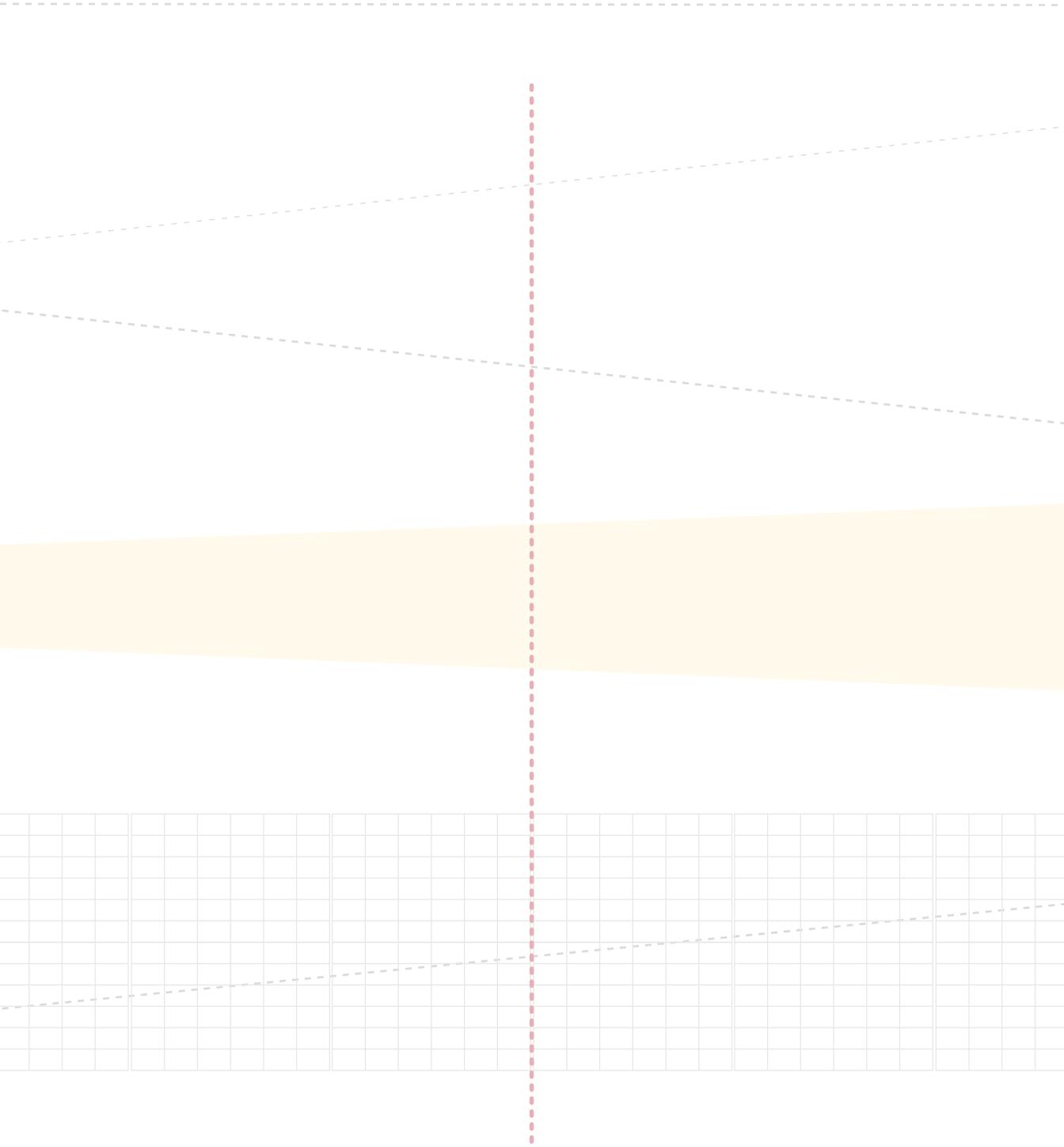# How America Supports Retirement

Challenging the Conventional Wisdom on Who Benefits

Peter J. Brady, PhD
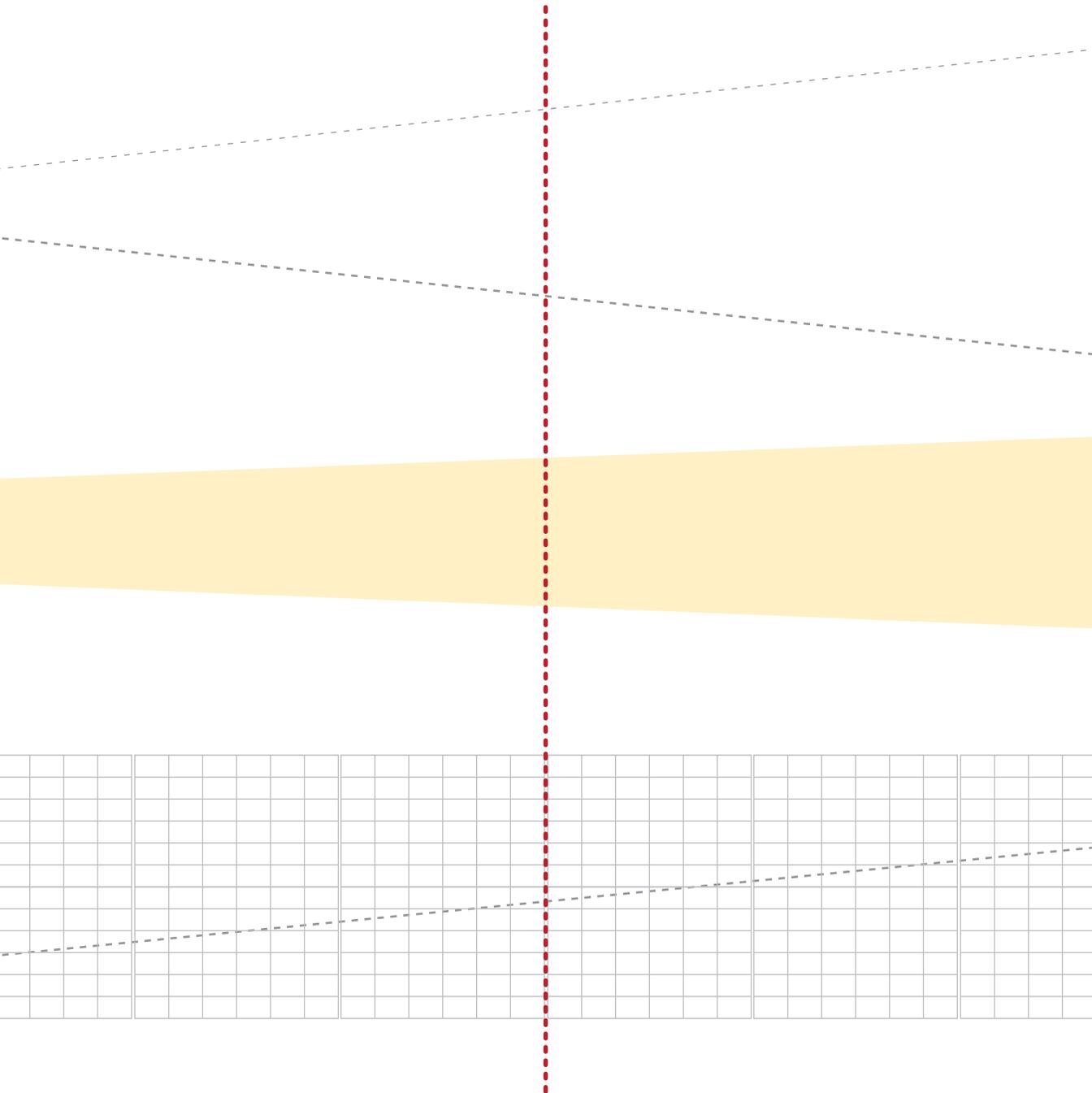
How America Supports Retirement

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Key Findings

» **When evaluating the U.S. retirement system, it is important to assess both the Social Security system and tax deferral. In combination, the benefits of the two programs are progressive.** Consistent with previous research, this study shows that the benefits of tax deferral are proportionately higher for higher-earning workers. Tax deferral, however, is only one part of the U.S. retirement system. Social Security is the primary component of the U.S. retirement system, and the benefits of the Social Security system are proportionately higher for workers with lower lifetime earnings.

» **Policy discussions of tax deferral often focus on the reduction in taxes enjoyed by workers and ignore the higher taxes these workers will pay during retirement.** Contributions to retirement plans are tax-deferred, not tax-free. For the higher-paid workers analyzed in this study, tax deferral affects when taxes are paid more than it affects the total amount of taxes paid over a lifetime. For these workers, increased taxes during retirement offset, in present value, more than half of the reduction in taxes enjoyed while working.

» **Contrary to conventional wisdom, the marginal benefits of tax deferral (the benefits of deferring an additional $1 of compensation) are higher, on average, for the lower-earning workers analyzed in this study than they are for the higher-earning workers.** Although the lower earners face lower marginal tax rates while working, their marginal benefits are higher because they experience the largest drop in marginal tax rates during retirement.

» **The benefits of tax deferral increase with lifetime earnings because of the design of the Social Security system, not because of the design of the income tax.** In this study's simulations, higher earners benefit more from tax deferral—not because they benefit more on every dollar they contribute to a retirement plan, but because they contribute more dollars.

Because Social Security benefit payments replace a smaller share of their pre-retirement income, higher earners need to save more to ensure they meet the target replacement rate of their income in retirement.

» **The incentive to save in the current tax code is not "upside down."** Normal income tax treatment discourages savings by taxing investment returns. Far from providing an "upside-down" incentive to save, tax deferral equalizes the incentive to save by effectively taxing investment returns at a zero rate for all workers.

» **The focus of policy discussions on *microprogressivity* (the effect of specific tax code provisions on progressivity) is misplaced.** If a comprehensive reform of the federal income tax is undertaken, it is important that policymakers consider how all the changes included in any proposed reform would affect the progressivity of the overall tax system. The effect of specific tax provisions on progressivity should not be a concern. Tax provisions that address legitimate policy goals can be included in a reformed income tax even if they are not, by themselves, progressive.

» **By essentially allowing workers to "income average" over a lifetime, tax deferral arguably makes the tax system more—not less—fair.** The justification for a progressive tax rate schedule rests largely on the assumption that annual income is a reasonable proxy for a taxpayer's economic circumstances, but the unevenness of earnings over an individual's lifetime makes this assumption problematic. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings (annual earnings typically increase when a worker is young, plateau later in a worker's career, then fall to zero in retirement) and results in a measure of taxable annual income that is a better indicator of lifetime circumstances.

» **The most prominent reform proposals for retirement plans would make the tax code less fair.** The current income tax is roughly neutral in its treatment of the different forms of tax deferral—tax deferral through defined benefit (DB) plans and defined contribution (DC) plans; tax deferral for employer contributions and employee contributions; and tax deferral by private-sector workers and government employees. Proposals to further limit or fundamentally change tax deferral would violate this neutrality by targeting only DC plans, or by targeting only tax-deferred contributions made by workers to DC plans and individual retirement accounts (IRAs).

» **Proposals to limit the up-front benefits of tax deferral would make the tax code more complex.** Tax deferral is fairly simple for workers to understand and for the government to administer. It allows a portion of a worker's compensation to be set aside for retirement and requires only that the compensation be included in taxable income when it is distributed to the worker. Many proposals to replace tax deferral would make the decision to contribute to a retirement plan more complex and would require the government to track information on individual taxpayers over an extended period of time.

How America Supports Retirement

Executive Summary

INTRODUCTION

This study analyzes the benefits of the U.S. retirement system as a whole, including both tax deferral and the Social Security system, and finds that the benefits of the U.S. retirement system are progressive. That is, as a percentage of their lifetime earnings, lower earners receive more in lifetime benefits from the combination of Social Security and tax deferral than higher earners receive.

The U.S. retirement system as a whole, including both tax deferral and the Social Security system, is progressive.

In retirement, Americans rely on a variety of resources. For many, Social Security benefits are the most important resource. In addition, about 80 percent of working households approaching retirement have resources earmarked for retirement that are tax-deferred—retirement benefits accrued in defined benefit (DB) plans, retirement assets in defined contribution (DC) plans or individual retirement accounts (IRAs), or both. What matters for retirement adequacy is the total amount of resources a household has, not the amount of resources provided by any single source.

Analyzing either the Social Security system or tax deferral in isolation provides an incomplete picture of the U.S. retirement system because the composition of retirement resources varies based on a household's economic circumstances. Households with lower lifetime earnings depend more on Social Security benefits; households with higher lifetime earnings depend more on tax-deferred retirement resources. These differences in the composition of retirement resources reflect the design of the system. The Social Security benefit payment formula is progressive, replacing a higher percentage of pay for workers with lower lifetime earnings. Employer-sponsored retirement plans supplement Social Security and are relied on more heavily by workers with higher lifetime earnings.

> **Analyzing either the Social Security system or tax deferral in isolation provides an incomplete picture of the U.S. retirement system.**

Few studies have evaluated the benefits of the U.S. retirement system—that is, estimated the net benefits to individuals of government retirement policies—holistically. Instead, most previous studies of the U.S. retirement system have focused on either the Social Security system or tax deferral alone. In addition, the two lines of research do not measure benefits in the same way, so the results are not easily compared. Studies that analyze who benefits from the Social Security system typically measure individuals' net benefit payments over their lifetimes—that is, the present value of Social Security benefit payments less the present value of Social Security payroll taxes. Studies that analyze who benefits from tax deferral typically estimate, for all taxpayers in a given year, the tax expenditure associated with retirement plan contributions—that is, the difference between the tax liability associated with a contribution to a taxable account and the tax liability associated with a contribution to a tax-deferred retirement plan.

Motivated, at least in part, by estimates of the tax expenditure associated with employer-sponsored retirement plans and IRAs, both comprehensive proposals to reform the federal income tax and more narrowly focused tax proposals included in the president's annual budget have targeted tax deferral. From the time of their first publication, tax expenditure estimates—those related to tax deferral and those related to other tax code provisions—have played an important role in efforts to reform the federal income tax. The focus of contemporary tax reform discussions on tax expenditure estimates has led some to question the tax treatment of employer-sponsored retirement plans and IRAs, which are estimated to be among the largest tax expenditures. In addition, several recent studies have analyzed who benefits from different tax code provisions by estimating how tax expenditures are distributed across taxpayers by income. These studies, showing that higher-income tax-payers benefit more from tax deferral, have placed additional scrutiny on the taxation of retirement plans.

This book uses the same measures used in previous studies of the benefits of tax deferral alone—tax expenditure estimates—to evaluate the benefits of the U.S. retirement system as a whole. The analysis is intended to provide context for interpreting previous research on the benefits of tax deferral and to improve understanding of the way in which tax deferral and the Social Security system combine to provide retirement resources to U.S. workers.

Scope of Analysis

The benefits of the U.S. retirement system are measured as the tax expenditure associated with the combination of tax deferral and Social Security. That is, the benefits are mea-sured as the difference in lifetime tax liability between a simulation that eliminates both tax deferral and Social Security and the baseline simulation of current policy. Lifetime tax liability includes both income taxes paid and net Social Security taxes paid.

This study also dispels two myths about tax deferral. The first myth is that higher-paid workers get more benefits from tax deferral because they face higher marginal tax rates. In fact, it is the Social Security benefit formula that causes workers with higher lifetime earnings to rely more on—and to benefit more from—tax deferral. The second myth is that

the current tax system provides an "upside-down" incentive to save. In fact, tax deferral eliminates the disincentive to save inherent in an income tax and equalizes the incentive to save across workers who face different marginal tax rates.

MYTH
Higher-paid workers get more benefits from tax deferral
because they face higher marginal tax rates.

FACT
Workers with higher lifetime earnings get more benefits from tax deferral because they save more in response to the fact that Social Security benefit payments replace a lower share of their pre-retirement earnings. As a result, higher-earning workers rely more on distributions from employer-sponsored retirement plans and IRAs to supplement Social Security.

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MYTH
The current tax system provides an "upside-down" incentive to save.

FACT
By taxing investment returns, an income tax discourages savings.
By effectively taxing investment returns at a zero rate, tax deferral
eliminates this disincentive and equalizes the incentive to save.

The study then examines the limitations of the tax deferral concept in general and of distributional analysis of tax expenditures specifically. The narrow focus of policy discussions on the effect of specific tax code provisions on progressivity is misplaced. If comprehensive income tax reform is undertaken, an important consideration would be the effect of any proposed reform on the progressivity of the overall income tax. The impact of a comprehensive reform on the distribution of benefits from specific tax code provisions would not be—and should not be—a concern.

If the income tax were reformed, the focus should instead be on the impact of specific tax code provisions on fairness, economic growth, and simplicity—and on these criteria, tax deferral scores well. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings, resulting in a measure of taxable annual income that is a better indicator of a worker's lifetime circumstances. Tax deferral reduces economic distortions by eliminating the disincentive to save that is inherent in any income tax. Tax deferral is also simple for the Internal Revenue Service (IRS) to administer and simple for workers to understand.

> Tax deferral reduces economic distortions by eliminating the
> disincentive to save that is inherent in any income tax.

In contrast, proposals to further restrict or to fundamentally change tax deferral would make the tax code less fair and more complex. Many of the proposals would make the tax code less fair because they target only DC plans, or in some cases only employee contributions to DC plans or IRAs. This would represent a substantial change from the current tax code's roughly neutral tax treatment of all forms of qualified deferred compensation. Proposals to change the up-front benefits of tax deferral would increase complexity, making it more difficult for workers to decide whether to contribute to a retirement plan and making it more difficult for the IRS to administer and enforce.

The Tax Expenditure Concept

Stanley Surrey, U.S. Department of the Treasury assistant secretary for tax policy from 1961 to 1969 who oversaw the first tax expenditure estimates done by Treasury, is widely attributed with coining the term *tax expenditure.* In 1974, Congress required that estimates of tax expenditures be published as part of the annual budget process. Both the Joint Committee on Taxation (JCT) and Treasury have since published detailed tax expenditure estimates each year.

Although Treasury does not distribute tax expenditures by taxpayer income class and the JCT typically provides such information for only about a dozen individual tax expenditures, several studies in recent years have provided more comprehensive distributional analysis of tax expenditures. Proposals to eliminate or limit tax expenditures—either as part of an effort to reform the income tax or as stand-alone proposals—have regularly cited the results of these studies.

The tax expenditure concept divides the tax code into two parts. The first part is the *normal income tax structure.* This part of the code strictly relates to raising revenue and includes provisions that define income, specify accounting rules, and set tax rate schedules. The second part includes all other tax code provisions, which are classified as *tax expenditures.* Tax expenditures include special preferences—such as exclusions, deductions, deferrals, credits, and special rates—that are not part of the normal income tax structure but instead are related to policy objectives that could otherwise be met with a direct government expenditure program.

The detailed lists of tax expenditure estimates published by the JCT and Treasury are independent and static. The estimates are independent, meaning that the tax expenditure estimate related to a specific tax code provision is the difference between tax liability under the existing tax code and tax liability if the provision were removed but the rest of the code—including all other tax expenditure provisions—were unchanged. In addition, the estimates are static, meaning that—relative to the baseline simulation of current policy—it is assumed that taxpayer behavior would not change if the provision were eliminated.

Why Tax Deferral Differs from Other Tax Expenditures

The benefits of tax deferral are more difficult to estimate than other tax expenditures. Most other tax expenditures are exclusions (such as the exclusion from income of employer-provided health insurance) or deductions (such as the deduction from income of mortgage-interest expense), which reduce taxes in the year they are taken but have no effect on tax liability in any other year. Unlike an exclusion or a deduction, tax deferral changes tax liability over the course of a worker's lifetime.

Unlike an exclusion or a deduction, which reduce taxes in the year they are taken but have no effect on tax liability in any other year, tax deferral changes tax liability over the course of a worker's lifetime.

Under current law, qualified deferred compensation is taxed differently from how it would be under the normal income tax structure at three points in time.

» First, employer contributions to all types of retirement plans and elective employee contributions to 401(k)-type plans are excluded from income subject to tax. Under the normal income tax structure, all compensation would be included in income and subject to tax, and only the after-tax amount would be contributed to a taxable investment account.

» Second, investment returns earned on contributions to a retirement plan are not included in income when received, with taxes deferred until funds are distributed. Under the normal income tax structure, all investment income earned in a taxable investment account would be included in income and subject to tax when received.

» Third, all distributions from a retirement plan are included in income and subject to tax. In contrast, under the normal income tax structure, withdrawals from a taxable investment account typically would not be included in income or subject to tax.

The official tax expenditure estimates for retirement plans are measured on a cash flow basis. Estimates are derived for each year during the budget period, with the tax expenditure estimate for the full budget period equal to the sum of the annual estimates. For example, the annual cash flow measure of the tax expenditure associated with DC plans combines three separate estimates:

» the reduction in taxes during the year caused by current contributions to DC plans;

» the reduction in taxes during the year caused by forgoing taxation on the investment income currently earned on all assets accumulated in DC plans to date; and

» the increase in taxes during the year caused by current distributions from DC plans.

Distributional Analysis of Tax Deferral

Official tax expenditure estimates typically are not used to examine who benefits from tax deferral. Although the aggregate tax expenditure could be distributed to individual taxpayers, the results of such an exercise would be difficult to interpret. This is because the cash flow measure includes the three effects of tax deferral, but the effects are not attributable to the same taxpayers. The revenue losses on contributions are attributable to one set of

taxpayers (workers). The revenue gains on distributions are attributable to another (largely retirees). And the revenue lost by deferring tax on investment income is attributable to all individuals—either working or retired—who have accrued DB plan benefits or who have accumulated assets in DC plans or IRAs.

As explained in Cronin (1999), Treasury uses a present value tax expenditure measure when it distributes the benefits of retirement plans to individual taxpayers, and most distributional analyses of tax deferral use a similar method. The present value measure estimates the benefits that workers will receive over a lifetime from a single year of retirement plan contributions.

Measuring the Benefits of the U.S. Retirement System

This study uses tax expenditure estimates to measure the benefits of the U.S. retirement system. Consistent with the method of estimating tax expenditures, the benefits of the U.S. retirement system are estimated by comparing current policy to an alternative tax and transfer system that would eliminate both tax deferral and the Social Security system but would otherwise be identical to the current system. In addition, the benefit estimates are static; that is, it is assumed that taxpayer behavior would not change in response to the change in policy.

To illustrate how the benefits vary with workers' lifetime earnings, the lifetime benefits of the U.S. retirement system are estimated for six representative workers. In the baseline simulation of current policy, retirement plan contributions are calibrated so that, to the extent allowed by law, all workers hit the same target replacement rate. The study then compares lifetime taxes paid in the baseline simulation with lifetime taxes paid in two alternative simulations. For a comparison to other research on the benefits of tax deferral, the first alternative eliminates tax deferral but maintains the Social Security system. To estimate the benefits of the retirement system as a whole, the second alternative eliminates both tax deferral and Social Security.

An advantage of calibrating retirement plan contributions is that the estimated benefits of tax deferral would be roughly the same for any type of retirement plan that provided the same amount of retirement resources. That is, although the simulations assume that tax-deferred compensation takes the form of employer and employee contributions to a 401(k) plan, the benefits of tax-deferred compensation paid through a DB plan funded solely with employer contributions would be roughly equivalent, provided DB plan benefits replaced the same percentage of pre-retirement earnings.

The estimates show that the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive. Although the benefits of tax deferral as a percentage of lifetime earnings are greater for higher earners, the benefits of the Social Security system as a percentage of lifetime earnings are greater for lower earners. Overall, lower earners benefit more from the U.S. retirement system.

Comparison with Previous Estimates of Benefits

This study estimates the *lifetime* benefits of tax deferral for each representative worker. Although it is standard in Social Security research to measure lifetime benefits, most previous research on tax deferral estimates the benefits that a worker derives from a single year of contributions. Annual measures may not reflect the benefits workers receive, on average, over their lifetimes. For example, younger workers who are not currently covered

by an employer-sponsored retirement plan but who will participate later in their working careers would be characterized as having received no benefits from tax deferral.

In addition, this study jointly estimates the benefits of tax deferral and the Social Security system. Although policymakers have long recognized the link between Social Security and the use of employer-sponsored retirement plans, few studies have measured the progressivity of the U.S. retirement system as a whole by jointly estimating the benefits of the two policies. The most notable exceptions are a series of related studies by Sylvester Schieber.[1]

This study is the first to use the same metric—a tax expenditure estimate—to measure the benefits of both tax deferral and the Social Security system. Previous studies of tax deferral have used tax expenditure estimates to measure its benefits.[2] In contrast, previous studies of the Social Security system have used net benefit payments—the present value of Social Security benefit payments less the present value of Social Security payroll taxes collected—to measure its benefits.[3] This study jointly estimates the tax expenditure associated with both tax deferral and Social Security. That is, it compares lifetime tax liability—inclusive of *both* income taxes and net Social Security taxes—under current policy to lifetime tax liability without both tax deferral and the Social Security system. In addition to net Social Security benefit payments, the tax expenditure estimate also includes the effect of the Social Security system on income tax liability.

The relative benefits of the two programs can only be compared if they are measured using the same metric. Net Social Security benefit payments would represent a tax expenditure measure only if the Social Security system were judged to have no effect on income tax liability relative to the normal income tax structure. As explained in chapter 2, however, the income tax treatment of Social Security is analogous to that of employer-sponsored retirement plans. Social Security would be judged to have no effect on income tax liability only if the current tax treatment of employer-sponsored retirement plans were considered to be part of the normal income tax structure. Of course, if this same standard were used to measure the benefits of employer-sponsored retirement plans—if it was assumed that the tax treatment of employer plans under current policy is part of the normal income tax structure—then, by definition, there would be no tax expenditure associated with these plans.

Six Representative Workers

The six representative workers used to illustrate the lifetime benefits of the U.S. retirement system were born in 1966, turned 40 in 2006, and will reach their full benefit retirement age under Social Security in 2033, at age 67. All income received by individuals during their lifetime is work-related—wage income, Social Security benefit payments, and 401(k) plan distributions. The representative individuals work continuously from when they turn 32 through age 66—or 35 years, the maximum included in the measure of average indexed monthly earnings (AIME) used to determine Social Security benefit payments.

Figure E.1 plots the workers' lifetime earnings paths. The workers' "names" are derived from their inflation-adjusted average wage income from age 32 through age 66, with all dollar amounts expressed in constant 2014 dollars (Figure E.2). Among all workers from age 35 through age 44 with positive earnings, the earnings of the representative workers at age 40 represent the 18th (Earn21k), 46th (Earn43K), 73rd (Earn69K), 85th (Earn92K), 92nd (Earn122K), and 98th (Earn234K) percentiles of the earnings distribution, respectively.

Lifetime Earnings Paths for Six Representative Workers

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

Earnings
Thousands, 2014 dollars

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. Lifetime earnings paths are anchored at age 40 with earnings equal to median earnings of full-time, full-year workers from age 35 through age 44 in 2006 with a high school degree (Earn43K), a bachelor's degree (Earn69K), and a graduate degree (Earn92K). Other earnings paths have earnings at all ages equal to half of the earnings of the Earn43K worker (Earn21K) and one-third more than the Earn92K worker (Earn122K). The final earnings path (Earn234K) is for a worker with earnings that are 20 percent higher than the Earn122K worker at age 32, with earnings increasing to be twice as high as the Earn122K worker by age 40 and then remaining twice as high thereafter.

Source: ICI simulations

Baseline Simulation of Current Policy

All of the income generated by the representative workers throughout their lifetimes is work-related. While working, individuals are compensated for their labor. A portion of their compensation is used to pay Social Security payroll taxes and a portion is contributed to a 401(k) plan and set aside for retirement. It is assumed that individuals save nothing outside of their 401(k) plans. In retirement, income comes from two sources: Social Security benefits and 401(k) plan distributions.

Throughout their lifetimes, the representative workers fund consumption with income left over after contributing to their 401(k) plans and paying taxes. While working, they are subject to both income tax and payroll tax and also contribute to a 401(k) plan. Retirees continue to be subject to income tax but no longer pay payroll taxes and no longer make 401(k) plan contributions.

Each worker's 401(k) plan contributions are calibrated so that retirement income hits a target replacement rate. The target is to have net retirement income (Social Security

benefits plus 401(k) plan distributions less income tax liability) that replaces 94 percent of average pre-retirement net earnings (wage income less income taxes, payroll taxes, and 401(k) plan contributions).

Although all workers have the same replacement rate target, they do not all contribute to the 401(k) plan at the same rate (Figure E.2). In combination with Social Security benefits, the Earn21K worker is able to hit the target 94 percent net replacement rate with 401(k) plan contributions, including both employee and employer contributions, of 6.0 percent of pay beginning at age 52. In contrast, the Earn122K worker requires combined employee and employer contributions of 10.0 percent of pay starting at age 36 to hit the same target replacement rate, and the Earn234K worker is unable to hit the target replacement rate despite contributing the maximum allowed by law and receiving an employer match of 3.0 percent of pay from age 32 through age 66.

FIGURE E.2

Selected Statistics for Six Representative Workers

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

	Representative workers[1]					
	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
	Earnings					
Average inflation-indexed annual wages, age 32 through age 66	$21,497	$42,994	$69,299	$91,818	$122,424	$234,046
Annual wages at age 40	$20,472	$40,944	$65,433	$88,648	$118,197	$236,394
Wages at age 40 equal to median earnings of full-time, full-year workers from age 35 through age 44	0.5 x high school	High school diploma	Bachelor's degree	Graduate degree	1.33 x grad degree	2.66 x grad degree
Wage income rank at age 40 among all workers from age 35 through age 44	18th	46th	73rd	85th	92nd	98th
	401(k) plan contribution behavior[2]					
Age at which 401(k) plan contributions begin	52	47	43	37	36	32
Total contribution rate (employee plus employer)	6.0%	9.0%	9.0%	9.0%	10.0%	11.5%
Account balance at age 66 (thousands)	$26.0	$111.0	$227.3	$404.6	$625.7	$1,566.6

[1] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. Lifetime earnings paths are anchored at age 40 with earnings equal to median earnings of full-time, full-year workers from age 35 through age 44 in 2006 with a high school degree (Earn43K), a bachelor's degree (Earn69K), and a graduate degree (Earn92K). Other earnings paths have earnings at all ages equal to half of the earnings of the Earn43K worker (Earn21K) and one-third more than the Earn92K worker (Earn122K). The final earnings path (Earn234K) is for a worker with earnings that are 20 percent higher than the Earn122K worker at age 32, with earnings increasing to be twice as high as the Earn122K worker by age 40 and then remaining twice as high thereafter. Earnings at age 40 represent, approximately, the 18th, 46th, 73rd, 85th, 92nd, and 98th percentile of the earnings distribution among working individuals with positive earnings from age 35 through age 44 in 2006 based on the March 2007 Current Population Survey.

[2] In this simulation, 401(k) plan contributions are assumed to be invested in bonds paying interest equal to 3.0 percent plus inflation. All investment returns are in the form of interest payments that are paid annually.

Source: ICI simulations

The reason that higher-earning workers begin saving earlier and often save a higher percentage of their pay is that Social Security benefits replace a lower share of average earnings for workers with higher lifetime earnings than for workers with lower lifetime earnings (Figure E.3). In this case, the share of average gross wages replaced by Social Security benefits ranges from a high of 67 percent for the Earn21K worker to a low of 17 percent for the Earn234K worker (blue portion of bars). In contrast, the share of earnings replaced by 401(k) plan distributions increases with lifetime earnings. The share of average gross wages replaced by 401(k) plan distributions ranges from 9 percent for the Earn21K worker to 51 percent for the Earn234K worker (orange portion of bars). This allows all but the Earn234K worker to reach the 94 percent net replacement rate target (green bars).

FIGURE E.3

Representative Workers' Retirement Savings Calibrated to Hit Replacement Rate Target

Inflation-adjusted retirement income as a percentage of inflation-adjusted average gross and net earnings
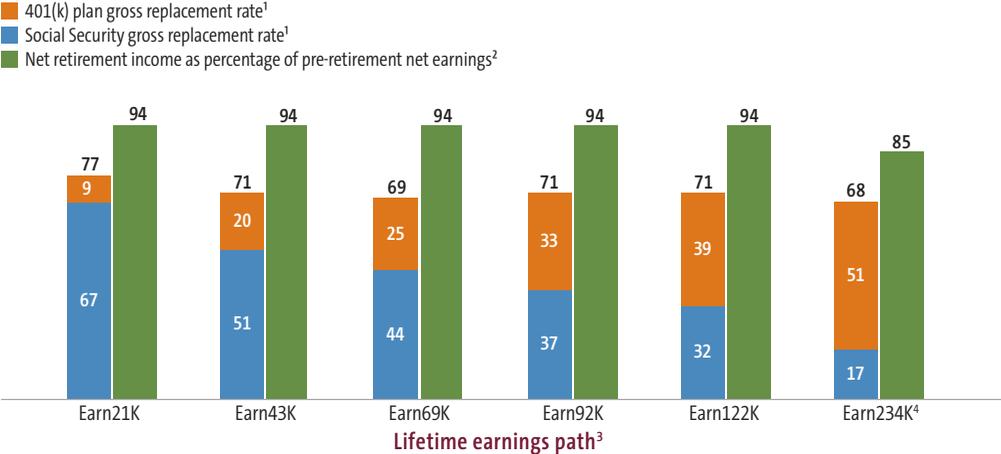
- 401(k) plan gross replacement rate[1]
- Social Security gross replacement rate[1]
- Net retirement income as percentage of pre-retirement net earnings[2]

[1] The gross replacement rate is the survival-weighted average (ages 67 and older) inflation-adjusted total retirement income divided by average (from age 32 through age 66) inflation-adjusted wage income.

[2] The net replacement rate is the survival-weighted average (ages 67 and older) inflation-adjusted net retirement income divided by average (from age 32 through age 66) inflation-adjusted net earnings.

[3] The lifetime earnings paths of the representative workers are based on the earnings paths derived in Brady 2010. See Figure E.2 for additional detail.

[4] The Earn234K worker is unable to hit the target replacement rate despite contributing the maximum amount allowed by law and receiving employer matching contributions of 3 percent.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

The Benefits of Tax Deferral

Before jointly estimating the benefits of tax deferral and the Social Security system, the benefits of tax deferral are estimated separately. To illustrate how the benefits vary with lifetime earnings, a second simulation is run, which assumes that tax deferral is disallowed and the results are compared with the baseline simulation of current policy. For each worker, the lifetime benefits of tax deferral are measured as the present value of taxes paid in the second simulation less the present value of taxes paid in the baseline simulation.

To model the change in tax treatment, it is assumed that 401(k) plans would continue to exist but would be treated as taxable individual investment accounts. That is, both (1) 401(k) plan contributions and (2) investment income generated by the 401(k) plan would be included in an individual's income and subject to tax. In retirement, however, only the portion of 401(k) plan distributions that represent unrealized gains would be included in income and subject to tax because all interest and dividend income would have already been subject to tax. No changes are made to other tax code provisions, and it is assumed that there are no changes in taxpayer behavior relative to the baseline simulation of current policy.

To assist in comparing the benefits of tax deferral across workers, lifetime benefits are expressed as a percentage of the present value of lifetime total compensation. The lifetime benefits of tax deferral also are broken down into two components: the income tax benefits accrued while working (i.e., the reduction in income taxes paid while working, which is expressed as a positive benefit) and the income tax benefits accrued during retirement (i.e., the increase in income taxes paid during retirement, which is expressed as a negative benefit).

Estimation Results

While working, the representative workers with higher lifetime earnings benefit more (in the form of lower income tax liability) from tax deferral (Figure E.4, first set of bars). As a percentage of lifetime total compensation, reductions in income taxes range from 0.5 percent for the Earn21K worker to 6.4 percent for the Earn234K worker.

While working, the representative workers with higher lifetime earnings benefit more (in the form of lower income tax liability) from tax deferral.

During retirement, workers with higher lifetime earnings accrue more negative income tax benefits (in the form of higher income tax liability) from tax deferral (Figure E.4, second set of bars). There is no effect on income taxes paid during retirement for the Earn21K worker, because the worker pays no income tax during retirement either with or without tax deferral. For other workers, tax increases (or equivalently, benefit reductions) range from 0.1 percent of lifetime total compensation for the Earn43K worker to 3.3 percent for the Earn234K worker.

During retirement, workers with higher lifetime earnings accrue more negative income tax benefits (in the form of higher income tax liability) from tax deferral.

The lifetime benefits of tax deferral (Figure E.4, third set of bars) are the sum of the benefits accrued while working (first set of bars) and the (negative) benefits accrued while retired (second set of bars). The lifetime benefits range from 0.5 percent of lifetime total compensation for the Earn21K worker to 3.0 percent for the Earn234K worker. For other workers, the lifetime benefits of tax deferral vary little, ranging from 1.3 percent to 1.6 percent of lifetime total compensation.

The lifetime benefits of tax deferral vary less across workers than either the benefits accrued while working or the (negative) benefits accrued during retirement because workers whose taxes are reduced the most while working also experience the largest increases in taxes during retirement. Higher income taxes during retirement offset, in present value, more than half of the reduction in income taxes while working for the three highest-earning workers and offset about 40 percent of the pre-retirement reduction in income tax for the fourth highest-earning worker.

FIGURE E.4

Present Value of the Benefits of Tax Deferral by Lifetime Earnings

Benefits of tax deferral expressed as the present value of the net reductions in taxes paid because of tax deferral[1] as a percentage of the present value of total compensation[2] earned from age 32 through age 66 for representative individuals with various levels of lifetime earnings

Lifetime earnings path[3]

- ■ Earn21K
- ■ Earn43K
- ■ Earn69K
- ■ Earn92K
- ■ Earn122K
- ■ Earn234K

Income tax benefits accrued while working (income tax reduced)		Income tax benefits accrued during retirement (income tax increased)		Lifetime benefits of tax deferral
Earn21K	0.5	Earn21K	0.0	Earn21K 0.5
Earn43K	1.4	Earn43K	-0.1	Earn43K 1.3
Earn69K	2.3	Earn69K	-0.9	Earn69K 1.4
Earn92K	3.3	Earn92K	-1.8	Earn92K 1.5
Earn122K	3.9	Earn122K	-2.3	Earn122K 1.6
Earn234K	6.4	Earn234K	-3.3	Earn234K 3.0

+ =
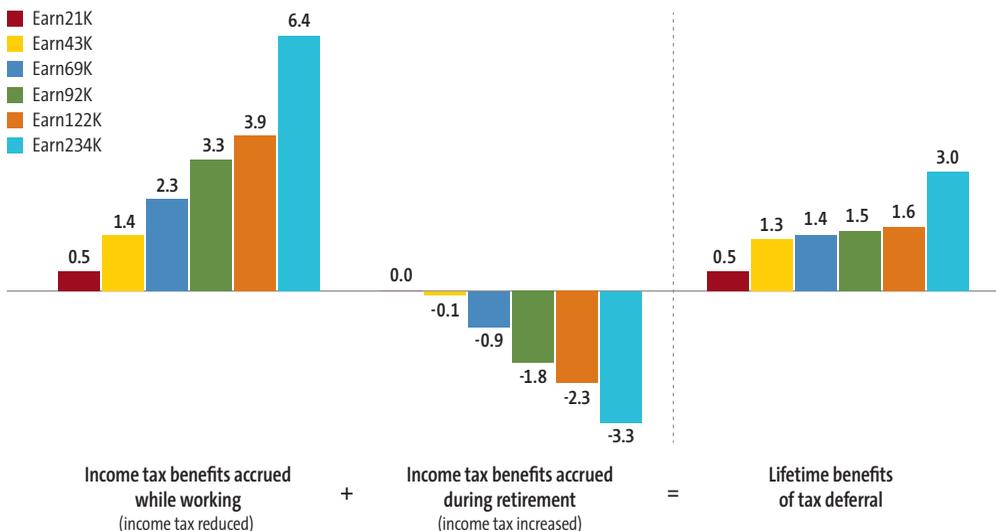
[1] In the absence of tax deferral, it is assumed that 401(k) plans would continue to exist but would be treated as taxable investment accounts. For assumed contribution behavior, see Figure E.2. Contributions to 401(k) accounts are assumed to be invested in bonds earning 3.0 percent plus inflation, with accumulated assets used to purchase an actuarially fair, inflation-indexed, immediate life annuity upon retirement.

[2] Total compensation is the sum of wage and salary earnings, the employer share of payroll taxes (both old age, survivor, and disability insurance [OASDI] and hospital insurance [HI]), and employer matching contributions to 401(k) plans.

[3] The lifetime earnings paths of the representative workers are based on the earnings paths derived in Brady 2010. See Figure E.2 for additional detail.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

The Benefits of the U.S. Retirement System

To measure the benefits of the U.S. retirement system, a third simulation is run in which both tax deferral and the Social Security system are eliminated and the results are compared with the baseline simulation of current policy. For each worker, the lifetime benefits of the U.S. retirement system are calculated by subtracting the present value of taxes paid in the baseline simulation from the present value of taxes paid in the third simulation. The difference in overall tax liability can be decomposed into the difference in income taxes *plus* net Social Security benefit payments in the baseline simulation.

In addition to assuming that 401(k) plans would be treated as taxable individual investment accounts, the third simulation assumes that the Social Security system would continue to exist but that Social Security taxes would be contributed on the worker's behalf to a taxable individual investment account. That is, while working, both (1) compensation used to contribute to the account and (2) investment income earned by the account would be included in income and subject to tax. In addition, the portion of distributions from the account that represent unrealized gains would be included in income and subject to tax. No changes are made to other tax code provisions and it is assumed that there are no changes in taxpayer behavior.

The lifetime benefits of the U.S. retirement system are presented as a percentage of lifetime total compensation and are broken down into three components. As with the analysis of tax deferral (Figure E.4), the income tax benefits accrued while working (i.e., the reduction in income taxes paid while working, which is expressed as a positive benefit) and the income tax benefits accrued during retirement (i.e., the increase in income taxes paid during retirement, which is expressed as a negative benefit) are reported. In addition, net Social Security benefit payments from the baseline simulation (i.e., the present value of Social Security benefit payments less the present value of Social Security taxes paid) are broken out as a separate category.

Estimation Results

The Social Security system provides positive net Social Security benefit payments (i.e., Social Security benefit payments received are greater, in present value, than Social Security taxes collected) to the Earn21K worker and provides negative net benefit payments (i.e., Social Security benefit payments received are less, in present value, than Social Security taxes collected) to the other five representative workers (Figure E.5, first set of bars). Net Social Security benefit payments as a percentage of lifetime total compensation decline from positive 2.3 percent for the Earn21K worker to negative 4.8 percent for the Earn122K worker, before increasing to negative 2.8 percent for the Earn234K worker.

While individuals are working, the U.S. retirement system reduces income taxes paid substantially, with reductions in taxes ranging from 3.7 percent of total compensation for the Earn21K worker to 9.3 percent for the Earn234K worker (Figure E.5, second set of bars). These benefits can be divided into the benefits of tax deferral presented in Figure E.4 (Figure E.5, the solid portion of the bars) and the benefits of the Social Security system (the screened portion of the bars). By reducing income tax liability, the Social Security system provides substantial benefits to all six representative workers.

While individuals are in retirement, the U.S. retirement system increases income taxes paid for five of the six representative workers, with increases ranging from 0.1 percent of lifetime total compensation for the Earn43K worker to 3.4 percent for the Earn234K worker (Figure E.5, third set of bars). Social Security has a modest effect on income taxes paid during retirement (the screened portion of the bars).

Evaluated as a whole, the U.S. retirement system is progressive. Combining net Social Security benefit payments and the reduction in income tax liability, lifetime benefits represent a larger share of lifetime total compensation for workers with lower lifetime earnings (Figure E.5, fourth set of bars). The present value of the lifetime benefits of the U.S. retirement system in these simulations declines from 6.0 percent of lifetime total compensation for the worker with the lowest lifetime earnings (the Earn21K worker) to 1.3 percent for

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the Earn122K worker. The lifetime benefits increase to 3.1 percent of total compensation for the Earn234K worker, but remain below the percentage for the three lowest-earning workers. Including its effect on income tax liability, Social Security provides substantial benefits for the three lowest-earning workers, but has a more modest effect on the lifetime benefits of the three highest-earning workers (the screened portion of the fourth set of bars).

Evaluated as a whole, the U.S. retirement system is progressive, with lifetime benefits representing a larger share of lifetime total compensation for workers with lower lifetime earnings.

A Closer Look at the Effect of Tax Deferral on Income Tax Liability

The effect of tax deferral on lifetime tax liability is complex. Policy discussions of tax deferral often focus on the reduction in taxes enjoyed by workers and ignore the higher taxes these workers will pay during retirement. Even analysts attempting to account for all the effects of tax deferral over a worker's lifetime by using calculations of the benefits of tax deferral that rely solely on a worker's marginal tax rates are likely to understate the impact of tax deferral during retirement. Simulating tax liability over a full lifetime shows that even workers with higher lifetime earnings would pay little income tax during retirement without tax deferral.

Tax liability is determined by applying the tax rate schedule to taxable income. The tax rate schedule for the federal income tax is progressive, with the rate of tax increasing as taxable income increases.

While individuals are working, tax deferral reduces tax liability for all workers, with the reduction largest for higher earners. Tax deferral reduces taxable income by excluding retirement plan contributions and investment returns on those contributions. Taxable income is reduced the most for workers with higher lifetime earnings who need to contribute a higher percentage of their lifetime compensation to meet the target replacement rate. These reductions in taxable income have only modest effects on tax rates.

While individuals are retired, however, tax deferral substantially increases taxes for higher earners, offsetting (in present value) a substantial portion of the reduction in taxes experienced while working. Tax deferral increases taxable income both directly—because of the inclusion of retirement plan distributions—and indirectly—because the inclusion of retirement plan contributions increases the share of Social Security benefit payments included. The impact on tax liability is further amplified because the increase in taxable income, in turn, increases tax rates substantially for all but the lowest-earning worker (who pays no income tax in retirement with or without tax deferral).

Policy discussions of tax deferral often focus on the reduction in taxes enjoyed by workers and ignore the higher taxes these workers will pay during retirement.

Dispelling Popular Misconceptions About Tax Deferral

In addition to illustrating who benefits from the U.S. retirement system, the simulation results can be used to illustrate that two widely held beliefs about tax deferral are incorrect.

Myth 1

MYTH: *Workers with higher earnings get more benefits from tax deferral because they face higher marginal tax rates.*

FACT: *The design of the Social Security system, not the design of the income tax, is the primary reason that benefits of tax deferral increase with lifetime earnings.*

A common criticism of tax deferral is that, because they face higher marginal tax rates, workers with higher lifetime earnings get more tax benefits for every dollar of compensation they defer. For example, this was the explanation used in a recent report to explain why workers with higher earnings get more benefits from tax deferral:

> The benefit from the deferral on retirement contributions is tied to a tax-payer's marginal tax rate and thus rises as household income increases. For example, someone making $40,000 and in the 10 percent tax bracket receives an up-front tax subsidy of 10 cents per dollar of deductible retirement contributions, whereas someone who makes $450,000 and is in the 35 percent bracket receives an up-front subsidy of 35 cents on the dollar. As a result, the benefits from retirement savings tax expenditures 'tilt heavily toward the top,' as a recent CBO report explains. (Marr, Frentz, and Huang 2013, page 3)

The widespread belief that higher-earning workers get more benefits from every dollar they defer has led to proposals to remedy the supposed problem by reducing the up-front benefits of tax deferral for workers with high marginal tax rates.

This belief, however, is based on a basic misunderstanding of the benefits of tax deferral. Unlike an exclusion or a deduction, the marginal benefits of tax deferral do not increase proportionately with an individual's marginal tax rate. The up-front tax savings associated with a retirement plan contribution is only one aspect of tax deferral. The marginal benefits of tax deferral are determined by many factors, including the length of deferral, the marginal tax rate at the time of the contribution, and the marginal tax rate at the time of distribution.

Unlike an exclusion or a deduction, the marginal benefits of tax deferral do not increase proportionately with an individual's marginal tax rate. The marginal benefits of tax deferral are determined by many factors.

In this study, the workers with higher lifetime earnings do benefit more from tax deferral, but it is not because they get higher marginal benefits from tax deferral. In fact, the three representative workers with the lowest earnings would benefit more, on average, from contributing an additional $1 of compensation to a 401(k) plan.

It is the design of the Social Security system—not the design of the income tax—that causes the benefits of tax deferral to increase with lifetime earnings. That is, the reason the representative workers with higher lifetime earnings benefit more from tax deferral is not that their marginal benefits are higher, but because they start contributing to their 401(k) plans earlier in their careers, and often contribute a higher percentage of their pay. And, the reason that they defer more of their compensation is that Social Security benefit payments replace a smaller share of their pre-retirement earnings.

> **It is the design of the Social Security system—not the design of the income tax—that causes the benefits of tax deferral to increase with lifetime earnings.**

The Marginal Benefits of Tax Deferral with No Change in a Worker's Marginal Tax Rates over Time

The marginal benefits of tax deferral increase with marginal tax rates if tax rates are the same at the time of contribution and the time of distribution, but the increase in benefits is not proportional to the increase in tax rates. For example, suppose that, relative to the baseline simulation of current policy, the six representative workers contributed an additional $1 to the 401(k) plan at age 50 and distributed all the assets associated with the contribution at age 71 (Figure E.6). Suppose further that each worker's marginal tax rate was unchanged over this period and was equal to the average rate they faced while working. Average (from age 32 through age 66) marginal tax rates range from 19.7 percent for the Earn21K worker to 38.4 percent for the Earn234K worker. An additional $1 of tax-deferred compensation would produce a tax benefit equal to $0.16, in present value, for the Earn21K worker. Despite having a marginal tax rate nearly twice as high, the marginal benefit for the Earn234K would be $0.22, or about one-third higher. In fact, despite having marginal tax rates that range from 30.8 percent to 38.4 percent, the four highest earners get about the same marginal benefits from tax deferral.

Assuming a worker's marginal tax rate does not change over time, the benefits of tax deferral are equivalent to facing a zero rate of tax on investment income. Recall that tax deferral has three separate effects on tax liability: it reduces taxes when contributions are made; it reduces taxes during the deferral period; and it increases taxes when distributions are taken. When marginal tax rates do not change, the taxes paid upon distribution are equal, in present value, to tax savings associated with the contribution. Because these two effects exactly offset each other, the tax benefit is the one remaining effect: the reduction in taxes paid during the deferral period. Specifically, the tax benefit of deferral is equivalent to facing a zero rate of tax on the investment income that would have been generated if compensation was first subject to income tax and the net-of-tax amount was then contributed to an investment account.

Even If Marginal Tax Rates Are Constant, Marginal Benefits of Deferral Are Not Proportional to Marginal Tax Rates

Calculated present value of marginal benefits of an additional $1 contribution to a 401(k) plan at age 50, assuming marginal tax rate in retirement is the same as when working, by lifetime earnings[1]

Earn21K (19.7%)	Earn43K (20.8%)	Earn69K (30.8%)	Earn92K (30.8%)	Earn122K (32.8%)	Earn234K (38.4%)

Lifetime earnings path[2]
(Marginal tax rate while working)

[1] Calculations assume additional contributions are invested in bonds earning 5.8 percent nominal interest and that assets are distributed at age 71.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure E.2 for additional detail. Reported marginal tax rates are average marginal tax rates from age 32 through age 66 from the baseline simulation (see Figure E.7).

Source: ICI calculations

Once this equivalence is understood, it is easier to explain why the marginal benefits of deferral do not increase proportionally with a worker's marginal tax rate. Workers with higher marginal tax rates benefit more on every dollar of *investment income* to which the zero rate applies. The amount of investment income that would be generated by an after-tax contribution, however, is lower for workers with higher marginal tax rates. The result is that the marginal benefits of tax deferral increase with marginal tax rates, but the rate of increase slows as the marginal tax rate increases.

The Marginal Benefits of Tax Deferral When Accounting for Changes in a Worker's Marginal Tax Rates over Time

The marginal benefit estimates in Figure E.6, however, understate the benefits of deferring an additional $1 of compensation because all six representative workers face lower marginal income tax rates in retirement in the baseline simulations of current policy (Figure E.7). If marginal tax rates were lower in retirement, then the income tax paid upon distribution would then be less, in present value, than the tax savings associated with the contribution. With tax rates lower in retirement, the benefits of deferral are equivalent to a worker paying a zero rate of tax on the investment income the worker would have earned in a taxable

account, plus a bonus equal to the difference, in present value, between the tax savings associated with the contribution and the taxes paid upon distribution.

Although marginal tax rates decline during retirement for all workers in the baseline simulation of current policy, the rates fall more sharply for workers with lower lifetime earnings (Figure E.7). For example, combined federal and state marginal income tax rates are 6.3 percentage points lower in retirement for the Earn234K worker (32.1 percent compared with 38.4 percent). In contrast, marginal tax rates are 15.8 percentage points lower in retirement for the Earn69K worker (15.0 percent compared with 30.8 percent).

FIGURE E.7

Representative Workers' Marginal Tax Rates Are Lower in Retirement

Marginal tax rates[1] for representative individuals under current policy baseline by lifetime earnings,[2] percent

Working
Average from age 32 through age 66

Retired
Survival-weighted average for ages 67 and older

Lifetime earnings path[2]	Working	Retired
Earn21K	19.7	0.0
Earn43K	20.8	10.0
Earn69K	30.8	15.0
Earn92K	30.8	30.0
Earn122K	32.8	30.8
Earn234K	38.4	32.1

[1] Marginal tax rates are calculated using statutory tax rates, but the federal statutory rates are adjusted for interactions with the limitation on itemized deductions, the alternative minimum tax (AMT), and the phaseout of the AMT standard deduction. For taxpayers who are not subject to the AMT and who itemize deductions, combined federal and state marginal tax rates are adjusted to account for the deductibility of state income taxes. For taxpayers who are subject to the AMT (which does not allow for the deduction of state income taxes) or who do not itemize deductions, the combined marginal rate is simply the sum of federal and state marginal tax rates. Rates plotted are the representative workers' average marginal tax rates during the period covered (age 32 through age 66; or ages 67 and older).

[2] The lifetime earnings paths of the representative workers are based on the earnings paths derived in Brady 2010. See Figure E.2 for additional detail.

Source: ICI simulations

Accounting for changes in marginal tax rates, it can be seen that the representative workers with lower lifetime earnings typically would get more benefits from deferring an additional $1 of compensation (Figure E.8). For example, the marginal benefits of a $1 retirement plan contribution at age 50 are $0.33 for the Earn21K worker and $0.34 for the Earn69K worker. In comparison, the marginal benefits of a $1 retirement plan contribution at age 50 are $0.28 for the Earn234K worker and $0.23 for the Earn122K worker.

> ## Accounting for changes in marginal tax rates, representative workers with lower lifetime earnings typically would get more benefits from deferring an additional $1 of compensation.

Contrary to conventional wisdom, the marginal benefits of tax deferral are not closely linked to a worker's marginal tax rate. Although the representative workers with lower lifetime earnings face lower marginal tax rates while working, their marginal tax rates decline more sharply when they retire. The result is that, controlling for the length of deferral, workers with lower lifetime earnings typically would benefit more from deferring an additional $1 of compensation.

FIGURE E.8

Accounting for Change in Marginal Tax Rates, Workers with Lower Lifetime Earnings Typically Get Higher Marginal Benefits

Calculated present value of marginal benefits of an additional $1 contribution to a 401(k) plan at age 50, accounting for change in marginal tax rates during retirement, by lifetime earnings[1]
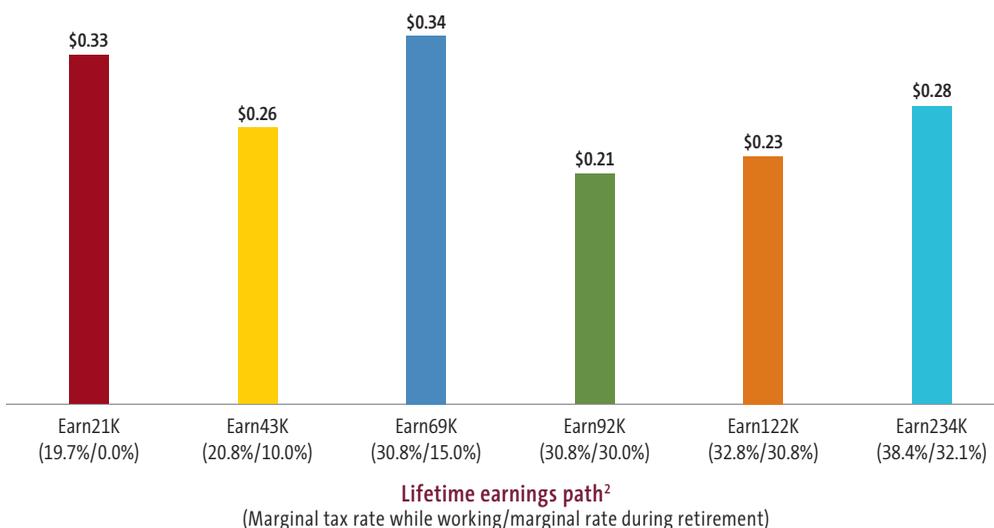
$0.33	$0.26	$0.34	$0.21	$0.23	$0.28
Earn21K (19.7%/0.0%)	Earn43K (20.8%/10.0%)	Earn69K (30.8%/15.0%)	Earn92K (30.8%/30.0%)	Earn122K (32.8%/30.8%)	Earn234K (38.4%/32.1%)

Lifetime earnings path[2]
(Marginal tax rate while working/marginal rate during retirement)

[1] Calculations assume additional contributions are invested in bonds earning 5.8 percent nominal interest and that assets are distributed at age 71.

[2] The lifetime earnings paths of the representative workers are based on the earnings paths derived in Brady 2010. See Figure E.2 for additional detail. Reported marginal tax rates are average marginal tax rates during the period covered (age 32 through age 66; or ages 67 and older) from the baseline simulation (see Figure E.7).

Source: ICI calculations

Myth 2

MYTH: *Because of tax deferral, the current income tax system provides an "upside-down" incentive to save.*

FACT: *Far from providing an "upside-down" incentive, tax deferral equalizes the incentive to save. Normal income tax treatment reduces the incentive to save by taking a share of the return earned on investments. By effectively taxing investment returns at a zero rate, tax deferral removes this disincentive.*

An accusation often leveled against tax deferral is that it provides an "upside down" incentive to save. It has been argued that the presence of tax deferral results in higher-income workers having a greater incentive to save than lower-income workers. For example, the following quote is a typical characterization of the incentive to save for lower-income workers with no federal income tax liability:

> While the current tax system ensures that they are not unfairly taxed, it also leaves them with *no incentive to save*—even though savings could potentially increase their economic security. (Valenti and Weller 2013, page 7; emphasis added)

Far from providing an "upside-down" incentive, tax deferral equalizes the incentive to save. The incentive to save is provided by the return on investments available in the capital and credit markets, not by the income tax. By taking a share of the return on investments, an income tax reduces the rate of return received by investors and discourages saving. In a taxable investment account, workers with high marginal tax rates have the lowest incentive to save. Tax deferral removes the disincentive to save inherent in an income tax and effectively taxes investment returns at a zero rate. This allows all workers, regardless of marginal tax rate, to receive the full market rate of return on their savings.

Tax deferral equalizes the incentive to save by effectively taxing investment returns at a zero rate.

The Incentive to Save

The incentive to save is the rate of return earned on investments after accounting for taxation. Because savings is defined as current income less current spending, increasing savings requires an individual to reduce current spending. The reward for reducing spending today is that spending can be increased in the future. The trade-off between current and future spending represents the incentive to save: If I reduce my spending by $1 today, how much can I increase my spending in the future? It is the after-tax rate of return earned on investments that determines the terms of this trade-off.

The normal income tax structure discourages saving and results in workers with higher marginal tax rates having less of an incentive to save. For example, consider workers with different marginal tax rates who invest in bonds paying 6.0 percent annual interest

(Figure E.9). The worker with a zero marginal tax rate pays no tax on investment returns and earns the full 6.0 percent market rate of return on forgone consumption, whereas the worker with a 25 percent marginal tax rate earns an effective 4.5 percent annual rate of return. The worker with the 25 percent marginal tax rate earns a lower return because the worker must pay income tax each year equal to 25 percent of interest income, or 1.5 percent of assets (6% × 0.25). Without an income tax, the trade-off between current and future spending would be determined by the rate of return on investments set in the markets. An income tax introduces a wedge between the market rate of return earned on investments and the after-tax rate of return received by taxpayers. And the size of this wedge increases with a worker's marginal tax rate.

The normal income tax structure discourages saving, especially for workers with higher marginal tax rates.

Tax deferral removes the disincentive to save that is inherent in an income tax, which can be illustrated by calculating the same trade-offs between current and future consumption when compensation is tax deferred (Figure E.10). Assuming marginal tax rates do not change over time, all workers face the same incentive to save with tax deferral, regardless of the marginal tax rate that they face. Expressed as an effective annual rate of return, all workers earn a 6.0 percent return on forgone consumption with tax deferral. In effect, all workers face a zero marginal tax rate on investment income with tax deferral. In this way, tax deferral removes the wedge between the rate of return paid by the market and the after-tax rate of return received by investors and equalizes the incentive to save.

All workers face the same incentive to save with tax deferral, regardless of the marginal tax rate that they face.

A Closer Look at the Effect of Social Security on Income Tax Liability

Previous studies have used net Social Security benefit payments to measure the benefits of the Social Security system. As discussed earlier, this measure ignores the preferential income tax treatment of Social Security and, as a result, is not consistent with the benefit measures used for tax deferral. In addition to measuring net Social Security benefit payments, this study also measures the reduction in income tax liability—relative to the normal income tax structure—caused by the Social Security system.

The Social Security system reduces lifetime income tax liability substantially for all six representative workers. In fact, for all but the highest-earning worker, the income tax benefits of Social Security are greater than the tax expenditure associated with tax deferral.

Social Security reduces income taxes while individuals are working, but has little to no effect on taxes while individuals are retired. While individuals are working, Social Security reduces taxable income by excluding the employer share of Social Security payroll

An Income Tax Reduces the Effective Annual Rate of Return Earned on Investments

Effective rate of return earned on forgone consumption assuming a 20-year investment and normal income tax treatment, by worker's marginal tax rate

Market rate of return
(6.0%)

6.0%	5.1%	4.5%	3.9%
0 percent	15 percent	25 percent	35 percent

Marginal tax rate

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

Tax Deferral Equalizes the Incentive to Save

Effective rate of return earned on foregone consumption assuming a 20-year investment and tax deferral, by worker's marginal tax rate

Market rate of return
(6.0%)

6.0%	6.0%	6.0%	6.0%
0 percent	15 percent	25 percent	35 percent

Marginal tax rate

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

taxes and by effectively excluding the investment income that would have been earned in a taxable investment account. The exclusion of investment income has the largest effect on taxable income: in short order, 12.4 percent of pay contributed to a taxable investment account would generate substantial investment income. In addition to reducing taxable income, the Social Security system reduces marginal tax rates for workers with lower lifetime earnings. Without Social Security, the additional taxable income would push these workers into higher statutory tax brackets.

Is Distributional Analysis of Tax Expenditures Relevant?

The motivation for the analysis in this study was that distributional analyses of tax expenditures have often been invoked in the context of tax reform, and that distributional analysis of tax deferral alone gives an incomplete picture of the benefits of the U.S. retirement system. Using the same standard by which tax deferral has been judged in previous research, this study illustrates that the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive.

Using the same standard by which tax deferral has been judged in previous research, this study illustrates that the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive.

A more fundamental question is whether this distributional analysis, or any other distributional analysis of tax expenditures, should play a large role in any future tax reform effort. The belief of this author is that they should not. Although aggregate tax expenditure estimates have some, albeit limited, analytical value, it is not clear that distributional analyses of tax expenditures have any analytical value. Allocating tax expenditures to individual taxpayers does not accurately measure the impact of a particular tax code provision on the overall progressivity of the tax code. In fact, taken to its logical extreme, the focus on microprogressivity can lead to perverse results. If a comprehensive reform of the federal income tax is undertaken, an important consideration would be the effect of the complete tax reform package on the progressivity of the overall income tax. The impact of reform on the distribution of benefits from specific tax code provisions should not be a consideration. Tax provisions that address legitimate policy goals can be included in a progressive income tax even if they are not, in themselves, progressive.

If a comprehensive reform of the federal income tax is undertaken, it would be important for policymakers to consider the effect of the complete tax reform package on the progressivity of the overall income tax. The impact of reform on the distribution of benefits from specific tax code provisions should not be a consideration.

The Limitations of the Tax Deferral Concept

Tax expenditure estimates answer a very narrow question. The estimates represent a particular measure of the tax benefits of individual tax code provisions: they measure how much tax liability would change if a specific tax code provision was eliminated, no other changes were made to the tax code, and there was no change in taxpayer behavior. Provided it is understood what the estimates represent, they provide potentially useful information to tax policy analysts.

The problem with tax expenditure estimates is not so much what they estimate, but how those estimates are interpreted. Tax expenditure estimates have analytical value only to the extent that the question they answer is of interest to the analyst. Tax expenditure estimates do not have direct policy implications. The fact that a particular tax code provision is associated with a tax expenditure estimate does not, by itself, suggest a future path for tax reform. Tax expenditure estimates also do not answer the broader policy questions that would be raised by a comprehensive tax reform effort. They are neither estimates of the revenue that would be raised if tax code provisions were eliminated, nor predictions about the impact of future tax reform efforts.

Tax Expenditures and Previous Tax Reform Efforts

Although eliminating or limiting tax expenditures has been a consistent focus of tax reform efforts, the impact of tax expenditures on the progressivity of the income tax has not typically been the overriding concern. In previous tax reform efforts, concerns about the impact of tax expenditures on the fairness of the income tax have typically centered on horizontal equity (the concept that taxpayers with similar economic circumstances should have similar tax burdens) rather than vertical equity (the concept that taxpayers with more economic resources should face higher tax burdens).

For example, the policy discussions leading up to the Tax Reform Act of 1986 (TRA '86) were more focused on horizontal equity than on progressivity. Treasury I (U.S. Department of the Treasury 1984) and Treasury II (U.S. Department of the Treasury 1985)—the two reports that served as the basis for TRA '86—proposed to reform the tax code for "fairness, growth, and simplicity." With regard to fairness, the concern was primarily about the impact of tax expenditures on the tax burden within income classes.

> Erosion of the tax base also creates inequities. Most obviously it is unfair that two households with equal income should pay different amounts of tax, simply because one receives or spends its income in ways that are tax-preferred. (U.S. Department of the Treasury 1984, vol. 1, page 5)

In fact, the reform process that led to TRA '86 explicitly ignored the impact of tax expenditures on the progressivity of the tax system. The decision was made that the proposal would be roughly distributionally neutral. Although tax reform would result in winners and losers among taxpayers within an income class, the relative burden across income classes would be roughly maintained.

How Does Tax Deferral Affect the Progressivity of the Current Tax System?

The effect of tax deferral on the progressivity of the U.S. tax system cannot be determined without first answering a seemingly simple question: Compared to what? Depending on the alternative tax policy chosen as a comparison, tax deferral could be judged to make the tax code less progressive, to make it more progressive, or to have no impact at all.

Tax expenditure estimates have a very specific alternative policy to which they compare current policy: a tax code with the relevant tax provision eliminated but that is otherwise unchanged. This type of change to the tax code is uncommon, however. Most tax legislation, particularly major reforms, includes changes to multiple tax code provisions.

The most appropriate comparison for determining the effect of tax deferral on progressivity would be to ask what the tax code would look like if tax deferral had been eliminated by TRA '86. Although the tax code is constantly changing, the 1986 tax reform was the last comprehensive reform of federal income tax.

Comparing the current tax code to a hypothetical 1986 tax reform that eliminated tax deferral, tax deferral would be judged to have no impact on the progressivity of the current U.S. tax code. As already noted, the tax reform process that resulted in TRA '86 aimed to produce a new tax system that, compared to the prior law, was distributionally neutral. Given the goals set early on in the reform process, any tax reform—whether it retained tax deferral or eliminated tax deferral—would have produced a tax code with the same level of progressivity. That is, if tax deferral had been eliminated, then other changes would have been made—such as reducing statutory tax rates—to ensure that TRA '86 had no net effect on the progressivity of the tax code.

The Misplaced Focus on Microprogressivity

Focusing on the distribution of benefits from a single tax code provision can lead tax policy discussions astray. Although there are rationales for having a tax system that is progressive, there is no rationale for ensuring that every provision included in the tax code is progressive—a concept that, for ease of exposition, will be referred to as *microprogressivity*.

Not only is microprogressivity not a necessary condition for the tax code to be progressive, focusing on achieving it may lead to perverse results. Taken to its logical extreme, the quest for microprogressivity could lead to the adoption of policies that would make the tax and transfer system, as a whole, less progressive. For example, for high-income taxpayers, the tax expenditure estimates associated with any exclusion or deduction could be reduced substantially by cutting the top statutory tax rates.

Tax Expenditures and Comprehensive Tax Reform

If a new comprehensive reform of the federal income tax is to be undertaken, the reform should be judged not on its impact on the progressivity of individual tax provisions but, rather, on its impact on the overall progressivity of a tax system. Before focusing on changing specific tax code provisions, it would be appropriate to set goals for a comprehensively reformed tax code, such as targets for revenue and progressivity. Regardless of the target level of progressivity, tax provisions that address legitimate policy goals can be included in the income tax even if they are not, in themselves, progressive. Then other aspects of the tax code—such as statutory tax rates—can be adjusted to achieve the desired level of progressivity in the system as a whole.

If such a comprehensive reform process is undertaken, a decision to eliminate or restrict tax deferral would be less about its impact on the progressivity of the federal income tax and more about its impact on horizontal equity, economic growth, and simplicity. For any given target level of progressivity, there would be multiple combinations of policy changes that would hit the target. These policy combinations would not be judged by their impact on progressivity—as all would hit the target—but by their other effects. Tax deferral should only be eliminated or restricted if it was determined that it was a better way to hit the target level of progressivity than alternative policies, such as adjusting statutory tax rates.

Evaluating Tax Deferral by Criteria of Fairness, Economic Growth, and Simplicity

Tax-deferred compensation differs in many respects from other tax expenditures, and not simply because it defers, rather than eliminates, tax liability. *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977) notes perhaps a more fundamental difference between tax deferral and other tax expenditures: the impact that tax deferral has on economic growth and fairness.

> Also, tax deferral on income from certain investments for retirement purposes is an example of how current law attempts to offset the adverse effects on savings of using an accretion income base. Significantly, this last example is also viewed as desirable for reasons of equity. (U.S. Department of the Treasury 1977, page 23)

Despite the claims of its critics, tax deferral increases the fairness of the income tax, enhances economic growth, and is relatively simple to understand and administer. In contrast, recent proposals to change the tax deferral rules would reduce horizontal equity and make the tax code considerably more complex.

Tax deferral increases the fairness of the income tax, enhances economic growth, and is relatively simple to understand and administer.

Fairness

Allowing workers to defer a portion of their compensation until retirement arguably increases the fairness of the income tax. In contrast, many of the proposals to change tax deferral would make the tax code less fair by treating some forms of deferred compensation (DC plans, or in some cases employee contributions to DC plans) differently from other forms of deferred compensation (DB plans, or in some cases employer contributions to either DB plans or DC plans).

A progressive tax rate schedule can be justified only to the extent that annual income is a good measure of a household's economic resources. To the extent that annual income is not a good proxy for a household's economic resources, then a progressive tax rate schedule can lead

to horizontal inequity—different tax burdens for individuals in similar economic situations. This is a particular concern if an individual's annual income varies considerably over time.

It has long been recognized that the tax burden can be affected by the timing of the receipt of income, and certain adjustments to annual income have been allowed to help counteract the impact of timing. For example, before TRA '86, taxpayers could elect to take advantage of "income averaging." That is, taxpayers could elect to have a lower marginal tax rate applied to income that was in excess of 140 percent of their average income over the previous three years.

The impact of the timing of income was highlighted in *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977), which emphasizes that annual income is an imperfect measure of economic resources and that the decision to measure income over a single year was based on practical considerations rather than on principle. To properly compare the relative economic circumstances of two taxpayers requires measuring income over a much longer period of time—preferably a whole lifetime.

By essentially allowing workers to "income-average" over a lifetime, tax deferral arguably makes the tax system more—not less—fair. Earnings typically vary considerably over an individual's lifetime. On average, inflation-indexed wages increase early in a working career, with wage growth slowing and then plateauing during peak earning years. As a worker transitions into retirement, wages are either reduced substantially or eliminated, after which the individual may have many years at the end of life with no earnings at all. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings on taxable annual income, resulting in a measure of taxable annual income that is a better indicator of lifetime circumstances.

> **By essentially allowing workers to "income-average" over a lifetime, tax deferral arguably makes the tax system more—not less—fair.**

Proposals to Change Tax Deferral Rules Would Reduce Horizontal Equity

Qualified tax-deferred compensation takes many forms. Compensation can be deferred through an employer-sponsored retirement plan or an IRA. Employers can sponsor a DB plan or a DC plan. Both private-sector and government workers can participate in a retirement plan. Compensation can be deferred through either employer contributions or elective employee contributions.

Regardless of the form that qualified tax-deferred compensation takes, it provides the same benefit—workers defer tax on current compensation until they receive a distribution from the retirement plan—and, fittingly, the current income tax maintains a rough neutrality in its treatment of the many different forms of qualified tax-deferred compensation. Recent proposals to change tax deferral would end this neutrality by targeting only DC plans, with some proposals targeting only elective employee contributions to DC plans and IRAs.

These proposals would arbitrarily punish workers based on how their employer structures their compensation package. In particular, the proposals would hit workers in the private-sector (where DB plans are increasingly rare) harder than government workers

(where DB plans are still the norm). Further, proposals targeted at tax-deferred employee contributions would have more of an impact on workers whose employers contribute little to their retirement plan than it would have on workers with generous employer contributions and more impact on workers whose plans do not allow Roth contributions than on workers who have a Roth contribution option in their plan.

Economic Growth

A primary motivation for eliminating tax expenditures is the belief that an income tax with a broad base and low rates would encourage more economic growth. An income tax can reduce economic growth by distorting economic behavior. In general, tax expenditures are viewed as increasing economic distortions because they narrow the tax base and necessitate higher marginal tax rates. Higher marginal tax rates reduce economic activity by discouraging work and investment. If the revenue raised by eliminating tax expenditures were used to reduce marginal tax rates, then economic efficiency would be increased because the disincentive to work and the disincentive to save, which are inherent in any income tax, would be reduced. In addition, a narrow tax base leads to an inefficient allocation of resources by favoring certain forms of economic activity over others. Eliminating tax expenditures would lead to a more efficient allocation of economic resources, as resources move from the formerly subsidized activity to more productive uses.

Tax deferral is different from other tax expenditures, however, in that it actually reduces the economic distortions caused by the income tax. By taxing investment returns, an income tax reduces the incentive to save. Tax deferral effectively reduces the tax on investment returns and increases the incentive to save.

Simplicity

Although complex rules govern who can defer tax on compensation, it is relatively simple for the IRS to administer tax deferral. At its root, tax deferral simply involves setting aside a portion of compensation for retirement and not taxing that compensation until a worker takes a distribution. Provided plan rules are followed, the IRS does not need to track taxpayer contributions and distributions over time. The IRS need only ensure that contributions are not made in excess of annual limits on contributions, that benefits paid out are not in excess of annual limits on benefits, and that all distributions are subject to tax in the year in which they are distributed.

From a worker's point of view, it is fairly easy under current law to decide whether or not to contribute to a retirement plan. Workers not subject to an early withdrawal penalty cannot be made worse off by contributing and need only keep the contribution in the plan for one year to be better off. Although the contribution decision is slightly more complicated for those subject to an early withdrawal penalty, most would expect to benefit from deferral provided that the probability of withdrawal in the first few years was low.

A Refundable Credit or Government Matching Contributions Would Encourage Churning

If adopted, proposals to change the up-front benefit of tax deferral to a flat-rate refundable tax credit[4] or flat-rate government matching contributions[5] would encourage workers with low marginal tax rates to churn contributions to retirement plans—that is, contribute to a retirement plan and then withdraw the contribution shortly thereafter. With a flat-rate

refundable credit or matching government contributions, workers with low marginal tax rates would have an incentive to churn contributions because the benefit of the contribution would exceed the tax on the distribution.

Tax deferral does not provide an incentive to churn contributions. Even for workers older than 59½ who are not subject to early withdrawal penalties, contributing to a retirement plan and immediately withdrawing the contribution provides no benefits. This is because the benefit of the contribution would exactly equal the tax on the distribution. Tax deferral only provides benefits for those who defer compensation for a minimum of one year, with the benefits increasing with each additional year that taxes are deferred.

These proposals would make the tax system more complex because a new mechanism would be needed to control churning or the proposals would be prohibitively expensive in terms of lost tax revenue. Current law penalties for early withdrawal would not be sufficient to discourage churning for those younger than 59½, and would not apply at all to those aged 59½ or older. It would be difficult to design simple penalties that would discourage churning among low-income workers, but that were not considered overly punitive for other workers. Instead, complex penalties or direct restrictions on access to retirement plan assets would be required. In either case, the IRS would need to expend additional resources to track individuals' contributions and distributions over an extended period of time.

Proposals to Limit the Up-Front Benefit Would Complicate the Contribution Decision

In contrast to tax deferral, proposals to limit the up-front benefit of retirement plan contributions—by either imposing an up-front cap[6] or by replacing tax deferral with a refundable credit[7] or government matching contributions[8]—would make the decision to contribute to a retirement plan more complicated. These proposals would reduce the up-front tax benefits of retirement plan contributions for workers with higher marginal tax rates, but would continue to tax distributions from the plans. The limit on up-front benefits acts as a contribution penalty that can only be offset by deferring further taxation of the contribution for an extended period of time. Unlike current law, workers not subject to an early withdrawal penalty could be made worse off by contributing to a retirement plan. Workers subject to an early withdrawal penalty would need even greater certainty that they would not need to access their account unexpectedly before they decided to contribute to a retirement account.

Summary

Tax expenditure estimates of the benefits of tax deferral have been widely used to motivate proposals to change the tax treatment of employer-sponsored retirement plans and IRAs.

The estimates in this study illustrate that—using the same standard used to judge the progressivity of tax deferral in isolation—the U.S. retirement system as a whole, inclusive of both tax deferral and the Social Security system, is, in fact, progressive. These estimates are intended to provide context for interpreting the previous research on the benefits of tax deferral and to improve understanding of the way in which tax deferral and the Social Security system combine to provide retirement resources to U.S. workers.

The analysis also refutes two often repeated and widely accepted myths. First, rather than differences in marginal tax rates, the primary reason that workers with high lifetime earnings benefit more from tax deferral is that Social Security benefits replace less of their pre-retirement earnings and they rely more on employer-sponsored retirement plans and IRAs. Second, far from providing an "upside-down" incentive, tax deferral equalizes the incentive to save by eliminating the disincentive to save inherent in an income tax.

If a comprehensive reform of the income tax is undertaken, it would be important to consider the effect of the complete tax reform package on the progressivity of the overall income tax. A narrow focus on microprogressivity (that is, the progressivity of specific tax code provisions) is misplaced. Tax provisions that address legitimate policy goals can be included in a progressive income tax even if the provisions are not, by themselves, progressive.

Specific tax provisions should be judged less narrowly and assessed by their impact on fairness, economic growth, and simplicity—and on these criteria tax deferral scores well. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings, resulting in a measure of taxable annual income that is a better indicator of a worker's lifetime circumstances and resulting in a fairer tax system. Tax deferral reduces the economic distortions by eliminating the disincentive to save that is inherent in any income tax. Tax deferral is also simple for the IRS to administer and simple for workers to understand.

Introduction
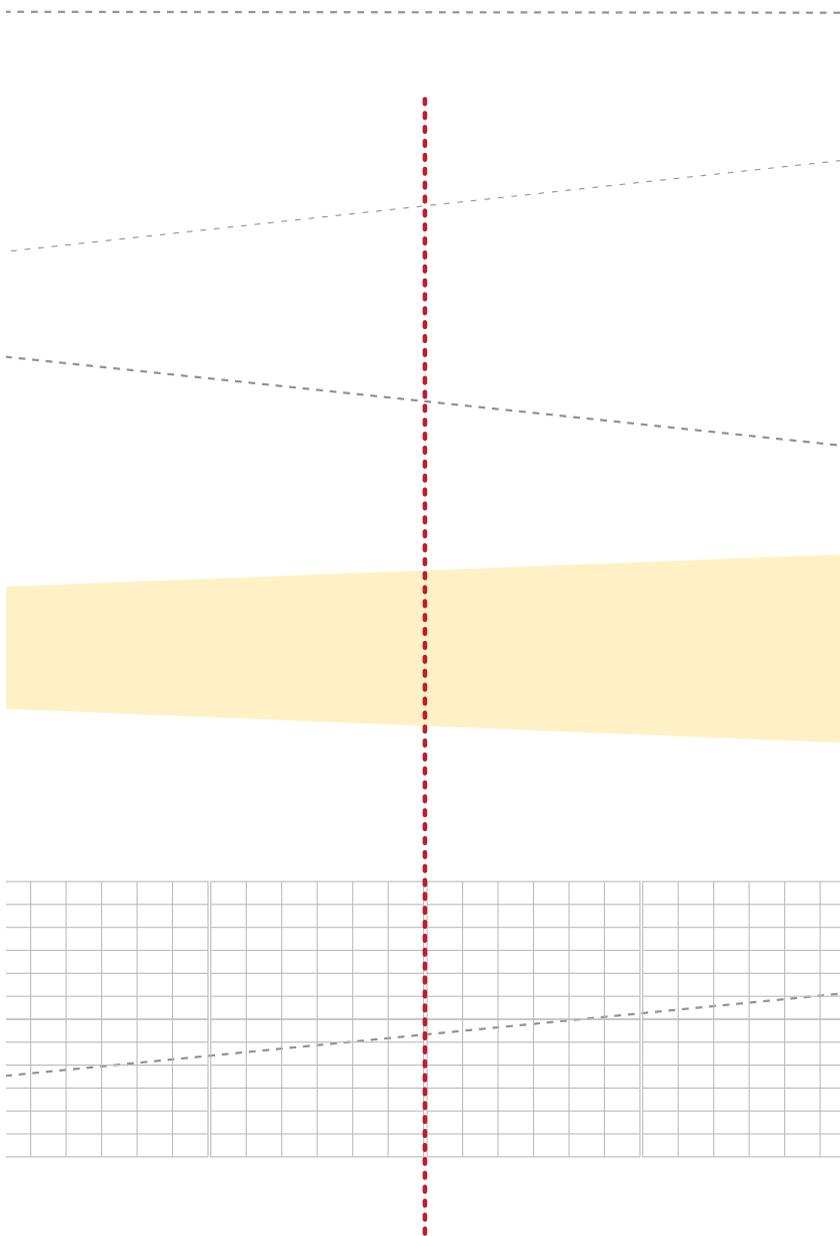
This study analyzes the benefits of the U.S. retirement system as a whole, including both tax deferral and the Social Security system, and finds that the benefits of the U.S. retirement system are progressive. That is, as a percentage of their lifetime earnings, lower earners receive more in lifetime benefits from the combination of Social Security and tax deferral than higher earners receive.

In retirement, Americans rely on a variety of resources. For many, Social Security benefits are the most important resource. Homeownership represents another important resource, as households who own their home do not need to generate as much monthly income as they would if they were renting. In addition, about 80 percent of working households approaching retirement have resources earmarked for retirement that are tax-deferred—retirement benefits accrued in defined benefit plans (DB) plans, retirement assets in defined contribution (DC) plans or individual retirement accounts (IRAs), or both.[1] What matters for retirement adequacy is the total amount of resources a household has, not the amount of resources provided by any single source.[2]

Analyzing either the Social Security system or tax deferral in isolation provides an incomplete picture of the U.S. retirement system because the composition of retirement resources varies based on a household's economic circumstances. Households with lower lifetime earnings depend more on Social Security benefits; households with higher lifetime earnings depend more on tax-deferred retirement resources.[3] These differences in the composition of retirement resources reflect the design of the system. The Social Security benefit payment formula is progressive, replacing a higher percentage of pay for workers with lower lifetime earnings. Employer-sponsored retirement plans supplement Social Security and are relied on more heavily by workers with higher lifetime earnings.

Few studies have evaluated the benefits of the U.S. retirement system—that is, estimated the net benefits to individuals of government retirement policies—holistically. Instead, most previous studies of the U.S. retirement system have focused on either the Social Security system or tax deferral alone. In addition, the two lines of research do not measure benefits in the same way, so the results are not easily compared. Studies that analyze who benefits from the Social Security system typically measure individuals' net benefit payments over their lifetimes—that is, the present value of Social Security benefit payments less the present value of Social Security payroll taxes. Studies that analyze who benefits from tax deferral typically estimate, for all taxpayers in a given year, the tax expenditure associated with retirement plan contributions—that is, the difference between the tax liability associated with a contribution to a taxable account and the tax liability associated with a contribution to a tax-deferred retirement plan.

From the time of their first publication, tax expenditure estimates—those related to tax deferral and those related to other tax code provisions—have played an important role in efforts to reform the federal income tax. The focus of contemporary tax reform discussions on tax expenditure estimates has led some to question the tax treatment of employer-sponsored retirement plans and IRAs, which are estimated to be among the largest tax expenditures. In addition, several recent studies have analyzed who benefits from different tax code provisions by estimating how tax expenditures are distributed across taxpayers by income.[4] These studies, showing that higher-income taxpayers benefit more from tax deferral, have placed additional scrutiny on the taxation of retirement plans.

Motivated, at least in part, by estimates of the tax expenditure associated with employer-sponsored retirement plans and IRAs, both comprehensive proposals to reform the federal

income tax and more narrowly focused tax proposals included in the president's annual budget have targeted tax deferral. For example, in their comprehensive reform proposals, both the Debt Reduction Task Force of the Bipartisan Policy Center (2010) and the National Commission on Fiscal Responsibility and Reform (2010) included provisions to reduce the annual limit on retirement plan contributions by about 60 percent. In addition, both the president's annual budget[5] and the 2014 tax reform legislation of House Ways and Means Chairman Dave Camp[6] included proposals to limit the up-front tax benefit associated with retirement plan contributions.

This study uses the same measures used in previous studies of the benefits of tax deferral alone—that is, tax expenditure estimates—to evaluate the benefits of the U.S. retirement system as a whole. The analysis is intended to provide context for interpreting previous research on the benefits of tax deferral and to improve understanding of the way in which tax deferral and the Social Security system combine to provide retirement resources to U.S. workers.

Scope of Analysis

To motivate the analytical approach of the book, chapter 1 explains the tax expenditure concept and illustrates the role that tax expenditures have played in recent policy discussions about tax reform. The benefits of tax deferral are more difficult to estimate than most other tax expenditures, and it is also more difficult to distribute those benefits across taxpayers. In this analysis, the estimation method is consistent with the tax expenditure concept but differs from typical measures in two important respects. First, rather than estimating the benefits a worker receives from tax deferral in a single year, the benefits of the U.S. retirement system are estimated over each representative worker's lifetime. Second, the benefits are measured by jointly estimating the benefits of tax deferral and the Social Security system.

Chapter 2 illustrates that the combination of the Social Security system and tax deferral results in a U.S. retirement system that is progressive. The benefits of the U.S. retirement system are measured as the tax expenditure associated with the combination of tax deferral and Social Security. That is, the benefits are measured as the difference in lifetime tax liability between a simulation that eliminates both tax deferral and Social Security and the baseline simulation of current policy. The baseline simulation of current policy also illustrates that retirees rely on the combination of Social Security benefits and distributions from employer-sponsored retirement plans, and that the design of the Social Security system causes the composition of retirement resources to vary depending on a worker's lifetime earnings.

Chapter 3 examines the benefits of tax deferral in more detail. The effect of tax deferral on tax liability changes over the life cycle. Tax deferral reduces income taxes while working by excluding contributions and investment returns from income. It increases taxes in retirement, however, by including all retirement plan distributions in income. The simulations illustrate that policy discussions that focus on the up-front benefits of tax deferral are misleading. For workers with higher earnings, tax deferral has a larger effect on when workers pay taxes than it does on the amount of taxes workers pay over their lifetimes.

Chapter 4 dispels two myths about tax deferral. The first myth is that higher-paid workers get more benefits from tax deferral because they face higher marginal tax rates.

In fact, it is the Social Security benefit formula that causes workers with higher lifetime earnings to rely more on—and to benefit more from—tax deferral. Lower-earning workers would actually benefit more, on average, from contributing an additional $1 to a retirement plan. The reason higher earners benefit more from tax deferral is not that they get more benefits on every dollar they contribute to a retirement plan, but that they contribute more dollars. The second myth is that the current tax system provides an "upside-down" incentive to save. In fact, tax deferral eliminates the disincentive to save inherent in an income tax and equalizes the incentive to save across workers who face different marginal tax rates.

Chapter 5 examines the effect that Social Security has on income tax liability in more detail. Previous studies have estimated the benefits of the Social Security system by calculating each worker's net benefit payments, measured as the present value of Social Security benefit payments received less the present value of Social Security taxes paid. Net benefit payments, however, are only one component of the tax expenditure associated with Social Security. Social Security also affects income tax liability. In fact, for all but the highest-earning worker in this study, Social Security has a larger effect on income tax liability than tax deferral.

The first five chapters of the book illustrate that, using the same standard by which tax deferral has been judged in previous research, the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive.

Chapter 6 takes a step back and examines the limitations of the tax expenditure concept in general and of distributional analysis of tax expenditures specifically. The narrow focus of policy discussions on the effect of specific tax code provisions on progressivity is misplaced. Taken to its logical extreme, the focus on "microprogressivity" (the effect of specific tax code provisions on progressivity) can lead to perverse results: some policy changes would increase microprogressivity but reduce the progressivity of the income tax as a whole.[7] If comprehensive income tax reform is undertaken, an important consideration would be the effect of any proposed reform on the progressivity of the overall income tax. The impact of a comprehensive reform on the distribution of benefits from specific tax code provisions would not be—and should not be—a concern.

If the income tax were reformed, the focus should instead be on the impact of specific tax code provisions on fairness, economic growth, and simplicity—and Chapter 7 argues that tax deferral scores well on these criteria. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings, resulting in a measure of taxable annual income that is a better indicator of a worker's lifetime circumstances. Tax deferral reduces economic distortions by eliminating the disincentive to save that is inherent in any income tax. Tax deferral is also simple for the Internal Revenue Service (IRS) to administer and simple for workers to understand.

In contrast, proposals to further restrict or to fundamentally change tax deferral would make the tax code less fair and more complex. Many of the proposals would make the tax code less fair because they target only DC plans, or in some cases only employee contributions to DC plans or IRAs. This would represent a substantial change from the current tax code's roughly neutral tax treatment of all forms of qualified deferred compensation. Proposals to change the up-front benefits of tax deferral would increase complexity, making it more difficult for workers to decide whether to contribute to a retirement plan and making it more difficult for the IRS to administer and enforce.

The Tax Expenditure Concept

▶ The tax expenditure concept divides the tax code into two parts. The first part is the normal income tax structure. This part of the code strictly relates to raising revenue and includes provisions that define income, specify accounting rules, and set tax rate schedules. The second part includes all other tax code provisions that are classified as tax expenditures.

▶ The tax expenditure estimate related to a specific tax code provision is the difference between tax liability under the existing tax code and tax liability if the provision were removed but the rest of the code—including all other tax expenditure provisions—were unchanged. The estimates assume that taxpayer behavior does not change in response to the change in tax law.

▶ Tax deferral is more difficult to estimate than other tax expenditures because—unlike a tax exclusion or a tax deduction, which reduce taxes in the year they are taken but have no effect on tax liability in any other year—tax deferral changes tax liability over the course of a worker's lifetime.

▶ The tax expenditure estimates in this study differ from typical estimates in two respects. First, rather than measure the benefits individuals accrue in a given tax year, they measure the benefits individuals receive over a lifetime. Second, they jointly estimate the benefits of both tax deferral and the Social Security system.

This book measures the benefits of the U.S. retirement system with methods consistent with those used to estimate tax expenditures. To motivate this analytical approach, this chapter explains the tax expenditure concept and the role tax expenditure estimates have played in recent policy discussions about tax reform.

Stanley Surrey, U.S. Department of the Treasury assistant secretary for tax policy from 1961 to 1969, is widely attributed with coining the term *tax expenditure*.[1] Surrey was concerned that the tax code was being used to achieve objectives unrelated to taxation, when many of the policy objectives either were not worth pursuing or could be better addressed with a direct expenditure program. Of particular concern to Surrey was that such tax expenditures were not subject to the same level of scrutiny as direct expenditures. To address these concerns, Surrey publicly introduced the concept in a November 1967 speech and oversaw the first tax expenditure estimates, which were published just over a year later.[2] In 1974, Congress required that estimates of tax expenditures be published as part of the annual budget process. Both the Joint Committee on Taxation (JCT) and the U.S. Department of the Treasury (Treasury) have since published detailed tax expenditures estimates each year.[3]

The tax expenditure concept divides the tax code into two parts.[4] The first part is the *normal income tax structure*. This part of the code strictly relates to raising revenue and includes provisions that define income, specify accounting rules, and set tax rate schedules. The second part includes all other tax code provisions which are classified as *tax expenditures*. Tax expenditures include special preferences—such as exclusions, deductions, deferrals, credits, and special rates—that are not part of the normal income tax structure but instead are related to policy objectives that could otherwise be met with a direct government expenditure program.

What constitutes the normal income tax structure is subject to interpretation.[5] For example, the JCT's definition includes "one personal exemption for each taxpayer and one for each dependent, the standard deduction, the existing tax rate schedule, and deductions for investment and employee business expenses."[6] Treasury's definition is more expansive, including a few more features of the current tax code.[7]

Tax Expenditures and Tax Reform

Tax expenditures have played a central role in discussions of tax reform from the time the first estimates were released. Surrey (1973) viewed the elimination of tax expenditures as the "pathway to tax reform." Tax expenditures were also a primary focus of the Tax Reform Act of 1976.[8] Eliminating or limiting tax expenditures was the centerpiece of discussions of tax reform in a seminal Treasury report *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977) and in the two reports—typically referred to as Treasury I (U.S. Department of the Treasury 1984) and Treasury II (U.S. Department of the Treasury 1985)—that served as the basis for the Tax Reform Act of 1986.[9] Not surprisingly, more recent tax reform proposals also have focused on reducing or eliminating tax expenditures, such as the President's Advisory Panel on Federal Tax Reform (2005), the Debt Reduction Task Force of the Bipartisan Policy Center (2010), and the National Commission on Fiscal Responsibility and Reform (2010).

Although tax expenditures and tax reform have been linked for decades, recent tax reform discussions have put a greater emphasis on which taxpayers benefit from these provisions.

This may be, in part, because distributional analysis of tax expenditures is now more widely available. Some of the earliest tax expenditure estimates distributed tax expenditures by income class (see, for example, Committee on Ways and Means 1972), and it has long been recognized that exclusions and deductions reduce taxes more for taxpayers with higher marginal tax rates. In their annual reports, however, Treasury does not distribute tax expenditures by taxpayer income class and the JCT provides such information for only about a dozen individual tax expenditures.[10] In recent years, several studies have provided more comprehensive distributional analysis of tax expenditures.[11] The results of these studies have often been cited in proposals to eliminate or limit tax expenditures, either as part of an effort to reform the income tax[12] or as stand-alone proposals.[13]

The focus of tax reform efforts on tax expenditures has led to scrutiny of the tax treatment of employer-sponsored retirement plans and IRAs. Tax code provisions that allow for the deferral of tax on compensation set aside for retirement are estimated to be some of the largest tax expenditures. For example, Joint Committee on Taxation (2014) estimates that for fiscal years 2014 to 2018, employer-sponsored DC plans are the fifth-largest tax expenditure and employer-sponsored DB plans are the 10th-largest.[14] Further, because workers with higher earnings are more likely to participate in employer-sponsored retirement plans,[15] there has long been a concern that higher-income taxpayers receive a disproportionate share of the benefits of tax deferral.[16]

Method of Estimation

Each tax expenditure included in the detailed lists published by the JCT and Treasury is estimated independently. The tax expenditure estimate related to a specific tax code provision is the difference between tax liability under the existing tax code and tax liability if the provision were removed but the rest of the code—including all other tax expenditure provisions—were unchanged.[17]

The estimate of tax liability under current tax law is taken from the revenue baseline estimate. The revenue baseline estimate incorporates forecasts of both economic activity during the estimation period and taxpayer behavior. Forecasts of economic activity are provided to the JCT by the Congressional Budget Office (CBO) and provided to Treasury by the Office of Management and Budget (OMB). Forecasts of taxpayer behavior are made by the JCT and Treasury analysts and are predicated on both the economic forecast and current tax law.

The estimate of tax liability with the tax code provision removed and no other changes made to the tax code is static. That is, the estimate of tax liability without the tax expenditure provision assumes that—relative to the revenue baseline—forecasted taxpayer behavior does not change in response to the change in tax law.

Why Tax Deferral Differs from Other Tax Expenditures

Until relatively recently, few studies formally estimated the benefits of tax deferral by income class. This was likely due, at least in part, to the fact that the benefits of tax deferral are more difficult to estimate than other tax expenditures. Most other tax expenditures are exclusions (such as the exclusion from income of employer-provided health insurance) or deductions (such as the deduction from income of mortgage-interest expense), which reduce taxes in the year they are taken but have no effect on tax liability in any other year.

Unlike an exclusion or a deduction, tax deferral changes tax liability over the course of a worker's lifetime.

As illustrated in Figure 1.1, qualified deferred compensation under current law is taxed differently from how it would be under the normal income tax structure at three points in time.[18]

» First, employer contributions to retirement plans (inclusive of both DB plans and DC plans) are excluded from taxable wages reported on Form W-2, as are elective employee contributions to 401(k)-type plans (Figure 1.1, upper panel). Under the normal income tax structure, all compensation would be included in taxable wages reported on Form W-2 and subject to income tax. Only the funds available after income taxes were paid could be contributed to a taxable investment account.

FIGURE 1.1

Tax Deferral Differs from Normal Income Tax Treatment

Comparison of the normal income tax structure with tax deferral
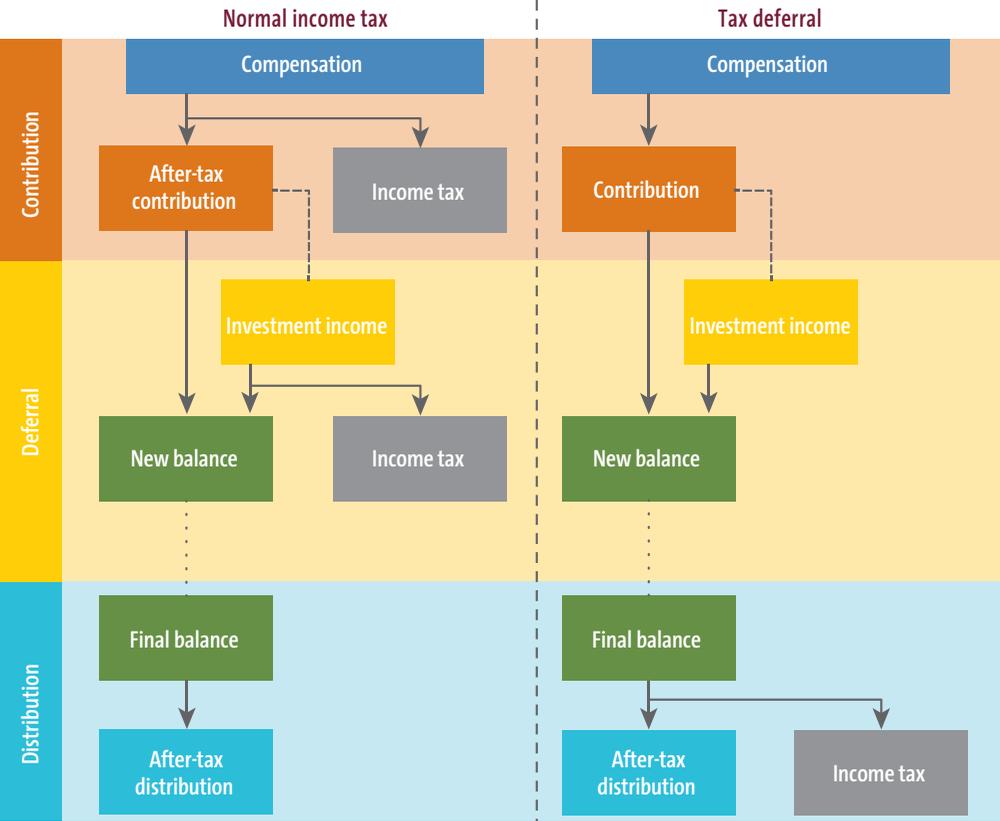
Note: This illustration assumes all investment returns are in the form of annual interest or dividend payments that would be taxed when received. If any investment returns were in the form of unrealized capital gains, the unrealized gains would be taxed upon distribution from the taxable account.

Source: Investment Company Institute

» Second, investment returns earned on contributions to a retirement plan are not included in income when received, with taxes deferred until funds are distributed (Figure 1.1, middle panel). Under the normal income tax structure, all investment income earned in a taxable investment account would be included in income and subject to tax when received.[19]

» Third, all distributions from a retirement plan are included in income and subject to tax (Figure 1.1, lower panel). In contrast, under the normal income tax structure, withdrawals from a taxable account typically would not be included in income or subject to tax.[20]

Corresponding to these three points in time, tax expenditure estimates consist of three separate estimates:

» the reduction in taxes at the time of the contribution;

» the reduction in taxes on investment income during the deferral period; and

» the increase in taxes when distributions are taken during retirement.

Tax deferral is more difficult to estimate than other tax expenditures because it affects tax liabilities throughout a worker's lifetime. The microsimulation models used to estimate tax expenditures, such as the models used by Treasury and the JCT to produce the official tax expenditure estimates, are based on data from a large sample of tax returns from a single tax-filing year. These models are used to produce annual estimates of tax expenditures in a given year, with multiyear estimates over a budget period simply being the sum of individual year estimates. For tax expenditures that are exclusions, deductions, and credits under the individual income tax, the aggregate tax expenditure estimate and the distribution of the estimate to individual taxpayers can typically be derived directly from a microsimulation model. Estimating and distributing the tax expenditures associated with tax deferral is not as direct.

A Brief Explanation of Microsimulation Models

For individual income tax provisions, the primary tools used by Treasury and the JCT to estimate tax expenditures are their respective Individual Tax Models (ITMs). The ITMs are microsimulation models based on cross-sectional data—data from a large representative sample of individual income tax returns from a single tax-filing year.[21] In addition to the tax data, other data sources are used to either directly provide or to impute additional demographic or economic information that is needed for estimation purposes. For example, the tax data are linked to Social Security Administration data that provide the date of birth for individuals included in the sample, and household survey data are used to impute consumption expenditures, which can be used to estimate excise tax liability. These data are then used in conjunction with other computer programs to estimate tax liability.

To allow the ITMs to forecast future tax revenue, the data need to be "aged" or extrapolated to represent the years during the budget period. As explained in Cilke (1994), this is done in two steps. First, every dollar amount in the data is increased in line with per capita inflation and real growth. Second, the weights on the observations are adjusted to hit aggregate targets, such as the forecast of aggregate national income and the forecast of the age distributions of the population. Estimates for the budget period are the sum of estimates for each individual year in the budget period.

The Treasury and JCT ITMs cannot be used to produce estimates for an individual taxpayer across multiple years because the data are not extrapolated to future years at the level of the individual taxpayer. Rather, the extrapolated data are made consistent with forecasts of population changes and economic activity during the budget period by adjusting the weights of individual taxpayers. For example, a taxpayer who is 45 years old in the source data will be, in the extrapolated data, 45 years old in every year during the budget period. Rather than aging individual taxpayers so that a taxpayer who is 45 years old in one year becomes a taxpayer who is 46 years old in the subsequent year, the weights are adjusted so that the taxpayer remains the same age in all years but represents a different number of taxpayers in each year.

Microsimulation models that follow individuals over time do exist, but are not typically used to estimate tax expenditures. These models are based, not on cross-sectional data, but on panel data—data on a large number of individuals, with each individual associated with data from multiple time periods. Unlike cross-sectional models, panel models extrapolate the source data at the level of the individual.[22] For example, CBO and the Social Security Administration have built models based on panel data to forecast receipts and expenditures for the Social Security system.[23] In addition, both Treasury and the JCT have built panel models based on a sample of taxpayers with data from multiple tax-filing years.[24] The Treasury and JCT panel models are not used, however, to produce the official tax expenditure estimates.

Official Tax Expenditure Estimates

The JCT and Treasury use similar methods to produce the official aggregate tax expenditure estimates. Although they group retirement tax code provisions slightly differently and may use different assumptions when estimating tax expenditures,[25] they both use roughly the same concept of tax expenditures and both use essentially the same simulation methods to derive their estimates.[26]

The official tax expenditure estimates for retirement plans are measured on a cash flow basis. Estimates are derived for each year during the budget period, with the tax expenditure estimate for the full budget period equal to the sum of the annual estimates. For example, the annual cash flow measure of the tax expenditure associated with DC plans combines three separate estimates:

» the reduction in taxes during the year caused by current contributions to DC plans;

» the reduction in taxes during the year caused by forgoing taxation on the investment income currently earned on all assets accumulated in DC plans to date; and

» the increase in taxes during the year caused by current distributions from DC plans.

To produce the official aggregate tax expenditure estimates, both the JCT and Treasury use their ITMs supplemented by other data. As already noted, the Treasury and JCT ITMs are based on a large sample of individual tax returns from a single tax-filing year. Tax returns and the associated information returns provide data on contributions to IRAs and employee contributions to employer-sponsored retirement plans. The tax data also include information on distributions from IRAs and employer-sponsored retirement plans. Individual income tax data do not include information on employer contributions to retirement plans. Instead, outside data—either household survey data or aggregated data from retirement plans—must be used to impute employer contributions. Similarly, tax returns provide no information about asset accumulations in retirement plans or the amount of investment

income the plans would generate. Instead, the most recent aggregate data on assets held by employer-sponsored retirement plans and IRAs are used to estimate the aggregate amount of investment income generated by retirement plans.

Whatever other concerns there may be regarding the use of a cash flow measure of tax expenditures,[27] the official aggregate estimates cannot easily be allocated to individual taxpayers and—even if analysts succeed in doing so—the results from such an exercise would be difficult to interpret. Mechanically, it is difficult to distribute the aggregate tax expenditure estimates for tax deferral to each tax return in the ITM because a portion of the estimate is based on aggregate data. Even if a reasonable method is used to distribute the cash flow estimates across taxpayers, the results of such an exercise would be difficult to interpret. Although the cash flow estimates include estimates of the three effects of tax deferral, these three effects are not attributable to the same taxpayers. The revenue losses on contributions are attributable to one set of taxpayers (workers). The revenue gains on distributions are attributable to another set of taxpayers (largely retirees). And the revenue lost by deferring tax on investment income is attributable to all individuals—either working or retired—who have accrued DB plan benefits or who have accumulated assets in DC plans or IRAs.

Distributional Analysis of Tax Deferral

As explained in Cronin (1999), a present value measure is used in place of the official cash flow tax expenditure estimate when Treasury distributes the benefits of tax deferral to individual tax returns. The present value measure estimates the benefits of compensation deferred through employer-sponsored retirement plans or IRAs during a single year. It is a forward-looking estimate of the tax benefits—from the time a contribution is made to the time a distribution is taken. As such, it includes not only an estimate of the reduction in taxes during the current year, but also an estimate of the present value of the tax reduction from the deferral of tax on investment income during the deferral period and an estimate of the present value of the tax increase when distributions are taken during retirement.[28] For example, suppose that the combination of employer and employee 401(k) plan contributions in a single year equal $10,000 for a worker. In the year of the contributions, the tax expenditure estimate for that worker would be the reduction in taxes in the current year caused by the $10,000 contribution; plus the present value of the tax that would have been collected during the deferral period on investment income had the $10,000 in compensation been used to fund a contribution to a taxable investment account; less the present value of the tax collected when the $10,000 contribution plus investment returns are distributed in retirement.

Relative to cash flow measures, present value measures of the benefits of tax deferral have key advantages for distributional analysis. The analysis is mechanically easier because, although the amount of employer contributions must be imputed for each worker, the benefits of tax deferral can be directly estimated for individual taxpayers using the Treasury and JCT ITMs. Further, the results are easier to interpret because all benefits from a retirement plan contribution—including the up-front tax savings, the tax savings during the deferral period, and the increase in taxes during retirement—are attributed to the same taxpayer. Studies that focus specifically on the benefits of tax deferral, such as Burman et al. (2004) and Burtless and Toder (2010), typically follow the method described in Cronin (1999) and use present value tax expenditure estimates.

A More Holistic Measure of the Benefits of the U.S. Retirement System

This book examines the benefits of the U.S. retirement system more holistically than is typical in distributional analyses of the benefits of tax deferral. Although the benefit measures used are consistent with the general concept of a tax expenditure, they differ from typical measures in two important respects.

First, the estimates in this book measure the benefits of the U.S. retirement system over a worker's lifetime. Typical distributional analysis can provide a distorted view of the benefits of tax deferral, even when using a present value measure of tax expenditures. Despite being forward-looking, present value tax expenditure estimates measure the benefits of a single year of retirement plan contributions. Estimates based on a single year of data may not reflect the benefits that a worker receives, on average, from tax deferral because contribution rates can change over the course of a worker's career. For example, younger workers who are not currently covered by an employer-sponsored retirement plan but who will participate later in their working careers would be characterized as receiving no benefits from tax deferral. Conversely, older workers who only recently increased their retirement plan contributions, but who made modest contributions for most of their working careers as they established households and raised children, would be estimated as receiving large benefits from tax deferral.

A recent study that estimated the distributional impact of proposals to change retirement tax incentives illustrates the importance of measuring the lifetime benefits of tax deferral. Butrica et al. (2014) evaluates a proposal that, instead of excluding employer and employee retirement plan contributions from income, would include the contributions in income and provide all workers with a refundable 25 percent tax credit on contributions.[29] The study provides two different estimates of the impact of the proposal: an annual measure derived using a cross-sectional microsimulation model and a lifetime measure derived using a panel microsimulation model.[30] Measured over a single year, the proposal is estimated to reduce lifetime taxes (by $10 or more), in present value, for 20.1 percent of tax returns and increase lifetime taxes (by $10 or more), in present value, for 9.5 percent of tax returns.[31] Measured over workers' lifetimes, however, the results are reversed: only 9 percent of taxpayers are categorized as winners (reduction in lifetime taxes paid of 1.0 percent or more) and 24 percent of taxpayers are categorized as losers (increase in lifetime taxes paid of 1.0 percent or more).

Although Butrica et al. (2014) does not discuss why the two estimation approaches produced such different results, it is presumably because workers' savings behavior and earnings typically follow a predictable pattern over their lifetimes. On average, inflation-adjusted earnings tend to increase early in a worker's career, reach a peak in the prime earnings years, and then level off or decline as the worker approaches retirement.[32] As illustrated in Brady and Bogdan (2014a), savings goals also change over workers' lifetimes, with younger workers more focused on education, their families, and saving to purchase a home, and older workers more focused on saving for retirement. During retirement, individuals stop saving and begin taking retirement plan distributions.[33] Because contributions to and distributions from retirement plans are correlated with life-cycle savings patterns, estimates based on a single year of data are unlikely to accurately represent the benefits workers will accrue from tax deferral, on average, over their lifetimes.

The second way in which the measures used in this book differ from those typically used is that the benefits of the U.S. retirement system are measured by jointly estimating the benefits of tax deferral and the benefits of the Social Security system.[34] Social Security is the largest component of the U.S. retirement system. Taxes equal to 12.4 percent of pay are collected from every worker covered by Social Security, and benefit payments represent a large share of total retirement resources.[35] Furthermore, the benefit payment formula is progressive, replacing a higher percentage of pay for workers with lower lifetime earnings (Figure 1.2). For example, if workers born in the 1960s claim Social Security benefits at age 65, CBO estimates that Social Security benefit payments will replace 88 percent of average inflation-adjusted earnings for workers in the lowest 20 percent of households ranked by lifetime household earnings.[36] As lifetime earnings increase, Social Security benefits replace a smaller share of earnings, falling to 56 percent for workers in the middle 20 percent of households ranked by lifetime household earnings, and to 34 percent for workers in the highest 20 percent of households ranked by lifetime household earnings.

The benefits of tax deferral cannot be evaluated in isolation. Employer-sponsored retirement plans supplement Social Security. Workers with higher lifetime earnings rely much more heavily on these plans because Social Security benefit payments replace a much lower share of their pre-retirement earnings. Assessing either component in isolation provides an incomplete picture of the U.S. retirement system.[37]

The fact that employer-sponsored retirement plans and the Social Security system work together is not unintentional. Policymakers created a mandatory contributory retirement

FIGURE 1.2

Social Security Benefit Formula Is Highly Progressive

Average projected Social Security replacement rate for workers claiming at age 65, by quintile of lifetime household earnings, 1960s birth cohort, percent

Quintile of lifetime household earnings
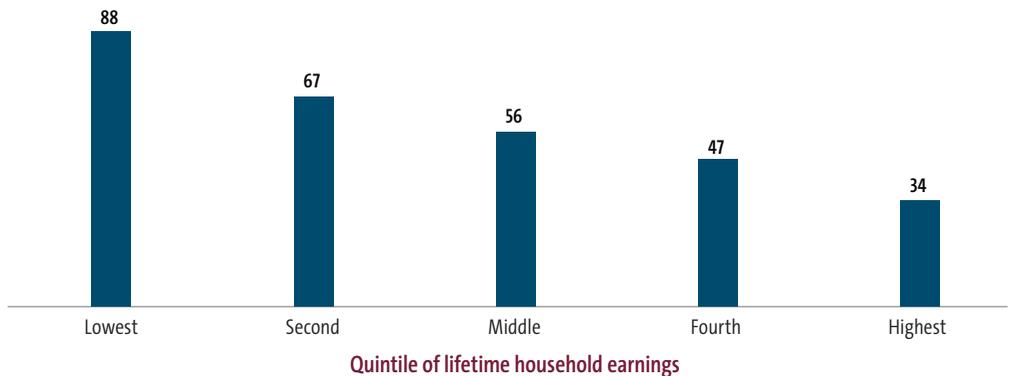
Note: The replacement rate is calculated as Social Security benefit payments divided by average inflation-indexed earnings. For workers born in the 1960s, the Social Security full benefit retirement age is age 67. If these workers delayed claiming from age 65 to the full benefit retirement age, Social Security benefit payments would increase by 15.3 percent. For every month claiming is delayed, benefit payments would continue to increase until age 70. If claiming was delayed until age 70, benefit payments would be 24 percent higher than if claimed at age 67 and 43 percent higher than if claimed at age 65.

Source: Congressional Budget Office 2014

system—Social Security—that covers nearly all U.S. workers but does not, on its own, provide adequate retirement resources for workers with higher lifetime earnings. To supplement Social Security, workers also are allowed to defer a portion of their compensation until retirement.

Evidence that policymakers intended Social Security and employer-sponsored retirement plans to work together is that, since the enactment of Social Security, Congress has allowed private-sector employers to "integrate" their pension plans with Social Security. That is, Congress allows employers to provide a more generous benefit formula in DB plans, and higher employer contribution rates in DC plans, for earnings not covered by Social Security—that is, earnings in excess of the Social Security maximum taxable amount ($117,000 in 2014).[38]

Evidence that Social Security and employer-sponsored retirement plans work together in practice is provided by data on retirement resources. For example, Gustman, Steinmeier, and Tabatabai (2009) uses detailed household data to construct a measure of wealth that includes the value of future Social Security benefits and the value of accrued DB plan benefits. Using analysis provided by these authors, Figure 1.3 shows the share of retirement resources for households with at least one member aged 57 to 62 in 2010 ranked by household wealth.[39] Consistent with the design of the Social Security system, the share of wealth in the form of future Social Security benefits declines from 80 percent for the lowest 20 percent of households ranked by wealth, to 44 percent for the middle 20 percent, to 17 percent for the highest

FIGURE 1.3

Retirees Rely on a Combination of Social Security System and Retirement Plans

Percentage of wealth by wealth quintile, households with at least one member aged 57 to 62, 2010

| Average wealth by quintile: | Lowest [$121,500] | Second [$358,000] | Middle [$641,000] | Fourth [$1,072,000] | Highest [$2,138,000] |

Quintile of wealth
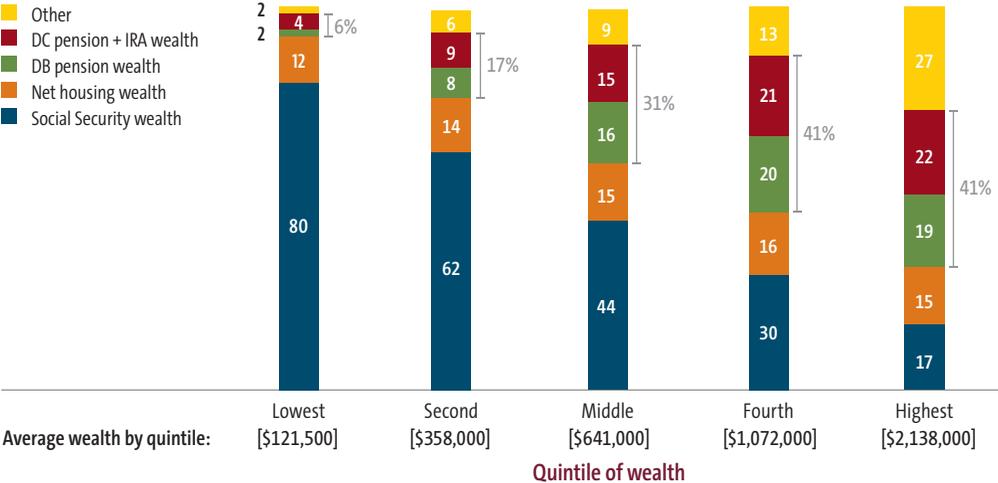
Note: Households with the top and bottom 1 percent of wealth are excluded. Social Security wealth is estimated as the present value of the stream of Social Security benefits. Net housing wealth is the value of the home less mortgages. Defined benefit (DB) pension wealth is estimated as the present value of the stream of DB benefits. Components may not add to 100 percent because of rounding.

Source: Investment Company Institute tabulation of an updated Table 3 of Gustman, Steinmeier, and Tabatabai 2009, which uses Health and Retirement Study (HRS) data

20 percent. As the share of wealth in the form of future Social Security benefit payments declines, the share of wealth in the form of employer-sponsored retirement plans and IRAs increases. The combination of the value of accrued DB plan benefits and assets in DC plans and IRAs increases from 6 percent for the lowest 20 percent of households ranked by wealth, to 31 percent for the middle 20 percent, to 41 percent for the highest 20 percent.

Summary

Since the first tax expenditure estimates were released by the U.S. Department of the Treasury in the 1960s, tax expenditures have played a central role in discussions of tax reform. Not surprisingly, more recent tax reform proposals also have focused on reducing or eliminating tax expenditures. Unlike previous efforts to reform the tax code, however, recent policy discussions have placed more emphasis on which taxpayers benefit from tax expenditures.

Given that distributional analysis of tax expenditures has played a large role in recent policy discussions, this book provides estimates of the progressivity of the benefits provided by the U.S. retirement system. The methods used to estimate the benefits of the U.S. retirement system are consistent with the standard tax expenditure methods used to measure the benefits of tax deferral in isolation. The measures used in this book, however, differ from typical measures in two important respects. First, rather than estimating the benefits a worker receives from tax deferral in a single year, the benefits of the U.S. retirement system are estimated over each representative worker's lifetime. Second, the benefits are measured by jointly estimating the benefits of tax deferral and the Social Security system.

Measuring the Benefits of the U.S. Retirement System

▶ When evaluating the U.S. retirement system, it is important to assess both the Social Security system and tax deferral. In combination, the benefits of the two programs are progressive. Consistent with previous research, this analysis shows that the benefits of tax deferral are proportionately higher for higher-earning workers. Tax deferral, however, is only one part of the U.S. retirement system. Social Security is the primary component of the U.S. retirement system, and the benefits of the Social Security system are proportionately higher for workers with lower lifetime earnings.

▶ Although all workers have the same replacement rate target in the baseline simulation, they do not all contribute the same amount to their 401(k) plans. Because the share of a worker's average wage replaced by Social Security declines as lifetime earnings increase, workers with higher lifetime earnings need to begin contributing to 401(k) plans earlier and need to contribute a higher percentage of pay to reach the target replacement rate goal.

▶ For the higher-paid workers analyzed in this study, tax deferral affects when taxes are paid more than it affects the total amount of taxes paid over a lifetime. For these workers, increased taxes during retirement offset, in present value, more than half of the reduction in taxes enjoyed while working.

▶ This study is the first to use the same metric—a tax expenditure estimate—to measure the benefits of both tax deferral and the Social Security system. In addition to measuring net Social Security benefit payments, the tax expenditure estimate also includes the effect of the Social Security system on income tax liability. The lifetime benefits of Social Security are substantial for the worker with the lowest lifetime earnings, decline as lifetime earnings increase, and are small or slightly negative for workers with higher lifetime earnings.

Given that distributional analyses of tax expenditures have played a large role in recent policy discussions, this chapter provides estimates of the progressivity of the benefits provided by the U.S. retirement system. The analysis in this chapter is intended to provide context for interpreting the results of previous studies that have focused solely on the benefits of tax deferral in isolation and to improve understanding of the way in which tax deferral and the Social Security system combine to provide retirement benefits to U.S. workers.

This book uses tax expenditure estimates to measure the benefits of the U.S. retirement system. The estimation method used is consistent with the standard methods used to estimate aggregate tax expenditures and to distribute those estimates across taxpayers. Like the official tax expenditure estimates for various tax code provisions, the benefits of the U.S. retirement system are measured by comparing current retirement policies to a tax and transfer system that eliminates both tax deferral and Social Security, but is otherwise identical to the current system. In addition, the benefit estimates are static; that is, it is assumed that taxpayer behavior does not change in response to the change in policy.

The results from this study show that the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive when evaluated holistically. Consistent with the results from previous studies, the benefits of tax deferral as a share of income are estimated to be higher for workers with higher lifetime earnings. However, tax deferral is only a part of the U.S. retirement system. Tax deferral works in combination with the Social Security system, and the benefits of the Social Security system are highly progressive.

Comparison with Previous Estimates of Benefits

As explained in chapter 1, the estimated benefits of the U.S. retirement system in this study differ from the typical measures seen in the research literature. First, rather than estimating the benefits that taxpayers receive from tax deferral—either on a cash flow or present value basis—in a single year, this book measures the lifetime benefits of tax deferral. Second, the study jointly estimates the benefits of both tax deferral and the Social Security system.

Typical distributional analyses of the benefits of tax deferral use cross-sectional microsimulation models to estimate the benefits that taxpayers receive in a single year (Figure 2.1).[1] For example, Burman et al. (2004) uses a present value measure to estimate the tax expenditure associated with DC plan and IRA contributions made during a single year and Congressional Budget Office (2013) uses a cash flow measure from a single year to distribute the benefits of tax deferral by broad income category.[2] One exception to this rule is Gokhale, Kotlikoff, and Warshawsky (2001), which estimates the present value of the lifetime tax expenditure associated with tax deferral for a number of representative households.

Measuring benefits over individuals' lifetimes is an approach that is more common in the Social Security research literature than in the tax expenditure research literature (Figure 2.1). The Social Security research literature typically uses microsimulation models based on panel data. For example, Smith, Toder, and Iams (2004) uses the Model of Income in the Near Term (MINT), a microsimulation model developed at the Social Security Administration, and Congressional Budget Office (2006) uses the Congressional Budget Office long-term (CBOLT) simulation model. These studies, as well as studies that analyze representative workers such as Goodfellow and Schieber (1993) and Schieber (2012, 2014), use net benefit

payments—the present value of Social Security benefit payments less the present value of Social Security payroll taxes collected—to measure the benefits of the Social Security system.

In addition to measuring the benefits of tax deferral on a lifetime basis, this study jointly estimates the benefits of tax deferral and the benefits of the Social Security system.

It has long been recognized that employer-sponsored retirement plans are a complement to Social Security and that—because of the progressive Social Security benefit formula— retirement plans (both DB plans and DC plans) provide more benefits to workers with higher earnings. For example, it is noted in Congressional Budget Office (1987) that Social Security benefit payments can "fully replace previous earnings levels" for workers with low lifetime earnings,[3] and that the combination of the Social Security system and employer-sponsored retirement plans are "intended to help assure adequate retirement incomes for as many workers as possible."[4] The study then makes a more general observation about the design of the U.S. retirement system.

> Social Security favors lower-income workers, who receive benefits that are relatively high in proportion to their earnings. In contrast to Social Security, the tax advantages enjoyed by qualified plans accrue primarily to middle- and higher-income people. One can argue that without these tax advantages, upper- and middle-income workers might be less inclined to support the redistributional formula in Social Security than they are now. By the same token, without the redistribution formula in Social Security, there might be pressure to regulate qualified plans even more than now in order to achieve larger benefits for those at the lower end of the income distribution. (Congressional Budget Office 1987, page 11)

Gokhale, Kotlikoff, and Warshawsky (2001) also highlights the relationship between the Social Security system and tax deferral. The study does not formally estimate the benefits of the Social Security system, but it notes the link between the structure of the Social Security system and the study's distributional analysis of the benefits of DC plans.

> In raising the lifetime consumption of the very poor, Social Security lowers their DC benefit rate. It does the opposite for those with higher incomes, especially those who are in the middle class. (Gokhale, Kotlikoff, and Warshawsky 2001, page 10)

Although the link between Social Security and participation in employer-sponsored retirement plans has long been recognized, only a few studies have measured the progressivity of the U.S. retirement system as a whole by jointly estimating the benefits of tax deferral and the Social Security system (Figure 2.1). Goodfellow and Schieber (1993) jointly estimates the lifetime benefits that representative workers receive through employer-sponsored retirement plans and the Social Security system and finds that the overall system—inclusive of both tax deferral and Social Security—is "somewhat progressive up to the Social Security maximum taxable income level, where stabilization of Social Security losses is gradually offset by increased benefits provided through the pension system."[5] The analysis in Goodfellow and Schieber (1993) is updated and expanded in Schieber (2012) and Schieber (2014), with qualitatively similar results. Schieber (2012) concludes with the following admonition: "We

need to view the system from a more holistic perspective."[6] Despite being sound advice, it appears few other analysts have heeded it.

A more recent study, Smith and Toder (2014)—which was undertaken at the same time as the research presented in this book, but that was conducted independently—also focuses on the distribution of benefits from the combination of tax deferral and the Social Security system. It follows a similar approach and, at least preliminarily, reaches conclusions similar to the analysis in this book, but does so using a microsimulation model instead of using simulations of representative workers. The study uses the Urban Institute's Dynamic Simulation of Income Model (DYNASIM3) that incorporates detailed information—both actual and projected—on individual workers. For each individual, the model projects Social Security taxes and benefit payments as well as benefit accruals and asset accumulations in employer-sponsored retirement plans and IRAs. The preliminary results from the research show that the combined benefits of the Social Security system (measured by net benefit payments) and tax deferral (measured by tax expenditures) are progressive when compared with a variety of alternative policies.

FIGURE 2.1

Examples of the Existing Research on the Benefits of the U.S. Retirement System

Policies for which benefits are estimated	Time period over which benefits are estimated	
	Annual benefits	**Lifetime benefits**
Tax deferral only	Burman et al. 2004 » Cross-sectional microsimulation » Present value measure of tax expenditure Congressional Budget Office 2013 » Cross-sectional microsimulation » Cash flow measure of tax expenditure	Gokhale, Kotlikoff, and Warshawsky 2001 » Representative households » Present value of lifetime tax expenditure as percentage of lifetime consumption
Social Security only		Smith, Toder, and Iams 2004 » Panel microsimulation » Present value of net Social Security benefit payments as a percentage of lifetime earnings Congressional Budget Office 2006 » Panel microsimulation » Ratio of present value of Social Security benefit payments to present value of Social Security taxes

Both tax deferral and Social Security		Goodfellow and Schieber 1993 and Schieber 2012, 2014
		» Representative workers
		» Sum of present value of:
		  » Net Social Security benefit payments
		  » Lifetime tax expenditure for tax deferral

Source: Investment Company Institute

In many ways, studies using microsimulation models and studies analyzing a limited number of representative individuals are complementary. Microsimulation models include thousands of observations with a wide range of individual circumstances and are able to estimate average benefits across groups of individuals using various methods of categorization. It is often hard to untangle, however, what exactly is driving the results derived from microsimulation models. In contrast, although the results from representative worker studies may not be fully generalizable to the entire population, they can be more easily used to illustrate the factors influencing the benefits workers receive from the U.S. retirement system.

This study follows the approaches taken in previous studies to measure the lifetime benefits of the U.S. retirement system (Figure 2.1). As with Goodfellow and Schieber (1993); Gokhale, Kotlikoff, and Warshawsky (2001); and Schieber (2012, 2014), this study measures the benefits that accrue over a lifetime for representative workers with different levels of lifetime earnings. Like Goodfellow and Schieber (1993) and Schieber (2012, 2014), this study takes a holistic approach by measuring the benefits of both tax-deferred compensation (received through employer-sponsored retirement plans and IRAs) and the Social Security system. Finally, like Gokhale, Kotlikoff, and Warshawsky (2001), the simulations in this study incorporate a sophisticated calculation of federal and state income taxes, which provide a measure of total tax benefits inclusive of the impact of changing marginal tax rates and the interaction with other tax provisions—in particular, the taxation of Social Security benefit payments.

Although similar to the previous literature, the method used to measure the tax benefits of the U.S. retirement system in this book incorporates three innovations: (1) estimates of the tax expenditures attributable to the Social Security system; (2) workers' savings that are calibrated to reach a target replacement rate; and (3) one retirement plan design for all representative workers.

Tax Expenditure Estimates for Social Security

This study is the first to use the same metric—a tax expenditure estimate—to measure the benefits of both tax deferral and the Social Security system. Previous studies of tax deferral have used tax expenditure estimates to measure its benefits.[7] In contrast, previous studies of the Social Security system have used net benefit payments—the present value of Social Security benefit payments less the present value of Social Security payroll taxes collected—to measure its benefits.[8] This study jointly estimates the tax expenditure associated with both tax deferral and Social Security. That is, it compares lifetime tax liability—inclusive of *both* income taxes and net Social Security taxes—under current policy to lifetime tax liability without both tax deferral and the Social Security system. In addition to measuring net Social Security benefit payments, the tax expenditure estimate also includes the effect of the Social Security system on income tax liability.[9]

The relative benefits of the two programs can only be compared if they are measured using the same metric. Net Social Security benefit payments would represent a tax expenditure measure only if the Social Security system was judged to have no effect on income tax liability relative to the normal income tax structure. The income tax treatment of Social Security, however, is analogous to that of employer-sponsored retirement plans. Social Security would be judged to have no effect on income tax liability only if the current tax treatment of employer-sponsored retirement plans were considered to be part of the normal income tax structure. Of course, if this same standard were used to measure the benefits of

employer-sponsored retirement plans—that is, if it were assumed that the tax treatment of employer plans under current policy is part of the normal income tax structure—then, by definition, there would be no tax expenditure associated with these plans.

Tax Treatment of Social Security Mirrors Tax Treatment of Retirement Plans

Compensation that is deferred through an employer-sponsored retirement plan is taxed differently than other compensation (Figure 2.2, left panel).

» Employer contributions to any type of retirement plan are excluded from a worker's adjusted gross income (AGI) under the income tax, as are elective deferrals made by employees to 401(k)-type plans.[10] When distributions are made during retirement that are attributable to employer contributions or elective deferrals, the entire distribution is included in AGI and subject to income tax.

» Provided they are allowed by the plan, employees may also make (non-Roth) after-tax contributions to both DB and DC retirement plans. These contributions are included in AGI and subject to income tax. When distributions are made during retirement that are attributable to (non-Roth) after-tax contributions, amounts in excess of contributions are included in AGI and subject to income tax.

FIGURE 2.2

Taxation of Social Security Modeled After Tax Treatment of Retirement Plans

Tax treatment for individuals filing a single tax return

	Employer-sponsored retirement plans	Social Security
	Contributions	**Payroll taxes**
Excluded from AGI	» Employer contributions » Employee elective deferrals	» Employer share of payroll taxes
Included in AGI	» (Non-Roth) after-tax employee contributions » Roth contributions	» Employee share of payroll taxes
	Distributions	**Benefit payments**
Excluded from AGI	» Portion of distributions attributable to (non-Roth) after-tax contributions that represent the return of the amount contributed » 100 percent of distributions attributable to Roth contributions	» At least 15 percent of benefit payments if MAGI > $34,000 » At least 50 percent of benefit payments if $25,000 < MAGI ≤ $34,000 » 100 percent of benefit payments if MAGI ≤ $25,000
Included in AGI	» 100 percent of distributions attributable to employer contributions or employee elective deferrals » Portion of distributions attributable to (non-Roth) after-tax contributions that are in excess of the amount contributed	» Up to 85 percent of benefit payments if MAGI > $34,000 » Up to 50 percent of benefit payments if $25,000 < MAGI ≤ $34,000 » 0 percent of benefit payments if MAGI ≤ $25,000

Note: The percentage of Social Security benefit payments included in adjusted gross income (AGI) under the federal income tax is based on a taxpayer's modified adjusted gross income (MAGI). MAGI includes half of Social Security benefit payments plus non–Social Security income included in AGI. For single taxpayers, if MAGI is $25,000 or less, no Social Security benefit payments are included in AGI; if MAGI is between $25,000 and $34,000, the lesser of 50 percent of Social Security benefit payments or 50 percent of MAGI in excess of $25,000 is included in AGI; if MAGI is in excess of $34,000, the lesser of 85 percent of Social Security benefit payments or 85 percent of MAGI in excess of $34,000 plus $4,500 (=50%*($34,000-$25,000)) is included in AGI.

Sources: Internal Revenue Service and Investment Company Institute

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» Some 401(k)-type plans also allow workers to make Roth contributions, which are included in AGI and subject to tax. When distributions are made during retirement that are attributable to Roth contributions, however, the entire distribution is excluded from AGI.[11]

The tax treatment of Social Security mirrors that of employer-sponsored retirement plans (Figure 2.2, right panel).[12] Much like employer contributions to retirement plans, the employer share of payroll taxes is not reported as part of workers' taxable wages and is excluded from AGI. Much like (non-Roth) after-tax employee contributions, the employee share of payroll taxes is reported as part of workers' taxable wages and is included in AGI and subject to income tax. During retirement, only a portion of Social Security benefit payments is included in AGI, with the share dependent on the amount of the taxpayer's income.[13] There are three statutory inclusion rates of zero, 50 percent, and 85 percent.[14] The actual share of Social Security benefit payments included in income can be any percentage from zero to 85 percent because these inclusion rates phase in with income. Depending on the amount of Social Security benefit payments included in AGI, the income tax treatment can be compared with the tax treatment of different types on retirement plan contributions.

» For higher-income taxpayers who include 85 percent of Social Security benefit payments in AGI, the federal income tax treatment under current law is designed to mimic the tax treatment of employer-sponsored retirement plans, with the employee share of payroll taxes treated like (non-Roth) after-tax contributions. As explained in DeWitt (2001), in the late 1970s the Office of the Actuary of the Social Security Administration estimated that the employee share of payroll taxes paid while working, measured in nominal dollars, represented roughly 15 percent of the benefits that workers with high lifetime earnings could expect to receive. To be roughly consistent with the tax treatment of retirement plans, higher-income workers are allowed to exclude 15 percent of Social Security benefit payments from AGI.

» For taxpayers who include less than 85 percent of their Social Security benefit payments in income, the tax treatment is more favorable. For example, if it is assumed that—because payroll taxes are split evenly between the employer share and the employee share—half of Social Security benefit payments can be attributed to the employer share of payroll taxes and half can be attributed to the employee share of payroll taxes, then:

» For taxpayers who include exactly 50 percent of Social Security benefit payments in AGI, the tax treatment of Social Security is equivalent to a mix of tax deferral and Roth tax treatment. That is, the half of Social Security benefit payments attributable to the employer share of payroll taxes are treated like an employer contribution to a retirement plan (contributions excluded from AGI and all distributions included in AGI), and the half attributable to the employee share are taxed like a Roth contribution (contributions included in AGI and all distributions excluded from AGI).

» For taxpayers who do not include any Social Security benefit payments in AGI, the tax treatment of Social Security is equivalent to a mix of a complete exclusion from tax and Roth tax treatment. That is, the half of Social Security benefit payments attributable to the employer share of payroll taxes is not just tax-deferred but, rather, completely exempt from income tax (both contributions and distributions

excluded from AGI) and the half attributable to the employee share is taxed like a Roth contribution (contributions included in AGI and all distributions excluded from AGI).

Measuring the Benefit of Social Security and Tax Deferral Consistently

Using only net benefit payments to measure the benefits of the Social Security system—without accounting for its effect on income tax liability—is inconsistent with using tax expenditure estimates to measure the benefits of tax deferral. Tax expenditure estimates of employer-sponsored retirement plans and IRAs assume that the normal income tax structure would not allow tax deferral. Given that the taxation of Social Security is designed to mimic the tax treatment of retirement plans, Social Security must provide qualitatively the same tax benefits as retirement plans. To be consistent, the effect of Social Security on income tax liability cannot be ignored.

It should be noted that both the JCT and Treasury estimate a tax expenditure for the exclusion of Social Security benefit payments from income, but that these estimates also are not consistent with tax expenditure estimates of tax deferral. As explained in Carroll, Joulfaian, and Mackie (2012), the concept of tax expenditures used by the JCT and Treasury compares the tax treatment of Social Security not to a comprehensive income tax, but rather to the tax treatment of employer-sponsored retirement plans under the current tax code. Therefore, the exclusion of Social Security benefit payments is counted as a tax expenditure only to the extent that it exceeds 15 percent of benefit payments.[15]

This study uses the same measure used in previous research to judge tax deferral in isolation—a tax expenditure estimate—to measure the benefits of the U.S. retirement system as a whole. The benefits of the U.S. retirement system are measured as the difference in lifetime tax liability between a simulation that eliminates both tax deferral and Social Security and the baseline simulation of current policy. Lifetime tax liability includes both income taxes paid and net Social Security taxes paid.[16] Because workers pay zero net Social Security taxes when the Social Security system is eliminated, the tax expenditure associated with the U.S. retirement system can also be expressed as the sum of (1) the reduction in lifetime *income tax* liability associated with the combination of the Social Security system and tax deferral and (2) net Social Security benefit payments.[17]

Workers' Retirement Plan Contributions Calibrated to Reach a Target Replacement Rate

In this study, the savings behaviors of six representative workers under current law are calibrated so that, to the extent allowed by law, all workers achieve the same replacement rate in retirement.[18] That is, net income in retirement—the combination of Social Security benefit payments and 401(k) plan distributions less taxes paid—replaces the same percentage of net earnings—wage income less 401(k) plan contributions and taxes—for each worker.

As a result of this assumption, each worker defers a different percentage of their lifetime earnings in the baseline simulation of current policy. Although all workers have the same replacement rate target, they do not all contribute the same amount to their 401(k) plans. Because the share of wages replaced by Social Security benefit payments declines as lifetime earnings increase, workers with higher lifetime earnings need to begin contributing to 401(k) plans earlier and need to contribute a higher percentage of pay to reach the target replacement rate goal.

Calibrating savings in this way differs from the savings assumptions used to estimate the lifetime benefits of tax deferral in previous studies. When calculating the lifetime benefits of tax deferral for its representative households, Gokhale, Kotlikoff, and Warshawsky (2001) assumes that all workers, regardless of earnings, contribute 16.5 percent of earnings (inclusive of employer matching contributions) in every year. Estimating the benefits of tax deferral for four representative workers, Schieber (2012) also assumes that workers contribute to a retirement plan every year from age 25 through age 64, although it is assumed that workers with higher lifetime earnings contribute a higher percentage of pay.

Having savings behavior that incorporates the generosity of Social Security benefit payments arguably produces more realistic variation in 401(k) plan contributions with lifetime earnings[19] and, all else equal, reduces the estimate of benefits received by lower-wage workers relative to the benefits received by higher-wage workers.

An additional advantage of calibrating retirement plan contributions is that the estimated benefits of tax deferral would be roughly the same for any type of retirement plan that provided the same amount of retirement resources. That is, although the simulation assumes that tax-deferred compensation takes the form of employer and employee contributions to a 401(k) plan, the benefits of tax-deferred compensation paid through a DB plan funded solely with employer contributions would be roughly equivalent, provided DB plan benefits replaced the same percentage of pre-retirement earnings.

One Retirement Plan Design for All Workers

In this study, all workers are assumed to be covered by a retirement plan with the same design. Specifically, all workers are eligible to participate in a 401(k) plan that provides matching employer contributions equal to 50 percent of employee contributions on up to 6 percent of employee pay, for a maximum employer contribution of 3 percent of pay. This is the most common simple matching formula used by 401(k) plans.[20]

The implicit assumption in both Gokhale, Kotlikoff, and Warshawsky (2001) and Schieber (2012) is that low-earning workers and high-earning workers are covered by different plans. Contributions to 401(k) plans are subject to two distinct limits—an employee contribution limit (equal to $17,500 for workers younger than age 50 and $23,000 for workers aged 50 or older in 2014) and a combined employee and employer contribution limit (equal to $52,000 for workers of all ages in 2014).[21] Implicitly, both studies assume that higher earners get more generous employer contributions as a percentage of pay than lower earners.[22] If both higher-paid workers and lower-paid workers were covered by the same retirement plan, nondiscrimination rules would almost certainly not allow the disparity in employer contributions implicit in these studies.[23] Without an explicit assumption that the labor market sorts higher-paid workers and lower-paid workers into different firms, the 401(k) plan contribution assumptions used in these studies are hard to justify.

Simulation Method and Key Assumptions

To illustrate how benefits vary with workers' lifetime earnings, the lifetime benefits of the U.S. retirement system are estimated for six representative workers. The simulations are based on the simulations in Brady (2010). The representative workers were born in 1966, turned 40 in 2006, and will reach their full benefit retirement age under Social Security in 2033, at age 67. All income received by individuals during their lifetime is work related— wage income, Social Security benefit payments, and 401(k) plan distributions.

The representative individuals work continuously from age 32 through age 66—or 35 years, the maximum included in the measure of average indexed monthly earnings (AIME) used to determine Social Security benefit payments.[24] No explicit assumptions are made regarding work prior to age 32 other than (1) that, when indexed for wage growth for use in the Social Security benefit formula, earnings in these years would be lower than earnings from age 32 through age 66; and (2) that the individual does not have any net savings prior to age 32. Any wages earned or taxes paid prior to age 32 are excluded from measures of lifetime total compensation and lifetime taxes.[25]

While working, individuals receive compensation in exchange for their labor. A portion of compensation is used to pay income and payroll taxes; a portion is contributed to a 401(k) plan and set aside for retirement; and the remainder is used to fund consumption expenditures. It is assumed that no saving is done outside of a 401(k) plan.

Workers retire at age 67, which is their Social Security full benefit retirement age.[26] During retirement, income consists of Social Security benefit payments and income generated by 401(k) plan assets. It is assumed workers no longer save during retirement and, because they no longer work, are not subject to payroll tax. A portion of income is used to pay income tax and the remainder is used to fund consumption expenditures.

All workers are assumed to survive until retirement. During retirement, it is assumed that the probability a retiree is alive declines with age. All representative workers are assumed to have the same probability of survival at every age.[27] Annual survival rates for a 67-year-old in 2033 are assumed to be equal to annual survival rates for a 65-year-old in 2003, as reported in Arias (2006). This is roughly consistent with the intermediate projection in Social Security Administration (2006) that assumes life expectancy at age 65 will increase 1.9 years for males and 1.5 years for females between 2005 and 2035.

All dollar amounts presented in the simulation results are adjusted for inflation and reported in constant 2014 dollars. As in Brady (2010), inflation assumptions are based on projected inflation in Social Security Administration (2006). All average income measures that are reported for retirees are weighted by survival probability.

Lifetime Earnings Paths

The lifetime earnings paths of the six representative workers plotted in Figure 2.3 are based on the lifetime earnings paths derived in Brady (2010). For each earnings path, earnings at age 40 (Figure 2.4, row 1) are based on 2006 median earnings of full-time, full-year workers aged 35 through 44 with different levels of education.[28] Among all workers from age 35 through age 44 with positive earnings, the earnings of the representative workers at age 40 represent the 18th, 46th, 73rd, 85th, 92nd, and 98th percentiles of the earnings distribution, respectively (Figure 2.4, row 2).

Individuals' inflation-adjusted average wage income from age 32 through age 66 (Figure 2.4, row 3) serves as the basis for the workers' "names," with all dollar amounts expressed in constant 2014 dollars. Among all full-time, full-year workers from age 35 through age 44, the six representative workers' earnings at age 40 represent, respectively,

- » **Earn21K**, half the median earnings of high school graduates;
- » **Earn43K**, the median earnings of high school graduates;
- » **Earn69K**, the median earnings of workers with a bachelor's degree;
- » **Earn92K**, the median earnings of workers with a graduate degree;
- » **Earn122K**, earnings one-third higher than median earnings of workers with a graduate degree; and

FIGURE 2.3

Lifetime Earnings Paths for Six Representative Workers

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

Earnings
Thousands, 2014 dollars

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. Lifetime earnings paths are anchored at age 40 with earnings equal to median earnings of full-time, full-year workers from age 35 through age 44 in 2006 with a high school degree (Earn43K), a bachelor's degree (Earn69K), and a graduate degree (Earn92K). Other earnings paths have earnings at all ages equal to half of the earnings of the Earn43K worker (Earn21K) and one-third more than the Earn92K worker (Earn122K). The final earnings path (Earn234K) is for a worker with earnings that are 20 percent higher than the Earn122K worker at age 32, with earnings increasing to be twice as high as the Earn122K worker by age 40, and then remaining twice as high thereafter.

Source: ICI simulations

» **Earn234K**, a worker with earnings that are 20 percent higher than the Earn122K worker at age 32, with earnings increasing to be twice as high as the Earn122K worker by age 40, and then remaining twice as high thereafter.

Taxes

The simulations account for federal and state individual income taxes and federal payroll taxes. The income tax calculator was originally created for Brady (2010). The calculator is based on 2006 tax law, with relevant parameters indexed for inflation both prior to and after 2006, without regard to rounding rules.[29] Adjustments are made to the federal income tax calculator to account for legislation passed in 2012 and effective in 2013. These changes include the new top statutory tax rate of 39.6 percent, the phaseout of personal exemptions, the phaseout of itemized deductions, and changes made to the alternative minimum tax (AMT). State income taxes are calculated using the Virginia income tax. Federal payroll taxes include both Social Security taxes (OASDI) and Medicare taxes (HI). The Social Security portion of the payroll tax is a tax of 12.4 percent imposed on earnings below the annual earnings base ($117,000 for 2014), with half (or 6.2 percent) paid by the employee and half paid by the employer. The Medicare portion of the payroll tax, which is a tax of

2.9 percent, is imposed on all earnings without limit, with half (or 1.45 percent) paid by the employee and half paid by the employer.[30]

Social Security Benefit Payments

Social Security benefit payments are based on an individual's earnings history, with earnings below the annual earnings base ($117,000 for 2014) included in the calculation. The benefit formula is progressive, with benefits representing a higher share of earnings for workers with lower lifetime earnings than it does for those with higher lifetime earnings.[31] In general, individuals who have worked for 10 years are eligible to receive Social Security benefit payments.[32] Growth in the Average Wage Index (AWI) used in calculating benefit payments is based on projections in Social Security Administration (2006).

Target Replacement Rates and Calibrated 401(k) Plan Contributions

Each individual is assumed to work for an employer with a 401(k) plan, with the employer offering 50 percent matching contributions up to 6 percent of compensation, for a maximum employer matching contribution of 3 percent of compensation.[33]

The age at which employees begin participating in their 401(k) plan and the percentage of salary that the employee contributes to the plan are based on the savings assumptions used in Brady (2010), but calibrated so that, when combined with Social Security, each worker has net retirement income—the combination of Social Security benefit payments and 401(k) plan distributions less taxes—that replaces 94 percent of average (age 32 through age 66) inflation-indexed net earnings—wage income less taxes and 401(k) plan contributions. The lone exception to this rule is the Earn234K worker, who—because of legal limits on the amount of compensation that can be deferred and the amount of compensation that can be considered when calculating employer matching contributions—cannot set aside enough compensation to achieve the replacement rate of the other workers.[34]

Replacing 94 percent of average inflation-indexed net earnings was chosen as the replacement rate target because it represents a reasonable estimate of adequate retirement resources. Using data on households before and after retirement, Hurd and Rohwedder (2008) finds a median decline in total spending of about 6 percent. Hurst (2008) illustrates that the decline in household spending that occurs as households enter retirement is concentrated in work-related expenses. Once individuals retire, they no longer incur the costs associated with working and can reduce overall spending while still maintaining their standard of living—that is maintaining their non-work-related spending.

Although all workers have the same replacement rate target, they do not all contribute to the 401(k) at the same rate (Figure 2.4). Because the share of a worker's average wage replaced by Social Security declines as lifetime earnings increase, workers with higher lifetime earnings need to begin contributing to 401(k) plans earlier and need to contribute a higher percentage of pay to reach the target replacement rate goal.

» The age that workers begin participating in 401(k) plans ranges from age 52 for the Earn21K worker to age 32 for the Earn234K worker (Figure 2.4, row 4).

» The percentage of pay deferred is 4 percent for the Earn21K worker; 6 percent for the Earn43K, Earn69K, and Earn92K workers; and 7 percent for the Earn122K worker (Figure 2.4, row 5). Because of limits on contributions, the Earn234K worker cannot save enough to reach the replacement rate goal. Instead, it is assumed that the Earn234K worker contributes the maximum amount allowed by law to the 401(k) plan in every

year from age 32 through age 66, including catch-up contributions beginning at age 50. The result is that the Earn234K worker defers 8.5 percent of wage income, on average, from age 32 through age 66.

» Employer matching contributions are equal to 2 percent of pay for the Earn21K worker because the worker contributes 4 percent of pay (Figure 2.4, row 6), which is less than all the other representative workers. The other representative workers are assumed to contribute 6 percent of pay or more and receive the maximum employer matching contribution (3 percent of pay).[35]

401(k) Plan Investments and Rate of Return

Contributions are assumed to be invested in Treasury bonds with a 3.0 percent real rate of return. For most of the projection period, this translates into a 5.8 percent nominal rate of return, which is paid annually as interest.

At retirement, account balances, in constant 2014 dollars, range from about $26,000 for the Earn21K worker to $1.57 million for the Earn234K worker (Figure 2.4, row 7). These assets are used to purchase an actuarially fair inflation-indexed immediate annuity.[36]

FIGURE 2.4

Savings Assumptions Used in Current Policy Baseline Simulations

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

	Representative individuals with various levels of lifetime earnings[1]					
	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Earnings						
Wage income at age 40[1]	$20,472	$40,944	$65,433	$88,648	$118,197	$236,394
Wage income rank at age 40[1]	18th	46th	73rd	85th	92nd	98th
Average wage income age 32 through age 66	$21,497	$42,994	$69,299	$91,818	$122,424	$234,046
401(k) plan participation[2]						
Age at which 401(k) plan contributions begin	52	47	43	37	36	32
Employee deferral rate (percent)[3]	4.0%	6.0%	6.0%	6.0%	7.0%	8.5%
Employer contribution rate (percent)[4]	2.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Account balance at age 66	$26,033	$111,044	$227,350	$404,593	$625,700	$1,566,598

[1] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[2] Contributions are invested in bonds. All investment returns are in the form of interest payments that are paid annually earning interest equal to 3.0 percent plus inflation. Upon retirement, account balances are used to purchase an actuarially fair, inflation-indexed, immediate life annuity. Deferral rates and the ages at which contributions begin are based on Brady 2010, but are calibrated so that each representative individual achieves the same replacement rate in retirement, with the replacement rate measured as the ratio of average annual net retirement income to average annual net earnings. The lone exception is the Earn234K worker, who contributes the maximum allowed by law but cannot achieve the same replacement rate.

[3] The Earn234K worker contributes the maximum allowed by law from age 32 through age 66, inclusive of catch-up contributions beginning at age 50.

[4] The employer match formula is 50 percent of employee contributions up to a maximum of 6 percent of pay, resulting in a maximum matching contribution of 3 percent of pay. The match rate for the Earn234K worker is 3 percent of pay, but is subject to the limit on considered compensation (Internal Revenue Code Section 401(a)(17)), which limits the amount of compensation upon which matching contributions are calculated. The considered compensation limit is binding from age 58 through age 66. Because of this, the average employer match for the Earn234K worker is 2.99 percent of wage income.

Source: ICI simulations

Sensitivity of Results to Key Assumptions

Estimates of the lifetime benefits of 401(k) plans are sensitive to the assumptions used in the simulations. In particular, estimates are sensitive to the assumptions used for the rate of return, the character of investment returns, the method of distribution, annuity pricing, and the target replacement rates. Every effort was made to use reasonable assumptions. To the extent that there was a range of reasonable assumptions to choose from, the assumptions chosen are more likely, as a group, to err on the side of overestimating, rather than underestimating, the lifetime benefits of tax deferral.

» Rate of return: It is assumed that the nominal risk-free rate of return is 5.8 percent over most of the projection period. This is slightly below the 6.5 percent average yield on 10-year Treasury securities since 1962.[37] Since the beginning of September 2008, however, the yield on 10-year Treasury securities has averaged just under 2.7 percent. If current market interest rates were used, the estimated benefits of tax deferral would be reduced substantially.[38] In addition, use of current market interest rates would increase the estimated benefits of the Social Security system substantially.

» Character of investment returns: It is assumed that investment returns are in the form of annual interest payments. The estimated benefits of tax deferral would be reduced if investment returns were in the form of dividends and capital gains.[39]

» Method of distribution: It is assumed that 401(k) plan account balances are used during retirement to purchase an actuarially fair inflation-indexed immediate annuity. If it was assumed instead that 401(k) plan balances were distributed using systematic withdrawals based on life expectancy, the estimated benefits would be higher because the systematic withdrawals effectively increase the length of deferral. As illustrated in Brady (2012b), however, the two methods produce benefit estimates that do not differ by much.[40]

» Annuity pricing: The price of immediate annuities is assumed to be actuarially fair. That is, the price of the annuity is equal to the expected present value of annuity payments over the remainder of the annuitant's life.[41] The price paid in the private market for annuities is not actuarially fair for the average individual because of adverse selection: individuals who choose to buy annuities live longer, on average, than the general population, and insurers adjust their pricing to reflect this.[42] Using market-priced annuities rather than actuarially fair annuities would reduce the estimated benefits of tax deferral (and increase the estimated benefits of Social Security) by reducing the implicit rate of return earned on investments.

» Target replacement rate: It is assumed that retirees save enough so that the combination of Social Security benefit payments and 401(k) plan distributions results in net retirement income that is 94 percent of net pre-retirement earnings. Although a 94 percent replacement of net pre-retirement income is arguably a reasonable estimate of adequate retirement resources, there is no consensus as to what constitutes retirement resource adequacy, and reasonable arguments could be made in favor of having a higher or lower target replacement rate.[43] Lower target replacement rates would reduce the benefits of tax deferral (because individuals would reduce 401(k) plan contributions) and, for individuals whose contributions were not constrained by contributions limits, higher target replacement rates would increase the benefits of tax deferral (because individuals would increase 401(k) plan contributions).

Although the benefit estimates are sensitive to the assumptions used in their calculation, the relative benefits of tax deferral by lifetime earnings—which is the focus of this analysis—would not be greatly affected by these assumptions. This is because, whether they would increase or decrease the estimated benefits of tax deferral, alternative assumptions would affect the results for all workers.

Work and Retirement Outcomes Under Current Policy

This section summarizes the baseline simulation results of work and retirement outcomes under the current tax and transfer policy in the United States. Measures of total income and net income while working and during retirement are defined and the simulated values for these measures are presented for six representative workers. The income measures are then used to calculate income replacement rates during retirement and to analyze the composition of retirement income. All dollar amounts discussed in the text and presented in the figures are in constant 2014 dollars.

Illustrative Results for the Earn69K Worker

Before presenting results for all six workers, the concepts are illustrated by examining one of the workers—the Earn69K worker—in more detail. The Earn69K worker has earnings at age 40 equal to the median earnings of full-time, full-year workers aged 35 through 44 with a bachelor's degree. The earnings of the Earn69K worker at age 40 represent the 73rd percentile of earnings among all workers aged 35 through 44 with positive earnings (Figure 2.4).

On average from age 32 through age 66, the Earn69K worker has wage income equal to about $69,000 (in constant 2014 dollars). For this worker, earnings increase from approximately $57,000 at age 32 to about $65,000 at age 40 to about $76,000 at age 66 (Figure 2.5). The portion of wage income shown in green is used to pay federal and state income taxes, the portion in orange is used to pay the employee share of payroll taxes (both Social Security [OASDI; Old Age, Survivor, and Disability Insurance] and Medicare [HI; Hospital Insurance]), and the portion in light blue is used to fund employee contributions to the 401(k) plan. The portion of wage income shown in dark blue represents net earnings, which is the amount of wage income available, after paying taxes and making 401(k) plan contributions, to fund the worker's pre-retirement consumption expenditures. Net earnings average a little less than $48,000 from age 32 through age 66 and range from about $42,000 at age 32 to just below $51,000 at age 66, in constant 2014 dollars.

For every year the individual is alive during retirement, total retirement income is equal to approximately $47,850 (Figure 2.5). At age 67, the worker retires and gets retirement income from two sources: Social Security benefit payments and an actuarially fair inflation-indexed immediate annuity purchased with financial assets accumulated in the 401(k) plan. Because both Social Security benefit payments and 401(k) plan distributions are in the form of an inflation-indexed immediate annuity, inflation-indexed total retirement income is, conditioned on survival, constant throughout retirement.

Despite having constant inflation-indexed total retirement income, net retirement income (shown in dark blue) declines with age (Figure 2.5). This is because the federal income tax provision that excludes a portion of Social Security benefit payments is not indexed for inflation, which causes federal income taxes to increase with age.[44] Combined federal and state income taxes (shown in green) increase from about $2,550 at age 67 to about $3,800 at age

100. Conditioned on survival, net retirement income averages $44,788 from age 67 through age 100 and ranges from about $45,300 at age 67 to about $44,050 at age 100.

The difference between total income and net income is smaller during retirement because: (1) retirees are not subject to payroll tax (Figure 2.5, orange area); (2) retirees no longer set aside a portion of their income in the 401(k) plan (light blue area); and (3) federal and state income taxes are lower during retirement (green areas). Income taxes decline during retirement both because total income is lower and because only a portion of Social Security benefit payments is subject to tax.[45]

Using the Earn69K worker as an example, Figure 2.6 illustrates the various measures of average income that will be used throughout this study. These averages are calculated from the annual data plotted in Figure 2.5.

Illustration of Current Tax Policy Baseline Simulation: Wage Income and Retirement Income for the Earn69K Worker

Wage income from age 32 through age 66 and total retirement income (Social Security plus annuity purchased with 401(k) plan assets) starting at age 67, all dollar amounts expressed in constant 2014 dollars
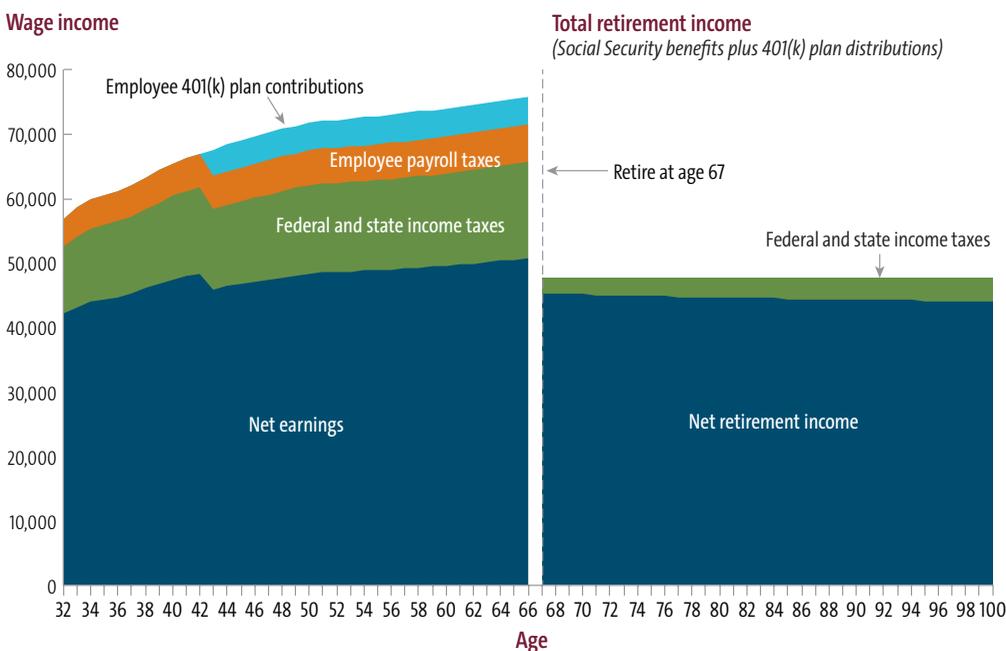
Wage income

Total retirement income
(Social Security benefits plus 401(k) plan distributions)

Employee 401(k) plan contributions

Employee payroll taxes

Federal and state income taxes

Retire at age 67

Federal and state income taxes

Net earnings

Net retirement income

Age

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

Income While Working

Three measures of pre-retirement income are presented in the upper panel of Figure 2.6: total compensation, wage income, and net earnings. All three measures are inflation-adjusted income averaged from age 32 through age 66.

» **Total compensation** is the employer's total compensation costs for the Earn69K worker—inclusive of the worker's wage income (Figure 2.6, the red portion of the bar), the employer share of the payroll tax (the orange portion of the bar), and employer 401(k) plan contributions (the light blue portion of the bar). Total compensation for the Earn69K worker averages $76,091 annually from age 32 through age 66. Although it is not directly used in the calculation of the target replacement rate, comparisons of alternative policies are facilitated by expressing each worker's lifetime tax burden as a percentage of lifetime total compensation.[46]

» **Wage income** of the Earn69K worker from age 32 through age 66, which is illustrated in Figure 2.5, averages $69,299 per year in constant 2014 dollars (Figure 2.6, upper panel).

» **Net earnings** (the dark blue portion of the bar) is the Earn69K worker's wage income less federal and state income taxes (Figure 2.6, the green portion of the bar), the employee share of payroll taxes (the dark orange portion of the bar), and employee contributions to the 401(k) plan (the light blue portion of the bar). Net earnings for the Earn69K worker averages $47,715 annually. On average from age 32 through age 66, net earnings are 69 percent of wage income.

Income During Retirement

Two measures of retirement income are presented in the lower panel of Figure 2.6: total retirement income and net retirement income. Both measures are averages of income for ages 67 and older, adjusted for inflation and survival probability.[47]

» **Total retirement income** is the combination of the Earn69K worker's Social Security benefit payments (the dark orange portion of the bar) and distributions from 401(k) plans (the light blue portion of the bar), which are in the form of an actuarially fair inflation-indexed immediate annuity. Total retirement income for the Earn69K worker is $47,842 per year during retirement in constant 2014 dollars.

» **Net retirement income** (the dark blue portion of the bar) is total retirement income less federal and state income taxes (the green portion of the bar). The survival-weighted average of net retirement income for the Earn69K worker is $44,788 per year. On average during retirement, net retirement income represents 94 percent of total retirement income.

FIGURE 2.6

Illustration of Alternative Income Measures: Current Tax Policy Baseline Simulation for the Earn69K Worker

Inflation-adjusted income for one representative individual, all dollar amounts expressed in constant 2014 dollars

- ■ Wage income
- ■ Employer share of payroll taxes
- ■ Employer 401(k) plan contributions
- ■ Net earnings
- ■ Federal and state income taxes
- ■ Employee share of payroll taxes
- ■ Employee 401(k) plan contributions

Working (average from age 32 through age 66)

Total compensation: $76,091

		1,491
69,299	5,301	

Wage income: $69,299

47,715	13,301	5,301	2,982

Net earnings: $47,715

47,715

- ■ Social Security benefits
- ■ 401(k) plan distributions
- ■ Net retirement income
- ■ Federal and state income taxes

Retired (survival-weighted average age 67 and older)

Total retirement income: $47,842

30,639	17,203

Total retirement income: $47,842

44,788	3,054

Net retirement income: $44,788

44,788

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

Replacement Rates

Typical replacement rates measure the extent to which total (or gross) retirement income replaces total (or gross) pre-retirement income (see, for example, Aon 2008). In the simulations, the gross replacement rate for the Earn69K worker is 69 percent. This is the ratio of survival-weighted average total retirement income of $47,842 (Figure 2.6, lower panel) to average wage income of $69,299 (upper panel). Looking at the components of total retirement income separately, the Earn69K worker's annual Social Security benefit payments of $30,639 replace 44 percent of average wage income, and annual 401(k) plan distributions of $17,203 replace 25 percent (lower panel).

Rather than use a gross replacement rate measure, this study uses a net replacement rate measure to calibrate 401(k) plan contributions. A net replacement rate assesses the extent to which net retirement income can replace net pre-retirement earnings. As explained in Brady (2012a), the replacement of net earnings more directly measures the ability of retirees to maintain their pre-retirement consumption expenditures. In the simulations, the net replacement rate for the Earn69K worker is the target rate of 94 percent. This is the ratio of survival-weighted average net retirement income of $44,788 (Figure 2.6, lower panel) to average net earnings of $47,715 (upper panel).

Composition of Retirement Income

Despite having relatively high earnings—annual earnings at age 40 are in the 73rd percentile of earnings among all workers from age 35 through age 44 with positive earnings (see Figure 2.4)—the Earn69K worker gets the bulk of retirement income from Social Security benefit payments. During retirement, Social Security benefit payments of $30,639 are 64 percent of the $47,842 of total retirement income, and 401(k) plan distributions of $17,203 are 36 percent (Figure 2.6, lower panel).

Results for All Representative Workers

Simulations were run for all six representative workers. The results of the simulations are summarized in Figure 2.7. Again, all dollar amounts are expressed in constant 2014 dollars.

Income While Working

While individuals are working, all income is in the form of labor compensation; it is assumed that no investment income is realized. Three measures of pre-retirement income are presented in Figure 2.7: total compensation (row 4), wage income (row 3, row 5, and row 8), and net earnings (row 12). All three measures are inflation-adjusted income, averaged from age 32 through age 66.

» **Total compensation** (Figure 2.7, row 4) is the combination of wage income (row 5), the employer share of payroll taxes (row 6), and employer matching contributions to the 401(k) plan (row 7). Average total compensation ranges from $23,337 for the Earn21K worker to $252,215 for the Earn234K worker.

» **Wage income** (Figure 2.7, row 3, row 5, and row 8), which excludes the employer share of payroll taxes (row 6), and employer matching contributions to the 401(k) plan (row 7), ranges from $21,497, on average, for the Earn21K worker to $234,046 for the Earn234K worker.

FIGURE 2.7

Summary of Current Tax Policy Baseline Simulation Results

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

	Representative individuals with various levels of lifetime earnings[1]					
	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Earnings						
(1) Wage income at age 40[1]	$20,472	$40,944	$65,433	$88,648	$118,197	$236,394
(2) Wage income rank at age 40[1]	18th	46th	73rd	85th	92nd	98th
(3) Average wage income age 32 through age 66	$21,497	$42,994	$69,299	$91,818	$122,424	$234,046
Average compensation and wage income, age 32 through age 66						
(4) **Total compensation = (5) + (6) + (7)**	**$23,337**	**$47,058**	**$76,091**	**$101,261**	**$135,022**	**$252,215**
(5) Wage income	21,497	42,994	69,299	91,818	122,424	234,046
(6) Employer share of payroll taxes[2]	1,645	3,289	5,301	7,024	9,279	11,174
(7) Employer 401(k) plan matching contributions	196	774	1,491	2,419	3,318	6,995
(8) **Wage income = (5)**	**$21,497**	**$42,994**	**$69,299**	**$91,818**	**$122,424**	**$234,046**
(9) Federal and state income taxes[2]	1,901	6,090	13,301	19,655	28,665	62,222
(10) Employee share of payroll taxes[2]	1,645	3,289	5,301	7,024	9,279	11,174
(11) Employee 401(k) plan contributions	392	1,549	2,982	4,838	7,743	19,875
(12) **Net earnings = (8) - (9) - (10) - (11)**	**17,560**	**32,067**	**47,715**	**60,301**	**76,736**	**140,774**
(13) Net earnings as a percentage of wage income = (12) / (8)	82%	75%	69%	66%	63%	60%
Survival-weighted average annual retirement income, age 67 and older						
(14) **Total survival-weighted retirement income = (15) + (16)**	**$16,449**	**$30,384**	**$47,842**	**$64,939**	**$86,433**	**$158,316**
(15) Social Security benefit payments	14,479	21,982	30,639	34,325	39,088	39,776
(16) 401(k) plan distributions	1,970	8,402	17,203	30,614	47,345	118,539
(17) Share of retirement income from Social Security = (15) / (14)	88%	72%	64%	53%	45%	25%
(18) Share of retirement income from 401(k) plan distributions = (16) / (14)	12%	28%	36%	47%	55%	75%
(19) **Total retirement income = (14)**	**$16,449**	**$30,384**	**$47,842**	**$64,939**	**$86,433**	**$158,316**
(20) Federal and state income taxes[2]	0	334	3,054	8,390	14,581	39,082
(21) **Net retirement income = (19) - (20)**	**16,449**	**30,050**	**44,788**	**56,549**	**71,851**	**119,234**
(22) Net retirement income as a percentage of total retirement income = (21) / (19)	100%	99%	94%	87%	83%	75%

Continued on next page

FIGURE 2.7 CONTINUED

Summary of Current Tax Policy Baseline Simulation Results

Individuals born in 1966 and who retire in 2033; all dollar amounts expressed as constant 2014 dollars

		Representative individuals with various levels of lifetime earnings[1]					
		Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Earnings replacement rates in retirement							
(23)	Total retirement income as a percentage of wage income = (14) / (8)	77%	71%	69%	71%	71%	68%
(24)	Social Security benefit payments as a percentage of wage income = (15) / (8)	67	51	44	37	32	17
(25)	401(k) plan distributions as a percentage of wage income = (16) / (8)	9	20	25	33	39	51
(26)	Net retirement income as a percentage of net earnings = (21) / (12)	94%	94%	94%	94%	94%	85%

[1] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[2] Simulations assume that current tax policy (appropriately indexed for inflation) applies in all periods of the simulation.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

» **Net earnings** (Figure 2.7, row 12), is equal to wage income (row 8) less federal and state income taxes (row 9) less the employee share of payroll taxes (row 10) less employee contributions to the 401(k) plan (row 11). Average net earnings range from $17,560 for the Earn21K worker to $140,774 for the Earn234K worker.

Net earnings represent a smaller share of wage income for workers with higher lifetime earnings. For example, average net earnings are 82 percent of average wage income for the Earn21K worker, but fall to 60 percent for the Earn234K worker (Figure 2.8, upper panel). There are two reasons why the ratio of net earnings to wage income is lower for workers with higher lifetime earnings. First, federal and state income taxes are progressive, so income taxes represent a higher share of income for higher earners. On average while individuals are working, federal and state income taxes increase from 9 percent of wage income for the Earn21K worker to 27 percent for the Earn234K worker. Second, higher earners contribute a higher share of their pre-retirement income to 401(k) plans. On average from age 32 through age 66, the Earn21K worker contributes about 2 percent of wage income to the 401(k) plan, whereas the Earn234K worker contributes just under 8.5 percent.[48]

Income During Retirement

During retirement, all income is from two sources: Social Security benefit payments and distributions from 401(k) plans (in the form of an actuarially fair inflation-indexed immediate annuity). Two measures of retirement income are presented in Figure 2.7: total retirement

FIGURE 2.8

Net Income Is a Higher Share of Total Income in Retirement

Net earnings as a percentage of wage income while working

- ▇ Employee 401(k) plan contributions
- ▇ Employee payroll taxes paid
- ▇ Federal and state income taxes
- ▇ Net earnings[1]

Lifetime earnings path[2]
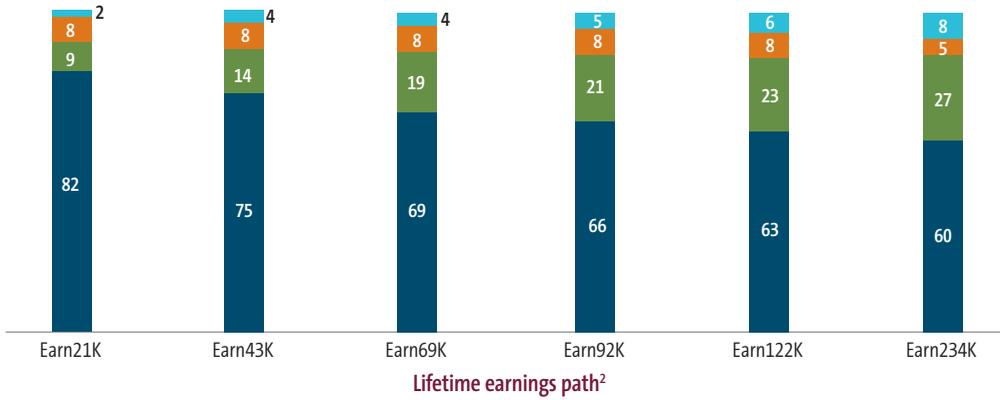
Net retirement income as a percentage of total retirement income during retirement

- ▇ Federal and state income taxes
- ▇ Net retirement income[3]

Lifetime earnings path[2]

[1] See row 13 of Figure 2.7.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[3] See row 22 of Figure 2.7.

Note: See Figure 2.7 for additional detail. Components may not add to 100 percent because of rounding.

Source: ICI simulations

income (row 14 and row 19) and net retirement income (row 21). Both measures are averages of income for ages 67 and older, adjusted for inflation and survival probability.[49]

> » **Total retirement income** (Figure 2.7, row 14 and row 19) is the sum of Social Security benefit payments (row 15) and distributions from the 401(k) account (row 16). Both Social Security benefit payments and annuity payments from the 401(k) plan are indexed to inflation. Total retirement income ranges from $16,449 annually for the Earn21K worker to $158,316 annually for the Earn234K worker.

> » **Net retirement income** (Figure 2.7, row 21) is total retirement income (row 19) less federal and state income taxes (row 20). Annual net retirement income ranges from $16,449 for the Earn21K worker (who pays no federal or state income taxes during retirement) to $119,234, on average, for the Earn234K worker.

For all individuals, the ratio of net income to total income is much higher during retirement than when working. For example, in addition to paying no payroll taxes and making no 401(k) plan contributions during retirement, the Earn21K worker also pays no federal or state income tax. Thus, the ratio of net retirement income to total retirement income is 100 percent (Figure 2.8, lower panel) compared with a ratio of net earnings to wage income of 82 percent while working (upper panel). Although the Earn234K worker has a much higher income tax burden during retirement than the Earn21K worker, the Earn234K worker's ratio of net income to total income is still higher during retirement than it was while working. Income taxes as a share of income are only slightly lower during retirement for the Earn234K worker, falling from 27 percent of wage income while working to 25 percent of total retirement income. Nonetheless, combined with the absence of payroll taxes and 401(k) plan contributions, the Earn234K worker's ratio of net income to total income increases during retirement: the ratio of net retirement income to total retirement income is 75 percent, compared with a ratio of net earnings to wage income of 60 percent while working.

Replacement Rates

Despite having different gross replacement rates, the first five representative workers ranked by lifetime earnings all replace the same share of net income during retirement. At age 40, earnings for these workers range from the 18th percentile to the 92nd percentile among all workers from age 35 through age 44 with positive earnings (Figure 2.7). For these workers, gross replacement rates range from 77 percent for the Earn21K worker to 69 percent for the Earn69K (Figure 2.9). Despite having different gross replacement rates, net retirement income is 94 percent of pre-retirement earnings for all five of these representative workers.

The worker with both the lowest gross replacement rate and the lowest net replacement rate is the Earn234K earner (Figure 2.9). Retirement plan contribution assumptions used in the simulations were calibrated so that, where possible, all representative workers replaced the same percentage of net earnings during retirement. Because of limitations on employee contributions and, to a lesser extent, the limits on compensation that can be taken into account in an employer-sponsored retirement plan, net retirement income only replaces 85 percent of net earnings for the Earn234K worker.[50]

FIGURE 2.9

Workers Replace Different Shares of Wage Income, but the Same Share of Net Earnings

Percent
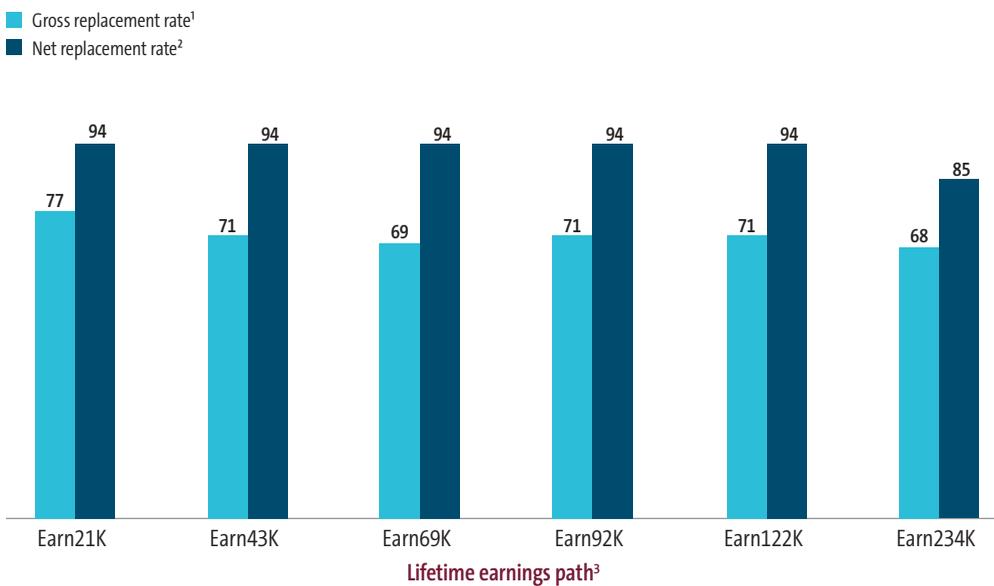
■ Gross replacement rate[1]
■ Net replacement rate[2]

Lifetime earnings path[3]

[1] The gross replacement rate is the survival-weighted average (ages 67 and older) inflation-adjusted total retirement income divided by average (from age 32 through age 66) inflation-adjusted wage income. See row 23 of Figure 2.7.

[2] The net replacement rate is the survival-weighted average (ages 67 and older) inflation-adjusted net retirement income divided by average (from age 32 through age 66) inflation-adjusted net earnings. See row 26 of Figure 2.7.

[3] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

The simulations illustrate the progressivity of the Social Security benefit formula. The $14,479 of annual Social Security benefit payments received by Earn21K worker (Figure 2.7, row 15) represents 67 percent of the worker's average inflation-adjusted wage income (Figure 2.10). In comparison, the $21,982 of annual Social Security benefit payments received by the Earn43K worker (Figure 2.7, row 15) represents 51 percent of average wages (Figure 2.10). The Earn234K worker receives little more in Social Security benefit payments, at $39,776 per year, than does the Earn122K worker, at $39,088 per year (Figure 2.7, row 15). This is because, despite having much higher earnings, most of the additional earnings are in excess of the Social Security earnings base and are neither subject to Social Security taxes nor included in the Social Security benefit formula.[51] The result is that annual Social Security benefit payments represents just 17 percent of the Earn234K worker's average wage income, compared with 32 percent for the Earn122K worker (Figure 2.10).

FIGURE 2.10

Social Security Replaces a Higher Share of Wage Income for Lower Earners

Social Security replacement rate; Social Security benefit payments as percentage of average (from age 32 through age 66) inflation-adjusted wage income

Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
67	51	44	37	32	17

Lifetime earnings path
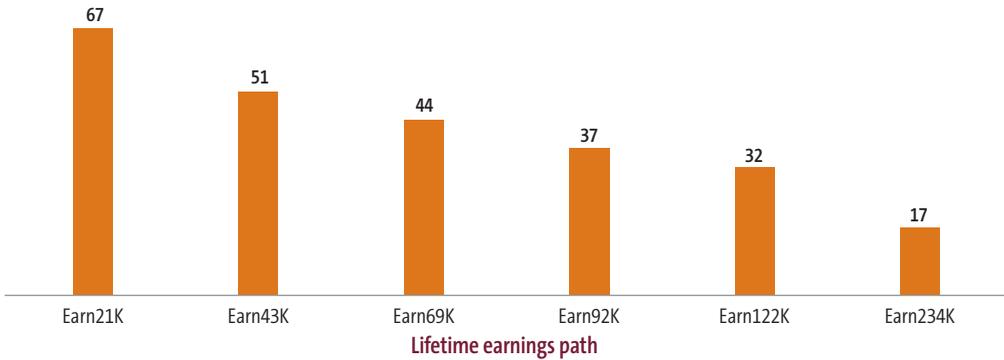
Note: This figure plots row 24 from Figure 2.7. The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

The share of wage income replaced by 401(k) plan distributions has the opposite pattern by lifetime earnings, complementing the share replaced by Social Security benefits. As a share of wage income, 401(k) plan distributions range from 9 percent for the Earn21K worker to 51 percent for the Earn234K worker (Figure 2.7, row 25).

Composition of Retirement Income

Because of the progressivity of the Social Security benefit formula, workers with lower lifetime earnings get a higher share of their retirement income from Social Security benefit payments. In the simulations, the share of total retiree income from Social Security ranges from 88 percent for the Earn21K worker to 25 percent for the Earn234K worker (Figure 2.11). The simulation results in this study are consistent with empirical evidence that Social Security benefit payments comprise a much larger share of retirement income for lower-income and lower-wealth retiree households.[52]

In contrast with Social Security benefit payments, 401(k) plan distributions increase in importance with lifetime earnings. Overall, the share of total retirement income from 401(k) plan distributions ranges from 12 percent for the Earn21K worker to 75 percent for the Earn234K worker (Figure 2.11).

FIGURE 2.11

Social Security Benefit Payments Are a Higher Share of Total Retirement Income for Lower Earners

Composition of total retirement income by source, percentage of total retirement income

- 401(k) plan distributions
- Social Security benefit payments

Lifetime earnings path	401(k) plan distributions	Social Security benefit payments
Earn21K	12	88
Earn43K	28	72
Earn69K	36	64
Earn92K	47	53
Earn122K	55	45
Earn234K	75	25

Lifetime earnings path
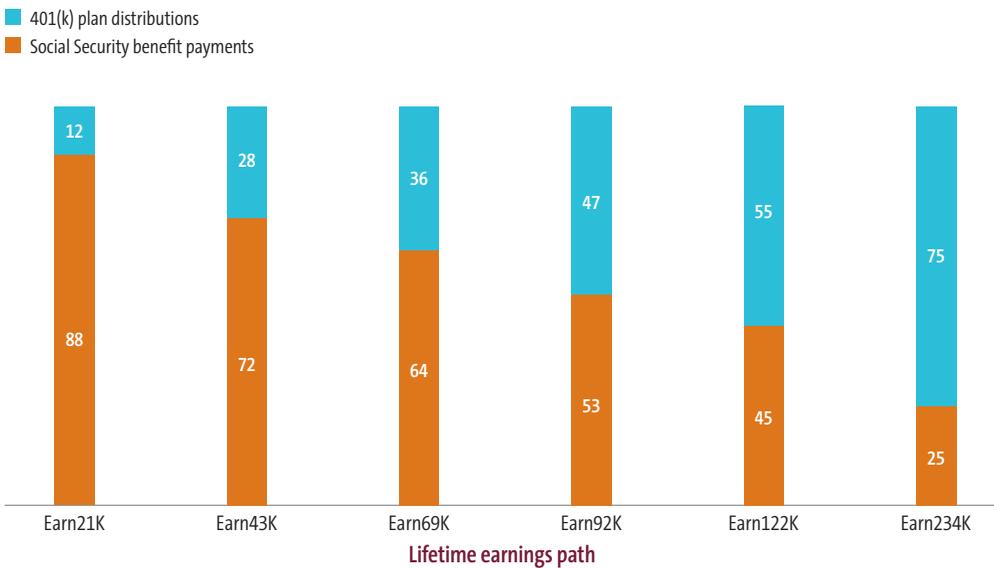
Note: This figure plots lines 17 and 18 from Figure 2.7. The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulation

Lifetime Tax Burden Under Current Policy

Before estimating the benefits of the U.S. retirement system, this section illustrates the lifetime tax burden faced by the representative workers in the baseline simulation of current policy. The lifetime tax burden for an individual worker is the present value of all income and payroll taxes paid over the worker's lifetime less the present value of Social Security benefit payments. To facilitate comparisons across workers, the lifetime tax burden is expressed as a percentage of each worker's income. To facilitate comparisons between the baseline simulation of current policy and simulations of alternative policies, the measure of lifetime income used is the present value of a worker's lifetime total compensation.[53]

To better understand how the net tax burden of individuals would change under alternative policies, the tax burden of workers in the baseline simulation of current policy is separated into three categories:

- » taxes paid while working (income taxes plus the Medicare [HI] portion of payroll taxes, including both the employer and the employee share);
- » taxes paid during retirement (income taxes); and
- » net Social Security taxes (the present value of Social Security [OASDI] portion of payroll taxes, including both the employer and the employee share, less the present value of Social Security benefit payments).

Income taxes are incurred throughout life and are included in both taxes paid while working and taxes paid during retirement. In contrast, payroll taxes are only incurred while working. For purposes of this analysis, the two components of payroll taxes—the Social Security portion (OASDI) and the Medicare portion (HI)—are included in different categories. The Medicare portion of the payroll tax, inclusive of both employee and employer taxes, is included in the measure of taxes paid while working. Social Security taxes, inclusive of both employee and employer taxes, are included in the net Social Security taxes category. Net Social Security taxes are measured as the present value of taxes paid while working, inclusive of both the employee and the employer share of Social Security taxes, less the present value of Social Security benefit payments received during retirement.

The results from the baseline simulation of current policy help to illustrate the progressive nature of the current tax and transfer system. In present value, the net tax burden as a percentage of lifetime total compensation ranges from 8.4 percent for the Earn21K worker to 33.5 percent for the Earn234K worker (Figure 2.12).

FIGURE 2.12

Taxes as a Percentage of Lifetime Total Compensation Under Current Tax Policy

Present value of taxes paid from age 32 through age 100 as a percentage of the present value of total compensation[1] from age 32 through age 66 for representative individuals with various levels of lifetime earnings

Legend:
- Taxes paid while working[2] (green)
- Taxes paid in retirement[3] (yellow)
- Net Social Security taxes[4] (blue)

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Total	8.4	16.9	23.5	27.8	31.2	33.5
Taxes paid while working	10.7	15.7	20.2	22.0	23.9	27.1
Taxes paid in retirement		0.1	0.9	1.9	2.5	3.6
Net Social Security taxes	-2.3	1.1	2.5	3.9	4.8	2.8

Lifetime earnings path[5]

[1] Total compensation is the sum of wage and salary earnings, the employer share of payroll taxes (both old age, survivor, and disability insurance [OASDI] and hospital insurance [HI]), and employer matching contributions to 401(k) plans.

[2] Taxes paid while working include the sum of federal income taxes, state income taxes, and both the employer and employee share of HI payroll taxes.

[3] Taxes paid in retirement are the sum of federal income taxes and state income taxes.

[4] Net Social Security taxes are calculated as the net present value of taxes paid (both employer and employee OASDI taxes) less the net present value of Social Security benefit payments received.

[5] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

The progressive nature of federal and state income taxes can be seen in both taxes paid while working and taxes paid during retirement. Expressed in present value, taxes paid while working range from 10.7 percent of lifetime total compensation for the Earn21K worker to 27.1 percent for the Earn234K worker (Figure 2.12, green portion of bars). As already noted in the discussion of Figure 2.8, the Earn21K worker pays no federal or state income tax during retirement. For the other workers, the burden of federal and state income taxes during retirement ranges from 0.1 percent of lifetime total compensation, in present value, for the Earn43K worker to 3.6 percent for the Earn234K worker (Figure 2.12, yellow portion of bars).

Net Social Security taxes also are progressive. This result may be surprising, given that payroll taxes are typically described as being regressive.[54] Social Security taxes are regressive, however, only if looked at in isolation. Social Security benefit payments are highly progressive, replacing a much higher percentage of wage income for workers with low lifetime earnings. Accounting for both Social Security taxes and Social Security benefit payments, the overall Social Security tax and transfer system is progressive (see "Differential Life Expectancy" below). For the Earn21K worker, the present value of Social Security benefit payments is greater than the present value of Social Security taxes, resulting in negative net Social Security taxes (or, equivalently, positive net Social Security benefit payments)

Differential Life Expectancy

The estimates of net Social Security taxes and, equivalently, net Social Security benefit payments in this study do not factor in life expectancy differences for different socio-economic groups. Because lower-income groups tend to have shorter life expectancy, it is possible that accounting for differential mortality could reduce the measured progressivity of the Social Security system—that is, it would increase estimated net Social Security taxes, or, equivalently, decrease net Social Security benefit payments, for workers with lower lifetime earnings.

The estimates in this study, however, also ignore disability benefit payments provided through the Social Security system—the DI portion of OASDI. Because lower-income groups also receive a large share of disability benefit payments, incorporating disability benefits would increase the measured progressiveness of the Social Security system.

Ideally, these benefit measures could be estimated using a microsimulation model that accounted for both differential mortality and disability benefit payments. In fact, a much more in-depth study of the Social Security system (Congressional Budget Office 2006) did just such an analysis. It found, accounting for differential mortality, the retirement portion of Social Security (OASI) was progressive, but that mortality differences partially offset the progressivity of the benefit formula. It also found, however, that the disability portion of Social Security (DI) was highly progressive. As a result, when both differential mortality and disability benefits were accounted for, the full Social Security system (OASDI) was estimated to be highly progressive.

equal to 2.3 percent of the present value of lifetime total compensation (Figure 2.12, light blue portion of bars). For all the other representative workers, the Social Security system imposes positive net taxes (or, equivalently, provides negative net benefit payments), ranging from 1.1 percent of lifetime total compensation for the Earn43K worker to 4.8 percent of lifetime total compensation for the Earn122K worker. Because Social Security taxes only are imposed on—and the Social Security benefit formula only includes—earnings up to the annual earnings base, the net tax imposed by the Social Security system actually falls as a percentage of lifetime total compensation for the Earn234K worker, to 2.8 percent of lifetime total compensation.

The Benefits of Tax Deferral

This section illustrates that workers with higher lifetime earnings get proportionately more benefits from tax deferral but that the benefits do not increase sharply with lifetime income. For higher-earning workers, tax deferral has more impact on when taxes are paid than on the total amount of taxes paid over a lifetime. Although tax deferral reduces taxes paid while working substantially for the higher-paid representative workers, only a portion of that change translates into a reduction in lifetime taxes. The remainder is paid back through higher taxes during retirement. It will be shown in the discussion below that higher income taxes during retirement offset, in present value, more than half of the reduction in income taxes while working for the three highest-earning workers and offset about 40 percent of the pre-retirement reduction in income tax for the fourth highest-earning worker.

Lifetime Benefits Estimation Method

For each representative worker, the lifetime benefits of tax deferral are calculated as the present value of the reduction in lifetime taxation attributable to tax deferral.[55] To assist in comparing the benefits of tax deferral across workers, lifetime benefits are expressed as a percentage of the present value of lifetime total compensation. The lifetime benefits of tax deferral also are separated into two components: the income tax benefits accrued while working (i.e., the reduction in income taxes paid while working, which is expressed as a positive benefit) and the income tax benefits accrued during retirement (i.e., the increase in income taxes paid during retirement, which is expressed as a negative benefit).

To calculate the benefits of tax deferral, the results of the baseline simulation of current policy are compared with the results of a second alternative simulation with tax deferral eliminated. Consistent with methods used to estimate tax expenditures, it is assumed that no changes would be made to other tax code provisions and that there would be no changes in taxpayer behavior.[56] To model this change in tax treatment, it is assumed that 401(k) plans would continue to exist but would be treated as taxable individual investment accounts. That is, both 401(k) plan contributions and investment income generated by the 401(k) plan would be included in an individual's income and subject to tax. In addition, distributions from a 401(k) plan would no longer be fully taxable: as with any other withdrawal from a taxable individual investment account, only the portion of distributions that represents unrealized gains would be included in income and subject to tax.

While individuals are working, it is assumed that both 401(k) plan contributions and a worker's net earnings (that is, wage income less income taxes, payroll taxes, and 401(k) plan contributions) would be unchanged relative to the simulation of current policy. It is assumed that employers and employees would use the same amount of compensation

to fund contributions to their taxable individual investment accounts as they do to fund contributions to their tax-deferred 401(k) plans under current policy. Unlike current policy, both employer and employee contributions would be included in wages reported on Form W-2 and reported on line 7 of Form 1040 (the line that asks for "wages, salaries, tips, etc.").[57] In addition, workers would annually report as income on their tax return all interest income earned by their taxable 401(k) plan accounts. To ensure that net earnings while working remain unchanged, it is assumed that taxpayers would pay any additional income tax liability by withdrawing funds from their taxable 401(k) plan accounts. No early withdrawal penalty would be imposed on funds withdrawn to cover additional income taxes.

With net earnings unchanged when working, the full impact of the increase in lifetime taxation would be reflected in lower net retirement income. As in the current policy simulation, all assets accumulated at retirement would be used to buy an actuarially fair inflation-indexed immediate annuity. Because assets accumulated in taxable 401(k) plan accounts would be lower than the assets accumulated in tax-deferred 401(k) plan accounts, gross distributions would be reduced.

Not all of the reduction in gross distributions would translate into a reduction in net distributions, however, because taxes paid during retirement would be reduced substantially relative to current policy. With tax deferral, all 401(k) plan distributions are included in income and subject to tax. Without tax deferral, only a portion of 401(k) plan distributions would be included in income and subject to tax. In the simulations without tax deferral, no income tax would be incurred when funds are withdrawn from a taxable 401(k) plan account at retirement to purchase an annuity. This is because all contributions to, and all interest income earned by, the taxable individual investment account already would have been subject to tax. During retirement, only the portion of annuity payments that represent tax-deferred income are taxed. In this case, as with an annuity held outside of a qualified plan under current law, 30.1 percent of the annuity payment is included in income in each year.[58]

Lifetime Benefits Estimation Results

While working, the representative workers with higher lifetime earnings benefit more (in the form of lower income tax liability) from tax deferral (Figure 2.13, first set of bars). As a percentage of lifetime total compensation, reductions in income taxes range from 0.5 percent for the Earn21K worker to 6.4 percent for the Earn234K worker.[59] Workers benefit from deferral of tax on both contributions to 401(k) plans and interest income earned on 401(k) plan assets. The impact is larger for workers with higher lifetime earnings because they begin contributing to the 401(k) plan at a younger age and, in some cases, contribute a higher percentage of pay.

During retirement, workers with higher lifetime earnings accrue more negative income tax benefits (in the form of higher income tax liability) from tax deferral (Figure 2.13, second set of bars). There is no effect on income taxes paid during retirement for the Earn21K worker, because the worker pays no income tax during retirement either with or without tax deferral. For other workers, tax increases (or, equivalently benefit reductions) range from 0.1 percent of lifetime total compensation for the Earn43K worker to 3.3 percent for the Earn234K worker. During retirement, workers typically pay more income tax with tax deferral than they would without tax deferral, as all distributions represent tax-deferred income—either tax-deferred compensation or tax-deferred investment returns—and are included in income and subject to tax.

The lifetime benefits of tax deferral (Figure 2.13, third set of bars) are the sum of the benefits accrued while working (first set of bars) and the (negative) benefits accrued while retired (second set of bars). The lifetime benefits range from 0.5 percent of lifetime total compensation for the Earn21K worker to 3.0 percent for the Earn234K worker.[60] For other workers, the lifetime benefits of tax deferral vary little, ranging from 1.3 percent to 1.6 percent of lifetime total compensation.

The causes for this pattern of benefits by lifetime earnings are complex. A detailed explanation as to how tax deferral affects lifetime tax liability is provided in chapter 3. The intuition behind the result is that the lifetime benefits of tax deferral depend on both the amount of compensation deferred and the benefits associated with each dollar of compensation deferred. Because the share of compensation that is deferred increases with lifetime earnings, lifetime benefits tend to increase with lifetime earnings. The benefits associated with each dollar of compensation deferred, however, are not a simple function of lifetime earnings.[61] For the middle four wage earners (Earn43K, Earn69K, Earn92K,

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FIGURE 2.13

Present Value of the Benefits of Tax Deferral by Lifetime Earnings

Benefits of tax deferral expressed as the present value of the net reductions in taxes paid because of tax deferral[1] as a percentage of the present value of total compensation[2] earned from age 32 through age 66 for representative individuals with various levels of lifetime earnings

Lifetime earnings path[3]

- Earn21K
- Earn43K
- Earn69K
- Earn92K
- Earn122K
- Earn234K

Income tax benefits accrued while working (income tax reduced): 0.5, 1.4, 2.3, 3.3, 3.9, 6.4

+

Income tax benefits accrued during retirement (income tax increased): 0.0, -0.1, -0.9, -1.8, -2.3, -3.3

=

Lifetime benefits of tax deferral: 0.5, 1.3, 1.4, 1.5, 1.6, 3.0

[1] In the absence of tax deferral, it is assumed that 401(k) plans would continue to exist but would be treated as taxable investment accounts. For assumed contribution behavior, see Figure 2.4. Contributions to 401(k) accounts are assumed to be invested in bonds earning 3.0 percent plus inflation, with accumulated assets used to purchase an actuarially fair, inflation-indexed, immediate life annuity upon retirement.

[2] Total compensation is the sum of wage and salary earnings, the employer share of payroll taxes (both old age, survivor, and disability insurance [OASDI] and hospital insurance [HI]), and employer matching contributions to 401(k) plans.

[3] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

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and Earn 122K), the lifetime benefits of tax deferral increase only modestly because the benefits per dollar of compensation deferred actually decline as earnings increase. In contrast, the Earn234K worker not only defers the highest share of compensation, but also receives benefits similar to the Earn69K worker on every dollar of compensation deferred. As a result, the lifetime benefits for the Earn234K worker are substantially higher than the benefits of other workers.

Consistent with estimates of the benefits of tax deferral from previous studies, this analysis shows that workers with higher earnings get more benefits as a percentage of income. The impact of tax deferral, however, changes considerably over workers' lifetimes, reducing income taxes while working but increasing income taxes during retirement. Moreover, those with the greatest reduction in taxes while working experience the greatest increase in taxes during retirement. Higher income taxes during retirement offset, in present value, more than half of the reduction in income taxes while working for the three highest-earning workers, and offset about 40 percent of the pre-retirement reduction in income tax for the fourth highest-earning worker. As a result, the lifetime benefits of tax deferral vary less across workers than either the benefits accrued while working or the (negative) benefits accrued during retirement.

The Benefits of the U.S. Retirement System

To better assess the U.S. retirement system, this section jointly estimates the benefits of tax deferral and the Social Security system.

Estimates of the benefits of tax deferral provide an incomplete picture of the U.S. retirement system, as tax deferral is only one part. The primary U.S. retirement program is Social Security, and the lifetime benefits of the Social Security system are highly progressive. The Social Security system covers nearly all U.S. workers,[62] with payroll taxes collected from all covered workers and benefits paid to all workers covered for the equivalent of 10 years.[63] Employer-sponsored retirement plans and IRAs supplement Social Security benefit payments. By design, workers with lower lifetime earnings will get a larger share of retirement resources from Social Security. As lifetime earnings increase, workers need to rely more on resources they have accumulated through employer-sponsored retirement plans and IRAs to maintain their pre-retirement standard of living.

The simulations illustrate that the U.S. retirement system as a whole, inclusive of both tax deferral and the Social Security system, is progressive. That is, combining the benefits of tax deferral with the benefits of the Social Security system, workers with lower lifetime earnings typically receive more lifetime benefits, as a percentage of lifetime total compensation, from the U.S. retirement system.

The Social Security system provides substantial lifetime benefits to workers with lower lifetime earnings but has little effect on the lifetime benefits of workers with higher lifetime earnings.[64] As a share of lifetime total compensation, the Earn21K worker receives the most lifetime benefits from Social Security. In addition to being the only worker who receives positive net Social Security benefit payments, the Social Security system reduces income tax liability substantially over the Earn21K worker's lifetime. The lifetime benefits of Social Security are lower, but still positive, for moderate income workers. For these workers, reductions in lifetime income tax liability more than offset negative net Social

Security benefit payments. Social Security has little impact on workers with higher lifetime earnings. For these workers, negative net Social Security benefit payments are roughly offset by reduced income tax liability.

Lifetime Benefits Estimation Method

To measure the benefits of the U.S. retirement system, a third simulation is run in which both tax deferral and the Social Security system are eliminated, and the results are compared with the baseline simulation of current policy. For each worker, the lifetime benefits of the U.S. retirement system are calculated by subtracting the present value of taxes paid in the baseline simulation from the present value of taxes paid in the third simulation.[65] The difference in overall tax liability can be decomposed into the difference in income taxes *plus* the difference in net Social Security taxes.[66] Because workers pay zero net Social Security taxes in the third simulation, the difference in net Social Security taxes paid is equal to the negative value of net Social Security taxes paid in the baseline simulation. Thus, lifetime benefits of the U.S. retirement system can be expressed as the difference in income taxes *minus* net Social Security taxes in the baseline simulation or, equivalently, as the difference in income taxes *plus* net Social Security benefit payments in the baseline simulation.[67]

In addition to assuming that 401(k) plans would be treated as taxable individual investment accounts, the third simulation assumes that the Social Security system would continue to exist, but that Social Security taxes would be contributed on the worker's behalf to a taxable individual investment account. That is, while working, both (1) compensation used to contribute to the account and (2) investment income earned by the account would be included in income and subject to tax. In addition, the portion of distributions from the account that represent unrealized gains would be included in income and subject to tax. No changes are made to other tax code provisions, and it is assumed that there are no changes in taxpayer behavior.

The lifetime benefits of the U.S. retirement system are presented as a percentage of lifetime total compensation and are broken down into three components. As with the analysis of tax deferral (Figure 2.13), the income tax benefits accrued while working (i.e., the reduction in income taxes paid while working, which is expressed as a positive benefit) and the income tax benefits accrued during retirement (i.e., the increase in income taxes paid during retirement, which is expressed as a negative benefit) are reported. In addition, net Social Security benefit payments from the baseline simulation (i.e., the present value of Social Security benefit payments less the present value of Social Security taxes paid) are broken out as a separate category.

In addition to illustrating the benefits of the U.S. retirement system as a whole, the benefits provided by tax deferral are distinguished from the benefits provided by the Social Security system. The benefits of the Social Security system are derived by comparing the results from the third simulation, which assumes that both tax deferral is disallowed and that Social Security is eliminated, to the second simulation, which assumes that tax deferral is disallowed but that the current Social Security system is maintained. The lifetime benefits of Social Security include not just net Social Security benefit payments but also the effect of Social Security on income tax liability.

While working, both Social Security taxes and the worker's net earnings are assumed to be unchanged relative to the simulation of current policy. As under current policy, the employee share of Social Security taxes would be included in income under the income tax. Unlike current policy, the employer share of Social Security taxes also would be included in income.[68] Both the employer and employee share of Social Security taxes would be contributed on the employee's behalf to a taxable individual investment account. As with 401(k) plans, the accounts would be invested in U.S. Treasury bonds paying interest equal to inflation plus 3.0 percent, with the interest income subject to federal and state individual income taxes. To ensure that net earnings would be unchanged while working, it is assumed that taxpayers would fund any additional income tax liability by withdrawing funds from their taxable Social Security individual investment accounts. It is assumed that no early withdrawal penalty would be imposed on funds withdrawn to cover additional income taxes.

With net earnings unchanged when working, the impact of the changes to the Social Security system—inclusive of the change from a formula-based benefit to a benefit based on assets accumulated in an individual investment account, the change in the income tax treatment of Social Security taxes and benefit payments, and the taxation of investment income earned by the individual investment account—would be reflected in net retirement income.

While individuals are in retirement, the share of annual Social Security benefit payments included in income would change. Under current policy, Social Security benefit payments are determined using a progressive benefit formula and the share of Social Security benefit payments included in taxable income ranges from 0 percent to 85 percent, depending on income. With taxable Social Security individual investment accounts, all assets accumulated in the account at the time of retirement would be used to purchase an actuarially fair inflation-indexed immediate annuity. No income tax would be incurred when the annuity is purchased because all Social Security taxes contributed to the individual investment account and all interest income earned by the account would have already been subject to income tax. During retirement, only the portion of annuity payments that represent deferred income would be taxed. As was the case with the taxable 401(k) plan account and a non-qualified annuity under current policy, 30.1 percent of the annuity payment would be included in income in each year.[69]

Lifetime Benefits Estimation Results

The Social Security system provides positive net Social Security benefit payments (i.e., pays Social Security benefits that are greater, in present value, than Social Security taxes collected) to the Earn21K worker and provides negative net benefit payments (i.e., pays Social Security benefits that are less, in present value, than Social Security taxes collected) to the other five representative workers (Figure 2.14, first set of bars).[70] Net Social Security benefit payments as a percentage of lifetime total compensation decline from positive 2.3 percent for the Earn21K worker to negative 4.8 percent for the Earn122K worker, before increasing to negative 2.8 percent for the Earn234K worker.

While individuals are working, the U.S. retirement system reduces income taxes paid substantially, with reductions in taxes ranging from 3.7 percent of total compensation for the Earn21K worker to 9.3 percent for the Earn234K worker (Figure 2.14, second set of bars). These benefits can be divided into the benefits of tax deferral calculated from the

tax deferral simulation and presented in Figure 2.13 (Figure 2.14, the solid portion of the bars) and the benefits of the Social Security system (the screened portion of the bars). By reducing income tax liability, the Social Security system provides substantial benefits to all six representative workers, ranging from 2.9 percent of lifetime total compensation for the Earn234K worker to 4.6 percent for the Earn92K worker.[71]

While individuals are in retirement, the U.S. retirement system increases income taxes paid for five of the six representative workers, with increases ranging from 0.1 percent of lifetime total compensation for the Earn43K worker to 3.4 percent for the Earn234K worker (Figure 2.14, third set of bars). Social Security has a modest effect on income taxes paid during retirement (the screened portion of the third set of the bars). Social Security has no effect on income taxes for the two lowest-paid workers because—absent tax deferral—these workers would pay no income tax during retirement regardless of the tax treatment of Social Security benefit payments. For the next three workers by income—the Earn69K, Earn92K, and Earn122K workers—the impact of the Social Security system on income taxes paid in retirement rounds to 0.0 percent of lifetime total compensation. For the Earn234K worker, the Social Security system increases income taxes paid during retirement by 0.1 percent of lifetime total compensation.

Evaluated as a whole, the U.S. retirement system is progressive. Combining net Social Security benefit payments and the reduction in income tax liability, lifetime benefits represent a larger share of lifetime total compensation for workers with lower lifetime earnings (Figure 2.14, fourth set of bars). The present value of the lifetime benefits of the U.S. retirement system in these simulations declines from 6.0 percent of lifetime total compensation for the worker with the lowest lifetime earnings (the Earn21K worker) to 1.3 percent for the Earn122K worker. The lifetime benefits increase to 3.1 percent of total compensation for the Earn234K worker, but are still a lower percentage than for the three workers with the lowest lifetime earnings.[72] Including its effect on income tax liability, Social Security provides substantial benefits for the three lowest-earning workers, but has a more modest effect on the lifetime benefits of the three highest-earning workers (screened portion of the fourth set of bars).

Among the three highest-earning workers, the pattern of lifetime benefits is driven primarily by the benefits they receive from tax deferral. As noted earlier, the Earn92K and the Earn122K workers defer a higher share of their compensation than lower-earning workers, but benefit less on every dollar they defer.[73] The Earn234K worker both defers the highest percentage of compensation and receives benefits similar to the Earn69K worker on every dollar of compensation deferred. As a result, the lifetime benefits of deferral are higher for the Earn234K worker.

Impact of the Social Security System

Net Social Security benefit payments are only a portion of the lifetime benefits that the Social Security system provides to workers, as the Social Security system also reduces income tax liability substantially for all workers.

Social Security reduces income taxes paid while working for all six representative workers, but has little or no impact during retirement. Income taxes paid while working are reduced both because the employer's share of Social Security taxes is excluded from income and because the Social Security system does not generate taxable investment income

FIGURE 2.14

Present Value of the Benefits of the U.S. Retirement System by Lifetime Earnings

Benefits of the U.S. retirement system expressed as the present value of the net reductions in taxes paid because of tax deferral[1] and the current Social Security system[2] as a percentage of the present value of total compensation[3] earned from age 32 through age 66 for representative individuals with various levels of lifetime earnings

Lifetime earnings path[4]

- Earn21K
- Earn43K
- Earn69K
- Earn92K
- Earn122K
- Earn234K

Incremental benefit of Social Security system (screened)

Benefit of tax deferral (solid)

Net Social Security benefit payments[5] + Income tax benefits accrued while working (income tax reduced) + Income tax benefits accrued during retirement (income tax increased) = Lifetime benefits of the U.S. retirement system

[1] In the absence of tax deferral, it is assumed that 401(k) plans would continue to exist but would be treated as taxable investment accounts. For assumed contribution behavior, see Figure 2.4. Contributions to 401(k) accounts are assumed to be invested in bonds earning 3.0 percent plus inflation, with accumulated assets used to purchase an actuarially fair, inflation-indexed, immediate life annuity upon retirement.

[2] In the absence of the current Social Security system, it is assumed that Social Security would establish a system of taxable individual investment accounts. Social Security taxes (both employer and employee share of old age, survivor, and disability insurance [OASDI] taxes) are contributed to the investment accounts. Investments are assumed to be the same as with 401(k) accounts (see note 1).

[3] Total compensation is the sum of wage and salary earnings, the employer share of payroll taxes (both OASDI and hospital insurance [HI]), and employer matching contributions to 401(k) plans.

[4] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[5] Net Social Security benefit payments are calculated as the net present value of benefit payments received less the net present value of taxes paid (both employer and employee OASDI taxes).

Note: Components may not add to the total because of rounding.

Source: ICI simulations

for individuals. Of the two effects, the reduction in taxable investment income is larger, because taxable individual investment accounts funded with 12.4 percent of salary in every year of work would quickly accumulate large amounts of assets and would generate substantial taxable interest income.

The lowest-earning worker, the Earn21K worker, receives the largest positive lifetime benefits from the Social Security system as a percentage of lifetime compensation. In addition to net Social Security benefit payments equivalent in present value to 2.3 percent of lifetime total compensation (Figure 2.14, first set of bars), the Earn21K worker receives a benefit of 3.2 percent of lifetime total compensation in the form of lower income tax liability while working (screened portion of the second set of bars), and no change in income tax liability during retirement (screened portion of the third set of bars). The result is that the Social Security system provides a lifetime benefit of 5.5 percent of lifetime total compensation (screened portion of the fourth set of bars).

The workers with lifetime earnings in the middle—the Earn43K, Earn69K, and Earn92K workers—receive positive lifetime benefits from the Social Security system, though they benefit to a lesser extent than the lowest-earning worker. All three workers receive negative net Social Security benefit payments (Figure 2.14, first set of bars), but these are more than offset by the reduction in income tax liability provided by the Social Security system (screened portions of the second and third sets of bars). The lifetime benefits of Social Security decline from 3.1 percent of lifetime total compensation, in present value, for the Earn43K worker to 0.8 percent for the Earn92K worker (screened portion of the fourth set of bars) because net Social Security benefit payments become increasingly negative as lifetime earnings increase.

The lifetime benefits of the Social System are more modest for the two highest-earning workers. The income tax benefits of the Social Security system are not large enough to offset negative net Social Security benefit payments for the Earn122K worker, resulting in a negative effect equal to 0.3 percent of lifetime total compensation (Figure 2.14, screened portion of the fourth set of bars). For the Earn234K worker, negative net benefit payments and the reduction in lifetime income taxes just about offset, with the benefit of the Social Security system equal to just 0.1 percent of lifetime income.

Summary

The U.S. retirement system is progressive. The primary U.S. retirement program is the Social Security system, and the lifetime benefits of the Social Security system are highly progressive. In addition to Social Security, workers are allowed to set aside a portion of their compensation for retirement through employer-sponsored retirement plans (both DB plans and DC plans; sponsored by both government employers and private-sector employers) and IRAs, only paying taxes when they receive distributions from their retirement plans or IRAs. To maintain their pre-retirement standard of living, workers with higher lifetime income have a greater need to supplement Social Security benefit payments during retirement because Social Security benefit payments replace a lower share of their pre-retirement wage income. Not surprisingly, the benefits of tax deferral are proportionately higher for workers with higher lifetime earnings. The combination of Social Security and tax deferral, however, results in a retirement system that is progressive when evaluated holistically.

A Closer Look at the Effect of Tax Deferral on Income Tax Liability

▶ Policy discussions of tax deferral often focus on the reduction in taxes enjoyed by workers and ignore the higher taxes these workers will pay during retirement. Contributions to retirement plans are tax-deferred, not tax-free.

▶ The effect of tax deferral on lifetime tax liability is complex. Back-of-the-envelope calculations of the benefits of tax deferral that rely solely on marginal tax rates are likely to understate the impact tax deferral on taxes paid during retirement. Simulating tax liability over a full lifetime shows that without deferral even workers with higher lifetime earnings would pay little income tax during retirement.

▶ Tax deferral increases adjusted gross income (AGI) in retirement, both directly (because of the inclusion of retirement plan distributions) and indirectly (because the inclusion of retirement plan distributions increases the share of Social Security benefit payments included in AGI). Combined with a progressive tax rate schedule, tax deferral substantially increases income taxes during retirement for workers with higher lifetime earnings.

Although the lifetime benefits of tax deferral estimated in chapter 2 are qualitatively similar to results found in previous studies,[1] this study's finding of modest differences across workers in the lifetime benefits of tax deferral may be surprising given the rhetoric often used in policy discussions.[2] Policy discussions typically focus on the up-front benefits of tax deferral, which can be misleading. The simulations illustrate that the workers for whom tax deferral reduces taxes the most while working are also the workers for whom tax deferral increases taxes the most during retirement. As a result, the lifetime benefits of tax deferral vary less across workers than do the up-front benefits.

To better understand the lifetime benefits of tax deferral, this chapter provides a detailed explanation of how tax deferral affects the timing of taxation. Tax deferral has different effects on income tax liability over a worker's lifetime. While individuals are working, tax deferral reduces measured income by excluding both contributions to and investment income earned by retirement plans. This reduces the amount of income subject to tax, and in some cases reduces a worker's marginal tax rate. During retirement, tax deferral increases measured income both directly, by including retirement plan distributions, and indirectly, by increasing the share of Social Security benefit payments included in income. This increases the amount of income subject to tax and increases marginal tax rates for nearly all of the representative workers.

Tax-Deferred, Not Tax-Free

One reason that the benefits received by higher-earning workers are often overstated in policy discussions is that it is often implied that tax deferral provides the same tax benefits as a tax exclusion or a tax deduction.[3] Exclusions (such as the exclusion from income of employer-paid health insurance premiums) and deductions (such as the deduction from income of mortgage interest) reduce taxes in the year they are taken and never increase taxes in the future. In addition, the tax benefits are proportional to a taxpayer's marginal tax rate and simple to calculate. For example, an additional $1 of mortgage interest deduction reduces income taxes by $0.35 for a taxpayer with a 35 percent marginal tax rate and reduces income taxes by $0.25 for a taxpayer with a 25 percent marginal tax rate.

Tax deferral, however, is neither a tax exclusion nor a tax deduction.[4] Contributions to 401(k) plans are tax-deferred, not tax-free, and the benefit of tax deferral is *not* the reduction in taxes when the contribution is made. As explained in chapter 1, the taxation of deferred compensation differs from normal tax treatment at three points in time:

» First, contributions made by employers or employees to a retirement plan—whether a DC plan or a DB plan—are excluded from taxable wages reported on Form W-2.

» Second, investment returns earned on contributions are not taxed when earned.

» Third, all distributions from tax-deferred retirement plans are taxed.

To fully understand how tax deferral changes income tax liability, the impact has to be traced over a worker's lifetime. The reduction in taxes paid when a worker contributes to a retirement account is only one aspect of tax deferral. The reduction in taxes when a contribution is made will eventually lead to an increase in taxes when a distribution is taken. In addition, no tax is paid on investment income during the deferral period.

The relationship between the benefits of tax deferral and a worker's marginal tax rate is much more complex than is the case with a tax exclusion or a tax deduction. Assuming plan participants make similar investments, the benefits of tax deferral will depend on how long taxes are deferred and on a worker's marginal tax rates at the time of contribution, during the deferral period, and at the time of distribution.[5]

How Tax Deferral Affects Income Tax Liability

Tax liability is determined by applying the tax rate schedule to taxable income. Taxable income is AGI less personal exemptions, less the greater of itemized deductions or the standard deduction.[6] The tax rate that applies to taxable income is determined by the tax rate schedule. The federal income tax rate schedule is progressive, with the rate of tax increasing as taxable income increases.

Two tax rates are of importance when assessing the impact of a policy on tax liability: the statutory tax rate and the marginal tax rate. The tax rate from the tax rate schedule that applies to a taxpayer's last dollar of taxable income is referred to as the taxpayer's *statutory tax rate*. The term *marginal tax rate* refers to the implicit rate of tax that would apply if a taxpayer's taxable income increased by a small amount, such as by $1. It can differ from a taxpayer's statutory tax rate because certain tax code provisions phase in and phase out based on AGI, which can cause a taxpayer's marginal tax rate to differ from the applicable statutory tax rate.

Tax deferral affects tax liability primarily by changing AGI and thus changing taxable income. In some cases, the impact on taxable income is large enough to change a representative worker's marginal tax rate, which amplifies the impact of the change in AGI.

Effect of Tax Deferral on Adjusted Gross Income

Tax deferral reduces AGI when working but increases AGI during retirement. While individuals are working, tax deferral reduces AGI in the simulation by excluding employer and employee 401(k) plan contributions and by excluding the interest income earned on 401(k) plan assets. During retirement, tax deferral increases AGI because all 401(k) plan distributions are included in AGI. Without tax deferral, only the portion of 401(k) plan distributions that were not already taxed would be included in AGI, which in this case would be 30.1 percent.[7] In addition to directly increasing AGI during retirement, tax deferral can also increase the share of Social Security benefit payments included in AGI.

The impact of tax deferral on AGI is first illustrated in detail for the Earn69K worker before the results for all representative workers are examined. The Earn69K worker has earnings at age 40 equal to the median earnings of full-time, full-year workers from age 35 through age 44 with a bachelor's degree. The earnings of the Earn69K worker at age 40 represent the 73rd percentile of earnings among all workers from age 35 through age 44 with positive earnings (see Figure 2.4).

Illustrative Results for the Earn69K Worker

For Earn69K worker, tax deferral reduces AGI while working from $73,136 without tax deferral, on average, to $66,317 with tax deferral (Figure 3.1, upper panel). Without tax deferral, the Earn69K worker would include, on average, $70,790 on line 7 of Form 1040 (the line that asks for "wages, salaries, tips, etc."). This would include $69,299 in wage income plus $1,491 of employer matching contributions to the 401(k) plan. In addition, the 401(k) plan would generate $2,346 of interest income, on average, while working that would be included in AGI. With tax deferral, the Earn69K worker would include only $66,317 of wages, on average, on line 7 of Form 1040. This amount is equal to average wage income without employer 401(k) plan contributions of $69,299 less average employee 401(k) plan contributions of about $2,982. In addition, there would be no interest income included in AGI, as all tax on investment returns would be deferred until distributions were taken during retirement.

During retirement, tax deferral has the opposite effect, increasing AGI for the Earn69K worker from $8,008, on average during retirement, without tax deferral to $34,420 with tax deferral (Figure 3.1, lower panel). Without tax deferral, only $2,914 per year of 401(k) plan distributions are included in AGI, compared with $17,203 per year with tax deferral. Tax deferral increases the amount of 401(k) plan distributions included in AGI for two reasons. First, with tax deferral, account balances are higher at retirement and the additional assets are used to purchase additional annuity income. Total 401(k) plan distributions for the Earn69K worker would be only $9,672 annually without tax deferral, compared with $17,203 with tax deferral. Second, only 30.1 percent of the $9,672, or $2,914, would be included in AGI without tax deferral, whereas 100 percent of the $17,203 would be included with tax deferral.

The increase in taxable 401(k) plan distributions, however, represents only part of the impact of tax deferral on AGI during retirement. The impact is amplified because only a portion of Social Security benefit payments are included in AGI under the federal income tax, with the share dependent on the amount of other income a taxpayer receives. The Earn69K worker receives the same amount of Social Security benefit payments—$30,639 per year—with or without tax deferral (Figure 3.1, lower panel). Because only $2,914 of 401(k) plan distributions are included in AGI, on average, without tax deferral, however, only 16.6 percent of Social Security benefit payments, or $5,094 per year on average, are included in AGI. In contrast, because $17,203 of 401(k) plan distributions are included in AGI with tax deferral, 56.2 percent of Social Security benefit payments, or $17,217 per year on average, are included in AGI.[8]

FIGURE 3.1

Effect of Tax Deferral on Adjusted Gross Income for the Earn69K Worker

All dollar amounts expressed as constant 2014 dollars

Working (annual average from age 32 through age 66)

Without tax deferral	
Adjusted gross income	*$73,136*
Line 7 of Form 1040 (Wages, salaries, tips, etc.)	70,790
Wage income	69,299
Employer 401(k) plan contributions	1,491
Interest income earned by 401(k) plan	2,346
With tax deferral (current policy baseline)	
Adjusted gross income	*$66,317*
Line 7 of Form 1040 (Wages, salaries, tips, etc.)	66,317
Wage income	69,299
Less: employee 401(k) plan contributions	2,982

Retired (survival-weighted annual average for ages 67 and older)

Without tax deferral	
Total retirement income	$40,311
Social Security benefit payments	30,639
401(k) plan distributions	9,672
Adjusted gross income	*$8,008*
Social Security benefit payments (16.6 percent)	5,094
401(k) plan distributions (30.1 percent)	2,914
With tax deferral (current policy baseline)	
Total retirement income	$47,842
Social Security benefit payments	30,639
401(k) plan distributions	17,203
Adjusted gross income	*$34,420*
Social Security benefit payments (56.2 percent)	17,217
401(k) plan distributions (100 percent)	17,203

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

Results for All Representative Workers

Tax deferral reduces AGI while working more for workers with higher lifetime earnings because they are assumed to begin saving for retirement at younger ages, and in some cases save a higher percentage of their wage income. Looking across all workers, reductions in average annual AGI while working range from 4 percent (from about $21,900 to about $21,100) for the Earn21K worker to 17 percent (from about $258,000 to about $214,000) for the Earn234K worker (Figure 3.2, upper panel).

Tax deferral has the smallest impact on AGI while working for the Earn21K worker, who does not begin contributing to the 401(k) plan until age 52, and then contributes 4 percent of pay and receives a 2 percent employer match (see Figure 2.4). On average from age 32 through age 66, the combination of employee and employer contributions for the Earn21K worker are about $600 per year, reducing the amount reported on line 7 of Form 1040 from about $21,700 without tax deferral to about $21,100 with tax deferral (Figure 3.2, upper panel). In addition, approximately $200 of interest income, on average, is generated by the 401(k) plan but is not included in AGI with tax deferral.

Tax deferral has the largest impact on AGI while working for the Earn234K worker, who contributes the maximum allowed by law from age 32 through age 66—equal to about 8.5 percent of pay, on average—and receives the maximum employer match of 3 percent of pay (see Figure 2.4). On average from age 32 through age 66, the combination of employee and employer contributions for the Earn234K worker are about $27,000 per year, reducing the amount reported on line 7 of Form 1040 from about $241,000 without tax deferral to about $214,000 with tax deferral (Figure 3.2, upper panel). In addition, approximately $17,000 per year of interest income, on average, is generated by the 401(k) plan but is not included in AGI with tax deferral.

Tax deferral increases AGI during retirement substantially for all six representative workers. Across all workers, average AGI during retirement with tax deferral is between four and five times higher than it would be without tax deferral. For example, average AGI of the Earn21K worker during retirement increases from about $500 without tax deferral to about $2,200 with tax deferral (Figure 3.2, lower panel). For the Earn234K worker, AGI increases from about $34,000 without tax deferral to about $152,000 with tax deferral.

For all six representative workers, tax deferral increases AGI during retirement both directly, by increasing the amount of 401(k) plan distributions included in AGI, and indirectly, by increasing the share of Social Security benefit payments included in AGI. For example, without tax deferral, total distributions from the taxable 401(k) plan are approximately $1,500 per year for the Earn21K worker (not shown in Figure 3.2), with about $400 included in AGI (Figure 3.2, lower panel). With tax deferral, total distributions from the tax-deferred 401(k) plan are about $2,000 per year for the Earn21K worker and all distributions are included in AGI. In addition, Social Security benefit payments included in AGI increase from less than $50 (0.2 percent of benefit payments), on average, without tax deferral to more than $200 (1.3 percent of benefit payments), on average, with tax deferral.[9] For the Earn234K worker, total distributions from the taxable 401(k) plan are approximately $49,000 per year without tax deferral (not shown in Figure 3.2), with about $15,000 included in AGI (Figure 3.2, lower panel). With tax deferral, total distributions from the tax-deferred 401(k) plan are about $119,000 for the Earn234K worker, with the entire amount included in AGI. In addition, Social Security benefit payments included in AGI by the Earn234K worker increase from about $19,000 (48 percent of benefit payments), on average, without tax deferral to about $34,000 (85 percent of benefit payments) with tax deferral.[10]

FIGURE 3.2

Effect of Tax Deferral on Adjusted Gross Income for Six Representative Workers

Average annual adjusted gross income (AGI) and components, with and without tax deferral, while working and during retirement, thousands of 2014 dollars

Working
Average from age 32 through age 66

▪ Interest income in AGI—without tax deferral
▪ Wages (line 7 of Form 1040) in AGI—without tax deferral
▪ Wages (line 7 of Form 1040) in AGI—with tax deferral (current policy baseline)

Lifetime earnings paths
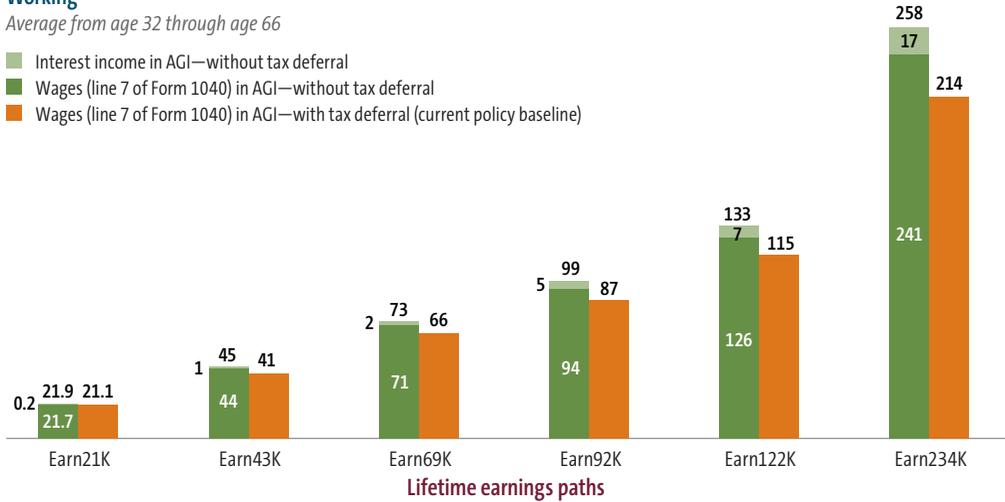
Retired
Survival-weighted average for ages 67 and older

▪ 401(k) distributions in AGI—without tax deferral
▪ Social Security in AGI—without tax deferral
▪ 401(k) distributions in AGI—with tax deferral (current policy baseline)
▪ Social Security in AGI—with tax deferral (current policy baseline)
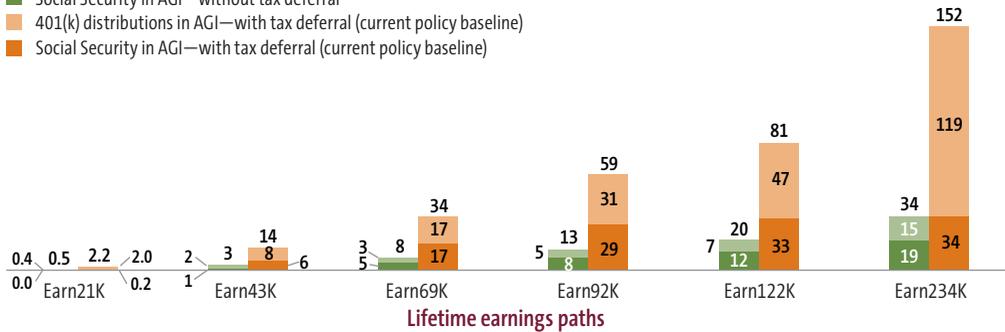
Lifetime earnings paths

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail. Components may not add to the total because of rounding.

Source: ICI simulations

Effect of Tax Deferral on Marginal Tax Rates

Tax deferral has a larger impact on marginal tax rates during retirement than it does during working years.[11] While individuals are working, tax deferral does not affect marginal tax rates for some representative workers and has a relatively modest effect for others. While retired, however, tax deferral increases marginal tax rates substantially for all but the Earn21K worker.

Marginal tax rates are the implicit tax rate that would apply if a representative worker's AGI increased by a small amount. Marginal tax rates do not capture the interaction of 401(k)

plan distributions with the share of Social Security benefit payments included in AGI. As already discussed, because of this interaction, an additional $1 of 401(k) plan distributions can increase AGI by more than $1.

While Working

While individuals are working, tax deferral has a modest, albeit uneven, effect on the marginal tax rates faced by the representative workers (Figure 3.3, left panels). The impact is uneven because changes in AGI translate into changes in marginal tax rates only for those taxpayers with either: (1) taxable income near the edge of a statutory taxable rate bracket; (2) with AGI near the start of the limitations on itemized deductions; or (3) on the cusp of having AMT liability. Despite the fact that the impact of tax deferral on AGI while working increases with lifetime earnings, the impact on marginal tax rates does not. Marginal tax rates are unchanged for the Earn21K and Earn69K workers, change modestly for the Earn122K and Earn234K workers, and fall noticeably for the Earn43K and Earn92K worker.

On average during their working career, tax deferral reduces marginal tax rates the most for the Earn43K and Earn92K workers (Figure 3.3, left panels). The combined federal and state marginal income tax rate falls from 25.6 percent without tax deferral to 20.8 percent with tax deferral for the Earn43K worker, and falls from 32.7 percent to 30.8 percent for the Earn92K worker.[12]

In contrast, although tax deferral has a much larger impact on the AGI of the two workers with the highest lifetime earnings, tax deferral has a much smaller effect on their marginal tax rates (Figure 3.3, left panels). Tax deferral reduces the Earn234K worker's marginal tax rate from 39.1 percent, on average, without tax deferral to 38.4 percent, on average, with tax deferral.[13] The marginal tax rate actually increases slightly for the Earn122K worker, to 32.8 percent with deferral from 32.4 percent without tax deferral.[14]

During Retirement

Tax deferral has a much larger impact during retirement, increasing marginal tax rates substantially for all but the Earn21K worker, who has no income tax liability during retirement either with or without tax deferral (Figure 3.3, right panels). For example, the Earn43K worker would have no income tax liability during retirement without tax deferral, but has a 10.0 percent marginal tax rate with tax deferral. The Earn234K worker would have a 15.0 percent marginal tax rate without tax deferral, but has a 32.1 percent marginal tax rate with tax deferral. Without tax deferral, none of the retirees would have state income tax liability, and those with federal income tax liability would have marginal tax rates no higher than 15 percent. With tax deferral, the three highest-earning workers face marginal tax rates (inclusive of both federal and state income tax) of 30 percent or higher.

Effect of Tax Deferral on Average Tax Rates

The impact of tax deferral on average tax rates changes over a worker's lifetime. Tax deferral reduces average tax rates while working, but typically increases average tax rates during retirement. Both the reductions in average tax rates while working and the increases in average tax rates during retirement are proportionately larger for workers with higher lifetime earnings.

Average tax rate measures are helpful in comparing tax policies with different definitions of taxable income because they reflect both the share of total income subject to tax and the rate at which it is taxed. Average tax rates, which are simply the ratio of total taxes paid to a measure of total income, are a way to summarize the total impact of tax deferral

FIGURE 3.3

Effect of Tax Deferral on Marginal Tax Rates

Marginal tax rates[1] for representative individuals with various levels of lifetime earnings,[2] percent

Working
Average from age 32 through age 66

Retired
Survival-weighted average for ages 67 and older

Without tax deferral

Earn21K: 19.7, Earn43K: 25.6, Earn69K: 30.8, Earn92K: 32.7, Earn122K: 32.4, Earn234K: 39.1

Earn21K: 0.0, Earn43K: 0.0, Earn69K: 0.9, Earn92K: 7.4, Earn122K: 12.1, Earn234K: 15.0

Lifetime earnings path[2]

With tax deferral
Current policy baseline

Earn21K: 19.7, Earn43K: 20.8, Earn69K: 30.8, Earn92K: 30.8, Earn122K: 32.8, Earn234K: 38.4

Earn21K: 0.0, Earn43K: 10.0, Earn69K: 15.0, Earn92K: 30.0, Earn122K: 30.8, Earn234K: 32.1

Lifetime earnings path[2]

[1] The marginal tax rates are calculated using statutory tax rates, but the federal statutory rates are adjusted for interactions with the limitation on itemized deductions, the alternative minimum tax (AMT), and the phaseout of the AMT standard deduction. For taxpayers who are not subject to the AMT and who itemize deductions, combined federal and state marginal tax rates are adjusted to account for the deductibility of state income taxes. For taxpayers who are subject to the AMT (which does not allow for the deduction of state income taxes) or who do not itemize deductions, the combined marginal rate is simply the sum of federal and state marginal tax rates. Rates plotted are the representative workers' average rates during the period covered (age 32 through age 66; or ages 67 and older).

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

on income tax liability, inclusive of both changes in AGI and changes to marginal tax rates. Average tax rates differ from marginal tax rates because only a portion of total income is taxed at a taxpayer's marginal tax rate. Some income may not be subject to any tax because of exclusions, adjustments, exemptions, and deductions. Other income may be included in taxable income but subject to tax at a lower rate than the marginal tax rate, which applies to the last dollar of income.

This analysis uses a measure of total income that ensures all retirement-related income is treated equivalently and—to simplify comparisons between alternative tax policies—is defined to be the same with tax deferral as it is without tax deferral. While individuals are working, total income is set equal to wage income less employee contributions to the 401(k) plan and less employee Social Security taxes. During retirement, total income is set equal to total retirement income—the sum of Social Security benefit payments and 401(k) plan distributions.[15]

While Working

While individuals are working—by reducing AGI and, in some cases, marginal tax rates—tax deferral reduces average tax rates for all workers. The reductions in average tax rates are proportionately larger for workers with higher lifetime earnings (Figure 3.4, left panels). Average tax rate reductions range from 0.8 percentage points for the Earn21K worker (from 10.4 percent without tax deferral to 9.6 percent with tax deferral) to 8.1 percentage points for the Earn234K worker (from 38.0 percent without tax deferral to 29.9 percent with tax deferral).

During Retirement

During an individual's retirement, tax deferral typically increases average tax rates, with the impact substantially larger for workers with higher lifetime earnings (Figure 3.4, right panels). Without tax deferral, workers would pay little or no income tax during retirement, with the three lowest-earning workers paying no income tax and other workers paying income taxes ranging from 0.4 percent of total retirement income for the Earn92K worker to 3.4 percent of total retirement income for the Earn234K worker. With tax deferral, the Earn21K worker continues to pay no income tax during retirement, but all other workers pay more in income taxes. Average tax rates with deferral range from 1.1 percent for the Earn43K worker to 24.7 percent for the Earn234K worker.

Summary

The benefits of tax deferral increase only modestly with lifetime earnings because those workers for whom tax deferral reduces income taxes the most while working are also the workers for whom tax deferral increases income taxes the most during retirement. Policy discussions that focus only on the up-front benefit of tax deferral are misleading. The impact of tax deferral on income tax liability varies much less across workers when measured over a lifetime.

FIGURE 3.4

Effect of Tax Deferral on Average Tax Rates

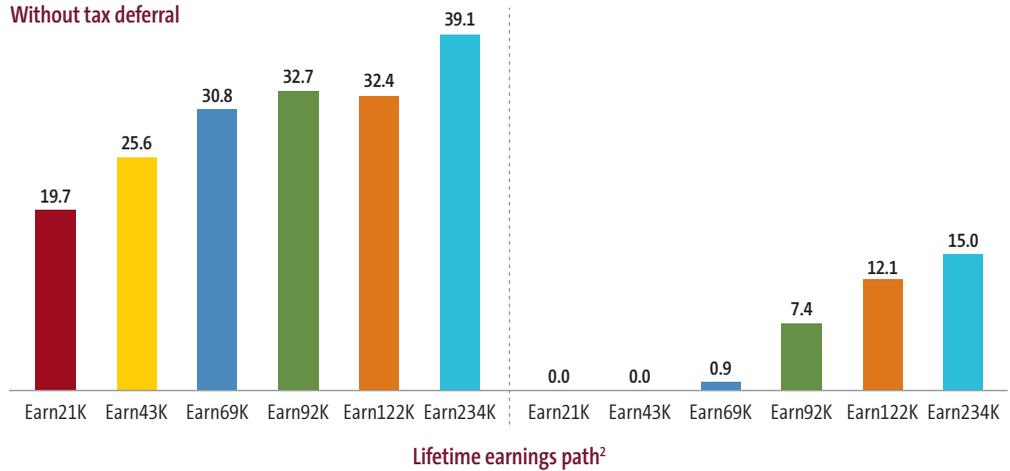*Average tax rates[1] with and without tax deferral for representative individuals with various levels of lifetime earnings,[2] percent*

Working
Average from age 32 through age 66

Retired
Survival-weighted average for ages 67 and older

Without tax deferral

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Without tax deferral (Working)	10.4	17.9	24.7	28.8	32.1	38.0
Without tax deferral (Retired)	0.0	0.0	0.0	0.4	1.4	3.4

Lifetime earnings path[2]

With tax deferral
Current policy baseline

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
With tax deferral (Working)	9.6	15.7	21.4	24.1	26.7	29.9
With tax deferral (Retired)	0.0	1.1	6.4	12.9	16.9	24.7

Lifetime earnings path[2]
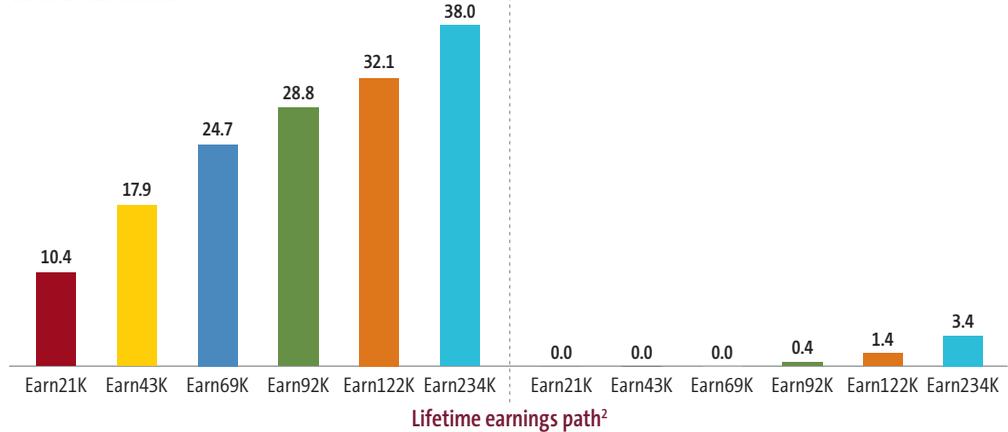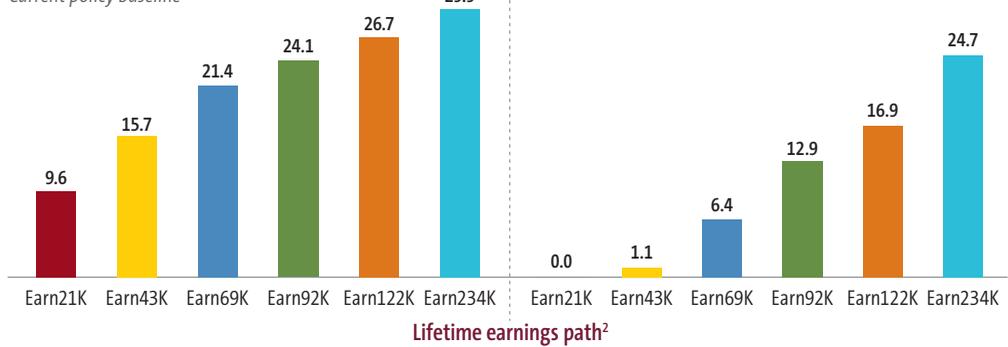
[1] Average tax rates while working are the sum of federal and state income taxes divided by wage income less employee share of Social Security payroll tax and less employee 401(k) plan contributions. Average tax rates while retired are the sum of federal income tax and state income taxes divided by the sum of Social Security benefits and 401(k) plan distributions. Rates plotted are the representative workers' average rates during the period covered (age 32 through age 66; or ages 67 and older).

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

Even analysis that attempts to measure the lifetime benefits of tax deferral, however, may overstate the differences across workers. Without a full simulation of lifetime tax liability, back-of-the-envelope calculations of the benefits of tax deferral that rely solely on marginal tax rates are likely to understate the impact of tax deferral on taxes during retirement. Without tax deferral, even workers with higher lifetime earnings would pay little income tax during retirement. In the simulations, tax deferral directly affects AGI during retirement by increasing the amount of 401(k) plan distributions included in AGI. This impact is amplified, however, by the effect that 401(k) plan distributions have on the share of Social Security benefit payments included in AGI. As illustrated by comparisons of average tax rates, combining the impact of tax deferral on AGI during retirement—including both direct and indirect effects—with a progressive tax rate schedule, tax deferral substantially increases income taxes during retirement for workers with higher lifetime earnings.

Dispelling Popular Misconceptions About Tax Deferral

▶ Contrary to conventional wisdom, the marginal benefits of tax deferral (the benefits of deferring an additional $1 of compensation) are higher, on average, for the lower-earning workers analyzed in this study than they are for the higher-earning workers. Although the lower earners face lower marginal tax rates while working, their marginal benefits are higher because they experience the largest drop in marginal tax rates during retirement.

▶ The benefits of tax deferral increase with lifetime earnings because of the design of the Social Security system, not because of the design of the income tax. In this study's simulations, higher earners benefit more from tax deferral—not because they benefit more on every dollar they contribute to a retirement plan, but because they contribute more dollars. Because Social Security benefit payments replace a smaller share of their pre-retirement income, higher earners need to save more to ensure they meet the target replacement rate of their income in retirement.

▶ The incentive to save in the current tax code is not "upside down." Normal income tax treatment discourages savings by taxing investment returns. Far from providing an "upside-down" incentive to save, tax deferral equalizes the incentive to save by effectively taxing investment returns at a zero rate for all workers.

In addition to illustrating who benefits from the U.S. retirement system, the simulation results from this study can be used to show that two widely held beliefs about tax deferral are incorrect.

The first myth is that higher-earning workers benefit more from tax deferral because they benefit more on every $1 of compensation that they defer. This belief presumably is the result of confusing a deferral of tax with a tax exclusion or a tax deduction. Unlike an exclusion or a deduction, the marginal benefits of tax deferral do not increase proportionately with an individual's marginal tax rate. In fact, the three lowest-earning representative workers in this study would benefit more, on average, from deferring an additional $1 of compensation.

The second myth is that, because of tax deferral, the current income tax system provides an "upside-down" incentive to save. This myth compounds the error of the first myth: it not only assumes that the marginal benefits of tax deferral are proportional to a worker's marginal tax rate, it also equates the *marginal benefits of tax deferral* with the *incentive to save*. The *benefits of tax deferral* are measured by comparing tax liability under current tax law with tax liability under the normal income tax structure. The *incentive to save* is the trade-off between current and future spending. By taxing investment returns, an income tax discourages saving by reducing the amount of future spending that can be funded by foregoing current spending. By effectively taxing investment returns at a zero rate, tax deferral provides all workers with roughly the same incentive to save.

The widespread beliefs that higher-earning workers get more benefits from every dollar they defer and that tax deferral produces an "upside-down" incentive to save have, in turn, led to proposals to reduce the up-front benefits of tax deferral for workers with higher marginal tax rates.[1] In addition to being based on an apparent misunderstanding of tax deferral, these proposals would reduce the fairness of the income tax and would increase its complexity (see discussion in chapter 7).

The Marginal Benefits of Tax Deferral

> MYTH: *Workers with higher earnings get more benefits from tax deferral because they face higher marginal tax rates.*

> FACT: *The design of the Social Security system, not the design of the income tax, is the primary reason the benefits of tax deferral increase with lifetime earnings.*

A common criticism of tax deferral is that, because they face higher marginal tax rates, workers with higher lifetime earnings get more tax benefits for every dollar of compensation they defer. For example, here is how a recent report explained why workers with higher earnings get more benefits from tax deferral:

> "The benefit from the deferral on retirement contributions is tied to a taxpayer's marginal tax rate and thus rises as household income increases. For example, someone making $40,000 and in the 10 percent tax bracket receives an upfront tax subsidy of 10 cents per dollar of deductible retirement contributions, whereas someone who makes $450,000 and is in the 35 percent bracket receives an upfront subsidy of 35 cents on the dollar. As a result, the

benefits from retirement savings tax expenditures 'tilt heavily toward the top,' as a recent CBO report explains." (Marr, Frentz, and Huang 2013, page 3)

This explanation, however, equates the benefits of tax deferral with the benefits of a tax exclusion or a tax deduction. The up-front tax savings associated with a retirement plan contribution is only one aspect of tax deferral. Tax deferral also reduces taxes during the deferral period and increases taxes when distributions are taken from the plan.

Contrary to conventional wisdom, the marginal benefits a worker gets from deferring an additional $1 of compensation are not closely linked to the worker's marginal tax rate. The marginal benefits of tax deferral are determined by many factors, including the length of deferral, the marginal tax rate at the time of the contribution, and the marginal tax rate at the time of distribution. To the extent any generalization can be made based on the simulations in this study, it is that the marginal benefits of tax deferral are typically higher for workers with lower lifetime earnings. Despite facing lower marginal tax rates while working, the lower-earning workers in this study would benefit more from deferring an additional $1 of compensation because they experience the largest reductions in marginal tax rates when they retire.

It is the design of the Social Security system—not the design of the income tax—that causes the benefits of tax deferral to increase with lifetime earnings. In this study, workers with higher lifetime earnings do benefit more from tax deferral, but it is not because they benefit more on every dollar of compensation they defer. It is because they defer more of their compensation. And the reason that they defer more of their compensation is that Social Security benefit payments replace a smaller share of their pre-retirement earnings.

Measuring the Marginal Benefits of Tax Deferral

Up until this point in the book, the analysis has focused on estimating the total benefits that workers get from tax deferral. To estimate total benefits, the baseline simulation of current policy is compared with a simulation in which tax deferral is completely eliminated and 401(k) plans are changed to taxable individual investment accounts.

This chapter switches gears and estimates the marginal benefits of tax deferral—the lifetime benefits workers receive from a one-time increase in retirement plan contributions of $1. Rather than comparing current policy to an alternative policy that completely eliminates tax deferral, two alternative scenarios are compared that both start with the baseline simulation of current policy. In the first alternative, tax-deferred compensation is increased by $1 relative to the baseline simulation. In the second alternative, the same $1 of compensation is used to fund a contribution to a taxable investment account. The marginal benefits of deferral are then calculated as the present value of the difference in lifetime taxation between the two alternative scenarios.[2]

Marginal Tax Rates and Marginal Benefits

The marginal benefits of tax deferral depend on more than a worker's marginal tax rate in the year a retirement plan contribution is made. Assuming plan participants make similar investments, the benefits of deferring tax on an additional $1 of compensation depend on a worker's marginal tax rate at the time of contribution, the worker's marginal tax rate during the deferral period, the worker's marginal tax rate at the time of distribution, and the length of deferral.[3] The relationship between marginal benefits and the length of deferral is fairly straightforward: for any given combination of marginal tax rates, the marginal

benefits of tax deferral increase with every year the contribution remains in the plan. The relationship between the marginal benefits of tax deferral and a worker's marginal tax rate at the time of a contribution is much more complex.

» If a taxpayer's marginal tax rate is the same at the time of contribution and distribution, the benefits of contributing an additional $1 to a 401(k) plan typically increase with a worker's marginal tax rate. The marginal benefits do not increase proportionally with a taxpayer's marginal tax rate, however. In fact, past a certain threshold tax rate, the benefits of an additional $1 retirement plan contribution actually decline for workers with higher marginal tax rates.[4]

» If a taxpayer's marginal tax rate changes between the time of contribution and the time of distribution, the relationship becomes even more complex. Relative to the case where marginal tax rates are equal, marginal benefits increase if the marginal tax rate at the time of distribution is less than the marginal tax rate at the time of contribution and decrease if the marginal tax rate is higher when distributed.

» A further complication is the interaction between distributions from a 401(k) plan and the share of Social Security benefits included in AGI during retirement. Marginal tax rates measure the change in taxes associated with a small change in taxable income. As explained in chapter 3, an additional $1 of distributions from a 401(k) plan can increase AGI—and, in turn, increase taxable income—by more than $1 because it can affect the share of Social Security benefits included in AGI. If this is the case, the taxpayer's marginal tax rate that applies to taxable income does not capture the full impact of 401(k) plan distributions on income tax liability. In these cases, benefits of contributing an additional $1 to a 401(k) plan would be less than the benefits implied by a worker's marginal tax rates.

Estimates of Marginal Benefits

Corresponding to these three scenarios, three estimates of the marginal benefits of tax deferral are presented below for each of the six representative workers analyzed in this study.

» The first is a back-of-the-envelope calculation that assumes workers' marginal tax rates are the same at the time of contribution and the time of distribution. Researchers who only have information about workers at the time they make a contribution may use this type of calculation to estimate marginal benefits.[5]

» The second and third estimates are derived using full simulations. The simulations are able to capture the difference in income tax liability in every year over the workers' remaining lifetimes, and thus, both account for changes in marginal tax rates in retirement.

» To isolate the impact of lower marginal tax rates in retirement, the second marginal benefit estimate assumes that the amount of Social Security benefit payments included in AGI remains the same as in the baseline simulation of current policy. The results from this simulation could be replicated fairly closely by a researcher using a back-of-the-envelope calculation that accounted for the reduction in marginal tax rates during retirement.[6]

The third marginal benefit estimate allows the amount of Social Security benefit payments included in AGI to change relative to the baseline simulation of current policy. This is the most accurate measure of marginal benefits, but would be difficult to measure accurately without a full lifetime simulation.

Calculated Marginal Benefits Assuming No Change in a Worker's Marginal Tax Rates over Time

The marginal benefits of tax deferral increase with marginal tax rates if tax rates are the same at the time of contribution and the time of distribution, but the increase in benefits is not proportional to the increase in tax rates. For example, suppose that, relative to the baseline simulation of current policy, the six representative workers contributed an additional $1 to the 401(k) plan at age 50 and distributed all the assets associated with the contribution at age 71 (Figure 4.1, middle panel).[7] Suppose further that each worker's marginal tax rate was unchanged over this period and was equal to the average rate they faced while working (from age 32 through age 66). Average marginal tax rates in the baseline simulation range from 19.7 percent for the Earn21K worker to 38.4 percent for the Earn234K worker. An additional $1 of tax deferred compensation at age 50 would produce a tax benefit equal to $0.16, in present value, for the Earn21K worker. Despite having a marginal tax rate nearly twice as high, the marginal benefit for the Earn234K would be $0.22, or about one-third higher. In fact, despite having marginal tax rates that range from 30.8 percent to 38.4 percent, the four highest earners get about the same marginal benefits from tax deferral.

Assuming a worker's marginal tax rate does not change over time, the benefits of tax deferral are equivalent to facing a zero rate of tax on investment income.[8] Recall that tax deferral has three separate effects on tax liability: it reduces taxes when contributions are made; it reduces taxes during the deferral period; and it increases taxes when distributions are taken. When marginal tax rates do not change, the taxes paid upon distribution are equal, in present value, to tax savings associated with the contribution. Because these two effects exactly offset each other, the tax benefit is the one remaining effect: the reduction in taxes paid during the deferral period. Specifically, the tax benefit of deferral is equivalent to facing a zero rate of tax on the investment income that would have been generated if compensation was first subject to income tax and the net-of-tax amount was then contributed to an investment account.

Once this equivalence is understood, it is easier to explain why the marginal benefits of deferral do not increase proportionally with a worker's marginal tax rate. Workers with higher marginal tax rates benefit more on every dollar of *investment income* to which the zero rate applies. The amount of *investment income* that would be generated by an after-tax contribution, however, is lower for workers with higher marginal tax rates. The result is that the marginal benefits of tax deferral increase with marginal tax rates, but the rate of increase slows as the marginal tax rate increases.

In addition to illustrating how the benefits of deferral differ across workers when there is no change in marginal tax rates, the back-of-the-envelope calculations also illustrate that, holding lifetime earnings fixed, the marginal benefits of tax deferral increase with the length of deferral (Figure 4.1). For example, the calculated benefits of an additional $1 contribution to a 401(k) plan at age 60, expressed in present value, would range from

FIGURE 4.1

Even If Marginal Tax Rates Are Constant, Marginal Benefits Are Not Proportional to Marginal Tax Rate

Calculated present value of marginal benefits of an additional $1 contribution to a 401(k) plan assuming marginal tax rate in retirement is the same as when working, by lifetime earnings and age at the time of contribution[1]

Lifetime earnings path[2]
Marginal tax rate while working[3]

- Earn21K (19.7%)
- Earn43K (20.8%)
- Earn69K (30.8%)
- Earn92K (30.8%)
- Earn122K (32.8%)
- Earn234K (38.4%)
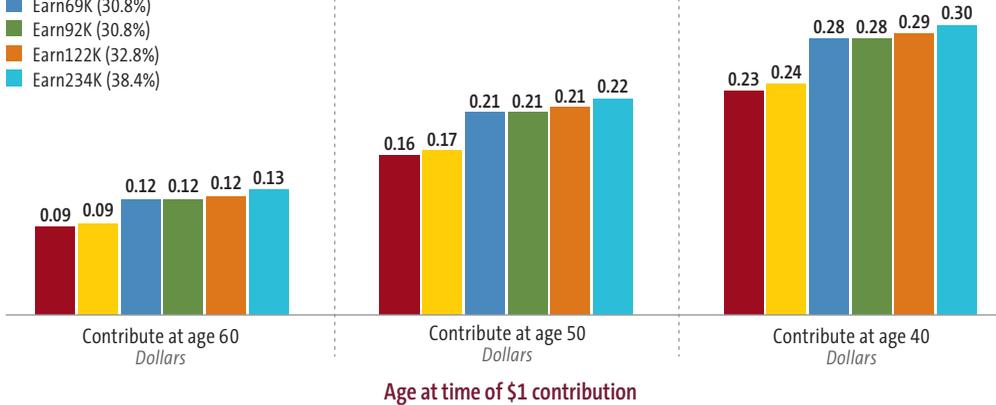
Contribute at age 60
Dollars
0.09 0.09 0.12 0.12 0.12 0.13

Contribute at age 50
Dollars
0.16 0.17 0.21 0.21 0.21 0.22

Contribute at age 40
Dollars
0.23 0.24 0.28 0.28 0.29 0.30

Age at time of $1 contribution

[1] Calculations assume additional contributions are invested in bonds earning 5.8 percent nominal interest and that assets are distributed at age 71.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[3] Reported marginal tax rates are average marginal tax rates from age 32 through age 66 from the baseline simulation (see Figure 3.3, lower panel).

Source: ICI calculations

$0.09 for the Earn21K worker earnings to $0.13 for the Earn234K worker (first panel). For an additional $1 contribution at age 40, the benefits would range from $0.23 for the Earn21K worker to $0.30 for the Earn234K worker (third panel). As these calculations illustrate, an individual's age typically is more important than an individual's marginal tax rate in determining the marginal benefits of tax deferral.

Once again, understanding that, when a worker's marginal tax rate does not change over time, the benefits of tax deferral are equivalent to facing a zero rate of tax on investment income makes it easier to explain why the benefits increase with the length of deferral. That is, as the number of years a contribution remains invested increases, the investment income that is generated by the contribution increases, and the benefits of the zero rate of tax on that investment income increase.

Simulated Marginal Benefits Accounting for Changes in a Worker's Marginal Tax Rates over Time

If the reductions in the representative workers' marginal income tax rates during retirement are accounted for, the pattern of marginal benefits is roughly flipped, with the marginal benefits of tax deferral typically higher for representative workers with lower lifetime earnings.

Despite facing lower marginal tax rates while working, lower-earning workers get higher marginal benefits because their marginal tax rates fall more sharply during retirement.

The marginal benefit estimates in Figure 4.1 do not represent the true marginal benefits of tax deferral because all six representative workers face lower marginal income tax rates in retirement in the baseline simulations of current policy (as was shown in Figure 3.3, lower panel). If marginal tax rates are lower in retirement, then the income tax paid upon distribution is now less, in present value, than the tax savings associated with the contribution. With tax rates lower in retirement, the benefits of deferral are equivalent to a worker paying a zero rate of tax on the investment income they would have earned in a taxable account, plus a bonus equal to the difference, in present value, between the tax savings associated with the contribution and the taxes paid upon distribution. For example, if a worker's marginal tax rate is 25 percent when making a contribution but falls to 15 percent when taking a distribution, then the benefits of deferring $1,000 of compensation would be equal to getting a zero percent tax rate on the investment income that would be generated by a $750 contribution to a taxable account, plus a $100 bonus (in present value).

To provide an estimate of the marginal benefits of a $1 retirement plan contribution at a particular age that accounts for the change in marginal tax rates over a worker's lifetime, two simulations were run and compared. The first simulation started with the baseline simulation of current policy, but each representative worker was assumed to make an additional $1 employee contribution to the 401(k) plan.[9] The second simulation also started with the baseline simulation, but assumed all workers used the additional $1 of compensation to fund a contribution to a separate taxable investment account. No other assumptions were changed in the simulations.[10] To isolate the impact of marginal tax rates on the benefits of tax deferral, both simulations assumed that the amount of Social Security benefit payments included in AGI was held fixed at the amount included in AGI in the baseline simulation of current policy. The marginal benefit of tax deferral was calculated as the difference in the present value of lifetime taxes between the two simulations.

Although marginal tax rates decline during retirement for all workers in the baseline simulation of current policy, the rates fall more sharply for workers with lower lifetime earnings. For example, combined federal and state marginal income tax rates are 6.3 percentage points lower in retirement for the Earn234K worker (32.1 percent in retirement compared with 38.4 percent while working) and 2.0 percentage points lower for the Earn122K worker (30.8 percent compared with 32.8 percent). In contrast, marginal tax rates are 15.8 percentage points lower in retirement for the Earn69K worker (15.0 percent compared with 30.8 percent), and 19.7 percentage points lower for the Earn21K worker, who pays no income tax during retirement.

Compared with the first estimates derived using back-of-the envelope calculations (Figure 4.1), the second set of marginal benefit estimates—which are derived by simulation and which account for the change in marginal tax rates—are higher for all six representative workers (Figure 4.2). The differences between the two estimates are greater for workers with lower lifetime earnings, however, because they experience a larger decline in marginal tax rates during retirement. For example, the simulated marginal benefits of a $1 retirement plan contribution at age 40 are $0.41 for the Earn21K worker, an increase of $0.18 compared with the calculations that assumed no change in marginal tax rates. For the Earn234K worker, the simulated benefits are $0.35, an increase of $0.06 (accounting for rounding) relative to the calculations with no change in rates.

Accounting for changes in marginal tax rates, it can be seen that the representative workers with lower lifetime earnings typically would get more benefits from deferring an additional $1 of compensation (Figure 4.2). Regardless of the length of deferral, the two workers who experience the sharpest drop in marginal tax rates during retirement—the Earn21K worker and the Earn69K worker—get the largest marginal benefits from tax deferral (Figure 4.2). For example, the marginal benefits of a $1 retirement plan contribution at age 60 are $0.26 for both the Earn21K and Earn69K workers, but are only $0.20 for the Earn234K worker. Similarly, the marginal benefits of a $1 retirement plan contribution at age 40 are $0.41 for the Earn21K worker and $0.44 for the Earn69K worker but are only $0.35 for the Earn234K worker. Including the Earn43K worker, the marginal benefits of tax deferral for the three workers with the lowest lifetime earnings are either about the same or substantially higher than the marginal benefits for the three workers with the highest lifetime earnings.

FIGURE 4.2

Accounting for Change in Marginal Tax Rates, Workers with Lower Lifetime Earnings Typically Get Higher Marginal Benefits

Present value of benefits of an additional $1 contribution to a 401(k) plan derived by simulation but holding share of Social Security benefit payments included in AGI fixed, by lifetime earnings and age at the time of contribution[1]

Lifetime earnings path[2]
Marginal tax rate while working / marginal tax rate during retirement[3]

- Earn21K (19.7% / 0.0%)
- Earn43K (20.8% / 10.0%)
- Earn69K (30.8% / 15.0%)
- Earn92K (30.8% / 30.0%)
- Earn122K (32.8% / 30.8%)
- Earn234K (38.4% / 32.1%)

Age at time of $1 contribution
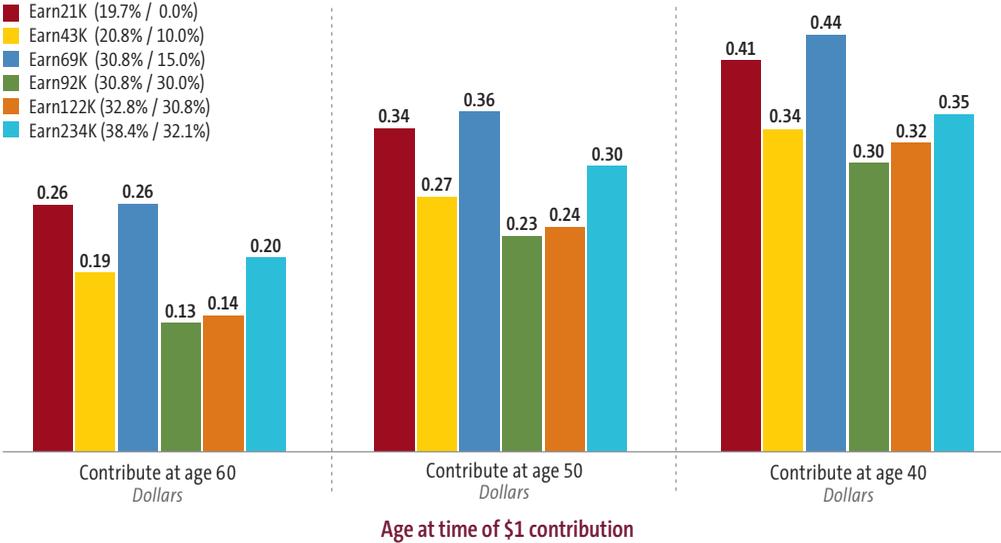
[1] Simulations assume additional contributions are invested in bonds earning 3.0 percent plus inflation, which, for much of the simulation period, equals a nominal interest rate of 5.8 percent. At retirement, accumulated assets are used to purchase an actuarially fair, inflation-indexed, immediate life annuity. Simulations assume the amount of Social Security benefit payments included in AGI is the same as baseline simulations of current policy.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[3] Reported marginal tax rates while working are average marginal tax rates from age 32 through age 66 from the baseline simulation. Reported marginal tax rates during retirement are survival-weighted average marginal tax rates for ages 67 and older from the baseline simulation. (See Figure 3.3, lower panel.)

Source: ICI simulations

Simulated Marginal Benefits Accounting for the Taxation of Social Security Benefits

The third measure of the marginal benefits of tax deferral is derived by simulation in the same manner as the second measure, but the share of Social Security benefit payments included in AGI is allowed to vary. The third measure accounts for both changes in marginal tax rates and the impact of Social Security taxation.

Accounting for the impact of additional retirement income on the share of Social Security benefit payments included in AGI reduces the marginal benefits of tax deferral for the representative workers with more moderate lifetime earnings—the Earn43K, the Earn69K, and the Earn92K workers (Figure 4.3 compared with Figure 4.2). These three workers are in the phaseout range for the exclusion of Social Security benefit payments in the baseline simulation of current policy and additional retirement income, either from a 401(k) plan or from a taxable account, would increase the share of Social Security benefit payments included in AGI.

FIGURE 4.3

Phaseout of Social Security Benefits Exclusion Reduces Marginal Benefits for Workers with Moderate Lifetime Earnings

Present value of benefits of an additional $1 contribution to a 401(k) plan derived by full simulation allowing share of Social Security benefit payments included in AGI to vary, by lifetime earnings and age at the time of contribution[1]

Lifetime earnings path[2]
Marginal tax rate while working / marginal tax rate during retirement[3]

- Earn21K (19.7% / 0.0%)
- Earn43K (20.8% / 10.0%)
- Earn69K (30.8% / 15.0%)
- Earn92K (30.8% / 30.0%)
- Earn122K (32.8% / 30.8%)
- Earn234K (38.4% / 32.1%)

Contribute at age 60 — *Dollars*: 0.26, 0.12, 0.15, 0.06, 0.14, 0.20
Contribute at age 50 — *Dollars*: 0.34, 0.20, 0.25, 0.14, 0.24, 0.30
Contribute at age 40 — *Dollars*: 0.41, 0.27, 0.32, 0.22, 0.32, 0.35

Age at time of $1 contribution
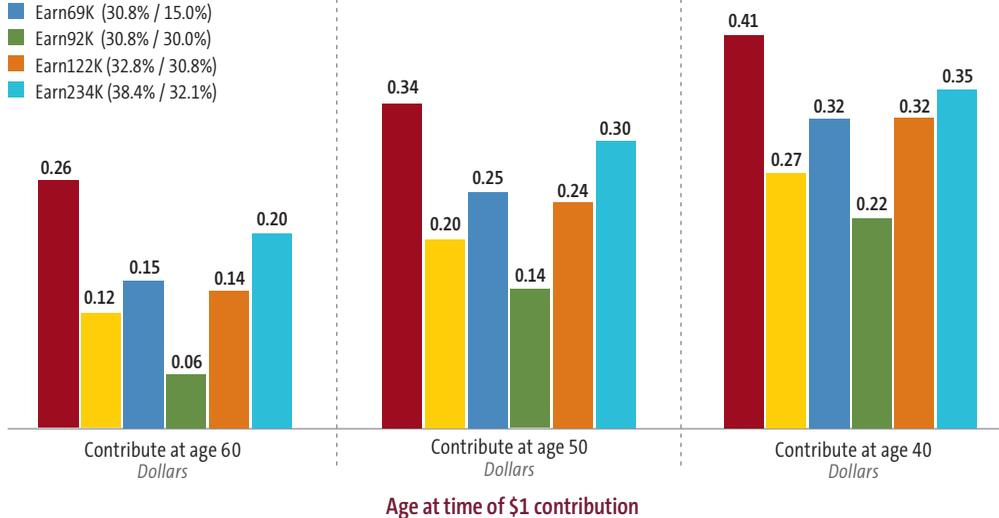
[1] Simulations assume 401(k) plan contributions are invested in bonds earning 3.0 percent plus inflation, which, for much of the simulation period, equals a nominal interest rate of 5.8 percent. At retirement, accumulated assets are used to purchase an actuarially fair, inflation-indexed, immediate life annuity.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

[3] Reported marginal tax rates while working are average marginal tax rates from age 32 through age 66 from the baseline simulation. Reported marginal tax rates during retirement are survival-weighted average marginal tax rates for ages 67 and older from the baseline simulation. (See Figure 3.3, lower panel.)

Source: ICI simulations

For the other three representative workers, the marginal benefit estimates are unchanged (Figure 4.3 compared with Figure 4.2). Although additional retirement income would increase the share of Social Security benefit payments included in AGI for the Earn21K worker, income tax liability would not be affected because AGI would remain well below the taxable threshold. Additional retirement income also would not affect tax liability for the Earn122K worker or Earn234K worker, who already include the maximum 85 percent of Social Security benefit payments in AGI in the baseline simulation of current policy.

Even accounting for the taxation of Social Security benefits, it is still the case that the marginal benefits of tax deferral are higher, on average, for the three representative workers with the lowest lifetime earnings (Figure 4.3). For example, the simulated marginal benefits of an additional $1 contribution to a 401(k) plan at age 40 for the Earn21K worker, the Earn43K worker, and the Earn69K worker are $0.41, $0.27, and $0.32, respectively, or $0.33 on average. This compares with simulated benefits for Earn92K worker, Earn122K worker, and Earn234K worker of $0.22, $0.32, and $0.35, respectively, or $0.30 on average.

The Effect of Tax Deferral on the Incentive to Save

MYTH: *Because of tax deferral, the current income tax system provides an "upside-down" incentive to save.*

FACT: *Far from providing an "upside-down" incentive, tax deferral equalizes the incentive to save.*

An accusation often leveled against tax deferral is that it provides an "upside-down" incentive to save.[11] That is, it is argued that the presence of tax deferral results in higher-income workers having a greater incentive to save than lower-income workers. For example, the following quote is a common characterization of the incentive to save for lower-income workers with no federal income tax liability.

> While the current tax system ensures that they are not unfairly taxed, it also leaves them with *no incentive to save*—even though savings could potentially increase their economic security. (Valenti and Weller, 2013, page 7, emphasis added)

Far from providing an upside-down incentive, tax deferral equalizes the incentive to save. The incentive to save is provided by the return on investments available in the capital and credit markets, not the income tax. By taking a share of the return on investments, an income tax reduces the rate of return received by investors and discourages saving. In a taxable investment account, workers with high marginal tax rates have the lowest incentive to save. Assuming no change in a worker's marginal tax rate in retirement, tax deferral removes the disincentive to save inherent in an income tax and effectively taxes investment returns at a zero rate. This allows all workers, regardless of marginal tax rate, to receive the full market rate of return on their savings.

Even when the assumption that a worker's marginal tax rates do not change over time is relaxed, it is still the case that tax deferral equalizes the incentive to save relative to an income tax. Workers whose marginal tax rates decline in retirement receive the full market rate of return plus an additional benefit from the fall in their marginal tax rates.[12]

When changes in tax liability are fully accounted for in a simulation, including the effect of savings on the taxation of Social Security benefit payments, the incentive to save for the three representative workers with the lowest lifetime earnings is higher, on average, than the incentive to save for the three representative workers with the highest lifetime earnings.

The Incentive to Save

The incentive to save is the rate of return earned on investments after accounting for taxation. Savings is defined as current income less spending. Saving requires that individuals reduce their spending today. The reward for reducing spending today is that spending can be increased in the future. The trade-off between current and future spending represents the incentive to save: if I reduce my spending by $1 today, how much can I increase my spending in the future? It is the after-tax rate of return earned on investments that determines the terms of this trade-off.

Normal Income Tax Treatment Reduces the Incentive to Save

The normal income tax structure discourages saving and results in workers with higher marginal tax rates having less of an incentive to save. This can be illustrated by comparing the tax treatment of compensation used to fund savings for workers with different marginal tax rates. For example, consider workers who wish to set aside $1,000 of current pre-tax compensation in a taxable investment account for 20 years, who invest in bonds paying 6.0 percent interest annually, and who have the same marginal tax rates throughout the 20-year period (Figure 4.4).

> » For a worker with a zero marginal tax rate, $1,000 of pre-tax compensation would not generate income tax liability and could fund $1,000 of current consumption (column 1). Alternatively, the $1,000 of after-tax income could be saved in a taxable investment account. After 20 years of interest payments, the worker would have $3,207 available to fund consumption (column 2).

> » For a worker with a 25 percent marginal tax rate, $1,000 of pre-tax compensation could fund $750 of current consumption, after income taxes of $250 (1,000 × 25%) were paid (column 1). Alternatively, the $750 of after-tax income could be saved in a taxable investment account. After 20 years of earning interest and paying income tax on the interest income, the worker would have $1,809 available to fund consumption (column 2).

As illustrated in this example, workers with higher marginal tax rates have less of an incentive to save under a normal income tax structure (Figure 4.4, column 3). For the worker with a zero marginal tax rate, every $1 of consumption given up today would generate about $3.21 ($3,207 / $1,000) to fund consumption in 20 years. For the worker with a 25 percent marginal tax rate, every $1 of consumption given up today yields about $2.41 ($1,809 / $750) of consumption in 20 years.

The incentive to save can also be expressed as the effective annual rate of return earned on foregone consumption (Figure 4.5). The worker with a zero marginal tax rate pays no tax on investment returns and earns the full 6.0 percent market rate of return on their forgone consumption, whereas the worker with a 25 percent marginal tax rate earns an effective 4.5 percent annual rate of return.[13] The worker with the 25 percent marginal tax rate earns a lower rate of return because they must pay income tax each year equal to 25 percent of interest income, or 1.5 percent of assets (6% × 0.25).

FIGURE 4.4

Normal Income Tax Reduces the Incentive to Save

Amount of after-tax income generated by $1,000 of compensation in current year and in 20 years under normal income tax treatment, by worker's marginal tax rate

Assumptions

Initial compensation	$1,000
Rate of return (annual interest payments)	6%
Length of time invested	20 years

Marginal tax rate	After-tax income available to fund consumption in current year	Amount available in 20 years to fund consumption, after income taxes are paid	Amount of future consumption funded for every $1 of consumption given up today
	(1)	(2)	(2) / (1)
0%	$1,000	$3,207	$3.21
15%	850	2,299	2.70
25%	750	1,809	2.41
35%	650	1,397	2.15

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

FIGURE 4.5

An Income Tax Reduces the Effective Annual Rate of Return Earned on Investments

Effective rate of return earned on forgone consumption assuming a 20-year investment and normal income tax treatment, by worker's marginal tax rate

Market rate of return (6.0%)

0 percent	15 percent	25 percent	35 percent
6.0%	5.1%	4.5%	3.9%

Marginal tax rate

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

Normal income tax treatment discourages savings. Without an income tax, the trade-off between current and future spending would be determined by the rate of return on investments set in the markets. An income tax introduces a wedge between the market rate of return earned on investments and the after-tax rate of return received by taxpayers. And the size of this wedge increases with a worker's marginal tax rate.

Tax Deferral Removes the Bias Against Saving

Tax deferral eliminates the disincentive to save that is inherent in an income tax. This can be illustrated by calculating the same trade-offs between current and future consumption when compensation is tax deferred (Figure 4.6).

» For a worker with a zero marginal tax rate, $1,000 of pre-tax compensation could be used to fund $1,000 of current consumption (column 1). Alternatively, the entire $1,000 could be contributed to a 401(k) plan. After 20 years earning 6.0 percent interest, the 401(k) plan account would have a balance of $3,207. Because the worker is assumed to still face a zero percent marginal tax rate when taking the distribution, the entire account balance of $3,207 would be available to fund consumption in 20 years (column 2).

» For a worker with a 25 percent marginal tax rate, $1,000 of pre-tax compensation could fund $750 of current consumption, after income taxes of $250 (1,000 × 25%) were paid (column 1). Alternatively, the entire $1,000 could be contributed to a 401(k) plan. After 20 years earning 6.0 percent interest, 401(k) plan would have a balance of $3,207. Upon withdrawal, income tax of $802 ($3,210 × 25%) would be incurred, resulting in $2,405 ($3,207 − $802) available to fund consumption in 20 years (column 2).

As illustrated in this example, assuming marginal tax rates do not change over time, all workers face the same incentive to save with tax deferral, regardless of the marginal tax rate that they face (Figure 4.6, column 3). For the worker with a zero marginal tax rate, the incentive to save is the same with tax deferral as it was under the normal income tax structure: every $1 of consumption given up today would generate about $3.21 ($3,207 / $1,000) to fund consumption in 20 years. Tax deferral increases the incentive to save, however, for all other workers, who would face the same trade-off as the worker with a zero marginal tax rate. For example, every $1 of consumption given up today by the worker with a 25 percent marginal tax rate yields about $3.21 ($2,405 / $750) to fund consumption in 20 years.

Expressed as an effective annual rate of return, assuming no change in a worker's marginal tax rate, all workers earn a 6.0 percent of return on foregone consumption with tax deferral (Figure 4.7).[14] In effect, all workers face a zero marginal tax rate on investment income with tax deferral. In this way, tax deferral removes the wedge between the rate of return paid by the market and the after-tax rate of return received by investors, and equalizes the incentive to save.

Tax Deferral Removes the Disincentive to Save

Amount of after-tax income generated by $1,000 of compensation in current year and in 20 years with tax deferral, by worker's marginal tax rate

Assumptions

Initial compensation	$1,000
Rate of return (annual interest payments)	6%
Length of time invested	20 years

Marginal tax rate	After-tax income available to fund consumption in current year	Amount available in 20 years to fund consumption, after income taxes are paid	Amount of future consumption funded for every $1 of consumption given up today
	(1)	(2)	(2) / (1)
0%	$1,000	$3,207	$3.21
15%	850	2,726	3.21
25%	750	2,405	3.21
35%	650	2,085	3.21

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

Tax Deferral Equalizes the Incentive to Save

Effective rate of return earned on foregone consumption assuming a 20-year investment and tax deferral, by worker's marginal tax rate

Market rate of return (6.0%)

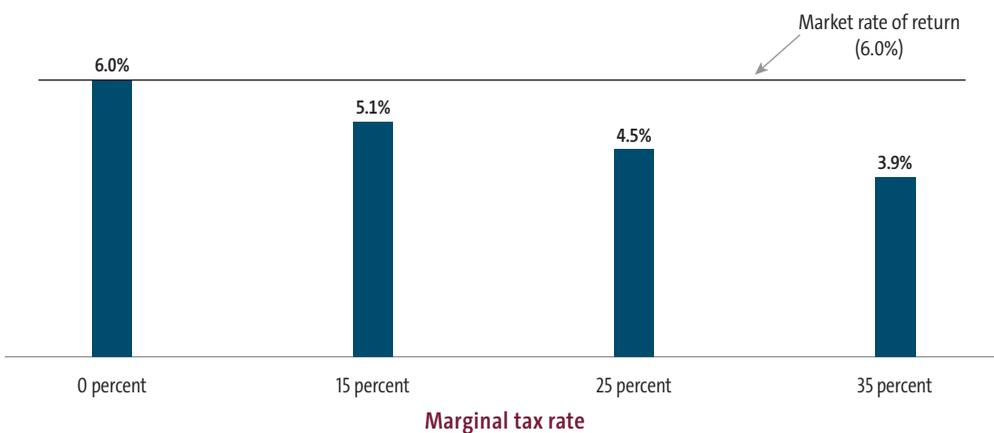| 6.0%	6.0%	6.0%	6.0%
0 percent	15 percent	25 percent	35 percent
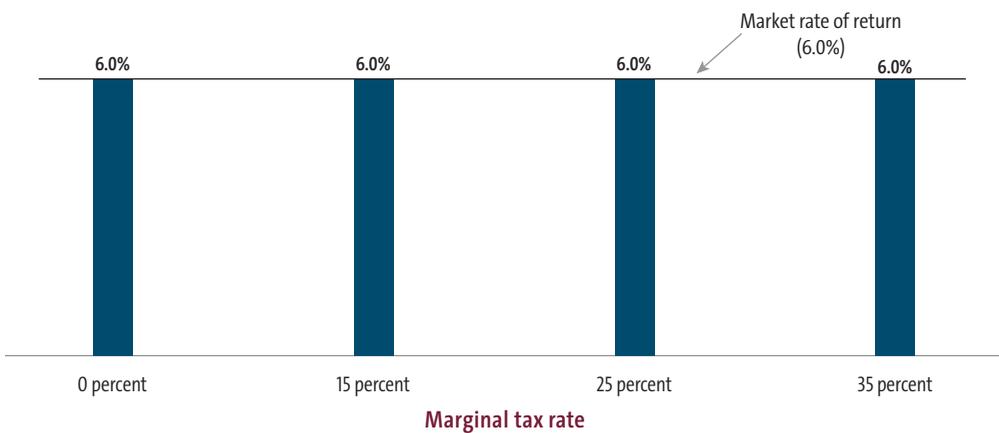
Marginal tax rate

Note: Marginal tax rates are assumed to remain the same throughout the 20-year period.

Source: ICI calculations

The Incentive to Save for Six Representative Workers

The incentive to save is more difficult to analyze when workers' marginal tax rates change over time, but the incentives can be illustrated using the six representative workers analyzed earlier. Even when changes in marginal tax rates and interactions with the taxation of Social Security benefit payments are fully accounted for, the incentive to save for the three representative workers with lower lifetime earnings is typically as high as or higher than the incentives for those with higher lifetime earnings.

To calculate the marginal incentive to save, it is assumed that each representative worker uses an additional $1 of compensation, relative to the baseline simulation of current policy, to fund savings at age 50, and then withdraws the savings plus all investment returns as a lump sum at age 71. The after-tax lump sum distribution at age 71 is then used to calculate an effective rate of return on the reduction in spending at age 50.[15]

The marginal incentive to save is calculated for both taxable and tax-deferred savings, with two measures presented for each. To isolate the impact of lower marginal tax rates in retirement, the first set of measures are derived assuming that the amount of Social Security benefit payments included in AGI remains the same as in the baseline simulation of current policy. The second set of measures, which represents the true marginal incentive faced by the workers, is derived allowing the amount of Social Security benefit payments included in AGI to change relative to the baseline simulation.

Effective Rate of Return Holding the Share of Social Security Benefits in AGI Fixed

The normal income tax structure reduces the effective rate of return on savings for all workers, with the incentive to save declining as lifetime earnings increase (Figure 4.8, upper panel). In the baseline simulation of current policy, the market rate of return is assumed to be 5.8 percent. Holding the share of Social Security benefits included in AGI fixed, the effective rate of return on taxable savings ranges from 4.6 percent for the Earn21K worker to 3.3 percent for the Earn234K worker.[16]

In isolation, a decline in marginal tax rates in retirement increases the incentive to save when taxes are deferred (Figure 4.8, upper panel). Recall that if marginal tax rates do not change over time, the effective rate of return on tax-deferred compensation would equal the market rate of return of 5.8 percent for all workers. Holding the share of Social Security benefit payments included in AGI fixed, all six representative workers have an effective rate of return greater than 5.8 percent because all experience a reduction in marginal tax rates in retirement. And the workers who experience the largest drop in marginal tax rates in retirement have the highest incentive to save with tax deferral, with effective rates of return of 6.9 percent for the Earn21K worker and 6.8 percent the Earn69K worker.[17]

Accounting for the decline in marginal tax rates in retirement, the incentive to save is no longer the same for every worker, but it remains decidedly not upside down. The incentive to save with tax deferral for the three representative workers with the lowest lifetime earnings is as high as or higher than the incentive for the three highest-earning workers (Figure 4.8, upper panel).

Effective Rate of Return Allowing the Share of Social Security Benefits in AGI to Vary

Allowing the share of Social Security benefits included in AGI to vary reduces the incentive to save for the three representative workers with more moderate lifetime earnings—the Earn43K, Earn69K, and Earn92K workers—but does not affect the measured incentive for the other three workers (Figure 4.8, comparison of upper and lower panels). For these workers, additional retirement income would increase the share of Social Security benefit payments included in AGI because they are in the phaseout range of the exclusion of Social Security benefit payments.

The taxation of Social Security benefit payments reduces the incentive to save in a taxable account modestly for the more moderate-earning workers (Figure 4.8, comparison of upper and lower panels). This is because the share of Social Security benefits included in AGI would be affected by only the interest income generated during retirement. For example, allowing the share of Social Security benefit payments included in AGI to vary reduces the effective rate of return in a taxable account from 3.7 percent (upper panel) to 3.4 percent (lower panel) for the Earn92K worker.[18]

In contrast, the taxation of Social Security benefit payments reduces the incentive to save with tax deferral substantially for the more moderate-earning workers (Figure 4.8, comparison of upper and lower panels). This is because the share of Social Security benefits included in AGI would be affected by the entire withdrawal from a retirement plan—including the original contribution and all interest income accrued during the deferral period. For example, allowing the share of Social Security benefit payments included in AGI to vary reduces the effective rate of return with tax deferral from 5.9 percent (upper panel) to 4.0 percent (lower panel) for the Earn92K worker.[19]

As illustrated in Figure 4.8, tax deferral more than offsets the disincentive to save of the normal income tax structure (upper panel) but, for workers with more moderate earnings, may not fully offset the saving disincentive introduced by phasing out the exclusion of Social Security benefit payments (lower panel).

Even with the taxation of Social Security benefit payments accounted for, however, the incentive is not upside down (Figure 4.8, lower panel). Instead, the incentive to save is higher, on average, for the three representative workers with the lowest lifetime earnings. The effective rate of return on an additional $1 contribution to a 401(k) plan at age 50 for the Earn21K worker, the Earn43K worker, and the Earn69K worker are 6.9 percent, 5.9 percent, and 6.0 percent, respectively, or 6.3 percent on average. This compares with an effective rate of return for the Earn92K worker, the Earn122K worker, and the Earn234K worker of 4.0 percent, 6.0 percent, and 6.4 percent, respectively, or 5.5 percent on average.

FIGURE 4.8

Tax Deferral Results in More Equal Incentive to Save for Six Representative Workers

Effective rate of return earned on forgone consumption assuming a 20-year investment for both normal income tax treatment and tax deferral, by worker's marginal tax rate, percent

Derived by simulation holding share of Social Security benefit payments included in AGI fixed[1]
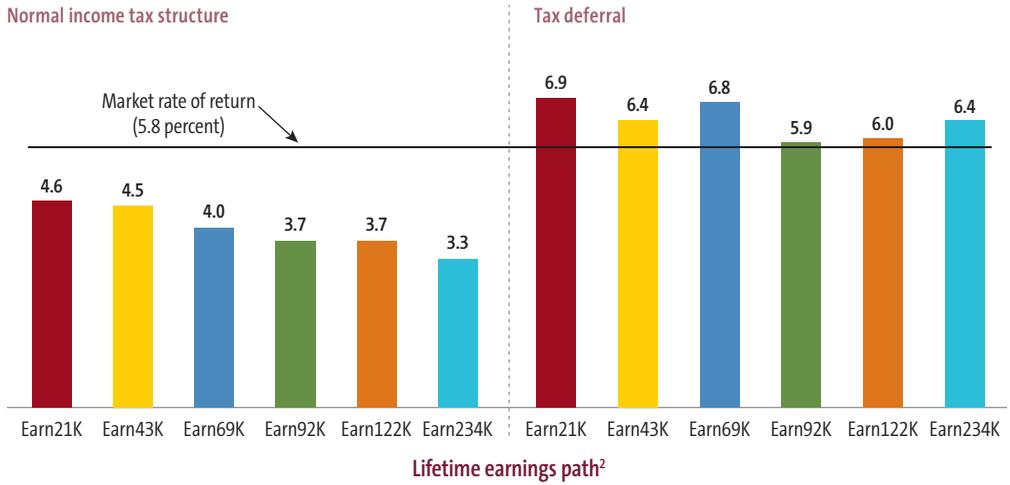
Normal income tax structure

Tax deferral

Lifetime earnings path[2]

Derived by simulation allowing share of Social Security benefit payments included in AGI to vary[1]

Normal income tax structure

Tax deferral

Lifetime earnings path[2]
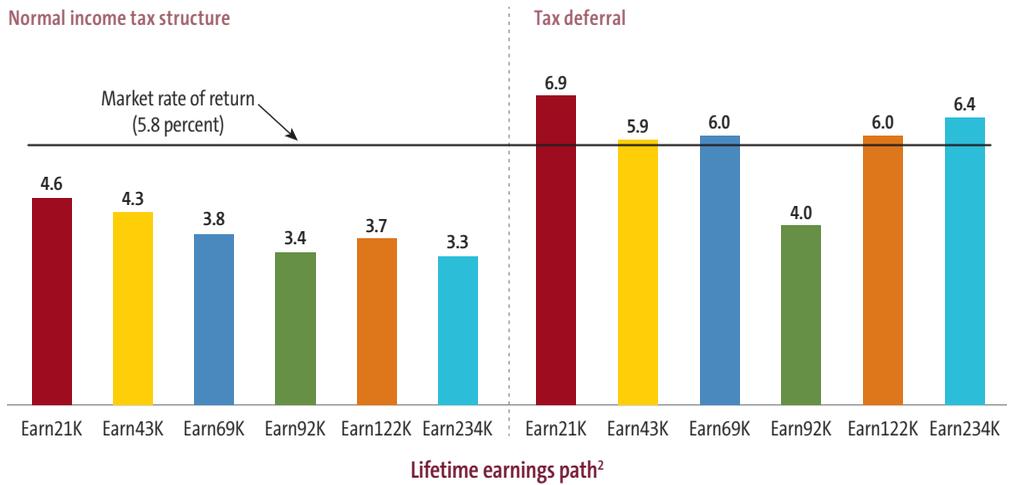
[1] Effective annual rate of return on additional savings at age 50 funded with $1 of compensation. Funds are withdrawn as a lump sum at age 71.

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI calculations

Summary

In this chapter, simulation results for the six representative workers analyzed in this study were used to dispel two popular misconceptions about tax deferral. Contrary to conventional wisdom, the simulations illustrate that the benefits of tax deferral increase with lifetime earnings because of the design of the Social Security system, not because of the design of the income tax. The simulations also illustrate that, far from providing an "upside-down" incentive to save, tax deferral equalizes the inventive to save across workers, regardless of the marginal tax rate they face.

A common criticism of tax deferral is that, because they face higher marginal tax rates, workers with higher lifetime earnings get more tax benefits for every dollar of compensation they defer. In fact, the marginal benefits a worker gets from deferring an additional $1 of compensation are not closely linked to the worker's marginal tax rate. For the representative workers analyzed in this study, the marginal benefits of tax deferral are typically higher for workers with lower lifetime earnings because they experience the largest reductions in marginal tax rates when they retire.

The representative workers with higher lifetime earnings do benefit more from tax deferral, but it is because they defer a higher share of their compensation, not because they benefit more from every dollar of compensation they defer. And the reason that they defer more of their compensation is that Social Security benefit payments replace a smaller share of their pre-retirement earnings.

Another accusation often leveled against tax deferral is that it provides an "upside-down" incentive to save. It is argued that the presence of tax deferral results in higher-income workers having a greater incentive to save than lower-income workers.

The incentive to save is provided by the return on investments available in the capital and credit markets, however, not the income tax. Saving requires that individuals reduce their spending today. The reward for reducing spending today is that spending can be increased in the future. The trade-off between current and future spending represents the incentive to save: if I reduce my spending by $1 today, how much can I increase my spending in the future? It is the after-tax rate of return earned on investments that sets the terms of this trade-off.

Far from providing an upside-down incentive, tax deferral equalizes the incentive to save. By taking a share of the return on investments, normal income tax treatment discourages saving and results in workers with high marginal tax rates having the lowest incentive to save. By effectively taxing investment returns at a zero rate, tax deferral provides all workers with roughly the same incentive to save.

A Closer Look at the Effect of Social Security on Income Tax Liability

▶ The Social Security system reduces lifetime income tax liability substantially for all six representative workers. In fact, for all but the highest-earning worker, the income tax benefits of Social Security are greater than the tax expenditure associated with tax deferral.

▶ Relative to the normal income tax structure, Social Security reduces workers' measured income by excluding the employer share of Social Security payroll taxes and by reducing investment income. The reduction of taxable investment income has the largest effect: in short order, 12.4 percent of pay contributed to a taxable investment account would generate substantial investment income.

▶ In addition to reducing taxable income, the Social Security system reduces marginal tax rates for workers with lower life-time earnings. Without Social Security, the additional taxable income would push these workers into higher statutory tax brackets.

As noted in chapter 2, previous studies, such as Goodfellow and Schieber (1993), Schieber (2012, 2014), and Smith and Toder (2014), use net Social Security benefit payments—the present value of Social Security benefit payments less the present value of Social Security payroll taxes collected—to measure the benefits of the Social Security system. Net benefit payment measures, however, ignore the preferential income tax treatment of Social Security and, as a result, are not consistent with the benefit measures used for tax deferral.

In addition to measuring net Social Security benefit payments, the analysis in this book also measures the reduction in income tax liability—relative to the normal income tax structure—caused by the Social Security system. Social Security reduces lifetime income tax liability substantially for all six representative workers. In fact, for all but the highest-earning worker the income tax benefit associated with Social Security is larger than the tax expenditure associated with tax deferral (see Figure 2.14).

This section examines the impact of Social Security on income tax liability in further detail, given its importance in measuring the lifetime benefits of the Social Security system. It then discusses what the Social Security tax expenditure estimates reveal about the limitations of the tax expenditure concept.

How Social Security Affects Income Tax Liability

As discussed in chapter 3, tax liability is determined by applying the tax rate schedule to taxable income. Taxable income is AGI less personal exemptions, less the greater of itemized deductions or the standard deduction.[1] The tax rate that applies to taxable income is determined by the tax rate schedule. The federal income tax rate schedule is progressive, with the rate of tax increasing as taxable income increases.

Two tax rates are of importance when assessing the impact of a policy on tax liability: the statutory tax rate and the marginal tax rate. The tax rate from the tax schedule that applies to a taxpayer's last dollar of taxable income is referred to as the taxpayer's *statutory tax rate*. The term *marginal tax rate* refers to the implicit rate of tax that would apply if a taxpayer's taxable income increased by a small amount, such as by $1.

The Social Security system affects tax liability primarily by changing AGI, and thus changing taxable income. In some cases, the impact on taxable income is large enough to change a representative worker's marginal tax rate, which amplifies the impact of the change in AGI.

Effect of Social Security on Adjusted Gross Income

As discussed in chapter 2, the taxation of Social Security benefit payments is modeled after the taxation of employer-sponsored retirement plans (DeWitt 2001). Therefore, the benefits of the Social Security system are estimated by the same method used to estimate the benefits of tax deferral.

The Social Security system affects tax liability both while working and in retirement. In the absence of Social Security, it is assumed that workers would have 12.4 percent of pay contributed to a taxable individual investment account on their behalf. The 6.2 percent of pay taken from the employee would be, as under current policy, included in AGI. Unlike current policy, the 6.2 percent of pay taken from the employer would also be included in AGI. In addition, interest income earned by the taxable individual investment account would also be included in AGI. At retirement, the account balance would be used to buy an actuarially fair inflation-indexed annuity. Only the portion of annuity payments that

represent unrealized investment returns would be included in AGI during retirement, which, in this case would be 30.1 percent.[2]

As was done in chapter 3 when analyzing tax deferral, the impact of the Social Security system on AGI is first illustrated in detail for the Earn69K worker before the results for all representative workers are examined. The Earn69K worker has earnings at age 40 equal to the median earnings of full-time, full-year workers from age 35 through age 44 with a bachelor's degree. The earnings of the Earn69K worker at age 40 represent the 73rd percentile of earnings among all workers from age 35 through age 44 with positive earnings.

Illustrative Results for the Earn69K Worker

For the Earn69K worker, Social Security reduces average AGI while working by roughly $12,300, from $85,439 without both tax deferral and Social Security to $73,136 without tax deferral but with Social Security (Figure 5.1, upper panel). Like tax deferral, AGI is lower with Social Security both because workers report less income on line 7 of Form 1040 (the line that asks for "wages, salaries, tips, etc.") and because workers have less taxable interest income. Social Security has a larger impact on taxable interest income than on reported wage income.

For the Earn69K worker, Social Security reduces wages reported on line 7 of Form 1040 by about $4,300 annually, on average, from age 32 through age 66. As explained in chapter 3, without tax deferral but with Social Security, the Earn69K worker would include, on average, $70,790 on line 7 of Form 1040 (Figure 5.1, upper panel), which would represent $69,299 in wage income plus $1,491 of employer matching contributions to the 401(k) plan. Without both tax deferral and Social Security, the Earn69K worker would also include the $4,297 for the employer portion of the Social Security payroll tax.[3] This would result in $75,086 reported on line 7 of Form 1040.

While individuals are working, Social Security also reduces taxable interest income by about $8,000 annually, on average, for the Earn69K worker (Figure 5.1, upper panel). Without tax deferral but with Social Security, the Earn69K worker would, on average from age 32 through age 66, include $2,346 of interest income in AGI. Without both tax deferral and Social Security, the Earn69K worker would also include in AGI $8,007 of interest income, on average, from the taxable Social Security individual investment account.

For the Earn69K worker, Social Security has a much greater impact on taxable interest income than does tax deferral. This reflects the fact that more assets would be accumulated in the taxable individual investment account under Social Security than would be accumulated in the taxable individual investment account that replaces the 401(k) plan. More assets would be accumulated primarily because Social Security taxes are collected from the start of the simulation, when the worker is aged 32, whereas 401(k) plan contributions do not begin until age 43 for the Earn69K worker. In addition, more assets would be accumulated because Social Security taxes are 12.4 percent of wage income, compared with combined employer and employee contributions to the 401(k) plan equal to 9.0 percent of wage income.

While individuals are in retirement, Social Security reduces AGI for the Earn69K worker slightly, from $10,126 per year without both tax deferral and Social Security to about $8,008 per year without tax deferral but with Social Security (Figure 5.1, lower panel). Total retirement income (Social Security distributions plus 401(k) plan distributions) actually would increase, from $33,607 without both tax deferral and Social Security to $40,311

FIGURE 5.1

Effect of Social Security on Adjusted Gross Income for the Earn69K Worker

All dollar amounts expressed as constant 2014 dollars

Working (average from age 32 through age 66)

Without both tax deferral and Social Security	
Adjusted gross income	***$85,439***
Line 7 of Form 1040 (Wages, salaries, tips, etc.)	75,086
Wage income	69,299
Employer 401(k) plan contributions	1,491
Employer share of Social Security taxes	4,297
Interest income earned by taxable individual investment accounts	10,353
Interest income earned without tax deferral	2,346
Incremental interest income earned without Social Security	8,007
Without tax deferral but with Social Security	
Adjusted gross income	***$73,136***
Line 7 of Form 1040 (Wages, salaries, tips, etc.)	70,790
Wage income	69,299
Employer 401(k) plan contributions	1,491
Interest income earned by taxable individual investment account	2,346

Retired (survival-weighted average for ages 67 and older)

Without both tax deferral and Social Security	
Total retirement income	$33,607
Social Security benefit payments	23,935
401(k) plan distributions	9,672
Adjusted gross income	***$10,126***
Social Security benefit payments (30.1 percent)	7,212
401(k) plan distributions (30.1 percent)	2,914
Without tax deferral but with Social Security	
Total retirement income	$40,311
Social Security benefit payments	30,639
401(k) plan distributions	9,672
Adjusted gross income	***$8,008***
Social Security benefit payments (16.6 percent)	5,094
401(k) plan distributions (30.1 percent)	2,914

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail. Components may not add to the total because of rounding.

Source: ICI simulations

without tax deferral but with Social Security. A smaller share of total retirement income, however, would be included in AGI with Social Security. Without Social Security, 30.1 percent ($7,212 / $23,935) of annuity distributions from the Social Security taxable individual investment account would be included in AGI. With Social Security, the Earn69K worker would include only 16.6 percent ($5,094 / $30,639) of Social Security benefit payments, on average, in AGI.

Results for All Representative Workers

For all representative workers, Social Security substantially reduces AGI while working. For example, AGI is reduced by 6 percent (from about $26,100 to $21,900) for the Earn21K worker, by 14 percent (from about $154,000 to about $133,000) for the Earn122K worker, and by 8 percent (from about $279,000 to about $258,000) for the Earn234K worker (Figure 5.2, upper panel). Compared with other workers, Social Security has a proportionately smaller impact on both wages and interest income for the Earn234K worker because they have earnings above the Social Security earnings cap throughout their careers and, thus, only pay Social Security taxes on a portion of their wages.

While individuals are in retirement, the effect of Social Security on tax liability is much more modest. Although it increases total retirement income (Social Security benefit payments plus 401(k) plan distributions), the Social Security system reduces AGI during retirement for the four lowest-earning workers because a smaller percentage of Social Security benefit payments would be included in AGI. For these workers, reductions in AGI range from about $1,000 to about $3,000 (Figure 5.2, lower panel). In contrast, the Social Security system reduces total retirement income for the Earn122k worker but increases the percentage of Social Security benefit payments included in AGI (not shown in Figure 5.2), leaving AGI roughly unchanged at about $20,000 (Figure 5.2, lower panel). For the Earn234K worker, the Social Security system increases both total retirement income and AGI, with AGI increasing from about $26,000 to about $34,000.

Effect of Social Security on Marginal Tax Rates

The impact of the Social Security system on marginal income tax rates differs by lifetime earnings. For lower-earning workers, Social Security reduces marginal tax rates while working and has little effect on marginal tax rates during retirement. For higher-earning workers, Social Security has little bearing on marginal tax rates while working and has a mixed impact during retirement.

While Working

While individuals are working, the Social Security system reduces marginal tax rates for lower-earning workers but has little impact on marginal tax rates for higher-earning workers. For example, Social Security reduces the Earn43K worker's marginal tax rate by 2.6 percentage points, from 28.2 percent to 25.6 percent (Figure 5.3, left panels).[4] Social Security reduces the marginal tax rates of both the Earn21K worker and the Earn69K worker by 0.7 percentage points, from 20.4 percent to 19.7 percent and from 31.5 percent to 30.8 percent, respectively. In contrast, Social Security has little impact on marginal tax rates for higher-earning workers. Marginal tax rates are reduced slightly for the Earn234K worker and actually increase modestly for the Earn92K worker and the Earn122K worker.[5]

FIGURE 5.2

Incremental Effect of Social Security on Adjusted Gross Income

Average annual adjusted gross income (AGI) and components while working and during retirement, thousands of 2014 dollars

Working
Average from age 32 through age 66

■ Interest income in AGI—without both tax deferral and Social Security
■ Wages (line 7 of Form 1040) in AGI—without both tax deferral and Social Security
■ Interest income in AGI—without tax deferral but with Social Security
■ Wages (line 7 of Form 1040) in AGI—without tax deferral but with Social Security

Lifetime earnings path

Retired
Survival-weighted average for ages 67 and older

■ 401(k) plan distributions—without both tax deferral and Social Security
■ Social Security distributions—without both tax deferral and Social Security
■ 401(k) distributions in AGI—without tax deferral but with Social Security
■ Social Security in AGI—without tax deferral but with Social Security
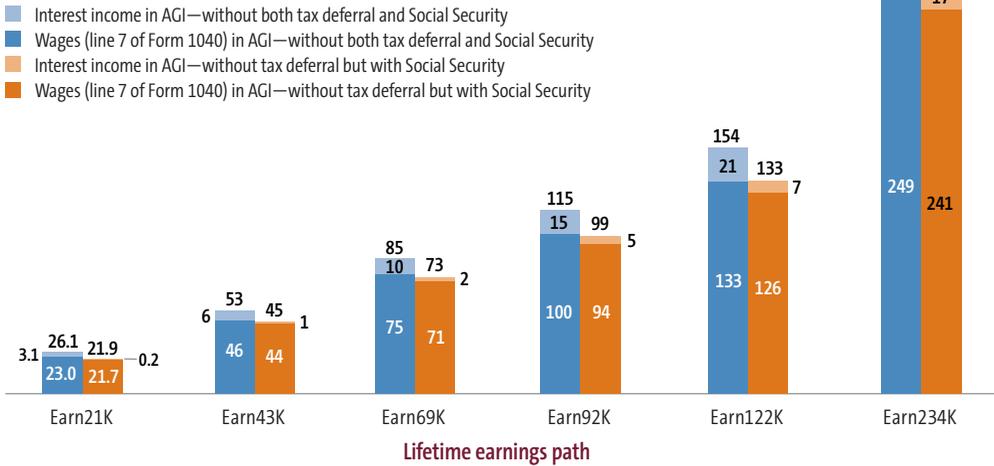
Lifetime earnings path

Note: The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail. Components may not add to the total because of rounding.
Source: ICI simulations

During Retirement

While individuals are in retirement, the Social Security system has no impact on marginal tax rates for the two lowest-earning workers and the highest-earning worker, and has a mixed impact for the other workers (Figure 5.3, right panels). Without tax deferral, no workers would pay any state income tax during retirement, either with or without the Social Security system. In addition, the Earn21K worker and Earn43K worker would pay no federal income tax and the Earn234K worker would face a 15 percent marginal tax rate, either with or without the Social Security system. For the Earn69K, Earn92K, and Earn122K workers, the impact of Social Security on marginal tax rates is mixed, although the effects are modest.[6]

FIGURE 5.3

Incremental Effect of Social Security on Marginal Tax Rates

Marginal income tax rates[1] for representative individuals with various levels of lifetime earnings,[2] percent

Working
Average from age 32 through age 66

Retired
Survival-weighted average for ages 67 and older

Without tax deferral and Social Security

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
	20.4	28.2	31.5	32.3	32.3	39.2	0.0	0.0	0.0	10.0	10.0	15.0

Lifetime earnings path[2]

Without tax deferral but with Social Security

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
	19.7	25.6	30.8	32.7	32.4	39.1	0.0	0.0	0.9	7.4	12.1	15.0

Lifetime earnings path[2]

[1] The marginal tax rates are calculated using statutory tax rates, but the federal statutory rates are adjusted for interactions with the limitation on itemized deductions, the alternative minimum tax (AMT), and the phaseout of the AMT standard deduction. For taxpayers who are not subject to the AMT and who itemize deductions, combined federal and state marginal tax rates are adjusted to account for the deductibility of state income taxes. For taxpayers who are subject to the AMT (which does not allow for the deduction of state income taxes) or who do not itemize deductions, the combined marginal rate is simply the sum of federal and state marginal tax rates. Rates plotted are the representative workers' average rates during the period covered (age 32 through age 66; or ages 67 and older).

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

Effect of Social Security on Average Tax Rates

The combination of the effects of the Social Security system on AGI and marginal tax rates substantially reduces average tax rates while working for all representative workers, but has little effect on average tax rates during retirement.

Similar to the analysis examining the impact of tax deferral on tax liability, average tax rates are used to summarize the impact of the Social Security system on income tax liability. Average tax rates are measured as the ratio of total federal and state income taxes paid to total income. The measure of total income is defined to be the same with Social Security as it is without Social Security. While individuals are working, total income is set equal to wage income less employee contributions to the 401(k) plan and less employee Social Security taxes. During retirement, total income is set equal to total retirement income—the sum of Social Security benefit payments and 401(k) plan distributions.[7]

While Working

The effects of Social Security on AGI and marginal tax rates combine to substantially lower average tax rates while working for all workers. For example, Social Security lowers average tax rates for the Earn21K worker by 4.2 percentage points while working, from 14.6 percent without both tax deferral and Social Security to 10.4 percent without tax deferral but with Social Security (Figure 5.4, left panels). Effective rates are reduced by even more as lifetime earnings increase. Social Security reduces average effective rates by 5.8 percentage points for the Earn43K worker, by 6.0 percentage points for the Earn69K worker, and by 6.3 percentage points for the Earn92K and Earn122K workers. Because a large portion of earnings are above the Social Security wage base for the Earn234K worker, Social Security has a smaller impact, reducing effective tax rates by 3.8 percentage points, from 41.8 percent to 38.0 percent.

During Retirement

While individuals are in retirement, Social Security has a much more modest impact on average tax rates. Without both tax deferral and Social Security, workers would pay little or no income tax during retirement. Without tax deferral but with Social Security, the two lowest-earning workers would continue to pay no tax and the four highest-earning workers would experience small changes in tax liability (Figure 5.4, right panels). Social Security has the largest impact on the Earn234K worker during retirement, increasing average effective tax rates by 1.3 percentage points, from 2.1 percent without both tax deferral and Social Security to 3.4 percent without tax deferral but with Social Security.

Effect on Lifetime Income Tax Liability

Although many studies focus on net Social Security benefit payments provided by—or, equivalently, net Social Security taxes imposed by—the Social Security system, this study shows that the tax expenditures associated with the Social Security system are a larger component of the lifetime benefits of Social Security for many workers.

The Social Security system is estimated to provide substantial tax benefits because it reduces tax liability substantially while working and has little impact on tax liability in retirement. In part, Social Security reduces income taxes while working by excluding

FIGURE 5.4

Incremental Effect of Social Security on Average Tax Rates

Average income tax rates[1] for representative individuals with various levels of lifetime earnings,[2] percent
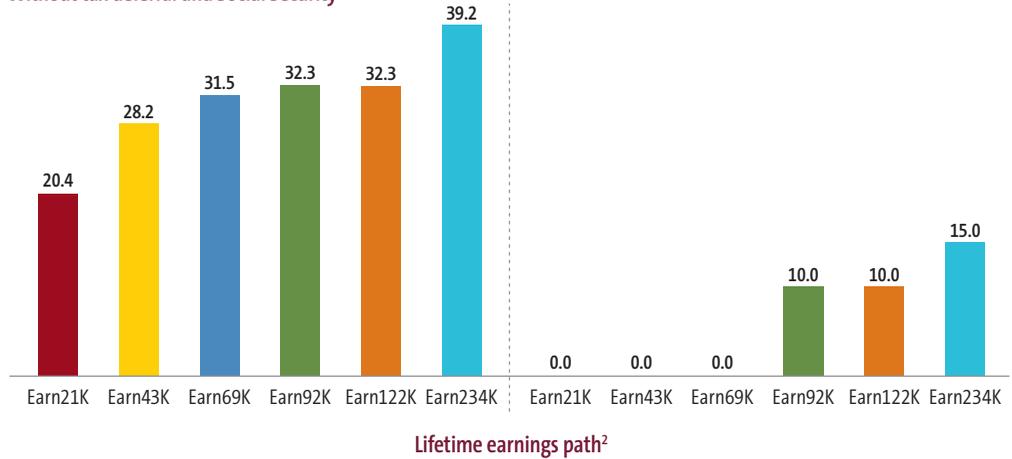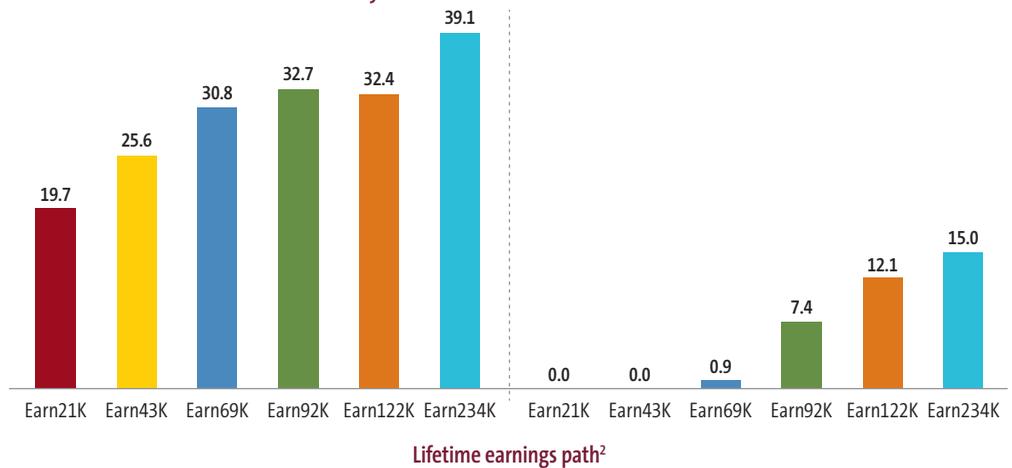
Working
Average from age 32 through age 66

Retired
Survival-weighted average for ages 67 and older

Without tax deferral and Social Security

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Working	14.6	23.7	30.7	35.1	38.4	41.8
Retired	0.0	0.0	0.0	0.6	1.3	2.1

Lifetime earnings path[2]

Without tax deferral but with Social Security

	Earn21K	Earn43K	Earn69K	Earn92K	Earn122K	Earn234K
Working	10.4	17.9	24.7	28.8	32.1	38.0
Retired	0.0	0.0	0.01	0.4	1.4	3.4
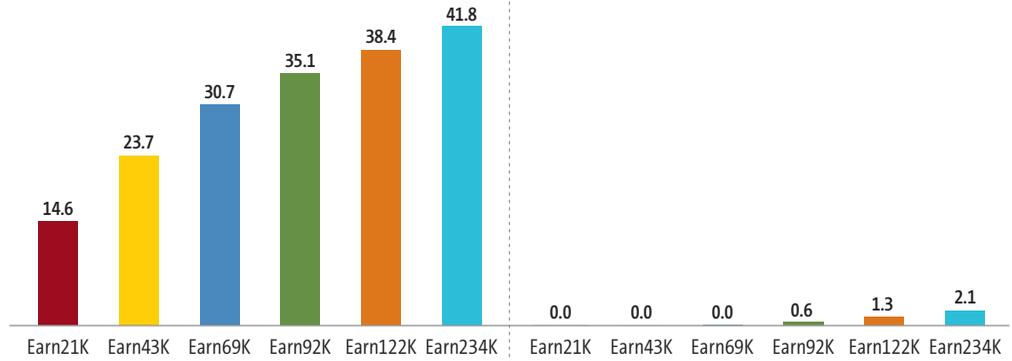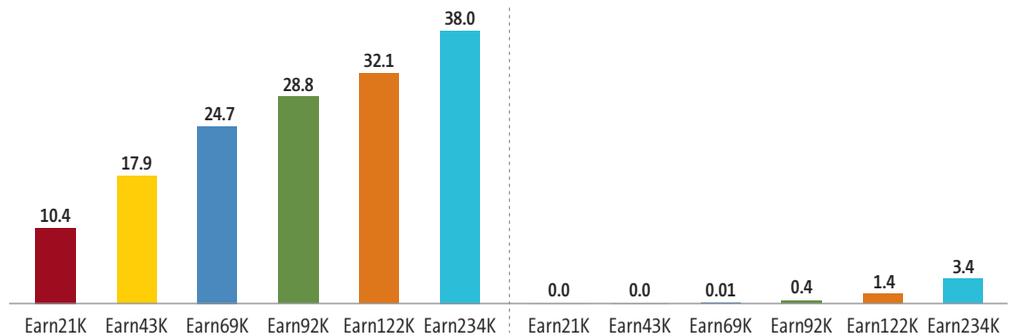
Lifetime earnings path[2]

[1] Average tax rates while working are the sum of federal and state income taxes divided by wage income less the employee share of Social Security payroll tax and less employee 401(k) plan contributions. Average tax rates while retired are the sum of federal income tax and state income taxes divided by the sum of Social Security benefits and 401(k) plan distributions. Rates plotted are the representative workers' average rates during the period covered (age 32 through age 66; or ages 67 and older).

[2] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Source: ICI simulations

the employer share of payroll taxes from AGI. The bigger impact, however, is that Social Security reduces the amount of investment income workers would include in AGI. Without Social Security, 12.4 percent of pay would be contributed to a taxable individual investment account in every year. In short order, these accounts would generate substantial taxable interest income. For lower earners, the impact of the additional income on tax liability would be amplified because they would also face higher marginal tax rates while working.

Social Security Estimates Highlight the Limitations of the Tax Expenditure Concept

In many ways the Social Security tax expenditure estimates may seem unrealistic. For example, it could be argued that Congress would never allow income taxes to increase to such an extent for workers with lower lifetime earnings. Congress sets tax rates so that higher-income taxpayers face higher statutory tax rates. If the Social Security system was replaced with taxable individual investment accounts, all workers—even workers with lower lifetime earnings—would generate considerable interest income while working. If all workers had, in addition to earnings, taxable investment accounts generating substantial interest income, the amount of income that would be needed to be considered a "higher-income taxpayer" would change, and Congress would likely adjust the statutory tax rate schedule accordingly.

It also could be argued that the alternative policy that should be modeled is not that Congress would change Social Security into a system of taxable individual investment accounts, but rather that Congress would simply abolish Social Security and the Social Security portion of the payroll tax. It could further be argued that workers would not save the additional take-home pay they would receive but would spend it. And, if workers did not save the additional take-home pay, no interest income would be earned, and no additional income tax would be collected on the nonexistent interest income.

These issues are not unique to the Social Security tax expenditure estimates in this study. They apply, to differing degrees, to all tax expenditure estimates. For example, the same issues could be raised in the context of the tax expenditure estimates for tax deferral. That is, if tax deferral was eliminated, it could be argued that Congress would adjust the tax rate schedule to help offset the tax increase on workers. It also could be argued that workers would react to the change in tax treatment by saving less or shifting savings to investments that would minimize tax liability, reducing the additional amount of income tax that would be collected on investment income.

The fact that tax expenditure estimates may be viewed as unrealistic, however, is not a valid criticism of the benefit estimates in this study. The method used to estimate the benefits of the U.S. retirement system in this study are consistent with the methods used to produce the official tax expenditure estimates and consistent with the methods used in recent studies that have distributed the benefit of tax expenditures by income class. Both the official tax expenditure estimates and the distributional analyses have been referenced repeatedly in discussions of tax reform. The benefit estimates in this study illustrate that, by the same criteria used to judge the distribution of the benefits of tax deferral, the benefits of the U.S. retirement system—inclusive of both tax deferral and the Social Security system—are progressive.

Nor is the fact that tax expenditure estimates may be viewed as unrealistic necessarily a fatal criticism of the tax expenditure concept or method of estimation. Tax expenditure estimates represent a particular measure of the tax benefits individuals receive from specific tax code provisions under current law: they measure how much tax liability would change if a specific tax code provision was eliminated, no other changes were made to the tax code, and there was no change in taxpayers' behavior. Provided it is understood what the estimates represent, they provide potentially useful information to tax policy analysts.

That said, the fact that tax expenditure estimates may be viewed as unrealistic does highlight the limits of both the tax expenditure concept and the methods of estimation. Tax expenditure estimates represent answers to very narrow questions. The estimates have analytical value, but only to the extent that the questions they answer are of interest to the analyst. Tax expenditure estimates do not have direct policy implications, nor do they answer the broader policy questions that would be raised by a comprehensive tax reform effort. This is less a criticism of the tax expenditure concept or estimation methods than an observation that tax expenditure estimates are often misinterpreted.[8] They are neither estimates of the revenue that would be raised if tax code provisions were eliminated nor predictions about the impact of future tax reform efforts.[9] Further, the fact that a particular tax code provision is associated with a tax expenditure estimate does not, by itself, suggest a future path for tax reform.

Summary

This chapter examines the impact of the Social Security system on income tax liability in more detail. This study is the first to use tax expenditure estimates to measure the benefits of both tax deferral and the Social Security system. Previous studies have used a net benefit payments measure to estimate the benefits of Social Security, but ignore the effect of Social Security on income tax liability. The tax treatment of the Social Security system in the current tax code is modeled on that of retirement plans, however, so Social Security has similar effects on income tax liability. In fact, for all but the highest-earning representative workers, Social Security reduces lifetime income tax liability more than tax deferral does.

While individuals are working, Social Security is estimated to reduce income taxes substantially compared with the normal income tax structure. In part, Social Security reduces income taxes by excluding the employer share of payroll taxes from AGI. The bigger impact, however, is that Social Security reduces the amount of investment income workers would include in AGI.

While individuals are in retirement, Social Security has little effect on income taxes paid relative to the normal income tax structure. The tax liability of lower earners is unaffected and higher earners generally experience modest increases. This is in contrast to tax deferral, where a large portion of the reduction in income taxes while working is offset by increased taxes during retirement.

The tax expenditure estimates of the Social Security system help to illustrate the limits of the tax expenditure concept. Tax expenditure estimates answer a very narrow question. Whether the estimates are of analytical value depends on the question of interest. The limits of the tax expenditure concept will be explored in more detail in chapter 6, which argues that—in particular—distributional analyses of tax expenditures have little analytical value in the broader context of tax reform.

Is Distributional Analysis of Tax Expenditures Relevant?

▶ The focus of policy discussions on microprogressivity (the effect of specific tax code provisions on progressivity) is misplaced. Although there are rationales for making the overall tax system progressive, none of these rationales support the goal that every provision within the tax code should be progressive.

▶ If a comprehensive reform of the federal income tax is undertaken, it is important that policymakers consider how all the changes included in any proposed reform would affect the progressivity of the overall tax system. The effect of specific tax provisions on progressivity should not be a concern. Tax provisions that address legitimate policy goals can be included in a reformed income tax even if they are not, by themselves, progressive.

▶ Previous tax reform efforts have focused on tax expenditures, but the effect of tax expenditures on progressivity was not a primary concern. The primary concerns revolved around economic efficiency, simplicity, and horizontal equity.

The motivation for the analysis in this study was that distributional analyses of tax expenditures have often been invoked in the context of tax reform and that distributional analysis of tax deferral alone gives an incomplete picture of the benefits of the U.S. retirement system. Using the same standard by which tax deferral has been judged in previous research, this study illustrates that the combination of Social Security and tax deferral results in a U.S. retirement system that is progressive.

This chapter takes a step back and asks whether the distributional analysis in this study, or any other distributional analysis of tax expenditures, should play a large role in any future tax reform effort. The belief of this author is that they should not. Although aggregate tax expenditure estimates have some, albeit limited, analytical value, it is not clear that distributional analysis of tax expenditures have any analytical value. Allocating tax expenditures to individual taxpayers does not accurately measure the impact of a particular tax code provision on the overall progressivity of the tax code. In fact, taken to its logical extreme, the focus on microprogressivity can lead to perverse results. If a comprehensive reform of the federal income tax is undertaken, an important consideration would be the effect of the complete tax reform package on the progressivity of the overall income tax. The impact of reform on the distribution of benefits from specific tax code provisions should not be a consideration. Tax provisions that address legitimate policy goals can be included in a progressive income tax even if they are not, in themselves, progressive.

Tax Expenditures and Previous Tax Reform Efforts

Although eliminating or limiting tax expenditures has been a consistent focus of tax reform efforts, the impact of tax expenditures on progressivity has not typically been the overriding concern. *Progressivity* is a concept that summarizes how taxes paid vary with taxpayers' incomes.[1] Taxes are progressive if the ratio of total taxes paid to income increases as income increases. Taxes are neutral if the ratio of taxes to income remains flat as income increases. Taxes are regressive if the ratio of taxes to income declines as income increases. Rather than concerns about vertical equity and their impact on progressivity, concerns about the impact of tax expenditures on the fairness of the income tax have typically centered on horizontal equity—that is, the concept that taxpayers with similar economic circumstances should have similar tax burdens.

Despite being known as a proponent of progressive taxation,[2] and despite the fact that his support for a progressive income tax likely "tainted" the tax expenditure concept for some,[3] Stanley Surrey did not primarily argue that tax expenditures should be eliminated because of their impact on progressivity. For example, prior to coining the term *tax expenditure*, Surrey summarized his concerns regarding the impact that "special tax provisions" had on the fairness of the tax system, and these concerns were about horizontal equity.

> The criticisms on the whole involve these assumptions: (1) that it is essential under a progressive income tax, and also progressive estate and gift taxes, to adhere as far as possible to the criterion of equity or fairness. Stated simply, this criterion demands that the income tax burden should as far as possible apply equally to persons with the same dollar income; (2) that the Congress

has not always followed this criterion in tax legislation; and (3) that there are a good many instances in the income, estate, and gift taxes in which the failure to follow this criterion is not properly justified by the requirements of other criteria. (Surrey 1957, pages 1146–1147)

Surrey did later come to criticize the "upside-down" nature of many tax expenditures (Surrey and McDaniel 1976), but even then, the criticism, at least as formally stated, was not primarily about tax code progressivity (see "Upside-Down Tax Expenditures" below). Further, the combination of policies that Surrey viewed as the pathway to tax reform—the removal of tax expenditures coupled with reductions in marginal tax rates—would not necessarily lead to a more progressive tax code.

Upside-Down Tax Expenditures

Surrey's primary critique of tax expenditures, as evidenced by the name he chose to give these tax code provisions, was that the government was essentially running expenditure programs through the tax code. Provided a policy objective was worth pursuing, Surrey believed that policymakers should carefully consider whether the objective would be better met with a direct expenditure program than it would be with a tax expenditure. Surrey criticized the "upside-down" nature of many tax expenditures in this context. He argued that direct expenditures programs would generally be preferable to tax expenditures, particularly given the "upside-down" benefits associated with tax expenditures.

> Assuming that government assistance in the particular area is a priority goal, then should the assistance be in the form of a direct program or through the tax system? It is the experience in the United States that until recently little thought was given to this aspect of the inquiry and thus there were no criteria developed to govern the choice since no analysis had been made of the factors involved in the choice. Gradually, however, various factors that are involved in a choice of the tax system are being recognized. Thus, it is now realized that a tax expenditure in the form of an exemption, exclusion, or deduction provides the greatest assistance to the wealthiest taxpayers and to the large corporations, in view of the progressive individual tax rates and the higher rate for large as opposed to small corporations. Tax expenditure assistance is usually "upside-down" assistance. Moreover, the choice of the tax system automatically excludes from the assistance non-taxpayers, such as individuals below taxable levels, loss proprietorships and loss corporations, exempt organizations, and governmental units. This exclusion exists even where the aspect of upside-down assistance is alleviated by using a credit against tax instead of an exemption or deduction….It is clear that no direct program would be structured in such an upside-down or exclusionary fashion. (Surrey and McDaniel 1976, page 693)

The policy discussions leading up to the Tax Reform Act of 1986 (TRA '86) were more focused on horizontal equity than on progressivity. Treasury I (U.S. Department of the Treasury 1984) and Treasury II (U.S. Department of the Treasury 1985)—the two reports that served as the basis for TRA '86—proposed to reform the tax code for "fairness, growth, and simplicity." The proliferation of tax expenditures were viewed as increasing the complexity of the tax code, making it more burdensome to fill out a tax return and inserting tax considerations into many economic decisions. Tax expenditures were also seen as a drag on economic growth, both because they distorted economic decisions by favoring certain activities and because the smaller tax base necessitated higher statutory tax rates to raise a given amount of revenue. To the extent that fairness was a concern, the concern was, again, primarily about horizontal equity rather than the overall progressivity of the income tax.

> Erosion of the tax base also creates inequities. Most obviously it is unfair that two households with equal income should pay different amounts of tax, simply because one receives or spends its income in ways that are tax preferred. (U.S. Department of the Treasury 1984, vol. 1, page 5)

In fact, the reform process that led to TRA '86 explicitly ignored the impact of tax expenditures on the progressivity of the tax system. Concerns were expressed that many tax expenditures primarily benefited those with higher incomes, but the decision was made that the proposal would be roughly distributionally neutral. That is, although tax reform would result in winners and losers among taxpayers within an income class, the relative burden across income classes would be roughly maintained.

> In its study of fundamental tax reform the Treasury Department has adopted the simple working assumption that the existing distribution of tax payments across income classes should not be significantly changed by tax reform. If any change in the existing distribution of tax burdens is desired, it can and should be implemented by adjusting the proposed personal exemptions and rate schedules. It should not be achieved by taxing some sources or uses of income more or less heavily than others, since that would violate both economic neutrality and the principle that those with equal incomes should pay approximately equal taxes. (U.S. Department of the Treasury 1984, vol. 1, page 15)

How Does Tax Deferral Affect the Progressivity of the Current Tax System?

The effect of tax deferral on the progressivity of the U.S. tax system cannot be determined without first answering a seemingly simple question: compared to what?[4] Depending on the alternative tax policy chosen as a comparison, tax deferral could be judged to make the tax code less progressive, to make it more progressive, or to have no impact at all.

Tax expenditure estimates have a very specific alternative policy to which they compare current policy: a tax code with the relevant tax provision eliminated, but which is otherwise unchanged. Compared to this alternative, tax deferral would be judged to make the tax code less progressive. This type of change to the tax code is uncommon, however.

Although some have proposed to reduce tax expenditures without changing other aspects of the tax code (Senate Budget Committee 2015; Van Hollen 2013), most tax legislation, particularly major reforms, include changes to multiple tax code provisions. For example, both the Debt Reduction Task Force of the Bipartisan Policy Center (2010) and the National Commission on Fiscal Responsibility and Reform (2010) included restrictions on tax deferral in tax reform packages that also included many other changes to the tax code, including reductions in the top statutory tax rates.

If the alternative policy was a tax system that would eliminate tax deferral and use the additional revenue exclusively to reduce the top statutory tax rate, then allowing tax deferral would be judged to make the tax code more progressive. That is because tax deferral reduces taxes paid for workers throughout the income distribution, but only the highest-income taxpayers would benefit from a reduction in the top statutory tax rate.

The most appropriate comparison for determining the effect of tax deferral on progressivity would be to ask what the tax code would look like if tax deferral had been eliminated by TRA '86. Although the tax code is constantly changing, the 1986 tax reform was the last comprehensive reform of federal income tax.

Comparing the current tax code to a hypothetical 1986 tax reform that eliminated tax deferral, tax deferral would be judged to have no impact on the progressivity of the current U.S. tax code. As already noted, the tax reform process that resulted in TRA '86 aimed to produce a new tax system that, compared to the prior law, was distributionally neutral (i.e., did not, on net, change the overall tax burden of groups of taxpayers ranked by income). Given the goals set early on in the reform process, any tax reform—whether it retained tax deferral or eliminated tax deferral—would have produced a tax code with the same level of progressivity. That is, if tax deferral had been eliminated, then other changes would have been made—such as reducing statutory tax rates—to ensure that TRA '86 had no net effect on the progressivity of the tax code.

If a new comprehensive reform of the federal income tax is to be undertaken, a decision to restrict tax deferral would be less about its impact on the progressivity of the income tax and more about its impact on horizontal equity, economic growth, and simplicity.

Prior to focusing on changing specific tax code provisions, it would be appropriate to set goals for a comprehensively reformed tax code, such as targets for revenue and progressivity. For example, as illustrated in chapter 2, the combination of the current income tax and the Social Security system is progressive, with lifetime taxes as a percentage of lifetime earnings ranging from 8.4 percent for the Earn21K worker to 33.5 percent for the Earn234K worker (Figure 6.1, left panel).[5] If tax deferral was eliminated and no other changes were made to the tax code, the tax and transfer system would be made more progressive, with lifetime taxes as a percentage of lifetime earnings ranging from 8.9 percent for the Earn21K worker to 36.5 percent for the Earn234K worker (Figure 6.1, right panel). Either level of progressivity, or some other alternative, could be chosen as the target for a reformed tax code.

Regardless of the target level of progressivity, however, a decision to eliminate tax deferral should only be made if it was determined that doing so was a better way to hit the target level of progressivity than alternatives, such as adjusting statutory tax rates. And this judgment would have to weigh the often conflicting goals of fairness, economic growth, and simplicity.

Taxes as a Percentage of Lifetime Total Compensation Under Alternative Tax Treatments

Present value of taxes paid from age 32 through age 100 as a percentage of the present value of total compensation[1] from age 32 through age 66 for representative individuals with various levels of lifetime earnings

■ Taxes paid while working[2]
■ Taxes paid during retirement[3]
■ Net Social Security taxes[4]

With tax deferral
Current policy baseline

Without tax deferral

	With tax deferral						Without tax deferral					
Total	8.4	16.9	23.5	27.8	31.2	33.5	8.9	18.2	24.9	29.3	32.8	36.5
Taxes paid while working	10.7	15.7	20.2	22.0	23.9	27.1	11.2	17.1	22.4	25.4	27.8	33.5
Taxes paid during retirement				1.9	2.5	3.6					0.1	0.3
Net Social Security taxes	-2.3	1.1	2.5	3.9	4.8	2.8	-2.3	1.1	2.5	3.9	4.8	2.8
(small values)		0.1	0.9									

Earn21K Earn43K Earn69K Earn92K Earn122K Earn234K | Earn21K Earn43K Earn69K Earn92K Earn122K Earn234K

Lifetime earnings path[5]

[1] Total compensation is the sum of wage and salary earnings, the employer share of payroll taxes (both old age, survivor, and disability insurance [OASDI] and hospital insurance [HI]), and employer matching contributions to 401(k) plans.

[2] Taxes paid while working include the sum of federal income taxes, state income taxes, and both the employer and employee share of HI payroll taxes.

[3] Taxes paid in retirement are the sum of federal income taxes and state income taxes.

[4] Net Social Security taxes are calculated as the net present value of taxes paid (both employer and employee OASDI taxes) less the net present value of Social Security benefit payments received.

[5] The lifetime earnings paths are based on the earnings paths derived in Brady 2010. See Figure 2.3 for additional detail.

Note: Components may not add to the total because of rounding.

Source: ICI simulations

The Misplaced Focus on Microprogressivity

Focusing on the distribution of benefits from a single tax code provision can lead tax policy discussions astray. Although there is no consensus as to the optimal level of progressivity, there are several possible rationales for having a progressive tax system.[6] None of the rationales for tax code progressivity, however, support the goal that every provision within the tax code should be progressive—a concept that, for ease of exposition, will be referred to as *microprogressivity*.

Rather than assessing the progressivity of every provision within the tax code, the progressivity of a tax system should be measured in its entirety. Tax provisions that address legitimate policy goals can be included in the income tax even if they are not, in themselves, progressive. Then, other aspects of the tax code—such as statutory tax rates—can be adjusted to achieve the desired level of progressivity in the system as a whole.

Not only is microprogressivity not a necessary condition for the tax code to be progressive, but also, focusing on achieving it may lead to perverse results. Taken to its logical conclusion, the quest for microprogressivity could lead to the adoption of policies that would make the tax and transfer system, as a whole, less progressive.

For example, many are concerned that higher-income workers get more tax benefits when they contribute to a 401(k) plan. As discussed in chapter 3, this concern may be misplaced.[7] However, if marginal tax rates are the same at the time of contribution and the time of distribution, it is true that the benefits of deferral typically increase with marginal tax rates. If marginal tax rates do not change over time, the benefit of tax deferral is roughly equivalent to getting a zero rate of tax on the investment income that would otherwise be subject to tax if invested in a taxable savings or investment account. Thus, to the extent that taxpayers with higher marginal tax rates benefit more from tax deferral, it is because, under the normal income tax structure, they would be taxed more heavily on investment income earned in a taxable account.

The most direct solution to the "problem" of higher-earning workers benefiting more from the effective zero rate of tax imposed on investment income though tax deferral is to tax all investment income earned in a taxable account at the same rate, regardless of a taxpayer's income. This can be achieved in one of two ways: by increasing the tax rate on investment income earned by lower-income workers or by reducing the tax rate on investment income earned by higher-income workers. Either change would ensure that all taxpayers got the same tax benefit on every dollar of investment income to which the zero rate of tax applied, and thus would increase microprogressivity. Either change would also make the tax system, as a whole, less progressive.

If instead, the concern was that higher-earning workers begin contributing to retirement accounts earlier in their careers and contribute a higher percentage of pay, addressing this concern could make the overall tax and transfer system much less progressive. In the baseline simulation of current policy presented in chapter 2, higher-earning workers get a higher percentage of their retirement income from 401(k) plans because Social Security benefit payments replace a lower share of their pre-retirement earnings (see Figure 2.10). The most direct way to increase the participation in retirement plans by the lower-earning workers in these simulations would be to reduce the generosity of Social Security benefit payments for these workers. To the extent that workers with lower lifetime earnings relied to a greater degree on retirement income generated by 401(k) plans, this change would result in a more progressive distribution of benefits from tax deferral. Alternatively, participation in retirement plans by higher-earning workers could be reduced by increasing the generosity of Social Security benefit payments for these workers. To the extent that workers with higher lifetime earnings rely to a lesser extent on retirement income generated by 401(k) plans, this change would result in a more progressive distribution of benefits from tax deferral. Either change would also make the benefits of the Social Security system less progressive and result in a less progressive overall tax and transfer system.

Summary

Since the publication of the first tax expenditure estimates, tax expenditures have played a central role in tax policy discussions. Although they are likely to continue to be a focus of tax reform, the focus should not be primarily about microprogressivity. Indeed, a narrow concern about the distributional impact of specific tax code provisions—if followed to its logical conclusion—can lead to perverse results.

If a comprehensive reform of the federal income tax is undertaken, an important consideration would be the effect of the complete tax reform package on the progressivity of the overall income tax, not the impact of reform on the distribution of benefits from specific tax code provisions. Comprehensive tax reform would involve changes to many different provisions of the tax code. Each of these changes would produce winners and losers and potentially affect the progressivity of the tax code. Prior to focusing on specific tax code provisions, it would be appropriate to set goals for the new tax code, such as targets for revenue and progressivity. The reform proposal that came out of the process would be a package of changes to multiple tax code provisions. Changes to some tax code provisions would raise revenue and changes to other tax code provisions would lose revenue. Similarly, some changes would make the tax code more progressive, whereas other changes would make the tax code less progressive.

Tax provisions that address legitimate policy goals can be included in the income tax even if they are not, in themselves, progressive. The criteria for judging any tax reform proposal would be the extent to which the entire package met the goals for revenue and progressivity determined earlier in the process, and how the entire package was judged on the criteria of fairness, economic growth, and simplicity.

Judging Tax Deferral by Criteria of Fairness, Economic Growth, and Simplicity

► By essentially allowing workers to "income average" over a lifetime, tax deferral arguably makes the tax system more—not less—fair. The justification for a progressive tax rate schedule rests largely on the assumption that annual income is a reasonable proxy for a taxpayer's economic circumstances, but the unevenness of earnings over an individual's lifetime makes this assumption problematic. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings and results in a measure of taxable annual income that is a better indicator of lifetime circumstances.

► The current income tax is roughly neutral in its treatment of the different forms of tax deferral—tax deferral through DB plans and DC plans; tax deferral for employer contributions and employee contributions; and tax deferral by private-sector workers and government employees.

► Tax deferral differs from other tax expenditures because it actually reduces the economic distortions caused by the income tax. An income tax reduces the incentive to save by taxing investment income. Tax deferral eliminates the savings disincentive inherent in an income tax by effectively taxing investment income at a zero rate.

► Tax deferral is fairly simple for workers to understand and for the government to administer. It allows a portion of a worker's compensation to be set aside for retirement and requires only that the compensation be included in taxable income when it is distributed to the worker.

► The most prominent reform proposals for retirement plans would make the tax code less fair by violating the rough neutrality toward different forms of qualified deferred compensation maintained in the current income tax. These proposals would target only DC plans or target only tax-deferred contributions made by workers to DC plans and IRAs.

► Proposals to limit the up-front benefits of tax deferral would make the tax code more complex. Many proposals to replace tax deferral would make the decision to contribute to a retirement plan more complex and would require the government to track information on individual taxpayers over an extended period of time.

Tax-deferred compensation differs in many respects from other tax expenditures, and not simply because it defers, rather than eliminates, tax liability. *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977) notes perhaps a more fundamental difference between tax deferral and other tax expenditures: the impact that tax deferral has on economic growth and fairness.

> Also, tax deferral on income from certain investments for retirement purposes is an example of how current law attempts to offset the adverse effects on savings of using an accretion income base. Significantly, this last example is also viewed as desirable for reasons of equity. (U.S. Department of the Treasury 1977, page 23)

Despite the claims of its critics, tax deferral increases the fairness of the income tax, enhances economic growth, and is relatively simple to understand and administer. In contrast, recent proposals to change the tax deferral rules would reduce horizontal equity and make the tax code considerably more complex.

Fairness

As already noted, discussions of the fairness of the tax system typically encompass concerns about both vertical equity—the distribution of the tax burden across income classes—and horizontal equity—the distribution of the tax burden within income classes.

As explained in chapter 6, how the benefits of tax deferral are distributed across income classes (i.e., the effect of tax deferral on the progressivity of the income tax) would not be a primary consideration in the context of a comprehensive reform of the federal income tax. One of the first steps in a tax reform process would be to set a target level of progressivity for the income tax as a whole. There would be different combinations of policy changes that would meet the progressivity target. For example, a reform package that included tax deferral likely would have higher statutory tax rates than a reform package that eliminated tax deferral. Choosing among these combinations of policies would involve comparing the options along dimensions other than progressivity: horizontal equity, economic efficiency, and simplicity.

Thus, the primary issue for evaluating tax deferral on the criterion of fairness would be its impact on horizontal equity, not its impact on vertical equity (progressivity). The concept of horizontal equity is that taxpayers in similar economic situations should have similar tax burdens. Along this dimension, allowing workers to defer a portion of their compensation until retirement arguably increases the fairness of the income tax by allowing workers to smooth the receipt of income over their lifetime. This is because workers' annual income is a better representation of their lifetime circumstances if they are allowed to defer a portion of their compensation until retirement.

The most prominent proposals to further limit or fundamentally change tax deferral would reduce horizontal equity. The current tax code provides roughly neutral income tax treatment to all forms of qualified plans. The proposals would violate this neutrality by targeting only DC plans or by targeting only tax-deferred employee contributions to DC plans and IRAs. In addition, proposals to further boost the benefits of tax deferral for workers with low annual incomes are likely to be poorly targeted.

Other considerations also suggest that tax deferral increases the fairness of the income tax. For example, the timing of tax liability and tax revenue would be very different without tax deferral. This could raise concerns about the distribution of tax burden across different generations of taxpayers. Another consideration for fairness is the impact of tax deferral on the decision of employers to sponsor retirement plans. Beyond the direct benefits of tax deferral, employees benefit in other ways from participating in employer-sponsored retirement plans, and lower-earning workers may place greater value on these non-tax benefits.

Tax Deferral as Income Averaging

There are two primary rationales for a progressive income tax.[1] First, it could be argued that taxes should be assessed on ability to pay, and that higher-income taxpayers have more capacity to bear high tax burdens. Second, it could be argued that an additional dollar of income is worth more to lower-income taxpayers than it is worth to higher-income taxpayers, and that, relative to a proportional income tax, a progressive income tax would increase social welfare by raising more dollars from taxpayers who place a lower value on them.

A progressive tax rate schedule can be justified under these rationales, however, only to the extent that annual income is a good measure of a household's economic circumstances. To the extent that annual income is not a good proxy for a household's economic circumstances, then a progressive tax rate schedule can lead to horizontal inequity—different tax burdens for individuals in similar economic situations. This is a particular concern if an individual's annual income varies considerably over time.

With a Progressive Tax Rate Schedule, Income Volatility Increases Tax Burden

Because statutory tax rates increase with income, an individual whose annual income varies considerably from year to year will have a higher tax burden than an individual with the same average income but whose annual income is steady. For example, consider two workers who earn $350,000 over a five-year period (Figure 7.1). The first earns $70,000 per year for five years. The second earns $25,000 per year for four of the five years and $250,000 in one of the five years. Assuming their personal circumstances were otherwise the same and, for ease of exposition, ignoring inflation and the time value of money, the two workers would be judged to be equally well-off over this five-year period. Assuming 2014 federal income tax parameters apply in all years, however, the worker with steady earnings would pay income tax equal to 15.5 percent of income over the five-year period and the worker with uneven earnings would pay income tax equal to 20.0 percent. Given that the two taxpayers have the same economic resources over this period, the higher average tax rate cannot be justified on the basis of ability to pay or on the basis of increasing social welfare.

The fact that a taxpayer's tax burden can be affected by the timing of income has long been recognized, and certain adjustments to annual income have been allowed to help counteract the impact of timing. For example, net operating losses from businesses can be carried back or carried forward to offset net operating profits in other years. Net capital losses and excess charitable contributions can be carried forward to offset income in future years. Prior to the Tax Reform Act of 1986 (TRA '86), taxpayers also could elect to take advantage of "income averaging." That is, prior to TRA '86, taxpayers could elect to have a lower marginal tax rate applied to income that was in excess of 140 percent of their average income over the previous three years.[2]

Variation in Annual Income Increases Tax Liability with Progressive Tax Rates

Federal income tax for two hypothetical taxpayers; income tax in all years calculated using 2014 income tax schedule for single individuals taking the standard deduction

Year	Steady earner			Uneven earner		
	Wage income	Federal income taxes	Average tax rate	Wage income	Federal income taxes	Average tax rate
1	$70,000	$10,819	15.5%	$25,000	$1,774	7.1%
2	70,000	10,819	15.5	25,000	1,774	7.1
3	70,000	10,819	15.5	250,000	63,009	25.2
4	70,000	10,819	15.5	25,000	1,774	7.1
5	70,000	10,819	15.5	25,000	1,774	7.1
Total	$350,000	$54,094	15.5%	$350,000	$70,104	20.0%

Source: ICI calculations

Tax Deferral Helps Counteract Typical Income Fluctuations over the Life Cycle

Earnings typically vary considerably over an individual's lifetime. On average, inflation-indexed wages increase early in a working career, with wage growth slowing and then plateauing during peak earning years.[3] As a worker transitions into retirement, wages are either reduced substantially before being eliminated (if, for example, an individual switches from full-time work to part-time work before ultimately retiring) or are simply eliminated (if, for example, an individual moves directly from full-time work to retirement). Depending on retirement age, the individual may have many years at the end of life with no earnings at all. The variation in annual earnings of the life cycle cannot be addressed by tax provisions—such as averaging income over a four-year period—that are aimed at smoothing short-term variations.

The unevenness of a worker's earnings over a lifetime makes annual income a problematic measure of a household's economic circumstances. For example, consider two 60-year-old individuals who have the same annual income and otherwise have similar personal circumstances, but who have different sources of income. The first individual's income is composed solely of wages. The second individual's income is composed solely of interest income from a portfolio of U.S. Treasury securities. From a lifetime perspective, the second individual has more economic resources: the worker will eventually cease to work, but the bond portfolio can generate interest income in perpetuity. Based on annual income alone, however, both would be judged to be equally well-off.

The impact of the timing of income was highlighted in *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977), which emphasizes that annual income is an imperfect measure of economic circumstances and that the decision to measure income over a single year was based on practical considerations rather than on principle. To properly compare the relative economic circumstances of two taxpayers requires measuring income over a much longer period of time.

It is assumed in this study that the period over which such comparisons are made should be as long as possible. Ideally, two taxpayers should be compared on the basis of a whole <u>lifetime</u> of circumstances, and this is taken here to be a general goal of tax system design: lifetime tax burden should depend upon lifetime circumstances. (U.S. Department of the Treasury 1977, page 25; emphasis in original)

Tax deferral smooths out the income tax burden over a worker's lifetime. As illustrated in Figure 3.4, income taxes would be much higher when working and much lower during retirement without tax deferral. The net result, as show in Figure 2.13, is that tax deferral has a larger impact on the timing of income taxes for higher-earning workers than it does on the total value of taxes paid over a lifetime.

By essentially allowing workers to "income average" over a lifetime, tax deferral arguably makes the tax system more—not less—fair. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings on taxable annual income, resulting in a measure of taxable annual income that is a better indicator of lifetime circumstances.[4] This is perhaps the reason that tax-deferred compensation has been allowed under the U.S. income tax for nearly its entire existence.[5]

Proposals Would Reduce Horizontal Equity

Qualified tax-deferred compensation can take many forms. Income taxes on compensation can be deferred through an employer-sponsored retirement plan or an IRA. Employer-sponsored retirement plans are available to both workers whose employers are in the private sector and workers whose employers are federal, state, and local governments. Employer-sponsored retirement plans can be designed as either a DB plan or a DC plan. Tax-deferred contributions to retirement plans can be made by employers or employees.

The principle of horizontal equity implies that a fair tax code would provide the same tax treatment for all forms of qualified tax-deferred compensation.

Under the current income tax, tax deferral provides the same benefit regardless of the form that it takes: workers defer tax on current compensation until they receive a distribution from the retirement plan.[6] In addition, other rules attempt to maintain rough neutrality in the treatment of the different types of tax deferral. For example, both private-sector workers and government employees face roughly the same limits on the annual benefits that can be paid by a DB plan and roughly the same limits on the annual contributions that can be made to a DC plan. In addition, the rules that limit the generosity of DB plans and DC plans are linked.

In contrast to current law, the most prominent proposals to change the tax treatment of retirement plan contributions would violate tax neutrality by targeting only DC plans—or, in some cases, only tax-deferred employee contributions to DC plans—while leaving DB plans unaffected—or in some cases leaving employer contributions to both DB plans and DC plans unaffected. In addition, proposals to replace the up-front benefit of tax deferral with a flat-rate refundable tax credit or government matching contributions would be poorly targeted because they would subsidize the contributions of workers with low *annual income* rather than the contributions of workers with low *lifetime earnings*.

Proposals Target DC Plans and IRAs

In recent policy discussions about reforming the tax system, proposals to change the tax treatment of retirement plans have primarily taken two different approaches. One set of proposals would further limit the amount of compensation that could be contributed annually to a DC plan. For example, the so-called 20/20 proposal would limit total (employer plus employee) annual contributions to DC plans to the lesser of $20,000 or 20 percent of compensation.[7] Another set of proposals would reduce the up-front tax benefits of contributing to a DC plan or IRA. This could be accomplished by placing a "cap" on the up-front benefit of tax deferral[8] or by replacing the up-front benefit with a flat-rate refundable tax credit[9] or with flat-rate government matching contributions.[10] A more detailed description of these proposals and some historical context for the proposed rule changes are provided in the appendix.

If implemented, the 20/20 proposal would break the historical link between the rules that limit the generosity DB plans and DC plans. Because the 20/20 proposal would only affect DC plans, the ratio of the DB plan annual benefit limit and the DC plan annual contribution limit would increase from four-to-one under current law (see Figure A.2 in the appendix) to more than 10-to-one. In addition, the 20/20 proposal would represent an unprecedented restriction on the ability of working individuals to defer compensation until retirement. In inflation-adjusted dollars, a $20,000 contribution limit would be less than one-fifth of the limit put in place by ERISA (see Figure A.1 in the appendix). In fact, a $20,000 limit would be less than the original 1975 limit *in nominal dollars.*

Proposals to limit the up-front tax benefits of retirement plan contributions would affect only tax-deferred employee contributions to DC plans and tax-deferred IRA contributions. Employer contributions to both DB plans and DC plans, as well as Roth contributions made by workers to both DC plans and IRAs, would not be affected.[11]

Both the 20/20 proposal and the proposals to limit the up-front benefits of tax deferral would arbitrarily punish workers based on how their employer structures their compensation package. In particular, the proposals would hit workers in the private sector (where DB plans are increasingly rare) harder than government workers (where DB plans still are the norm). Further, proposals targeted at tax-deferred employee contributions would have more of an impact on workers whose employers contribute little to their retirement plan than it would have on workers with generous employer contributions, and more impact on workers whose plans do not allow Roth contributions than on workers who have a Roth contribution option in their plan.

Flat-Rate Refundable Credits or Matching Contributions May Be Off Target

Proposals to replace the up-front benefit of tax deferral with either a flat-rate refundable credit or government matching contributions not only appear to be based on a misunderstanding of the benefits of tax deferral, they also do not address the primary reason that workers with low earnings get fewer benefits from tax deferral. As explained in chapter 4, the workers with low lifetime earnings in this study do not benefit less from every dollar they contribute to a retirement plan—which is the implicit reasoning behind proposals to subsidize the contributions of low-income workers. Instead, these workers contribute less to their retirement plan because Social Security benefit payments replace a higher share of their pre-retirement earnings, reducing the supplemental income needed from the 401(k) plan to reach the target replacement rate.

It is not clear that additional tax incentives would induce those with low lifetime earnings—presumably the target of these proposals—to save much more for retirement.[12] Even if contribution subsidies succeeded in encouraging more savings among this group, it is not clear that public policy should encourage lower-income workers to save more because it would require them to spend less on food, shelter, and clothing while they are working (and perhaps also trying to raise children). Short of encouraging 401(k) plan contributions by reducing the generosity of Social Security benefit payments, few retirement policy proposals are likely to substantially increase the benefits of tax deferral for workers with low lifetime earnings.[13]

In contrast, workers with higher lifetime earnings whose earnings were temporarily low—presumably not the target of these proposals—would be more likely to take advantage of the contribution subsidies. The contribution subsidies provided by these proposals depend on a worker's current annual income. As already noted, annual income is not necessarily a good proxy for a worker's lifetime economic resources. Workers whose annual earnings vary during their working career would be able to take advantage of the subsidies when their earnings were temporarily low. If they did so, these workers would end up paying lower lifetime taxes than workers who had the same lifetime earnings but had more steady annual earnings. And, as a result, the proposals would reduce horizontal equity.

Generational Equity

Tax deferral likely increases the perception of generational equity within the tax code and possibly increases actual generational equity. Without tax deferral, taxes on workers would be much higher, but few retirees would pay any income tax at all. With tax deferral, income taxes are spread more evenly over a worker's lifetime (see Figure 3.4). In addition to making the tax burden more equitable across generations on an annual basis, tax deferral likely matches the timing of tax revenue more closely to the timing of government spending. This is a particular concern going forward, as projections show that the share of federal government expenditures devoted to the elderly will continue to increase.[14]

Employer-Sponsored Retirement Plans Provide Benefits to All Employees

In the United States, tax deferral is the primary means of encouraging employers to voluntarily sponsor retirement plans. The voluntary system of employer-sponsored retirement plans has helped millions of workers accumulate resources for retirement. In 2013, 81 percent of working households aged 55 to 64 had accumulated assets in DC plans and IRAs, accrued benefits in a DB plan, or both.[15]

The number of employers providing retirement plans has, in turn, encouraged a vibrant market for plan services. In particular, the growth in 401(k) plans has coincided with the development of low-cost investment services for the mass market. Thanks to competition and innovation, 401(k) plan participants with modest account balances today can invest in a diversified investment portfolio at a lower cost than could wealthy and savvy investors 30 or 40 years ago. In 2012, the average 401(k) plan participant was in a plan with total plan costs equal to 0.53 percent of assets (BrightScope and Investment Company Institute 2014).

Though workers with lower lifetime earnings receive substantial tax benefits from contributing, they may value the nontax benefits of employer-sponsored retirement plans more highly than do workers with higher lifetime earnings. For example, lower-earning workers may place a higher value on the convenience of payroll deduction, the economies of scale that

reduce the cost of investing, and the professional investment management offered through employer-sponsored retirement plans. In addition, there is evidence that workers with moderate and high incomes are willing to accept lower cash wages in exchange for retirement benefits, whereas lower-income workers are not (Toder and Smith 2011). Thus, employer contributions are more likely to represent an increase in total compensation for lower-income workers, rather than a shift in the form of compensation.

Economic Growth

A primary motivation for eliminating tax expenditures is the belief that an income tax with a broad base and low rates would encourage more economic growth. An income tax can reduce economic growth by distorting economic behavior. In general, tax expenditures are viewed as increasing economic distortions because they narrow the tax base and necessitate higher marginal tax rates. Higher marginal tax rates reduce economic activity by discouraging work and investment. If the revenue raised by eliminating tax expenditures were used to reduce marginal tax rates, then economic efficiency would be increased because the disincentive to work and the disincentive to save, which are inherent in any income tax, would be reduced. In addition, a narrow tax base leads to an inefficient allocation of resources by favoring certain forms of economic activity over others. Eliminating tax expenditures would lead to a more efficient allocation of economic resources, as resources move from the formerly subsidized activity to more productive uses.

Tax deferral is different from other tax expenditures, however, in that it actually reduces the economic distortions caused by the income tax. By taxing investment returns, an income tax reduces the incentive to save. Tax deferral effectively reduces the tax on investment returns and increases the incentive to save.[16] In the quote from *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977) at the beginning of this chapter, this is what was meant when it said that tax deferral offsets the "adverse effects on savings" of an income tax.

If tax deferral were eliminated and the additional revenue raised were used to reduce marginal tax rates, it would be more likely to reduce, rather than increase, economic efficiency. That is, the change would be more likely to reduce, rather than increase, the incentive to work, the incentive to save, and allocative efficiency.

For most taxpayers, eliminating tax deferral and reducing marginal tax rates either would have no impact or would reduce the incentive to work. Viewed from a lifetime perspective, tax deferral reduces the effective tax rate on compensation, increasing the incentive to work. At best, the effects of eliminating tax deferral and reducing marginal tax rates would offset each other, resulting in little or no change to the returns from work, viewed from a lifetime perspective. If all the additional tax revenue were used exclusively to reduce the top statutory tax rate, all workers would lose the ability to defer compensation but most workers would get no offsetting benefit from the rate cut. The result for most workers would be to increase their lifetime tax burden and reduce the lifetime returns to work.

Similarly, eliminating tax deferral and reducing marginal tax rates would reduce the incentive to save, on net, for most workers. Eliminating tax deferral would sharply increase the effective tax rate on investment returns for savings that, under current law, would be

done through employer-sponsored retirement plans and IRAs. Offsetting this effect, however, marginal tax rates on taxable investment income would be reduced by a small percentage. The overall impact on the incentive to save would depend on the relative importance of these two effects. For most workers, the impact of eliminating tax deferral would dominate, and their overall incentive to save (accounting for both the lower incentive to save in tax-deferred retirement plans and the higher incentive to save in taxable accounts) would be reduced. This would be true especially if all the additional tax revenue were used to reduce the top statutory tax rate, because most workers would not be affected by the lower rate.

Finally, it is unlikely that allocative efficiency would improve if tax deferral were eliminated. Because it does not favor investments in any particular sector of the economy, eliminating tax deferral would not, by itself, improve allocative efficiency. The effect of reducing marginal tax rates would, by itself, improve allocative efficiency by making investors in taxable accounts somewhat less sensitive to tax considerations. Offsetting this effect, however, would be the fact that investors in tax-deferred accounts would be considerably more sensitive to tax considerations. The full impact of eliminating tax deferral and reducing marginal tax rates on allocative efficiency would depend on the relative magnitude of these two effects.

Simplicity

Although complex rules govern who can defer tax on compensation,[17] it is relatively simple for the IRS to administer tax deferral. At its root, tax deferral simply involves setting aside a portion of compensation for retirement and not taxing that compensation until a worker takes a distribution. Provided plan rules are followed, the IRS does not need to track taxpayer contributions and distributions over time. The IRS need only ensure that contributions are not made in excess of annual limits on contributions; that benefits paid out are not in excess of annual limit on benefits; and that all distributions are subject to tax in the year in which they are distributed.

From a worker's point of view, it is fairly easy to decide whether or not to contribute to a retirement plan. It is also fairly easy for taxpayers to comply with the tax rules because, in most cases, all the information that is needed to comply with the law is mailed to the taxpayer each year.

In contrast, proposals to limit the up-front benefit of tax deferral would increase the complexity of the income tax. From the point of view of the government, administering employer-sponsored retirement plans and IRAs would become considerably more complex. In particular, proposals for a refundable credit and proposals for government matching contributions would incentivize workers with low marginal tax rates to churn contributions. To counteract these new incentives, Congress would need to adopt new withdrawal penalties and the IRS would likely be required to track the behavior of taxpayers over time. From the point of view of the individual taxpayer, these proposals would make the decision to contribute to a retirement plan considerably more complex for workers with higher marginal tax rates.

Flat-Rate Credits or Government Matching Contributions Would Encourage Churning

Proposals to replace tax deferral with a flat-rate refundable credit or government matching contributions would encourage workers with low marginal tax rates to churn contributions to retirement plans—that is, contribute to a retirement plan and then withdraw the contribution shortly thereafter. This is because the proposals effectively subsidize contributions but do not subsidize deferral. That is, they provide a large incentive to contribute to a retirement plan, but provide no more incentive than current law to keep the contributions in the plan.

These proposals would make the tax system more complex because new rules would be needed to counteract the incentive to churn contributions. Current law penalties for early withdrawal would not be sufficient to discourage churning for those younger than age 59½ and would not apply to workers aged 59½ or older. A new mechanism would be needed to control churning or the proposals would be prohibitively expensive in terms of lost tax revenue. It would be difficult to design simple penalties that would discourage churning that were not also excessively punitive to those who needed to access their retirement accounts in a time of need. Instead, complex penalties would need to be developed or direct restrictions on access to retirement plan assets and benefits would be required. In either case, the IRS would need to expend additional resources to monitor retirement plan contributions and withdrawals made by individuals over time.

The Incentive to Churn

Tax deferral under current law does not provide an incentive to churn retirement plan contributions (Figure 7.2, column 1).[18] Even without an early withdrawal penalty, contributing to a retirement plan and immediately withdrawing the contribution provides no benefits to workers. In addition, the benefits of tax deferral are modest for short holding periods.

Proposals to adopt a flat-rate refundable tax credit or flat-rate government matching contributions would provide a substantial incentive to churn contributions. For example, consider a worker who does not currently owe income taxes, faces a zero marginal tax rate, funds a retirement plan contribution with $1,000 of compensation, and is not subject to an early withdrawal penalty (Figure 7.2, column 3). With either a 25 percent refundable credit or 33.3 percent government matching contributions, this worker would generate $333 of tax benefits by making a retirement plan contribution and then withdrawing it immediately.[19] In fact, if the worker's marginal tax rate remained at zero, there would be no further incentive to keep the contribution in the plan, because tax deferral would offer the worker no additional benefits.

Current Penalties Would Not Discourage Churning

Current early withdrawal penalties would not be sufficient to discourage churning if either a refundable credit or government matching contributions were adopted. First, not all workers would be subject to the penalties, because they only apply to workers aged 59½ or younger. As such, the penalties would do nothing to discourage churning by older workers. Second, even workers subject to early withdrawal penalties would have an incentive to churn contributions.

The current 10 percent penalty on early withdrawals would not be sufficient to prevent churning by workers with a zero marginal tax rate. Even after paying the penalty, the worker in the example would net $200 in tax benefits from churning a contribution (Figure 7.2, column 4).[20]

For a worker subject to a 15 percent marginal tax rate, a 10 percent penalty would remove the incentive to churn, but would no longer discourage the worker from using a retirement plan to save for reasons other than retirement (Figure 7.2, column 4). In fact, the tax benefits of deferral for a worker with a 15 percent marginal tax rate who is subject to the early withdrawal penalty (column 4) would be the same as the benefits under current law for workers without an early withdrawal penalty (column 1).

Simple Penalties to Discourage Churning Would Be Difficult to Design

Some proponents of refundable flat-rate credits and government matching contributions recognize that churning would be an issue, but believe simple mechanisms could be devised to prevent churning. For example, in the context of a government matching contribution, Gale, Gruber, and Orszag (2008) proposes that individuals with early withdrawals be required to forfeit government matching contributions.

FIGURE 7.2

A Flat-Rate Refundable Credit Would Encourage Churning

Present value of the tax benefit of retirement plan contribution under alternative tax treatments

Assumptions

Pre-tax compensation used to fund savings	$1,000
Pre-tax market rate of return (interest)	6%
Individual's marginal tax rate does not change over time	

Time between contribution and distribution	Tax deferral under current law		Flat-rate 25 percent refundable credit or 33.3 percent government matching contributions		
	No withdrawal penalty (1)	10 percent withdrawal penalty (2)	No withdrawal penalty (3)	10 percent withdrawal penalty (4)	Take back credit (5)
Zero marginal tax rate					
Immediately	$0	-$100	$333	$200	$0
After 1 year	0	-100	333	200	19
After 5 year	0	-100	333	200	84
After 10 years	0	-100	333	200	147
15 percent marginal tax rate					
Immediately	$0	-$100	$113	$0	-$170
After 1 year	7	-93	121	7	-147
After 5 year	35	-65	149	35	-63
After 10 years	69	-31	183	69	25
25 percent marginal tax rate					
Immediately	$0	-$100	$0	-$100	-$250
After 1 year	11	-89	11	-89	-225
After 5 year	52	-48	52	-48	-135
After 10 years	100	-0	100	-0	-40

Source: ICI calculations

Forfeiting government matching contributions would remove the incentive to churn contributions for workers with a zero marginal tax rate (Figure 7.2, column 5). It would not, however, discourage the use of retirement plans to save for reasons other than retirement because, even after forfeiting matching contributions, workers would benefit from making a retirement plan contribution so long as it remained invested for a year or longer.

Forfeiting government matching contributions would arguably be overly punitive, however, for workers with positive marginal tax rates who needed to access retirement assets unexpectedly. For example, a worker with a 25 percent marginal tax rate who contributed $1,000 to a retirement account would have $225 less in after-tax distributions after one year and $135 less after five years, compared with an after-tax contribution to a taxable investment account (Figure 7.2, column 5). Relative to early withdrawals under current law (Figure 7.2, column 2), these effective penalties are more than twice as high. And workers with higher marginal tax rates would face even steeper effective penalties.

Complex Penalties Would Be Difficult to Administer

More complex penalties could be devised that would discourage churning without being overly punitive, but they would be much more difficult for the IRS to administer than current law. Even the relatively simple penalty of requiring workers to forfeit government matching contributions would require that the IRS maintain records for each taxpayer on their history of government matching contributions. More-complex penalties designed to better calibrate penalties, such as making the penalty a function of a worker's marginal tax rate at the time a contribution was made, would require that both the taxpayer and the IRS keep track of this information. To the extent that workers contribute to a plan over many years when they would possibly be subject to different marginal tax rates, it would also require a method to link distributions to specific contributions. In addition, the penalties would have to remain in place regardless of a taxpayer's age to discourage older workers from churning contributions.

Tax deferral under current law does not require the IRS to expend effort to prevent churning because churning provides no tax benefits. In fact, early withdrawal penalties on distributions are not even needed to prevent churning under current law. The early withdrawal penalty is only needed to prevent workers from using retirement plans to save for reasons other than retirement that involve a shorter time horizon. In addition, there is no need for the IRS to keep track of an individual taxpayer's contributions and distributions over time, as tax deferral simply requires that qualified plans report distributions paid out to plan participants on an annual basis.

It is not clear how well the IRS would be able to enforce rules that required them to maintain records on retirement plan contributions and distributions made by individual taxpayers. As noted in *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977), the decision to measure income over a single year was based on practical considerations rather than on principle. Among the practical considerations is presumably the difficulty that the IRS would have if it was required to track and store large quantities of data over extended periods of time.

Limiting the Up-Front Benefits Would Complicate the Contribution Decision

Limiting the up-front benefit of retirement plan contributions—by either imposing an up-front cap or replacing the up-front benefits with a refundable credit or government matching contributions—would make the decision to contribute to a retirement plan much

more difficult for workers with marginal tax rates in excess of the limit. For these workers, the up-front tax benefits of their retirement plan contributions would be reduced, but their retirement plan distributions would continue to be taxed. These workers would have to carefully weigh whether they should contribute to a retirement plan or simply pay tax on the compensation and then invest the after-tax amount in a taxable investment account.

The Contribution Decision Under Current Law

The decision to make a tax-deferred retirement plan contribution is fairly simple under current law for workers who are not subject to early withdrawal penalties.[21] Provided marginal tax rates do not increase between the time contributions are made and distributions are taken—these workers are typically better off deferring tax on compensation and cannot be made worse off (Figure 7.3, column 1).[22] Even if these workers contribute and then immediately withdraw the funds, they are made no worse off. If the contribution remains in the plan for longer than a year, contributing will make them better off, with the benefits of tax deferral increasing with each additional year of deferral.

The decision to make a tax-deferred retirement plan contribution is slightly more complex for workers subject to the 10 percent penalty on early withdrawals. These workers must hold the investment for a period of time before they are assured that contributing to a retirement plan makes them better off.

If workers subject to an early withdrawal penalty contribute and immediately withdraw funds, they would be made worse off than if they had not contributed in the first place (Figure 7.3, column 3). For example, $1,000 of compensation results in $650 of after-tax income for a worker with a 35 percent marginal tax rate who does not contribute it to a retirement account. If the $1,000 of compensation were contributed to a retirement account and withdrawn the next day, it would result in $550 of after-tax income after paying income

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FIGURE 7.3

Limiting the Up-Front Benefit Would Complicate the Contribution Decision

Present value of the tax benefit of retirement plan contribution under alternative tax treatments

Assumptions

Pre-tax compensation used to fund savings	$1,000
Pre-tax market rate of return (interest)	6%
Marginal tax rate	35%
Individual's marginal tax rate does not change over time	

Time between contribution and distribution	No withdrawal penalty		10 percent withdrawal penalty	
	Tax deferral (1)	25 percent up-front cap (2)	Tax deferral (3)	25 percent up-front cap (4)
Immediately	$0	-$87	-$100	-$173
After 1 year	13	-74	-87	-160
After 5 year	62	-25	-38	-111
After 10 years	118	31	18	-55

Source: ICI calculations

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tax of $350 and an early withdrawal penalty of $100. The net effect of the contribution would be tax penalties (or negative benefits) of $100.

If they do not withdraw the contribution immediately, then the early withdrawal penalty is partially offset, and eventually outweighed by the benefits of deferral (Figure 7.3, column 3). For example, the same worker would be, in present value, only $38 worse off relative to an investment in a taxable account after five years, slightly better off after nine years (not shown in Figure 7.3), and have benefits of $18 after 10 years (Figure 7.3, column 3).

Although the early withdrawal penalty makes the contribution decision a little more difficult, the penalties are low enough that many workers still choose to contribute. Some workers subject to an early withdrawal penalty will prefer to pay income tax on their compensation and contribute the after-tax amount to a taxable investment account. Provided the probability of withdrawal in the first few years is low, however, the expected benefits from contributing to a retirement plan would outweigh the risk that the worker would unexpectedly need to access the funds.

The Contribution Decision with the Up-Front Benefits Limited

If the up-front benefits of tax deferral were limited, even workers who are not subject to early withdrawal penalties could be made worse off by contributing to a retirement account and then immediately withdrawing the funds (Figure 7.3, column 2). If held for more than a year, the benefits of tax deferral would begin to offset, and would eventually outweigh, the penalty imposed by the up-front benefit limit. For example, assuming retirement plan contributions are invested in bonds paying 6 percent interest annually, a worker with a 35 percent marginal tax rate who was subject to a 25 percent up-front cap and who used $1,000 of compensation to fund retirement contributions would need to remain invested for at least eight years before contributing to the retirement account would make them better off (not shown in Figure 7.3), and have a net benefit of only $31, in present value, after 10 years (Figure 7.3, column 2).

Workers affected by the up-front benefit limit and subject to early withdrawal penalties would be made substantially worse off if they unexpectedly needed to withdraw contributions early (Figure 7.3, column 4). For example, the tax penalties for withdrawing a contribution after five years would nearly triple, from $38 in present value under current law (column 3) to $111 (column 4). If subject to an early withdrawal penalty, this worker would need to remain invested for 16 years before being better off relative to a taxable account, compared with nine years under current law (not shown in Figure 7.3).

If the up-front benefits of deferral were limited, workers with a marginal tax rate in excess of the up-front limit would need to weigh the decision to contribute to a retirement plan more carefully. Workers could be made worse off by contributing to a retirement plan even if they were not subject to early withdrawal penalties. Workers subject to an early withdrawal penalty would face very steep penalties if they unexpectedly needed to access the funds. Some workers, particularly those approaching retirement, may decide to stop contributing to their retirement plans—or at a minimum, contribute less—and instead pay tax on the compensation and invest in a taxable account. Others may decide to contribute and unwittingly make themselves worse off.

Summary

Tax deferral differs from other tax expenditures—not only mechanically in the way it affects tax liability, but also in its effects on fairness, economic growth, and simplicity.

Tax deferral increases the fairness of the tax code by increasing horizontal equity. The standard of horizontal equity used in *Blueprints for Basic Tax Reform* (U.S. Department of the Treasury 1977) was that lifetime tax burden should depend upon lifetime circumstances. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings on taxable income. This results in a measure of taxable annual income that is a better indicator of lifetime circumstances, which, in turn, results in a fairer tax code.

In contrast, the most prominent proposals to further restrict or fundamentally change tax deferral would reduce horizontal equity. These proposals would change the roughly neutral tax treatment of all forms of qualified deferred compensation that exists in the current tax code by targeting only DC plans or targeting only tax-deferred employee contributions to DC plans and IRAs. Further, proposals to increase the benefits of tax deferral for low-income workers are poorly targeted because they are based on a worker's *annual income* and not a worker's *lifetime earnings*.

Other aspects of tax deferral arguably increase fairness as well. A worker's income tax liability is spread out more equally across their lifetime with tax deferral. This likely helps to match the timing of tax revenue to the timing of government spending and results in a more equitable distribution of tax burden across generations. Furthermore, tax deferral is the backbone of the voluntary system of employer-sponsored retirement plans, which the vast majority of working households benefit from by the time they reach retirement.

In addition, tax deferral has a positive impact on economic efficiency. Unlike other tax expenditures, tax deferral actually reduces the economic distortions caused by the income tax. It does this by eliminating the disincentive to save that is inherent in the normal income tax structure. Eliminating tax deferral and using the revenue to reduce marginal tax rates would be more likely to reduce, not increase, the incentives to work and save.

Tax deferral is also straightforward for the IRS to administer and simple for workers to understand. In contrast, proposals to limit the up-front benefits of tax deferral would make the income tax much more complex. Changing tax deferral into a flat-rate refundable credit or matching government contributions would introduce an incentive for workers with low marginal tax rates to churn contributions. To discourage churning, new withdrawal penalties would need to be introduced. Withdrawal penalties that both would discourage churning and would not be overly punitive would be difficult for the IRS to administer. For workers with higher marginal tax rates, limiting the up-front benefits of tax deferral would make the decision to contribute to a retirement plan more difficult than under current law.

Conclusion

Since the first tax expenditure estimates were released by the U.S. Department of the Treasury in the 1960s, tax expenditures have played a central role in discussions of tax reform. Not surprisingly, more recent tax reform proposals also have focused on reducing or eliminating tax expenditures. Unlike previous efforts to reform the tax code, however, recent policy discussions have placed more emphasis on which taxpayers benefit from tax expenditures.

Given that distributional analysis of tax expenditures has played a large role in recent policy discussions, this book provides estimates of the progressivity of the benefits provided by the U.S. retirement system. This study is the first to use the same metric—a tax expenditure estimate—to measure the benefits of both tax deferral and the Social Security system. The analysis is intended to provide context for interpreting results of previous studies that examine tax deferral in isolation and to improve understanding of the way in which tax deferral and the Social Security system combine to provide retirement benefits to U.S. workers.

The estimates in this book illustrate that the U.S. retirement system as a whole, inclusive of both tax deferral and the Social Security system, is progressive. That is, combining the benefits of tax deferral with the benefits of the Social Security system, workers with lower lifetime earnings typically receive more lifetime benefits, as a percentage of lifetime total compensation, from the U.S. retirement system. Consistent with the results from previous studies using annual data, the benefits of tax deferral as a share of income are estimated to be higher for workers with higher lifetime earnings. However, tax deferral works in combination with the Social Security system, and the benefits of the Social Security system are highly progressive.

In addition to illustrating the progressiveness of the U.S. retirement system, the simulations in this book also address two widespread misperceptions about the benefits of tax deferral.

» The first myth is that higher-earning workers benefit more from tax deferral because they benefit more on every $1 of compensation that they defer. In fact, workers with higher lifetime earnings benefit more from tax deferral not because they get more benefits on every dollar they defer but because they defer more dollars. And the reason that they defer more dollars is that Social Security replaces a lower share of their pre-retirement earnings.

» The second myth is that, because of tax deferral, the current income tax system provides an "upside-down" incentive to save. In fact, tax deferral equalizes the incentive to save across workers. Normal income tax treatment discourages savings by taxing investment returns and results in higher-income workers having the lowest incentive to save. Tax deferral effectively taxes investment returns at a zero rate, which results in all workers having the same incentive to save.

Using the same standard by which tax deferral has been judged in previous research, this study illustrates that the U.S. retirement system is progressive. The belief of this author, however, is that such distributional estimates of tax expenditures should not play a large role in efforts to reform the income tax.

In the context of tax reform, the narrow focus on the progressivity of specific tax code provisions is misplaced. Tax reform would involve changes to many tax code provisions. What matters is the impact of the complete tax reform package on the progressivity of the overall income tax. Goals for progressivity can be set early in the tax reform process. Reform packages that met these goals would then be judged on criteria other than progressivity, such as horizontal equity, economic growth, and simplicity. Tax provisions that address legitimate policy goals can be included in a tax reform package even if they are not, evaluated in isolation, progressive.

On the criteria of fairness, economic growth, and simplicity, tax deferral scores well. Tax deferral arguably increases the fairness of the tax code. Allowing workers to set aside a portion of their compensation until retirement reduces the impact of the life-cycle pattern of earnings, resulting in a measure of taxable annual income that is a better indicator of a worker's lifetime circumstances. Tax deferral has a positive impact on economic efficiency. By effectively taxing investment returns at a zero rate, tax deferral offsets the disincentive to save inherent in an income tax. Tax deferral is also simple for the IRS to administer and simple for workers to understand.

In contrast, proposals to further restrict or to fundamentally change tax deferral would reduce horizontal equity and add substantially to tax code complexity. Many of the proposals would change the roughly neutral tax treatment of all forms of qualified deferred compensation by targeting only DC plans or targeting only tax-deferred contributions workers make to DC plans and IRAs. Proposals to change the up-front benefits of tax deferral would make the decision to contribute to a retirement plan considerably more complicated and would require more IRS resources to administer properly.

Acknowledgments

Proposals to Further Limit or Fundamentally Change Tax Deferral

In recent policy discussions about reforming the tax system, proposals to change the tax treatment of retirement plans have primarily taken two different approaches. One set of proposals would further limit the amount of compensation that could be contributed annually to a DC plan. Another set of proposals would reduce the up-front tax benefit of contributions to a DC plan or IRA.

This appendix describes the proposals and compares them to current law. Proposals to reduce annual contribution limits to DC plans would restrict tax deferral substantially and would break the historic link between DC plan contribution limits and DB plan benefit limits. Proposals to limit the up-front benefit of tax deferral, despite being characterized as modest by their proponents, would fundamentally change the tax treatment of qualified deferred compensation.

Proposals to Further Limit DC Plan Contributions

The Debt Reduction Task Force of the Bipartisan Policy Center (2010) and the National Commission on Fiscal Responsibility and Reform (2010) both included the so-called 20/20 proposal in broad plans to reduce federal government debt and reform the income tax. This proposed to limit total (employer plus employee) annual contributions to DC plans to the lesser of $20,000 or 20 percent of compensation (this limit was the lesser of $52,000 or 100 percent of compensation in 2014).

DC Plan Contribution Limits Since 1974

Limits on annual benefits paid by DB plans and annual contributions to DC plans were created by the Employee Retirement Income Security Act of 1974 (ERISA). Despite the fact that the tax code had explicitly permitted tax deferral in DC plans since the passage of the Revenue Act of 1921 and in DB plans since passage of the Revenue Act of 1926,[1] there were no explicit limits on annual benefit payments or annual contributions prior to ERISA. Instead, nondiscrimination rules—which limit the extent to which employers can provide higher benefits to or contribute more on behalf of highly paid workers—served to indirectly limit benefits and contributions.

Legislative changes since ERISA have reduced the inflation-adjusted value of the total (employer plus employee) annual contribution limit to DC plans (Figure A.1). Effective starting in 1974, the annual contribution limit was the lesser of $25,000 or 25 percent of an employee's compensation (upper panel). As stipulated by ERISA, limits were initially indexed for inflation and, in nominal dollars, had increased to $45,475 by 1982. In response to fiscal pressure, Congress enacted legislation that cut the contribution limit to $30,000 in 1983. Subsequent legislative changes effectively kept it frozen at $30,000 through 2000.[2] In 2001, the limit was increased to $35,000 by inflation indexing.[3] In 2002, the Economic Growth Tax Relief Reconciliation Act of 2001 (EGTRRA) increased the annual contributions limit to the lesser of $40,000 or 100 percent of pay.[4] Subsequently, the limit has been adjusted for inflation. In inflation-adjusted dollars, the current law limit is less than half of the 1975 limit (lower panel).

DC Plan Annual Contribution Limit Since ERISA

Limit on annual contributions to DC plans, nominal and inflation-adjusted 2014 dollars, 1975–2014

Nominal dollars

TEFRA '82

$45,475

TRA '86

$30,000

Separate limit for employee
contributions (TRA '86)

$7,000

EGTRRA '01

$40,000

$35,000

Limit on contributions
(employer + employee)

2001 limits

$10,500

$15,000

$17,500

$52,000
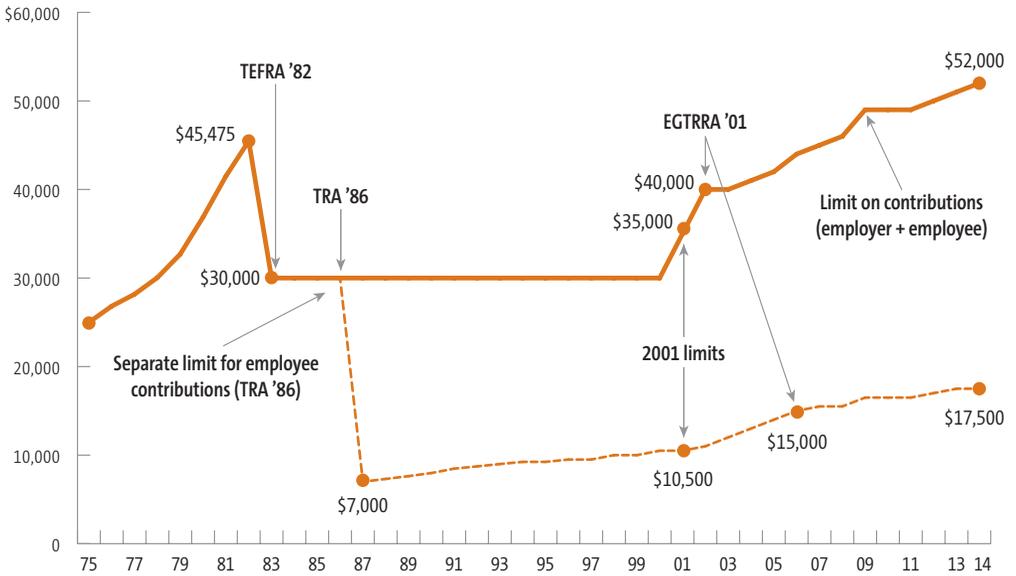
Inflation-adjusted constant 2014 dollars

TEFRA '82

$113,710

TRA '86

$71,348

Separate limit for employee
contributions (TRA '86)

$14,822

EGTRRA '01

$52,571

$46,978

Limit on contributions
(employer + employee)

2001 limits

$14,093

$17,586

$52,000

$17,500
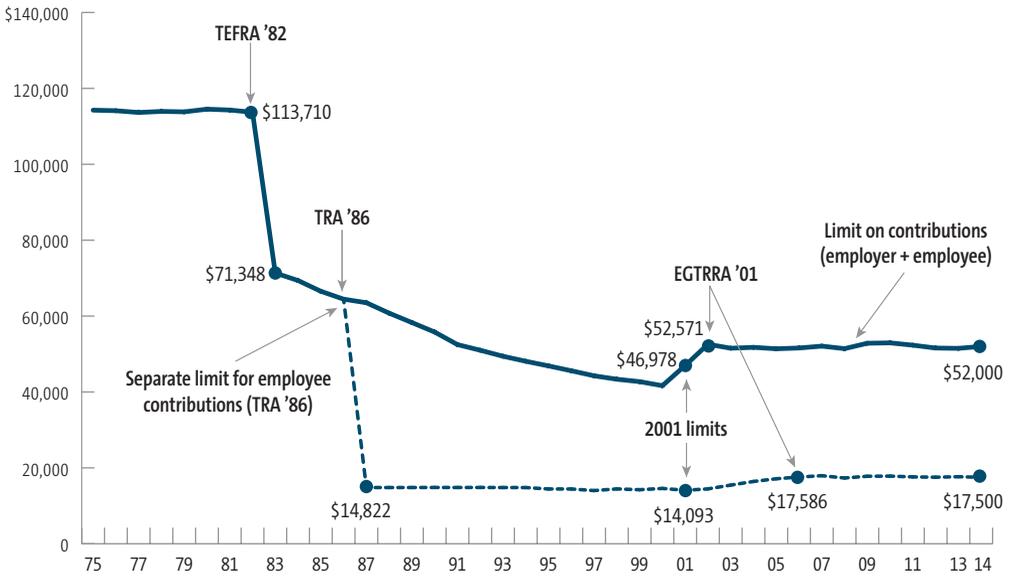
Source: Investment Company Institute summary of Internal Revenue Code

The Link Between DB Plan and DC Plan Generosity

The 20/20 proposal would break the historical link between DB plan benefit limits and DC plan contribution limits (Figure A.2). The limits established by ERISA were intended to place roughly equivalent restrictions on the generosity of DB and DC plans. The DB annual benefit limit was originally set at three times the DC annual contribution limit. Congress reduced both limits in 1982 and the limits remained unindexed until the passage of the Tax Reform Act of 1986. However, in an effort to encourage employers to offer DB plans, Congress suspended inflation indexing of the DC limit until the inflation-indexed DB benefit limit was four times that of the DC contribution limit.[5]

FIGURE A.2

20/20 Proposal Would Break the Link Between the DC Contribution Limit and the DB Benefit Limit

DC plan annual contribution limit and DB plan annual benefit limit, nominal dollars, 1975 to 2014
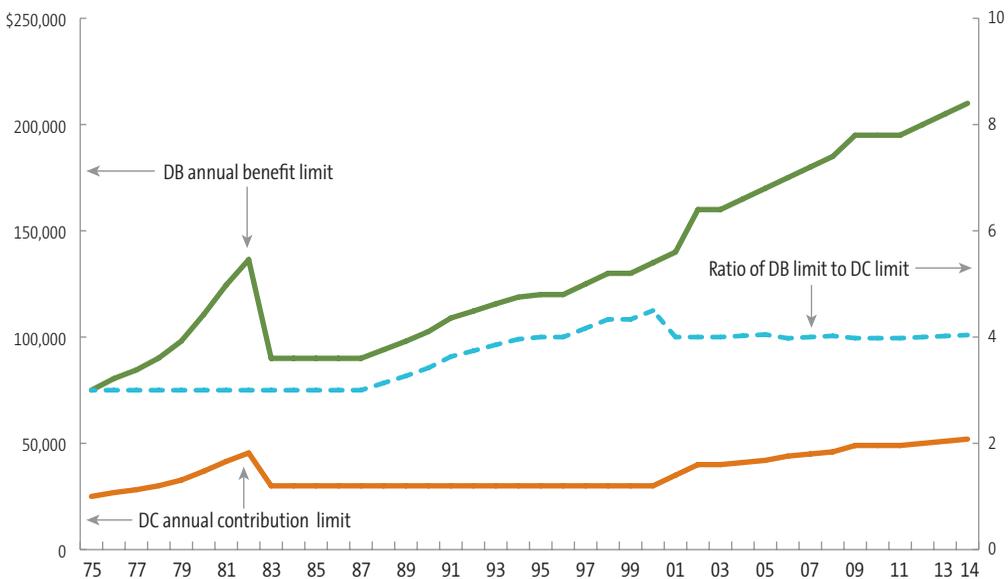
Note: The ratio went well above four-to-one in 1997, 1998, and 1999 because, although both the DC annual contribution limit and the DB annual benefit limit were indexed to inflation, the indexation was subject to a $5,000 round-down rule after 1995. That is, the limits were set equal to the 1995 limits indexed to inflation but rounded down to the nearest $5,000. The annual DB contribution limit changed more frequently because the limit was larger and the change in the inflation-indexed amount exceeded the $5,000 threshold more often. The ratio returned to four-to-one in 2001, when the inflation-indexed annual contribution limit exceeded $35,000. Legislation passed in 2001 increased both limits effective in 2002 and changed the round-down rule for the annual contribution limit to $1,000. As a result, the ratio has remained close to four-to-one since 2001.

Sources: Internal Revenue Service and Investment Company Institute

Three Proposals to Limit the Up-Front Benefit of Tax Deferral

There are at least three different types of proposals that would limit the up-front benefit of retirement plan contributions for workers with higher marginal tax rates:

» a "cap" on the up-front benefits of tax deferral;[6]

» a flat-rate refundable tax credit;[7] and

» flat-rate government matching contributions.[8]

Up-front caps, flat-rate refundable tax credits, and flat-rate government matching contributions would work differently mechanically, but would have the same impact of reducing the benefits of tax deferral for workers with higher marginal tax rates. For workers with lower marginal tax rates, an up-front cap would have no impact on the benefits of tax deferral. In contrast, flat-rate refundable credits or government matching contributions could increase the benefits of tax deferral for workers with lower marginal tax rates.

Proposals to limit the up-front benefit of tax deferral represent a significant change to the tax treatment of retirement savings. The proposals appear to be based on a misunderstanding of the benefits of tax deferral. A deferral of tax is neither a deduction nor an exclusion. Limiting the up-front tax benefit of retirement contributions would arbitrarily penalize workers, substantially reducing the benefits of tax deferral for those closest to retirement.

Capping the Up-Front Benefit

With an up-front cap, the preliminary calculation of income tax liability would be the same as under current law, but a separate tax on retirement plan contributions (a "contribution tax") would be imposed on workers with a statutory tax rate higher than the cap rate. The rate of the contribution tax would be equal to the difference between a worker's marginal tax rate and the cap rate. For example, with a 25 percent cap, individuals making retirement contributions would calculate their income taxes as under current law, but taxpayers with marginal tax rates of more than 25 percent would owe an additional tax. Consider a worker with a 35 percent statutory tax rate. Retirement contributions would be excluded from taxable wage and salary income reported on Form W-2 and line 7 of Form 1040, and would be excluded from the measure of taxable income used to make the initial calculation of tax liability. After the initial calculation of taxes, however, an additional tax would be added, just as the alternative minimum tax (AMT) is added to the initial calculation of taxes under current law. In this case, the taxpayer would pay an additional tax of 10 percent—the difference between the taxpayer's marginal tax rate of 35 percent and the 25 percent cap—on retirement plan contributions. No other changes would be made to the tax treatment of these contributions. In particular, 100 percent of retirement plan distributions would continue to be taxed.

Flat-Rate Refundable Credit

With a flat-rate refundable credit, retirement plan contributions would not be excluded from income, but a credit equal to a percentage of retirement plan contributions would be subtracted from the preliminary calculation of income tax liability. For example, with a 25 percent refundable credit, retirement plan contributions would be included in wage and salary income reported on Form W-2 and line 7 of Form 1040, and would be included in the measure of taxable income used to make the initial calculation of tax liability. After the initial calculation, however, a credit equal to 25 percent of retirement plan contributions would be subtracted from the calculated tax liability. If the tax credit was in excess of the initial calculation of tax liability, workers would receive a refund check. No other changes would be made to the tax treatment of these contributions. In particular, 100 percent of retirement plan distributions would continue to be taxed.

Flat-Rate Government Matching Contributions

With flat-rate government matching contributions, retirement plan contributions would not be excluded from income, but the government would directly deposit matching contributions on the worker's behalf to a retirement plan. No other changes would be made to the tax treatment of these contributions. In particular, 100 percent of retirement plan distributions would continue to be taxed.

Rates Differ for Economically Equivalent Refundable Credits and Matching Contributions

For workers with high statutory tax rates, a 25 percent cap and a 25 percent refundable credit are economically equivalent. The only difference between the two proposals are for workers with statutory tax rates below 25 percent, who would benefit more from a refundable credit.

In contrast, a 25 percent refundable credit is not equivalent to government matching contributions of 25 percent. Rather, a 25 percent refundable credit is economically equivalent to government matching contributions equal to one-third (33.3 percent) of employee contributions. The different rates are equivalent because the refundable credit rate is expressed as an inclusive rate (i.e., including the value of the refundable credit), whereas the match rate is expressed as an exclusive rate (i.e., excluding the value of the government matching contribution).[9]

Illustrative Example for Workers with High Marginal Tax Rates

Figure A.3 illustrates the tax treatment of retirement plan contributions for a worker with a 35 percent marginal tax rate under current law and under the three proposed alternative policies. In the example, it is assumed that $1,000 of compensation is used to fund the contribution, investment returns are in the form of 6 percent interest payments, and the individual's marginal tax rate does not change over time.

Benefits of Tax Deferral Under Current Law

Under current law, a worker could choose to defer the $1,000 of compensation by contributing it to a retirement plan or choose to receive the $1,000 immediately, include the compensation in taxable wage and salary income reported on line 7 of Form 1040, and contribute the after-tax amount to a taxable investment account. If the worker choses to defer the compensation, the full $1,000 of compensation would be contributed to a retirement

plan (Figure A.3, column 1). If the worker chose to receive the compensation immediately, $350 ($1,000 × 35%) would be collected in income taxes and the remaining $650 would be contributed to a taxable investment account (column 2).

The up-front reduction in income taxes does not represent the benefits of tax deferral. The benefits of tax deferral are the additional after-tax distributions the worker would have in retirement relative to an investment in a taxable account. As explained in detail in chapter 4, the benefits of tax deferral increase the longer compensation is deferred.

If the worker were not subject to an early withdrawal penalty and decided to withdraw the retirement plan contribution immediately, tax deferral would provide no benefits (Figure A.3, column 3). The retirement plan would have a balance of $1,000, but, if distributed, the entire amount would be subject to income tax, resulting in an after-tax distribution of $650 (column 1). The taxable investment account would have a balance of only $650, but, if distributed, would incur no income tax and would also result in an after-tax distribution of $650 (column 2). In the case of an immediate withdrawal of contributions, there would be no benefits from tax deferral because no taxes would be deferred.

The benefits of tax deferral are equivalent to the benefits of taxing investment returns at a zero rate.[10] The benefits of getting this zero rate of tax increase with each year taxes are deferred. For example, if the contribution was distributed after one year, the tax-deferred retirement plan would generate an after-tax distribution of $689 (Figure A.3, column 1).[11] In contrast, after all taxes were paid, the taxable investment account would generate $675 (column 2), or $14 less (column 3).[12] In present value, the benefits of tax deferral for a one-year holding period would be $13 (column 4).[13] The longer the contribution remains in the account, the more the tax benefits would grow, increasing in present value to $62 if distributed in five years and $118 if distributed in 10 years.

Benefits of Tax Deferral Under Proposed Alternatives

Any of the three proposals would fundamentally change the nature of tax deferral.[14] The three alternative tax treatments would be implemented differently from each other, but all three would result in the same initial contribution to the retirement account (Figure A.3).

» With a 25 percent cap, $1,000 of compensation could fund a retirement plan contribution of $867 (column 5).[15] The remaining $133 would be taken as current compensation and would be just enough to pay income tax of $47 ($133 × 35%) and a contribution tax of $87 ($867 × 10%).

» With a 25 percent refundable credit, $1,000 of compensation could fund a retirement plan contribution of $867 (column 6). The remaining $133 would pay income tax. The full $1,000 would be included in current compensation. In the initial calculation of income tax, the $1,000 would generate $350 of income tax liability. However, after accounting for the offsetting contribution credit of $217 ($867 × 25%), income tax liability would be $133 ($350 − $217).

» With a 33 percent government matching contribution, the $1,000 of compensation could fund a retirement plan contribution of $650 (column 7). The remaining $350 would be used to pay income tax on the compensation. The government, however, would then provide a matching contribution of $217 ($650 × 33%), resulting in a total contribution of $867 ($650 + $217).

FIGURE A.3

Illustration of Proposed Alternative Tax Treatments for Workers with High Marginal Tax Rates

Assumptions

Pre-tax compensation used to fund savings	$1,000
Pre-tax market rate of return (interest)	6%
Marginal tax rate	35%
Individual's marginal tax rate does not change over time	

	Current law		Tax benefits under current law		Proposed alternative tax treatments			Tax benefits under alternative tax treatments	
	Tax Deferral	Taxable individual investment account	Nominal	Present value	25 percent cap	25 percent refundable credit	33.3 percent government matching contributions	Nominal	Present Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Compensation	$1,000	$1,000			$1,000	$1,000	$1,000		
Taxable compensation	0	1,000			133	1,000	1,000		
Initial calculation of income tax liability	0	350			47	350	350		
Refundable credit (-)	NA	NA			NA	217	NA		
Contribution tax (+)	NA	NA			87	NA	NA		
Final income tax liability	0	350			133	133	350		
Worker contribution	1,000	650			867	867	650		
Government matching contribution	NA	NA			NA	NA	217		
Total contribution	1,000	650			867	867	867		

Continued

Illustration of Proposed Alternative Tax Treatments for Workers with High Marginal Tax Rates

	Current law		Tax benefits under current law		Proposed alternative tax treatments			Tax benefits under alternative tax treatments	
	Tax Deferral	Taxable individual investment account	Nominal	Present value	25 percent cap	25 percent refundable credit	33.3 percent government matching contributions	Nominal	Present Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
After-tax distribution (no early withdrawal penalty)					----- Same after-tax amounts -----				
Immediate withdrawal	$650	$650	$0	$0	--------	$563	--------	-$87	-$87
Withdrawal after one year	689	675	14	13	--------	597	--------	-78	-74
Withdrawal after five years	870	787	83	62	--------	754	--------	-33	-25
Withdrawal after 10 years	1,164	953	211	118	--------	1,009	--------	56	31

NA = not applicable
Source: ICI calculations

Unlike current law, if the worker were not subject to an early withdrawal penalty and decided to withdraw the retirement plan contribution immediately, the worker would be made worse off by contributing to the retirement plan (Figure A.3, column 8). In all three alternative proposals, a distribution of the account balance of $867 would incur an income tax of $303 ($867 × 35%) and result in an after-tax distribution of $563. Relative to simply paying income tax on the compensation and contributing it to a taxable account, the worker would be worse off by $87 ($650 – $563).

For workers with marginal tax rates in excess of the up-front limit on benefits, all three proposals effectively impose a separate contribution tax. If the contributions remain invested in the account long enough, the benefits of tax deferral would eventually outweigh the contribution tax (Figure A.3, column 9). In this example, contributions would need to remain invested for eight years before a retirement plan contribution made the worker better off (not shown in Figure A.3). Even if contributions remained invested long enough to offset the contribution tax, however, the benefits of tax deferral would be reduced substantially. After 10 years, tax benefits are reduced by 74 percent, from $118 in present value (Figure A.3, column 4) to $31 (column 9), and remain nearly 50 percent lower after 20 years (not shown in Figure A.3).[16]

Illustrative Example for Workers with Low Marginal Tax Rates

Figure A.4 illustrates the tax treatment of retirement plan contributions for a worker with a 15 percent marginal tax rate under current law and three proposed alternative tax treatments. As with the illustration in Figure A.3, it is assumed that $1,000 of compensation is used to fund the contribution and investment returns are in the form of 6 percent interest payments.

Benefits of Tax Deferral Under Current Law

Under current law, if the worker chose to defer the compensation, the full $1,000 of compensation would be contributed (Figure A.4, column 1). If the worker chose to receive the compensation immediately, $150 ($1,000 × 15%) would be collected in income taxes and the remaining $850 would be contributed to a taxable investment account (column 2).

Again, the up-front reduction in income taxes does not represent the benefits of tax deferral. The benefits of tax deferral are the additional after-tax distributions the worker would have in retirement relative to an investment in a taxable account.

If the worker was not subject to an early withdrawal penalty and decided to withdraw the retirement plan contribution immediately, tax deferral would provide no benefits (Figure A.4, column 3). The retirement plan would have a balance of $1,000, but if distributed, the entire amount would be subject to income tax, resulting in an after-tax distribution of $850 (column 1). The taxable investment account would have a balance of only $850, but if distributed, would incur no income tax and would also result in an after-tax distribution of $850 (column 2).

The longer contributions remain in the plan, the greater the benefits from tax deferral. For example, if the contribution was distributed after one year, the tax-deferred retirement plan would generate an after-tax distribution of $901 (Figure A.4, column 1).[17] In contrast, after all taxes were paid, the taxable investment account would generate $893 (column 2), or $8 less (column 3).[18] In present value, the benefits of tax deferral for a one-year holding period would be $7 (column 4).[19] The tax benefits would grow the longer the contribution remained in the account, increasing, in present value, to $35 if distributed in five years and $69 if distributed in 10 years.

Benefits of Tax Deferral Under Proposed Alternatives

Unlike the case with the worker with a high marginal tax rate, the three alternative tax treatments would not result in the same initial contribution to the retirement plan. For a worker with a 15 percent marginal tax rate, a 25 percent cap on the up-front tax benefit would have no impact on the initial contribution relative to current law (Figure A.4, column 5). Either a 25 percent refundable credit or government matching contributions equal to one-third (33.3 percent) of employee contributions would change the initial contribution amount in the same manner.

» With a 25 percent refundable credit, $1,000 of compensation would fund a retirement plan contribution of $1,133 (Figure A.4, column 6). Under the proposal, all compensation is subject to income tax, regardless of the size of contributions. If nothing was contributed to the retirement plan, the $1,000 of compensation would incur income tax of $150 and generate $850 of after-tax income. If $1,333 of was contributed to the retirement plan, the contribution would generate a refundable tax credit of $283. After subtracting the $283 refundable credit, the $1,133 contribution would reduce after-tax income by $850. Therefore, in after-tax income, a contribution of $1,133 would cost the worker the equivalent of $1,000 of taxable compensation.[20]

» With a 33.3 percent government matching contribution, the $1,000 of compensation could fund a retirement plan contribution of $850 (Figure A.4, column 7). The remaining $150 would be used to pay income tax on the compensation. The government, however, would then provide a matching contribution of $283 ($850 × 33%), resulting in a total contribution of $1,133 ($850 + $283).

Either a refundable credit or government matching contributions would fundamentally change the nature of tax deferral for workers with low marginal tax rates. Under current law, tax deferral only provides benefits if contributions remain in the account, with the benefits growing slowly over time. Unless contributions remain invested for an extended period, the benefits of deferral are modest. Under either of the two alternative policies, there would be a large tax benefit associated with simply contributing to a retirement plan. After the initial contribution, the benefits of a contribution would grow only slowly over time, exactly as under current law.

FIGURE A.4

Illustration of Proposed Alternative Tax Treatments for Workers with Low Marginal Tax Rates

Assumptions

Pre-tax compensation used to fund savings	$1,000
Pre-tax market rate of return (interest)	6%
Marginal tax rate	15%
Individual's marginal tax rate does not change over time	

	Current law		Tax benefits under current law		Proposed alternative tax treatments			Tax benefits with refundable credit or government match	
	Tax Deferral	Taxable individual investment account	Nominal	Present value	25 percent cap	25 percent refundable credit	33.3 percent government matching contributions	Nominal	Present Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Compensation	$1,000	$1,000			$1,000	$1,000	$1,000		
Taxable compensation	0	1,000			0	1,000	1,000		
Initial calculation of income tax liability	0	150			0	150	150		
Refundable credit (-)	NA	NA			NA	283	NA		
Contribution tax (+)	NA	NA			0	NA	NA		
Final income tax liability	0	150			0	-133	150		
Worker contribution	1,000	850			1,000	1,133	850		
Government matching contribution	NA	NA			NA	NA	283		
Total contribution	1,000	850			1,000	1,133	1,133		

Continued

Illustration of Proposed Alternative Tax Treatments for Workers with Low Marginal Tax Rate

	Current law		Tax benefits under current law		Proposed alternative tax treatments			Tax benefits with refundable credit or government match	
	Tax Deferral	Taxable individual investment account	Nominal	Present value	25 percent cap	25 percent refundable credit	33.3 percent government matching contributions	Nominal	Present Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
After-tax distribution (no early withdrawal penalty)						----- Same after-tax amounts -----			
Immediate withdrawal	$850	$850	$0	$0	$850	--------	$963	$113	$113
Withdrawal after one year	901	893	8	7	901	--------	1,021	128	121
Withdrawal after five years	1,137	1,090	47	35	1,137	--------	1,289	199	149
Withdrawal after 10 years	1,522	1,398	124	69	1,522	--------	1,725	327	183

NA = not applicable
Source: ICI calculations

Unlike current law, a worker with low marginal tax rates who was not subject to an early withdrawal penalty would generate substantial tax benefits by contributing to a retirement plan and withdrawing the contribution immediately with either a refundable credit or government matching contributions (Figure A.4, column 8). In both alternative proposals, a distribution of the account balance of $1,133 would incur an income tax of $170 ($1,133 × 15%) and result in an after-tax distribution of $963. Relative to simply paying income tax on the compensation and contributing it to a taxable account, the worker would be better off by $113 ($963 − $850).

For workers with low marginal tax rates, these proposals effectively provide a contribution subsidy. The total benefits of deferral under the proposed alternatives would be the combination of the contribution subsidy and the benefits of tax deferral. Unlike the benefits of tax deferral, the contribution subsidy does not increase, in present value, as the length of deferral increases.

Notes

Executive Summary

[1] Goodfellow and Schieber 1993, Schieber 2012, and Schieber 2014.

[2] See, for example, Burman et al. 2004; Goodfellow and Schieber 1993; Schieber 2012; Congressional Budget Office 2013; and Schieber 2014.

[3] See, for example, Goodfellow and Schieber 1993; Smith, Toder, and Iams 2004; Congressional Budget Office 2006; Schieber 2012; Schieber 2014; and Smith and Toder 2014.

[4] See, for example, Batchelder, Goldberg, and Orszag 2006.

[5] See, for example, Gale, Gruber, and Orszag 2006; Gale 2011; and Gale, John, and Smith 2012.

[6] See, for example, the president's budget proposals beginning in fiscal year 2013 (U.S. Department of the Treasury 2012, 2013, 2014, and 2015) and House Ways and Means Chairman Camp's 2014 tax reform proposal (Tax Reform Act of 2014).

[7] See note 4.

[8] See note 5.

Introduction

[1] ICI analysis of the Federal Reserve Board's Survey of Consumer Finances (SCF). See Figure 13 on page 29 of Brady, Burham, and Holden 2012.

[2] For this reason, Brady, Burham, and Holden 2012 suggests that a pyramid is a better analogy for retirement resources than is a three-legged stool.

[3] See discussion of Figure 1.2 in chapter 1.

[4] Burman, Toder, and Geissler 2008; Toder, Harris, and Lim 2009; Toder and Baneman 2012; and Congressional Budget Office 2013.

[5] U.S. Department of the Treasury 2012, 2013, 2014, and 2015.

[6] The Tax Reform Act of 2014.

Chapter 1

[1] For a discussion of the early history of tax expenditures, see Forman 1986 and Shaviro 2003. Although Surrey is credited with coining the term *tax expenditure*, concerns about special tax provisions had existed for some time. For example, Forman 1986 points out that in the United States there was growing academic interest in special tax provisions after enactment of the Internal Revenue Code of 1954. Shaviro 2003 points out that, in Germany, writers had noticed the equivalence of certain tax provisions and direct government subsidies as early as 1954 and that, when the German government began reporting on government subsidies in 1959, it included both direct subsidies and subsidies provided by the tax system.

[2] U.S. Department of the Treasury 1969.

[3] For the most recent estimates, see Joint Committee on Taxation 2014 and Office of Management and Budget 2015.

[4] This paragraph summarizes the explanation of tax expenditures found in Surrey and McDaniel 1985.

[5] One of the earliest criticisms of the tax expenditure concept was the arbitrary nature of the normal income tax structure: "The trouble is that, aside from the many ambiguities that become apparent as soon as one attempts to apply the Haig-Simons definition [of income] to the protean stream of economic life, any system of income taxation is an aggregation of decisions about a host of structural issues that the Haig-Simons definition does not even purport to settle. As to these, one could lock forty tax experts in a room for forty days, and get no agreement—except as a surrender to hunger or boredom—even if they all could recite the complete works of Henry Simons by heart. For such issues, every man can create his own set of 'tax expenditures,' but it will be no more than his collection of disparities between the income tax law as it is, and as he thinks it ought to be. Such compilation would be interesting, but I do not know how we can select one of them for inclusion in the National Budget." (Bittker 1969, page 260). Note that Haig-Simons income is defined as the sum of an individual's consumption plus the change in the individual's net worth over a given period, such as a calendar year. The arbitrary nature of the normal income tax structure to which the current income tax is compared has continued to be a primary criticism of the tax expenditure concept. See, for example, Kahn and Lehman 1992 and Bartlett 2001.

[6] See Joint Committee on Taxation 2014, page 4.

[7] For example, the current tax code allows certain businesses (typically smaller businesses) to use the cash method of accounting. Treasury considers this to be part of the normal income tax structure, whereas the JCT treats this as a tax expenditure. For a more detailed explanation of differences between the JCT and Treasury tax expenditure estimates, see Joint Committee on Taxation 2014, pages 13–14.

[8] For a description and explanation of the Tax Reform Act of 1976, see Joint Committee on Taxation 1976.

[9] For a description and explanation of the Tax Reform Act of 1986, see Joint Committee on Taxation 1987.

[10] For example, Joint Committee on Taxation 2014 distributes the following tax expenditures by taxpayer income class: untaxed Social Security and Railroad Retirement benefits; medical deduction; real estate tax deduction; mortgage interest deduction; state and local income, sales, and personal property tax deduction; charitable contribution deduction; child care credit; earned income

credit; education credits; student loan interest; child tax credit; and the phaseout of the personal exemption for the regular tax and denial of personal exemption and the standard deduction for the alternative minimum tax (AMT). The last item is considered a negative tax expenditure—that is, it increases tax liability above that of the normal income tax structure.

[11] See Toder, Burman, and Geissler 2008; Toder, Harris, and Lim 2009; Toder and Baneman 2012; and the Congressional Budget Office 2013. In addition, the Tax Policy Center posts regularly updated distributional analysis of tax expenditures on their website (see www.taxpolicycenter.org/taxtopics/Tax-Expenditures-2013-2.cfm). These estimates are based on the previously published work of Tax Policy Center economists (Toder, Burman, and Geissler 2008; Toder, Harris, and Lim 2009; and Toder and Baneman 2012).

[12] See, for example, Marr and Highsmith 2011 and Hanlon 2011.

[13] See, for example, Van Hollen 2013 and Senate Budget Committee 2015.

[14] Joint Committee on Taxation 2014 estimates that, over the five fiscal years of 2014 to 2018, the top 10 tax expenditures are: the exclusion of employer-paid healthcare expenses and premiums ($785.1 billion); reduced tax rates on dividends and long-term capital gains ($632.8 billion); deferral of active income of controlled foreign corporations ($418.0 billion); the mortgage interest deduction ($405.2 billion); deferral of tax on contributions to and investment earnings of DC plans ($399.0 billion); the earned income credit ($352.8 billion); subsidies for insurance purchased through health benefit exchanges ($318.1 billion); the deduction for state and local taxes ($316.4 billion); the child credit ($285.5 billion); and the deferral of tax on contributions to and investment earnings of DB plans ($248.3 billion).

[15] See Brady and Bogdan 2014a.

[16] See, for example, the discussion in Congressional Budget Office 1987.

[17] Because both the JCT and Treasury estimate each tax expenditure independently, tax expenditure estimates are generally not additive. That is, because there may be interactions between tax code provisions, it cannot be assumed that the joint estimate of two tax expenditures would equal the sum of the two independent estimates. Although both the JCT and Treasury assume no other changes are made to the tax code, as explained in Joint Committee on Taxation 2014, page 13, they make somewhat different assumptions as to how tax liability is changed. The JCT assumes that, if the tax expenditure were removed, taxpayers would be allowed to take advantage of other tax expenditures. Treasury assumes taxpayers would not be allowed to take advantage of other tax expenditures.

[18] For a detailed explanation of the benefits of tax deferral, see Brady 2012b.

[19] Interest and dividend payments are taxed when received and thus subject to income tax every year. Capital gains are taxed when realized.

[20] Withdrawals are only taxed if a portion of the withdrawal represents unrealized gains that have not previously been subject to tax. In that case, the unrealized gain would be included in income at the time of the withdrawal and subject to tax.

[21] For a complete technical description of Treasury's model, see Cilke 1994.

[22] Schwabish and Topeleski 2013 concisely explains the differences between the Congressional Budget Office long-term (CBOLT) simulation model, which is a panel model, and other models: "Unlike many other models that project Social Security's finances, CBOLT projects behavior at the individual level. For each individual in the model, CBOLT projects levels of educational attainment, transitions in and out of marriage, labor force participation and employment transitions, immigration and emigration, and claiming patterns for Social Security benefits. An important feature of CBOLT is that it models each worker's annual earnings over that worker's lifetime. Those lifetime earnings patterns are the key determinants of individual payroll taxes paid and Social Security benefits received, and thus of aggregate Social Security finances."

[23] For a description of the CBOLT simulation model, see Congressional Budget Office 2009. For a description of the microsimulation model used by the Social Security Administration, which is the modeling income in the near term (MINT) simulation model, see Smith and Favreault 2013.

[24] For a description of Treasury's panel model, see Nunns et al. 2008. For a description of the JCT's panel model, see Joint Committee on Taxation 2011.

[25] For example, Treasury jointly estimates the tax expenditure of traditional and Roth IRAs, whereas the JCT estimates them separately. In addition to other differences, Treasury projects tax expenditures for 10 years, whereas the JCT projects tax expenditures for five years.

[26] See discussion in note 17 of this chapter.

[27] The cash flow measure used to produce the official aggregate tax expenditure estimates for employer-sponsored retirement plans is not consistent with measures used for other tax expenditure estimates. Measures used for other tax expenditures are forward-looking, estimating tax expenditures that will take place over the budget period. The cash flow measure used for tax deferral is essentially backward-looking. The tax expenditure estimates for employer-sponsored retirement plans are not measuring what the impact would be if workers were prohibited from deferring compensation through employer-sponsored retirement plans during the budget period. Instead, it is measuring what the impact would have been during the budget period if workers had never been allowed to defer taxes on compensation set aside for retirement. For a discussion of the importance of this difference and alternative tax expenditure measures for employer-sponsored retirement plans, see Brady 2012b, pages 29–34.

[28] Although they are much more consistent with the concept of a tax expenditure, present value measures require that analysts make more assumptions, and the resulting estimates can vary considerably based on the assumptions that are made. For a discussion of the advantages and disadvantages of cash flow measures and present value measures, see Brady 2012b, pages 30–31.

[29] The proposal would not change other aspects of tax deferral. That is, investment income earned by an employer-sponsored retirement plan would be excluded from income and distributions from the plan would be included in income.

[30] The annual estimates are derived using the Urban-Brookings Tax Policy Center Microsimulation Model, which is a cross-sectional model similar in structure to the Treasury and JCT ITMs. For a description of the Tax Policy Center Microsimulation Model, see Rohaly, Carasso, and Saleem 2005. The lifetime estimates are derived using the Urban Institute's Dynamic Simulation of Income Model (DYNASIM3), which is a panel model developed to study retirement issues. For a description of the DYNASIM3 model, see Smith and Favreault 2004.

[31] The remainder of the samples were either unaffected by the change or affected by less than $10.

[32] For evidence on earnings over the life cycle, see, for example, Guvenen et al. 2015.

[33] For analysis of IRA withdrawal activity, see Holden and Bass 2014, Holden and Schrass 2014, and Holden and Schrass 2015. For analysis of the drawdown of retirement resources more generally, see Poterba, Venti, and Wise 2011 and 2013.

[34] A full accounting of the U.S. retirement system also would include an evaluation of Medicare, in addition to other programs that provide resources to retirees, such as supplemental security insurance (SSI), supplemental nutrition assistance program (SNAP—the government program formerly known as the Food Stamp Program), and housing assistance. Such a comprehensive analysis is beyond the scope of this book, which is content with improving, albeit not perfecting, measurement of the benefits of the U.S. retirement system. The payroll taxes and income taxes collected to pay for these other retirement programs (and to finance other government spending as well) are included in the measure of lifetime taxes. Unlike Social Security, however, no effort is made to assign the benefits of these programs to the representative workers.

[35] As illustrated in Brady and Bogdan 2014b, Social Security benefit payments are a substantial share of retiree income. As illustrated in Gustman, Steinmeier, and Tabatabai 2009, future Social Security benefit payments represent a substantial share of retirement resources for pre-retirees.

[36] Replacement rates are for scheduled Social Security benefit payments and are reported in Exhibit 10 of Congressional Budget Office 2014. For workers born in the 1960s, the Social Security full benefit retirement age is age 67. If these workers delayed claiming from age 65 to the full benefit retirement age, Social Security benefit payments would increase by 15.3 percent. For every month claiming is delayed, benefit payments would continue to increase until age 70. If claiming was delayed until age 70, benefit payments would be 24 percent higher than if claimed at age 67, and 43 percent higher than if claimed at age 65.

[37] For a discussion of the U.S. retirement system and the resources that U.S. workers rely on in retirement, see Brady, Burham, and Holden 2012.

[38] Permitted disparity—the provision in the tax code that allows Social Security integration—is defined in Section 401(*l*) of the Internal Revenue Code. See Perun 2002 for a discussion of Social Security integration. Perun 2002 finds that, as of 1997, about one out of three DB plans and about one in four DC plans were integrated. Because integrated DB plans were larger than the average DB plan, about 42 percent of DB participants were in an integrated plan in 1997. The study was not able to determine the exact proportion of DC participants in integrated plans, but substantially fewer than 25 percent of participants were in integrated plans because most integrated DC plans were smaller than the average DC plan (75 percent have fewer than 20 participants). Permitted disparity rules do not apply to employee 401(k) plan contributions and employer 401(k) matching contributions; that is, employers that provide only matching contributions to a 401(k) plan are not permitted to integrate their plans with Social Security.

[39] The statistics in Figure 1.3 were tabulated using data from an updated Table 3 of Gustman, Steinmeier, and Tabatabai 2009, which provides the same information for these households from 2006, when they were aged 53 to 58. The 2006 data were summarized in Figure 16 of Brady, Burham, and Holden 2012.

Chapter 2

1   As discussed in chapter 1, tax expenditure estimates for a multiyear budget period are simply the sum of tax expenditure estimates for individual years.

2   For a discussion of the difference between cash flow and present value measures of the benefits of tax deferral, see chapter 1 and Brady 2012b, pages 29–34.

3   Congressional Budget Office 1987, page xii.

4   Congressional Budget Office 1987, page xi.

5   Goodfellow and Schieber 1993, page 167.

6   Schieber 2012, page 293.

7   See, for example, Burman et al. 2004; Goodfellow and Schieber 1993; Schieber 2012; Congressional Budget Office 2013; and Schieber 2014.

8   See, for example, Goodfellow and Schieber 1993; Smith, Toder, and Iams 2004; Congressional Budget Office 2006; Schieber 2012; Schieber 2014; and Smith and Toder 2014.

9   Net Social Security benefit payments are a part of the benefit measure because they represent the difference in net Social Security taxes paid between the alternative simulation (the third simulation) without Social Security and the baseline simulation of current policy. See notes 16 and 17 in this chapter.

10   Adjusted gross income (AGI) under the current income tax is the sum of income from all sources—including, for example, wage and salary income, interest income, dividend income, business income, capital gains, IRA distributions, pension and annuity income, rental income, farm income, and Social Security benefit payments—less adjustments to income such as moving expenses, health insurance expenses for the self-employed, deductible IRA contributions, and student loan interest.

11   Under certain conditions, the benefits of a tax-deferred contribution are the same as the benefits of a Roth contribution funded with the same amount of pretax compensation. For explanation of why the two different tax treatments often provide the same benefits, see Brady 2013a and Brady 2012b, pages 4–12.

12   As quoted in DeWitt 2001, the House Budget Committee made the following statement to explain the rationale for the 1993 law changes which, as explained in note 14 of this chapter, added an 85 percent inclusion rate for Social Security benefit payments: "The committee desires to more closely conform the income tax treatment of Social Security benefits and private pension benefits by increasing the maximum amount of Social Security benefits included in gross income for certain higher-income beneficiaries. Reducing the exclusion for Social Security benefits for these beneficiaries will enhance both the horizontal and vertical equity of the individual income tax system by treating all income in a more similar manner."

13   The percentage of Social Security benefit payments included in AGI under the federal income tax is based on a taxpayer's modified adjusted gross income (MAGI), which includes half of Social Security benefit payments and other income. For single taxpayers, if MAGI is $25,000 or less, no Social Security benefit payments are included in AGI; if MAGI is between $25,000 and $34,000, the lesser of 50 percent of Social Security benefit payments or 50 percent of MAGI in excess of $25,000 is included in AGI; if MAGI is in excess of $34,000, the lesser of 85 percent

of Social Security benefit payments or 85 percent of MAGI in excess of $34,000 plus $4,500 [=50%*($34,000–$25,000)] is included in AGI. The thresholds are not indexed for inflation. The $25,000 threshold has been in effect since 1984, and the $34,000 threshold has been in effect since 1994. See discussion in note 14 in this chapter.

[14] Prior to 1984, all Social Security benefit payments were excluded from income under the federal income tax. Beginning in 1984, as part of the Social Security Amendments enacted in 1983, a statutory 50 percent inclusion rate applied to Social Security benefit payments for taxpayers with income above a certain threshold. Beginning in 1994, as part of the Omnibus Reconciliation Act enacted in 1993, an additional statutory 85 percent inclusion rate was added for taxpayers with income above a higher threshold. The thresholds are not indexed for inflation. For an explanation of the thresholds and the income measure to which the thresholds are applied, see note 13 in this chapter.

[15] As explained by the JCT: "Under normal income tax law, retirees would be entitled to exclude only the portion of the retirement benefits that represents a return of the payroll taxes that they paid during their working years. Thus, the exclusion of Social Security and Railroad Retirement benefits in excess of payroll tax payments is classified as a tax expenditure" (Joint Committee on Taxation 2014, page 4). In other words, the official Social Security tax expenditure estimates compare the current tax code to a normal income tax structure that incorporates the current tax code's treatment of employer-sponsored retirement plans.

[16] Net Social Security taxes are measured as the difference, in present value, between the Social Security payroll taxes paid by an individual and the Social Security benefit payments received by the individual. The term *net Social Security taxes* and the term *net Social Security benefit payments* can be used somewhat interchangeably. Net Social Security taxes are the difference, in present value, between the amount of taxes paid and the amount of benefit payments received. Net Social Security benefit payments are the difference, in present value, between the amount of benefit payments received and the amount of taxes paid. The two measures are of equal magnitude but opposite sign. That is, an individual who pays positive net Social Security taxes receives negative net Social Security benefit payments, and an individual who pays negative net Social Security taxes receives positive net Social Security benefit payments.

[17] Because workers pay zero net Social Security taxes in the third simulation in which both tax deferral and the Social Security system are eliminated, the difference between net Social Security taxes paid in the third simulation and the baseline simulation is equal to the negative value of net Social Security taxes paid in the baseline simulation. Therefore, the difference between net Social Security taxes paid in the two simulations is also equal to net Social Security benefit payments received in the baseline simulation of current policy (see note 16 in this chapter).

[18] Because of employee contribution limits, not all of the hypothetical workers are able to save enough to attain the target replacement rate.

[19] Consistent with the assumptions used in this white paper, Brady and Bogdan 2014a illustrates that the probability of working for an employer that sponsors a retirement plan increases with both age and earnings.

[20] Analysis of employee matching contribution formulas find that, among the 40 percent of 401(k) plans with simple match formulas, the most common simple match was 50 cents on the dollar up to 6 percent of pay. Among plans with simple match formulas, more than 90 percent of plans matched up to 6 percent of pay or less and about half matched 50 cents on the dollar or less. Combining

the maximum percentage of pay matched and the match rate, nearly 60 percent of plans with a simple match formula offered a maximum employer matching contribution of 3 percent of pay or less. See BrightScope and Investment Company Institute 2014.

[21] The limitation on employee contributions (Section 402(g) of the Internal Revenue Code) applies to individual taxpayers. In 2014, individuals could contribute $17,500 annually ($23,000 for workers aged 50 or older) across all 401(k) plans in which they participated. The limitation on total (employee plus employer) contributions (Section 415(c) of the Internal Revenue Code) is a plan limitation. In 2014, participants could have $52,000 contributed to a DC plan on their behalf through the combination of employee and employer contributions. Workers who participated in multiple plans could have total contributions in excess of $52,000 annually, but, across all plans, only $17,500 ($23,000 for workers aged 50 or older) could be from employee contributions.

[22] Gokhale, Kotlikoff, and Warshawsky (2001) assumes that all workers contribute 13.5 percent of pay and have employer matching contributions equal to 3.0 percent of pay. The study ignores the distinction between employee and employer contributions, and only limits contributions if 16.5 percent of pay is greater than the limit on total (employee plus employer) contributions. Because of the separate limit on employee contributions, however, the highest-earning workers would be unable to make elective deferrals of 13.5 percent of pay and, thus, could have total contributions of 16.5 percent of pay only if their employer contributions were much higher than 3.0 percent of pay. Schieber (2012) does not specify employer and employee contributions separately. However, as a percentage of pay, implied employer contributions (that is, the portion of the total contribution in excess of the employee contribution limit) for the highest-paid worker are greater than the total (employer plus employee) contributions for the lowest-paid worker. If both workers were employed by the same firm, a retirement plan with such disparities in contribution rates would be unlikely to pass nondiscrimination testing (see note 23 in this chapter).

[23] Nondiscrimination rules are designed to ensure that pension benefits do not disproportionately accrue to highly compensated employees. This is accomplished by linking the benefits received by high-paid workers to the benefits received by low-paid workers within a given firm. In the case of 401(k) plans, in addition to the general nondiscrimination rules, there are two tests that apply to contributions—the actual deferral percentage (ADP) test and the actual contribution percentage (ACP) test. The ADP test applies to the sum of employee contributions and nonmatching mandatory employer contributions. The ACP test applies to the sum of employer matching contributions and (non-Roth) after-tax employee contributions. The tests set a maximum ratio of contributions to compensation for the high-paid group of employees at a firm based on the ratio of contributions to compensation for the low-paid group of employees at a firm. For example, if low-paid employees, as a group, received employer matching contributions equal to 3 percent of pay, then high-paid employees, as a group, could receive employer matching contributions of no more than 5 percent of pay. For a more detailed explanation of the nondiscrimination rules that apply to 401(k) plans, see Holden, Brady, and Hadley 2006a and 2006b.

[24] Average indexed monthly earnings (AIME) are the sum of wage-indexed covered earnings from the 35 highest-earning years (chosen after indexation) divided by 420 (the number of months in a 35-year period). For a complete explanation of the Social Security benefit formula, see note 31 in this chapter.

[25] As explained in notes 24 and 31 in this chapter, additional years of work before age 32 would not affect Social Security benefit payments unless wage-indexed annual earnings in one or more of those years was greater than wage-indexed annual earnings in one or more of the years from age 32 through age 66. To the extent that representative workers paid Social Security taxes prior to

age 32, these taxes are ignored when measuring the benefits of the Social Security system. To the extent that workers pay Social Security taxes for more than 35 years, the simulations will overestimate the lifetime benefits of the Social Security system.

[26] The Social Security benefit payments are calculated assuming that workers claim benefits at their full benefit retirement age of 67 years. Provided workers have 35 years of covered earnings, this assumption does not greatly affect the estimated benefits of the Social Security system. If workers claim earlier or later than their full benefit retirement age, then benefit payments are adjusted so that the expected value of total lifetime benefit payments are roughly the same. See note 31 in this chapter.

[27] See discussion of the effect of this assumption on the estimation results in the callout box on page 78.

[28] Based on tabulations from the March 2007 Current Population Survey, which contains information on annual earnings for 2006.

[29] To better isolate the benefits of tax deferral, the tax calculations differ somewhat from current law because they assume that workers do not claim the Savers Credit. Only the Earn21K worker would be eligible for the Savers Credit in the baseline simulation. Including the Savers Credit would have only a modest impact on the estimated lifetime benefits the Earn21K worker receives from 401(k) plan contributions and would make it hard to distinguish between the benefits of tax deferral and the benefits of the Savers Credit. Results from a simulation that includes the Savers Credit are available upon request.

[30] The additional Medicare tax of 0.9 percent on certain wage income and 3.8 percent on certain nonwage income (new for 2013) was not incorporated into the tax calculator. This new tax would primarily affect the taxation of the highest-earning representative worker (the Earn234K worker). Including the new Medicare tax in the calculations would both increase the lifetime tax burden of the Earn234K worker and increase the estimated benefits of tax deferral.

[31] Social Security benefit payments are based on an individual's earnings history, with earnings below the maximum taxable amount ($117,000 for 2014)—also referred to as *covered earnings*—included in the calculation. Average indexed monthly earnings (AIME) is the sum of indexed earnings from the 35 highest-earning years (chosen after indexation) divided by 420 (the number of months in a 35-year period). Covered earnings before age 60 are indexed using the average wage index (AWI) at age 60. Earnings after age 60 are not indexed; that is, nominal earnings are used in the calculation. (For an explanation of the indexing of earnings, see Social Security Administration 2015d.) The benefit that a recipient is entitled to upon reaching full retirement age is the primary insurance amount (PIA). The formula for the PIA is 90 percent of AIME up to the first breakpoint, plus 32 percent of AIME above the first breakpoint up through the second break point, plus 15 percent of any AIME in excess of the second breakpoint. (For an explanation of the PIA formula, see Social Security Administration 2015c.) The breakpoint values used to calculate an individual's benefit are set at the time the recipient attains age 62, the age at which a worker is first eligible for benefits. For example, for those attaining age 62 in 2014 the PIA formula breakpoints are $816 and $4,917. These breakpoints are equivalent to annual wage-indexed earnings of $9,792 and $59,004, respectively. A retiree's initial Social Security benefit at the time of claiming is based on the PIA obtained using this formula, but adjusted to account for inflation that occurred between the year the recipient attained age 62 and the year the individual became entitled to benefits. In addition, Social Security benefit payments are reduced if individuals claim prior to their full benefit retirement age and are

increased if individuals claim after their full benefit retirement age (up to age 70). In the simulations, all representative workers claim Social Security benefits at their full benefit retirement age.

[32] To qualify for benefits, a worker must have 40 quarters of coverage. Prior to 1978, a quarter of coverage was, generally, any quarter in which a worker had $50 of earnings or more. For the self-employed, four quarters of coverage was credited for any year in which self-employment income was $400 or more. In 1978, most employers switched to reporting annual earnings, and a quarter of coverage was credited for each $250 of earnings, up to a maximum of four covered quarters in a year. Since 1978, the amount of earnings needed to earn a quarter of coverage has increased in line with the AWI, so that a quarter of coverage was credited for each $1,200 of earnings in 2014. For a description of the AWI, see Social Security Administration 2015b. For a description of covered quarters, see Social Security Administration 2015a.

[33] For an explanation of why this matching formula was chosen, see note 20 in this chapter.

[34] As explained in note 21 in this chapter, there are separate limits on both employee contributions to a DC plan and total (employee plus employer) contributions to a DC plan. In addition, the amount of compensation that can be considered in a qualified plan is limited, with the limit set at $260,000 in 2014 (Section 401(a)17 of the Internal Revenue Code). In the context of a 401(k) plan, the considered compensation limit affects the amount of compensation to which the match rate is applied when determining employer matching contributions. The Earn234K worker's total 401(k) plan contributions are constrained by both the employee contribution limit and the considered compensation limit in some years. The Earn234K worker's 401(k) plan contributions are not constrained in any year, however, by the limit on total (employee plus employer) contributions.

[35] As explained in note 34, matching contributions can only apply to compensation up to the considered compensation limit. Because the Earn234K worker is constrained by the considered compensation limit in some years, the average employer match is slightly below 3.0 percent of wage income—in hundredths of a percent, it rounds to 2.99 percent.

[36] Annuity pricing for a 67-year-old in 2033 was calculated using conditional annual survival rates for a 65-year-old in 2003, as reported in Arias 2006. This is roughly consistent with the intermediate projection in Social Security Administration 2006 that assumes life expectancy at age 65 will increase 1.9 years for males and 1.5 years for females between 2005 and 2035. An annuity was chosen as the form of payout for illustrative purposes only.

[37] This is based on ICI calculations using data from Federal Reserve Board 2015.

[38] For a discussion of the effect of rate of return assumptions on estimates of the tax benefits and revenue costs of tax deferral, as well as a discussion of why estimates should assume that the rate of return is equal to the discount rate, see Brady 2012b, pages 14–17.

[39] Investment returns in the form of annual dividend payments would reduce the benefits of tax deferral because, when generated by assets held in a taxable account, dividends are taxed at a lower rate than interest income. Investment returns in the form of capital gains would reduce the benefits of tax deferral both because long-term gains are taxed at a lower rate than interest income and because capital gains are taxed only when realized, rather than being taxed every year as they accrue. Because capital gains are taxed on realization rather than on an accrual basis, unrealized capital gains benefit from tax deferral. For a discussion of the impact of the character of investment income on estimates of the tax benefits and revenue costs of tax deferral, see Brady 2012b, pages 21–24 and pages 42–45.

[40] See discussion of the effect of distribution method on the tax benefits and revenue costs of tax deferral in Brady 2012b, pages 42–45.

[41] The price of an annuity is the amount an annuitant would pay to get a set amount of annuity income. If one annuity costs more than another annuity, that means, for a given investment, the higher-priced annuity provides lower periodic annuity payments than the lower-priced annuity.

[42] For a discussion of the "money's worth" of annuities, see Mitchell et al. 1999.

[43] For a discussion of the arguments for why retirement adequacy can be achieved with net retirement income that is less than net pre-retirement income, as well as arguments for why adequacy could require net retirement income that is greater than net pre-retirement income, see Brady 2012a. For a discussion of why the target replacement rates used to assess retirement adequacy are typically too high, see Brady 2014.

[44] For an explanation of how the percentage of Social Security benefit payments included in AGI is determined, see note 13 in this chapter.

[45] The representative workers pay no state income tax on Social Security benefit payments because they are excluded from income under the Virginia income tax. Virginia is not unusual in this respect. Forty-one states and the District of Columbia have broad-based personal income taxes. Of these, 28 states and the District of Columbia do not tax Social Security benefit payments. See Malm, Borean, and Carvajal 2013. Under the federal income tax, only a portion of Social Security benefit payments is taxed (see note 13 in this chapter). In addition to having lower total income and only taxing a portion of Social Security benefit payments, there are other provisions that reduce taxable income for taxpayers aged 65 or older. For example, those aged 65 or older have a larger standard deduction under the federal income tax and have a higher personal exemption and an old-age deduction under the Virginia income tax.

[46] To estimate the tax expenditure associated with a specific provision of the tax code, an alternative tax code that excludes the provision must be simulated. These alternative policies would change the tax code's definition of wage income and, by increasing taxes paid, reduce net earnings. Regardless of the tax policy simulated, however, each worker's total compensation is assumed to remain unchanged.

[47] The adjustment for survival probability does not affect the measure of average total retirement income because both Social Security benefit payments and 401(k) plan distributions are in the form of an inflation-indexed immediate annuity. Federal income tax liability increases with age in retirement, however, because the thresholds for the exclusion of Social Security benefit payments from adjusted gross income are not indexed for inflation (see note 13 and note 14 in this chapter). The increase in federal income tax liability with age causes net retirement income to decline with age. Survival-weighted average retirement income is greater than a simple average of retirement income that a retiree would have, conditioned on survival, throughout the projection period because of the decline in net retirement income with age.

[48] The difference between the ratios of net earnings to wage income for the Earn234K and Earn122K workers is primarily attributable to higher 401(k) plan contributions. As a percentage of wage income, federal and state income taxes increase from 23.4 percent for the Earn122K worker to 26.6 percent for the Earn234K worker (see Figure 2.8). However because OASDI taxes only apply to wages up to the earnings cap, the employee share of payroll taxes as a percentage of wage income falls from 7.6 percent for the Earn122K worker to 4.8 percent for the Earn234K worker. As a

result, the sum of income taxes and payroll taxes as a percentage of wage income is little changed, increasing from 31.0 percent for the Earn122K worker to 31.4 percent for the Earn234K worker.

[49] See note 47 in this chapter.

[50] For an explanation of DC plan contribution limits and the considered compensation limit, see note 21 and note 34 in this chapter.

[51] The Earn122K worker has earnings very close to the Social Security earnings base. Out of the 35 years from age 32 through age 66, the Earn122K worker has earnings in excess of the annual earnings base in 12 years. Assigning a value of 100 percent to those 12 years, the average ratio of earnings to the annual earnings base for the Earn122K worker is 96.6 percent. Thus, very little of the difference in earnings between the Earn234K worker and the Earn122K worker translates into additional Social Security taxes or additional Social Security benefit payments.

[52] See, for example, Brady and Bogdan 2014b and Gustman, Steinmeier, and Tabatabai 2009.

[53] A worker's total compensation is the preferred measure for scaling tax burden because total compensation is assumed to remain unchanged in response to alternative policies, making it easier to interpret changes in the tax burden caused by the alternative policies. This is not the case with other measures, such as adjusted gross income (AGI), that could be used to scale lifetime tax burdens. In fact, the way in which the alternative tax policies affect the tax burden is by changing the definition of AGI. For example, without tax deferral, both employer and employee 401(k) plan contributions would be included in AGI when working and only the portion of 401(k) plan distributions attributable to unrealized investment returns would be included during retirement.

[54] Social Security taxes of 12.4 percent, split evenly between the employer and employee, are imposed on all wage income up to the annual earnings base ($117,000 in 2014). Analysis of tax return data shows that Social Security taxes tend to decline as a percentage of income as income increases. This is because higher-earning workers are more likely to have nonwage income, such as capital gains or dividends, and because Social Security taxes decline as a share of earnings for those workers with wage income above the annual earnings base.

[55] The present value of the benefits of tax deferral can be calculated using one of three equivalent measures: (a) the present value of the reduction in lifetime taxes paid; (b) the present value of the lifetime revenue cost incurred by the government; or (c) the present value of the increase in net retirement income.

[56] As discussed in note 29 in this chapter, the tax deferral benefits estimates do not include the benefits of the Savers Credit. To better isolate the benefits of tax deferral, it is assumed that workers do not claim the Savers Credit. Incorporating the Savers Credit into the simulations only affects the results for the Earn21K worker, and the effects are modest. Simulation results including the impact of Savers Credit are available upon request.

[57] In part because the focus of this section is the tax treatment of retirement accounts under the income tax, and in part to simplify implementation of the assumption that an employer's total compensation expense is not affected by tax law changes, it is assumed that the tax treatment of 401(k) plan contributions under the payroll tax is unchanged. That is, as under current law, employee contributions are subject to payroll tax, but employer contributions are not. The payroll tax base and the income tax base already differ under current law, so it is not unreasonable to assume that changes to income tax treatment would not automatically affect payroll tax treatment. Imposing payroll tax on employer contributions in the second simulation would increase the estimated

⁵⁸ benefits of tax deferral, but would not have a large impact on the benefits of higher-earning workers relative to the tax benefits of lower-earning workers.

⁵⁸ The tax code specifies the percentage of non-qualified annuity payments that are subject to tax. In the case of immediate annuities, the percentage varies by the age of the individual at the time payments begin. The percentage is an estimate of the portion of distributions attributable to untaxed investment income (also referred to as inside buildup). The percentage is calculated using a worksheet in *IRS Publication 939* (Internal Revenue Service 2013). For the actuarially fair annuity used in the simulations, an inflation-indexed immediate-life annuity that cost $100,000 at age 67 would pay $7,779 annually. Using Table V from *IRS Publication 939*, life expectancy for an annuitant aged 67 is 18.4 years. Expected payments from the annuity would be $143,125 (18.4 years × $7,779). The ratio of basis in the annuity to expected payments would be 69.9 percent ($100,000 / $143,125). The estimated inclusion rate for the portion of the annuity that represents unrealized investment income would thus be 30.1 percent.

⁵⁹ As discussed in note 29 of this chapter, to better isolate the benefits of tax deferral, the baseline simulation of current policy assumes that workers do not claim the Savers Credit. If it was assumed that the Earn21K worker claimed the Savers Credit under current policy and was not eligible for the Savers Credit without tax deferral, and no other changes were made to the simulation, then the lifetime benefits of tax deferral would increase by about 20 percent to 0.6 percent of the Earn21K worker's lifetime compensation. Results from simulations that incorporate the Savers Credit are available upon request.

⁶⁰ For workers with higher lifetime earnings than the Earn234K worker, the tax benefits likely decline as a percentage of lifetime total compensation because of the contribution and benefit limits placed on retirement plans. Using a microsimulation model and estimating the lifetime benefits of contributions made to DC plans and IRAs in a single year, Burman et al. 2004 estimates that the top 1 percent of tax returns receive benefits that are a lower percentage of income than the top 5 percent, and the top 0.1 percent of tax returns receive benefits that are a smaller percentage of income than the top 1 percent.

⁶¹ The benefits per dollar of compensation deferred are calculated as the present discounted value of the reduction in lifetime taxes divided by the present discounted value of total (employer plus employee) 401(k) plan contributions. The benefits per dollar of compensation deferred, expressed in cents per dollar, are: 27.0 for the Earn21K worker; 32.5 for the Earn43K worker; 27.2 for the Earn69K worker; 22.4 for the Earn92K worker; 20.8 for the Earn122K worker; and 28.6 for the Earn234K worker. For some intuition as to why this is the pattern of average benefits, see the discussion of factors other than a worker's marginal tax rate that influence the marginal benefits of tax deferral in chapter 4. For a detailed accounting of all the factors that affect the lifetime benefits of tax deferral, see chapter 3.

⁶² As reported in Social Security Administration 2014, approximately 94 percent of the U.S. workforce in 2013 was covered by Social Security. Workers not covered by Social Security either were covered by another retirement system—such as the Civil Service Retirement System (for civilian federal employees hired before 1984), certain state and local government employee retirement systems, or the Railroad Retirement System—or were self-employed, farm, or domestic workers with very low net earnings.

⁶³ For explanation of benefit payment eligibility rules, see note 32 in this chapter.

⁶⁴ In revenue estimating parlance, tax deferral is "stacked first" and the benefits of the Social Security system are calculated as the residual benefits of the U.S. retirement system. That is, the benefits

of the tax deferral are first estimated by comparing the baseline simulation of current policy to an alternative simulation assuming that tax deferral would be eliminated but that Social Security would be unchanged. The benefits of the U.S. retirement system are then estimated by comparing the baseline simulation of current policy to an alternative simulation assuming that both tax deferral Social Security would be eliminated. Finally, the benefits of Social Security are measured as the difference between the benefits of the U.S. retirement system and the benefits of tax deferral. Alternatively, Social Security could be estimated by comparing the baseline simulation of current policy to an alternative simulation assuming that Social Security would be eliminated but that tax deferral would be unchanged. Then the benefits of tax deferral could be calculated as the difference between the benefits of the U.S. retirement system and the benefits of Social Security. Results from simulations where Social Security is "stacked first" and the benefits of tax deferral are calculated as the residual benefits of the U.S. retirement system are available upon request.

[65] As discussed in note 55 of this chapter, the present value of the reduction in taxes paid by individuals is equal to the present value of the increase in net retirement income.

[66] See definition of net Social Security taxes in note 16 of this chapter.

[67] See discussion in note 17 of this chapter.

[68] In part because the focus of this section is the treatment of the Social Security system under the income tax and in part to simplify implementation of the assumption that an employer's total compensation expense is not affected by tax law changes, it is assumed that the base of the payroll tax is unchanged. That is, as under current law, the employee share of the tax is included in the payroll tax base, but the employer share is not. The payroll tax base and the income tax base already differ under current law, so it is not unreasonable to assume that changes to income tax treatment would not automatically affect payroll tax treatment. Imposing payroll tax on the employer share of the Social Security taxes in the third simulation would increase the estimated benefits of the Social Security system but would not have a large impact on the benefits of higher-earning workers relative to the benefits of lower-earning workers.

[69] See note 58 in this chapter.

[70] This result was already noted in the discussion of Figure 2.12. In Figure 2.12, the net value of Social Security taxes and Social Security benefit payments for each worker was expressed as net Social Security taxes—the present value of Social Security taxes paid less the present value of Social Security benefit payments received. In Figure 2.14, the net value of Social Security taxes and Social Security benefit payments for each worker are expressed as net Social Security benefit payments—the present value of Social Security benefit payments received less the present value of Social Security taxes paid. The two concepts are equivalent. That is, net Social Security benefit payments are the same magnitude as net Social Security taxes, but are expressed using the opposite sign.

[71] The benefits of the Social Security system are estimated as the difference between the benefits of the U.S. retirement system (inclusive of both Social Security and tax deferral), and the benefits of tax deferral alone. The benefits would differ if they were estimated in isolation because of interaction between the two policy changes. See the discussion in note 63 of this chapter.

[72] As explained in note 60 of this chapter, the benefits of the U.S. retirement system likely decline as a percentage of lifetime earnings for workers with higher earnings than the Earn234K worker.

[73] See discussion in note 61 of this chapter.

[1] See, for example, Burman et al. (2004).

[2] See, for example, Marr 2013 and Bernstein 2014.

[3] See, for example, Morrissey 2011; Orszag 2011; and Ellis, Munnell, and Eschtruth 2014.

[4] For a more complete discussion of the differences between tax deferral and tax exclusions and deductions, see Brady 2012b, 2013a, and 2013b.

[5] For a discussion of how each one of these factors affects the benefits of deferring an additional dollar of compensation, see Brady 2012b.

[6] For an explanation of what is included in AGI, see note 10 in chapter 2. The representative workers in this study have income from a limited number of sources and do not have any adjustments to income, making the calculation of AGI fairly straightforward.

[7] See note 58 in chapter 2.

[8] As explained in note 13 and note 14 of chapter 2, the threshold amounts of income that determine the share of Social Security benefit payments included in AGI are not indexed for inflation. Because total retirement income is constant in inflation-adjusted dollars but the exclusion thresholds are not, the share of benefits included in AGI increases over time for workers with inclusion rates greater than zero in at least a few years and below 85 percent in at least a few years. For the Earn69K worker, without tax deferral, 6.9 percent of Social Security benefit payments are included in AGI at age 67 and 32.6 percent of Social Security benefit payments are included at age 100. With tax deferral, the inclusion rate for the Earn69K worker is 45.5 percent at age 67 and 72.3 percent at age 100. All averages presented for retirees are weighted by the probability of surviving to a particular age.

[9] Without tax deferral, the Earn21K worker would not include Social Security benefit payments in AGI until age 89, with 7.1 percent included by age 100. With tax deferral, the Earn21K worker would begin including Social Security benefit payments at age 83, with 16.1 percent included by age 100.

[10] Without tax deferral, the inclusion rate for Social Security benefit payments for the Earn234K worker ranges from 40 percent at age 67 to 61 percent at age 100. With tax deferral, the Earn234K worker includes 85 percent of Social Security benefit payments in AGI throughout retirement.

[11] The marginal tax rates reported in this book are calculated using statutory tax rates, but the federal statutory rates are adjusted for interactions with the limitation on itemized deductions, the alternative minimum tax (AMT), and the phaseout of the AMT standard deduction. The Pease limitation on itemized deductions increases marginal tax rates by 3 percentage points relative to statutory tax rates until itemized deductions are reduced by 80 percent. The alternative minimum tax (AMT) imposes statutory rates of 26 percent and 28 percent. The phaseout of the AMT standard deduction increases marginal tax rates by 5 percentage points relative to the AMT statutory tax rates. No adjustment is made to marginal tax rates for the personal exemption phaseout (PEP), as PEP reduces personal exemptions in 50 discrete steps and would typically not affect tax liability if taxable income increased by a small amount, such as by $1. For taxpayers who are not subject to the AMT and who itemize deductions,

combined federal and state marginal tax rates are adjusted to account for the deductibility of state income taxes. For taxpayers who are subject to the AMT (which does not allow for the deduction of state income taxes) or who do not itemize deductions, the combined marginal tax rate is simply the sum of federal and state marginal tax rates.

[12] Without deferral, the combination of higher taxable wages and higher interest income would push the Earn43K worker from the 15 percent federal income tax bracket to the 25 percent bracket at age 50 and would move the Earn92K worker from the 25 percent bracket to the 28 percent bracket at age 44. With deferral, the Earn43K worker and the Earn92K worker would remain in the 15 percent and 25 percent federal income tax brackets, respectively, throughout their working careers.

[13] Only a portion of this change is due to changes in the statutory rates under the normal income tax. For the Earn234K worker, tax deferral delays the move from the 28 percent federal statutory tax rate to the 33 percent federal statutory rate by two years, from age 37 to age 39. The larger impact is from the Pease limitation on itemized deductions and the AMT. Without deferral, the Earn234K worker is subject to the Pease limitation under the normal tax beginning at age 39 and is subject to the AMT from age 44 through age 66. With deferral, the Earn234K worker is not subject to the Pease limitation under the normal tax and is subject to the AMT from age 45 through age 66.

[14] Tax deferral does not actually change either federal or state marginal tax rates for the Earn122K worker, but—because tax deferral reduces state income taxes—the Earn122K worker itemizes deductions less frequently with tax deferral and thus faces a higher average combined federal and state marginal tax rate. Both with and without tax deferral, the Earn122K worker faces a federal marginal tax rate of 28 percent and a state marginal tax rate of 5.75 percent throughout the worker's career. Because state income taxes are deductible under the federal income tax, however, the combined federal and state marginal tax rate is higher if a taxpayer takes the standard deduction than if a taxpayer itemizes deductions. When the Earn122K worker takes the standard deduction, the combined federal and state marginal tax rate is 33.75 percent (=28%+5.75%). When the Earn122K worker itemizes deductions, then any state income taxes paid reduce federal taxable income, and the combined marginal rate becomes 32.1 percent [=28%+(5.75%*(100%-28%))]. The Earn122K worker's average marginal tax rate is higher with tax deferral because without deferral the Earn122K worker pays higher state income taxes and thus begins to itemize deductions at age 38, whereas with deferral, the Earn122K worker does not begin to itemize deductions until age 47.

[15] The measure of total income used to calculate average tax rates excludes all 401(k) plan contributions and Social Security taxes while working and includes all 401(k) plan contributions and Social Security benefit payments during retirement. Under current tax law, employer and employee contributions to 401(k) plans and the employer share of Social Security taxes are excluded from AGI while working, but the employee share of Social Security taxes is not. The measure of total income used in this analysis treats all 401(k) plan contributions and Social Security taxes—whether paid by the employer or paid by the employee—equivalently. Under current tax law, all 401(k) plan distributions and a portion of Social Security benefit payments are included in AGI during retirement. By including all Social Security benefit payments in total income during retirement, the measure of total income used in this analysis treats 401(k) plan distributions and Social Security benefit payments equivalently.

Chapter 4

[1] In these proposals, the up-front benefits of tax deferral would be directly limited or converted to a flat-rate refundable credit or matching government contributions. For examples of proposals to directly limit the up-front benefits of tax deferral, see the president's budget proposals beginning in fiscal year 2013 (U.S. Department of the Treasury 2012, 2013, 2014, and 2015) and House Ways and Means Chairman Camp's 2014 tax reform proposal (Tax Reform Act of 2014). For an example of a flat-rate refundable credit proposal, see Batchelder, Goldberg, and Orszag 2006. For examples of government matching contributions proposals, see Gale, Gruber, and Orszag 2006; Gale 2011; and Gale, John, and Smith 2012. See the appendix for a detailed description of these proposals.

[2] The marginal benefits of tax deferral can be calculated using one of three equivalent measures: (a) the present value of the reduction in lifetime taxes paid; (b) the present value of the lifetime revenue cost incurred by the government; or (c) the present value of the increase in net retirement income.

[3] See Brady 2012b for a detailed discussion of all the factors that affect the benefit of an additional dollar of tax-deferred compensation. For a discussion of the impact of marginal tax rates on the benefits of tax deferral, see Brady 2012b, pages 18–21, and Brady 2013b.

[4] The tax rate at which the benefits of an additional $1 in retirement plan contributions are maximized varies by length of deferral. For a deferral of one year, assuming no change in marginal tax rates, an additional $1 contribution to a retirement plan provides the maximum benefit at a marginal tax rate of 50 percent. The marginal tax rate at which benefits are maximized declines as the length of deferral increases. See discussion in Brady 2012b, pages 18–21.

[5] For a derivation of the back-of the-envelope formula, see pages 34–40 of Brady 2012b. If marginal tax rates are the same at the time of contribution and the time of distribution, the expected rate of return on investments is equal to the discount rate, investment returns are in the form of annual interest payments, and distributions are taken as a single lump sum, then the formula for the back-of-the-envelope calculation of the marginal benefits of tax deferral (in present value) is:

$$[(1-t)(1+r)^T - (1-t)(1+r(1-t))^T]/(1+r)^T$$

where
  t = the worker's marginal tax rate
  r = the expected rate of return on investments and the discount rate
  T = the number of years between the contribution and the lump-sum distribution.

[6] For a derivation of the back-of the-envelope formula, see pages 34–40 of Brady 2012b. If marginal tax rates decline when a worker retires but all other assumptions are unchanged from the assumptions listed in note 5 of this chapter, the formula for the back-of-the-envelope calculation of the marginal benefits of tax deferral (in present value) is:

$$t^W + \sum_{n=1}^{R-1} \frac{t^W r\left[(1-t^W)(1+r(1-t^W))^{n-1}\right]}{(1+r)^n} + \sum_{n=R}^{T} \frac{t^R r\left[(1-t^W)(1+r(1-t^W))^{R-1}(1+r(1-t^R))^{n-R}\right]}{(1+r)^n} - \frac{t^R(1+r)^T}{(1+r)^T}$$

where
  t^W = the worker's marginal tax rate while working
  t^R = the worker's marginal tax rate during retirement
  r = the expected rate of return on investments and the discount rate
  n = index of the number of years from the time of contribution, with contribution year = 0, retirement year = R, and distribution year = T.

[7] Age 71 was chosen for the age of the lump sum distribution because the back-of-the-envelope calculations using this assumption produced marginal benefit estimates that were fairly close to the estimates derived by simulation. That is, when a distribution age of 71 was used in back-of-the-envelope calculations that accounted for changes in marginal tax rates (see discussion in note 6 of this chapter), the marginal benefit estimates were roughly equivalent to those derived by simulation. The back of-the-envelope calculations that account for changes in marginal tax rates are not reported, but are available upon request.

[8] For a more detailed analysis of the marginal benefits of tax deferral, see Brady 2012b.

[9] In the case of the Earn234K worker, who already was contributing the maximum amount allowed by law, the limit on employee contributions was ignored.

[10] There was no change to employer 401(k) plan contributions. Other than the Earn21K worker, all workers already received the maximum employer matching contribution. Although eligible for an additional match, no change was made to employer contributions for the Earn21K worker so that the simulations measured the marginal benefits of deferring an additional $1 of compensation.

[11] For example, see Gale, Iwry, and Orszag 2005; Valenti and Weller 2013; and Corporation for Enterprise Development 2014.

[12] Workers whose marginal tax rates increase in retirement receive the full market rate of return less the impact of the tax rate increase. In the simulations, which assume that current tax policy, adjusted for inflation, applies in all years, all six representative workers face lower marginal tax rates in retirement.

[13] That is, the $1,809 of future consumption is equal to the $750 of foregone consumption grown at a compound rate of 4.5 percent interest for 20 years. Or, expressed mathematically, $1,809 = \$750*(1.045)^{20}$.

[14] That is, for all workers, future consumption is equal to the foregone consumption grown at a compound rate of 6.0 percent interest for 20 years. Expressed mathematically, $3,207 = \$1,000*(1.06)^{20}$; $2,726 = \$850*(1.06)^{20}$; $2,405 = \$750*(1.06)^{20}$; and $2,085 = \$650*(1.06)^{20}$.

[15] Mathematically, the effective rate of return is the rate that solves the equation

$$C_{71} = S_{50}(1 + r)^n$$

where

r = the effective rate of return
C_{71} = after-tax lump sum distribution at age 71
S_{50} = the reduction in spending at age 50
n = the number of years invested (21 years in this case).

[16] Holding the share of Social Security benefit payments included in AGI fixed, the effective marginal tax rates on investment income in a taxable account (calculated as the percent difference between that market annual rate of return and the effective after-tax rate of return) are 20.1 percent for the Earn21K worker, 23.1 percent for the Earn43K worker, 31.9 percent for the Earn69K worker, 35.5 percent for the Earn92K worker, 36.7 percent for the Earn122K worker, and 44.0 percent for the Earn234K worker.

[17] Holding the share of Social Security benefit payments included in AGI fixed, the effective marginal tax rates on investment income in a tax-deferred account (calculated as the percent difference between that market annual rate of return and the effective after-tax rate of return) are –19.5 percent for the Earn21K worker, –11.1 percent for the Earn43K worker, –17.9 percent for the

Earn69K worker, –0.9 percent for the Earn92K worker, –3.9 percent for the Earn122K worker, and –9.7 percent for the Earn234K worker.

[18] Allowing the share of Social Security benefit payments included in AGI to vary, the effective marginal tax rates on investment income in a taxable account (calculated as the percent difference between that market annual rate of return and the effective after-tax rate of return) are 25.1 percent for the Earn43K worker, 34.9 percent for the Earn69K worker, and 40.6 percent for the Earn92K worker. For the other representative workers, the effective marginal tax rates are the same as reported in note 16 of this chapter.

[19] Allowing the share of Social Security benefit payments included in AGI to vary, the effective marginal tax rates on investment income in a tax-deferred account (calculated as the percent difference between that market annual rate of return and the effective after-tax rate of return) are –2.4 percent for the Earn43K worker, –3.7 percent for the Earn69K worker, and 30.2 percent for the Earn92K worker. For the other representative workers, the effective marginal tax rates are the same as reported in note 17 of this chapter.

Chapter 5

[1] For a detailed explanation of what is included in the measure of AGI, see note 10 in chapter 2. The representative workers in this study have income from a limited number of sources and do not have any adjustments to income, making the calculation of AGI fairly straightforward.

[2] See note 58 in chapter 2.

[3] The employer pays $5,301 of payroll taxes (Figure 2.7, row 6), which is composed of $4,297 of Social Security taxes (OASDI) and $1,004 of Medicare taxes (HI). The income tax treatment of the employer share of Medicare taxes is assumed to be unchanged in the alternative policy simulation without both tax deferral and Social Security.

[4] Marginal tax rates are lower, on average, from age 32 through age 66 because the Earn43K worker moves from the 15 percent to the 25 percent federal income tax bracket at age 41 without both tax deferral and Social Security, but the increase in tax rates is delayed until age 50 without tax deferral but with Social Security.

[5] Social Security has no impact on the statutory tax rates faced by these workers. Marginal tax rates decline for the Earn234K because the worker is subject to the AMT for two fewer years with Social Security. Marginal tax rates increase for the Earn92K and Earn122K workers because Social Security reduces state income tax liability and, as a result, they itemize less frequently. Itemizing deductions reduces combined federal and state marginal tax rates. See discussion in note 11 of chapter 3.

[6] For these workers, Social Security would reduce AGI at the beginning of retirement but—because the exclusion of Social Security benefit payments under current law is not indexed for inflation— would increase AGI near the end of retirement. How these changes in AGI translate into changes in marginal tax rates differs among the workers. For the Earn92K worker, Social Security decreases marginal tax rates, on average, during retirement because the early reductions in AGI translate into lower marginal tax rates, but the later increases in AGI do not increase marginal tax rates. Without both tax deferral and Social Security, the Earn92K worker faces a 10 percent marginal tax rate throughout retirement. Without tax deferral but with Social Security, the Earn92K worker pays no income tax from age 67 through age 71 and then faces a 10 percent marginal tax rate starting at age 72. For the Earn69K and Earn122K workers, Social Security increases marginal tax rates, on average, during retirement because the early reductions in AGI have no effect on marginal tax rates, but the later increases translate into higher marginal tax rates. Without both tax deferral and Social Security, the Earn69K worker pays no income tax throughout retirement and the Earn122K worker faces a 10 percent marginal tax rate throughout retirement. Without tax deferral but with Social Security, the Earn69K worker pays no income tax from age 67 through age 89 and then faces a 10 percent marginal tax rate starting at age 90, and the Earn122K worker faces a 10 percent marginal tax rate from age 67 through age 78 and then faces a 15 percent marginal tax rate starting at age 79.

[7] See discussion in note 15 in chapter 3.

[8] Although it delves much more deeply into the conceptual underpinnings of tax expenditures, Shaviro 2003 makes an argument that is fairly consistent with the opinion expressed here—that the issue with tax expenditure estimates is more about how the estimates are interpreted than it is about the concept or the estimation method. The academic literature that is critical of tax expenditure analysis—such as Bittker 1969, Kahn and Lehman 1992, and Bartlett 2001—focuses on conceptual flaws and the method of estimation. While admitting that this strain of the academic

literature raises valid concerns, Shaviro 2003 expresses less concern about these issues than it does with "overreaching" on the part of those who overstate the policy implications of the estimates. "At least in the United States, efforts to make tax expenditure analysis do too much—by serving as an instrument for one particular vision of tax reform—have unnecessarily undermined its acceptance" (Shaviro 2003, page 67). Despite being a flawed measure, tax expenditure estimates provide useful information. The primary problem is that the policy implications of that information are often overstated.

[9] Revenue estimates would need to account for changes in taxpayer behavior. Predicting the impact of a comprehensive reform of the income tax would require accounting for both taxpayer behavior and other, possibly offsetting, changes made to the tax code. The confusion between tax expenditure estimates and revenue estimates is not caused by nondisclosure, as both the JCT (Joint Committee on Taxation 2014, pages 16–17) and Treasury (Office of Management and Budget 2015, pages 219–220) explain the differences between the two types of estimates.

Chapter 6

[1] For a concise discussion of progressive taxation, see Slemrod 1993. There are several rationales for having a progressive tax system, but there is no consensus as to the optimal level of progressivity.

[2] See discussion of early history of tax expenditures in Forman 1986.

[3] See discussion of early history of tax expenditures in Shaviro 2003.

[4] The importance of the choice of alternative tax policy was illustrated in Brady, Cronin, and Houser 2006, which compared allowing the deduction of home mortgage interest to three revenue neutral alternative policies that eliminated the deduction. The same point also was illustrated with respect to tax expenditures generally in Toder, Harris, and Lim 2009.

[5] The left panel of Figure 6.1 is a replication of Figure 2.12.

[6] Rationales for a progressive income tax are discussed in chapter 7, which evaluates tax deferral on the criterion of fairness.

[7] The concern would be misplaced if it was based on the mistaken belief that the benefit of tax deferral is the up-front exclusion from income. In fact, the analysis in chapter 3 shows that workers with lower lifetime earnings often benefit more from tax deferral because their marginal tax rates often decline more during retirement.

Chapter 7

1. See Slemrod 1993. In addition to these two rationales for progressive taxation, Slemrod 1993 provides a third possible rationale: if taxes are seen as a payment for government services, one rationale for progressivity is that higher-income taxpayers get more benefits from many government services performed by the government, such as national defense or the protection of property rights. To justify a progressive income tax, however, it would not be sufficient that the benefits of government services simply increase with income. Rather, the benefits would need to increase as a percentage of income. As noted in Slemrod 1993, even if the absolute benefits of government activity are higher for higher-income taxpayers, it is not clear that the benefits are higher as a percentage of income.

2. Income averaging was repealed by TRA '86 because it was thought that the provision was no longer needed given that there were only two statutory tax rates and the top statutory tax rate was reduced to 28 percent (see Conrad 1998). Income averaging was reinstated for farmers in 1997 and for fishermen in 2004.

3. For evidence on earnings over the life cycle, see, for example, Guvenen et al. 2015.

4. The argument that the fairness of the income tax is increased by allowing workers to defer a portion of their compensation until retirement is distinct from the argument that tax expenditures should be measured by comparing the current tax code to a comprehensive consumption tax. It is true that tax deferral would not be considered a tax expenditure if the normal tax structure was a comprehensive consumption tax. However, one can generally be in favor of including investment returns in income and, thus, believe the normal income tax structure is the proper comparison for current law when estimating tax expenditures, but also believe that workers should be able to defer a portion of their compensation until retirement. That is, it can be argued that allowing tax deferral increases the fairness of the income tax regardless of whether it is classified as a tax expenditure or not.

5. The extent to which tax-deferred compensation would have been allowed under the income tax established in 1913 is not clear from the statutory language because the early code did not provide the detailed definition of income that developed over the years. The code contained some general anti-abuse language aimed at entities that accumulated gains and profits "beyond the reasonable needs of the business," with the criteria for reasonable needs left to the secretary of the Treasury. The Revenue Act of 1921 specifically allowed tax deferral through what we now refer to as DC plans. It stipulated that employer contributions to and investment income of a "trust created by an employer as part of a stock bonus or profit-sharing plan for the exclusive benefit of some or all of his employees, to which contributions are made by such employer, or employees, or both, for the purpose of distributing to such employees the earnings and principal of the fund accumulated by the trust" did not constitute taxable income for the employee. Rather, distributions from the plan would be taxed. Employee contributions were treated as taxable income, but investment returns on those contributions were not taxed. A deduction was allowed for employee contributions at the time of distribution. The Revenue Act of 1926 added pension plans (i.e., DB plans) as a form of qualified deferred compensation. As explained in Holden, Brady, and Hadley 2006a, IRS rulings in the 1950s extended full tax deferral to employee contributions made through cash or deferred arrangements (CODAs). CODAs were the precursor of the modern 401(k) plan.

6. Employers do not benefit directly from tax deferral. Allowing employers to deduct retirement plan contributions from revenue when calculating net business income is not a tax expenditure because, under the normal income tax structure, net business income is defined as revenues less expenses.

[7] Both the Debt Reduction Task Force of the Bipartisan Policy Center 2010 and the National Commission on Fiscal Responsibility and Reform 2010 included the 20/20 proposal in broad plans to reduce federal government debt and reform the income tax. The limit on total annual contributions to a DC plan was the lesser of $52,000 or 100 percent of compensation in 2014.

[8] See, for example, the president's budget proposals beginning in fiscal year 2013 (U.S. Department of the Treasury 2012, 2013, 2014, and 2015) and House Ways and Means Chairman Camp's 2014 tax reform proposal (Tax Reform Act of 2014).

[9] See, for example, Batchelder, Goldberg, and Orszag 2006.

[10] See, for example, Gale, Gruber, and Orszag 2006; Gale 2011; and Gale, John, and Smith 2012.

[11] Employer contributions to employer-sponsored retirement plans—either DB plans or DC plans—receive the same federal income tax treatment as employee deferrals. As explained in note 6 of this chapter, allowing employers to deduct retirement plan contributions from revenue when calculating net business income is not a tax preference. Instead, it is the treatment of employer pension contributions under the individual income tax that represents preferential treatment. Compensation, including the present value of deferred compensation, would be included in individual income under a normal income tax structure. Special rules allow deferral of the individual income tax on compensation in the form of qualified deferred compensation, such as DB pension plans and DC pension plans.

[12] Other policy options could more directly target individuals with low lifetime resources and ensure that they have adequate retirement resources. For example, if the Social Security system were to be reformed, maintaining or limiting the reduction in Social Security benefit payments for workers with low lifetime earnings would more directly benefit workers with low lifetime resources.

[13] For example, the estimated benefits of tax deferral in this analysis do not include the impact of the Savers Credit (see discussion in note 29 of chapter 2). If it was assumed that the Earn21K worker claimed the Savers Credit and no other changes were made to the simulations, then the lifetime benefits of tax deferral would increase by only about 20 percent, from about 0.5 percent of lifetime compensation to about 0.6 percent of lifetime compensation.

[14] See, for example, Figure 4 in Congressional Budget Office 2015.

[15] ICI tabulations of Federal Reserve Board 2013 Survey of Consumer Finances data.

[16] As illustrated in chapter 4, provided a worker's marginal tax rate does not increase after retirement, tax deferral removes the disincentive to save of the normal income tax structure. For workers with more moderate lifetime earnings, however, it does not always offset the disincentive to save from phasing out the exclusion of Social Security benefit payments.

[17] The rules covering employer-sponsored retirement plans are among the lengthiest and most complicated sections of the tax code and associated regulations. Multiple IRA options with different rules for eligibility and tax treatment also create complexity.

[18] For the derivation of the tax benefits estimates in Figure 7.2, see Figure A.4 in the appendix and the related text.

[19] If tax deferral is replaced by a flat-rate 25 percent refundable credit, a $1,333 contribution would have a net cost to the worker of only $1,000 because the contribution would generate a tax refund of $333 (=$1,333*0.25). If the worker was not subject to an early withdrawal penalty and no new restrictions were placed on distributions, the full $1,333 contribution could then be withdrawn without incurring any income tax liability. As a result, churning would net the worker $333.

[20] If subject to the penalty, the worker would pay a $133 penalty on a withdrawal of $1,333 resulting in an after-tax withdrawal of $1,200, resulting in a tax benefit of $200.

[21] Distributions from qualified plans by workers younger than age 59½ are generally subject to a 10 percent penalty. Exceptions to the penalty include: distributions made in the cases of death and disability; distributions from employer-sponsored retirement plans taken by workers who have separated from employment and are either part of a series of substantially equal periodic payments or taken by individuals aged 55 or older in the year of the distribution; and distributions from IRAs that are made to pay certain medical expenses, first-time homebuyer expenses, qualified higher-education expenses, health insurance expenses of unemployed individuals, or as part of a series of substantially equal periodic payments.

[22] For the derivation of the tax benefits estimates in Figure 7.3, see Figure A.3 in the appendix and the related text.

Appendix

[1] See discussion in note 5 of chapter 7.

[2] The Tax Equity and Fiscal Responsibility Act of 1982 § 235 (PL 97-248) reduced the total DC plan contribution limit to $30,000 and did not allow for inflation indexing until after 1985. The Deficit Reduction Act of 1984 § 15 (PL 98-369) postponed indexing for inflation until after 1987. The Tax Reform Act of 1986 (TRA '86) reinstituted indexing, but delayed indexing of the DC plan annual contribution limit until inflation indexing caused the DB plan annual benefit limit to increase from three times the DC plan annual contribution limit (where it had been since ERISA) to four times the DC plan annual contribution limit. This would have occurred by 1995, but, in 1994, the Uruguay Round Agreements Act of 1994 § 732 (PL 103-465) set the 1995 limits equal to $30,000 and $120,000, respectively, and provided that both limits would be indexed for inflation. However, the legislation also instituted a new $5,000 round-down rule, which stipulated that the limit after 1995 would be the 1995 limit indexed for inflation, but rounded down to the nearest $5,000 increment. The net effect of all of these legislation changes was to keep the limit frozen at $30,000 until 2001, when the inflation-adjusted 1995 limit exceeded $35,000. In addition to delaying the indexation of the total annual contribution limit, TRA '86 instituted a separate limit on employee elective deferral in 401(k) plans. It was set equal to $7,000 in 1987 and indexed for inflation, but subject to a $500 round-down rule after 1994. Prior to TRA '86, there was no distinction made between employer and employee contributions.

[3] See note 2 in this appendix.

[4] In addition to increasing the total annual contribution limit, EGTRRA increased, in steps, the employee elective deferral limit from $10,500 in 2001 to $15,000 in 2006. It also allowed workers aged 50 or older to make additional "catch-up" contributions.

[5] See discussion in note 2 from this appendix. The ratio went well above four-to-one in 1997, 1998, and 1999 because, although both the DC annual contribution limit and the DB annual benefit limit were indexed to inflation, the indexation was subject to a $5,000 round-down rule after 1995. That is, the limits were set equal to the 1995 limits indexed to inflation but rounded down to the nearest $5,000. The annual DB contribution limit changed more frequently because the limit was larger and the change in the inflation-indexed amount exceeded the $5,000 threshold more often. The ratio returned to four-to-one in 2001, when the inflation-indexed annual contribution limit exceeded $35,000. In 2001, EGTRRA increased the limits to $40,000 and $160,000, respectively, effective in 2002. It also changed the round-down rule for the annual contribution limit to $1,000. As a result, the annual contribution limit changes more frequently and the ratio has remained close to four-to-one since 2001.

[6] See, for example, the president's budget proposals beginning in fiscal year 2013 (U.S. Department of the Treasury 2012, 2013, 2014, and 2015) and House Ways and Means Chairman Camp's 2014 tax reform proposal (Tax Reform Act of 2014).

[7] See, for example, Batchelder, Goldberg, and Orszag 2006.

[8] See, for example, Gale, Gruber, and Orszag 2006; Gale 2011; and Gale, John, and Smith 2012.

[9] Exclusive rates can also be expressed as inclusive rates and vice versa. For example, a $333 government matching contribution on a $1,000 worker contribution, on an exclusive basis, is a rate of one-third ($333/$1,000). Equivalently, a $333 government matching contribution on a $1,000 worker contribution, on an inclusive basis, is a rate of 25 percent ($333/$1,333). For a given refundable credit rate t, the matching contribution rate that is equivalent is calculated as $t/(1-t)$.

In this example, for a refundable credit rate of 25 percent, the equivalent matching contribution rate is one-third (25%/75%). For a discussion of the rate differences between refundable credits and matching contributions, see Gale, John, and Smith 2012.

[10] If marginal tax rates are the same at the time of contribution and distribution, the benefits of tax deferral are equivalent to getting a zero rate of tax on the investment income that would have been earned had the compensation been contributed to a taxable investment account. This is because, provided marginal tax rates are the same, the tax paid on distributions simply pays back the initial tax benefit with "interest" (i.e., the investment return on the portion of the initial contribution attributable to the up-front reduction in income tax). If marginal tax rates on contributions and distributions differ, the benefits of tax deferral are equivalent to getting a zero rate of tax on the investment income that would have been earned had the compensation been contributed to a taxable investment account, plus an adjustment for the difference in tax rates. For example, if tax rates are 10 percent lower in retirement, the benefits of tax deferral on $1,000 of compensation would be equal to getting a zero rate of tax on the investment income that would have been earned had the compensation been contributed to a taxable investment account plus $100, in present value, regardless of the length of deferral. Similarly, if tax rates are 10 percent higher in retirement, the benefits of tax deferral on $1,000 of compensation would be equal to getting a zero rate of tax on the investment income that would have been earned had the compensation been contributed to a taxable investment account less $100, in present value, regardless of the length of deferral. See Brady 2012a, 2013a, and 2013b for further discussion of this point.

[11] The $1,000 contribution would produce a balance of $1,060 ($1,000 + $1,000 × 6%) after one year. When the $1,060 was withdrawn, income tax of $371 ($1,060 × 35%) would be incurred, leaving $689 ($1,060 − $371) after tax.

[12] The $650 contribution would generate interest income of $39 ($650 × 6%). After paying income tax of $13.65 ($39 × 35%), the balance after one year would be $675.35 ($650 + $39 − $13.65). The benefits of tax deferral are equal to $13.65 ($689 − $675.35), which is exactly equal to the tax that would be imposed on interest income generated in a taxable account.

[13] In this example, the promise of $13.65 one year from today would be worth $12.88 ($13.65 / 1.06) today.

[14] For some additional intuition on how these proposals would change the nature of tax deferral, see Brady 2013c.

[15] The algebra for deriving the contribution amount is not terribly intuitive. Suffice it to say that $1,000 of compensation could not fund a $900 contribution, plus $35 of income tax on $100 of taxable compensation, plus a $90 contribution tax (900 + 25 + 90 = 1,015). And a contribution of $850 would result in money left over after paying $52.50 of income tax on $150 of taxable compensation and an $85 contribution tax (850 + 52.50 + 85 = 987.50).

For those who wish to see the algebra, the contribution amount is equal to

$$\frac{C}{1 + t_{cap} + \frac{t_{cap} * t_i}{1 - t_i}}$$

where

C = compensation ($1,000 in this case)
t_{cap} = the contribution tax rate (10 percent in this case)
t_i = marginal income tax rate (35 percent in this case).

In this case, the contribution that could be funded with $1,000 of compensation would be $866.67.

[16] In this example, limiting the up-front tax benefits of tax deferral reduces the benefits of tax deferral by the amount of the contribution tax of $87, in present value, regardless of the length of deferral. This is the amount of the 10 percent tax on contributions.

[17] The $1,000 contribution would produce a balance of $1,060 ($1,000 + $1,000 × 6%) after one year. When the $1,060 was withdrawn, income tax of $159 ($1,060 × 15%) would be incurred, leaving $901 ($1,060 − $159) after tax.

[18] The $850 contribution would generate interest income of $51 ($850 × 6%). After paying income tax of $7.65 ($51 × 15%), the balance after one year would be $893.35 ($850 + $51 − $7.65). The benefits of tax deferral are equal to $7.65 ($901 − $893.35)—which is exactly equal to the tax imposed on interest income in the taxable account.

[19] In this example, the promise of $7.65 one year from today would be worth $7.21 ($7.65 / 1.06) today.

[20] If this explanation is not intuitive, the contribution can be thought of as a series of transactions that take place simultaneously. First, the worker contributes $1,000 of compensation. This generates an initial tax liability of $150, a tax credit of $250, and a tax refund of $100. If the $100 tax refund generated by the contribution of $1,000 of compensation is then contributed (bringing the total contribution to $1,100), no additional initial tax liability is incurred, but an additional $25 refundable tax credit is generated. If the $25 is then contributed (bringing the total contribution to $1,125), an additional $5 refundable tax credit is generated. Provided there was no de minimus limit on tax calculations, this process would continue until contributions totaled $1,133.33. The result is that an initial contribution of $1,000 of compensation would generate a total contribution of $1,133.33.

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Correcting Myths About Tax Deferral and Social Security

Assuring retirement security is a challenge for American workers, for their employers—and for the country's policymakers. Government policy supports retirement preparedness primarily through two mechanisms: Social Security, which is a mandatory contributory pension for all workers, and tax deferral, which provides incentives for employers to offer and workers to participate in voluntary retirement plans. Yet the combined effect of these two mechanisms is poorly understood—and subject to widespread myths. With new research, economist Peter Brady of the Investment Company Institute challenges the notion of an "upside-down" retirement system that benefits only the wealthy.

Brady's innovative work is the first to use a consistent metric—a tax-expenditure estimate—to measure the benefits of both tax deferral and Social Security. It illustrates that higher earners benefit more from tax deferral not because of their higher tax rates, but because the design of Social Security creates a strong incentive for them to defer more of their compensation. In findings that bear directly upon today's pressing policy debates, Brady demonstrates that the full system of government support for retirement is indeed progressive—and warns that tax proposals to limit or fundamentally change tax deferral would actually make the tax code less fair.

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"Building on ICI's solid research demonstrating the strengths of our voluntary, private-sector retirement system, Peter Brady shows how Social Security and tax incentives combine to benefit all working Americans. I urge policymakers on both sides of the aisle to take note of Brady's valuable and insightful analysis."
— *Senator Orrin G. Hatch, President Pro Tempore of the United States Senate, Chairman of the Senate Finance Committee*

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