen by over 20 percentage points (from 37% to 57.4%) over the same time period. Also, during the past six decades, the top marginal income tax rate on labor income has trended downward, from a high of over 90% to today's top rate of 35%. The effective marginal tax rate has fluctuated in a narrower range (between 20% and 30%), with no clear trend.³ These relationships are shown in **Figure 1**.

Figure 1. Tax Rates and Labor Force Participation
1960-2013



Source: Economic Report of the President, Urban-Brookings Tax Policy Center, and National Bureau of Economic Research.

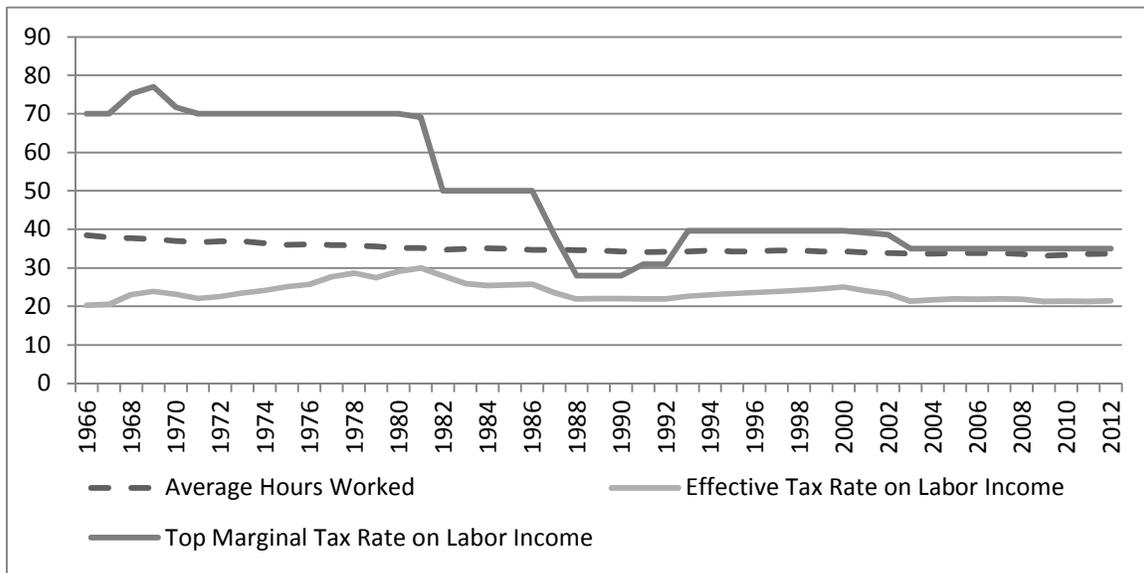
Given the divergent trends in male and female labor force participation rates, it seems unlikely that the downward trend in top marginal tax rates on labor income or the more stable effective tax rate on labor income could be a driving factor concerning labor force participation rates.

³ The effective tax rate is the rate applied to the last dollar of labor income and is thus a marginal rate.

Taxes could affect the hours (intensity) of work. During the 1965-2012 period (as mentioned above), the top marginal income tax rate on labor income has trended downward and the effective tax rate has fluctuated in a narrower range, while average hours worked has steadily declined (see **Figure 2**). Hours of work also declined in general around the world.⁴ This evidence should be used with caution, as hours have trended smoothly downward during the period, while tax changes have been more abrupt and the composition of the U.S. work force has changed markedly.

Figure 2. Tax Rates and Hours Worked

1965-2012



Source: Bureau of Labor Statistics, Urban-Brookings Tax Policy Center, and National Bureau of Economic Research.

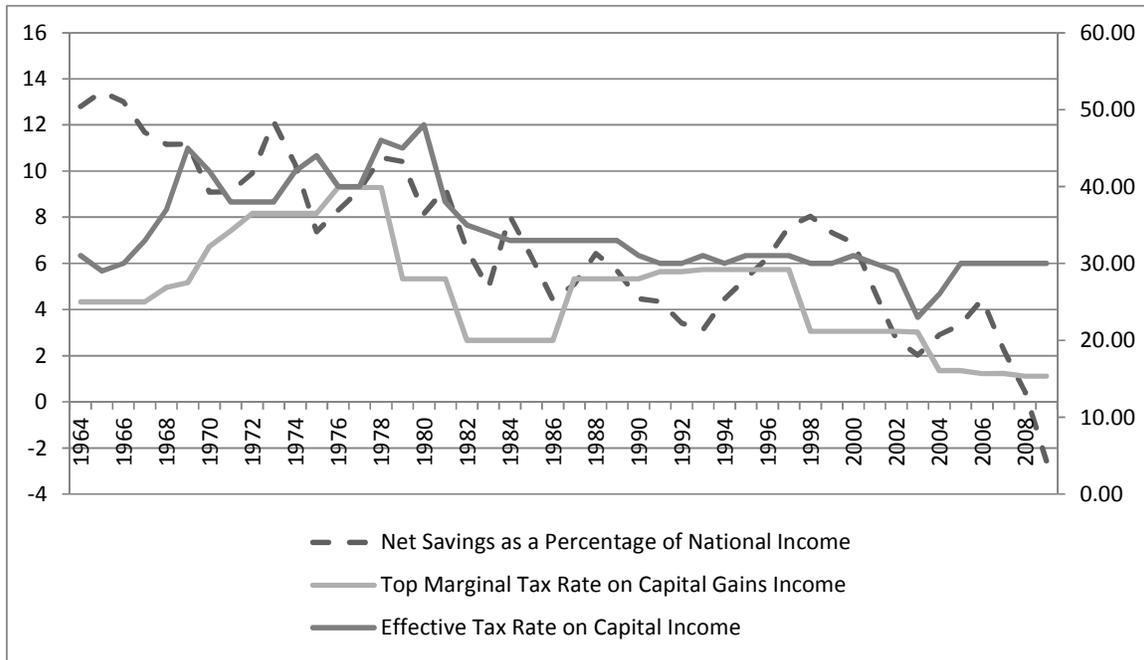
Savings and Investment and GDP Growth

U.S. savings has been generally declining over the past 60 years. Specifically, as shown in **Figure 3**, savings as a percentage of national income has declined 14 percentage points (from a high of 12.1% in 1951 to -1.9% in 2009) during the time period.

Over the same 60-year period, the top marginal income tax rate and effective tax rate of capital gains income has fluctuated. In particular, the maximum tax rate on capital gains income was 25% through most of the 1960s before rising in the 1970s, eventually reaching a high of 40% towards the end of the decade and subsequently falling to roughly 15% today. Similarly, effective tax rates on capital income fluctuated during the 1960s and 1970s before generally trending lower since the early 1980s.

⁴ See Lee Ohanian, Andrea Raffo, and Richard Rogerson, *Long Term Changes in Labor Supply and Taxes: Evidence from OECD Countries, 1956-2004*, The Federal Reserve Bank of Kansas City- Economic Research Department, December 2006 for data on declining hours in other countries.

Figure 3. Tax Rates and Net Savings
1964-2010



Source: CRS Report RS21706, *Historical Effective Marginal Tax Rates on Capital Income*; Bureau of Economic Analysis; and the Urban-Brookings Tax Policy Center.

Given the fluctuation in the tax rates on capital gains income along with the steady decline in broader income tax rates from **Figure 3**, it seems unlikely that changes in tax rates caused savings as a percentage of national income to steadily fall over this period. Note that maximum overall income tax rates in **Figure 1** applied to investment in unincorporated businesses and, during most of the period, to interest and dividends. During most of the 1970s, although the maximum tax rate on earned income was capped briefly at 60% and then at 50%, the tax rate on interest and dividends stayed at 70%.

Although not pictured in **Figure 3**, corporate tax rates also declined in this period, ranging between 50% and 60% in the 1950s, 40% to 50% in the 1960s and 1970s, 30% to 40% in the 1980s, and around 30% since that time.⁵

Over the past six decades, periods of higher average top tax rates appear on the surface to be related to periods of lower rates of growth in real gross domestic product (GDP) and real net fixed investment. As seen in **Table 1**, the full 60-year time period can be broken into three shorter time periods (1950-1970, 1971-1986, and 1987-2010) that correspond to periods of relatively high, moderate, and low taxes on labor income (and moderate, high, and low taxes on capital gains). The data show that real GDP growth and real growth in net fixed investment have each declined over the time period, suggesting that periods of lower taxes are not associated with higher rates of economic growth or increases in investment.

⁵ CRS Report RS21706, *Historical Effective Marginal Tax Rates on Capital Income*, by Jane G. Gravelle.

Table 1. Average Top Tax Rates on the Growth Rate of Real GDP and Real Net Fixed Investment, by Time Period

1950-2010

	Average Top Marginal Income Tax Rate on Labor Income	Average Top Marginal Tax Rate on Capital Gains Income	Rate of Growth in Real GDP	Rate of Growth in Real Net Fixed Investment
1950-1970	84.8%	25.6%	3.86%	0.93%
1971-1986	51.8%	30.2%	2.94%	0.32%
1987-2010	36.4%	23.0%	2.85%	0.23%

Source: BEA and the Urban-Brookings Tax Policy Center.

One concern when using a long historical view for economy-wide analysis is that the choice of time periods may lead to misleading conclusions, as the size and composition of the economy today differs in many ways from the economy in the 1950s. To examine whether this lack of an apparent clear relationship between top tax rates and the rate of economic growth is due to changes in the economy over time, a shorter time period can be used.

Table 2 decomposes the most recent time period from **Table 1** into three shorter time periods (1987-1992, 1993-2002, and 2003-2007) that correspond to periods of relatively low, high, and moderate income tax rates. Note that the average top marginal income tax rates in **Table 2** are more tightly clustered than the tax rates in **Table 1** and the time period used ends before the recent recession. Again the data do not appear to support a clear relationship between lower taxes and higher economic growth; if anything, they suggest the opposite (although we do not believe that relationship is causal, in light of other evidence presented in the following section).

Table 2. Average Top Income Tax Rate on the Growth Rate of Real GDP

1987-2007

	Average Top Marginal Income Tax Rate	Rate of Growth in Real GDP
1987-1992	33.3%	2.31%
1993-2002	39.5%	3.68%
2003-2007	35.0%	2.79%

Source: BEA and the Urban-Brookings Tax Policy Center.

Review of Evidence on Factors Affecting Growth

This section summarizes the theoretical insights and empirical evidence on the forces driving output and growth which supplement the information provided in the historical comparisons. More detailed discussion of various issues is contained in cited CRS reports.

Labor Supply⁶

An increase in wages or a decrease in taxes may increase or decrease labor supply. The increased after-tax income will, in theory, promote the consumption of more leisure which reduces labor supply, while the substitution effect (labor effort now pays more) promotes an increase in labor supply. The outcome depends on the strength of these opposing forces and is an empirical matter.

Empirical evidence has generally found small and uncertain labor supply effects from higher wages. Historical evidence over a long period of time suggests that increased wages result in less work. In 1856 the average workweek was 70 hours, which had declined to 40 hours a week by 1940. Participation has declined for men, although it has increased for women (which may be related to changes in social norms, birth control, marriage, and economies in household production). Econometric studies have found small, and often negative, labor supply responses for men. In the past, a larger and positive response has been found for women, especially married women, but more recent research has indicated small responses for women as well; women are increasingly becoming more like men in their response.⁷

Marginal tax rate reductions are more likely than average tax rate reductions to induce a positive supply response because marginal reductions have greater proportional effects on substitution than on income, although this difference becomes small at very high income levels. In general, however, tax cuts still lead to similar effects as wages because both income and substitution effects are small. A study specifically focusing on the affluent found that tax changes have no measurable effect on the labor supply of high income men, who tend to be relatively unresponsive.⁸

Savings and Investment Response⁹

The effect of taxes on savings is also, in theory, ambiguous. While substitution effects cause a preference for future consumption that increases savings, income effects mean that a given target can be achieved with smaller savings because the after-tax return is larger.

Empirical evidence suggests a negligible and possibly negative savings response. Historically the savings rate had been relatively constant until the early 1980s, after which it declined. It declined at the point that reductions in capital income taxes and an expansion of tax preferred savings vehicles (such as individual retirement accounts) were enacted. Studies that examined the savings rate over time found results that were small in magnitude, but uncertain in direction, with a central tendency suggesting no response. Moreover, even at the highest of these elasticity

⁶ The labor supply response is reviewed in CRS Report RL31949, *Issues in Dynamic Revenue Estimating*, by Jane G. Gravelle.

⁷ See 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; 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.

⁸ See 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, Russell Sage Foundation, New York, pp. 193-239.

⁹ Savings response is also reviewed in CRS Report RL31949, *Issues in Dynamic Revenue Estimating*, by Jane G. Gravelle. See also CRS Report RL33378, *Would Tax Reform Alter the Economy's Growth?*, by Marc Labonte.

estimates, the savings response would have a very modest effect on output. Completely eliminating capital income taxes would increase output by 4/10 of 1% after 10 years and 9/10 of 1% after 25 years. In the latter case the average increase is 4/100 of 1% per year, or about 1% to 2% of normal growth rate.¹⁰

Inter-temporal models, which are popular with academic researchers, sometimes predict large savings responses to certain tax changes, but these models are complex and highly stylized, making assumptions that individuals have perfect information and foresight, and are affected by various assumptions built into the model.¹¹

In a closed economy, capital accumulation depends on domestic saving. In an open economy capital can be increased by investment from abroad, although the benefits of that inflow are largely captured by foreigners. This inflow would generally not be affected by individual income taxes but could be affected by corporate rate cuts. These estimates are also small, given the imperfect mobility of capital and size of the capital stock. The effect of a 10-percentage point cut in the corporate income tax is estimated to eventually increase output by about 15/100 of 1% of output, but U.S. citizens would have a benefit of less than 2/100 of 1% of output.¹²

Sometimes the capital gains tax is singled out as being particularly important to savings.¹³ However, this tax is no different from any other tax on capital income, and its share of the tax burden is relatively small. According to estimates of tax rates, moving from a 15% to a 20% tax on capital gains would raise the tax rate on corporate equity capital from 34.7% to 35.2%, about 6/10 of a percentage point. The change would raise the overall tax rate in the economy (since corporate equity is about a third of capital) by about 2/10 of 1%. It would change the overall cost of capital before tax by about 6 basis points. These effects take into account that about half of equity income is in tax-preferred savings accounts.¹⁴

Technological Progress, Innovation, and Small Business

The same factors of production (labor and capital) can lead to larger output with technological and productivity enhancements. These factors include technological advances, organizational

¹⁰ These estimates are in Eric Engen, Jane Gravelle, and Kent A. Smetters, "Dynamic Tax Models: Why They Do the Things They Do," *National Tax Journal*, vol. 50, no. 3, September 1997, pp. 631-656.

¹¹ In addition to assuming perfect foresight and perfect information, and a variety of arbitrary assumptions (such as hours available for work), these models do not allow for marriage and, where labor is variable, barriers to entering and leaving the work force. These models in some cases cannot permit recessions, since the perfect equilibrium and information means there is no involuntary unemployment. Note also that in the short term, effects on savings from reducing taxes on capital income arise from shifting labor supply through time in response to rates of return, a response that seems unlikely given the consequences for employment of a spotty work history. For further technical discussion, in addition to CRS Report RL31949, *Issues in Dynamic Revenue Estimating*, by Jane G. Gravelle, see Eric Engen, Jane Gravelle, and Kent A. Smetters, "Dynamic Tax Models: Why They Do the Things They Do," *National Tax Journal*, vol. 50, no. 3, September 1997, pp. 631-656.

¹² CRS Report R41743, *International Corporate Tax Rate Comparisons and Policy Implications*, by Jane G. Gravelle.

¹³ For additional discussion see CRS Report R41364, *Capital Gains Tax Options: Behavioral Responses and Revenues*, by Jane G. Gravelle.

¹⁴ These estimates assume that the effective corporate tax rate is 30%, that half of capital gains are never realized and assets where gains are realized are held for five years, that the real return to equity after corporate tax is 7%, that dividends are 4% and the inflation rate is 2%. The effects would be twice as large if marginal investment is assumed to be financed only from taxable accounts. For further discussion of measuring effective tax rates see CRS Report RS21706, *Historical Effective Marginal Tax Rates on Capital Income*, by Jane G. Gravelle.

innovations (one historical example is the assembly line), education and training of the labor force, and public infrastructure. Economists are less able to determine the causes of technological advances and organizational innovation (accidental discovery, results of spending on research, etc.). Investment in research and development is, however, favorably treated by the tax code: most research costs are deducted when incurred, which is the same as a zero tax rate on the return to capital, and they are also eligible for a credit. Education is also favorably treated, and education and infrastructure are supported by public spending and loan guarantees.¹⁵

Some arguments have been made that raising the top rates may especially harm small businesses who create most of the jobs. However, as noted earlier, job creation is a short-term issue. In any case, an examination of the evidence suggests that small businesses do not create a disproportionate share of jobs, that only a small fraction of unincorporated businesses would be affected by changes in the two top rates (around 2% to 3%), and that 80% of the reduced taxes are likely to accrue to non-business income and almost 90% to either non-business income or businesses without employees. Finally, although evidence is mixed, most evidence suggests that higher tax rates encourage self-employment.¹⁶

In summation, the evidence in this section suggests that changing tax rates is likely to have small effects on supply of labor and capital and on output.

Dynamic Revenue Estimating

Claims that the cost of tax reductions is significantly reduced through feedback effects, because of increases in economic growth (and that gains from tax increases are significantly reduced) have been made. As indicated in the previous analysis, however, these effects are limited.¹⁷ Although various dynamic models can potentially produce larger results, the models with responses most consistent with empirical evidence suggest a revenue feedback effect of about 1% for the 2001-2004 Bush tax cuts.¹⁸ Feedback effects could arise from shifts of taxable income outside of changes in real output (such as increasing itemized deductions such as charitable contributions, realizing more income in fringe benefits, and similar responses). A series of studies providing direct relationships between tax rates and tax revenues designed to measure these responses initially found large effects. Subsequent critiques of the methodological problems with these studies and new estimates found much smaller results. Another problem with this approach is that it would vary depending on the type of tax change (for example, feedback effects would be less likely for a tax increase that broadened the base than from a rate increase). In any case, the evidence suggests feedback effects from 3% to 10%.¹⁹ In addition, studies that estimated significant responses to two important types of tax provisions, charitable contributions and capital gains, have recently been found to be much smaller.²⁰

¹⁵ One major cost of education is foregone earnings, which are not affected by taxes. There are also a number of education and training tax benefits such as the tuition tax credit.

¹⁶ CRS Report R41392, *Small Business and the Expiration of the 2001 Tax Rate Reductions: Economic Issues*, by Jane G. Gravelle and Sean Lowry.

¹⁷ See CRS Report RL31949, *Issues in Dynamic Revenue Estimating*, by Jane G. Gravelle for a general discussion.

¹⁸ See CRS Report RL33672, *Revenue Feedback from the 2001-2004 Tax Cuts*, by Jane G. Gravelle.

¹⁹ See CRS Report RL33672, *Revenue Feedback from the 2001-2004 Tax Cuts*, by Jane G. Gravelle.

²⁰ See CRS Report R41364, *Capital Gains Tax Options: Behavioral Responses and Revenues*, by Jane G. Gravelle and CRS Report R40518, *Charitable Contributions: The Itemized Deduction Cap and Other FY2011 Budget Options*, by (continued...)

Capital gains taxes have been scored for some time as having a significant feedback effect through changes in realizations, one that had a revenue offset of around 60%. More recent estimates, however, have suggested a feedback effect of about 20%.²¹

Claims have been made that a corporate rate cut would pay for itself through capital flows from abroad. However, using estimates from an international general equilibrium model with capital flow responses consistent with empirical evidence to simulate a 10 percentage point cut in the corporate tax rate, this factor offset corporate revenue losses by about 5%.²²

Any positive feedback effects would be much more than offset, for a stand-alone tax change, by the interest and crowding out effects of debt. For example, in the corporate rate cut, interest payments increased the effect of the change on the deficit by 25% in the budget horizon, and reduced output from crowding out reduced revenue by another 20%.

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²¹ CRS Report R41364, *Capital Gains Tax Options: Behavioral Responses and Revenues*, by Jane G. Gravelle.

²² CRS Report R41743, *International Corporate Tax Rate Comparisons and Policy Implications*, by Jane G. Gravelle.