Who Gets Paid to Save?

by

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Abstract

Who gains, and by how much from government saving incentives? This is a very tough question to answer because the tax code has myriad interacting provisions, many of which are difficult to appreciate fully. Take workers who contribute to 401(k) plans. They lower their current taxes, but they also raise their future ones. How much their taxes decline when young and rise when old depends on their tax brackets when young and old. But these brackets can change dramatically in response to the size of 401(k) contributions and withdrawals. Changes in tax brackets will, in turn, change the tax savings from mortgage interest payments and other tax deductions. In addition, the level of withdrawals can trigger higher federal income taxation of Social Security benefits and the phase out of itemized deductions under the federal income tax. Clearly, measuring the net gains from tax-favored saving requires a model of lifetime saving, spending, and tax payments. It also requires detailed federal income, state income, and payroll tax calculators, since all three taxes are potentially altered by contributions to tax-favored accounts. *ESPlanner* (Economic Security Planner), developed by Economic Security Planning, Inc., is a life-cycle financial planning model with highly detailed tax and Social Security benefit calculators that can assess the lifetime tax and spending implications of different types and levels of tax-favored saving.

Gokhale and Kotlikoff (2001) used ESPlanner to study the size and pattern of tax breaks to saving. Their analysis, based on tax law prior to 2001, reached the remarkable conclusion that participating fully in 401(k) or similar tax-deferred saving plans raises the lifetime tax payments of low-income households who earn moderate to high rates of return! This finding is driven, in large part, by increased federal income taxation of Social Security benefits when 401(k) assets are withdrawn. Their study was, however, written prior to the enactment of The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA). EGTRRA greatly expands the limits on contributions to tax-deferred accounts, including 401(k), 403b, Keogh, and traditional IRA plans. It also raises the limit on contributions to non tax-deductible Roth IRAs. But, most important for the issue of tax fairness, it provides a significant, but little known, non-refundable tax credit for qualified account contributions up to $2,000 made by low-earning workers.

This study reviews the pre-EGTRRA lifetime tax gains (or losses) available to low-, middle-, and high-lifetime earners from participating fully in 401(k) accounts, traditional IRA accounts, and Roth IRA accounts. It then shows how these subsidies have been changed by the new legislation. The paper's bottom line is that EGTRRA mitigates, but doesn't fully eliminate, the lifetime tax increases facing many low-income households from making significant contributions to tax-deferred retirement accounts. Additional research is needed to understand how many low- and moderate-income households are paying higher taxes, at the margin, due to their saving through such accounts. Our sense is that most low- and moderate-income households are contributing less than the maximum possible amount to these accounts and are, thereby, limiting their losses. But even these households are being ill served in so far as they have been told by the government, their employers, and their financial advisors that saving in tax-deferred accounts will deliver major tax savings.

I. Introduction

With the Social Security system under financial pressure from the impending retirement of the baby boom generation, the government is trying to encourage additional saving through retirement accounts. EGTRRA -- the Economic Growth and Tax Relief Reconciliation Act of 2001 -- greatly expanded the limits on contributions to tax-deductible accounts, including 401(k), 403b, Keogh, and traditional IRA plans. It also raised contribution limits of non tax-deductible Roth IRAs. And, in a less well-known provision, it provided a significant non-refundable tax credit to low-income workers for qualified contributions up to $2,000.

The debate on these provisions proceeded with little discussion of the gains to potential winners. And they proceeded with no discussion of the losses to potential losers, since the general presumption was that participating in tax-favored saving vehicles could only benefit workers by reducing their lifetime taxes. As demonstrated in our recent study (Gokhale and Kotlikoff, 2001), this view is true for high-income workers, but mistaken for low- and moderate-income workers who participate fully in 401(k) and similar tax-deferred saving plans.

How can workers end up with higher lifetime taxes and lower lifetime spending by saving in a tax-deferred plan?[1] The answer is simply by raising their taxes in old age by more than they lower them when young, where taxes when young and when old are measured in terms of their value when young – what economists call their present value.

Can this really happen? It surely can, for four reasons. First, relatively large withdrawals from 401(k) and other tax-deferred accounts can place one in higher, indeed

[1] The terms "lifetime taxes" and "lifetime spending" refer to present values as of the beginning of one's adult life of all future tax payments and expenditures.

much higher, tax brackets in retirement than during one's working years. Second, the government can raise taxes when one retires. Third, significant contributions to tax-deferred retirement accounts can place one in lower tax brackets when young. This, in turn, will reduce the value of mortgage interest and other deductions. Third, and very importantly, shifting taxable income from youth to old age can substantially increase the share of Social Security benefits that become subject to federal income taxation.

This study uses *ESPlanner*^{TM} (Economic Security Planner), developed by Economic Security Planning, Inc., to calculate the gains or losses from contributing to tax-deferred as well as non tax-deferred retirement accounts. ESPlanner is a life-cycle financial planning model with highly detailed tax and Social Security benefit calculators. Its purpose is to help households maintain their living standards as they age. ESPlanner takes into account a host of economic and demographic factors. It can be used to evaluate the gains or losses from contributing to retirement accounts by simply running the program under different assumptions about retirement account contributions and comparing the results.

Applying ESPlanner to representative worker households generates some surprising conclusions. Start with workers contributing fully to a typical 401(k) under the old tax law. Specifically, take a typical 25-year old couple that initially earns $50,000 (each spouse earns $25,000), contributes to a 401(k), earns a 6 percent real rate of return on its investments, and experiences 1 percent real wage growth.[2] Rather than lowering their lifetime taxes, 401(k) participation raises the couple's lifetime tax payments by 1.1

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[2] This couple's initial 401(k) contribution is set at $6,500 per spouse, and its employers' contribution is set at $1,500 per spouse. Both contributions are assumed to grow in real terms by 1 percent in line with the couple's projected real wage growth.

percent and lowers their lifetime expenditures by 0.4 percent. The lifetime tax hike is 6.4 percent and the lifetime spending reduction is 1.7 percent if the couple earns an 8 percent real rate of return. These figures rise to 7.3 percent and 2.3 percent, respectively, if taxes are increased by 20 percent when the couple retires – a very realistic possibility given the federal government's long-term finances.

Compare these results with those for a couple initially earning $300,000 per year ($150,000 per spouse) who also contributes fully.[3] Assuming a 6 percent real return, this high-income couple receives a 6.7 percent lifetime tax break from 401(k) participation, which translates into a 3.8 percent increase in lifetime spending. At an 8 percent rate of return, these figures are 4.2 percent and 2.3 percent, respectively. Moreover, such couples would enjoy a very large lifetime subsidy even were tax rates to be raised by as much as a fifth when they retire.

These findings, while striking, neglect the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA). EGTRRA greatly expanded the limits on contributions to tax-deductible accounts, including 401(k), 403b, Keogh, and traditional IRA plans. It also raised the limit on contributions to non tax-deductible Roth IRAs. But, most important for the issue of tax fairness, it provided a non-refundable tax credit for qualified account contributions up to $2,000 made by low-earning workers. Depending on the income of the contributor, the credit can equal as much as 50 cents per dollar contributed.

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[3] In this case, each spouse's initial contribution is set at the new legal employee contribution maximum of $10,500 and the employer's initial contribution is set at $4,500 per spouse, the typical employer-matching rate. Each of these contribution amounts is assumed to grow in real terms by 1 percent in line with the couple's projected real wage growth.

The credit's impact on poor workers depends on its longevity and erosion via inflation. According to the law, the credit will end in 2007, and prior to 2007 there will be no adjustment to the nominal income levels at which the credit is phased out. If these provisions are retained, the tax credit will do little to nullify the lifetime tax hike low-income households potentially face from participating in tax-deferred retirement plans.

On the other hand, if the law is extended beyond 2007 and the AGI limits that determine eligibility are indexed to keep pace with inflation, the credit will make tax-deferred saving by low-income workers at least a breakeven proposition. For couples with somewhat higher incomes, the tax credits, even if temporary and non-indexed, are more meaningful because such couples pay enough taxes to receive the full value of the non-refundable credit.

Even were the credit made permanent and inflation-indexed, moderate-income households would not qualify for the credit and would still face higher lifetime taxes from full 401(k) participation. And while low-income workers would gain, rather than lose, from 401(k) participation, their gains would remain extremely small compared to those provided high-income workers.

In contrast to the possible losses or, at best, small gains facing low-income workers from tax-deferred contributions, participating in a Roth IRA provides a guaranteed and non-trivial lifetime tax saving. Unlike a 401(k) plan, a Roth IRA does not permit the deduction of contributions. On the other hand, neither principal nor accrued capital income are subject to taxation at the time of withdrawal. The Roth is a good deal for low-income workers even in the absence of the new credit. The new credit,

if made permanent and inflation indexed, would significantly improve the tax savings available to the poor from contributing to a Roth.

Indeed, since the Roth provides an unambiguous tax advantage to the poor, it could be used as the basis for equalizing the tax savings across different income groups. As shown here, limiting all workers to contributing at most $2,000 to a Roth would convert a highly regressive public policy into one that delivers roughly the same percentage reduction in lifetime tax payments for all workers.

The paper proceeds by showing the ambiguous sign of the tax benefit to 401(k) participation. It then describes ESPlanner and the stylized young households used in our analysis. Next come the findings, which are presented under a range of alternative assumptions about rates of return, wage growth, and future tax rates. These findings raise a number of policy questions, many of which are taken up in the conclusion.

II. The Ambiguous Tax Advantage to 401(k) Participation

To see the ambiguous nature of the lifetime tax effect of participating in a 401(k), consider an agent who lives for two periods, earning a wage of W when young and facing a rate of return of r. Suppose the agent contributes an amount H to her 401(k) plan when young. Then her lifetime budget constraint is given by:

$$(1) \qquad C_y + C_o/(1+r) = W - T_y[W-H-D_y] - T_o[Y_o + M(B,Y_o)]/(1+r) ,$$

where Y_o stands of taxable income in old age apart from Social Security benefits, i.e.,

$$Y_o = (W-T_y(W-H-D_y) -H-C_y)r + H(1+r) - D_o ,$$

C_y and C_o stand for consumption when young and old, respectively, $M(B,Y_o)$ stands for the amount of taxable Social Security benefits, D_y and D_o, stand for deductions when young and old, respectively, and $T_y(\ \ )$ and $T_o(\ \ )$ are tax functions determining income-tax payments when young and old. Note that taxable income when young is computed by deducting 401(k) contributions, whereas taxable income when old is computed by including principal plus interest earned on the contribution.

If Social Security benefits were not subject to taxation ($M(B,Y_o)$=0) and both tax functions were a fixed tax rate, τ, times their respective tax bases, the household's lifetime budget constraint would equal

$$(2)\quad C_y + C_o/(1+r) = W - \tau(W-H-D_y) - \tau\,[(W-\tau(W-H-D_y)-H-C_y)r+(1+r)H-D_o]/(1+r)]$$

The right-hand side of (2) is wages less the present value of lifetime tax payments. Collecting terms gives

$$(3)\ C_y + C_o/(1+r) = W-[\tau W-\tau D_y+\ \tau\,[(W(1-\tau)+\tau D_y-C_y)r-D_o]/(1+r)-\tau(1-\tau)Hr/(1+r)]$$

Lifetime net taxes are now written as the lifetime taxes that would be paid absent 401(k) contributions less the lifetime tax benefit of contributing to the 401(k). Holding C_y fixed, the larger is H the smaller is the agent's lifetime tax payment. Thus if tax rates are constant and additional taxable income in old age doesn't trigger additional taxation of Social Security benefits, the direct impact of contributing to a 401(k) plan is a reduction in lifetime taxes.

Such contributions may also indirectly lower lifetime taxes through their effect on consumption when young. Specifically, if the household is doing positive saving outside

of the 401(k), 401(k) contributions will be intra-marginal. In this case, the reduction in lifetime taxes from 401(k) contributions will likely be spent, in part, on more consumption when young. This will lower non-401(k) saving and the income taxes paid when old on non-401(k) asset income. If all saving is done through the 401(k), non-401(k) saving, $(W-\tau(W-H-D_y)-H-C_y)$, will equal zero, and lifetime taxes will consist solely of taxes on labor earnings net of deductions.[4]

Next consider equation (2) under the assumption that tax rates are invariant to the tax base, but different when the agent is young and old. In this case,

$$(4)\quad C_y+C_o/(1+r)=W-\{\tau_y(W-H-D_y)+\tau_o[(W-\tau_y(W-H-D_y)-H-C_y)r+H(1+r)-D_o]/(1+r)\},$$

or

$$(5)\quad C_y+C_o/(1+r) = W-\{\tau_y(W-D_y)+\tau_o[(W-\tau_y(W-D_y)-C_y)r-D_o]/(1+r)-[\tau_o(1-\tau_y)rH/(1+r)+(\tau_y-\tau_o)H]\}$$

From (5) it's clear that lifetime taxes can be *increased* by contributing to a 401(k) if the tax rate when old, τ_o, is sufficiently high compared with the tax rate when young, τ_y.

Prior to EGTRRA, the U.S. federal income tax had five marginal tax brackets with rates of 15 percent, 28 percent, 31 percent, 36 percent, and 39.6 percent. In the case of married couple filing jointly, the corresponding taxable income tax brackets for 2001 were \$0 to \$45,200, \$45,200 to \$109,250, \$109,250 to \$166,550, \$166,550 to \$297,350, and \$297,350 plus. These bracket amounts, which are indexed to inflation, are used in our initial calculations. We also used the then prevailing Massachusetts state income tax rate of 5.95 percent, which was levied on every dollar of taxable income. Of course,

[4] This is the well established point that 401(k) tax treatment effectively eliminates capital income taxation.

exemptions and deductions can make federal or state taxable income negative, in which case no tax is assessed, although the household may receive refundable tax credits of various kinds.

Under EGTRRA, a new 10 percent tax-rate bracket was introduced for a portion of taxable income previously taxed at the 15 percent marginal rate. For married couples, the taxable-income bracket for the new lower marginal rate is $12,000 through 2007. Thereafter the bracket increases to $14,000. These amounts are not indexed for inflation. Other tax rates will be gradually reduced through 2010 based on the following schedule:

Calendar Years	28% rate reduced to:	31% rate reduced to:	36% rate reduced to:	39.6% rate reduced to:
2001[1]-2003	27%	30%	35%	38.6%
2004-2005	26%	29%	34%	37.6%
2006 and later	25%	28%	33%	35.0%

[1] Effective July 1, 2001

In addition new provisions relating to gradually eliminating the marriage tax penalty, eliminating the phaseout of exemptions and deductions, child and earned income tax credits, and a new non-refundable credit against contributions to qualified plans are taken into account in the calculations implemented here. Massachusetts' income tax was also reduced at roughly the same time that EGTRRA was passed from 5.95 percent to 5.85 percent.

While the current U.S. federal income tax provides low- and middle-income households with lots of scope for moving into higher tax brackets, compound interest is a very powerful force, and one might expect that in a multi-period model the value of tax

deferral would outweigh most increases in marginal tax rates that a 401(k) contributor might experience. However, the progressivity of the tax schedule is only one reason that a 401(k) contributor, particularly those in low tax brackets, might wonder about the size of their ultimate tax savings. Another reason is the value of tax deductions. Although we've left it out of the notation, the tax rates τ_y and τ_o are themselves increasing functions of their respective tax bases.[5] Hence, the larger is H, the smaller will be τ_y and the larger will be τ_o. If $D_y > D_o$, raising H may lower the value of the tax deductions; it will definitely do so if D_o equals zero. Since mortgage interest deductions are generally the largest deduction for those who itemize and since such deductions are concentrated in youth, 401(k) participation has the potential to reduce the value of tax deductions.

A final and very important factor in assessing the tax implications of 401(k) participation is the taxation of Social Security benefits. If the function determining the amount of Social Security benefits that are included in taxable income, $M(B,Y_o)$, is increasing in Y_o, larger contributions to 401(k) plans will raise Y_o and, thereby, raise the amount of taxes paid on Social Security benefits.

How much of Social Security benefits are included in federal AGI (adjusted gross income) depends upon a pair of dollar limits--call them X1 and X2. For single filers these limits are $25,000 and $34,000 respectively. For joint filers they are $32,000 and $44,000 respectively. These limits are not indexed for inflation, meaning that as nominal incomes rise, an ever-larger share of benefits become subject to income taxation.[6]

[5] Or, at least, non-decreasing functions.

[6] The non-indexation of these limits appears to be the brainchild of David Stockman, President Reagan's first Director of the Office of Management and Budget. Stockman viewed this as a way of making necessary cuts in net benefits through time without anyone noticing.

To determine the amount of Social Security benefits that must be included in federal AGI, we first calculate *provisional income*--which is modified AGI (non-Social Security income including tax-exempt interest) plus half of the Social Security benefit. If provisional income exceeds X1, but not X2, half of the excess over X1 or half of the Social Security benefit, whichever is smaller, is included in AGI. If provisional income exceeds X2, then the amount to be included equals the smaller of two items: A) 50 percent of benefits or $6000, whichever is smaller, plus 85 percent of the excess of provisional income over X2 and B) 85 percent of benefits.

This is a rather complicated formula. To understand its implications, Table 1 and Figure 1 present the share of Social Security that are taxable for different combinations of Social Security benefits and the non-Social Security component of AGI (other income). The table and figure incorporate high nominal values of Social Security benefits because when currently young workers begin receiving their benefits, their nominal values will be substantially higher than they are today. For example, assuming a 3 percent rate of inflation, the equivalent of a $25,000 benefit in 2001 dollars would be $81,551 in 2040. The share of Social Security benefits subject to taxation is highly sensitive to the level of other income and somewhat sensitive to the level of benefits. Also note that, for the range of nominal Social Security benefits shown, the taxable share of benefits equals its maximum value of 85 percent for levels of other income of $100,000 or more. However, because of Social Security's taxable earnings ceiling, benefits are capped for very high earners. Hence, there's no scope for 401(k) participation to increase benefit taxation for very high-income households.

With progressive taxes, multiple periods of life, the option to itemize deductions, exemptions, tax credits, and the federal and, in some cases, state taxation of Social Security benefits, deriving an explicit formula for lifetime tax payments becomes intractable. But one can use ESPlanner to calculate annual tax payments and form their present value. Furthermore, one can run ESPlanner with and without 401(k) contributions to determine the change in lifetime taxes from 401(k) participation as well as its impact on the present value of lifetime spending.

III. ESPlanner

ESPlanner smoothes a household's living standard over its life cycle to the extent possible without having the household go into debt beyond their mortgage. The program has highly detailed federal income tax, state income tax, Social Security's payroll tax, and Social Security benefit calculators. The federal and state income-tax calculators determine whether the household should itemize its deductions, computes deductions and exemptions, deducts from taxable income contributions to tax-deferred retirement accounts, includes in taxable income withdrawals from such accounts as well as the taxable component of Social Security benefits, and calculates total tax liabilities after all applicable refundable and non refundable tax credits. These calculations are made separately for each year that the couple is alive as well as for each year a survivor may be alive.[7]

The program also takes into account the non-fungible nature of housing, bequest plans, economies of shared living, the presence of children under age 19, and the desire

[7] More details about the program are available in the manual and in research papers, which can be downloaded at www.esplanner.com.

of households to make "off-the-top" expenditures on college tuition, weddings, and other special expenses. Finally, ESPlanner simultaneously calculates the amounts of life insurance needed by each spouse to guarantee that potential survivors suffer no decline in their living standards compared with what would otherwise be the case.

ESPlanner's calculates time-paths of consumption expenditure, taxable saving, and term-life insurance holdings in constant (2001) dollars. Consumption in this context is everything the household gets to spend after paying for its "off-the-top" expenditures – its housing expenses, special expenditures, life insurance premiums, special bequests, taxes, and net contributions to tax-favored accounts. Given the household's demographic information, preferences, and borrowing constraints, ESPlanner uses dynamic programming to determine the highest sustainable and smoothest possible living standard over time, leaving the household with zero terminal assets apart from the equity in homes that the user has chosen to not sell.

ESPlanner's principal outputs are recommended time-paths of consumption expenditure, taxable saving, and term-life insurance holdings. The amount of recommended consumption expenditures varies from year to year in response to changes in the household's composition. It also rises when the household moves from a situation of being borrowing constrained to one of being unconstrained. Finally, recommended household consumption will change over time if users intentionally specify that they want their living standard to change. For example, if users specify that they desire a 10 percent higher living standard after a certain year in the future, the software will incorporate that preference in making its recommendations, provided that it does not violate a borrowing constraint. This borrowing constraint does not apply to mortgage debt, which the user

can freely specify. The user can also specify the amount of non-mortgage debt that the household is willing to incur in order to facilitate the smoothing of its living standard. In this study, we specify that non-mortgage debt limit at zero.

In our use of ESPlanner for this study, we consider how contributing to retirement accounts affects the present values of a household's total tax payments and spending, which is defined as the sum of consumption expenditures, special expenditures, housing expenditures, and life insurance premiums.

IV. Our Stylized Couples

Our stylized couples consist of a husband and wife, both of whom are age 25 and live at most to age 95. Each spouse works to age 65 and earns half of the household's total earnings, which range from $25,000 to $1 million per year when they are 25. Real earnings grow annually by 1 percent. The couples live in Massachusetts and have no initial assets apart from their homes. Each couple has two children. The first is born when the couple is age 25 and the second when the couple is age 30. The market value of each couple's house is set at three times household labor earnings as of age 25.

The couples purchase their homes at age 25 by paying 20 percent down and borrowing the remainder at 8 percent for 30 years. Annual homeowner's insurance, property taxes, and maintenance are set at 0.17 percent, 1 percent, and 1 percent of house value, respectively. Each child attends college for four years. A couple earning $25,000 per year spends, by assumption, $7,500 per child for each year of college. This college expense is set at $15,000 for couples earning $50,000 and $30,000 for couples earning $100,000 or $150,000. For couples earning $200,000 or more per year, annual college

expenses are capped at $35,000. There are no bequests apart from the value of home equity, which the couple chooses not to sell.

V. Contribution Levels

Our calculations assume elective employee contributions and employer matching contributions equal to the average of maximum contributions permitted by employer-provided defined contribution plans. The household's elective contribution is set at 13.5 percent of earnings. The employer-matching contribution is set at 3 percent of earnings. Hence, 401(k) contributions total 16.5 percent of earnings. At this contribution rate, the contribution ceiling limits the household's combined elective and employer contribution to $60,000 at earnings exceeding of $363,636.36.[8] We assume that this ceiling rises with real wages at the assumed 1 percent real growth rate. In modeling the old tax law, we also apply the current $10,500 limit on elective individual contributions and assume that limit also grows with real wages. In modeling the new tax law, we adhere to the increase in nominal contribution limits specified through 2006 (from $11,000 in 2001 by $1,000 per year to reach $15,000 in 2006), and then allow those limits to grow with real wages.[9]

In considering maximum contribution rates, which plans permit, on average, we don't mean to imply that all contribute at these rates. Indeed, as shown by Poterba, Venti, and Weiss (2001), most low- and moderate-income participants in 401(k) and similar tax-deferred saving plans appear to contribute at less than those rates. The most likely reason they don't contribute to the maximum is that they are liquidity constrained

[8] We assume this ceiling grows at 1 percent real per year.
[9] The new tax law specifies that the contribution limits will be indexed to inflation after 2006. However, we think it is likely that these limits will be adjusted over time for real wage growth. In modeling other

and find that every dollar they contribute requires a dollar sacrifice in immediate consumption. The precise number of workers who contribute at or close to the maximum levels is the subject of our ongoing research as is determining the share of workers for whom marginal contributions generate higher lifetime taxes.

Our method of determining the lifetime net tax benefit of 401(k) participation is to compare lifetime taxes and spending with and without such participation. But to make the comparison meaningful, we need to ensure that the couple's gross income is the same in both cases. To do so we increase each spouse's earnings in the case they don't contribute to a 401(k) plan by the amount the employer contributes to their plan in the case that they do contribute. Hence, in the no-401(k) participation case, this additional income is subject to immediate federal and state income taxation as well as to payroll taxation.

In equalizing the pre-tax compensation across the two cases, we are making the standard economic assumption that workers are paid their marginal productivity. Employer contributions to 401(k) plans are part of a total compensation package, where the total compensation equals the worker's marginal productivity. Since workers can receive this total payment by switching to an employer that doesn't offer a 401(k) plan, firms that don't contribute to 401(k) plans will be forced by the market place to pay their workers the equivalent amount in straight wages.

Indeed, were markets working appropriately, one would expect employers offering 401(k) plans to give their workers the option of receiving their full compensation directly in wage payments or to receive it partly in the form of employer 401(k)

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changes in the new tax law we assume they continue after 2010 rather than revert back to their current values as formally stipulated in the new law.

contributions. Since most firms with 401(k) plans don't offer this option, workers who realize that participating in a 401(k) plan is, at the margin, a tax trap have three options. The first is to try to persuade their employer to make their contribution to the worker's Roth IRA or other non-tax deferred saving account. The second is to persuade their employer to pay to them directly what they would otherwise contribute to the worker's 401(k) plan. And the third is to quit and find an employer who pays the same total pre-tax compensation, but has either no 401(k) plan or a less "generous" plan.

The new tax law permits employers to make tax-deductible contributions to Roth IRAs starting in 2006. But there is nothing to prevent employers from making equal-sized tax-deductible wage payments to workers and, with the worker's consent, transmitting these payments directly to the worker's Roth or other non tax-deferred saving account. The only difference between what will be possible in 2006 and what is possible now seems to be the fact that in 2006, the Roth contributions, like 401(k) contributions, will be exempt from the employer portion of the FICA tax and will also be counted with respect to ERISA's non-discrimination rules.

For workers who find themselves in a 401(k) tax trap and can't persuade their employers to make their 401(k) contributions to them as direct wage payments or as contributions to non tax-deferred saving accounts, switching employers, at least in the short run, may not be an attractive option. Such workers may be able to cut back on their own contributions without thereby reducing their employers' contributions on their behalf. If that alternative is not available, the worker's best strategy will almost surely be to remain in the 401(k) plan and accept having to pay higher taxes on a lifetime basis; i.e., the value of receiving the employer's contribution will almost always exceed the tax

savings available from staying on the job, but withdrawing from the plan. Hence, low-income workers who read or hear of this study should not immediately withdraw from their 401(k) plans. Instead, they need to consider how much they are contributing, the tax implications of their marginal contributions, and the employer contribution implications of their contributing less. If they find themselves facing higher taxes at the margin by being forced or coerced to participate in their 401(k) plans, the first option, again, is to approach their employer and request receipt of the employer contribution in an alternative form.

VI. Findings

Table 2 considers our stylized couple that has $50,000 in total initial annual labor income and earns a 6 percent real pre-tax rate of return on its investments inside as well as outside retirement accounts. The table is based on the tax law prior to the 2001 legislation and shows the percentage change in lifetime total tax payments and spending from 401(k) participation. It begins in the first row assuming the couple is not covered by Social Security, has no home, no children, and makes no college tuition payments. The remaining rows add in each of these elements. For each case, the present values of lifetime taxes and spending are formed using the same rate of return assumed in generating the data. The figures in the table report the percentage changes in lifetime taxes and spending.

If the couple has only labor earnings, 401(k) participation is a terrific deal, delivering a 26.2 percent reduction in combined lifetime federal-income, payroll, and state-income tax payments and an 8.7 percent rise in lifetime spending. However, once

Social Security is included in the scenario, these gains decline dramatically. The reason is the aforementioned federal income taxation of Social Security benefits.

The further addition of homeownership to the case transforms 401(k) participation into a roughly break-even proposition. The reason is that 401(k) participation lowers tax brackets when young and, consequently, the tax savings from deducting mortgage interest payments. If children are also added to the equation, 401(k) participation turns, on balance, into a bad deal. Children make 401(k) participation worse because the value of the tax exemptions for children is reduced when the couple's tax brackets are lowered in their child-raising years.

Finally, if the couple also opts to pay their children's college tuition, 401(k) participation really begins to hurt – specifically, it raises the couple's lifetime taxes by 1.1 percent and lowers its lifetime spending by .39 percent. How does paying college tuition interact with 401(k) participation? Well, when the couple pays college tuition it brings less regular wealth into retirement. Given the structure of federal income tax brackets, 401(k) participation generates a bigger increase in tax brackets in old age than occurs when there is more taxable income, including taxable capital income.

To further clarify the importance of Social Security benefit taxation, Table 2's last row considers how the household with Social Security benefits and payroll taxes, children, housing, and college tuition payments would fare from 401(k) participation were there no federal income taxation of Social Security benefits. In this case, participation lowers lifetime taxes by 2.3 percent and raises lifetime spending by 0.5 percent. Hence, federal income taxation of Social Security benefits can suffice to change 401(k) participation from a good deal to a bad one for moderate-income households.

Table 2's findings show that the gains or losses from 401(k) participation are highly sensitive to each particular household's economic and demographic circumstances. Furthermore, as the next table shows, two households with the same economic and demographic circumstances can end up with different gains or losses from 401(k) participation simply because one household earns a higher rate of returns on its investments than does the other.

Who Wins and Who Looses from 401(k) Participation?

Table 3 shows the impact of 401(k) participation on lifetime taxes and spending assuming our stylized couples earn either a 4, 6, or 8 percent real rate of return on their regular as well as 401(k) assets. In considering this table, note that because U.S. federal tax rate schedules are progressive (average tax rates rise with taxable income), a given percentage change in taxes translates into a higher percentage change in spending (with the opposite sign) for high-income than it does for low-income individuals.[10]

Look first at the couple with $50,000 per year in initial earnings. As we've seen, if the couple receives a 6 percent real return on its assets, 401(k) participation translates into 1.1 percent higher lifetime taxes and a 0.39 percent reduction in lifetime spending. What if the couple earns 8 percent, rather than 6 percent real on its assets? In this case, the tax hike is 6.4 percent, and the spending reduction is 1.7 percent. If, on the other hand, the couple earns a 4 percent real return, 401(k) participation leads to a 3.3 percent reduction in lifetime taxes and a 0.7 percent increase in lifetime spending. This finding -- that 401(k) participation is a worse deal if the couple receives a higher rate of return --

[10] Let S stand for the spending, E for earnings, T for taxes, and B for benefits, all measured in present value. Then $\Delta S/S = (T/(E+B-T))\Delta T/T$.

may seem odd because the gain from deferring capital income taxes is greater the larger is the rate of return. The explanation is, again, that higher retirement account withdrawals spells greater Social Security benefit taxation as well as higher marginal tax brackets.

Consider next the table's finding for upper income households. Households with incomes of $200,000 or more enjoy a very significant tax reduction from 401(k) participation regardless of the rate of return. The rich fare well, in part, because they already in top tax brackets and can't be driven into higher ones by participating in a 401(k). In addition, the full 85 percent of their Social Security benefits will be subject to income taxation regardless of their participating in a 401(k) plan.

The super-rich, represented in this table by a couple earning $1 million per year, don't fare as well in percentage terms as their somewhat less rich counterparts because their 401(k) contributions are subject to Congressionally imposed limits. Whether the rate of return is 4, 6, or 8 percent, the $1 million couple enjoys a roughly 3 percent increase in its lifetime spending. In absolute dollars, under the 6 percent return scenario, the spending improvement corresponds to about $20,000 per year.

The Impact of Changing Social Security Benefit Taxation

How would the gains from 401(k) participation change were Congress to index for inflation the threshold limits, which determine taxable Social Security benefits? For the $50,000 household, inflation indexing raises the nominal values of the thresholds and eliminates Social Security benefit taxation in the no-participation case. But with participation, indexing the limit makes no difference to Social Security benefit taxation.

The reason is that the 401(k) withdrawals are so large that non-Social Security taxable income exceeds the top limit even if that limit is inflation indexed. Indeed, despite the indexation of the thresholds, the full 85 percent of Social Security benefits remains taxable. Given that indexing the limits lowers the Social Security benefit taxes paid by the non 401(k) participating household and leaves unchanged the taxes paid by the 401(k) participating household, indexation makes participating in a 401(k) an even worse choice. Another option is eliminating Social Security benefit taxation altogether. Doing so changes all the negative lifetime spending changes in the 6 percent Table 3 column to positive values and reduces the size of spending reductions in the 8 percent column.

The Implications of Future Tax Increases and Bracket Adjustments

Table 4 repeats Table 3 but assumes that federal income tax rates will be increased by 20 percent when the couple reaches age 65. For a low-income ($25,000) couple earning 8 percent real, lifetime taxes are raised by almost 11 percent and lifetime spending is reduced by just over 2 percent. In contrast, high-income households continue to benefit substantially from their 401(k) saving program. For example, at a 4 percent real return, a couple earning $300,000 enjoys an 8.2 percent reduction in lifetime taxes that finances a 6.3 percent increase in lifetime spending.

Indexing federal income tax brackets to nominal wages rather than the price level is another policy we considered. This assumption precludes real bracket creep and means that our stylized households will be in lower tax brackets in retirement. Nonetheless, this

assumption makes little difference to calculated gains and losses from 401(k) participation.

Reducing Contributions

If fully participating in 401(k) plans is a bad deal for low-income workers, how would they fare if they reduced their contributions by 50 percent? The answer is much better. For example, at a 6 percent real rate of return, the $50,000 couple now enjoys a lifetime tax cut of 2.6 percent and a lifetime spending gain of 0.64 percent. Another way to limit contributions is to stop contributing after a certain number of years or to delay the onset of contributions. Either practice can transform 401(k) participation into a much better deal for the poor.

The fact that low- and moderate-income workers are likely to do better contributing less than the maximum allowable amounts (together with the severe borrowing constraints they are likely to face in making maximum contributions) helps explain the findings in Poterba, Venti, and Weiss (2001) that 401(k) participants typically contribute only about 9 percent of their earnings to their plans.

401(k) Participation and The New Tax Law

The low-income contribution tax credit provides, in the case of married couples filing a joint return, a 50-cent tax credit for each dollar contributed by the individual (as opposed to his or her employer) up to $2,000 provided adjusted gross income is less than $30,000. For gross income between $30,000 and $32,000, the credit is provided at a 20-

cent per dollar rate. And for gross income between $32,000 and $50,000 the credit is provided at a 10-cent per dollar rate. There is no credit if gross income exceeds $50,000.

Table 5 repeats Table 3 for the 6 percent return case for three different assumptions about the evolution of the new contribution tax credit. The first is that it the law is not changed, so that the credit is terminated after 2006. The second is that the credit is extended, but the thresholds for the credit aren't indexed for inflation. And the third is that the credit is extended indefinitely and the thresholds are indexed for inflation.

For the $25,000 couple, the credit does relatively little unless it is made permanent and indexed for inflation. In this case, 401(k) participation becomes a break-even proposition. The reason that the credit does relatively little for this couple, even if extended and indexed, is that the amount of the credit the couple ends up receiving is limited. The credit is available only to the extent that taxes are actually paid; i.e., it is non refundable. Since each year's available credit exceeds the couple's tax liability for that year, the couple never enjoys the full advantage of the credit.

If the couple starts out earning $35,000, the credit is more effective because the couple has more taxes against which the credit may be offset. Indeed, even if the credit is only temporary, the $35,000 couple will still break even, when one measures the policy in terms of its impact on lifetime spending. If the credit is made permanent and indexed, the couple will enjoy a 0.3 percent increase in lifetime spending. This, of course, is still small potatoes compared with the treatment of the rich.

Table 6 repeats table 5, but assumes the couple lives in Florida, which has no state income tax. A comparison of the two tables shows that the gains from 401(k) participation of both the poor and the rich are lower in Florida. This is to be expected

because the tax advantage of these accounts comes largely from tax-free asset accumulation and the lower the total tax levied on capital income, the smaller the gain from being in a 401(k). Since low-income Massachusetts' workers were already experiencing a net loss from 401(k) participation, moving them to Florida leads to an even larger percentage increase in lifetime net taxes from 401(k) participation.

Optimal 401(k) Contributions

Table 7 performs the simple experiment of comparing the lifetime taxes and spending under two cases—A and B--under the new tax law assuming that the new contribution credit is credit is extended indefinitely and the thresholds are indexed for inflation. For case A we assume that all contributions are terminated at age 45 and the household earners receive grossed up wages after age 45. Under Case B, we assume that full plan contributions continue to be made through retirement (as under Table 6's last two columns). Table 7 shows the percentage change in present values of taxes and spending calculated as $[(A/B)-1]\times 100$. The results show that when the rate of return is 8 percent, only upper income individuals benefit from continuing plan contributions beyond age 45. Under a 4 or 6 percent rate of return, middle-income households would do better by terminating plan contributions at age 45. Low-income households benefit from continuing to contribute at low rates of return because they continue to benefit from the non-refundable credit at older ages when real incomes are higher and hence federal income taxes are sufficiently positive to make the non-refundable credit effective.

Table 8 presents optimal annual contribution levels for our stylized couples. For low- and middle-income couples, contributing between 4 and 6 percent is optimal in

terms of minimizing lifetime taxes and maximizing lifetime spending. Interestingly, even a couple with $125,000 fares better if it limits its rate of contribution, in this case, to 5 percent. For couples with yet higher incomes, the contribution limit, which, under the new tax law, is $11,000, applies.

Contributing to Regular and Roth IRAs

Not all employers offer tax-deferred saving plans. For workers in such firms, access to tax-sheltered saving plans is limited to regular or Roth IRAs. The new law raises contribution limits from $2,000 to $5,000 between now and 2008 and then indexes the limit to inflation. Table 9 compares the lifetime tax and spending effects under the new law of investing either $2,000 or $5,000 in real 2001 dollars each year in either a traditional or Roth IRA. The table assumes a 6 percent real return. It also assumes, counterfactually, that low-income workers are able to contribute these same amounts. Finally, it assumes that the contribution credit is permanent and indexed for inflation.

The first two columns of the table deal with contributions to regular IRAs and repeat the lesson learned above that too much tax-deferred saving should be avoided by low-income households. Take the $25,000 couple. If it makes, on an inflation-adjusted basis, a $2,000 annual contribution to a regular IRA, it lowers its lifetime taxes by 1.2 percent and increases its lifetime spending by 0.2 percent. But if its real contribution is $5,000, rather than $2,000, it raises its lifetime taxes by 38 percent and lowers its lifetime spending by 5.5 percent! In contrast, contributing the same amounts to a Roth IRA generates lifetime tax savings and spending increases in both cases. Lifetime taxes are lowered by 9.5 percent and spending rises by 1.4 percent for the lowest-income

households when their contributions are constant in real terms at $2,000 annually. When the contributions are maintained in real terms at $5,000 per year, lifetime taxes are reduced by 9.0 percent and lifetime spending increases by 1.3 percent. These percentage spending increases are larger than those enjoyed by higher-income households if they, too, contributed similarly to Roth IRAs, but did not contribute to any other retirement account. This reflects the fact that a fixed annual Roth contribution is a smaller share of earnings the higher the household's income level.

For households with initial earning less than $50,000 per year, tax savings and spending gains are both smaller when Roth-IRA contributions are $5,000 per year than when they are $2,000 per year. A similar result obtains for the same households if Roth contributions grow faster than inflation by 1 percent annually rather than remaining fixed in real terms. The explanation for this surprising result is that larger Roth contributions leave the couple more liquidity constrained. Hence, when the second child arrives, the couple spends less on that child's consumption if it's contributing $5,000 to the Roth than if it is contributing $2,000. In spending less on the second child's consumption, the $5,000 contribution couple saves more in non tax-favored assets and ends up paying more taxes on its non tax-favored asset income.

Table 10 repeats the analysis of Table 9, but assumes that both IRA and Roth contributions rise with earnings. The results are similar to those just presented. Both tables show that a policy that eliminated 401(k) and other tax-deferred saving plans in favor of a constant or growing limit on Roth contributions would be much fairer than our current retirement saving policy.

Conclusion

The federal government has spent over a quarter of a Century encouraging workers of all stripes to save in tax-deferred retirement accounts. In promoting participation in such plans, the government has encouraged the belief that workers would be saving taxes on a lifetime, rather than simply a short-term, basis. For those at the upper end of the nation's income distribution, tax-deferred saving does, indeed, convey significant lifetime tax benefits. But for those at the lower end, 401(k)s and similar tax-deferred retirement accounts may represent a tax trap rather than a tax shelter. The credit for retirement account contributions included in the new tax law limits the damage to low-income savers, but does little to change the overall regressivity of tax-deferred saving incentives.

The good news for low- and moderate-income households is that contributing to Roth IRAs is guaranteed to save taxes over one's lifetime. Thanks to the new credit, these savings can be substantial for the lowest-income households. However, despite the credit, the tax gains remain meager for most low- and moderate-income households compared to those available to the rich from tax-deferred saving in general.

If the federal government were interested in transforming today's highly regressive saving incentive policy to one that provides the same percentage lifetime tax reduction at all earning levels, it would do well to consider replacing the current system with a simple Roth IRA available to all workers with a common, but low, contribution limit.

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Table 1

Share of Social Security Income Included in Taxable Income

Social Security Income →	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000	100,000
Other Income ↓										
10,000	0.00	0.00	0.00	0.00	0.03	0.07	0.10	0.14	0.17	0.20
20,000	0.00	0.00	0.05	0.10	0.14	0.19	0.22	0.25	0.27	0.28
30,000	0.15	0.20	0.23	0.28	0.31	0.33	0.34	0.35	0.36	0.37
40,000	0.59	0.56	0.51	0.49	0.48	0.47	0.46	0.46	0.45	0.45
50,000	0.85	0.85	0.80	0.70	0.65	0.61	0.58	0.56	0.55	0.54
60,000	0.85	0.85	0.85	0.85	0.82	0.75	0.71	0.67	0.64	0.62
70,000	0.85	0.85	0.85	0.85	0.85	0.85	0.83	0.78	0.74	0.71
80,000	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.83	0.79
90,000	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
100,000	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

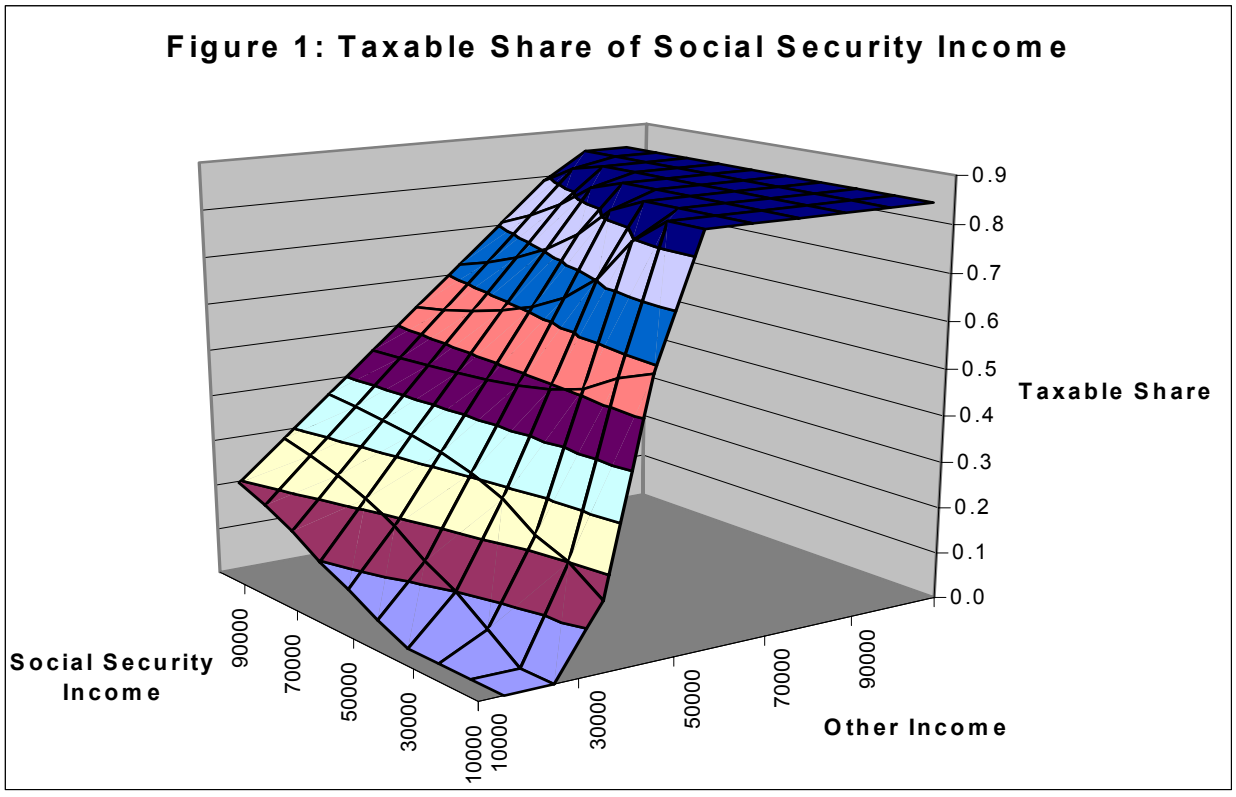

Table 2

Percentage Change in Lifetime Taxes and Spending from 401(k) Participation

Included Factors	Lifetime Taxes	Lifetime Spending
Earnings	-26.19	8.68
Earnings and Social Security	-4.71	1.49
Earnings, Social Security, and Housing	-0.56	0.07
Earnings, Social Security, Housing and Children	0.37	-0.19
Earnings, Social Security, Housing, Children, and College Tuition	1.10	-0.39
Earnings, Social Security, Housing, Children, College Tuition, but No Income Taxation of Social Security Benefits	-2.26	.50

Table assumes a stylized couple with $50,000 in initial labor earnings that earns a 6 percent real rate of return. Lifetime taxes equals the discounted actuarial present value of annual taxes paid through the end of life. Lifetime spending equals the discounted actuarial present value of annual spending through the end of life. Table shows percentage change in lifetime taxes and spending from 401(k) participation assuming couple contributes fully to the plan and that in the absence of participation, each spouse's employer makes a direct wage payment in lieu of his/her former 401(k) contribution.

Table 3

Percentage Change in Lifetime Taxes and Spending from 401(k) Participation

Calculations Based on Old Tax Law

Real Return →	4 percent		6 percent		8 Percent	
Couple's Total Age-25 Earnings	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**
25,000	-2.70	0.29	1.66	-0.36	9.37	-1.60
35,000	-3.27	0.49	1.88	-0.50	6.53	-1.49
50,000	-3.34	0.70	1.10	-0.39	6.38	-1.73
100,000	-5.23	1.95	-2.40	0.89	0.84	-0.35
150,000	-5.87	2.81	-2.44	1.15	0.38	-0.18
200,000	-8.32	4.33	-5.19	2.62	-2.56	1.24
250,000	-8.97	5.14	-6.55	3.58	-4.23	2.22
300,000	-8.43	5.10	-6.71	3.84	-4.23	2.31
1,000,000	-4.68	3.61	-4.56	3.24	-4.50	2.99

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings. Table shows percentage change in lifetime taxes and spending from 401(k) participation assuming couple contributes fully to the plan and that in the absence of participation, each spouse's employer makes a direct wage payment in lieu of his/her former 401(k) contribution.

Table 4

Percent Change in Lifetime Taxes and Spending from 401(k) Participation Assuming 20 Percent Higher Tax Liability After Retirement

Calculations Based on Old Tax Law

Real Return →	4 percent		6 percent		8 Percent	
Age-25 Earnings	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**
25,000	-2.45	0.30	2.27	-0.51	10.69	-2.03
35,000	-2.85	0.47	2.81	-0.80	7.71	-1.99
50,000	-2.49	0.57	2.10	-0.75	7.29	-2.27
100,000	-4.39	1.94	-1.65	0.71	1.49	-0.71
150,000	-4.94	2.84	-1.73	0.98	0.87	-0.49
200,000	-7.60	4.88	-4.59	2.85	-2.12	1.27
250,000	-8.55	6.15	-5.99	4.10	-3.81	2.50
300,000	-8.15	6.25	-6.29	4.57	-3.75	2.58
1,000,000	-5.01	5.17	-4.79	4.52	-4.55	3.99

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings. Table shows percentage change in lifetime taxes and spending from 401(k) participation assuming couple contributes fully to the plan and that in the absence of participation, each spouse's employer makes a direct wage payment in lieu of his/her former 401(k) contribution.

Table 5

Percentage Change in Lifetime Taxes and Spending from 401(k) Participation for Alternative Assumptions about the Contribution Tax-Credit

New Tax Law, Real Rate of Return is 6 Percent

	Credit Not Extended and Not Indexed		Credit Extended, but Not Indexed		Credit Extended and Indexed	
Age-25 Earnings	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**
25,000	1.35	-0.29	1.23	-0.27	-0.68	0.02
35,000	-0.68	0.05	-0.95	0.11	-2.08	0.34
50,000	1.07	-0.36	1.07	-0.36	0.58	-0.24
100,000	-2.79	1.00	-2.79	1.00	-2.79	1.00
150,000	-3.43	1.58	-3.43	1.58	-3.43	1.58
200,000	-4.97	2.43	-4.97	2.43	-4.97	2.43
250,000	-6.26	3.26	-6.26	3.26	-6.26	3.26
300,000	-6.69	3.61	-6.69	3.61	-6.69	3.61
1,000,000	-4.64	2.93	-4.64	2.93	-4.64	2.93

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings. Table shows percentage change in lifetime taxes and spending from 401(k) participation assuming couple contributes fully to the plan and that in the absence of participation, each spouse's employer makes a direct wage payment in lieu of his/her former 401(k) contribution.

Table 6

Percentage Change in Lifetime Taxes and Spending from 401(k) Participation for Alternative Assumptions about the Contribution Tax-Credit

Residence in Florida; New Tax Law; Real Rate of Return is 6 Percent

	Credit Not Extended and Not Indexed		Credit Extended, but Not Indexed		Credit Extended and Indexed	
Age-25 Earnings	**Taxes**	**Spending**	**Taxes**	**Spending**	**Taxes**	**Spending**
25,000	5.01	-0.62	4.86	-0.61	-0.75	0.00
35,000	0.36	-0.14	0.02	-0.08	-2.26	0.27
50,000	1.57	-0.4	1.57	-0.4	0.79	-0.24
100,000	-4.16	1.22	-4.16	1.22	-4.16	1.22
150,000	-4.02	1.54	-4.02	1.54	-4.02	1.54
200,000	-6.21	2.55	-6.21	2.55	-6.21	2.55
250,000	-6.76	2.96	-6.76	2.96	-6.76	2.96
300,000	-7.27	3.31	-7.27	3.31	-7.27	3.31
1,000,000	-4.64	2.47	-4.64	2.47	-4.64	2.47

Note: Lifetime taxes and spending refer to the present values of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums.
Na – these values are being calculated and are not yet available.

Table 7

Percentage Change in Lifetime Taxes and Spending from 401(k) Participation: Participation Through Age 45 Versus Participation Through Retirement

Residence in Massachusetts; New Tax Law; Non-Refundable Credit Extended and Indexed

Real Return →	4 percent		6 percent		8 percent	
Age-25 Earnings	**Taxes**	**Spending**	**Taxes**	**Spending**	**Taxes**	**Spending**
25,000	1.94	-0.28	0.15	-0.03	-0.8	0.13
35,000	0.22	-0.04	-2.23	0.45	-2.18	0.47
50,000	-0.37	0.09	-2.14	0.55	-1.6	0.43
100,000	-0.02	0.01	-0.48	0.18	-0.6	0.22
150,000	0.91	-0.39	-0.86	0.38	-0.31	0.13
200,000	2.36	-1.05	-0.78	0.35	-0.31	0.14
250,000	3.35	-1.58	0.32	-0.15	0.19	-0.09
300,000	3.18	-1.57	0.83	-0.4	0.14	-0.07
1,000,000	1.52	-0.83	1.36	-0.67	1	-0.43

Note: Lifetime taxes and spending refer to the present values of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Percentage change is calculated as $[(A/B)-1]\times 100$, where A refers to present value if participating through age 45 and B refers to present value if participating through retirement.

Table 8

How Much Should Couples Contribute to 401(k) Plans?

Household Income	Income Per Spouse	Optimum Contribution Per Spouse in First Year ($)	Employer Match in First Year ($)	Employee Contribution as Percent of Income	Percent Reduction in Lifetime Taxes	Percent Increase in Lifetime Spending
25,000	12,500	750	375	6.00	8.64	1.23
35,000	17,500	1050	525	6.00	6.20	1.19
50,000	25,000	1000	500	4.00	4.43	1.05
100,000	50,000	2000	1000	4.00	4.78	1.75
150,000	75,000	3750	1875	5.00	4.65	2.15
200,000	100,000	6000	3000	6.00	5.86	2.86
250,000	125,000	6250	3125	5.00	6.26	3.26
300,000	150,000	11000	4500	7.33	6.66	3.60
1,000,000	500,000	11000	5500	2.20	4.53	2.86

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings.

Table 9

Percent Change in Lifetime Taxes and Spending from Participating in Regular and Roth IRA Plans

Constant Annual Contribution in 2001 Dollars
Credit is Permanent and Indexed, 6 Percent Real Rate of Return

	Regular IRA ($2000/spouse/year)		Regular IRA ($5000/spouse/year)		Roth IRA ($2000/spouse/year)		Roth IRA ($5000/spouse/year)	
Age-25 Earnings	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**
25,000	-1.22	0.18	37.90	-5.47	-9.48	1.37	-8.96	1.29
35,000	-4.59	0.92	9.11	-1.83	-3.98	0.80	-3.85	0.77
50,000	-3.33	0.83	2.87	-0.71	-3.29	0.82	-3.25	0.81
100,000	-2.93	1.07	-3.47	1.27	-3.59	1.31	-3.64	1.33
150,000	-2.27	1.04	-4.45	2.03	-2.63	1.20	-3.95	1.80
200,000	-2.04	0.98	-4.11	1.98	-2.33	1.12	-4.97	2.39
250,000	-1.73	0.89	-3.69	1.90	-2.23	1.14	-4.41	2.26
300,000	-1.50	0.80	-3.38	1.80	-1.97	1.05	-4.00	2.13
1,000,000	-0.68	0.43	-1.55	0.98	-1.03	0.65	-2.25	1.42

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings. Table assumes, counterfactually, that upper-income couples are eligible to contribute to IRAs.

Table 10

Percent Change in Lifetime Taxes and Spending from Participating in Regular and Roth IRA Plans

Annual Contribution Grows 1 Percent Faster Than Inflation
Credit is Permanent and Indexed, 6 Percent Real Rate of Return

	Regular IRA ($2000/spouse/year)		Regular IRA ($5000/spouse/year)		Roth IRA ($2000/spouse/year)		Roth IRA ($5000/spouse/year)	
Age-25 Earnings	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**	**Lifetime Taxes**	**Lifetime Spending**
25,000	1.03	-0.15	45.72	-6.60	-9.31	1.34	-7.50	1.08
35,000	-3.73	0.75	12.62	-2.54	-3.92	0.79	-3.38	0.68
50,000	-3.06	0.76	4.31	-1.07	-3.25	0.81	-2.95	0.74
100,000	-3.26	1.19	-3.37	1.23	-3.61	1.32	-3.54	1.30
150,000	-2.52	1.15	-4.63	2.11	-2.97	1.36	-3.93	1.79
200,000	-2.23	1.07	-4.53	2.17	-2.63	1.26	-5.04	2.42
250,000	-1.99	1.02	-4.05	2.08	-2.51	1.29	-4.84	2.48
300,000	-1.75	0.93	-3.77	2.01	-2.23	1.19	-4.43	2.36
1,000,000	-0.76	0.48	-1.74	1.09	-1.16	0.73	-2.52	1.58

Note: Lifetime taxes and spending refer to the present value of the couples' annual taxes and spending on consumption, housing, college tuition, and life insurance premiums. Each spouse earns half of couple's total earnings. Table assumes, counterfactually, that upper-income couples are eligible to contribute to IRAs.